

US ROCKIES WATTENBERG PLANNING

WELD-NAD83-UTMFT13N

1N-68W-08 SHUMAKER PAD

SHUMAKER 8-9HZ - Slot SHUMAKER 8-9HZ

Plan A

Plan: Permit Rev-1

Standard Planning Report

16 March, 2017



Azimuths to True North
Magnetic North: 8.20°

Magnetic Field
Strength: 52320.4snT
Dip Angle: 66.54°
Date: 3/8/2017
Model: IGRF2010

SITE: 1N-68W-08 SHUMAKER PAD

Well: SHUMAKER 8-9HZ
Wellbore: Plan A
Design: Permit Rev-1

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
1053.00	1100.00	Fox Hills
4228.00	4364.39	Parkman
4576.00	4726.98	Sussex
7454.00	7704.50	Sharon Springs
7489.00	7747.41	Niobrara
7610.00	7919.03	Nio B
7717.00	8161.27	Nio C

WELL DETAILS: SHUMAKER 8-9HZ

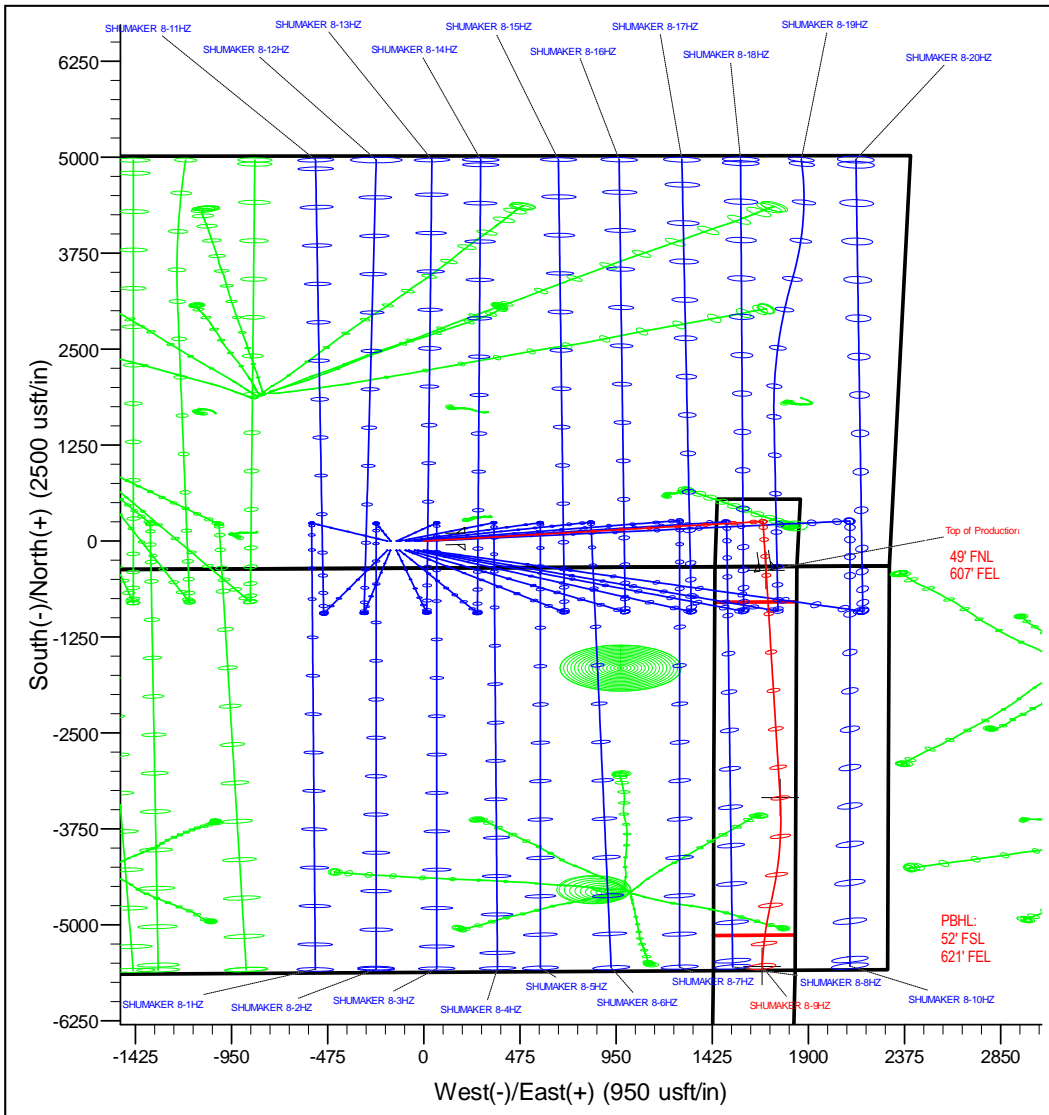
+N/-S	+E/-W	GL: 5104.00	RKB @ 5121.00usft (D Rig)	Latitude	Longitude	Slot
0.00	0.00	14548304.90	1633031.11	40.059236	-105.026395	SHUMAKER 8-9HZ

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
SHUMAKER 8-9HZ PBHL	7741.00	-5541.38	1671.00	14542763.03	1634700.47	40.044018	-105.020424

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Diag	Vsect
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
1337.09	16.31	81.30	1322.47	23.24	151.88	1.50	21.60
6414.50	16.31	81.30	6195.64	238.84	1561.09	0.00	221.99
7229.82	0.00	0.00	7000.00	256.27	1675.00	2.00	238.18
7333.30	0.00	0.00	7103.48	256.27	1675.00	0.00	238.18
8333.19	89.99	178.65	7740.10	-380.06	1690.04	9.00	851.77
11293.97	89.99	178.65	7740.62	-3340.01	1760.00	0.00	3705.89
12643.21	89.99	185.07	7740.85	-4667.84	1744.26	0.48	4983.71
13498.13	89.99	181.00	7741.00	-5541.38	1671.00	0.48	5787.84



Corporate Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well SHUMAKER 8-9HZ - Slot SHUMAKER 8-9HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB @ 5121.00usft (D Rig)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB @ 5121.00usft (D Rig)
Site:	1N-68W-08 SHUMAKER PAD	North Reference:	True
Well:	SHUMAKER 8-9HZ	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	1N-68W-08 SHUMAKER PAD		
Site Position:		Northing:	14,548,245.20 usft
From:	Map	Easting:	1,632,948.27 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	40.059072
		Longitude:	-105.026691
		Grid Convergence:	-0.02 °

Well	SHUMAKER 8-9HZ - Slot SHUMAKER 8-9HZ					
Well Position	+N-S	59.72 usft	Northing:	14,548,304.90 usft	Latitude:	40.059236
	+E-W	82.82 usft	Easting:	1,633,031.11 usft	Longitude:	-105.026395
Position Uncertainty		3.28 usft	Wellhead Elevation:		Ground Level:	5,104.00 usft

Wellbore	Plan A				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	3/8/2017	8.20	66.54	52,320.43597676

Design	Permit Rev-1				
Audit Notes:					
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.00	
Vertical Section:	Depth From (TVD) (usft)	+N-S (usft)	+E-W (usft)	Direction (°)	
	0.00	0.00	0.00	163.22	

Plan Survey Tool Program	Date	3/16/2017			
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks	
1	0.00	1,522.06	Permit Rev-1 (Plan A)	APC_ISCWSA REV 2 MWI Fixed:v2:standard declination	
2	1,522.06	13,498.13	Permit Rev-1 (Plan A)	APC_ISCWSA REV 2 MWI Fixed:v2:Rockies, crustal dex	

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Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB @ 5121.00usft (D Rig)
Site:	1N-68W-08 SHUMAKER PAD	North Reference:	True
Well:	SHUMAKER 8-9HZ	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	
250.00	0.00	0.00	250.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,337.09	16.31	81.30	1,322.47	23.24	151.88	1.50	1.50	0.00	81.30	
6,414.50	16.31	81.30	6,195.64	238.84	1,561.09	0.00	0.00	0.00	0.00	
7,229.82	0.00	0.00	7,000.00	256.27	1,675.00	2.00	-2.00	0.00	180.00	
7,333.30	0.00	0.00	7,103.48	256.27	1,675.00	0.00	0.00	0.00	0.00	
8,333.19	89.99	178.65	7,740.10	-380.06	1,690.04	9.00	9.00	0.00	178.65	
11,293.97	89.99	178.65	7,740.62	-3,340.01	1,760.00	0.00	0.00	0.00	0.00	SHUMAKER 8-9HZ
12,643.21	89.99	185.07	7,740.85	-4,687.84	1,716.26	0.48	0.00	0.48	90.00	
13,498.13	89.99	181.00	7,741.00	-5,541.38	1,671.00	0.48	0.00	-0.48	-90.00	SHUMAKER 8-9HZ

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Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB @ 5121.00usft (D Rig)
Site:	1N-68W-08 SHUMAKER PAD	North Reference:	True
Well:	SHUMAKER 8-9HZ	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
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
300.00	0.75	81.30	300.00	0.05	0.32	0.05	1.50	1.50	0.00
400.00	2.25	81.30	399.96	0.45	2.91	0.41	1.50	1.50	0.00
500.00	3.75	81.30	499.82	1.24	8.08	1.15	1.50	1.50	0.00
600.00	5.25	81.30	599.51	2.42	15.84	2.25	1.50	1.50	0.00
700.00	6.75	81.30	698.96	4.00	26.17	3.72	1.50	1.50	0.00
800.00	8.25	81.30	798.10	5.98	39.07	5.56	1.50	1.50	0.00
900.00	9.75	81.30	896.87	8.34	54.54	7.76	1.50	1.50	0.00
1,000.00	11.25	81.30	995.19	11.10	72.55	10.32	1.50	1.50	0.00
1,100.00	12.75	81.30	1,093.00	14.24	93.10	13.24	1.50	1.50	0.00
Fox Hills									
1,200.00	14.25	81.30	1,190.24	17.77	116.18	16.52	1.50	1.50	0.00
1,300.00	15.75	81.30	1,286.83	21.69	141.76	20.16	1.50	1.50	0.00
1,337.09	16.31	81.30	1,322.47	23.24	151.88	21.60	1.50	1.50	0.00
1,400.00	16.31	81.30	1,382.85	25.91	169.34	24.08	0.00	0.00	0.00
1,500.00	16.31	81.30	1,478.83	30.16	197.10	28.03	0.00	0.00	0.00
1,522.06	16.31	81.30	1,500.00	31.09	203.22	28.90	0.00	0.00	0.00
9 5/8"									
1,600.00	16.31	81.30	1,574.81	34.40	224.85	31.97	0.00	0.00	0.00
1,700.00	16.31	81.30	1,670.79	38.65	252.61	35.92	0.00	0.00	0.00
1,800.00	16.31	81.30	1,766.76	42.89	280.36	39.87	0.00	0.00	0.00
1,900.00	16.31	81.30	1,862.74	47.14	308.12	43.81	0.00	0.00	0.00
2,000.00	16.31	81.30	1,958.72	51.39	335.87	47.76	0.00	0.00	0.00
2,100.00	16.31	81.30	2,054.70	55.63	363.62	51.71	0.00	0.00	0.00
2,200.00	16.31	81.30	2,150.67	59.88	391.38	55.65	0.00	0.00	0.00
2,300.00	16.31	81.30	2,246.65	64.13	419.13	59.60	0.00	0.00	0.00
2,400.00	16.31	81.30	2,342.63	68.37	446.89	63.55	0.00	0.00	0.00
2,500.00	16.31	81.30	2,438.61	72.62	474.64	67.49	0.00	0.00	0.00
2,600.00	16.31	81.30	2,534.58	76.87	502.40	71.44	0.00	0.00	0.00
2,700.00	16.31	81.30	2,630.56	81.11	530.15	75.39	0.00	0.00	0.00
2,800.00	16.31	81.30	2,726.54	85.36	557.91	79.33	0.00	0.00	0.00
2,900.00	16.31	81.30	2,822.51	89.60	585.66	83.28	0.00	0.00	0.00
3,000.00	16.31	81.30	2,918.49	93.85	613.41	87.23	0.00	0.00	0.00
3,100.00	16.31	81.30	3,014.47	98.10	641.17	91.17	0.00	0.00	0.00
3,200.00	16.31	81.30	3,110.45	102.34	668.92	95.12	0.00	0.00	0.00
3,300.00	16.31	81.30	3,206.42	106.59	696.68	99.07	0.00	0.00	0.00
3,400.00	16.31	81.30	3,302.40	110.84	724.43	103.01	0.00	0.00	0.00
3,500.00	16.31	81.30	3,398.38	115.08	752.19	106.96	0.00	0.00	0.00
3,600.00	16.31	81.30	3,494.36	119.33	779.94	110.91	0.00	0.00	0.00
3,700.00	16.31	81.30	3,590.33	123.57	807.69	114.85	0.00	0.00	0.00
3,800.00	16.31	81.30	3,686.31	127.82	835.45	118.80	0.00	0.00	0.00
3,900.00	16.31	81.30	3,782.29	132.07	863.20	122.75	0.00	0.00	0.00
4,000.00	16.31	81.30	3,878.27	136.31	890.96	126.69	0.00	0.00	0.00
4,100.00	16.31	81.30	3,974.24	140.56	918.71	130.64	0.00	0.00	0.00
4,200.00	16.31	81.30	4,070.22	144.81	946.47	134.59	0.00	0.00	0.00
4,300.00	16.31	81.30	4,166.20	149.05	974.22	138.53	0.00	0.00	0.00
4,364.39	16.31	81.30	4,228.00	151.79	992.09	141.08	0.00	0.00	0.00
Parkman									
4,400.00	16.31	81.30	4,262.18	153.30	1,001.97	142.48	0.00	0.00	0.00
4,500.00	16.31	81.30	4,358.15	157.55	1,029.73	146.43	0.00	0.00	0.00

Corporate Planning Report

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Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB @ 5121.00usft (D Rig)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB @ 5121.00usft (D Rig)
Site:	1N-68W-08 SHUMAKER PAD	North Reference:	True
Well:	SHUMAKER 8-9HZ	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)
4,600.00	16.31	81.30	4,454.13	161.79	1,057.48	150.37	0.00	0.00	0.00
4,700.00	16.31	81.30	4,550.11	166.04	1,085.24	154.32	0.00	0.00	0.00
4,726.98	16.31	81.30	4,576.00	167.18	1,092.73	155.39	0.00	0.00	0.00
Sussex									
4,800.00	16.31	81.30	4,646.09	170.28	1,112.99	158.27	0.00	0.00	0.00
4,900.00	16.31	81.30	4,742.06	174.53	1,140.75	162.21	0.00	0.00	0.00
5,000.00	16.31	81.30	4,838.04	178.78	1,168.50	166.16	0.00	0.00	0.00
5,100.00	16.31	81.30	4,934.02	183.02	1,196.26	170.11	0.00	0.00	0.00
5,200.00	16.31	81.30	5,030.00	187.27	1,224.01	174.05	0.00	0.00	0.00
5,300.00	16.31	81.30	5,125.97	191.52	1,251.76	178.00	0.00	0.00	0.00
5,400.00	16.31	81.30	5,221.95	195.76	1,279.52	181.95	0.00	0.00	0.00
5,500.00	16.31	81.30	5,317.93	200.01	1,307.27	185.89	0.00	0.00	0.00
5,600.00	16.31	81.30	5,413.91	204.26	1,335.03	189.84	0.00	0.00	0.00
5,700.00	16.31	81.30	5,509.88	208.50	1,362.78	193.79	0.00	0.00	0.00
5,800.00	16.31	81.30	5,605.86	212.75	1,390.54	197.73	0.00	0.00	0.00
5,900.00	16.31	81.30	5,701.84	216.99	1,418.29	201.68	0.00	0.00	0.00
6,000.00	16.31	81.30	5,797.81	221.24	1,446.04	205.63	0.00	0.00	0.00
6,100.00	16.31	81.30	5,893.79	225.49	1,473.80	209.57	0.00	0.00	0.00
6,200.00	16.31	81.30	5,989.77	229.73	1,501.55	213.52	0.00	0.00	0.00
6,300.00	16.31	81.30	6,085.75	233.98	1,529.31	217.47	0.00	0.00	0.00
6,400.00	16.31	81.30	6,181.72	238.23	1,557.06	221.41	0.00	0.00	0.00
6,414.50	16.31	81.30	6,195.64	238.84	1,561.09	221.99	0.00	0.00	0.00
6,500.00	14.60	81.30	6,278.05	242.29	1,583.60	225.19	2.00	-2.00	0.00
6,600.00	12.60	81.30	6,375.24	245.84	1,606.84	228.49	2.00	-2.00	0.00
6,700.00	10.60	81.30	6,473.19	248.88	1,626.71	231.32	2.00	-2.00	0.00
6,800.00	8.60	81.30	6,571.79	251.40	1,643.19	233.66	2.00	-2.00	0.00
6,900.00	6.60	81.30	6,670.91	253.40	1,656.25	235.52	2.00	-2.00	0.00
7,000.00	4.60	81.30	6,770.43	254.88	1,665.89	236.89	2.00	-2.00	0.00
7,100.00	2.60	81.30	6,870.22	255.83	1,672.09	237.77	2.00	-2.00	0.00
7,200.00	0.60	81.30	6,970.18	256.25	1,674.85	238.16	2.00	-2.00	0.00
7,229.82	0.00	0.00	7,000.00	256.27	1,675.00	238.18	2.00	-2.00	0.00
7,300.00	0.00	0.00	7,070.18	256.27	1,675.00	238.18	0.00	0.00	0.00
7,333.30	0.00	0.00	7,103.48	256.27	1,675.00	238.18	0.00	0.00	0.00
7,400.00	6.00	178.65	7,170.06	252.78	1,675.08	241.55	9.00	9.00	0.00
7,500.00	15.00	178.65	7,268.28	234.58	1,675.51	259.10	9.00	9.00	0.00
7,600.00	24.00	178.65	7,362.45	201.23	1,676.30	291.25	9.00	9.00	0.00
7,700.00	33.00	178.65	7,450.24	153.58	1,677.43	337.21	9.00	9.00	0.00
7,704.50	33.41	178.65	7,454.00	151.11	1,677.49	339.58	9.00	9.00	0.00
Sharon Springs									
7,747.41	37.27	178.65	7,489.00	126.30	1,678.07	363.50	9.00	9.00	0.00
Niobrara									
7,800.00	42.00	178.65	7,529.49	92.78	1,678.86	395.83	9.00	9.00	0.00
7,900.00	51.00	178.65	7,598.25	20.33	1,680.58	465.69	9.00	9.00	0.00
7,919.03	52.72	178.65	7,610.00	5.37	1,680.93	480.11	9.00	9.00	0.00
Nio B									
8,000.00	60.00	178.65	7,654.83	-61.98	1,682.52	545.05	9.00	9.00	0.00
8,100.00	69.00	178.65	7,697.83	-152.12	1,684.65	631.97	9.00	9.00	0.00
8,161.27	74.52	178.65	7,717.00	-210.27	1,686.03	688.05	9.00	9.00	0.00
Nio C									
8,200.00	78.00	178.65	7,726.20	-247.88	1,686.92	724.31	9.00	9.00	0.00
8,300.00	87.00	178.65	7,739.23	-346.89	1,689.26	819.78	9.00	9.00	0.00
8,333.19	89.99	178.65	7,740.10	-380.06	1,690.04	851.76	9.00	9.00	0.00

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Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB @ 5121.00usft (D Rig)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB @ 5121.00usft (D Rig)
Site:	1N-68W-08 SHUMAKER PAD	North Reference:	True
Well:	SHUMAKER 8-9HZ	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)
Top of Production - SHUMAKER 8-9HZ_PHL									
8,400.00	89.99	178.65	7,740.12	-446.85	1,691.62	916.17	0.00	0.00	0.00
8,500.00	89.99	178.65	7,740.13	-546.82	1,693.98	1,012.56	0.00	0.00	0.00
8,600.00	89.99	178.65	7,740.15	-646.79	1,696.34	1,108.96	0.00	0.00	0.00
8,700.00	89.99	178.65	7,740.17	-746.77	1,698.71	1,205.36	0.00	0.00	0.00
8,800.00	89.99	178.65	7,740.18	-846.74	1,701.07	1,301.76	0.00	0.00	0.00
8,900.00	89.99	178.65	7,740.20	-946.71	1,703.43	1,398.16	0.00	0.00	0.00
9,000.00	89.99	178.65	7,740.22	-1,046.68	1,705.80	1,494.55	0.00	0.00	0.00
9,100.00	89.99	178.65	7,740.24	-1,146.65	1,708.16	1,590.95	0.00	0.00	0.00
9,200.00	89.99	178.65	7,740.25	-1,246.63	1,710.52	1,687.35	0.00	0.00	0.00
9,300.00	89.99	178.65	7,740.27	-1,346.60	1,712.88	1,783.75	0.00	0.00	0.00
9,400.00	89.99	178.65	7,740.29	-1,446.57	1,715.25	1,880.14	0.00	0.00	0.00
9,500.00	89.99	178.65	7,740.31	-1,546.54	1,717.61	1,976.54	0.00	0.00	0.00
9,600.00	89.99	178.65	7,740.32	-1,646.51	1,719.97	2,072.94	0.00	0.00	0.00
9,700.00	89.99	178.65	7,740.34	-1,746.49	1,722.34	2,169.34	0.00	0.00	0.00
9,800.00	89.99	178.65	7,740.36	-1,846.46	1,724.70	2,265.74	0.00	0.00	0.00
9,900.00	89.99	178.65	7,740.38	-1,946.43	1,727.06	2,362.13	0.00	0.00	0.00
10,000.00	89.99	178.65	7,740.39	-2,046.40	1,729.42	2,458.53	0.00	0.00	0.00
10,100.00	89.99	178.65	7,740.41	-2,146.37	1,731.79	2,554.93	0.00	0.00	0.00
10,200.00	89.99	178.65	7,740.43	-2,246.35	1,734.15	2,651.33	0.00	0.00	0.00
10,300.00	89.99	178.65	7,740.45	-2,346.32	1,736.51	2,747.73	0.00	0.00	0.00
10,400.00	89.99	178.65	7,740.46	-2,446.29	1,738.88	2,844.12	0.00	0.00	0.00
10,500.00	89.99	178.65	7,740.48	-2,546.26	1,741.24	2,940.52	0.00	0.00	0.00
10,600.00	89.99	178.65	7,740.50	-2,646.23	1,743.60	3,036.92	0.00	0.00	0.00
10,700.00	89.99	178.65	7,740.52	-2,746.21	1,745.97	3,133.32	0.00	0.00	0.00
10,800.00	89.99	178.65	7,740.53	-2,846.18	1,748.33	3,229.71	0.00	0.00	0.00
10,900.00	89.99	178.65	7,740.55	-2,946.15	1,750.69	3,326.11	0.00	0.00	0.00
11,000.00	89.99	178.65	7,740.57	-3,046.12	1,753.05	3,422.51	0.00	0.00	0.00
11,100.00	89.99	178.65	7,740.59	-3,146.10	1,755.42	3,518.91	0.00	0.00	0.00
11,200.00	89.99	178.65	7,740.60	-3,246.07	1,757.78	3,615.31	0.00	0.00	0.00
11,293.97	89.99	178.65	7,740.62	-3,340.01	1,760.00	3,705.89	0.00	0.00	0.00
SHUMAKER 8-9HZ_PITL1									
11,300.00	89.99	178.67	7,740.62	-3,346.04	1,760.14	3,711.70	0.48	0.00	0.48
11,400.00	89.99	179.15	7,740.64	-3,446.02	1,762.04	3,807.98	0.48	0.00	0.48
11,500.00	89.99	179.63	7,740.66	-3,546.02	1,763.10	3,904.02	0.48	0.00	0.48
11,600.00	89.99	180.10	7,740.67	-3,646.01	1,763.34	3,999.83	0.48	0.00	0.48
11,700.00	89.99	180.58	7,740.69	-3,746.01	1,762.74	4,095.40	0.48	0.00	0.48
11,800.00	89.99	181.06	7,740.71	-3,846.00	1,761.32	4,190.72	0.48	0.00	0.48
11,900.00	89.99	181.53	7,740.73	-3,945.98	1,759.06	4,285.79	0.48	0.00	0.48
12,000.00	89.99	182.01	7,740.74	-4,045.93	1,755.97	4,380.59	0.48	0.00	0.48
12,100.00	89.99	182.48	7,740.76	-4,145.85	1,752.05	4,475.13	0.48	0.00	0.48
12,200.00	89.99	182.96	7,740.78	-4,245.74	1,747.30	4,569.39	0.48	0.00	0.48
12,300.00	89.99	183.44	7,740.79	-4,345.58	1,741.72	4,663.37	0.48	0.00	0.48
12,400.00	89.99	183.91	7,740.81	-4,445.38	1,735.31	4,757.07	0.48	0.00	0.48
12,500.00	89.99	184.39	7,740.83	-4,545.11	1,728.07	4,850.47	0.48	0.00	0.48
12,600.00	89.99	184.87	7,740.85	-4,644.79	1,720.01	4,943.57	0.48	0.00	0.48
12,643.21	89.99	185.07	7,740.85	-4,687.84	1,716.26	4,983.71	0.48	0.00	0.48
12,700.00	89.99	184.80	7,740.86	-4,744.41	1,711.38	5,036.47	0.48	0.00	-0.48
12,800.00	89.99	184.32	7,740.88	-4,844.10	1,703.42	5,129.61	0.48	0.00	-0.48
12,900.00	89.99	183.85	7,740.90	-4,943.84	1,696.30	5,223.05	0.48	0.00	-0.48
13,000.00	89.99	183.37	7,740.91	-5,043.64	1,690.00	5,316.78	0.48	0.00	-0.48
13,100.00	89.99	182.90	7,740.93	-5,143.49	1,684.53	5,410.80	0.48	0.00	-0.48
13,200.00	89.99	182.42	7,740.95	-5,243.39	1,679.90	5,505.10	0.48	0.00	-0.48

Corporate Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well SHUMAKER 8-9HZ - Slot SHUMAKER 8-9HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB @ 5121.00usft (D Rig)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB @ 5121.00usft (D Rig)
Site:	1N-68W-08 SHUMAKER PAD	North Reference:	True
Well:	SHUMAKER 8-9HZ	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)
13,300.00	89.99	181.94	7,740.97	-5,343.31	1,676.09	5,599.68	0.48	0.00	-0.48
13,400.00	89.99	181.47	7,740.98	-5,443.27	1,673.11	5,694.52	0.48	0.00	-0.48
13,498.13	89.99	181.00	7,741.00	-5,541.38	1,671.00	5,787.84	0.48	0.00	-0.48
SHUMAKER 8-9HZ_PBHL									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
SHUMAKER 8-9HZ_F - hit/miss target - Shape - Point	0.00	0.00	7,740.10	-380.06	1,690.04	14,547,924.34	1,634,721.04	40.058192	-105.020355
SHUMAKER 8-9HZ_F - plan hits target center - Point	0.00	0.00	7,740.62	-3,340.01	1,760.00	14,544,964.36	1,634,790.12	40.050064	-105.020106
SHUMAKER 8-9HZ_F - plan hits target center - Point	0.00	0.00	7,741.00	-5,541.38	1,671.00	14,542,763.02	1,634,700.47	40.044018	-105.020425

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
1,522.06	1,500.00	9 5/8"	9-5/8	13-1/2	
8,333.19	7,740.10	Top of Production	5-1/2	7-7/8	

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
1,100.00	1,093.00	Fox Hills				
4,364.39	4,228.00	Parkman				
4,726.98	4,576.00	Sussex				
7,704.50	7,454.00	Sharon Springs				
7,747.41	7,489.00	Niobrara				
7,919.03	7,610.00	Nio B				
8,161.27	7,717.00	Nio C				