

# **CRESTONE PEAK RESOURCES**

**ARAPAHOE COUNTY**

**SEC 30-T4S-R64W**

**WATKINS 4-64 30-29 4AH**

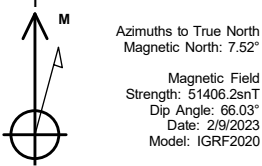
**OWB**

**Plan: PROPOSAL 1**

## **Standard Planning Report**

**10 February, 2023**

Project: ARAPAHOE COUNTY  
Site: SEC 30-T4S-R64W  
Well: WATKINS 4-64 30-29 4AH  
Wellbore: OWB  
Design: PROPOSAL 1



WELL DETAILS: WATKINS 4-64 30-29 4AH

5767.00						
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.00	0.00	1671397.56	3252836.95	39.673353°N	104.601774°W	

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	
3	1080.82	11.62	214.96	1076.85	-48.09	-33.62	2.00	214.96	-26.73	
4	7159.32	11.62	214.96	7030.84	-1051.18	-734.96	0.00	0.00	-584.20	
5	8123.74	90.00	91.10	7659.00	-1169.28	-167.78	10.00	-123.32	-6.19	LP-WATKINS 4-64 4AH
6	18146.71	90.00	91.10	7659.00	-1361.17	9853.36	0.00	0.00	9946.93	PBHL-WATKINS 4-64 4AH

ANNOTATIONS

MD	Inc	Azi	TVD	+N/-S	+E/-W	VSec	Departure	Annotation
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	Start Build 2.00
1080.82	11.62	214.96	1076.85	-48.09	-33.62	-26.73	58.68	Start 6078.50 hold at 1080.82 MD
7159.32	11.62	214.96	7030.84	-1051.18	-734.96	-584.20	1282.63	Start DLS 10.00 TFO -123.32
8123.74	90.00	91.10	7659.00	-1169.28	-167.78	-6.19	1889.50	Start 10022.97 hold at 8123.74 MD
18146.71	90.00	91.10	7659.00	-1361.17	9853.36	9946.93	11912.47	TD at 18146.71

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
LP-WATKINS 4-64 4AH	7659.00	-1169.28	-167.78	1670226.69	3252680.75	39.670143°N	104.602370°W	Point
- plan hits target center								
PBHL-WATKINS 4-64 4AH	7659.00	-1361.17	9853.36	1670133.89	3262703.15	39.669611°N	104.566772°W	Point
- plan hits target center								

PROJECT DETAILS: ARAPAHOE COUNTY

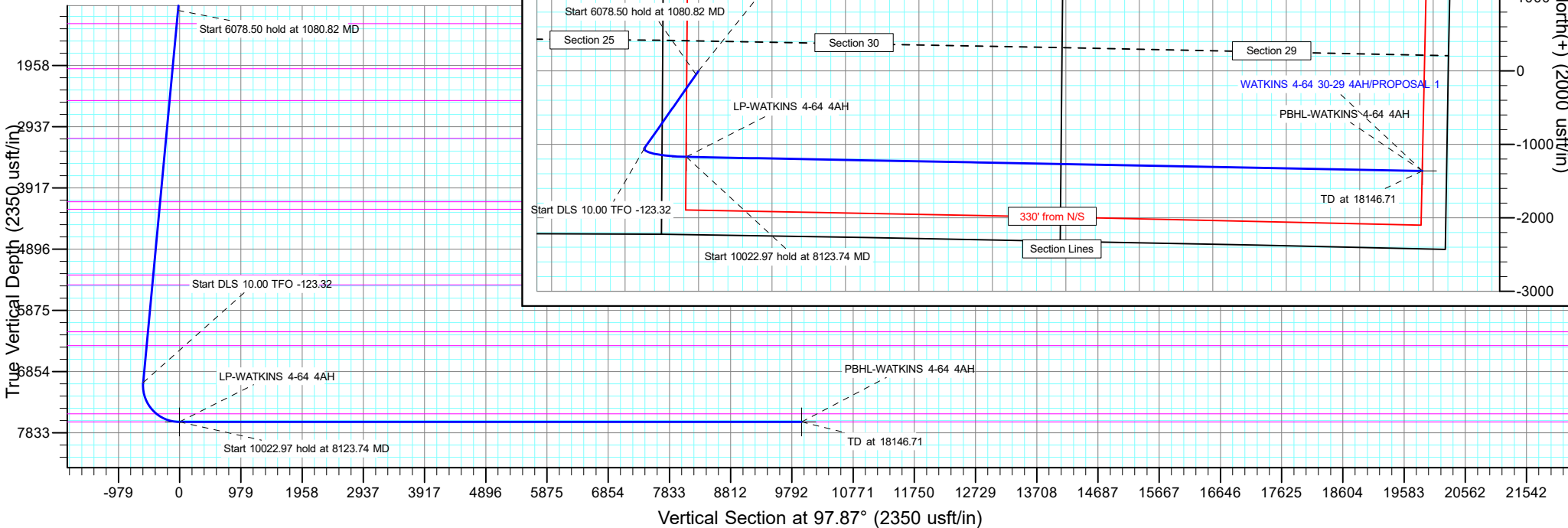
Geodetic System: US State Plane 1983  
Datum: North American Datum 1983  
Ellipsoid: GRS 1980  
Zone: Colorado Central Zone

System Datum: Mean Sea Level

SHL:  
2232' FSL, 490' FWL  
Sec 30-T4S-R64W

LP:  
1060' FSL, 330' FWL  
Sec 30-T4S-R64W

BHL:  
1060' FSL, 330' FEL  
Sec 29-T4S-R64W



## Planning Report

<b>Database:</b>	EDT_32Bit_ODBC	<b>Local Co-ordinate Reference:</b>	Well WATKINS 4-64 30-29 4AH
<b>Company:</b>	CRESTONE PEAK RESOURCES	<b>TVD Reference:</b>	KB 25' @ 5792.00usft
<b>Project:</b>	ARAPAHOE COUNTY	<b>MD Reference:</b>	KB 25' @ 5792.00usft
<b>Site:</b>	SEC 30-T4S-R64W	<b>North Reference:</b>	True
<b>Well:</b>	WATKINS 4-64 30-29 4AH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OWB		
<b>Design:</b>	PROPOSAL 1		

<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

Site		SEC 30-T4S-R64W			
Site Position:		Northing:	1,669,168.52 usft	Latitude:	39.667247°N
From:	Lat/Long	Easting:	3,252,354.22 usft	Longitude:	104.603567°W
Position Uncertainty:	0.00 usft	Slot Radius:	13.200 in	Grid Convergence:	0.57 °

Well	WATKINS 4-64 30-29 4AH					
Well Position	+N/-S	2,224.20 usft	Northing:	1,671,397.56 usft	Latitude:	39.673353°N
	+E/-W	504.72 usft	Easting:	3,252,836.96 usft	Longitude:	104.601774°W
Position Uncertainty		0.00 usft	Wellhead Elevation:		Ground Level:	5,767.00 usft

<b>Wellbore</b>	OWB				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2020	2/9/2023	7.52	66.03	51,406.20160690

<b>Design</b>	PROPOSAL 1			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PROTOTYPE	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>
	0.00	0.00	0.00	97.87

<b>Plan Survey Tool Program</b>	<b>Date</b>	2/10/2023		
<b>Depth From (usft)</b>	<b>Depth To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Remarks</b>
1	0.00	18,146.71	PROPOSAL 1 (OWB)	MWD OWSG
				OWSG MWD - Standard

<b>Plan Sections</b>										
<b>Measured Depth (usft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Dogleg Rate (°/100ft)</b>	<b>Build Rate (°/100ft)</b>	<b>Turn Rate (°/100ft)</b>	<b>TFO (°)</b>	<b>Target</b>
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,080.82	11.62	214.96	1,076.85	-48.09	-33.62	2.00	2.00	0.00	214.96	
7,159.32	11.62	214.96	7,030.84	-1,051.18	-734.96	0.00	0.00	0.00	0.00	
8,123.74	90.00	91.10	7,659.00	-1,169.28	-167.78	10.00	8.13	-12.84	-123.32	LP-WATKINS 4-64 4A
18,146.71	90.00	91.10	7,659.00	-1,361.17	9,853.36	0.00	0.00	0.00	0.00	PBHL-WATKINS 4-64

# Planning Report

<b>Database:</b>	EDT_32Bit_ODBC	<b>Local Co-ordinate Reference:</b>	Well WATKINS 4-64 30-29 4AH
<b>Company:</b>	CRESTONE PEAK RESOURCES	<b>TVD Reference:</b>	KB 25' @ 5792.00usft
<b>Project:</b>	ARAPAHOE COUNTY	<b>MD Reference:</b>	KB 25' @ 5792.00usft
<b>Site:</b>	SEC 30-T4S-R64W	<b>North Reference:</b>	True
<b>Well:</b>	WATKINS 4-64 30-29 4AH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OWB		
<b>Design:</b>	PROPOSAL 1		

Planned 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)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24.00	0.00	0.00	24.00	0.00	0.00	0.00	0.00	0.00	0.00
Denver									
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 2.00									
600.00	2.00	214.96	599.98	-1.43	-1.00	-0.79	2.00	2.00	0.00
689.14	3.78	214.96	689.00	-5.12	-3.58	-2.84	2.00	2.00	0.00
Arapahoe									
700.00	4.00	214.96	699.84	-5.72	-4.00	-3.18	2.00	2.00	0.00
800.00	6.00	214.96	799.45	-12.86	-8.99	-7.15	2.00	2.00	0.00
900.00	8.00	214.96	898.70	-22.85	-15.98	-12.70	2.00	2.00	0.00
1,000.00	10.00	214.96	997.47	-35.67	-24.94	-19.82	2.00	2.00	0.00
1,080.82	11.62	214.96	1,076.85	-48.09	-33.62	-26.73	2.00	2.00	0.00
Start 6078.50 hold at 1080.82 MD									
1,100.00	11.62	214.96	1,095.64	-51.25	-35.84	-28.48	0.00	0.00	0.00
1,200.00	11.62	214.96	1,193.59	-67.76	-47.37	-37.66	0.00	0.00	0.00
1,297.41	11.62	214.96	1,289.00	-83.83	-58.61	-46.59	0.00	0.00	0.00
Laramie-Fox Hills Formation									
1,300.00	11.62	214.96	1,291.54	-84.26	-58.91	-46.83	0.00	0.00	0.00
1,400.00	11.62	214.96	1,389.49	-100.76	-70.45	-56.00	0.00	0.00	0.00
1,500.00	11.62	214.96	1,487.44	-117.26	-81.99	-65.17	0.00	0.00	0.00
1,600.00	11.62	214.96	1,585.40	-133.77	-93.53	-74.34	0.00	0.00	0.00
1,700.00	11.62	214.96	1,683.35	-150.27	-105.06	-83.51	0.00	0.00	0.00
1,800.00	11.62	214.96	1,781.30	-166.77	-116.60	-92.68	0.00	0.00	0.00
1,900.00	11.62	214.96	1,879.25	-183.27	-128.14	-101.85	0.00	0.00	0.00
2,000.00	11.62	214.96	1,977.20	-199.77	-139.68	-111.03	0.00	0.00	0.00
2,032.46	11.62	214.96	2,009.00	-205.13	-143.42	-114.00	0.00	0.00	0.00
Pierre Formation									
2,100.00	11.62	214.96	2,075.15	-216.28	-151.22	-120.20	0.00	0.00	0.00
2,200.00	11.62	214.96	2,173.11	-232.78	-162.75	-129.37	0.00	0.00	0.00
2,300.00	11.62	214.96	2,271.06	-249.28	-174.29	-138.54	0.00	0.00	0.00
2,400.00	11.62	214.96	2,369.01	-265.78	-185.83	-147.71	0.00	0.00	0.00
2,500.00	11.62	214.96	2,466.96	-282.29	-197.37	-156.88	0.00	0.00	0.00
2,553.13	11.62	214.96	2,519.00	-291.05	-203.50	-161.75	0.00	0.00	0.00
Upper Pierre aquifer									
2,600.00	11.62	214.96	2,564.91	-298.79	-208.91	-166.05	0.00	0.00	0.00
2,700.00	11.62	214.96	2,662.86	-315.29	-220.44	-175.22	0.00	0.00	0.00
2,800.00	11.62	214.96	2,760.82	-331.79	-231.98	-184.40	0.00	0.00	0.00
2,900.00	11.62	214.96	2,858.77	-348.29	-243.52	-193.57	0.00	0.00	0.00
3,000.00	11.62	214.96	2,956.72	-364.80	-255.06	-202.74	0.00	0.00	0.00
3,100.00	11.62	214.96	3,054.67	-381.30	-266.60	-211.91	0.00	0.00	0.00
3,170.78	11.62	214.96	3,124.00	-392.98	-274.76	-218.40	0.00	0.00	0.00
Base of Upper Pierre aquifer									
3,200.00	11.62	214.96	3,152.62	-397.80	-278.13	-221.08	0.00	0.00	0.00
3,300.00	11.62	214.96	3,250.58	-414.30	-289.67	-230.25	0.00	0.00	0.00
3,400.00	11.62	214.96	3,348.53	-430.81	-301.21	-239.42	0.00	0.00	0.00
3,500.00	11.62	214.96	3,446.48	-447.31	-312.75	-248.59	0.00	0.00	0.00
3,600.00	11.62	214.96	3,544.43	-463.81	-324.29	-257.77	0.00	0.00	0.00
3,700.00	11.62	214.96	3,642.38	-480.31	-335.82	-266.94	0.00	0.00	0.00

# Planning Report

<b>Database:</b>	EDT_32Bit_ODBC	<b>Local Co-ordinate Reference:</b>	Well WATKINS 4-64 30-29 4AH
<b>Company:</b>	CRESTONE PEAK RESOURCES	<b>TVD Reference:</b>	KB 25' @ 5792.00usft
<b>Project:</b>	ARAPAHOE COUNTY	<b>MD Reference:</b>	KB 25' @ 5792.00usft
<b>Site:</b>	SEC 30-T4S-R64W	<b>North Reference:</b>	True
<b>Well:</b>	WATKINS 4-64 30-29 4AH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OWB		
<b>Design:</b>	PROPOSAL 1		

Planned 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)
3,800.00	11.62	214.96	3,740.33	-496.81	-347.36	-276.11	0.00	0.00	0.00
3,900.00	11.62	214.96	3,838.29	-513.32	-358.90	-285.28	0.00	0.00	0.00
4,000.00	11.62	214.96	3,936.24	-529.82	-370.44	-294.45	0.00	0.00	0.00
4,100.00	11.62	214.96	4,034.19	-546.32	-381.98	-303.62	0.00	0.00	0.00
4,200.00	11.62	214.96	4,132.14	-562.82	-393.51	-312.79	0.00	0.00	0.00
4,207.00	11.62	214.96	4,139.00	-563.98	-394.32	-313.44	0.00	0.00	0.00
Larimer ("Parkman") sandstone									
4,300.00	11.62	214.96	4,230.09	-579.33	-405.05	-321.96	0.00	0.00	0.00
4,329.51	11.62	214.96	4,259.00	-584.20	-408.46	-324.67	0.00	0.00	0.00
Pierre Formation									
4,400.00	11.62	214.96	4,328.04	-595.83	-416.59	-331.14	0.00	0.00	0.00
4,500.00	11.62	214.96	4,426.00	-612.33	-428.13	-340.31	0.00	0.00	0.00
4,600.00	11.62	214.96	4,523.95	-628.83	-439.67	-349.48	0.00	0.00	0.00
4,700.00	11.62	214.96	4,621.90	-645.34	-451.20	-358.65	0.00	0.00	0.00
4,800.00	11.62	214.96	4,719.85	-661.84	-462.74	-367.82	0.00	0.00	0.00
4,900.00	11.62	214.96	4,817.80	-678.34	-474.28	-376.99	0.00	0.00	0.00
5,000.00	11.62	214.96	4,915.76	-694.84	-485.82	-386.16	0.00	0.00	0.00
5,100.00	11.62	214.96	5,013.71	-711.34	-497.36	-395.33	0.00	0.00	0.00
5,200.00	11.62	214.96	5,111.66	-727.85	-508.89	-404.51	0.00	0.00	0.00
5,300.00	11.62	214.96	5,209.61	-744.35	-520.43	-413.68	0.00	0.00	0.00
5,400.00	11.62	214.96	5,307.56	-760.85	-531.97	-422.85	0.00	0.00	0.00
5,401.47	11.62	214.96	5,309.00	-761.09	-532.14	-422.98	0.00	0.00	0.00
Terry ("Sussex") sandstone									
5,500.00	11.62	214.96	5,405.51	-777.35	-543.51	-432.02	0.00	0.00	0.00
5,564.81	11.62	214.96	5,469.00	-788.05	-550.99	-437.96	0.00	0.00	0.00
Pierre Formation									
5,600.00	11.62	214.96	5,503.47	-793.86	-555.05	-441.19	0.00	0.00	0.00
5,700.00	11.62	214.96	5,601.42	-810.36	-566.58	-450.36	0.00	0.00	0.00
5,800.00	11.62	214.96	5,699.37	-826.86	-578.12	-459.53	0.00	0.00	0.00
5,900.00	11.62	214.96	5,797.32	-843.36	-589.66	-468.70	0.00	0.00	0.00
6,000.00	11.62	214.96	5,895.27	-859.86	-601.20	-477.87	0.00	0.00	0.00
6,100.00	11.62	214.96	5,993.23	-876.37	-612.74	-487.05	0.00	0.00	0.00
6,200.00	11.62	214.96	6,091.18	-892.87	-624.27	-496.22	0.00	0.00	0.00
6,300.00	11.62	214.96	6,189.13	-909.37	-635.81	-505.39	0.00	0.00	0.00
6,330.50	11.62	214.96	6,219.00	-914.40	-639.33	-508.19	0.00	0.00	0.00
Hygiene ("Shannon") sandstone									
6,400.00	11.62	214.96	6,287.08	-925.87	-647.35	-514.56	0.00	0.00	0.00
6,500.00	11.62	214.96	6,385.03	-942.38	-658.89	-523.73	0.00	0.00	0.00
6,555.10	11.62	214.96	6,439.00	-951.47	-665.24	-528.78	0.00	0.00	0.00
Pierre Formation									
6,600.00	11.62	214.96	6,482.98	-958.88	-670.43	-532.90	0.00	0.00	0.00
6,700.00	11.62	214.96	6,580.94	-975.38	-681.96	-542.07	0.00	0.00	0.00
6,800.00	11.62	214.96	6,678.89	-991.88	-693.50	-551.24	0.00	0.00	0.00
6,900.00	11.62	214.96	6,776.84	-1,008.38	-705.04	-560.42	0.00	0.00	0.00
7,000.00	11.62	214.96	6,874.79	-1,024.89	-716.58	-569.59	0.00	0.00	0.00
7,100.00	11.62	214.96	6,972.74	-1,041.39	-728.12	-578.76	0.00	0.00	0.00
7,159.32	11.62	214.96	7,030.84	-1,051.18	-734.96	-584.20	0.00	0.00	0.00
Start DLS 10.00 TFO -123.32									
7,200.00	9.97	194.94	7,070.82	-1,057.94	-738.22	-586.50	10.00	-4.04	-49.22
7,250.00	10.03	165.85	7,120.09	-1,066.35	-738.27	-585.40	10.00	0.13	-58.18
7,300.00	12.31	142.59	7,169.17	-1,074.81	-733.96	-579.98	10.00	4.55	-46.52
7,350.00	15.87	128.01	7,217.67	-1,083.26	-725.33	-570.27	10.00	7.12	-29.15
7,400.00	20.04	119.00	7,265.23	-1,091.63	-712.45	-556.36	10.00	8.34	-18.01

# Planning Report

<b>Database:</b>	EDT_32Bit_ODBC	<b>Local Co-ordinate Reference:</b>	Well WATKINS 4-64 30-29 4AH
<b>Company:</b>	CRESTONE PEAK RESOURCES	<b>TVD Reference:</b>	KB 25' @ 5792.00usft
<b>Project:</b>	ARAPAHOE COUNTY	<b>MD Reference:</b>	KB 25' @ 5792.00usft
<b>Site:</b>	SEC 30-T4S-R64W	<b>North Reference:</b>	True
<b>Well:</b>	WATKINS 4-64 30-29 4AH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OWB		
<b>Design:</b>	PROPOSAL 1		

Planned 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)
7,450.00	24.51	113.08	7,311.50	-1,099.85	-695.40	-538.35	10.00	8.95	-11.84
7,500.00	29.15	108.92	7,356.11	-1,107.87	-674.33	-516.38	10.00	9.27	-8.32
7,550.00	33.88	105.82	7,398.72	-1,115.62	-649.39	-490.61	10.00	9.46	-6.19
7,600.00	38.67	103.41	7,439.02	-1,123.05	-620.76	-461.24	10.00	9.59	-4.83
7,650.00	43.51	101.46	7,476.70	-1,130.10	-588.68	-428.49	10.00	9.67	-3.91
7,700.00	48.37	99.82	7,511.46	-1,136.71	-553.38	-392.62	10.00	9.72	-3.27
7,727.12	51.01	99.04	7,529.00	-1,140.09	-532.98	-371.95	10.00	9.75	-2.90
Sharon Springs Member									
7,750.00	53.25	98.42	7,543.05	-1,142.83	-515.13	-353.89	10.00	9.77	-2.70
7,800.00	58.14	97.19	7,571.22	-1,148.43	-474.22	-312.60	10.00	9.79	-2.47
7,850.00	63.05	96.08	7,595.76	-1,153.45	-430.96	-269.07	10.00	9.81	-2.22
7,900.00	67.96	95.06	7,616.48	-1,157.85	-385.69	-223.62	10.00	9.83	-2.03
7,950.00	72.88	94.11	7,633.23	-1,161.61	-338.75	-176.60	10.00	9.84	-1.90
8,000.00	77.81	93.21	7,645.88	-1,164.69	-290.49	-128.37	10.00	9.85	-1.80
8,050.00	82.73	92.34	7,654.33	-1,167.08	-241.28	-79.30	10.00	9.85	-1.73
8,100.00	87.66	91.50	7,658.52	-1,168.75	-191.50	-29.76	10.00	9.86	-1.70
8,123.74	90.00	91.10	7,659.00	-1,169.28	-167.78	-6.19	10.00	9.86	-1.68
Start 10022.97 hold at 8123.74 MD - Niobrara Formation									
8,200.00	90.00	91.10	7,659.00	-1,170.74	-91.53	69.54	0.00	0.00	0.00
8,300.00	90.00	91.10	7,659.00	-1,172.66	8.45	168.85	0.00	0.00	0.00
8,400.00	90.00	91.10	7,659.00	-1,174.57	108.44	268.15	0.00	0.00	0.00
8,500.00	90.00	91.10	7,659.00	-1,176.49	208.42	367.45	0.00	0.00	0.00
8,600.00	90.00	91.10	7,659.00	-1,178.40	308.40	466.76	0.00	0.00	0.00
8,700.00	90.00	91.10	7,659.00	-1,180.32	408.38	566.06	0.00	0.00	0.00
8,800.00	90.00	91.10	7,659.00	-1,182.23	508.36	665.36	0.00	0.00	0.00
8,900.00	90.00	91.10	7,659.00	-1,184.14	608.34	764.66	0.00	0.00	0.00
9,000.00	90.00	91.10	7,659.00	-1,186.06	708.33	863.97	0.00	0.00	0.00
9,100.00	90.00	91.10	7,659.00	-1,187.97	808.31	963.27	0.00	0.00	0.00
9,200.00	90.00	91.10	7,659.00	-1,189.89	908.29	1,062.57	0.00	0.00	0.00
9,300.00	90.00	91.10	7,659.00	-1,191.80	1,008.27	1,161.88	0.00	0.00	0.00
9,400.00	90.00	91.10	7,659.00	-1,193.72	1,108.25	1,261.18	0.00	0.00	0.00
9,500.00	90.00	91.10	7,659.00	-1,195.63	1,208.23	1,360.48	0.00	0.00	0.00
9,600.00	90.00	91.10	7,659.00	-1,197.55	1,308.22	1,459.79	0.00	0.00	0.00
9,700.00	90.00	91.10	7,659.00	-1,199.46	1,408.20	1,559.09	0.00	0.00	0.00
9,800.00	90.00	91.10	7,659.00	-1,201.37	1,508.18	1,658.39	0.00	0.00	0.00
9,900.00	90.00	91.10	7,659.00	-1,203.29	1,608.16	1,757.70	0.00	0.00	0.00
10,000.00	90.00	91.10	7,659.00	-1,205.20	1,708.14	1,857.00	0.00	0.00	0.00
10,100.00	90.00	91.10	7,659.00	-1,207.12	1,808.12	1,956.30	0.00	0.00	0.00
10,200.00	90.00	91.10	7,659.00	-1,209.03	1,908.11	2,055.60	0.00	0.00	0.00
10,300.00	90.00	91.10	7,659.00	-1,210.95	2,008.09	2,154.91	0.00	0.00	0.00
10,400.00	90.00	91.10	7,659.00	-1,212.86	2,108.07	2,254.21	0.00	0.00	0.00
10,500.00	90.00	91.10	7,659.00	-1,214.78	2,208.05	2,353.51	0.00	0.00	0.00
10,600.00	90.00	91.10	7,659.00	-1,216.69	2,308.03	2,452.82	0.00	0.00	0.00
10,700.00	90.00	91.10	7,659.00	-1,218.61	2,408.02	2,552.12	0.00	0.00	0.00
10,800.00	90.00	91.10	7,659.00	-1,220.52	2,508.00	2,651.42	0.00	0.00	0.00
10,900.00	90.00	91.10	7,659.00	-1,222.43	2,607.98	2,750.73	0.00	0.00	0.00
11,000.00	90.00	91.10	7,659.00	-1,224.35	2,707.96	2,850.03	0.00	0.00	0.00
11,100.00	90.00	91.10	7,659.00	-1,226.26	2,807.94	2,949.33	0.00	0.00	0.00
11,200.00	90.00	91.10	7,659.00	-1,228.18	2,907.92	3,048.64	0.00	0.00	0.00
11,300.00	90.00	91.10	7,659.00	-1,230.09	3,007.91	3,147.94	0.00	0.00	0.00
11,400.00	90.00	91.10	7,659.00	-1,232.01	3,107.89	3,247.24	0.00	0.00	0.00
11,500.00	90.00	91.10	7,659.00	-1,233.92	3,207.87	3,346.55	0.00	0.00	0.00
11,600.00	90.00	91.10	7,659.00	-1,235.84	3,307.85	3,445.85	0.00	0.00	0.00
11,700.00	90.00	91.10	7,659.00	-1,237.75	3,407.83	3,545.15	0.00	0.00	0.00

# Planning Report

<b>Database:</b>	EDT_32Bit_ODBC	<b>Local Co-ordinate Reference:</b>	Well WATKINS 4-64 30-29 4AH
<b>Company:</b>	CRESTONE PEAK RESOURCES	<b>TVD Reference:</b>	KB 25' @ 5792.00usft
<b>Project:</b>	ARAPAHOE COUNTY	<b>MD Reference:</b>	KB 25' @ 5792.00usft
<b>Site:</b>	SEC 30-T4S-R64W	<b>North Reference:</b>	True
<b>Well:</b>	WATKINS 4-64 30-29 4AH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OWB		
<b>Design:</b>	PROPOSAL 1		

Planned 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)	
11,800.00	90.00	91.10	7,659.00	-1,239.67	3,507.81	3,644.45	0.00	0.00	0.00	
11,900.00	90.00	91.10	7,659.00	-1,241.58	3,607.80	3,743.76	0.00	0.00	0.00	
12,000.00	90.00	91.10	7,659.00	-1,243.49	3,707.78	3,843.06	0.00	0.00	0.00	
12,100.00	90.00	91.10	7,659.00	-1,245.41	3,807.76	3,942.36	0.00	0.00	0.00	
12,200.00	90.00	91.10	7,659.00	-1,247.32	3,907.74	4,041.67	0.00	0.00	0.00	
12,300.00	90.00	91.10	7,659.00	-1,249.24	4,007.72	4,140.97	0.00	0.00	0.00	
12,400.00	90.00	91.10	7,659.00	-1,251.15	4,107.70	4,240.27	0.00	0.00	0.00	
12,500.00	90.00	91.10	7,659.00	-1,253.07	4,207.69	4,339.58	0.00	0.00	0.00	
12,600.00	90.00	91.10	7,659.00	-1,254.98	4,307.67	4,438.88	0.00	0.00	0.00	
12,700.00	90.00	91.10	7,659.00	-1,256.90	4,407.65	4,538.18	0.00	0.00	0.00	
12,800.00	90.00	91.10	7,659.00	-1,258.81	4,507.63	4,637.49	0.00	0.00	0.00	
12,900.00	90.00	91.10	7,659.00	-1,260.72	4,607.61	4,736.79	0.00	0.00	0.00	
13,000.00	90.00	91.10	7,659.00	-1,262.64	4,707.59	4,836.09	0.00	0.00	0.00	
13,100.00	90.00	91.10	7,659.00	-1,264.55	4,807.58	4,935.39	0.00	0.00	0.00	
13,200.00	90.00	91.10	7,659.00	-1,266.47	4,907.56	5,034.70	0.00	0.00	0.00	
13,300.00	90.00	91.10	7,659.00	-1,268.38	5,007.54	5,134.00	0.00	0.00	0.00	
13,400.00	90.00	91.10	7,659.00	-1,270.30	5,107.52	5,233.30	0.00	0.00	0.00	
13,500.00	90.00	91.10	7,659.00	-1,272.21	5,207.50	5,332.61	0.00	0.00	0.00	
13,600.00	90.00	91.10	7,659.00	-1,274.13	5,307.48	5,431.91	0.00	0.00	0.00	
13,700.00	90.00	91.10	7,659.00	-1,276.04	5,407.47	5,531.21	0.00	0.00	0.00	
13,800.00	90.00	91.10	7,659.00	-1,277.96	5,507.45	5,630.52	0.00	0.00	0.00	
13,900.00	90.00	91.10	7,659.00	-1,279.87	5,607.43	5,729.82	0.00	0.00	0.00	
14,000.00	90.00	91.10	7,659.00	-1,281.78	5,707.41	5,829.12	0.00	0.00	0.00	
14,100.00	90.00	91.10	7,659.00	-1,283.70	5,807.39	5,928.43	0.00	0.00	0.00	
14,200.00	90.00	91.10	7,659.00	-1,285.61	5,907.37	6,027.73	0.00	0.00	0.00	
14,300.00	90.00	91.10	7,659.00	-1,287.53	6,007.36	6,127.03	0.00	0.00	0.00	
14,400.00	90.00	91.10	7,659.00	-1,289.44	6,107.34	6,226.34	0.00	0.00	0.00	
14,500.00	90.00	91.10	7,659.00	-1,291.36	6,207.32	6,325.64	0.00	0.00	0.00	
14,600.00	90.00	91.10	7,659.00	-1,293.27	6,307.30	6,424.94	0.00	0.00	0.00	
14,700.00	90.00	91.10	7,659.00	-1,295.19	6,407.28	6,524.24	0.00	0.00	0.00	
14,800.00	90.00	91.10	7,659.00	-1,297.10	6,507.26	6,623.55	0.00	0.00	0.00	
14,900.00	90.00	91.10	7,659.00	-1,299.02	6,607.25	6,722.85	0.00	0.00	0.00	
15,000.00	90.00	91.10	7,659.00	-1,300.93	6,707.23	6,822.15	0.00	0.00	0.00	
15,100.00	90.00	91.10	7,659.00	-1,302.84	6,807.21	6,921.46	0.00	0.00	0.00	
15,200.00	90.00	91.10	7,659.00	-1,304.76	6,907.19	7,020.76	0.00	0.00	0.00	
15,300.00	90.00	91.10	7,659.00	-1,306.67	7,007.17	7,120.06	0.00	0.00	0.00	
15,400.00	90.00	91.10	7,659.00	-1,308.59	7,107.15	7,219.37	0.00	0.00	0.00	
15,500.00	90.00	91.10	7,659.00	-1,310.50	7,207.14	7,318.67	0.00	0.00	0.00	
15,600.00	90.00	91.10	7,659.00	-1,312.42	7,307.12	7,417.97	0.00	0.00	0.00	
15,700.00	90.00	91.10	7,659.00	-1,314.33	7,407.10	7,517.28	0.00	0.00	0.00	
15,800.00	90.00	91.10	7,659.00	-1,316.25	7,507.08	7,616.58	0.00	0.00	0.00	
15,900.00	90.00	91.10	7,659.00	-1,318.16	7,607.06	7,715.88	0.00	0.00	0.00	
16,000.00	90.00	91.10	7,659.00	-1,320.07	7,707.04	7,815.18	0.00	0.00	0.00	
16,100.00	90.00	91.10	7,659.00	-1,321.99	7,807.03	7,914.49	0.00	0.00	0.00	
16,200.00	90.00	91.10	7,659.00	-1,323.90	7,907.01	8,013.79	0.00	0.00	0.00	
16,300.00	90.00	91.10	7,659.00	-1,325.82	8,006.99	8,113.09	0.00	0.00	0.00	
16,400.00	90.00	91.10	7,659.00	-1,327.73	8,106.97	8,212.40	0.00	0.00	0.00	
16,500.00	90.00	91.10	7,659.00	-1,329.65	8,206.95	8,311.70	0.00	0.00	0.00	
16,600.00	90.00	91.10	7,659.00	-1,331.56	8,306.93	8,411.00	0.00	0.00	0.00	
16,700.00	90.00	91.10	7,659.00	-1,333.48	8,406.92	8,510.31	0.00	0.00	0.00	
16,800.00	90.00	91.10	7,659.00	-1,335.39	8,506.90	8,609.61	0.00	0.00	0.00	
16,900.00	90.00	91.10	7,659.00	-1,337.31	8,606.88	8,708.91	0.00	0.00	0.00	
17,000.00	90.00	91.10	7,659.00	-1,339.22	8,706.86	8,808.22	0.00	0.00	0.00	
17,100.00	90.00	91.10	7,659.00	-1,341.13	8,806.84	8,907.52	0.00	0.00	0.00	

## Planning Report

<b>Database:</b>	EDT_32Bit_ODBC	<b>Local Co-ordinate Reference:</b>	Well WATKINS 4-64 30-29 4AH
<b>Company:</b>	CRESTONE PEAK RESOURCES	<b>TVD Reference:</b>	KB 25' @ 5792.00usft
<b>Project:</b>	ARAPAHOE COUNTY	<b>MD Reference:</b>	KB 25' @ 5792.00usft
<b>Site:</b>	SEC 30-T4S-R64W	<b>North Reference:</b>	True
<b>Well:</b>	WATKINS 4-64 30-29 4AH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OWB		
<b>Design:</b>	PROPOSAL 1		

Planned 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)	
17,200.00	90.00	91.10	7,659.00	-1,343.05	8,906.82	9,006.82	0.00	0.00	0.00	
17,300.00	90.00	91.10	7,659.00	-1,344.96	9,006.81	9,106.13	0.00	0.00	0.00	
17,400.00	90.00	91.10	7,659.00	-1,346.88	9,106.79	9,205.43	0.00	0.00	0.00	
17,500.00	90.00	91.10	7,659.00	-1,348.79	9,206.77	9,304.73	0.00	0.00	0.00	
17,600.00	90.00	91.10	7,659.00	-1,350.71	9,306.75	9,404.03	0.00	0.00	0.00	
17,700.00	90.00	91.10	7,659.00	-1,352.62	9,406.73	9,503.34	0.00	0.00	0.00	
17,800.00	90.00	91.10	7,659.00	-1,354.54	9,506.71	9,602.64	0.00	0.00	0.00	
17,900.00	90.00	91.10	7,659.00	-1,356.45	9,606.70	9,701.94	0.00	0.00	0.00	
18,000.00	90.00	91.10	7,659.00	-1,358.37	9,706.68	9,801.25	0.00	0.00	0.00	
18,100.00	90.00	91.10	7,659.00	-1,360.28	9,806.66	9,900.55	0.00	0.00	0.00	
18,146.71	90.00	91.10	7,659.00	-1,361.17	9,853.36	9,946.93	0.00	0.00	0.00	
TD at 18146.71										

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
- hit/miss target										
- Shape										
PBHL-WATKINS 4-64 4H	0.00	0.00	7,659.00	-1,361.17	9,853.36	1,670,133.89	3,262,703.15	39.669611°N	104.566772°W	
- plan hits target center										
- Point										
LP-WATKINS 4-64 4AH	0.00	0.00	7,659.00	-1,169.28	-167.78	1,670,226.69	3,252,680.75	39.670143°N	104.602370°W	
- plan hits target center										
- Point										

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
24.00	24.00	Denver				
689.14	689.00	Arapahoe				
1,297.41	1,289.00	Laramie-Fox Hills Formation				
2,032.46	2,009.00	Pierre Formation				
2,553.13	2,519.00	Upper Pierre aquifer				
3,170.78	3,124.00	Base of Upper Pierre aquifer				
4,207.00	4,139.00	Larimer ("Parkman") sandstone				
4,329.51	4,259.00	Pierre Formation				
5,401.47	5,309.00	Terry ("Sussex") sandstone				
5,564.81	5,469.00	Pierre Formation				
6,330.50	6,219.00	Hygiene ("Shannon") sandstone				
6,555.10	6,439.00	Pierre Formation				
7,727.12	7,529.00	Sharon Springs Member				
8,123.74	7,659.00	Niobrara Formation				



## Planning Report

<b>Database:</b>	EDT_32Bit_ODBC	<b>Local Co-ordinate Reference:</b>	Well WATKINS 4-64 30-29 4AH
<b>Company:</b>	CRESTONE PEAK RESOURCES	<b>TVD Reference:</b>	KB 25' @ 5792.00usft
<b>Project:</b>	ARAPAHOE COUNTY	<b>MD Reference:</b>	KB 25' @ 5792.00usft
<b>Site:</b>	SEC 30-T4S-R64W	<b>North Reference:</b>	True
<b>Well:</b>	WATKINS 4-64 30-29 4AH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OWB		
<b>Design:</b>	PROPOSAL 1		

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
500.00	500.00	0.00	0.00	Start Build 2.00
1,080.82	1,076.85	-48.09	-33.62	Start 6078.50 hold at 1080.82 MD
7,159.32	7,030.84	-1,051.18	-734.96	Start DLS 10.00 TFO -123.32
8,123.74	7,659.00	-1,169.28	-167.78	Start 10022.97 hold at 8123.74 MD
18,146.71	7,659.00	-1,361.17	9,853.36	TD at 18146.71