

US ROCKIES WATTENBERG PLANNING

WELD-NAD83-UTMFT13N

1N-66W-09 Highlands 27-9HZ Pad

HIGHLANDS 1N-33HZ

Plan A

Plan: Permit Rev-3

Standard Planning Report

16 June, 2016



Azimuths to True North
Magnetic North: 8.32°

Magnetic Field
Strength: 52545.0snT
Dip Angle: 66.65°
Date: 5/12/2015
Model: IGRF2010

SITE: 1N-66W-09 Highlands 27-9HZ Pad

Well: HIGHLANDS 1N-33HZ
Wellbore: Plan A
Design: Permit Rev-3

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
1468.00	1479.10	Fox Hills
4203.00	4431.57	Parkman
4599.00	4836.75	Sussex
7177.00	7482.41	Sharon Springs
7218.00	7549.53	Niobrara
7270.00	7653.75	Nio B
7325.00	7847.54	Nio C

WELL DETAILS: HIGHLANDS 1N-33HZ

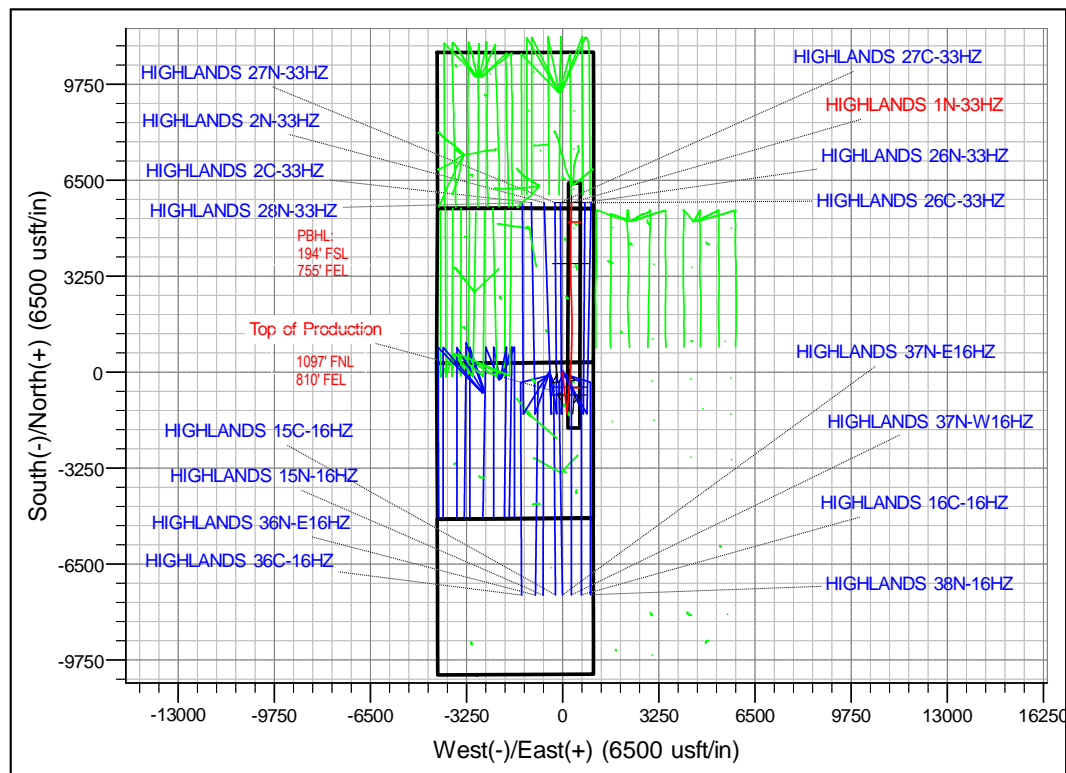
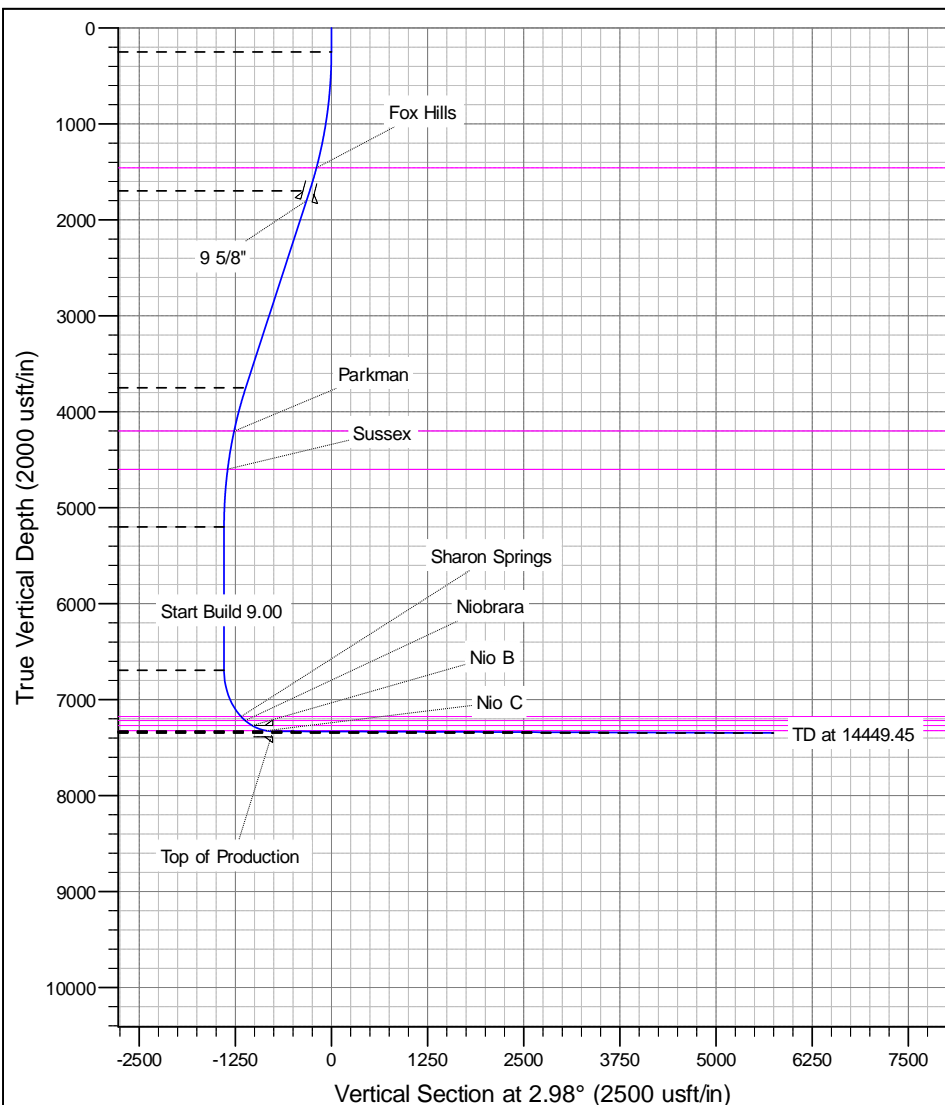
+N/-S	+E/-W	GL: 5001.00 Northing	RKB @ 5018.00usft (D Rig) Easting	Latitude	Longitude	Slot
0.00	0.00	14553072.89	1702953.93	40.072117	-104.776458	

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	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
1736.45	22.30	174.11	1699.21	-284.09	29.32	1.50	-282.18
3953.81	22.30	174.11	3750.79	-1120.91	115.68	0.00	-1113.39
5440.26	0.00	0.00	5200.00	-1405.00	145.00	1.50	-1395.57
6934.58	0.00	0.00	6694.32	-1405.00	145.00	0.00	-1395.57
7932.91	89.85	5.00	7330.94	-772.46	200.32	9.00	-761.01
8204.79	89.85	5.00	7331.65	-501.62	224.00	0.00	-489.31
11330.01	89.85	357.45	7339.85	2620.62	290.57	0.24	2632.17
12387.22	89.85	0.00	7342.62	3677.48	267.00	0.24	3686.38
14449.45	89.85	1.75	7348.00	5739.38	298.48	0.08	5747.14

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
HIGHLANDS 1N-33HZ_PHL	7330.94	-772.46	200.32	14552300.93	1703156.19	40.069996	-104.775742
HIGHLANDS 1N-33HZ_PBHL	7348.00	5739.38	298.48	14558813.00	1703238.00	40.087878	-104.775391



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Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well HIGHLANDS 1N-33HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB @ 5018.00usft (D Rig)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB @ 5018.00usft (D Rig)
Site:	1N-66W-09 Highlands 27-9HZ Pad	North Reference:	True
Well:	HIGHLANDS 1N-33HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan A		
Design:	Permit Rev-3		

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-66W-09 Highlands 27-9HZ Pad											
Site Position:						Northing:			14,553,120.23 usft			Latitude:			40.072250		
From:			Lat/Long			Easting:			1,702,521.87 usft			Longitude:			-104.778002		
Position Uncertainty:			0.00 usft			Slot Radius:			13-3/16 "			Grid Convergence:			0.14		

Well	HIGHLANDS 1N-33HZ					
Well Position	+N-S	-48.43 usft	Northing:	14,553,072.88 usft	Latitude:	40.072117
	+E-W	431.95 usft	Easting:	1,702,953.93 usft	Longitude:	-104.776458
Position Uncertainty		3.28 usft	Wellhead Elevation:	0.00 usft	Ground Level:	5,001.00 usft

Wellbore	Plan A				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	5/12/2015	8.32	66.65	52,545

Design	Permit Rev-3			
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	2.98

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	
1,736.45	22.30	174.11	1,699.21	-284.09	29.32	1.50	1.50	0.00	174.11	
3,953.81	22.30	174.11	3,750.79	-1,120.91	115.68	0.00	0.00	0.00	0.00	
5,440.26	0.00	0.00	5,200.00	-1,405.00	145.00	1.50	-1.50	0.00	180.00	
6,934.58	0.00	0.00	6,694.32	-1,405.00	145.00	0.00	0.00	0.00	0.00	
7,932.91	89.85	5.00	7,330.94	-772.46	200.32	9.00	9.00	0.00	5.00	
8,204.79	89.85	5.00	7,331.65	-501.62	224.00	0.00	0.00	0.00	0.00	HIGHLANDS 1N-33
11,330.01	89.85	357.45	7,339.85	2,620.62	290.57	0.24	0.00	-0.24	-90.01	
12,387.22	89.85	0.00	7,342.62	3,677.48	267.00	0.24	0.00	0.24	90.00	HIGHLANDS 1N-33
14,449.45	89.85	1.75	7,348.00	5,739.38	298.48	0.08	0.00	0.08	89.97	HIGHLANDS 1N-33

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Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well HIGHLANDS 1N-33HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB @ 5018.00usft (D Rig)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB @ 5018.00usft (D Rig)
Site:	1N-66W-09 Highlands 27-9HZ Pad	North Reference:	True
Well:	HIGHLANDS 1N-33HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan A		
Design:	Permit Rev-3		

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	174.11	300.00	-0.33	0.03	-0.32	1.50	1.50	0.00
400.00	2.25	174.11	399.96	-2.93	0.30	-2.91	1.50	1.50	0.00
500.00	3.75	174.11	499.82	-8.14	0.84	-8.08	1.50	1.50	0.00
600.00	5.25	174.11	599.51	-15.94	1.64	-15.83	1.50	1.50	0.00
700.00	6.75	174.11	698.96	-26.34	2.72	-26.16	1.50	1.50	0.00
800.00	8.25	174.11	798.10	-39.32	4.06	-39.06	1.50	1.50	0.00
900.00	9.75	174.11	896.87	-54.88	5.66	-54.51	1.50	1.50	0.00
1,000.00	11.25	174.11	995.19	-73.01	7.53	-72.52	1.50	1.50	0.00
1,100.00	12.75	174.11	1,093.00	-93.69	9.67	-93.06	1.50	1.50	0.00
1,200.00	14.25	174.11	1,190.24	-116.91	12.07	-116.12	1.50	1.50	0.00
1,300.00	15.75	174.11	1,286.83	-142.65	14.72	-141.70	1.50	1.50	0.00
1,400.00	17.25	174.11	1,382.71	-170.90	17.64	-169.76	1.50	1.50	0.00
1,479.10	18.44	174.11	1,458.00	-195.01	20.13	-193.70	1.50	1.50	0.00
Fox Hills									
1,500.00	18.75	174.11	1,477.81	-201.64	20.81	-200.29	1.50	1.50	0.00
1,600.00	20.25	174.11	1,572.07	-234.84	24.24	-233.27	1.50	1.50	0.00
1,700.00	21.75	174.11	1,665.43	-270.49	27.92	-268.68	1.50	1.50	0.00
1,736.45	22.30	174.11	1,699.21	-284.09	29.32	-282.18	1.50	1.50	0.00
1,800.00	22.30	174.11	1,758.01	-308.07	31.79	-306.00	0.00	0.00	0.00
1,845.38	22.30	174.11	1,800.00	-325.20	33.56	-323.01	0.00	0.00	0.00
9 5/8"									
1,900.00	22.30	174.11	1,850.54	-345.81	35.69	-343.49	0.00	0.00	0.00
2,000.00	22.30	174.11	1,943.06	-383.55	39.58	-380.98	0.00	0.00	0.00
2,100.00	22.30	174.11	2,035.58	-421.29	43.48	-418.46	0.00	0.00	0.00
2,200.00	22.30	174.11	2,128.11	-459.03	47.37	-455.95	0.00	0.00	0.00
2,300.00	22.30	174.11	2,220.63	-496.77	51.27	-493.44	0.00	0.00	0.00
2,400.00	22.30	174.11	2,313.15	-534.51	55.16	-530.92	0.00	0.00	0.00
2,500.00	22.30	174.11	2,405.68	-572.25	59.06	-568.41	0.00	0.00	0.00
2,600.00	22.30	174.11	2,498.20	-609.99	62.95	-605.90	0.00	0.00	0.00
2,700.00	22.30	174.11	2,590.72	-647.73	66.85	-643.38	0.00	0.00	0.00
2,800.00	22.30	174.11	2,683.25	-685.47	70.74	-680.87	0.00	0.00	0.00
2,900.00	22.30	174.11	2,775.77	-723.21	74.64	-718.36	0.00	0.00	0.00
3,000.00	22.30	174.11	2,868.29	-760.95	78.53	-755.84	0.00	0.00	0.00
3,100.00	22.30	174.11	2,960.82	-798.69	82.43	-793.33	0.00	0.00	0.00
3,200.00	22.30	174.11	3,053.34	-836.43	86.32	-830.82	0.00	0.00	0.00
3,300.00	22.30	174.11	3,145.86	-874.17	90.22	-868.30	0.00	0.00	0.00
3,400.00	22.30	174.11	3,238.38	-911.91	94.11	-905.79	0.00	0.00	0.00
3,500.00	22.30	174.11	3,330.91	-949.65	98.01	-943.28	0.00	0.00	0.00
3,600.00	22.30	174.11	3,423.43	-987.39	101.90	-980.76	0.00	0.00	0.00
3,700.00	22.30	174.11	3,515.95	-1,025.13	105.80	-1,018.25	0.00	0.00	0.00
3,800.00	22.30	174.11	3,608.48	-1,062.87	109.69	-1,055.74	0.00	0.00	0.00
3,900.00	22.30	174.11	3,701.00	-1,100.61	113.59	-1,093.22	0.00	0.00	0.00
3,953.81	22.30	174.11	3,750.79	-1,120.91	115.68	-1,113.39	0.00	0.00	0.00
4,000.00	21.60	174.11	3,793.63	-1,138.09	117.45	-1,130.45	1.50	-1.50	0.00
4,100.00	20.10	174.11	3,887.07	-1,173.50	121.11	-1,165.62	1.50	-1.50	0.00
4,200.00	18.60	174.11	3,981.42	-1,206.46	124.51	-1,198.37	1.50	-1.50	0.00
4,300.00	17.10	174.11	4,076.60	-1,236.96	127.66	-1,228.66	1.50	-1.50	0.00
4,400.00	15.60	174.11	4,172.55	-1,264.97	130.55	-1,256.48	1.50	-1.50	0.00
4,431.58	15.13	174.11	4,203.00	-1,273.29	131.41	-1,264.75	1.50	-1.50	0.00

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Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well HIGHLANDS 1N-33HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB @ 5018.00usft (D Rig)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB @ 5018.00usft (D Rig)
Site:	1N-66W-09 Highlands 27-9HZ Pad	North Reference:	True
Well:	HIGHLANDS 1N-33HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan A		
Design:	Permit Rev-3		

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)
Parkman									
4,500.00	14.10	174.11	4,269.21	-1,290.47	133.18	-1,281.81	1.50	-1.50	0.00
4,600.00	12.60	174.11	4,366.50	-1,313.44	135.55	-1,304.63	1.50	-1.50	0.00
4,700.00	11.10	174.11	4,464.37	-1,333.87	137.66	-1,324.92	1.50	-1.50	0.00
4,800.00	9.60	174.11	4,562.74	-1,351.75	139.50	-1,342.68	1.50	-1.50	0.00
4,836.75	9.05	174.11	4,599.00	-1,357.67	140.12	-1,348.56	1.50	-1.50	0.00
Sussex									
4,900.00	8.10	174.11	4,661.54	-1,367.06	141.08	-1,357.89	1.50	-1.50	0.00
5,000.00	6.60	174.11	4,760.72	-1,379.79	142.40	-1,370.53	1.50	-1.50	0.00
5,100.00	5.10	174.11	4,860.19	-1,389.94	143.45	-1,380.61	1.50	-1.50	0.00
5,200.00	3.60	174.11	4,959.90	-1,397.49	144.22	-1,388.11	1.50	-1.50	0.00
5,300.00	2.10	174.11	5,059.77	-1,402.44	144.74	-1,393.03	1.50	-1.50	0.00
5,400.00	0.60	174.11	5,159.74	-1,404.79	144.98	-1,395.36	1.50	-1.50	0.00
5,440.26	0.00	0.00	5,200.00	-1,405.00	145.00	-1,395.57	1.50	-1.50	0.00
5,500.00	0.00	0.00	5,259.74	-1,405.00	145.00	-1,395.57	0.00	0.00	0.00
5,600.00	0.00	0.00	5,359.74	-1,405.00	145.00	-1,395.57	0.00	0.00	0.00
5,700.00	0.00	0.00	5,459.74	-1,405.00	145.00	-1,395.57	0.00	0.00	0.00
5,800.00	0.00	0.00	5,559.74	-1,405.00	145.00	-1,395.57	0.00	0.00	0.00
5,900.00	0.00	0.00	5,659.74	-1,405.00	145.00	-1,395.57	0.00	0.00	0.00
6,000.00	0.00	0.00	5,759.74	-1,405.00	145.00	-1,395.57	0.00	0.00	0.00
6,100.00	0.00	0.00	5,859.74	-1,405.00	145.00	-1,395.57	0.00	0.00	0.00
6,200.00	0.00	0.00	5,959.74	-1,405.00	145.00	-1,395.57	0.00	0.00	0.00
6,300.00	0.00	0.00	6,059.74	-1,405.00	145.00	-1,395.57	0.00	0.00	0.00
6,400.00	0.00	0.00	6,159.74	-1,405.00	145.00	-1,395.57	0.00	0.00	0.00
6,500.00	0.00	0.00	6,259.74	-1,405.00	145.00	-1,395.57	0.00	0.00	0.00
6,600.00	0.00	0.00	6,359.74	-1,405.00	145.00	-1,395.57	0.00	0.00	0.00
6,700.00	0.00	0.00	6,459.74	-1,405.00	145.00	-1,395.57	0.00	0.00	0.00
6,800.00	0.00	0.00	6,559.74	-1,405.00	145.00	-1,395.57	0.00	0.00	0.00
6,900.00	0.00	0.00	6,659.74	-1,405.00	145.00	-1,395.57	0.00	0.00	0.00
6,934.58	0.00	0.00	6,694.32	-1,405.00	145.00	-1,395.57	0.00	0.00	0.00
7,000.00	5.89	5.00	6,759.63	-1,401.65	145.29	-1,392.22	9.00	9.00	0.00
7,100.00	14.89	5.00	6,857.89	-1,383.71	146.86	-1,374.22	9.00	9.00	0.00
7,200.00	23.89	5.00	6,952.12	-1,350.67	149.75	-1,341.07	9.00	9.00	0.00
7,300.00	32.89	5.00	7,040.00	-1,303.36	153.89	-1,293.61	9.00	9.00	0.00
7,400.00	41.89	5.00	7,119.38	-1,242.93	159.17	-1,232.99	9.00	9.00	0.00
7,482.41	49.30	5.00	7,177.00	-1,184.32	164.30	-1,174.19	9.00	9.00	0.00
Sharon Springs									
7,500.00	50.89	5.00	7,188.28	-1,170.88	165.47	-1,160.70	9.00	9.00	0.00
7,549.53	55.35	5.00	7,218.00	-1,131.43	168.92	-1,121.13	9.00	9.00	0.00
Niobrara									
7,600.00	59.89	5.00	7,245.03	-1,088.97	172.64	-1,078.54	9.00	9.00	0.00
7,653.75	64.73	5.00	7,270.00	-1,041.57	176.78	-1,030.99	9.00	9.00	0.00
Nio B									
7,700.00	68.89	5.00	7,288.21	-999.23	180.48	-988.51	9.00	9.00	0.00
7,800.00	77.89	5.00	7,316.77	-903.87	188.82	-892.84	9.00	9.00	0.00
7,847.54	82.17	5.00	7,325.00	-857.24	192.90	-846.06	9.00	9.00	0.00
Nio C									
7,900.00	86.89	5.00	7,330.00	-805.23	197.45	-793.89	9.00	9.00	0.00
7,932.91	89.85	5.00	7,330.94	-772.46	200.32	-761.02	9.00	9.00	0.00
Top of Production - HIGHLANDS 1N-33HZ_PHL									
8,000.00	89.85	5.00	7,331.11	-705.63	206.16	-693.97	0.00	0.00	0.00
8,100.00	89.85	5.00	7,331.38	-606.01	214.87	-594.03	0.00	0.00	0.00
8,200.00	89.85	5.00	7,331.64	-506.39	223.58	-494.09	0.00	0.00	0.00

Anadarko

Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well HIGHLANDS 1N-33HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB @ 5018.00usft (D Rig)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB @ 5018.00usft (D Rig)
Site:	1N-66W-09 Highlands 27-9HZ Pad	North Reference:	True
Well:	HIGHLANDS 1N-33HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan A		
Design:	Permit Rev-3		

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)
8,204.79	89.85	5.00	7,331.65	-501.62	224.00	-489.31	0.00	0.00	0.00
HIGHLANDS 1N-33HZ_PITL1									
8,300.00	89.85	4.77	7,331.90	-406.75	232.10	-394.15	0.24	0.00	-0.24
8,400.00	89.85	4.53	7,332.16	-307.08	240.21	-294.19	0.24	0.00	-0.24
8,500.00	89.85	4.28	7,332.42	-207.38	247.89	-194.22	0.24	0.00	-0.24
8,600.00	89.85	4.04	7,332.69	-107.64	255.15	-94.25	0.24	0.00	-0.24
8,700.00	89.85	3.80	7,332.95	-7.88	261.99	5.74	0.24	0.00	-0.24
8,800.00	89.85	3.56	7,333.21	91.92	268.40	105.73	0.24	0.00	-0.24
8,900.00	89.85	3.32	7,333.47	191.74	274.40	205.73	0.24	0.00	-0.24
9,000.00	89.85	3.08	7,333.73	291.58	279.98	305.73	0.24	0.00	-0.24
9,100.00	89.85	2.83	7,334.00	391.45	285.13	405.73	0.24	0.00	-0.24
9,200.00	89.85	2.59	7,334.26	491.33	289.87	505.73	0.24	0.00	-0.24
9,300.00	89.85	2.35	7,334.52	591.24	294.18	605.72	0.24	0.00	-0.24
9,400.00	89.85	2.11	7,334.78	691.16	298.07	705.71	0.24	0.00	-0.24
9,500.00	89.85	1.87	7,335.05	791.10	301.54	805.70	0.24	0.00	-0.24
9,600.00	89.85	1.63	7,335.31	891.06	304.59	905.67	0.24	0.00	-0.24
9,700.00	89.85	1.38	7,335.57	991.02	307.22	1,005.64	0.24	0.00	-0.24
9,800.00	89.85	1.14	7,335.83	1,091.00	309.42	1,105.60	0.24	0.00	-0.24
9,900.00	89.85	0.90	7,336.10	1,190.98	311.21	1,205.54	0.24	0.00	-0.24
10,000.00	89.85	0.66	7,336.36	1,290.97	312.57	1,305.46	0.24	0.00	-0.24
10,100.00	89.85	0.42	7,336.62	1,390.97	313.51	1,405.37	0.24	0.00	-0.24
10,200.00	89.85	0.18	7,336.88	1,490.96	314.02	1,505.26	0.24	0.00	-0.24
10,300.00	89.85	359.93	7,337.15	1,590.96	314.12	1,605.13	0.24	0.00	-0.24
10,400.00	89.85	359.69	7,337.41	1,690.96	313.79	1,704.98	0.24	0.00	-0.24
10,500.00	89.85	359.45	7,337.67	1,790.96	313.05	1,804.80	0.24	0.00	-0.24
10,600.00	89.85	359.21	7,337.93	1,890.95	311.88	1,904.60	0.24	0.00	-0.24
10,700.00	89.85	358.97	7,338.20	1,990.94	310.29	2,004.37	0.24	0.00	-0.24
10,800.00	89.85	358.73	7,338.46	2,090.92	308.27	2,104.11	0.24	0.00	-0.24
10,900.00	89.85	358.48	7,338.72	2,190.89	305.84	2,203.82	0.24	0.00	-0.24
11,000.00	89.85	358.24	7,338.98	2,290.85	302.98	2,303.49	0.24	0.00	-0.24
11,100.00	89.85	358.00	7,339.25	2,390.79	299.71	2,403.13	0.24	0.00	-0.24
11,200.00	89.85	357.76	7,339.51	2,490.73	296.01	2,502.74	0.24	0.00	-0.24
11,300.00	89.85	357.52	7,339.77	2,590.64	291.89	2,602.30	0.24	0.00	-0.24
11,330.01	89.85	357.45	7,339.85	2,620.62	290.57	2,632.17	0.24	0.00	-0.24
11,400.00	89.85	357.61	7,340.03	2,690.55	287.55	2,701.85	0.24	0.00	0.24
11,500.00	89.85	357.86	7,340.30	2,790.47	283.60	2,801.43	0.24	0.00	0.24
11,600.00	89.85	358.10	7,340.56	2,890.40	280.07	2,901.05	0.24	0.00	0.24
11,700.00	89.85	358.34	7,340.82	2,990.36	276.96	3,000.70	0.24	0.00	0.24
11,800.00	89.85	358.58	7,341.08	3,090.32	274.27	3,100.39	0.24	0.00	0.24
11,900.00	89.85	358.82	7,341.34	3,190.29	272.01	3,200.11	0.24	0.00	0.24
12,000.00	89.85	359.06	7,341.61	3,290.28	270.16	3,299.87	0.24	0.00	0.24
12,100.00	89.85	359.31	7,341.87	3,390.26	268.74	3,399.65	0.24	0.00	0.24
12,200.00	89.85	359.55	7,342.13	3,490.26	267.74	3,499.45	0.24	0.00	0.24
12,300.00	89.85	359.79	7,342.39	3,590.26	267.16	3,599.29	0.24	0.00	0.24
12,387.22	89.85	0.00	7,342.62	3,677.48	267.00	3,686.38	0.24	0.00	0.24
HIGHLANDS 1N-33HZ_PITL2									
12,400.00	89.85	0.01	7,342.65	3,690.26	267.00	3,699.14	0.08	0.00	0.08
12,500.00	89.85	0.10	7,342.92	3,790.26	267.09	3,799.01	0.08	0.00	0.08
12,600.00	89.85	0.18	7,343.18	3,890.26	267.34	3,898.89	0.08	0.00	0.08
12,700.00	89.85	0.27	7,343.44	3,990.25	267.72	3,998.77	0.08	0.00	0.08
12,800.00	89.85	0.35	7,343.70	4,090.25	268.26	4,098.66	0.08	0.00	0.08
12,900.00	89.85	0.44	7,343.96	4,190.25	268.95	4,198.56	0.08	0.00	0.08
13,000.00	89.85	0.52	7,344.22	4,290.25	269.78	4,298.47	0.08	0.00	0.08
13,100.00	89.85	0.60	7,344.48	4,390.24	270.76	4,398.38	0.08	0.00	0.08

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Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well HIGHLANDS 1N-33HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB @ 5018.00usft (D Rig)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB @ 5018.00usft (D Rig)
Site:	1N-66W-09 Highlands 27-9HZ Pad	North Reference:	True
Well:	HIGHLANDS 1N-33HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan A		
Design:	Permit Rev-3		

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)	
13,200.00	89.85	0.69	7,344.75	4,490.23	271.89	4,498.30	0.08	0.00	0.08	
13,300.00	89.85	0.77	7,345.01	4,590.23	273.17	4,598.22	0.08	0.00	0.08	
13,400.00	89.85	0.86	7,345.27	4,690.22	274.59	4,698.15	0.08	0.00	0.08	
13,500.00	89.85	0.94	7,345.53	4,790.20	276.17	4,798.08	0.08	0.00	0.08	
13,600.00	89.85	1.03	7,345.79	4,890.19	277.89	4,898.02	0.08	0.00	0.08	
13,700.00	89.85	1.11	7,346.05	4,990.17	279.76	4,997.96	0.08	0.00	0.08	
13,800.00	89.85	1.20	7,346.31	5,090.15	281.78	5,097.91	0.08	0.00	0.08	
13,900.00	89.85	1.28	7,346.57	5,190.13	283.94	5,197.87	0.08	0.00	0.08	
14,000.00	89.85	1.37	7,346.83	5,290.10	286.26	5,297.83	0.08	0.00	0.08	
14,100.00	89.85	1.45	7,347.09	5,390.07	288.72	5,397.79	0.08	0.00	0.08	
14,200.00	89.85	1.54	7,347.35	5,490.03	291.33	5,497.75	0.08	0.00	0.08	
14,300.00	89.85	1.62	7,347.61	5,589.99	294.08	5,597.72	0.08	0.00	0.08	
14,400.00	89.85	1.71	7,347.87	5,689.95	296.99	5,697.70	0.08	0.00	0.08	
14,449.45	89.85	1.75	7,348.00	5,739.38	298.48	5,747.14	0.08	0.00	0.08	
HIGHLANDS 1N-33HZ_PBHL										

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
HIGHLANDS 1N-33HZ - hit/miss target - Shape - Point	0.00	0.00	7,330.94	-772.46	200.32	14,552,300.93	1,703,156.19	40.069996	-104.775742
HIGHLANDS 1N-33HZ - plan hits target center - Point	0.00	0.00	7,331.65	-501.62	224.00	14,552,571.83	1,703,179.19	40.070740	-104.775658
HIGHLANDS 1N-33HZ - plan hits target center - Point	0.00	0.00	7,342.62	3,677.48	267.00	14,556,751.02	1,703,211.70	40.082216	-104.775504
HIGHLANDS 1N-33HZ - plan hits target center - Point	0.00	0.00	7,348.00	5,739.38	298.48	14,558,813.00	1,703,238.00	40.087878	-104.775391

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
1,845.38	1,800.00	9 5/8"	9-5/8	13-1/2	
7,932.91	7,330.94	Top of Production	5-1/2	8-1/2	

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Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well HIGHLANDS 1N-33HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB @ 5018.00usft (D Rig)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB @ 5018.00usft (D Rig)
Site:	1N-66W-09 Highlands 27-9HZ Pad	North Reference:	True
Well:	HIGHLANDS 1N-33HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan A		
Design:	Permit Rev-3		

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
1,479.10	1,458.00	Fox Hills				
4,431.58	4,203.00	Parkman				
4,836.75	4,599.00	Sussex				
7,482.41	7,177.00	Sharon Springs				
7,549.53	7,218.00	Niobrara				
7,653.75	7,270.00	Nio B				
7,847.54	7,325.00	Nio C				