

US ROCKIES WATTENBERG PLANNING

WELD-NAD83-UTMFT13N

3N-67W-30 RADEMACHER 14-30HZ PAD

RADEMACHER SOUTH 30-14HZ

Plan A

Plan: Permit Rev-1

Standard Planning Report

27 April, 2023

Project: WELD-NAD83-UTMFT13N

Site: 3N-67W-30 RADEMACHER 14-30HZ PAD

Well: RADEMACHER SOUTH 30-14HZ

Wellbore: Plan A

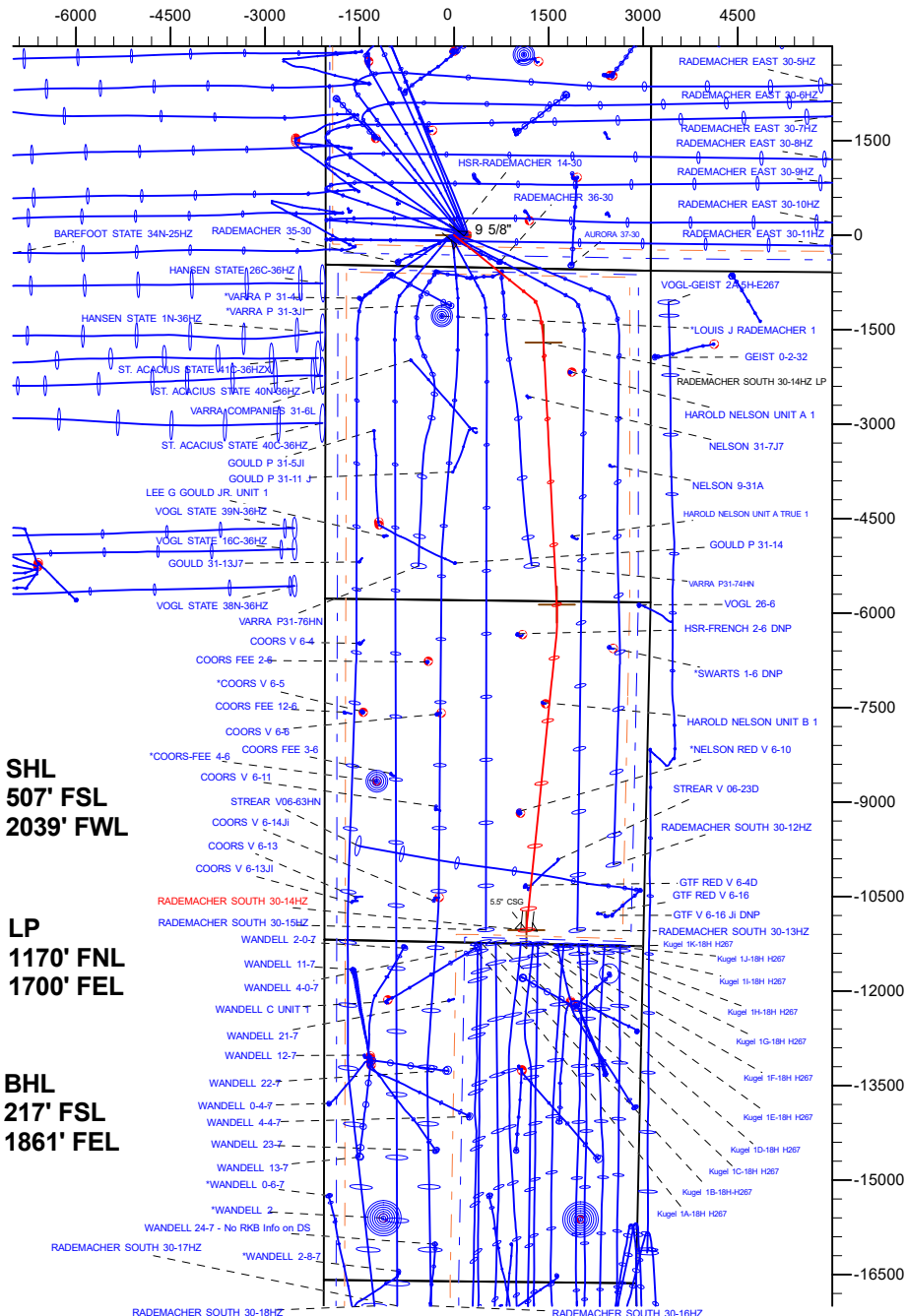
Design: Permit Rev-1

US ROCKIES WATTENBERG PLANNING

CASING DETAILS

TVD	MD	Name	Size
1500.00	1511.79	9 5/8"	9-5/8
7145.20	17040.00	5.5" CSG	5-1/2

West(-)/East(+) (3000 usft/in)



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	Target
2	500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	
3	1610.00	16.65	128.95	1594.44	-100.68	124.55	1.50	128.95	96.98	
4	6706.44	16.65	128.95	6477.20	-1018.65	1260.18	0.00	0.00	981.27	
5	7682.61	89.09	177.11	7043.00	-1703.41	1418.95	8.00	49.58	1661.08	
6	11851.57	89.09	177.11	7109.15	-5866.53	1629.35	0.00	0.00	5816.24	RADEMACHER SOUTH 30-14HZ INT TGT
7	12434.91	89.63	185.84	7115.66	-6449.08	1614.36	1.50	86.51	6398.98	
8	17040.00	89.63	185.84	7145.20	-11030.17	1145.74	0.00	0.00	10991.84	RADEMACHER SOUTH 30-14HZ BHL

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	Northing	Easting	Latitude	Longitude
RADEMACHER SOUTH 30-14HZ SHL	0.00	14596405.33	1658717.32	40.191311	-104.934469
RADEMACHER SOUTH 30-14HZ LP	7043.00	14594702.97	1660137.53	40.186633	-104.929389
RADEMACHER SOUTH 30-14HZ INT TGT	7109.15	14590540.00	1660351.00	40.175200	-104.928636
RADEMACHER SOUTH 30-14HZ BHL	7145.20	14585376.01	1659871.20	40.161021	-104.930368

WELL DETAILS: RADEMACHER SOUTH 30-14HZ

GL = 4819'

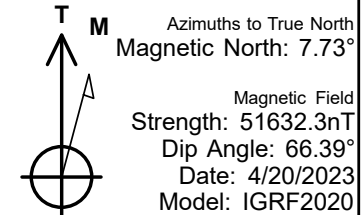
RKB = 17' @ 4836.00usft (RIG)

Plan: Permit Rev-1 (RADEMACHER SOUTH 30-14HZ/Plan A)

Date: 4/27/2023

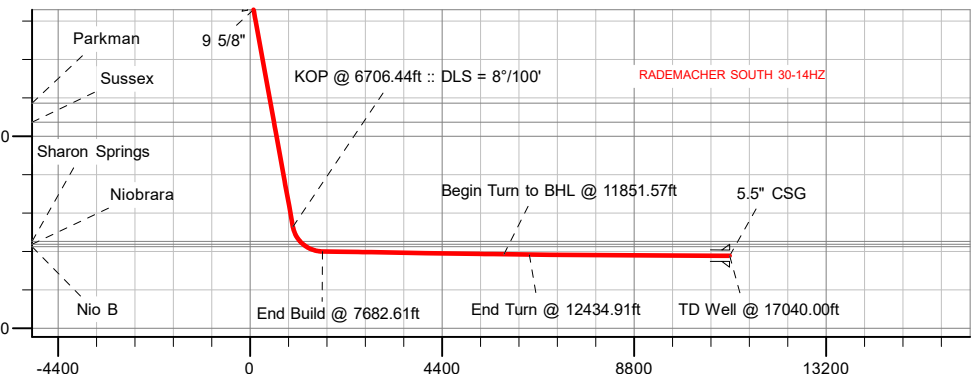
FORMATION TOP DETAILS

TVDPath	MDPath	Formation
36.00	36.00	Fox Hills
3644.00	3749.25	Parkman
4079.00	4203.29	Sussex
6812.00	7094.49	Sharon Springs
6879.00	7193.35	Niobrara
6932.00	7284.91	Nio B



usft/in (-) up/ft (+) down

True Vertical Depth (4400 usft/in)



Vertical Section at 181.68° (4400 usft/in)

Planning Report

Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well RADEMACHER SOUTH 30-14HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 4836.00usft (RIG)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4836.00usft (RIG)
Site:	3N-67W-30 RADEMACHER 14-30HZ PAD	North Reference:	True
Well:	RADEMACHER SOUTH 30-14HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan A		
Design:	Permit Rev-1		

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

Site		3N-67W-30 RADEMACHER 14-30HZ PAD			
Site Position:		Northing:	14,596,404.12 usft	Latitude:	40.191307
From:	Map	Easting:	1,658,931.24 usft	Longitude:	-104.933703
Position Uncertainty:		0.00 usft	Slot Radius:	13-3/16 "	

Well		RADEMACHER SOUTH 30-14HZ				
Well Position	+N/-S	0.00 usft	Northing:	14,596,405.33 usft	Latitude:	40.191311
	+E/-W	0.00 usft	Easting:	1,658,717.32 usft	Longitude:	-104.934469
Position Uncertainty		3.28 usft	Wellhead Elevation:	usft	Ground Level:	4,819.00 usft
Grid Convergence:		0.04 °				

Wellbore	Plan A				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF202013	4/20/2023	7.73	66.39	51,632.27634160

Design	Permit Rev-1				
Audit Notes:					
Version:		Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	181.68	

Plan Survey Tool Program	Date	4/24/2023			
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks	
1	0.00	1,500.00	Permit Rev-1 (Plan A)	APC_ISCWSA REV 2 MWD+I	
				Fixed:v2:crustal field declinatio	
2	1,500.00	17,040.00	Permit Rev-1 (Plan A)	APC_ISCWSA REV 2 MWD+I	
				Fixed:v2:Rockies, crustal dec +	

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Well:	RADEMACHER SOUTH 30-14HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan A		
Design:	Permit Rev-1		

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	
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,610.00	16.65	128.95	1,594.44	-100.68	124.55	1.50	1.50	0.00	128.95	
6,706.44	16.65	128.95	6,477.20	-1,018.65	1,260.18	0.00	0.00	0.00	0.00	
7,682.61	89.09	177.11	7,043.00	-1,703.41	1,418.95	8.00	7.42	4.93	49.58	
11,851.57	89.09	177.11	7,109.15	-5,866.53	1,629.35	0.00	0.00	0.00	0.00	RADEMACHER SOU
12,434.91	89.63	185.84	7,115.66	-6,449.08	1,614.36	1.50	0.09	1.50	86.51	
17,040.00	89.63	185.84	7,145.20	-11,030.17	1,145.74	0.00	0.00	0.00	0.00	RADEMACHER SOU

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Site:	3N-67W-30 RADEMACHER 14-30HZ PAD	North Reference:	True
Well:	RADEMACHER SOUTH 30-14HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan A		
Design:	Permit Rev-1		

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
36.00	0.00	0.00	36.00	0.00	0.00	0.00	0.00	0.00	0.00
Fox Hills									
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
Begin Nudge @ 500.00ft									
600.00	1.50	128.95	599.99	-0.82	1.02	0.79	1.50	1.50	0.00
700.00	3.00	128.95	699.91	-3.29	4.07	3.17	1.50	1.50	0.00
800.00	4.50	128.95	799.69	-7.40	9.16	7.13	1.50	1.50	0.00
900.00	6.00	128.95	899.27	-13.15	16.27	12.67	1.50	1.50	0.00
1,000.00	7.50	128.95	998.57	-20.54	25.41	19.79	1.50	1.50	0.00
1,100.00	9.00	128.95	1,097.54	-29.56	36.57	28.48	1.50	1.50	0.00
1,200.00	10.50	128.95	1,196.09	-40.21	49.74	38.73	1.50	1.50	0.00
1,300.00	12.00	128.95	1,294.16	-52.47	64.91	50.55	1.50	1.50	0.00
1,400.00	13.50	128.95	1,391.70	-66.35	82.08	63.91	1.50	1.50	0.00
1,500.00	15.00	128.95	1,488.62	-81.82	101.22	78.82	1.50	1.50	0.00
1,511.79	15.18	128.95	1,500.00	-83.75	103.61	80.68	1.50	1.50	0.00
9 5/8"									
1,610.00	16.65	128.95	1,594.44	-100.68	124.55	96.98	1.50	1.50	0.00
Hold Tangent @ 1610.00ft									
1,700.00	16.65	128.95	1,680.67	-116.89	144.60	112.60	0.00	0.00	0.00
1,800.00	16.65	128.95	1,776.48	-134.90	166.89	129.95	0.00	0.00	0.00
1,900.00	16.65	128.95	1,872.28	-152.91	189.17	147.30	0.00	0.00	0.00
2,000.00	16.65	128.95	1,968.09	-170.92	211.45	164.65	0.00	0.00	0.00
2,100.00	16.65	128.95	2,063.90	-188.94	233.73	182.00	0.00	0.00	0.00
2,200.00	16.65	128.95	2,159.71	-206.95	256.02	199.35	0.00	0.00	0.00
2,300.00	16.65	128.95	2,255.51	-224.96	278.30	216.70	0.00	0.00	0.00
2,400.00	16.65	128.95	2,351.32	-242.97	300.58	234.06	0.00	0.00	0.00
2,500.00	16.65	128.95	2,447.13	-260.98	322.87	251.41	0.00	0.00	0.00
2,600.00	16.65	128.95	2,542.94	-279.00	345.15	268.76	0.00	0.00	0.00
2,700.00	16.65	128.95	2,638.74	-297.01	367.43	286.11	0.00	0.00	0.00
2,800.00	16.65	128.95	2,734.55	-315.02	389.71	303.46	0.00	0.00	0.00
2,900.00	16.65	128.95	2,830.36	-333.03	412.00	320.81	0.00	0.00	0.00
3,000.00	16.65	128.95	2,926.16	-351.05	434.28	338.16	0.00	0.00	0.00
3,100.00	16.65	128.95	3,021.97	-369.06	456.56	355.51	0.00	0.00	0.00
3,200.00	16.65	128.95	3,117.78	-387.07	478.85	372.86	0.00	0.00	0.00
3,300.00	16.65	128.95	3,213.59	-405.08	501.13	390.22	0.00	0.00	0.00
3,400.00	16.65	128.95	3,309.39	-423.09	523.41	407.57	0.00	0.00	0.00
3,500.00	16.65	128.95	3,405.20	-441.11	545.69	424.92	0.00	0.00	0.00
3,600.00	16.65	128.95	3,501.01	-459.12	567.98	442.27	0.00	0.00	0.00
3,700.00	16.65	128.95	3,596.82	-477.13	590.26	459.62	0.00	0.00	0.00
3,749.25	16.65	128.95	3,644.00	-486.00	601.23	468.17	0.00	0.00	0.00
Parkman									
3,800.00	16.65	128.95	3,692.62	-495.14	612.54	476.97	0.00	0.00	0.00
3,900.00	16.65	128.95	3,788.43	-513.15	634.83	494.32	0.00	0.00	0.00
4,000.00	16.65	128.95	3,884.24	-531.17	657.11	511.67	0.00	0.00	0.00
4,100.00	16.65	128.95	3,980.04	-549.18	679.39	529.03	0.00	0.00	0.00
4,200.00	16.65	128.95	4,075.85	-567.19	701.67	546.38	0.00	0.00	0.00
4,203.29	16.65	128.95	4,079.00	-567.78	702.41	546.95	0.00	0.00	0.00
Sussex									

Planning Report

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Site:	3N-67W-30 RADEMACHER 14-30HZ PAD	North Reference:	True
Well:	RADEMACHER SOUTH 30-14HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan A		
Design:	Permit Rev-1		

Planned Survey

Measured			Vertical			Vertical	Dogleg	Build	Turn
Depth	Inclination	Azimuth	Depth	+N/-S	+E/-W	Section	Rate	Rate	Rate
(usft)	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(°/100usft)	(°/100usft)	(°/100usft)
4,300.00	16.65	128.95	4,171.66	-585.20	723.96	563.73	0.00	0.00	0.00
4,400.00	16.65	128.95	4,267.47	-603.22	746.24	581.08	0.00	0.00	0.00
4,500.00	16.65	128.95	4,363.27	-621.23	768.52	598.43	0.00	0.00	0.00
4,600.00	16.65	128.95	4,459.08	-639.24	790.81	615.78	0.00	0.00	0.00
4,700.00	16.65	128.95	4,554.89	-657.25	813.09	633.13	0.00	0.00	0.00
4,800.00	16.65	128.95	4,650.70	-675.26	835.37	650.48	0.00	0.00	0.00
4,900.00	16.65	128.95	4,746.50	-693.28	857.65	667.83	0.00	0.00	0.00
5,000.00	16.65	128.95	4,842.31	-711.29	879.94	685.19	0.00	0.00	0.00
5,100.00	16.65	128.95	4,938.12	-729.30	902.22	702.54	0.00	0.00	0.00
5,200.00	16.65	128.95	5,033.92	-747.31	924.50	719.89	0.00	0.00	0.00
5,300.00	16.65	128.95	5,129.73	-765.32	946.79	737.24	0.00	0.00	0.00
5,400.00	16.65	128.95	5,225.54	-783.34	969.07	754.59	0.00	0.00	0.00
5,500.00	16.65	128.95	5,321.35	-801.35	991.35	771.94	0.00	0.00	0.00
5,600.00	16.65	128.95	5,417.15	-819.36	1,013.63	789.29	0.00	0.00	0.00
5,700.00	16.65	128.95	5,512.96	-837.37	1,035.92	806.64	0.00	0.00	0.00
5,800.00	16.65	128.95	5,608.77	-855.39	1,058.20	823.99	0.00	0.00	0.00
5,900.00	16.65	128.95	5,704.58	-873.40	1,080.48	841.35	0.00	0.00	0.00
6,000.00	16.65	128.95	5,800.38	-891.41	1,102.77	858.70	0.00	0.00	0.00
6,100.00	16.65	128.95	5,896.19	-909.42	1,125.05	876.05	0.00	0.00	0.00
6,200.00	16.65	128.95	5,992.00	-927.43	1,147.33	893.40	0.00	0.00	0.00
6,300.00	16.65	128.95	6,087.81	-945.45	1,169.61	910.75	0.00	0.00	0.00
6,400.00	16.65	128.95	6,183.61	-963.46	1,191.90	928.10	0.00	0.00	0.00
6,500.00	16.65	128.95	6,279.42	-981.47	1,214.18	945.45	0.00	0.00	0.00
6,600.00	16.65	128.95	6,375.23	-999.48	1,236.46	962.80	0.00	0.00	0.00
6,706.44	16.65	128.95	6,477.20	-1,018.65	1,260.18	981.27	0.00	0.00	0.00
KOP @ 6706.44ft :: DLS = 8°/100'									
6,750.00	19.09	137.08	6,518.67	-1,027.80	1,269.89	990.13	8.00	5.60	18.67
6,800.00	22.22	144.15	6,565.45	-1,041.45	1,281.00	1,003.45	8.00	6.27	14.13
6,850.00	25.59	149.49	6,611.16	-1,058.43	1,292.02	1,020.10	8.00	6.73	10.69
6,900.00	29.11	153.64	6,655.57	-1,078.64	1,302.91	1,039.98	8.00	7.04	8.30
6,950.00	32.73	156.96	6,698.46	-1,101.99	1,313.60	1,063.00	8.00	7.24	6.63
7,000.00	36.42	159.68	6,739.62	-1,128.35	1,324.05	1,089.05	8.00	7.38	5.43
7,050.00	40.16	161.95	6,778.86	-1,157.62	1,334.20	1,118.00	8.00	7.49	4.55
7,094.49	43.53	163.70	6,812.00	-1,185.97	1,342.95	1,146.09	8.00	7.56	3.93
Sharon Springs									
7,100.00	43.95	163.90	6,815.98	-1,189.63	1,344.01	1,149.72	8.00	7.59	3.65
7,150.00	47.76	165.60	6,850.80	-1,224.24	1,353.43	1,184.04	8.00	7.62	3.39
7,193.35	51.08	166.91	6,879.00	-1,256.22	1,361.24	1,215.77	8.00	7.66	3.03
Niobrara									
7,200.00	51.59	167.10	6,883.15	-1,261.28	1,362.41	1,220.79	8.00	7.68	2.86
7,250.00	55.44	168.45	6,912.88	-1,300.56	1,370.91	1,259.81	8.00	7.70	2.70
7,284.91	58.14	169.32	6,932.00	-1,329.22	1,376.53	1,288.29	8.00	7.72	2.49
Nio B									
7,300.00	59.30	169.68	6,939.84	-1,341.90	1,378.88	1,300.90	8.00	7.74	2.39
7,350.00	63.18	170.82	6,963.89	-1,385.09	1,386.29	1,343.85	8.00	7.75	2.27
7,400.00	67.06	171.88	6,984.92	-1,429.92	1,393.10	1,388.47	8.00	7.77	2.12
7,450.00	70.95	172.88	7,002.84	-1,476.18	1,399.29	1,434.53	8.00	7.78	2.00
7,500.00	74.84	173.84	7,017.54	-1,523.64	1,404.81	1,481.80	8.00	7.79	1.91
7,550.00	78.74	174.76	7,028.96	-1,572.07	1,409.64	1,530.07	8.00	7.80	1.84
7,600.00	82.64	175.66	7,037.05	-1,621.23	1,413.75	1,579.08	8.00	7.80	1.79
7,650.00	86.55	176.54	7,041.76	-1,670.88	1,417.14	1,628.62	8.00	7.81	1.76
7,682.61	89.09	177.11	7,043.00	-1,703.41	1,418.95	1,661.08	8.00	7.81	1.75
End Build @ 7682.61ft									

Planning Report

Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well RADEMACHER SOUTH 30-14HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 4836.00usft (RIG)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4836.00usft (RIG)
Site:	3N-67W-30 RADEMACHER 14-30HZ PAD	North Reference:	True
Well:	RADEMACHER SOUTH 30-14HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan A		
Design:	Permit Rev-1		

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)
7,700.00	89.09	177.11	7,043.27	-1,720.78	1,419.83	1,678.41	0.00	0.00	0.00
7,800.00	89.09	177.11	7,044.86	-1,820.64	1,424.87	1,778.08	0.00	0.00	0.00
7,900.00	89.09	177.11	7,046.45	-1,920.50	1,429.92	1,877.75	0.00	0.00	0.00
8,000.00	89.09	177.11	7,048.03	-2,020.36	1,434.97	1,977.42	0.00	0.00	0.00
8,100.00	89.09	177.11	7,049.62	-2,120.22	1,440.01	2,077.09	0.00	0.00	0.00
8,200.00	89.09	177.11	7,051.21	-2,220.08	1,445.06	2,176.76	0.00	0.00	0.00
8,300.00	89.09	177.11	7,052.79	-2,319.94	1,450.11	2,276.43	0.00	0.00	0.00
8,400.00	89.09	177.11	7,054.38	-2,419.80	1,455.15	2,376.10	0.00	0.00	0.00
8,500.00	89.09	177.11	7,055.97	-2,519.66	1,460.20	2,475.77	0.00	0.00	0.00
8,600.00	89.09	177.11	7,057.55	-2,619.52	1,465.25	2,575.44	0.00	0.00	0.00
8,700.00	89.09	177.11	7,059.14	-2,719.38	1,470.29	2,675.11	0.00	0.00	0.00
8,800.00	89.09	177.11	7,060.73	-2,819.24	1,475.34	2,774.77	0.00	0.00	0.00
8,900.00	89.09	177.11	7,062.32	-2,919.10	1,480.39	2,874.44	0.00	0.00	0.00
9,000.00	89.09	177.11	7,063.90	-3,018.96	1,485.43	2,974.11	0.00	0.00	0.00
9,100.00	89.09	177.11	7,065.49	-3,118.82	1,490.48	3,073.78	0.00	0.00	0.00
9,200.00	89.09	177.11	7,067.08	-3,218.68	1,495.53	3,173.45	0.00	0.00	0.00
9,300.00	89.09	177.11	7,068.66	-3,318.54	1,500.58	3,273.12	0.00	0.00	0.00
9,400.00	89.09	177.11	7,070.25	-3,418.40	1,505.62	3,372.79	0.00	0.00	0.00
9,500.00	89.09	177.11	7,071.84	-3,518.26	1,510.67	3,472.46	0.00	0.00	0.00
9,600.00	89.09	177.11	7,073.42	-3,618.12	1,515.72	3,572.13	0.00	0.00	0.00
9,700.00	89.09	177.11	7,075.01	-3,717.98	1,520.76	3,671.80	0.00	0.00	0.00
9,800.00	89.09	177.11	7,076.60	-3,817.84	1,525.81	3,771.47	0.00	0.00	0.00
9,900.00	89.09	177.11	7,078.18	-3,917.70	1,530.86	3,871.13	0.00	0.00	0.00
10,000.00	89.09	177.11	7,079.77	-4,017.56	1,535.90	3,970.80	0.00	0.00	0.00
10,100.00	89.09	177.11	7,081.36	-4,117.42	1,540.95	4,070.47	0.00	0.00	0.00
10,200.00	89.09	177.11	7,082.94	-4,217.28	1,546.00	4,170.14	0.00	0.00	0.00
10,300.00	89.09	177.11	7,084.53	-4,317.14	1,551.04	4,269.81	0.00	0.00	0.00
10,400.00	89.09	177.11	7,086.12	-4,417.00	1,556.09	4,369.48	0.00	0.00	0.00
10,500.00	89.09	177.11	7,087.70	-4,516.86	1,561.14	4,469.15	0.00	0.00	0.00
10,600.00	89.09	177.11	7,089.29	-4,616.72	1,566.19	4,568.82	0.00	0.00	0.00
10,700.00	89.09	177.11	7,090.88	-4,716.58	1,571.23	4,668.49	0.00	0.00	0.00
10,800.00	89.09	177.11	7,092.46	-4,816.44	1,576.28	4,768.16	0.00	0.00	0.00
10,900.00	89.09	177.11	7,094.05	-4,916.30	1,581.33	4,867.82	0.00	0.00	0.00
11,000.00	89.09	177.11	7,095.64	-5,016.16	1,586.37	4,967.49	0.00	0.00	0.00
11,100.00	89.09	177.11	7,097.22	-5,116.02	1,591.42	5,067.16	0.00	0.00	0.00
11,200.00	89.09	177.11	7,098.81	-5,215.88	1,596.47	5,166.83	0.00	0.00	0.00
11,300.00	89.09	177.11	7,100.40	-5,315.74	1,601.51	5,266.50	0.00	0.00	0.00
11,400.00	89.09	177.11	7,101.98	-5,415.60	1,606.56	5,366.17	0.00	0.00	0.00
11,500.00	89.09	177.11	7,103.57	-5,515.46	1,611.61	5,465.84	0.00	0.00	0.00
11,600.00	89.09	177.11	7,105.16	-5,615.32	1,616.65	5,565.51	0.00	0.00	0.00
11,700.00	89.09	177.11	7,106.75	-5,715.18	1,621.70	5,665.18	0.00	0.00	0.00
11,800.00	89.09	177.11	7,108.33	-5,815.04	1,626.75	5,764.85	0.00	0.00	0.00
11,851.57	89.09	177.11	7,109.15	-5,866.53	1,629.35	5,816.24	0.00	0.00	0.00
Begin Turn to BHL @ 11851.57ft									
11,900.00	89.14	177.83	7,109.90	-5,914.91	1,631.49	5,864.54	1.50	0.09	1.50
12,000.00	89.23	179.33	7,111.33	-6,014.87	1,633.96	5,964.38	1.50	0.09	1.50
12,100.00	89.32	180.83	7,112.60	-6,114.86	1,633.83	6,064.33	1.50	0.09	1.50
12,200.00	89.41	182.32	7,113.70	-6,214.81	1,631.08	6,164.32	1.50	0.09	1.50
12,300.00	89.51	183.82	7,114.65	-6,314.66	1,625.72	6,264.28	1.50	0.09	1.50
12,400.00	89.60	185.32	7,115.43	-6,414.34	1,617.75	6,364.15	1.50	0.09	1.50
12,434.91	89.63	185.84	7,115.66	-6,449.08	1,614.36	6,398.98	1.50	0.09	1.50
End Turn @ 12434.91ft									
12,500.00	89.63	185.84	7,116.08	-6,513.83	1,607.74	6,463.90	0.00	0.00	0.00
12,600.00	89.63	185.84	7,116.72	-6,613.31	1,597.56	6,563.63	0.00	0.00	0.00

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Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 4836.00usft (RIG)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4836.00usft (RIG)
Site:	3N-67W-30 RADEMACHER 14-30HZ PAD	North Reference:	True
Well:	RADEMACHER SOUTH 30-14HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan A		
Design:	Permit Rev-1		

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)
12,700.00	89.63	185.84	7,117.36	-6,712.79	1,587.38	6,663.37	0.00	0.00	0.00
12,800.00	89.63	185.84	7,118.00	-6,812.27	1,577.21	6,763.10	0.00	0.00	0.00
12,900.00	89.63	185.84	7,118.65	-6,911.75	1,567.03	6,862.83	0.00	0.00	0.00
13,000.00	89.63	185.84	7,119.29	-7,011.22	1,556.86	6,962.57	0.00	0.00	0.00
13,100.00	89.63	185.84	7,119.93	-7,110.70	1,546.68	7,062.30	0.00	0.00	0.00
13,200.00	89.63	185.84	7,120.57	-7,210.18	1,536.50	7,162.04	0.00	0.00	0.00
13,300.00	89.63	185.84	7,121.21	-7,309.66	1,526.33	7,261.77	0.00	0.00	0.00
13,400.00	89.63	185.84	7,121.85	-7,409.14	1,516.15	7,361.51	0.00	0.00	0.00
13,500.00	89.63	185.84	7,122.49	-7,508.62	1,505.98	7,461.24	0.00	0.00	0.00
13,600.00	89.63	185.84	7,123.14	-7,608.10	1,495.80	7,560.97	0.00	0.00	0.00
13,700.00	89.63	185.84	7,123.78	-7,707.58	1,485.62	7,660.71	0.00	0.00	0.00
13,800.00	89.63	185.84	7,124.42	-7,807.06	1,475.45	7,760.44	0.00	0.00	0.00
13,900.00	89.63	185.84	7,125.06	-7,906.53	1,465.27	7,860.18	0.00	0.00	0.00
14,000.00	89.63	185.84	7,125.70	-8,006.01	1,455.09	7,959.91	0.00	0.00	0.00
14,100.00	89.63	185.84	7,126.34	-8,105.49	1,444.92	8,059.65	0.00	0.00	0.00
14,200.00	89.63	185.84	7,126.98	-8,204.97	1,434.74	8,159.38	0.00	0.00	0.00
14,300.00	89.63	185.84	7,127.63	-8,304.45	1,424.57	8,259.12	0.00	0.00	0.00
14,400.00	89.63	185.84	7,128.27	-8,403.93	1,414.39	8,358.85	0.00	0.00	0.00
14,500.00	89.63	185.84	7,128.91	-8,503.41	1,404.21	8,458.58	0.00	0.00	0.00
14,600.00	89.63	185.84	7,129.55	-8,602.89	1,394.04	8,558.32	0.00	0.00	0.00
14,700.00	89.63	185.84	7,130.19	-8,702.36	1,383.86	8,658.05	0.00	0.00	0.00
14,800.00	89.63	185.84	7,130.83	-8,801.84	1,373.69	8,757.79	0.00	0.00	0.00
14,900.00	89.63	185.84	7,131.47	-8,901.32	1,363.51	8,857.52	0.00	0.00	0.00
15,000.00	89.63	185.84	7,132.12	-9,000.80	1,353.33	8,957.26	0.00	0.00	0.00
15,100.00	89.63	185.84	7,132.76	-9,100.28	1,343.16	9,056.99	0.00	0.00	0.00
15,200.00	89.63	185.84	7,133.40	-9,199.76	1,332.98	9,156.72	0.00	0.00	0.00
15,300.00	89.63	185.84	7,134.04	-9,299.24	1,322.81	9,256.46	0.00	0.00	0.00
15,400.00	89.63	185.84	7,134.68	-9,398.72	1,312.63	9,356.19	0.00	0.00	0.00
15,500.00	89.63	185.84	7,135.32	-9,498.20	1,302.45	9,455.93	0.00	0.00	0.00
15,600.00	89.63	185.84	7,135.96	-9,597.67	1,292.28	9,555.66	0.00	0.00	0.00
15,700.00	89.63	185.84	7,136.61	-9,697.15	1,282.10	9,655.40	0.00	0.00	0.00
15,800.00	89.63	185.84	7,137.25	-9,796.63	1,271.92	9,755.13	0.00	0.00	0.00
15,900.00	89.63	185.84	7,137.89	-9,896.11	1,261.75	9,854.87	0.00	0.00	0.00
16,000.00	89.63	185.84	7,138.53	-9,995.59	1,251.57	9,954.60	0.00	0.00	0.00
16,100.00	89.63	185.84	7,139.17	-10,095.07	1,241.40	10,054.33	0.00	0.00	0.00
16,200.00	89.63	185.84	7,139.81	-10,194.55	1,231.22	10,154.07	0.00	0.00	0.00
16,300.00	89.63	185.84	7,140.45	-10,294.03	1,221.04	10,253.80	0.00	0.00	0.00
16,400.00	89.63	185.84	7,141.10	-10,393.50	1,210.87	10,353.54	0.00	0.00	0.00
16,500.00	89.63	185.84	7,141.74	-10,492.98	1,200.69	10,453.27	0.00	0.00	0.00
16,600.00	89.63	185.84	7,142.38	-10,592.46	1,190.52	10,553.01	0.00	0.00	0.00
16,700.00	89.63	185.84	7,143.02	-10,691.94	1,180.34	10,652.74	0.00	0.00	0.00
16,800.00	89.63	185.84	7,143.66	-10,791.42	1,170.16	10,752.48	0.00	0.00	0.00
16,900.00	89.63	185.84	7,144.30	-10,890.90	1,159.99	10,852.21	0.00	0.00	0.00
17,000.00	89.63	185.84	7,144.94	-10,990.38	1,149.81	10,951.94	0.00	0.00	0.00
17,040.00	89.63	185.84	7,145.20	-11,030.17	1,145.74	10,991.84	0.00	0.00	0.00
TD Well @ 17040.00ft - 5.5" CSG									

Planning Report

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Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 4836.00usft (RIG)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4836.00usft (RIG)
Site:	3N-67W-30 RADEMACHER 14-30HZ PAD	North Reference:	True
Well:	RADEMACHER SOUTH 30-14HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan A		
Design:	Permit Rev-1		

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
1,511.79	1,500.00	9 5/8"	9-5/8	13-1/2	
17,040.00	7,145.20	5.5" CSG	5-1/2	7-7/8	

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
36.00	36.00	Fox Hills				
3,749.25	3,644.00	Parkman				
4,203.29	4,079.00	Sussex				
7,094.49	6,812.00	Sharon Springs				
7,193.35	6,879.00	Niobrara				
7,284.91	6,932.00	Nio B				

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
500.00	500.00	0.00	0.00	Begin Nudge @ 500.00ft	
1,610.00	1,594.44	-100.68	124.55	Hold Tangent @ 1610.00ft	
6,706.44	6,477.20	-1,018.65	1,260.18	KOP @ 6706.44ft :: DLS = 8"/100'	
7,682.61	7,043.00	-1,703.41	1,418.95	End Build @ 7682.61ft	
11,851.57	7,109.15	-5,866.53	1,629.35	Begin Turn to BHL @ 11851.57ft	
12,434.91	7,115.66	-6,449.08	1,614.36	End Turn @ 12434.91ft	
17,040.00	7,145.20	-11,030.17	1,145.74	TD Well @ 17040.00ft	