

# **US ROCKIES WATTENBERG PLANNING**

**WELD-NAD83-UTMFT13N**

**3N-68W-33 Hergenreder 4-33HZ Pad**

**HERGENREDER 22N1-4HZ**

**Plan A**

**Plan: Permit Rev-2**

## **Standard Planning Report**

**27 June, 2017**

# US ROCKIES WATTENBERG PLANNING

# Corporate Planning Report

<b>Database:</b>	PLANNING	<b>Local Co-ordinate Reference:</b>	Well HERGENREDER 22N1-4HZ
<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>TVD Reference:</b>	RKB = 17' @ 4959.00usft (D Rig)
<b>Project:</b>	WELD-NAD83-UTMFT13N	<b>MD Reference:</b>	RKB = 17' @ 4959.00usft (D Rig)
<b>Site:</b>	3N-68W-33 Hergenreder 4-33HZ Pad	<b>North Reference:</b>	True
<b>Well:</b>	HERGENREDER 22N1-4HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Plan A		
<b>Design:</b>	Permit Rev-2		

<b>Project</b>	WELD-NAD83-UTMFT13N		
<b>Map System:</b>	Universal Transverse Mercator (US Survey Feet)	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Zone 13N (108 W to 102 W)		

<b>Site</b>	3N-68W-33 Hergenreder 4-33HZ Pad			
<b>Site Position:</b>		<b>Northing:</b>	14,595,483.88 usft	<b>Latitude:</b> 40.188798
<b>From:</b>	Lat/Long	<b>Easting:</b>	1,636,558.44 usft	<b>Longitude:</b> -105.013815
<b>Position Uncertainty:</b>	0.00 usft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b> -0.01 °

<b>Well</b>	HERGENREDER 22N1-4HZ			
<b>Well Position</b>	<b>+N/-S</b>	-57.90 usft	<b>Northing:</b>	14,595,425.97 usft
	<b>+E/-W</b>	15.08 usft	<b>Easting:</b>	1,636,573.51 usft
<b>Position Uncertainty</b>		3.28 usft	<b>Wellhead Elevation:</b>	0.00 usft
			<b>Ground Level:</b>	4,942.00 usft

<b>Wellbore</b>	Plan A				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	9/15/2015	8.41	66.69	52,545.69299756

<b>Design</b>	Permit Rev-2			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PLAN	<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	180.07

<b>Plan Survey Tool Program</b>		<b>Date</b>	6/27/2017		
<b>Depth From (usft)</b>	<b>Depth To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Remarks</b>	
1	0.00	1,000.00	Permit Rev-2 (Plan A)	APC_ISCWSA REV 2 MWD+I Fixed:v2:crustal field declination	
2	1,000.00	13,936.21	Permit Rev-2 (Plan A)	APC_ISCWSA REV 2 MWD+I Fixed:v2:crustal field declination	

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<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>TVD Reference:</b>	RKB = 17' @ 4959.00usft (D Rig)
<b>Project:</b>	WELD-NAD83-UTMFT13N	<b>MD Reference:</b>	RKB = 17' @ 4959.00usft (D Rig)
<b>Site:</b>	3N-68W-33 Hergenreder 4-33HZ Pad	<b>North Reference:</b>	True
<b>Well:</b>	HERGENREDER 22N1-4HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Plan A		
<b>Design:</b>	Permit Rev-2		

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
250.00	0.00	0.00	250.00	0.00	0.00	0.00	0.00	0.00	0.00	
916.67	10.00	9.00	913.29	57.32	9.08	1.50	1.50	0.00	9.00	
1,686.67	10.00	9.00	1,671.59	189.38	29.99	0.00	0.00	0.00	0.00	
2,186.67	0.00	0.00	2,169.05	232.37	36.80	2.00	-2.00	0.00	180.00	
6,308.56	0.00	0.00	6,290.94	232.37	36.80	0.00	0.00	0.00	0.00	
7,281.67	87.58	180.07	6,927.00	-377.37	36.03	9.00	9.00	-18.49	180.07	
13,936.21	87.58	180.07	7,208.00	-7,025.97	27.58	0.00	0.00	0.00	0.00	HERGENREDER 22N

**Corporate**  
Planning Report

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<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>TVD Reference:</b>	RKB = 17' @ 4959.00usft (D Rig)
<b>Project:</b>	WELD-NAD83-UTMFT13N	<b>MD Reference:</b>	RKB = 17' @ 4959.00usft (D Rig)
<b>Site:</b>	3N-68W-33 Hergenreder 4-33HZ Pad	<b>North Reference:</b>	True
<b>Well:</b>	HERGENREDER 22N1-4HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Plan A		
<b>Design:</b>	Permit Rev-2		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>HERGENREDER 22N1-4HZ_Hardline Box - HERGENREDER North Line Section 33 - HERGENREDER 22N2-4HZ_460 Polygon 3 - HERGEN</b>									
30.00	0.00	0.00	30.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>3N-R68W-Sec. 33_Section Lines - 2N-R68W-Sec. 4_Section Lines</b>									
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
250.00	0.00	0.00	250.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Begin Nudge @ 250.00ft</b>									
300.00	0.75	9.00	300.00	0.32	0.05	-0.32	1.50	1.50	0.00
400.00	2.25	9.00	399.96	2.91	0.46	-2.91	1.50	1.50	0.00
419.06	2.54	9.00	419.00	3.69	0.59	-3.70	1.50	1.50	0.00
<b>Fox Hills</b>									
500.00	3.75	9.00	499.82	8.08	1.28	-8.08	1.50	1.50	0.00
600.00	5.25	9.00	599.51	15.83	2.51	-15.83	1.50	1.50	0.00
700.00	6.75	9.00	698.96	26.15	4.14	-26.16	1.50	1.50	0.00
800.00	8.25	9.00	798.10	39.04	6.18	-39.05	1.50	1.50	0.00
900.00	9.75	9.00	896.87	54.49	8.63	-54.50	1.50	1.50	0.00
916.67	10.00	9.00	913.29	57.32	9.08	-57.33	1.50	1.50	0.00
<b>End Nudge @ 916.67ft</b>									
1,000.00	10.00	9.00	995.35	71.61	11.34	-71.62	0.00	0.00	0.00
1,004.72	10.00	9.00	1,000.00	72.42	11.47	-72.43	0.00	0.00	0.00
<b>9 5/8"</b>									
1,100.00	10.00	9.00	1,093.84	88.76	14.06	-88.78	0.00	0.00	0.00
1,200.00	10.00	9.00	1,192.32	105.91	16.77	-105.93	0.00	0.00	0.00
1,300.00	10.00	9.00	1,290.80	123.06	19.49	-123.08	0.00	0.00	0.00
1,400.00	10.00	9.00	1,389.28	140.21	22.21	-140.24	0.00	0.00	0.00
1,500.00	10.00	9.00	1,487.76	157.36	24.92	-157.39	0.00	0.00	0.00
1,600.00	10.00	9.00	1,586.24	174.51	27.64	-174.55	0.00	0.00	0.00
1,686.67	10.00	9.00	1,671.59	189.38	29.99	-189.42	0.00	0.00	0.00
<b>Begin Drop @ 1686.67ft</b>									
1,700.00	9.73	9.00	1,684.73	191.64	30.35	-191.67	2.00	-2.00	0.00
1,800.00	7.73	9.00	1,783.56	206.63	32.73	-206.67	2.00	-2.00	0.00
1,900.00	5.73	9.00	1,882.87	218.21	34.56	-218.25	2.00	-2.00	0.00
2,000.00	3.73	9.00	1,982.52	226.36	35.85	-226.40	2.00	-2.00	0.00
2,100.00	1.73	9.00	2,082.40	231.07	36.60	-231.12	2.00	-2.00	0.00
2,186.67	0.00	0.00	2,169.06	232.37	36.80	-232.41	2.00	-2.00	0.00
<b>End Drop @ 2186.67ft</b>									
2,200.00	0.00	0.00	2,182.39	232.37	36.80	-232.41	0.00	0.00	0.00
2,300.00	0.00	0.00	2,282.39	232.37	36.80	-232.41	0.00	0.00	0.00
2,400.00	0.00	0.00	2,382.39	232.37	36.80	-232.41	0.00	0.00	0.00
2,500.00	0.00	0.00	2,482.39	232.37	36.80	-232.41	0.00	0.00	0.00
2,600.00	0.00	0.00	2,582.39	232.37	36.80	-232.41	0.00	0.00	0.00
2,700.00	0.00	0.00	2,682.39	232.37	36.80	-232.41	0.00	0.00	0.00
2,800.00	0.00	0.00	2,782.39	232.37	36.80	-232.41	0.00	0.00	0.00
2,900.00	0.00	0.00	2,882.39	232.37	36.80	-232.41	0.00	0.00	0.00
3,000.00	0.00	0.00	2,982.39	232.37	36.80	-232.41	0.00	0.00	0.00
3,100.00	0.00	0.00	3,082.39	232.37	36.80	-232.41	0.00	0.00	0.00
3,200.00	0.00	0.00	3,182.39	232.37	36.80	-232.41	0.00	0.00	0.00
3,300.00	0.00	0.00	3,282.39	232.37	36.80	-232.41	0.00	0.00	0.00
3,400.00	0.00	0.00	3,382.39	232.37	36.80	-232.41	0.00	0.00	0.00
3,485.61	0.00	0.00	3,468.00	232.37	36.80	-232.41	0.00	0.00	0.00
<b>Parkman</b>									
3,500.00	0.00	0.00	3,482.39	232.37	36.80	-232.41	0.00	0.00	0.00

**Corporate**  
Planning Report

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<b>Well:</b>	HERGENREDER 22N1-4HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Plan A		
<b>Design:</b>	Permit Rev-2		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
3,600.00	0.00	0.00	3,582.39	232.37	36.80	-232.41	0.00	0.00	0.00
3,700.00	0.00	0.00	3,682.39	232.37	36.80	-232.41	0.00	0.00	0.00
3,800.00	0.00	0.00	3,782.39	232.37	36.80	-232.41	0.00	0.00	0.00
3,900.00	0.00	0.00	3,882.39	232.37	36.80	-232.41	0.00	0.00	0.00
3,956.61	0.00	0.00	3,939.00	232.37	36.80	-232.41	0.00	0.00	0.00
<b>Sussex</b>									
4,000.00	0.00	0.00	3,982.39	232.37	36.80	-232.41	0.00	0.00	0.00
4,100.00	0.00	0.00	4,082.39	232.37	36.80	-232.41	0.00	0.00	0.00
4,200.00	0.00	0.00	4,182.39	232.37	36.80	-232.41	0.00	0.00	0.00
4,300.00	0.00	0.00	4,282.39	232.37	36.80	-232.41	0.00	0.00	0.00
4,400.00	0.00	0.00	4,382.39	232.37	36.80	-232.41	0.00	0.00	0.00
4,500.00	0.00	0.00	4,482.39	232.37	36.80	-232.41	0.00	0.00	0.00
4,600.00	0.00	0.00	4,582.39	232.37	36.80	-232.41	0.00	0.00	0.00
4,700.00	0.00	0.00	4,682.39	232.37	36.80	-232.41	0.00	0.00	0.00
4,800.00	0.00	0.00	4,782.39	232.37	36.80	-232.41	0.00	0.00	0.00
4,900.00	0.00	0.00	4,882.39	232.37	36.80	-232.41	0.00	0.00	0.00
5,000.00	0.00	0.00	4,982.39	232.37	36.80	-232.41	0.00	0.00	0.00
5,100.00	0.00	0.00	5,082.39	232.37	36.80	-232.41	0.00	0.00	0.00
5,200.00	0.00	0.00	5,182.39	232.37	36.80	-232.41	0.00	0.00	0.00
5,300.00	0.00	0.00	5,282.39	232.37	36.80	-232.41	0.00	0.00	0.00
5,400.00	0.00	0.00	5,382.39	232.37	36.80	-232.41	0.00	0.00	0.00
5,500.00	0.00	0.00	5,482.39	232.37	36.80	-232.41	0.00	0.00	0.00
5,600.00	0.00	0.00	5,582.39	232.37	36.80	-232.41	0.00	0.00	0.00
5,700.00	0.00	0.00	5,682.39	232.37	36.80	-232.41	0.00	0.00	0.00
5,800.00	0.00	0.00	5,782.39	232.37	36.80	-232.41	0.00	0.00	0.00
5,900.00	0.00	0.00	5,882.39	232.37	36.80	-232.41	0.00	0.00	0.00
6,000.00	0.00	0.00	5,982.39	232.37	36.80	-232.41	0.00	0.00	0.00
6,100.00	0.00	0.00	6,082.39	232.37	36.80	-232.41	0.00	0.00	0.00
6,200.00	0.00	0.00	6,182.39	232.37	36.80	-232.41	0.00	0.00	0.00
6,300.00	0.00	0.00	6,282.39	232.37	36.80	-232.41	0.00	0.00	0.00
6,308.56	0.00	0.00	6,290.95	232.37	36.80	-232.41	0.00	0.00	0.00
<b>KOP @ 6308.56ft</b>									
6,400.00	8.23	180.07	6,382.07	225.81	36.79	-225.85	9.00	9.00	0.00
6,500.00	17.23	180.07	6,479.52	203.80	36.77	-203.84	9.00	9.00	0.00
6,600.00	26.23	180.07	6,572.31	166.81	36.72	-166.86	9.00	9.00	0.00
6,700.00	35.23	180.07	6,658.18	115.76	36.65	-115.81	9.00	9.00	0.00
6,800.00	44.23	180.07	6,735.01	51.91	36.57	-51.96	9.00	9.00	0.00
<b>DLS = 9°/100'</b>									
6,829.99	46.93	180.07	6,756.00	30.50	36.55	-30.54	9.00	9.00	0.00
<b>Sharon Springs</b>									
6,900.00	53.23	180.07	6,800.91	-23.17	36.48	23.13	9.00	9.00	0.00
6,978.69	60.31	180.07	6,844.00	-88.95	36.39	88.91	9.00	9.00	0.00
<b>Niobrara</b>									
7,000.00	62.23	180.07	6,854.24	-107.64	36.37	107.59	9.00	9.00	0.00
7,100.00	71.23	180.07	6,893.71	-199.41	36.25	199.36	9.00	9.00	0.00
7,124.00	73.39	180.07	6,901.00	-222.27	36.23	222.23	9.00	9.00	0.00
<b>Nio B</b>									
7,200.00	80.23	180.07	6,918.33	-296.22	36.13	296.18	9.00	9.00	0.00
7,281.67	87.58	180.07	6,927.00	-377.38	36.03	377.33	9.00	9.00	0.00
<b>End Build @ 7281.67ft - Top of Production</b>									
7,300.00	87.58	180.07	6,927.77	-395.69	36.00	395.64	0.00	0.00	0.00
7,400.00	87.58	180.07	6,931.99	-495.60	35.88	495.56	0.00	0.00	0.00
7,500.00	87.58	180.07	6,936.22	-595.51	35.75	595.47	0.00	0.00	0.00

**Corporate**  
Planning Report

<b>Database:</b>	PLANNING	<b>Local Co-ordinate Reference:</b>	Well HERGENREDER 22N1-4HZ
<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>TVD Reference:</b>	RKB = 17' @ 4959.00usft (D Rig)
<b>Project:</b>	WELD-NAD83-UTMFT13N	<b>MD Reference:</b>	RKB = 17' @ 4959.00usft (D Rig)
<b>Site:</b>	3N-68W-33 Hergenreder 4-33HZ Pad	<b>North Reference:</b>	True
<b>Well:</b>	HERGENREDER 22N1-4HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Plan A		
<b>Design:</b>	Permit Rev-2		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
7,600.00	87.58	180.07	6,940.44	-695.42	35.62	695.38	0.00	0.00	0.00
7,700.00	87.58	180.07	6,944.66	-795.33	35.50	795.29	0.00	0.00	0.00
7,800.00	87.58	180.07	6,948.88	-895.24	35.37	895.20	0.00	0.00	0.00
7,900.00	87.58	180.07	6,953.11	-995.15	35.24	995.11	0.00	0.00	0.00
8,000.00	87.58	180.07	6,957.33	-1,095.06	35.12	1,095.02	0.00	0.00	0.00
8,100.00	87.58	180.07	6,961.55	-1,194.97	34.99	1,194.93	0.00	0.00	0.00
8,200.00	87.58	180.07	6,965.78	-1,294.89	34.86	1,294.84	0.00	0.00	0.00
8,300.00	87.58	180.07	6,970.00	-1,394.80	34.73	1,394.75	0.00	0.00	0.00
8,394.77	87.58	180.07	6,974.00	-1,489.48	34.61	1,489.44	0.00	0.00	0.00
<b>Nio C</b>									
8,400.00	87.58	180.07	6,974.22	-1,494.71	34.61	1,494.66	0.00	0.00	0.00
8,500.00	87.58	180.07	6,978.44	-1,594.62	34.48	1,594.57	0.00	0.00	0.00
8,600.00	87.58	180.07	6,982.67	-1,694.53	34.35	1,694.49	0.00	0.00	0.00
8,700.00	87.58	180.07	6,986.89	-1,794.44	34.23	1,794.40	0.00	0.00	0.00
8,800.00	87.58	180.07	6,991.11	-1,894.35	34.10	1,894.31	0.00	0.00	0.00
8,900.00	87.58	180.07	6,995.33	-1,994.26	33.97	1,994.22	0.00	0.00	0.00
9,000.00	87.58	180.07	6,999.56	-2,094.17	33.85	2,094.13	0.00	0.00	0.00
9,100.00	87.58	180.07	7,003.78	-2,194.08	33.72	2,194.04	0.00	0.00	0.00
9,200.00	87.58	180.07	7,008.00	-2,293.99	33.59	2,293.95	0.00	0.00	0.00
9,300.00	87.58	180.07	7,012.23	-2,393.90	33.47	2,393.86	0.00	0.00	0.00
9,400.00	87.58	180.07	7,016.45	-2,493.81	33.34	2,493.77	0.00	0.00	0.00
9,500.00	87.58	180.07	7,020.67	-2,593.72	33.21	2,593.68	0.00	0.00	0.00
9,600.00	87.58	180.07	7,024.89	-2,693.64	33.08	2,693.59	0.00	0.00	0.00
9,700.00	87.58	180.07	7,029.12	-2,793.55	32.96	2,793.50	0.00	0.00	0.00
9,800.00	87.58	180.07	7,033.34	-2,893.46	32.83	2,893.41	0.00	0.00	0.00
9,900.00	87.58	180.07	7,037.56	-2,993.37	32.70	2,993.33	0.00	0.00	0.00
10,000.00	87.58	180.07	7,041.78	-3,093.28	32.58	3,093.24	0.00	0.00	0.00
10,100.00	87.58	180.07	7,046.01	-3,193.19	32.45	3,193.15	0.00	0.00	0.00
10,200.00	87.58	180.07	7,050.23	-3,293.10	32.32	3,293.06	0.00	0.00	0.00
10,300.00	87.58	180.07	7,054.45	-3,393.01	32.20	3,392.97	0.00	0.00	0.00
10,400.00	87.58	180.07	7,058.68	-3,492.92	32.07	3,492.88	0.00	0.00	0.00
10,500.00	87.58	180.07	7,062.90	-3,592.83	31.94	3,592.79	0.00	0.00	0.00
10,600.00	87.58	180.07	7,067.12	-3,692.74	31.81	3,692.70	0.00	0.00	0.00
10,700.00	87.58	180.07	7,071.34	-3,792.65	31.69	3,792.61	0.00	0.00	0.00
10,800.00	87.58	180.07	7,075.57	-3,892.56	31.56	3,892.52	0.00	0.00	0.00
10,900.00	87.58	180.07	7,079.79	-3,992.48	31.43	3,992.43	0.00	0.00	0.00
11,000.00	87.58	180.07	7,084.01	-4,092.39	31.31	4,092.34	0.00	0.00	0.00
11,100.00	87.58	180.07	7,088.23	-4,192.30	31.18	4,192.26	0.00	0.00	0.00
11,200.00	87.58	180.07	7,092.46	-4,292.21	31.05	4,292.17	0.00	0.00	0.00
11,300.00	87.58	180.07	7,096.68	-4,392.12	30.93	4,392.08	0.00	0.00	0.00
11,354.94	87.58	180.07	7,099.00	-4,447.01	30.86	4,446.97	0.00	0.00	0.00
<b>Fort Hayes</b>									
11,400.00	87.58	180.07	7,100.90	-4,492.03	30.80	4,491.99	0.00	0.00	0.00
11,500.00	87.58	180.07	7,105.13	-4,591.94	30.67	4,591.90	0.00	0.00	0.00
11,600.00	87.58	180.07	7,109.35	-4,691.85	30.54	4,691.81	0.00	0.00	0.00
11,700.00	87.58	180.07	7,113.57	-4,791.76	30.42	4,791.72	0.00	0.00	0.00
11,800.00	87.58	180.07	7,117.79	-4,891.67	30.29	4,891.63	0.00	0.00	0.00
11,852.25	87.58	180.07	7,120.00	-4,943.87	30.22	4,943.83	0.00	0.00	0.00
<b>Codell</b>									
11,900.00	87.58	180.07	7,122.02	-4,991.58	30.16	4,991.54	0.00	0.00	0.00
12,000.00	87.58	180.07	7,126.24	-5,091.49	30.04	5,091.45	0.00	0.00	0.00
12,100.00	87.58	180.07	7,130.46	-5,191.40	29.91	5,191.36	0.00	0.00	0.00
12,200.00	87.58	180.07	7,134.68	-5,291.31	29.78	5,291.27	0.00	0.00	0.00

# Corporate Planning Report

<b>Database:</b>	PLANNING	<b>Local Co-ordinate Reference:</b>	Well HERGENREDER 22N1-4HZ
<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>TVD Reference:</b>	RKB = 17' @ 4959.00usft (D Rig)
<b>Project:</b>	WELD-NAD83-UTMFT13N	<b>MD Reference:</b>	RKB = 17' @ 4959.00usft (D Rig)
<b>Site:</b>	3N-68W-33 Hergenreder 4-33HZ Pad	<b>North Reference:</b>	True
<b>Well:</b>	HERGENREDER 22N1-4HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Plan A		
<b>Design:</b>	Permit Rev-2		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
12,300.00	87.58	180.07	7,138.91	-5,391.23	29.66	5,391.18	0.00	0.00	0.00
12,400.00	87.58	180.07	7,143.13	-5,491.14	29.53	5,491.10	0.00	0.00	0.00
12,500.00	87.58	180.07	7,147.35	-5,591.05	29.40	5,591.01	0.00	0.00	0.00
12,600.00	87.58	180.07	7,151.58	-5,690.96	29.27	5,690.92	0.00	0.00	0.00
12,700.00	87.58	180.07	7,155.80	-5,790.87	29.15	5,790.83	0.00	0.00	0.00
12,800.00	87.58	180.07	7,160.02	-5,890.78	29.02	5,890.74	0.00	0.00	0.00
12,900.00	87.58	180.07	7,164.24	-5,990.69	28.89	5,990.65	0.00	0.00	0.00
13,000.00	87.58	180.07	7,168.47	-6,090.60	28.77	6,090.56	0.00	0.00	0.00
13,100.00	87.58	180.07	7,172.69	-6,190.51	28.64	6,190.47	0.00	0.00	0.00
13,200.00	87.58	180.07	7,176.91	-6,290.42	28.51	6,290.38	0.00	0.00	0.00
13,300.00	87.58	180.07	7,181.13	-6,390.33	28.39	6,390.29	0.00	0.00	0.00
13,400.00	87.58	180.07	7,185.36	-6,490.24	28.26	6,490.20	0.00	0.00	0.00
13,500.00	87.58	180.07	7,189.58	-6,590.15	28.13	6,590.11	0.00	0.00	0.00
13,600.00	87.58	180.07	7,193.80	-6,690.06	28.00	6,690.03	0.00	0.00	0.00
13,700.00	87.58	180.07	7,198.03	-6,789.98	27.88	6,789.94	0.00	0.00	0.00
13,800.00	87.58	180.07	7,202.25	-6,889.89	27.75	6,889.85	0.00	0.00	0.00
13,900.00	87.58	180.07	7,206.47	-6,989.80	27.62	6,989.76	0.00	0.00	0.00
13,936.21	87.58	180.07	7,208.00	-7,025.97	27.58	7,025.93	0.00	0.00	0.00
TD Well @ 13936.21ft - HERGENREDER 22N1-4HZ_TOE									



**Corporate**  
Planning Report

<b>Database:</b>	PLANNING	<b>Local Co-ordinate Reference:</b>	Well HERGENREDER 22N1-4HZ
<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>TVD Reference:</b>	RKB = 17' @ 4959.00usft (D Rig)
<b>Project:</b>	WELD-NAD83-UTMFT13N	<b>MD Reference:</b>	RKB = 17' @ 4959.00usft (D Rig)
<b>Site:</b>	3N-68W-33 Hergenreder 4-33HZ Pad	<b>North Reference:</b>	True
<b>Well:</b>	HERGENREDER 22N1-4HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Plan A		
<b>Design:</b>	Permit Rev-2		

Design Targets									
Target Name									
- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- Shape	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
2N-R68W-Sec. 4_Sectic	0.00	0.00	30.00	27.38	1,789.06	14,595,453.07	1,638,362.57	40.188714	-105.007355
- plan misses target center by 1789.27usft at 30.00usft MD (30.00 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1			30.00	-5,040.96	-2,769.50	14,590,412.54	1,635,592.29		
Point 2			30.00	-5,018.95	-136.58	14,590,434.14	1,638,225.21		
Point 3			30.00	-4,995.84	2,515.63	14,590,456.84	1,640,877.43		
Point 4			30.00	-7,591.82	2,497.44	14,587,860.86	1,640,858.83		
Point 5			30.00	-10,216.42	2,462.98	14,585,236.27	1,640,823.97		
Point 6			30.00	-10,271.92	-193.52	14,585,181.18	1,638,167.46		
Point 7			30.00	-10,321.42	-2,870.28	14,585,132.10	1,635,490.69		
Point 8			30.00	-7,652.28	-2,819.20	14,587,801.23	1,635,542.18		
3N-R68W-Sec. 33_Secti	0.00	0.00	30.00	27.38	1,789.06	14,595,453.07	1,638,362.57	40.188714	-105.007355
- plan misses target center by 1789.27usft at 30.00usft MD (30.00 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1			30.00	251.45	-2,791.30	14,595,704.95	1,635,571.31		
Point 2			30.00	282.36	-157.69	14,595,735.46	1,638,204.92		
Point 3			30.00	310.96	2,511.36	14,595,763.64	1,640,873.98		
Point 4			30.00	-2,346.36	2,515.74	14,593,106.32	1,640,877.95		
Point 5			30.00	-4,995.84	2,515.63	14,590,456.84	1,640,877.43		
Point 6			30.00	-5,018.95	-136.58	14,590,434.14	1,638,225.21		
Point 7			30.00	-5,040.96	-2,769.50	14,590,412.54	1,635,592.29		
Point 8			30.00	-2,394.09	-2,784.98	14,593,059.41	1,635,577.22		
HERGENREDER 22N1-	0.00	0.00	0.00	0.00	0.00	14,595,425.97	1,636,573.51	40.188639	-105.013761
- plan hits target center									
- Polygon									
Point 1			0.00	-162.75	779.84	14,595,263.10	1,637,353.32		
Point 2			0.00	-1,028.24	784.54	14,594,397.61	1,637,357.89		
Point 3			0.00	-2,353.34	789.98	14,593,072.51	1,637,363.12		
Point 4			0.00	-3,677.28	795.43	14,591,748.57	1,637,368.37		
Point 5			0.00	-5,000.85	799.11	14,590,425.00	1,637,371.84		
Point 6			0.00	-6,304.15	779.98	14,589,121.70	1,637,352.51		
Point 7			0.00	-7,147.35	767.53	14,588,278.50	1,637,339.93		
Point 8			0.00	-7,152.48	307.40	14,588,273.45	1,636,879.80		
Point 9			0.00	-7,157.61	-152.73	14,588,268.39	1,636,419.67		
Point 10			0.00	-6,313.26	-140.25	14,589,112.73	1,636,432.28		
Point 11			0.00	-5,008.80	-120.98	14,590,417.19	1,636,451.75		
Point 12			0.00	-3,685.20	-124.55	14,591,740.79	1,636,448.39		
Point 13			0.00	-2,361.22	-129.99	14,593,064.77	1,636,443.15		
Point 14			0.00	-1,037.58	-135.43	14,594,388.41	1,636,437.92		
Point 15			0.00	-173.58	-140.11	14,595,252.41	1,636,433.37		
Point 16			0.00	-168.16	319.86	14,595,257.76	1,636,893.34		
Point 17			0.00	-162.75	779.84	14,595,263.10	1,637,353.32		
HERGENREDER 22N1-	0.00	0.00	0.00	0.00	0.00	14,595,425.97	1,636,573.51	40.188639	-105.013761
- plan hits target center									
- Point									
HERGENREDER 22N1-	0.00	0.00	7,208.00	-7,025.97	27.58	14,588,400.00	1,636,600.00	40.169345	-105.013663
- plan hits target center									
- Point									
HERGENREDER 22N2-	0.00	0.00	0.00	-6,308.73	319.87	14,589,117.20	1,636,892.40	40.171315	-105.012616
- plan misses target center by 6316.83usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Circle (radius 460.00)									
HERGENREDER 22N2-	0.00	0.00	0.00	-1,032.93	324.56	14,594,393.00	1,636,897.91	40.185803	-105.012599
- plan misses target center by 1082.72usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Circle (radius 460.00)									

**Corporate**  
Planning Report

<b>Database:</b>	PLANNING	<b>Local Co-ordinate Reference:</b>	Well HERGENREDER 22N1-4HZ
<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>TVD Reference:</b>	RKB = 17' @ 4959.00usft (D Rig)
<b>Project:</b>	WELD-NAD83-UTMFT13N	<b>MD Reference:</b>	RKB = 17' @ 4959.00usft (D Rig)
<b>Site:</b>	3N-68W-33 Hergenreder 4-33HZ Pad	<b>North Reference:</b>	True
<b>Well:</b>	HERGENREDER 22N1-4HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Plan A		
<b>Design:</b>	Permit Rev-2		

HERGENREDER North	0.00	0.00	0.00	0.00	0.00	14,595,425.97	1,636,573.51	40.188639	-105.013761
- plan hits target center									
- Polygon									
Point 1		0.00	276.34	-999.41	14,595,702.47	1,635,574.14			
Point 2		0.00	336.16	4,303.26	14,595,761.47	1,640,876.82			
Point 3		0.00	291.84	317.36	14,595,717.76	1,636,890.91			
Point 4		0.00	307.34	1,634.14	14,595,733.06	1,638,207.70			
Point 5		0.00	321.75	2,968.70	14,595,747.26	1,639,542.26			

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
1,004.72	1,000.00	9 5/8"	9-5/8	13-1/2	
7,281.67	6,927.00	Top of Production	7	8-3/4	
13,936.21	7,208.00	4 1/2"	4-1/2	6-1/8	

Formations					
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
419.06	419.00	Fox Hills			
3,485.61	3,468.00	Parkman			
3,956.61	3,939.00	Sussex			
6,829.99	6,756.00	Sharon Springs			
6,978.69	6,844.00	Niobrara			
7,124.00	6,901.00	Nio B			
8,394.77	6,974.00	Nio C			
11,354.94	7,099.00	Fort Hayes			
11,852.25	7,120.00	Codell			

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
250.00	250.00	0.00	0.00	Begin Nudge @ 250.00ft
916.67	913.29	57.32	9.08	End Nudge @ 916.67ft
1,686.67	1,671.59	189.38	29.99	Begin Drop @ 1686.67ft
2,186.67	2,169.06	232.37	36.80	End Drop @ 2186.67ft
6,308.56	6,290.95	232.37	36.80	KOP @ 6308.56ft
6,800.00	6,735.01	51.91	36.57	DLS = 9°/100'
7,281.67	6,927.00	-377.38	36.03	End Build @ 7281.67ft
13,936.21	7,208.00	-7,025.97	27.58	TD Well @ 13936.21ft