

# **CRESTONE PEAK RESOURCES**

**ARAPAHOE COUNTY**

**SEC 15-T4S-R65W**

**LONE TREE 4-65 15-16 4AH**

**OWB**

**Design: FINAL SURVEY**

## **Standard Survey Report**

**05 December, 2022**

Project: ARAPAHOE COUNTY  
 Site: SEC 15-T4S-R65W  
 Well: LONE TREE 4-65 15-16 4AH  
 Wellbore: OWB  
 Design: FINAL SURVEY

PROJECT DETAILS: ARAPAHOE COUNTY  
 Geodetic System: US State Plane 1983  
 Datum: North American Datum 1983  
 Ellipsoid: GRS 1980  
 Zone: Colorado Central Zone  
 System Datum: Mean Sea Level



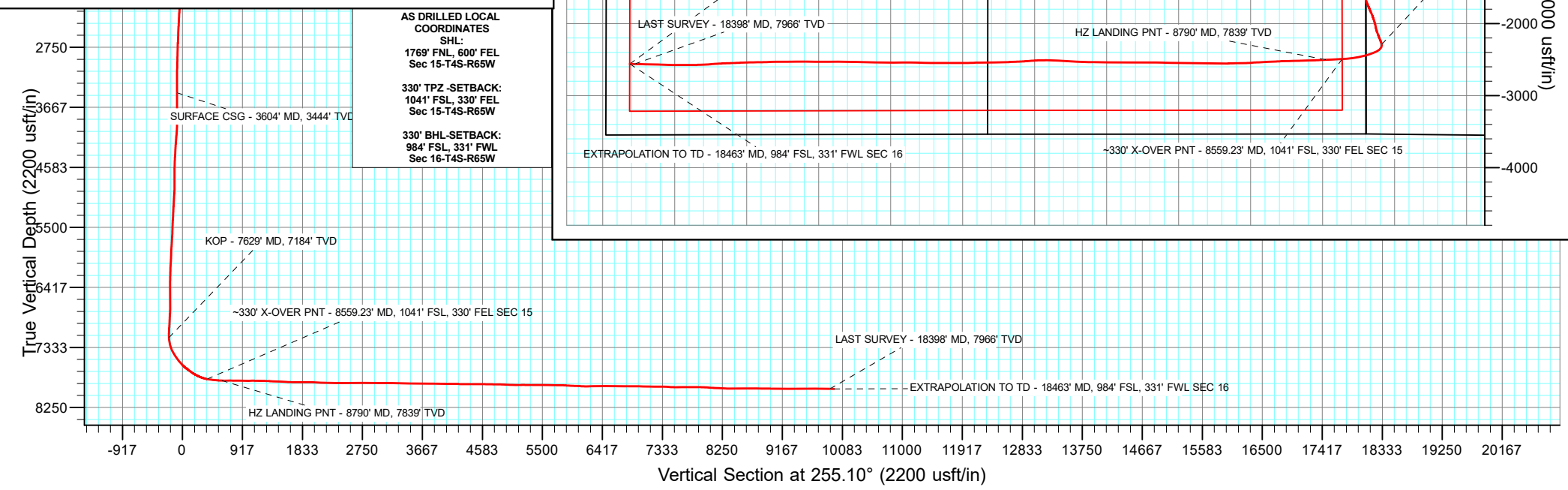
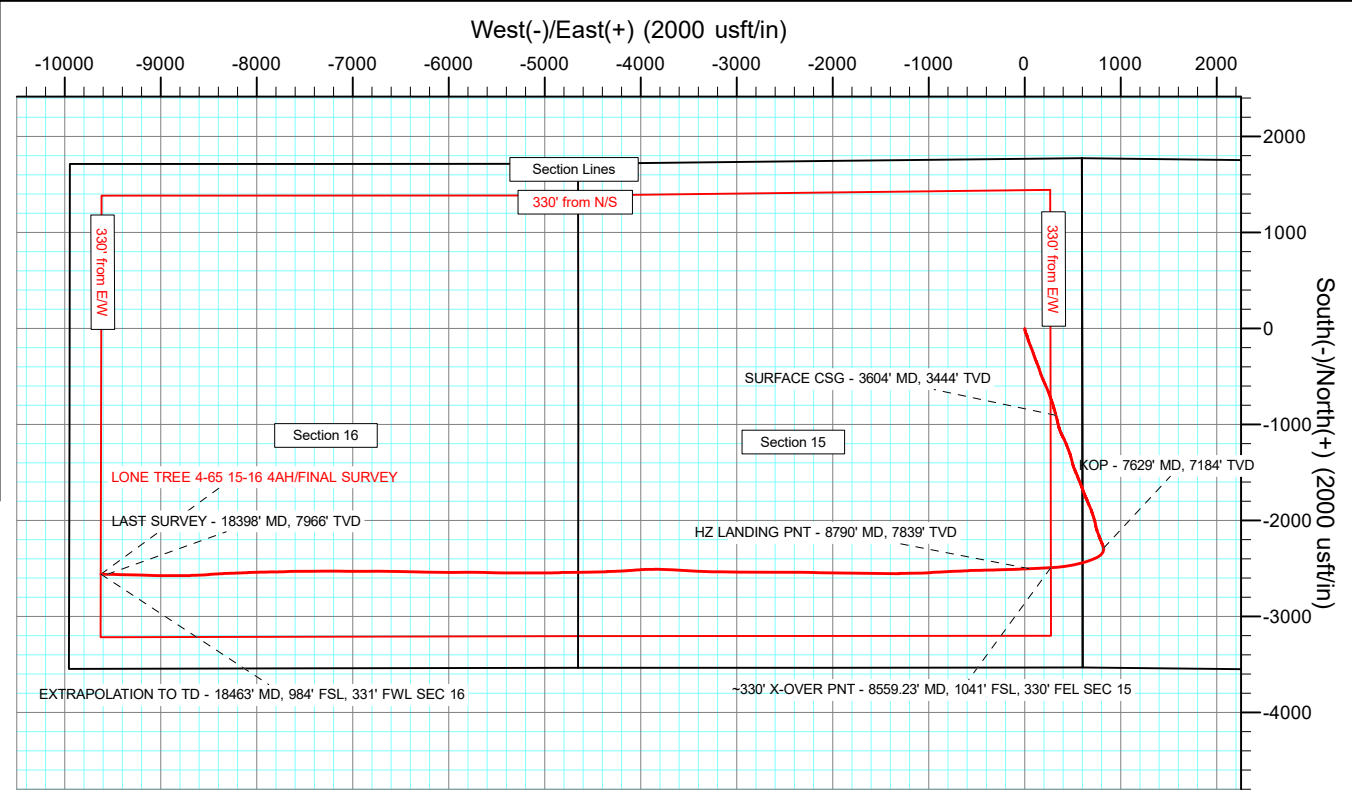
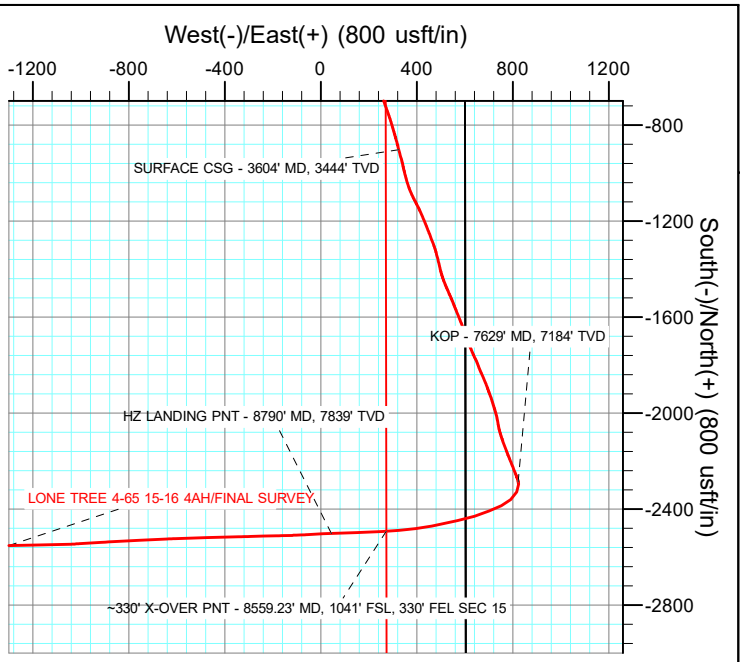
Azimuths to True North  
 Magnetic North: 7.65°  
 Magnetic Field  
 Strength: 51525.2nT  
 Dip Angle: 66.09°  
 Date: 2/10/2022  
 Model: IGRF2020

WELL DETAILS: LONE TREE 4-65 15-16 4AH

+N/-S	+E/-W	Northing	Easting	5693.30 Latitude	Longitude	Slot
0.00	0.00	1683280.37	3241110.37	39.706284°N	104.643033°W	

ANNOTATIONS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Vsect	Departure	Annotation
3604.00	14.14	165.37	3444.13	-902.03	325.31	-82.45	959.11	SURFACE CSG - 3604' MD, 3444' TVD
7629.00	19.99	170.18	7184.37	-2286.69	823.05	-207.45	2434.43	KOP - 7629' MD, 7184' TVD
8559.23	79.06	267.11	7816.43	-2491.42	273.49	376.28	3060.76	~330' X-OVER PNT - 8559.23' MD, 1041' FSL, 330' FEL SEC 15
8790.00	88.98	267.59	7839.05	-2501.23	44.23	600.35	3289.87	HZ LANDING PNT - 8790' MD, 7839' TVD
18398.00	89.45	270.46	7966.34	-2560.47	-9556.87	9893.91	12895.13	LAST SURVEY - 18398' MD, 7966' TVD
18463.00	89.45	270.46	7966.97	-2559.95	-9621.86	9956.58	12960.13	EXTRAPOLATION TO TD - 18463' MD, 984' FSL, 331' FWL SEC 16



AS DRILLED LOCAL COORDINATES  
 SHL  
 1769' FNL, 600' FEL  
 Sec 15-T4S-R65W  
 330' TPZ-SETBACK:  
 1041' FSL, 330' FEL  
 Sec 15-T4S-R65W  
 330' BHL-SETBACK:  
 984' FSL, 331' FWL  
 Sec 16-T4S-R65W

## Survey Report

<b>Company:</b> CRESTONE PEAK RESOURCES	<b>Local Co-ordinate Reference:</b> Well LONE TREE 4-65 15-16 4AH
<b>Project:</b> ARAPAHOE COUNTY	<b>TVD Reference:</b> KB 25' @ 5718.30usft
<b>Site:</b> SEC 15-T4S-R65W	<b>MD Reference:</b> KB 25' @ 5718.30usft
<b>Well:</b> LONE TREE 4-65 15-16 4AH	<b>North Reference:</b> True
<b>Wellbore:</b> OWB	<b>Survey Calculation Method:</b> Minimum Curvature
<b>Design:</b> FINAL SURVEY	<b>Database:</b> EDT_32Bit_ODBC

<b>Project</b> ARAPAHOE COUNTY		
<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 Central Zone	Using geodetic scale factor	

<b>Site</b> SEC 15-T4S-R65W		
<b>Site Position:</b>	<b>Northing:</b> 1,685,061.36 usft	<b>Latitude:</b> 39.711158°N
<b>From:</b> Lat/Long	<b>Easting:</b> 3,241,690.88 usft	<b>Longitude:</b> 104.640910°W
<b>Position Uncertainty:</b> 0.00 usft	<b>Slot Radius:</b> 13.200 in	<b>Grid Convergence:</b> 0.54 °

<b>Well</b> LONE TREE 4-65 15-16 4AH		
<b>Well Position</b> +N/-S 0.00 usft	<b>Northing:</b> 1,683,280.36 usft	<b>Latitude:</b> 39.706284°N
+E/-W 0.00 usft	<b>Easting:</b> 3,241,110.37 usft	<b>Longitude:</b> 104.643033°W
<b>Position Uncertainty</b> 0.00 usft	<b>Wellhead Elevation:</b> usft	<b>Ground Level:</b> 5,693.30 usft

<b>Wellbore</b> OWB					
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2020	2/10/2022	7.65	66.09	51,525.24349671

<b>Design</b> FINAL SURVEY					
<b>Audit Notes:</b>					
<b>Version:</b> 1.0	<b>Phase:</b> ACTUAL	<b>Tie On Depth:</b> 0.00			
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	255.10	

<b>Survey Program</b>		<b>Date</b> 12/5/2022		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
302.00	3,554.00	SURFACE SURVEY (OWB)	MWD OWSG	OWSG MWD - Standard
3,683.00	18,463.00	FINAL SURVEY (OWB)	MWD OWSG	OWSG MWD - Standard

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
211.00	0.60	162.40	211.00	-1.00	0.32	-0.05	0.00	0.00	0.00
302.00	1.20	152.10	301.98	-2.30	0.91	-0.29	0.68	0.66	-11.32
376.00	1.70	160.80	375.96	-4.02	1.63	-0.55	0.74	0.68	11.76
463.00	3.60	169.70	462.86	-7.92	2.55	-0.42	2.23	2.18	10.23
550.00	5.70	168.80	549.57	-14.85	3.87	0.07	2.42	2.41	-1.03
638.00	6.40	170.40	637.08	-23.97	5.54	0.81	0.82	0.80	1.82
725.00	7.80	162.10	723.42	-34.37	8.16	0.95	1.99	1.61	-9.54
812.00	9.30	156.50	809.45	-46.44	12.78	-0.41	1.97	1.72	-6.44
899.00	12.00	156.50	894.94	-61.18	19.19	-2.82	3.10	3.10	0.00
986.00	13.90	162.10	979.73	-79.42	26.01	-4.72	2.61	2.18	6.44

## Survey Report

<b>Company:</b>	CRESTONE PEAK RESOURCES	<b>Local Co-ordinate Reference:</b>	Well LONE TREE 4-65 15-16 4AH
<b>Project:</b>	ARAPAHOE COUNTY	<b>TVD Reference:</b>	KB 25' @ 5718.30usft
<b>Site:</b>	SEC 15-T4S-R65W	<b>MD Reference:</b>	KB 25' @ 5718.30usft
<b>Well:</b>	LONE TREE 4-65 15-16 4AH	<b>North Reference:</b>	True
<b>Wellbore:</b>	OWB	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL SURVEY	<b>Database:</b>	EDT_32Bit_ODBC

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
1,074.00	16.30	164.30	1,064.68	-101.37	32.60	-5.44	2.80	2.73	2.50	
1,161.00	18.10	160.90	1,147.79	-125.90	40.33	-6.60	2.37	2.07	-3.91	
1,248.00	20.00	159.30	1,230.02	-152.59	50.01	-9.10	2.26	2.18	-1.84	
1,335.00	20.90	157.90	1,311.54	-180.89	61.11	-12.55	1.18	1.03	-1.61	
1,423.00	21.80	158.40	1,393.50	-210.62	73.03	-16.42	1.04	1.02	0.57	
1,510.00	22.63	159.70	1,474.04	-241.34	84.78	-19.88	1.11	0.95	1.49	
1,597.00	23.30	161.60	1,554.15	-273.37	96.02	-22.51	1.15	0.77	2.18	
1,684.00	24.40	160.70	1,633.72	-306.66	107.39	-24.94	1.33	1.26	-1.03	
1,771.00	22.00	156.70	1,713.68	-338.59	119.78	-28.70	3.30	-2.76	-4.60	
1,858.00	19.37	157.85	1,795.07	-366.92	131.67	-32.90	3.06	-3.02	1.32	
1,946.00	20.43	159.26	1,877.81	-394.80	142.61	-36.31	1.32	1.20	1.60	
2,033.00	22.10	161.89	1,958.89	-424.56	153.08	-38.77	2.21	1.92	3.02	
2,120.00	22.50	162.60	2,039.38	-456.00	163.14	-40.41	0.55	0.46	0.82	
2,207.00	22.30	159.90	2,119.82	-487.39	173.79	-42.64	1.20	-0.23	-3.10	
2,294.00	21.90	156.30	2,200.43	-517.75	185.99	-46.62	1.62	-0.46	-4.14	
2,382.00	20.10	155.70	2,282.58	-546.56	198.81	-51.60	2.06	-2.05	-0.68	
2,469.00	17.80	156.30	2,364.86	-572.36	210.31	-56.07	2.65	-2.64	0.69	
2,556.00	16.80	156.60	2,447.92	-596.08	220.64	-59.97	1.15	-1.15	0.34	
2,643.00	16.90	157.00	2,531.19	-619.26	230.58	-63.61	0.18	0.11	0.46	
2,730.00	17.20	157.20	2,614.36	-642.76	240.50	-67.16	0.35	0.34	0.23	
2,817.00	18.40	158.50	2,697.20	-667.39	250.52	-70.51	1.45	1.38	1.49	
2,904.00	18.40	160.10	2,779.75	-693.08	260.23	-73.28	0.58	0.00	1.84	
2,992.00	19.90	160.30	2,862.88	-720.24	270.00	-75.75	1.71	1.70	0.23	
3,079.00	19.30	160.50	2,944.84	-747.73	279.79	-78.14	0.69	-0.69	0.23	
3,166.00	20.90	162.10	3,026.54	-776.05	289.36	-80.10	1.94	1.84	1.84	
3,253.00	20.30	163.50	3,107.97	-805.29	298.42	-81.34	0.89	-0.69	1.61	
3,341.00	18.00	163.90	3,191.10	-832.99	306.53	-82.05	2.62	-2.61	0.45	
3,428.00	16.20	164.50	3,274.25	-857.61	313.50	-82.46	2.08	-2.07	0.69	
3,515.00	15.40	165.20	3,357.96	-880.47	319.69	-82.57	0.95	-0.92	0.80	
3,554.00	14.30	165.50	3,395.66	-890.14	322.22	-82.52	2.83	-2.82	0.77	
3,604.00	14.14	165.37	3,444.13	-902.03	325.31	-82.45	0.32	-0.32	-0.27	
<b>SURFACE CSG - 3604' MD, 3444' TVD</b>										
3,683.00	13.89	165.15	3,520.77	-920.53	330.18	-82.40	0.32	-0.32	-0.27	
3,778.00	13.43	163.41	3,613.09	-942.13	336.25	-82.72	0.65	-0.48	-1.83	
3,872.00	16.85	168.65	3,703.82	-965.95	342.05	-82.20	3.92	3.64	5.57	
3,967.00	20.29	165.62	3,793.86	-995.42	348.85	-81.19	3.76	3.62	-3.19	
4,061.00	22.43	165.01	3,881.40	-1,028.53	357.54	-81.07	2.29	2.28	-0.65	
4,250.00	23.51	153.97	4,055.49	-1,097.27	383.42	-88.41	2.35	0.57	-5.84	
4,344.00	20.43	152.06	4,142.65	-1,128.62	399.34	-95.74	3.36	-3.28	-2.03	
4,439.00	22.39	155.48	4,231.10	-1,159.73	414.62	-102.50	2.45	2.06	3.60	
4,534.00	22.90	157.40	4,318.77	-1,193.26	429.23	-108.00	0.95	0.54	2.02	
4,629.00	24.94	158.54	4,405.61	-1,228.97	443.67	-112.77	2.20	2.15	1.20	
4,818.00	22.21	159.60	4,578.82	-1,299.55	470.70	-120.75	1.46	-1.44	0.56	

## Survey Report

<b>Company:</b>	CRESTONE PEAK RESOURCES	<b>Local Co-ordinate Reference:</b>	Well LONE TREE 4-65 15-16 4AH
<b>Project:</b>	ARAPAHOE COUNTY	<b>TVD Reference:</b>	KB 25' @ 5718.30usft
<b>Site:</b>	SEC 15-T4S-R65W	<b>MD Reference:</b>	KB 25' @ 5718.30usft
<b>Well:</b>	LONE TREE 4-65 15-16 4AH	<b>North Reference:</b>	True
<b>Wellbore:</b>	OWB	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL SURVEY	<b>Database:</b>	EDT_32Bit_ODBC

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
4,913.00	23.31	165.29	4,666.43	-1,334.56	481.73	-122.41	2.59	1.16	5.99	
5,103.00	21.73	166.73	4,841.94	-1,405.16	499.35	-121.29	0.88	-0.83	0.76	
5,197.00	25.10	160.42	4,928.20	-1,440.89	510.04	-122.42	4.46	3.59	-6.71	
5,292.00	22.42	156.40	5,015.15	-1,476.49	524.04	-126.81	3.29	-2.82	-4.23	
5,386.00	19.30	156.05	5,102.97	-1,507.12	537.53	-131.96	3.32	-3.32	-0.37	
5,481.00	21.52	158.11	5,192.01	-1,537.64	550.40	-136.55	2.46	2.34	2.17	
5,575.00	24.59	158.00	5,278.49	-1,571.78	564.16	-141.07	3.27	3.27	-0.12	
5,670.00	23.59	158.22	5,365.21	-1,607.76	578.62	-145.79	1.06	-1.05	0.23	
5,764.00	21.40	157.96	5,452.06	-1,641.12	592.03	-150.18	2.33	-2.33	-0.28	
5,859.00	25.05	161.61	5,539.35	-1,676.29	604.89	-153.56	4.13	3.84	3.84	
5,953.00	23.87	158.96	5,624.91	-1,712.93	617.99	-156.81	1.71	-1.26	-2.82	
6,048.00	21.67	156.25	5,712.51	-1,746.93	631.96	-161.56	2.56	-2.32	-2.85	
6,142.00	19.21	153.86	5,800.58	-1,776.70	645.77	-167.25	2.76	-2.62	-2.54	
6,237.00	19.12	160.91	5,890.33	-1,805.44	657.74	-171.43	2.44	-0.09	7.42	
6,332.00	19.58	154.71	5,979.97	-1,834.53	669.63	-175.44	2.21	0.48	-6.53	
6,521.00	18.64	160.07	6,158.57	-1,891.57	693.46	-183.80	1.05	-0.50	2.84	
6,616.00	21.68	159.55	6,247.74	-1,922.29	704.77	-186.83	3.21	3.20	-0.55	
6,710.00	23.51	163.16	6,334.52	-1,956.51	716.27	-189.15	2.44	1.95	3.84	
6,805.00	19.83	162.70	6,422.79	-1,990.04	726.55	-190.46	3.88	-3.87	-0.48	
6,899.00	18.69	168.00	6,511.54	-2,020.00	734.42	-190.37	2.22	-1.21	5.64	
6,994.00	20.00	170.77	6,601.17	-2,050.93	740.20	-188.00	1.68	1.38	2.92	
7,088.00	20.80	163.31	6,689.29	-2,082.78	747.57	-186.93	2.89	0.85	-7.94	
7,182.00	24.45	159.75	6,776.05	-2,117.04	759.10	-189.27	4.15	3.88	-3.79	
7,277.00	26.62	159.65	6,861.76	-2,155.44	773.31	-193.12	2.28	2.28	-0.11	
7,371.00	23.31	157.72	6,946.97	-2,192.41	787.69	-197.51	3.63	-3.52	-2.05	
7,466.00	24.76	158.69	7,033.73	-2,228.33	802.04	-202.15	1.58	1.53	1.02	
7,560.00	22.16	157.36	7,119.96	-2,263.04	816.02	-206.74	2.82	-2.77	-1.41	
7,629.00	19.99	170.18	7,184.37	-2,286.69	823.05	-207.45	7.37	-3.15	18.59	
<b>KOP - 7629' MD, 7184' TVD</b>										
7,655.00	19.44	175.63	7,208.85	-2,295.38	824.13	-206.26	7.37	-2.11	20.94	
7,749.00	24.47	205.95	7,296.28	-2,328.61	816.78	-190.61	13.01	5.35	32.26	
7,843.00	27.74	229.65	7,380.91	-2,360.37	791.51	-158.03	11.55	3.48	25.21	
7,937.00	32.16	244.58	7,462.45	-2,385.32	752.17	-113.59	9.19	4.70	15.88	
8,032.00	39.36	247.60	7,539.50	-2,407.69	701.41	-58.79	7.80	7.58	3.18	
8,126.00	47.58	252.65	7,607.68	-2,429.44	640.61	5.56	9.49	8.74	5.37	
8,221.00	52.27	257.59	7,668.84	-2,447.98	570.39	78.19	6.34	4.94	5.20	
8,315.00	56.51	258.52	7,723.56	-2,463.78	495.64	154.49	4.58	4.51	0.99	
8,410.00	64.67	260.83	7,770.18	-2,478.53	414.29	236.90	8.85	8.59	2.43	
8,504.00	73.81	266.22	7,803.49	-2,488.31	327.07	323.70	11.10	9.72	5.73	
8,559.23	79.06	267.11	7,816.43	-2,491.42	273.49	376.28	9.64	9.51	1.61	
<b>~330' X-OVER PNT - 8559.23' MD, 1041' FSL, 330' FEL SEC 15</b>										
8,599.00	82.85	267.73	7,822.68	-2,493.19	234.26	414.64	9.64	9.52	1.56	
8,693.00	84.17	267.49	7,833.31	-2,497.09	140.95	505.82	1.43	1.40	-0.26	
8,788.00	88.94	267.60	7,839.01	-2,501.15	46.23	598.39	5.02	5.02	0.12	

## Survey Report

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<b>Site:</b>	SEC 15-T4S-R65W	<b>MD Reference:</b>	KB 25' @ 5718.30usft
<b>Well:</b>	LONE TREE 4-65 15-16 4AH	<b>North Reference:</b>	True
<b>Wellbore:</b>	OWB	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL SURVEY	<b>Database:</b>	EDT_32Bit_ODBC

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
8,790.00	88.98	267.59	7,839.05	-2,501.23	44.23	600.35	1.97	1.83	-0.72	
<b>HZ LANDING PNT - 8790' MD, 7839' TVD</b>										
8,883.00	90.68	266.92	7,839.33	-2,505.69	-48.65	691.26	1.97	1.83	-0.72	
8,977.00	88.87	268.20	7,839.70	-2,509.69	-142.56	783.04	2.36	-1.93	1.36	
9,072.00	89.41	268.81	7,841.12	-2,512.17	-237.52	875.44	0.86	0.57	0.64	
9,166.00	89.78	268.26	7,841.79	-2,514.57	-331.49	966.87	0.71	0.39	-0.59	
9,260.00	90.68	268.62	7,841.41	-2,517.13	-425.45	1,058.33	1.03	0.96	0.38	
9,355.00	87.99	268.32	7,842.51	-2,519.67	-520.40	1,150.74	2.85	-2.83	-0.32	
9,450.00	88.84	267.63	7,845.14	-2,523.02	-615.30	1,243.31	1.15	0.89	-0.73	
9,544.00	87.40	267.01	7,848.22	-2,527.41	-709.15	1,335.13	1.67	-1.53	-0.66	
9,639.00	87.55	267.32	7,852.41	-2,532.11	-803.94	1,427.94	0.36	0.16	0.33	
9,733.00	87.23	266.70	7,856.69	-2,537.01	-897.71	1,519.82	0.74	-0.34	-0.66	
9,828.00	87.12	266.11	7,861.37	-2,542.96	-992.41	1,612.87	0.63	-0.12	-0.62	
9,923.00	89.15	268.75	7,864.47	-2,547.21	-1,087.25	1,705.62	3.50	2.14	2.78	
10,018.00	89.60	269.04	7,865.50	-2,549.04	-1,182.23	1,797.87	0.56	0.47	0.31	
10,112.00	91.33	268.26	7,864.74	-2,551.26	-1,276.19	1,889.25	2.02	1.84	-0.83	
10,207.00	88.14	270.40	7,865.18	-2,552.37	-1,371.17	1,981.31	4.04	-3.36	2.25	
10,302.00	87.86	270.27	7,868.49	-2,551.81	-1,466.11	2,072.92	0.32	-0.29	-0.14	
10,396.00	87.22	270.30	7,872.53	-2,551.35	-1,560.02	2,163.55	0.68	-0.68	0.03	
10,491.00	88.26	270.72	7,876.27	-2,550.50	-1,654.94	2,255.07	1.18	1.09	0.44	
10,585.00	89.79	271.12	7,877.87	-2,548.99	-1,748.91	2,345.49	1.68	1.63	0.43	
10,680.00	90.00	271.05	7,878.05	-2,547.19	-1,843.89	2,436.82	0.23	0.22	-0.07	
10,775.00	90.81	270.94	7,877.38	-2,545.54	-1,938.88	2,528.18	0.86	0.85	-0.12	
10,869.00	92.17	270.93	7,874.93	-2,544.01	-2,032.83	2,618.58	1.45	1.45	-0.01	
10,964.00	88.97	271.02	7,873.99	-2,542.39	-2,127.80	2,709.94	3.37	-3.37	0.09	
11,059.00	89.52	270.75	7,875.24	-2,540.93	-2,222.78	2,801.35	0.64	0.58	-0.28	
11,154.00	89.21	270.77	7,876.29	-2,539.67	-2,317.77	2,892.82	0.33	-0.33	0.02	
11,248.00	89.43	270.13	7,877.41	-2,538.93	-2,411.76	2,983.46	0.72	0.23	-0.68	
11,343.00	90.19	270.33	7,877.72	-2,538.55	-2,506.75	3,075.17	0.83	0.80	0.21	
11,437.00	90.76	269.69	7,876.94	-2,538.53	-2,600.75	3,166.00	0.91	0.61	-0.68	
11,532.00	88.03	270.37	7,877.95	-2,538.48	-2,695.73	3,257.78	2.96	-2.87	0.72	
11,626.00	88.14	270.26	7,881.09	-2,537.96	-2,789.68	3,348.44	0.17	0.12	-0.12	
11,721.00	88.68	270.37	7,883.72	-2,537.44	-2,884.64	3,440.07	0.58	0.57	0.12	
11,816.00	89.85	270.44	7,884.94	-2,536.77	-2,979.63	3,531.69	1.23	1.23	0.07	
11,911.00	90.55	271.18	7,884.61	-2,535.43	-3,074.62	3,623.14	1.07	0.74	0.78	
12,005.00	88.90	270.90	7,885.06	-2,533.72	-3,168.60	3,713.52	1.78	-1.76	-0.30	
12,195.00	89.32	271.61	7,888.01	-2,529.56	-3,358.53	3,896.00	0.43	0.22	0.37	
12,290.00	89.21	271.92	7,889.23	-2,526.64	-3,453.48	3,987.00	0.35	-0.12	0.33	
12,479.00	89.48	275.06	7,891.39	-2,515.13	-3,642.09	4,166.32	1.67	0.14	1.66	
12,574.00	89.34	272.26	7,892.37	-2,509.07	-3,736.88	4,256.36	2.95	-0.15	-2.95	
12,668.00	88.70	269.41	7,893.98	-2,507.70	-3,830.85	4,346.82	3.11	-0.68	-3.03	
12,763.00	91.39	269.01	7,893.90	-2,509.01	-3,925.83	4,438.94	2.86	2.83	-0.42	
12,858.00	89.17	265.77	7,893.44	-2,513.33	-4,020.71	4,531.75	4.13	-2.34	-3.41	

## Survey Report

<b>Company:</b>	CRESTONE PEAK RESOURCES	<b>Local Co-ordinate Reference:</b>	Well LONE TREE 4-65 15-16 4AH
<b>Project:</b>	ARAPAHOE COUNTY	<b>TVD Reference:</b>	KB 25' @ 5718.30usft
<b>Site:</b>	SEC 15-T4S-R65W	<b>MD Reference:</b>	KB 25' @ 5718.30usft
<b>Well:</b>	LONE TREE 4-65 15-16 4AH	<b>North Reference:</b>	True
<b>Wellbore:</b>	OWB	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL SURVEY	<b>Database:</b>	EDT_32Bit_ODBC

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
12,953.00	89.92	265.76	7,894.19	-2,520.35	-4,115.45	4,625.10	0.79	0.79	-0.01	
13,047.00	88.18	267.30	7,895.75	-2,526.04	-4,209.26	4,717.22	2.47	-1.85	1.64	
13,142.00	89.77	267.57	7,897.45	-2,530.29	-4,304.14	4,810.01	1.70	1.67	0.28	
13,237.00	87.22	268.31	7,899.95	-2,533.70	-4,399.04	4,902.60	2.79	-2.68	0.78	
13,331.00	88.17	268.34	7,903.73	-2,536.45	-4,492.92	4,994.03	1.01	1.01	0.03	
13,426.00	89.75	269.02	7,905.45	-2,538.64	-4,587.88	5,086.35	1.81	1.66	0.72	
13,521.00	90.51	269.42	7,905.24	-2,539.93	-4,682.87	5,178.48	0.90	0.80	0.42	
13,616.00	88.88	269.27	7,905.74	-2,541.01	-4,777.86	5,270.56	1.72	-1.72	-0.16	
13,710.00	89.55	268.17	7,907.03	-2,543.11	-4,871.82	5,361.90	1.37	0.71	-1.17	
13,805.00	90.86	269.19	7,906.69	-2,545.30	-4,966.79	5,454.25	1.75	1.38	1.07	
13,900.00	88.54	270.43	7,907.19	-2,545.62	-5,061.78	5,546.12	2.77	-2.44	1.31	
13,994.00	89.28	269.94	7,908.98	-2,545.31	-5,155.77	5,636.87	0.94	0.79	-0.52	
14,089.00	89.89	269.57	7,909.66	-2,545.72	-5,250.76	5,728.77	0.75	0.64	-0.39	
14,184.00	87.60	270.55	7,911.74	-2,545.62	-5,345.73	5,820.53	2.62	-2.41	1.03	
14,279.00	86.22	270.61	7,916.87	-2,544.66	-5,440.59	5,911.94	1.45	-1.45	0.06	
14,373.00	88.25	271.58	7,921.40	-2,542.87	-5,534.45	6,002.19	2.39	2.16	1.03	
14,468.00	86.99	270.57	7,925.34	-2,541.09	-5,629.35	6,093.44	1.70	-1.33	-1.06	
14,563.00	90.05	270.93	7,927.80	-2,539.84	-5,724.30	6,184.88	3.24	3.22	0.38	
14,657.00	90.45	269.61	7,927.39	-2,539.40	-5,818.30	6,275.60	1.47	0.43	-1.40	
14,752.00	91.11	269.51	7,926.09	-2,540.13	-5,913.28	6,367.59	0.70	0.69	-0.11	
14,847.00	91.84	269.37	7,923.65	-2,541.06	-6,008.25	6,459.60	0.78	0.77	-0.15	
14,941.00	88.59	271.70	7,923.30	-2,540.18	-6,102.22	6,550.19	4.25	-3.46	2.48	
15,036.00	89.11	271.49	7,925.20	-2,537.54	-6,197.17	6,641.26	0.59	0.55	-0.22	
15,130.00	89.34	271.54	7,926.47	-2,535.05	-6,291.13	6,731.42	0.25	0.24	0.05	
15,225.00	89.71	271.18	7,927.26	-2,532.80	-6,386.10	6,822.62	0.54	0.39	-0.38	
15,320.00	90.63	270.73	7,926.98	-2,531.21	-6,481.08	6,914.00	1.08	0.97	-0.47	
15,414.00	88.46	270.35	7,927.73	-2,530.33	-6,575.07	7,004.60	2.34	-2.31	-0.40	
15,509.00	88.74	270.51	7,930.05	-2,529.61	-6,670.04	7,096.19	0.34	0.29	0.17	
15,604.00	89.18	269.62	7,931.77	-2,529.51	-6,765.02	7,187.96	1.04	0.46	-0.94	
15,698.00	90.74	270.67	7,931.84	-2,529.27	-6,859.02	7,278.73	2.00	1.66	1.12	
15,793.00	87.36	270.49	7,933.41	-2,528.31	-6,953.98	7,370.26	3.56	-3.56	-0.19	
15,888.00	86.80	269.81	7,938.25	-2,528.06	-7,048.86	7,461.88	0.93	-0.59	-0.72	
15,982.00	89.98	270.62	7,940.89	-2,527.71	-7,142.81	7,552.58	3.49	3.38	0.86	
16,077.00	91.80	270.46	7,939.42	-2,526.81	-7,237.79	7,644.14	1.92	1.92	-0.17	
16,172.00	88.92	269.26	7,938.82	-2,527.04	-7,332.77	7,735.99	3.28	-3.03	-1.26	
16,266.00	90.81	268.82	7,939.04	-2,528.62	-7,426.76	7,827.22	2.06	2.01	-0.47	
16,361.00	87.97	270.31	7,940.05	-2,529.34	-7,521.74	7,919.19	3.38	-2.99	1.57	
16,456.00	86.76	268.97	7,944.42	-2,529.93	-7,616.63	8,011.05	1.90	-1.27	-1.41	
16,550.00	85.86	268.13	7,950.47	-2,532.31	-7,710.40	8,102.28	1.31	-0.96	-0.89	
16,645.00	87.83	269.22	7,955.70	-2,534.50	-7,805.23	8,194.48	2.37	2.07	1.15	
16,739.00	87.74	269.01	7,959.33	-2,535.95	-7,899.15	8,285.61	0.24	-0.10	-0.22	
16,834.00	89.73	267.77	7,961.43	-2,538.62	-7,994.08	8,378.04	2.47	2.09	-1.31	
16,928.00	90.51	268.22	7,961.23	-2,541.91	-8,088.02	8,469.67	0.96	0.83	0.48	
17,023.00	91.33	266.95	7,959.71	-2,545.91	-8,182.92	8,562.41	1.59	0.86	-1.34	

## Survey Report

<b>Company:</b>	CRESTONE PEAK RESOURCES	<b>Local Co-ordinate Reference:</b>	Well LONE TREE 4-65 15-16 4AH
<b>Project:</b>	ARAPAHOE COUNTY	<b>TVD Reference:</b>	KB 25' @ 5718.30usft
<b>Site:</b>	SEC 15-T4S-R65W	<b>MD Reference:</b>	KB 25' @ 5718.30usft
<b>Well:</b>	LONE TREE 4-65 15-16 4AH	<b>North Reference:</b>	True
<b>Wellbore:</b>	OWB	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL SURVEY	<b>Database:</b>	EDT_32Bit_ODBC

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
17,117.00	89.51	268.46	7,959.02	-2,549.67	-8,276.84	8,654.13	2.52	-1.94	1.61	
17,212.00	89.59	266.99	7,959.76	-2,553.45	-8,371.76	8,746.83	1.55	0.08	-1.55	
17,307.00	89.73	265.17	7,960.33	-2,559.94	-8,466.53	8,840.09	1.92	0.15	-1.92	
17,401.00	89.01	266.41	7,961.36	-2,566.84	-8,560.27	8,932.45	1.53	-0.77	1.32	
17,496.00	88.65	268.31	7,963.30	-2,571.21	-8,655.14	9,025.26	2.04	-0.38	2.00	
17,591.00	89.66	269.60	7,964.70	-2,572.95	-8,750.11	9,117.48	1.72	1.06	1.36	
17,686.00	89.68	269.31	7,965.25	-2,573.85	-8,845.11	9,209.52	0.31	0.02	-0.31	
17,780.00	90.25	270.77	7,965.31	-2,573.78	-8,939.10	9,300.34	1.67	0.61	1.55	
17,874.00	91.73	270.74	7,963.68	-2,572.55	-9,033.08	9,390.83	1.57	1.57	-0.03	
17,969.00	89.31	272.22	7,962.82	-2,570.09	-9,128.03	9,481.96	2.99	-2.55	1.56	
18,063.00	90.04	271.72	7,963.35	-2,566.86	-9,221.97	9,571.92	0.94	0.78	-0.53	
18,157.00	90.75	270.77	7,962.71	-2,564.82	-9,315.95	9,662.21	1.26	0.76	-1.01	
18,252.00	88.38	271.02	7,963.43	-2,563.34	-9,410.93	9,753.61	2.51	-2.49	0.26	
18,346.00	88.95	271.43	7,965.62	-2,561.33	-9,504.88	9,843.89	0.75	0.61	0.44	
18,398.00	89.45	270.46	7,966.34	-2,560.47	-9,556.87	9,893.91	2.10	0.96	-1.87	
<b>LAST SURVEY - 18398' MD, 7966' TVD</b>										
18,463.00	89.45	270.46	7,966.97	-2,559.95	-9,621.86	9,956.58	0.00	0.00	0.00	
<b>EXTRAPOLATION TO TD - 18463' MD, 984' FSL, 331' FWL SEC 16</b>										

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
LP-LT 4-65 4AH - hit/miss target - Shape - Point	0.00	0.00	7,845.00	-2,532.38	273.51	1,680,750.70	3,241,407.76	39.699332°N	104.642061°W	
- actual wellpath misses target center by 49.41usft at 8565.52usft MD (7817.59 TVD, -2491.73 N, 267.31 E)										
PBHL-LT 4-65 4AH - Point	0.00	0.00	7,980.00	-2,543.68	-9,622.62	1,680,646.05	3,231,512.26	39.699296°N	104.677230°W	
- actual wellpath misses target center by 20.85usft at 18463.00usft MD (7966.97 TVD, -2559.95 N, -9621.86 E)										

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
3,604.00	3,444.13	-902.03	325.31	SURFACE CSG - 3604' MD, 3444' TVD	
7,629.00	7,184.37	-2,286.69	823.05	KOP - 7629' MD, 7184' TVD	
8,559.23	7,816.43	-2,491.42	273.49	~330' X-OVER PNT - 8559.23' MD, 1041' FSL, 330' FEL SEC 15	
8,790.00	7,839.05	-2,501.23	44.23	HZ LANDING PNT - 8790' MD, 7839' TVD	
18,398.00	7,966.34	-2,560.47	-9,556.87	LAST SURVEY - 18398' MD, 7966' TVD	
18,463.00	7,966.97	-2,559.95	-9,621.86	EXTRAPOLATION TO TD - 18463' MD, 984' FSL, 331' FWL SEC 16	

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