

US ROCKIES WATTENBERG PLANNING

WELD-NAD83-UTMFT13N

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

HIGHLANDS 38N-16HZ

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 38N-16HZ
Wellbore: Plan A
Design: Permit Rev-3

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
1458.00	1479.10	Fox Hills
4203.00	4360.04	Parkman
4599.00	4756.04	Sussex
7142.00	7357.04	Sharon Springs
7183.00	7421.22	Niobrara
7248.00	7546.96	Nio B
7300.00	7716.85	Nio C

WELL DETAILS: HIGHLANDS 38N-16HZ

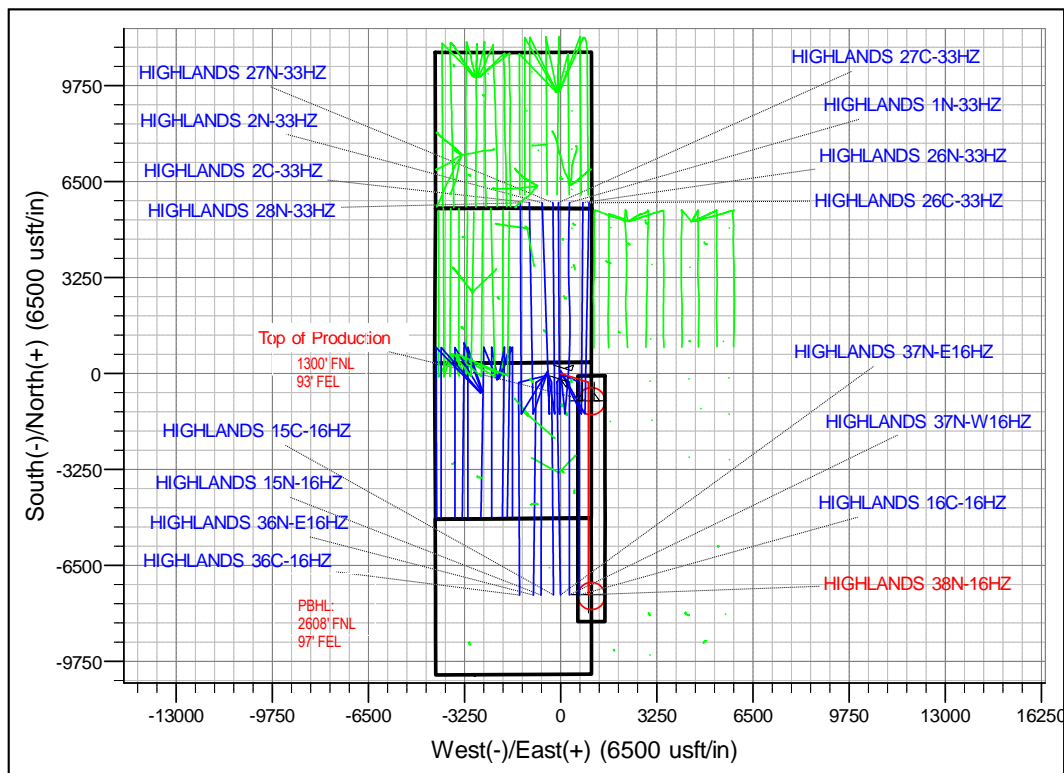
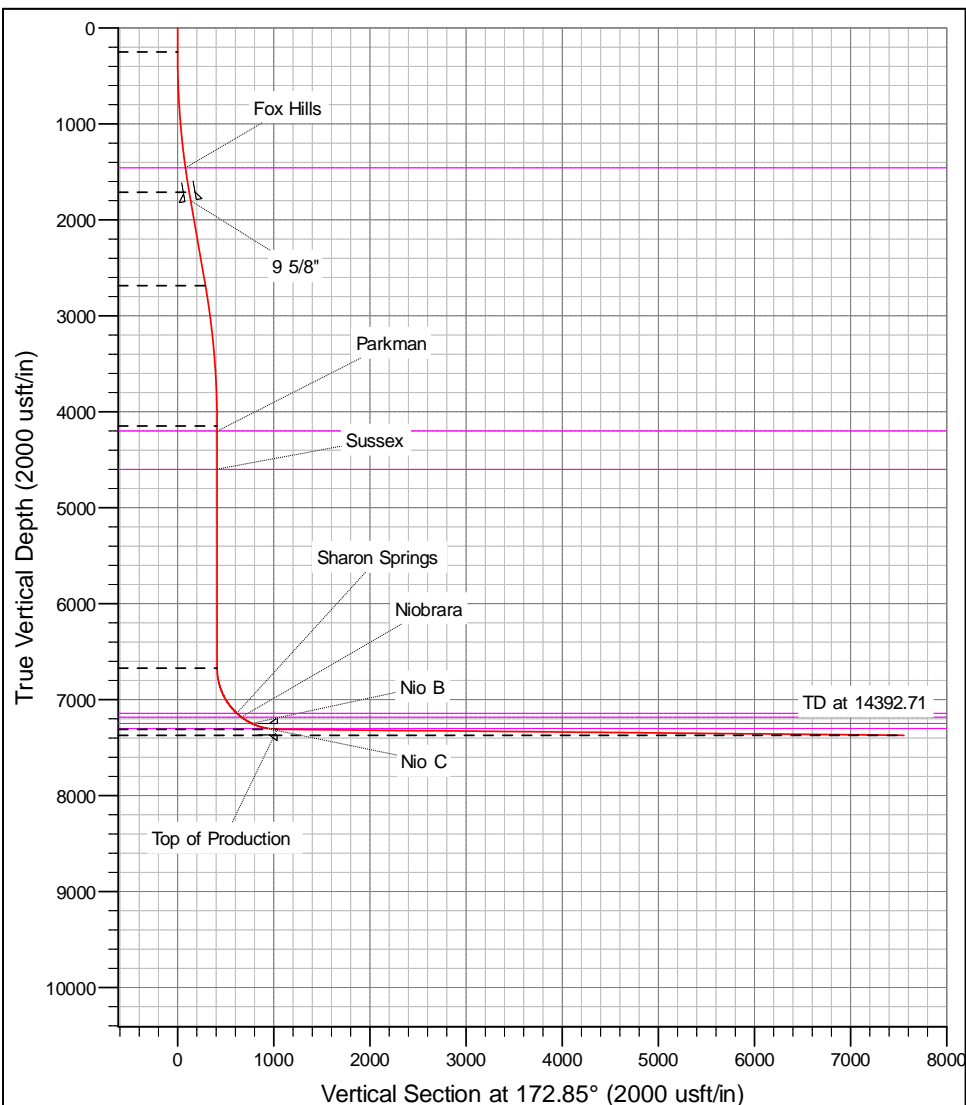
+N/-S	+E/-W	GL: 5001.00 Northing	RKB @ 5018.00usft (D Rig) Easting	Latitude	Longitude	Slot
0.00	0.00	14553028.10	1702953.77	40.071994	-104.776459	

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
1750.64	22.51	107.53	1712.34	-87.64	277.49	1.50	121.50
2806.40	22.51	107.53	2687.66	-209.36	662.92	0.00	290.26
4307.04	0.00	0.00	4150.00	-297.00	940.41	1.50	411.76
6830.55	0.00	0.00	6673.51	-297.00	940.41	0.00	411.76
7824.55	89.46	180.00	7310.10	-927.62	940.41	9.00	1037.47
14392.71	89.46	180.00	7372.00	-7495.48	940.41	0.00	7554.25

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
HIGHLANDS 38N-16HZ_PHL	7310.10	-927.62	940.41	14552102.84	1703896.50	40.069447	-104.773098
HIGHLANDS 38N-16HZ_PBHL	7372.00	-7495.48	940.41	14545535.00	1703913.00	40.061410	-104.773098



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Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well HIGHLANDS 38N-16HZ
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 38N-16HZ	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 38N-16HZ					
Well Position	+N-S	-93.22 usft	Northing:	14,553,028.09 usft	Latitude:	40.071994
	+E-W	431.67 usft	Easting:	1,702,953.77 usft	Longitude:	-104.776459
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	172.85	

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	
1,750.64	22.51	107.53	1,712.34	-87.64	277.49	1.50	1.50	0.00	107.53	
2,806.40	22.51	107.53	2,687.66	-209.36	662.92	0.00	0.00	0.00	0.00	
4,307.04	0.00	0.00	4,150.00	-297.00	940.41	1.50	-1.50	0.00	180.00	
6,830.55	0.00	0.00	6,673.51	-297.00	940.41	0.00	0.00	0.00	0.00	
7,824.55	89.46	180.00	7,310.10	-927.62	940.41	9.00	9.00	0.00	180.00	
14,392.71	89.46	180.00	7,372.00	-7,495.48	940.41	0.00	0.00	0.00	0.00	HIGHLANDS 38N-1

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Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well HIGHLANDS 38N-16HZ
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 38N-16HZ	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	107.53	300.00	-0.10	0.31	0.14	1.50	1.50	0.00
400.00	2.25	107.53	399.96	-0.89	2.81	1.23	1.50	1.50	0.00
500.00	3.75	107.53	499.82	-2.46	7.80	3.41	1.50	1.50	0.00
600.00	5.25	107.53	599.51	-4.83	15.28	6.69	1.50	1.50	0.00
700.00	6.75	107.53	698.96	-7.97	25.25	11.05	1.50	1.50	0.00
800.00	8.25	107.53	798.10	-11.90	37.69	16.50	1.50	1.50	0.00
900.00	9.75	107.53	896.87	-16.62	52.61	23.04	1.50	1.50	0.00
1,000.00	11.25	107.53	995.19	-22.10	69.99	30.64	1.50	1.50	0.00
1,100.00	12.75	107.53	1,093.00	-28.36	89.81	39.32	1.50	1.50	0.00
1,200.00	14.25	107.53	1,190.24	-35.39	112.07	49.07	1.50	1.50	0.00
1,300.00	15.75	107.53	1,286.83	-43.19	136.75	59.88	1.50	1.50	0.00
1,400.00	17.25	107.53	1,382.71	-51.74	163.83	71.74	1.50	1.50	0.00
1,479.10	18.44	107.53	1,458.00	-59.04	186.95	81.85	1.50	1.50	0.00
Fox Hills									
1,500.00	18.75	107.53	1,477.81	-61.05	193.30	84.64	1.50	1.50	0.00
1,600.00	20.25	107.53	1,572.07	-71.10	225.13	98.57	1.50	1.50	0.00
1,700.00	21.75	107.53	1,665.43	-81.89	259.30	113.54	1.50	1.50	0.00
1,750.64	22.51	107.53	1,712.34	-87.64	277.49	121.50	1.50	1.50	0.00
1,800.00	22.51	107.53	1,757.93	-93.33	295.51	129.39	0.00	0.00	0.00
1,845.54	22.51	107.53	1,800.00	-98.58	312.14	136.67	0.00	0.00	0.00
9 5/8"									
1,900.00	22.51	107.53	1,850.32	-104.86	332.02	145.38	0.00	0.00	0.00
2,000.00	22.51	107.53	1,942.70	-116.39	368.53	161.36	0.00	0.00	0.00
2,100.00	22.51	107.53	2,035.08	-127.92	405.03	177.34	0.00	0.00	0.00
2,200.00	22.51	107.53	2,127.46	-139.45	441.54	193.33	0.00	0.00	0.00
2,300.00	22.51	107.53	2,219.84	-150.98	478.05	209.31	0.00	0.00	0.00
2,400.00	22.51	107.53	2,312.22	-162.51	514.55	225.30	0.00	0.00	0.00
2,500.00	22.51	107.53	2,404.60	-174.04	551.06	241.28	0.00	0.00	0.00
2,600.00	22.51	107.53	2,496.99	-185.56	587.57	257.27	0.00	0.00	0.00
2,700.00	22.51	107.53	2,589.37	-197.09	624.07	273.25	0.00	0.00	0.00
2,800.00	22.51	107.53	2,681.75	-208.62	660.58	289.23	0.00	0.00	0.00
2,806.40	22.51	107.53	2,687.66	-209.36	662.92	290.26	0.00	0.00	0.00
2,900.00	21.11	107.53	2,774.56	-219.83	696.07	304.78	1.50	-1.50	0.00
3,000.00	19.61	107.53	2,868.31	-230.31	729.24	319.30	1.50	-1.50	0.00
3,100.00	18.11	107.53	2,962.94	-240.04	760.06	332.79	1.50	-1.50	0.00
3,200.00	16.61	107.53	3,058.39	-249.02	788.50	345.25	1.50	-1.50	0.00
3,300.00	15.11	107.53	3,154.58	-257.25	814.55	356.65	1.50	-1.50	0.00
3,400.00	13.61	107.53	3,251.46	-264.72	838.20	367.00	1.50	-1.50	0.00
3,500.00	12.11	107.53	3,348.95	-271.42	859.41	376.29	1.50	-1.50	0.00
3,600.00	10.61	107.53	3,446.99	-277.35	878.19	384.51	1.50	-1.50	0.00
3,700.00	9.11	107.53	3,545.51	-282.50	894.51	391.66	1.50	-1.50	0.00
3,800.00	7.61	107.53	3,644.44	-286.88	908.37	397.73	1.50	-1.50	0.00
3,900.00	6.11	107.53	3,743.73	-290.47	919.75	402.71	1.50	-1.50	0.00
4,000.00	4.61	107.53	3,843.29	-293.29	928.65	406.61	1.50	-1.50	0.00
4,100.00	3.11	107.53	3,943.06	-295.31	935.06	409.42	1.50	-1.50	0.00
4,200.00	1.61	107.53	4,042.97	-296.55	938.98	411.13	1.50	-1.50	0.00
4,300.00	0.11	107.53	4,142.96	-297.00	940.40	411.76	1.50	-1.50	0.00
4,307.04	0.00	0.00	4,150.00	-297.00	940.41	411.76	1.50	-1.50	0.00
4,360.04	0.00	0.00	4,203.00	-297.00	940.41	411.76	0.00	0.00	0.00

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Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well HIGHLANDS 38N-16HZ
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 38N-16HZ	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									
4,400.00	0.00	0.00	4,242.96	-297.00	940.41	411.76	0.00	0.00	0.00
4,500.00	0.00	0.00	4,342.96	-297.00	940.41	411.76	0.00	0.00	0.00
4,600.00	0.00	0.00	4,442.96	-297.00	940.41	411.76	0.00	0.00	0.00
4,700.00	0.00	0.00	4,542.96	-297.00	940.41	411.76	0.00	0.00	0.00
4,756.04	0.00	0.00	4,599.00	-297.00	940.41	411.76	0.00	0.00	0.00
Sussex									
4,800.00	0.00	0.00	4,642.96	-297.00	940.41	411.76	0.00	0.00	0.00
4,900.00	0.00	0.00	4,742.96	-297.00	940.41	411.76	0.00	0.00	0.00
5,000.00	0.00	0.00	4,842.96	-297.00	940.41	411.76	0.00	0.00	0.00
5,100.00	0.00	0.00	4,942.96	-297.00	940.41	411.76	0.00	0.00	0.00
5,200.00	0.00	0.00	5,042.96	-297.00	940.41	411.76	0.00	0.00	0.00
5,300.00	0.00	0.00	5,142.96	-297.00	940.41	411.76	0.00	0.00	0.00
5,400.00	0.00	0.00	5,242.96	-297.00	940.41	411.76	0.00	0.00	0.00
5,500.00	0.00	0.00	5,342.96	-297.00	940.41	411.76	0.00	0.00	0.00
5,600.00	0.00	0.00	5,442.96	-297.00	940.41	411.76	0.00	0.00	0.00
5,700.00	0.00	0.00	5,542.96	-297.00	940.41	411.76	0.00	0.00	0.00
5,800.00	0.00	0.00	5,642.96	-297.00	940.41	411.76	0.00	0.00	0.00
5,900.00	0.00	0.00	5,742.96	-297.00	940.41	411.76	0.00	0.00	0.00
6,000.00	0.00	0.00	5,842.96	-297.00	940.41	411.76	0.00	0.00	0.00
6,100.00	0.00	0.00	5,942.96	-297.00	940.41	411.76	0.00	0.00	0.00
6,200.00	0.00	0.00	6,042.96	-297.00	940.41	411.76	0.00	0.00	0.00
6,300.00	0.00	0.00	6,142.96	-297.00	940.41	411.76	0.00	0.00	0.00
6,400.00	0.00	0.00	6,242.96	-297.00	940.41	411.76	0.00	0.00	0.00
6,500.00	0.00	0.00	6,342.96	-297.00	940.41	411.76	0.00	0.00	0.00
6,600.00	0.00	0.00	6,442.96	-297.00	940.41	411.76	0.00	0.00	0.00
6,700.00	0.00	0.00	6,542.96	-297.00	940.41	411.76	0.00	0.00	0.00
6,800.00	0.00	0.00	6,642.96	-297.00	940.41	411.76	0.00	0.00	0.00
6,830.55	0.00	0.00	6,673.51	-297.00	940.41	411.76	0.00	0.00	0.00
6,900.00	6.25	180.00	6,742.82	-300.78	940.41	415.51	9.00	9.00	0.00
7,000.00	15.25	180.00	6,840.96	-319.42	940.41	434.00	9.00	9.00	0.00
7,100.00	24.25	180.00	6,934.98	-353.18	940.41	467.50	9.00	9.00	0.00
7,200.00	33.25	180.00	7,022.56	-401.23	940.41	515.17	9.00	9.00	0.00
7,300.00	42.25	180.00	7,101.55	-462.39	940.41	575.86	9.00	9.00	0.00
7,357.04	47.38	180.00	7,142.00	-502.58	940.41	615.74	9.00	9.00	0.00
Sharon Springs									
7,400.00	51.25	180.00	7,170.00	-535.15	940.41	648.05	9.00	9.00	0.00
7,421.22	53.16	180.00	7,183.00	-551.91	940.41	664.69	9.00	9.00	0.00
Niobrara									
7,500.00	60.25	180.00	7,226.22	-617.72	940.41	729.99	9.00	9.00	0.00
7,546.96	64.48	180.00	7,248.00	-659.32	940.41	771.26	9.00	9.00	0.00
Nio B									
7,600.00	69.25	180.00	7,268.83	-708.08	940.41	819.64	9.00	9.00	0.00
7,700.00	78.25	180.00	7,296.79	-803.98	940.41	914.80	9.00	9.00	0.00
7,716.85	79.77	180.00	7,300.00	-820.53	940.41	931.21	9.00	9.00	0.00
Nio C									
7,800.00	87.25	180.00	7,309.39	-903.08	940.41	1,013.13	9.00	9.00	0.00
7,824.55	89.46	180.00	7,310.10	-927.62	940.41	1,037.47	9.00	9.00	0.00
Top of Production - HIGHLANDS 38N-16HZ_PHL									
7,900.00	89.46	180.00	7,310.81	-1,003.07	940.41	1,112.33	0.00	0.00	0.00
8,000.00	89.46	180.00	7,311.75	-1,103.06	940.41	1,211.55	0.00	0.00	0.00
8,100.00	89.46	180.00	7,312.69	-1,203.06	940.41	1,310.77	0.00	0.00	0.00
8,200.00	89.46	180.00	7,313.64	-1,303.05	940.41	1,409.99	0.00	0.00	0.00

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Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well HIGHLANDS 38N-16HZ
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 38N-16HZ	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)	
8,300.00	89.46	180.00	7,314.58	-1,403.05	940.41	1,509.20	0.00	0.00	0.00	
8,400.00	89.46	180.00	7,315.52	-1,503.04	940.41	1,608.42	0.00	0.00	0.00	
8,500.00	89.46	180.00	7,316.46	-1,603.04	940.41	1,707.64	0.00	0.00	0.00	
8,600.00	89.46	180.00	7,317.41	-1,703.03	940.41	1,806.86	0.00	0.00	0.00	
8,700.00	89.46	180.00	7,318.35	-1,803.03	940.41	1,906.07	0.00	0.00	0.00	
8,800.00	89.46	180.00	7,319.29	-1,903.03	940.41	2,005.29	0.00	0.00	0.00	
8,900.00	89.46	180.00	7,320.23	-2,003.02	940.41	2,104.51	0.00	0.00	0.00	
9,000.00	89.46	180.00	7,321.18	-2,103.02	940.41	2,203.73	0.00	0.00	0.00	
9,100.00	89.46	180.00	7,322.12	-2,203.01	940.41	2,302.95	0.00	0.00	0.00	
9,200.00	89.46	180.00	7,323.06	-2,303.01	940.41	2,402.16	0.00	0.00	0.00	
9,300.00	89.46	180.00	7,324.00	-2,403.00	940.41	2,501.38	0.00	0.00	0.00	
9,400.00	89.46	180.00	7,324.95	-2,503.00	940.41	2,600.60	0.00	0.00	0.00	
9,500.00	89.46	180.00	7,325.89	-2,603.00	940.41	2,699.82	0.00	0.00	0.00	
9,600.00	89.46	180.00	7,326.83	-2,702.99	940.41	2,799.03	0.00	0.00	0.00	
9,700.00	89.46	180.00	7,327.77	-2,802.99	940.41	2,898.25	0.00	0.00	0.00	
9,800.00	89.46	180.00	7,328.72	-2,902.98	940.41	2,997.47	0.00	0.00	0.00	
9,900.00	89.46	180.00	7,329.66	-3,002.98	940.41	3,096.69	0.00	0.00	0.00	
10,000.00	89.46	180.00	7,330.60	-3,102.97	940.41	3,195.90	0.00	0.00	0.00	
10,100.00	89.46	180.00	7,331.54	-3,202.97	940.41	3,295.12	0.00	0.00	0.00	
10,200.00	89.46	180.00	7,332.49	-3,302.96	940.41	3,394.34	0.00	0.00	0.00	
10,300.00	89.46	180.00	7,333.43	-3,402.96	940.41	3,493.56	0.00	0.00	0.00	
10,400.00	89.46	180.00	7,334.37	-3,502.96	940.41	3,592.78	0.00	0.00	0.00	
10,500.00	89.46	180.00	7,335.31	-3,602.95	940.41	3,691.99	0.00	0.00	0.00	
10,600.00	89.46	180.00	7,336.26	-3,702.95	940.41	3,791.21	0.00	0.00	0.00	
10,700.00	89.46	180.00	7,337.20	-3,802.94	940.41	3,890.43	0.00	0.00	0.00	
10,800.00	89.46	180.00	7,338.14	-3,902.94	940.41	3,989.65	0.00	0.00	0.00	
10,900.00	89.46	180.00	7,339.08	-4,002.93	940.41	4,088.86	0.00	0.00	0.00	
11,000.00	89.46	180.00	7,340.03	-4,102.93	940.41	4,188.08	0.00	0.00	0.00	
11,100.00	89.46	180.00	7,340.97	-4,202.92	940.41	4,287.30	0.00	0.00	0.00	
11,200.00	89.46	180.00	7,341.91	-4,302.92	940.41	4,386.52	0.00	0.00	0.00	
11,300.00	89.46	180.00	7,342.85	-4,402.92	940.41	4,485.73	0.00	0.00	0.00	
11,400.00	89.46	180.00	7,343.79	-4,502.91	940.41	4,584.95	0.00	0.00	0.00	
11,500.00	89.46	180.00	7,344.74	-4,602.91	940.41	4,684.17	0.00	0.00	0.00	
11,600.00	89.46	180.00	7,345.68	-4,702.90	940.41	4,783.39	0.00	0.00	0.00	
11,700.00	89.46	180.00	7,346.62	-4,802.90	940.41	4,882.61	0.00	0.00	0.00	
11,800.00	89.46	180.00	7,347.56	-4,902.89	940.41	4,981.82	0.00	0.00	0.00	
11,900.00	89.46	180.00	7,348.51	-5,002.89	940.41	5,081.04	0.00	0.00	0.00	
12,000.00	89.46	180.00	7,349.45	-5,102.88	940.41	5,180.26	0.00	0.00	0.00	
12,100.00	89.46	180.00	7,350.39	-5,202.88	940.41	5,279.48	0.00	0.00	0.00	
12,200.00	89.46	180.00	7,351.33	-5,302.88	940.41	5,378.69	0.00	0.00	0.00	
12,300.00	89.46	180.00	7,352.28	-5,402.87	940.41	5,477.91	0.00	0.00	0.00	
12,400.00	89.46	180.00	7,353.22	-5,502.87	940.41	5,577.13	0.00	0.00	0.00	
12,500.00	89.46	180.00	7,354.16	-5,602.86	940.41	5,676.35	0.00	0.00	0.00	
12,600.00	89.46	180.00	7,355.10	-5,702.86	940.41	5,775.57	0.00	0.00	0.00	
12,700.00	89.46	180.00	7,356.05	-5,802.85	940.41	5,874.78	0.00	0.00	0.00	
12,800.00	89.46	180.00	7,356.99	-5,902.85	940.41	5,974.00	0.00	0.00	0.00	
12,900.00	89.46	180.00	7,357.93	-6,002.84	940.41	6,073.22	0.00	0.00	0.00	
13,000.00	89.46	180.00	7,358.87	-6,102.84	940.41	6,172.44	0.00	0.00	0.00	
13,100.00	89.46	180.00	7,359.82	-6,202.84	940.41	6,271.65	0.00	0.00	0.00	
13,200.00	89.46	180.00	7,360.76	-6,302.83	940.41	6,370.87	0.00	0.00	0.00	
13,300.00	89.46	180.00	7,361.70	-6,402.83	940.41	6,470.09	0.00	0.00	0.00	
13,400.00	89.46	180.00	7,362.64	-6,502.82	940.41	6,569.31	0.00	0.00	0.00	
13,500.00	89.46	180.00	7,363.59	-6,602.82	940.41	6,668.52	0.00	0.00	0.00	
13,600.00	89.46	180.00	7,364.53	-6,702.81	940.41	6,767.74	0.00	0.00	0.00	

Anadarko

Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well HIGHLANDS 38N-16HZ
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 38N-16HZ	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)
13,700.00	89.46	180.00	7,365.47	-6,802.81	940.41	6,866.96	0.00	0.00	0.00
13,800.00	89.46	180.00	7,366.41	-6,902.80	940.41	6,966.18	0.00	0.00	0.00
13,900.00	89.46	180.00	7,367.36	-7,002.80	940.41	7,065.40	0.00	0.00	0.00
14,000.00	89.46	180.00	7,368.30	-7,102.80	940.41	7,164.61	0.00	0.00	0.00
14,100.00	89.46	180.00	7,369.24	-7,202.79	940.41	7,263.83	0.00	0.00	0.00
14,200.00	89.46	180.00	7,370.18	-7,302.79	940.41	7,363.05	0.00	0.00	0.00
14,300.00	89.46	180.00	7,371.13	-7,402.78	940.41	7,462.27	0.00	0.00	0.00
14,392.71	89.46	180.00	7,372.00	-7,495.48	940.41	7,554.25	0.00	0.00	0.00
HIGHLANDS 38N-16HZ_PBHL									

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									
HIGHLANDS 38N-16H	0.00	0.00	7,310.10	-927.62	940.41	14,552,102.84	1,703,896.50	40.069447	-104.773098
- plan hits target center									
- Point									
HIGHLANDS 38N-16H	0.00	0.00	7,372.00	-7,495.48	940.41	14,545,535.00	1,703,913.00	40.051410	-104.773099
- plan hits target center									
- Point									

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
1,845.54	1,800.00	9 5/8"	9-5/8	13-1/2	
7,824.55	7,310.10	Top of Production	5-1/2	8-1/2	

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
1,479.10	1,458.00	Fox Hills				
4,360.04	4,203.00	Parkman				
4,756.04	4,599.00	Sussex				
7,357.04	7,142.00	Sharon Springs				
7,421.22	7,183.00	Niobrara				
7,546.96	7,248.00	Nio B				
7,716.85	7,300.00	Nio C				