

US ROCKIES WATTENBERG PLANNING

WELD-NAD83-UTMFT13N

5N-67W-19 CUMMINGS 18-19HZ PAD

CUMMINGS 19-5HZ

Plan A

Plan: Permit Rev-1

SHL Lat/Long: 40.389050/-104.940716

Survey Program: MWD+IFR+MSA

Standard Planning Report

07 April, 2019

Project: WELD-NAD83-UTMFT13N
Site: 5N-67W-19 CUMMINGS 18-19HZ PAD
Well: CUMMINGS 19-5HZ
Wellbore: Plan A
Design: Permit Rev-1

US ROCKIES WATTENBERG PLANNING

CASING DETAILS

TVD	MD	Size
1500.00	1526.50	9-5/8
6822.00	7595.86	5-1/2

WELL DETAILS: CUMMINGS 19-5HZ

GL = 4856.00

RKB = 17' @ 4873.00usft (Drilling Rig)

SECTION DETAILS

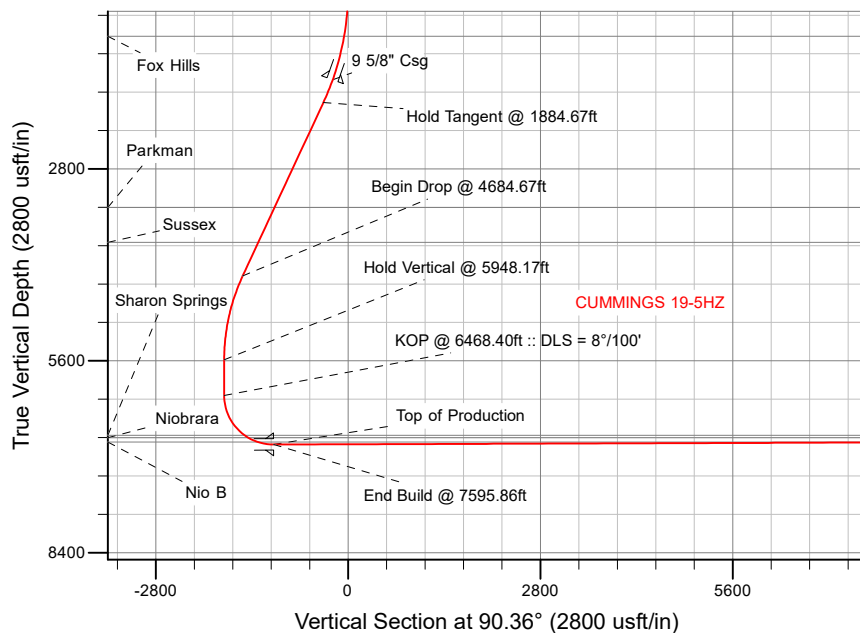
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	
3	1884.67	25.27	280.90	1830.58	69.12	-358.93	1.50	280.90	-359.36	
4	4684.67	25.27	280.90	4362.64	295.14	-1532.64	0.00	0.00	-1534.47	
5	5948.17	0.00	0.00	5585.57	346.98	-1801.84	2.00	180.00	-1803.98	
6	6468.40	0.00	0.00	6105.80	346.98	-1801.84	0.00	0.00	-1803.98	
7	7595.86	90.20	90.36	6822.00	342.47	-1083.19	8.00	90.36	-1085.32	
8	17476.90	90.20	90.36	6788.00	280.49	8797.59	0.00	0.00	8795.65	CUMMINGS 19-5HZ_BHL

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
CUMMINGS 19-5HZ_SHL	0.00	0.00	0.00	40.389050	-104.940716
CUMMINGS 19-5HZ_BHL	6788.00	280.49	8797.59	40.389816	-104.909121

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
866.00	869.42	Fox Hills
3362.00	3578.14	Parkman
3873.00	4143.22	Sussex
6687.00	7146.44	Sharon Springs
6723.00	7212.35	Niobrara
6785.00	7362.18	Nio B

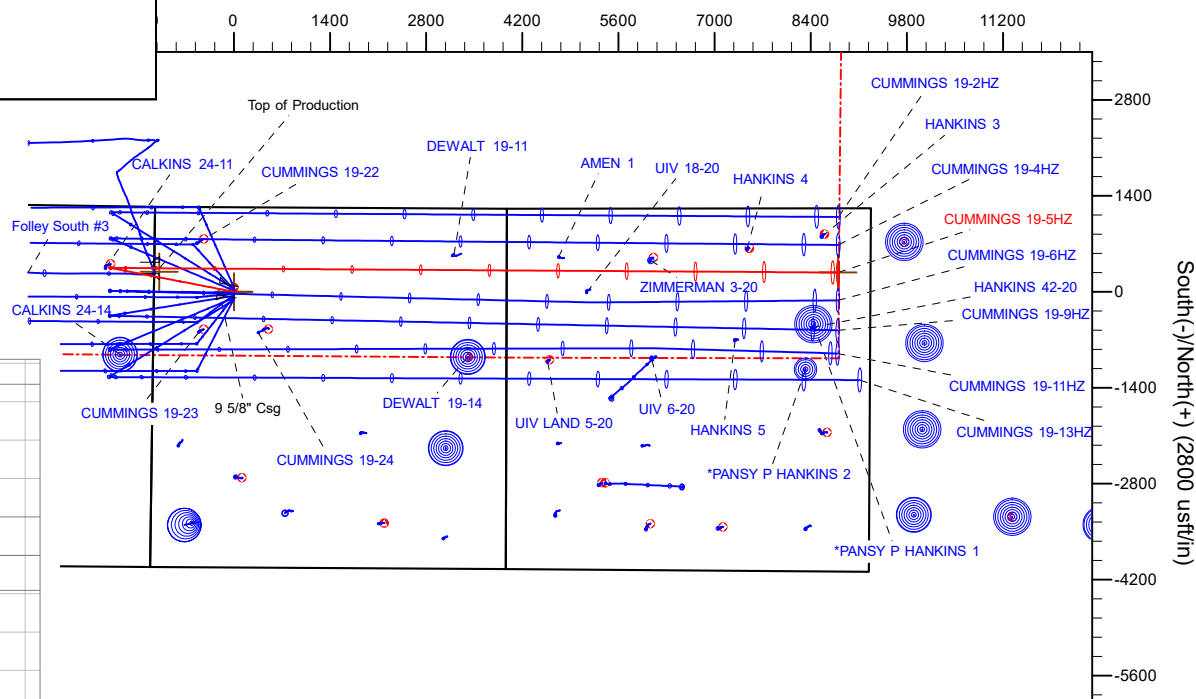


SHL
1235' FNL
1165' FWL

HEEL
899' FNL
75' FWL

TOE
936' FNL
475' FEL

West(-)/East(+) (2800 usft/in)



Plan: Permit Rev-1 (CUMMINGS 19-5HZ/Plan A)

Date: 4/7/2019

Corporate Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well CUMMINGS 19-5HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 4873.00usft (Drilling Rig)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4873.00usft (Drilling Rig)
Site:	5N-67W-19 CUMMINGS 18-19HZ PAD	North Reference:	True
Well:	CUMMINGS 19-5HZ	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	5N-67W-19 CUMMINGS 18-19HZ PAD			
Site Position:		Northing:	14,668,472.69 usft	Latitude: 40.389215
From:	Lat/Long	Easting:	1,656,925.11 usft	Longitude: -104.940714
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence: 0.04 °

Well	CUMMINGS 19-5HZ			
Well Position	+N/-S	-60.09 usft	Northing:	14,668,412.61 usft
	+E/-W	-0.56 usft	Easting:	1,656,924.60 usft
Position Uncertainty		3.28 usft	Wellhead Elevation:	Ground Level: 4,856.00 usft

Wellbore	Plan A				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	3/27/2019	8.12	66.77	52,165.39750116

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	90.36

Plan Survey Tool Program	Date	4/7/2019		
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	17,476.90	Permit Rev-1 (Plan A)	APC_ISCWSA REV 2 MWD+I Fixed:v2:Rockies, crustal dec +

Corporate
Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well CUMMINGS 19-5HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 4873.00usft (Drilling Rig)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4873.00usft (Drilling Rig)
Site:	5N-67W-19 CUMMINGS 18-19HZ PAD	North Reference:	True
Well:	CUMMINGS 19-5HZ	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	
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,884.67	25.27	280.90	1,830.58	69.12	-358.93	1.50	1.50	0.00	280.90	
4,684.67	25.27	280.90	4,362.64	295.14	-1,532.64	0.00	0.00	0.00	0.00	
5,948.17	0.00	0.00	5,585.57	346.98	-1,801.84	2.00	-2.00	0.00	180.00	
6,468.40	0.00	0.00	6,105.80	346.98	-1,801.84	0.00	0.00	0.00	0.00	
7,595.86	90.20	90.36	6,822.00	342.47	-1,083.19	8.00	8.00	8.01	90.36	
17,476.90	90.20	90.36	6,788.00	280.49	8,797.59	0.00	0.00	0.00	0.00	CUMMINGS 19-5HZ_

Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well CUMMINGS 19-5HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 4873.00usft (Drilling Rig)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4873.00usft (Drilling Rig)
Site:	5N-67W-19 CUMMINGS 18-19HZ PAD	North Reference:	True
Well:	CUMMINGS 19-5HZ	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)
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
Begin Nudge @ 200.00ft									
300.00	1.50	280.90	299.99	0.25	-1.29	-1.29	1.50	1.50	0.00
400.00	3.00	280.90	399.91	0.99	-5.14	-5.15	1.50	1.50	0.00
500.00	4.50	280.90	499.69	2.23	-11.56	-11.58	1.50	1.50	0.00
600.00	6.00	280.90	599.27	3.96	-20.55	-20.57	1.50	1.50	0.00
700.00	7.50	280.90	698.57	6.18	-32.09	-32.13	1.50	1.50	0.00
800.00	9.00	280.90	797.54	8.89	-46.18	-46.23	1.50	1.50	0.00
869.42	10.04	280.90	866.00	11.06	-57.45	-57.52	1.50	1.50	0.00
Fox Hills									
900.00	10.50	280.90	896.09	12.09	-62.81	-62.88	1.50	1.50	0.00
1,000.00	12.00	280.90	994.16	15.78	-81.96	-82.06	1.50	1.50	0.00
1,100.00	13.50	280.90	1,091.70	19.96	-103.64	-103.76	1.50	1.50	0.00
1,200.00	15.00	280.90	1,188.62	24.61	-127.81	-127.96	1.50	1.50	0.00
1,300.00	16.50	280.90	1,284.86	29.74	-154.46	-154.64	1.50	1.50	0.00
1,400.00	18.00	280.90	1,380.36	35.35	-183.58	-183.80	1.50	1.50	0.00
1,500.00	19.50	280.90	1,475.05	41.43	-215.14	-215.40	1.50	1.50	0.00
1,526.50	19.90	280.90	1,500.00	43.12	-223.91	-224.18	1.50	1.50	0.00
9 5/8" Csg									
1,600.00	21.00	280.90	1,568.86	47.97	-249.13	-249.42	1.50	1.50	0.00
1,700.00	22.50	280.90	1,661.74	54.98	-285.51	-285.85	1.50	1.50	0.00
1,800.00	24.00	280.90	1,753.62	62.45	-324.27	-324.66	1.50	1.50	0.00
1,884.67	25.27	280.90	1,830.58	69.12	-358.93	-359.36	1.50	1.50	0.00
Hold Tangent @ 1884.67ft									
1,900.00	25.27	280.90	1,844.44	70.36	-365.36	-365.79	0.00	0.00	0.00
2,000.00	25.27	280.90	1,934.88	78.43	-407.27	-407.76	0.00	0.00	0.00
2,100.00	25.27	280.90	2,025.31	86.50	-449.19	-449.73	0.00	0.00	0.00
2,200.00	25.27	280.90	2,115.74	94.57	-491.11	-491.70	0.00	0.00	0.00
2,300.00	25.27	280.90	2,206.17	102.65	-533.03	-533.66	0.00	0.00	0.00
2,400.00	25.27	280.90	2,296.60	110.72	-574.95	-575.63	0.00	0.00	0.00
2,500.00	25.27	280.90	2,387.03	118.79	-616.87	-617.60	0.00	0.00	0.00
2,600.00	25.27	280.90	2,477.46	126.86	-658.78	-659.57	0.00	0.00	0.00
2,700.00	25.27	280.90	2,567.89	134.93	-700.70	-701.54	0.00	0.00	0.00
2,800.00	25.27	280.90	2,658.32	143.01	-742.62	-743.50	0.00	0.00	0.00
2,900.00	25.27	280.90	2,748.75	151.08	-784.54	-785.47	0.00	0.00	0.00
3,000.00	25.27	280.90	2,839.18	159.15	-826.46	-827.44	0.00	0.00	0.00
3,100.00	25.27	280.90	2,929.61	167.22	-868.38	-869.41	0.00	0.00	0.00
3,200.00	25.27	280.90	3,020.04	175.30	-910.29	-911.38	0.00	0.00	0.00
3,300.00	25.27	280.90	3,110.47	183.37	-952.21	-953.35	0.00	0.00	0.00
3,400.00	25.27	280.90	3,200.90	191.44	-994.13	-995.31	0.00	0.00	0.00
3,500.00	25.27	280.90	3,291.33	199.51	-1,036.05	-1,037.28	0.00	0.00	0.00
3,578.14	25.27	280.90	3,362.00	205.82	-1,068.81	-1,070.08	0.00	0.00	0.00
Parkman									
3,600.00	25.27	280.90	3,381.77	207.58	-1,077.97	-1,079.25	0.00	0.00	0.00
3,700.00	25.27	280.90	3,472.20	215.66	-1,119.89	-1,121.22	0.00	0.00	0.00
3,800.00	25.27	280.90	3,562.63	223.73	-1,161.80	-1,163.19	0.00	0.00	0.00
3,900.00	25.27	280.90	3,653.06	231.80	-1,203.72	-1,205.15	0.00	0.00	0.00
4,000.00	25.27	280.90	3,743.49	239.87	-1,245.64	-1,247.12	0.00	0.00	0.00
4,100.00	25.27	280.90	3,833.92	247.94	-1,287.56	-1,289.09	0.00	0.00	0.00
4,143.22	25.27	280.90	3,873.00	251.43	-1,305.67	-1,307.23	0.00	0.00	0.00
Sussex									

Corporate
Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well CUMMINGS 19-5HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 4873.00usft (Drilling Rig)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4873.00usft (Drilling Rig)
Site:	5N-67W-19 CUMMINGS 18-19HZ PAD	North Reference:	True
Well:	CUMMINGS 19-5HZ	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)	
4,200.00	25.27	280.90	3,924.35	256.02	-1,329.48	-1,331.06	0.00	0.00	0.00	
4,300.00	25.27	280.90	4,014.78	264.09	-1,371.40	-1,373.03	0.00	0.00	0.00	
4,400.00	25.27	280.90	4,105.21	272.16	-1,413.31	-1,415.00	0.00	0.00	0.00	
4,500.00	25.27	280.90	4,195.64	280.23	-1,455.23	-1,456.96	0.00	0.00	0.00	
4,600.00	25.27	280.90	4,286.07	288.31	-1,497.15	-1,498.93	0.00	0.00	0.00	
4,684.67	25.27	280.90	4,362.64	295.14	-1,532.64	-1,534.47	0.00	0.00	0.00	
Begin Drop @ 4684.67ft										
4,700.00	24.96	280.90	4,376.52	296.37	-1,539.03	-1,540.86	2.00	-2.00	0.00	
4,800.00	22.96	280.90	4,467.90	304.05	-1,578.91	-1,580.79	2.00	-2.00	0.00	
4,900.00	20.96	280.90	4,560.63	311.12	-1,615.64	-1,617.56	2.00	-2.00	0.00	
5,000.00	18.96	280.90	4,654.62	317.58	-1,649.16	-1,651.12	2.00	-2.00	0.00	
5,100.00	16.96	280.90	4,749.74	323.41	-1,679.44	-1,681.44	2.00	-2.00	0.00	
5,200.00	14.96	280.90	4,845.88	328.61	-1,706.45	-1,708.48	2.00	-2.00	0.00	
5,300.00	12.96	280.90	4,942.92	333.17	-1,730.14	-1,732.20	2.00	-2.00	0.00	
5,400.00	10.96	280.90	5,040.74	337.09	-1,750.50	-1,752.58	2.00	-2.00	0.00	
5,500.00	8.96	280.90	5,139.23	340.36	-1,767.48	-1,769.59	2.00	-2.00	0.00	
5,600.00	6.96	280.90	5,238.26	342.98	-1,781.09	-1,783.21	2.00	-2.00	0.00	
5,700.00	4.96	280.90	5,337.71	344.95	-1,791.29	-1,793.42	2.00	-2.00	0.00	
5,800.00	2.96	280.90	5,437.47	346.25	-1,798.08	-1,800.22	2.00	-2.00	0.00	
5,900.00	0.96	280.90	5,537.41	346.90	-1,801.44	-1,803.58	2.00	-2.00	0.00	
5,948.17	0.00	0.00	5,585.57	346.98	-1,801.84	-1,803.98	2.00	-2.00	0.00	
Hold Vertical @ 5948.17ft										
6,000.00	0.00	0.00	5,637.40	346.98	-1,801.84	-1,803.98	0.00	0.00	0.00	
6,100.00	0.00	0.00	5,737.40	346.98	-1,801.84	-1,803.98	0.00	0.00	0.00	
6,200.00	0.00	0.00	5,837.40	346.98	-1,801.84	-1,803.98	0.00	0.00	0.00	
6,300.00	0.00	0.00	5,937.40	346.98	-1,801.84	-1,803.98	0.00	0.00	0.00	
6,400.00	0.00	0.00	6,037.40	346.98	-1,801.84	-1,803.98	0.00	0.00	0.00	
6,468.40	0.00	0.00	6,105.80	346.98	-1,801.84	-1,803.98	0.00	0.00	0.00	
KOP @ 6468.40ft :: DLS = 8°/100'										
6,500.00	2.53	90.36	6,137.39	346.97	-1,801.14	-1,803.29	8.00	8.00	0.00	
6,600.00	10.53	90.36	6,236.66	346.90	-1,789.78	-1,791.93	8.00	8.00	0.00	
6,700.00	18.53	90.36	6,333.39	346.75	-1,764.72	-1,766.86	8.00	8.00	0.00	
6,800.00	26.53	90.36	6,425.68	346.51	-1,726.44	-1,728.58	8.00	8.00	0.00	
6,900.00	34.53	90.36	6,511.75	346.19	-1,675.68	-1,677.82	8.00	8.00	0.00	
7,000.00	42.53	90.36	6,589.92	345.80	-1,613.44	-1,615.58	8.00	8.00	0.00	
7,100.00	50.53	90.36	6,658.66	345.34	-1,540.93	-1,543.07	8.00	8.00	0.00	
7,146.44	54.24	90.36	6,687.00	345.11	-1,504.15	-1,506.29	8.00	8.00	0.00	
Sharon Springs										
7,200.00	58.53	90.36	6,716.64	344.83	-1,459.56	-1,461.70	8.00	8.00	0.00	
7,212.35	59.52	90.36	6,723.00	344.77	-1,448.97	-1,451.11	8.00	8.00	0.00	
Niobrara										
7,300.00	66.53	90.36	6,762.74	344.28	-1,370.91	-1,373.05	8.00	8.00	0.00	
7,362.18	71.50	90.36	6,785.00	343.91	-1,312.87	-1,315.01	8.00	8.00	0.00	
Nio B										
7,400.00	74.53	90.36	6,796.05	343.69	-1,276.71	-1,278.84	8.00	8.00	0.00	
7,500.00	82.53	90.36	6,815.92	343.07	-1,178.79	-1,180.92	8.00	8.00	0.00	
7,595.86	90.20	90.36	6,822.00	342.47	-1,083.19	-1,085.33	8.00	8.00	0.00	
End Build @ 7595.86ft - Top of Production										
7,600.00	90.20	90.36	6,821.98	342.45	-1,079.05	-1,081.19	0.01	0.01	0.00	
7,700.00	90.20	90.36	6,821.64	341.82	-979.06	-981.19	0.00	0.00	0.00	
7,800.00	90.20	90.36	6,821.29	341.19	-879.06	-881.19	0.00	0.00	0.00	
7,900.00	90.20	90.36	6,820.95	340.56	-779.06	-781.19	0.00	0.00	0.00	
8,000.00	90.20	90.36	6,820.61	339.94	-679.06	-681.19	0.00	0.00	0.00	

Corporate Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well CUMMINGS 19-5HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 4873.00usft (Drilling Rig)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4873.00usft (Drilling Rig)
Site:	5N-67W-19 CUMMINGS 18-19HZ PAD	North Reference:	True
Well:	CUMMINGS 19-5HZ	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)	
8,100.00	90.20	90.36	6,820.26	339.31	-579.07	-581.19	0.00	0.00	0.00	
8,200.00	90.20	90.36	6,819.92	338.68	-479.07	-481.19	0.00	0.00	0.00	
8,300.00	90.20	90.36	6,819.57	338.05	-379.07	-381.19	0.00	0.00	0.00	
8,400.00	90.20	90.36	6,819.23	337.43	-279.08	-281.19	0.00	0.00	0.00	
8,500.00	90.20	90.36	6,818.89	336.80	-179.08	-181.19	0.00	0.00	0.00	
8,600.00	90.20	90.36	6,818.54	336.17	-79.08	-81.19	0.00	0.00	0.00	
8,700.00	90.20	90.36	6,818.20	335.55	20.92	18.81	0.00	0.00	0.00	
8,800.00	90.20	90.36	6,817.85	334.92	120.91	118.81	0.00	0.00	0.00	
8,900.00	90.20	90.36	6,817.51	334.29	220.91	218.81	0.00	0.00	0.00	
9,000.00	90.20	90.36	6,817.17	333.66	320.91	318.81	0.00	0.00	0.00	
9,100.00	90.20	90.36	6,816.82	333.04	420.91	418.81	0.00	0.00	0.00	
9,200.00	90.20	90.36	6,816.48	332.41	520.90	518.81	0.00	0.00	0.00	
9,300.00	90.20	90.36	6,816.13	331.78	620.90	618.80	0.00	0.00	0.00	
9,400.00	90.20	90.36	6,815.79	331.16	720.90	718.80	0.00	0.00	0.00	
9,500.00	90.20	90.36	6,815.44	330.53	820.90	818.80	0.00	0.00	0.00	
9,600.00	90.20	90.36	6,815.10	329.90	920.89	918.80	0.00	0.00	0.00	
9,700.00	90.20	90.36	6,814.76	329.27	1,020.89	1,018.80	0.00	0.00	0.00	
9,800.00	90.20	90.36	6,814.41	328.65	1,120.89	1,118.80	0.00	0.00	0.00	
9,900.00	90.20	90.36	6,814.07	328.02	1,220.89	1,218.80	0.00	0.00	0.00	
10,000.00	90.20	90.36	6,813.72	327.39	1,320.88	1,318.80	0.00	0.00	0.00	
10,100.00	90.20	90.36	6,813.38	326.76	1,420.88	1,418.80	0.00	0.00	0.00	
10,200.00	90.20	90.36	6,813.04	326.14	1,520.88	1,518.80	0.00	0.00	0.00	
10,300.00	90.20	90.36	6,812.69	325.51	1,620.88	1,618.80	0.00	0.00	0.00	
10,400.00	90.20	90.36	6,812.35	324.88	1,720.87	1,718.80	0.00	0.00	0.00	
10,500.00	90.20	90.36	6,812.00	324.26	1,820.87	1,818.80	0.00	0.00	0.00	
10,600.00	90.20	90.36	6,811.66	323.63	1,920.87	1,918.80	0.00	0.00	0.00	
10,700.00	90.20	90.36	6,811.32	323.00	2,020.87	2,018.80	0.00	0.00	0.00	
10,800.00	90.20	90.36	6,810.97	322.37	2,120.86	2,118.80	0.00	0.00	0.00	
10,900.00	90.20	90.36	6,810.63	321.75	2,220.86	2,218.80	0.00	0.00	0.00	
11,000.00	90.20	90.36	6,810.28	321.12	2,320.86	2,318.79	0.00	0.00	0.00	
11,100.00	90.20	90.36	6,809.94	320.49	2,420.86	2,418.79	0.00	0.00	0.00	
11,200.00	90.20	90.36	6,809.60	319.86	2,520.85	2,518.79	0.00	0.00	0.00	
11,300.00	90.20	90.36	6,809.25	319.24	2,620.85	2,618.79	0.00	0.00	0.00	
11,400.00	90.20	90.36	6,808.91	318.61	2,720.85	2,718.79	0.00	0.00	0.00	
11,500.00	90.20	90.36	6,808.56	317.98	2,820.85	2,818.79	0.00	0.00	0.00	
11,600.00	90.20	90.36	6,808.22	317.36	2,920.84	2,918.79	0.00	0.00	0.00	
11,700.00	90.20	90.36	6,807.88	316.73	3,020.84	3,018.79	0.00	0.00	0.00	
11,800.00	90.20	90.36	6,807.53	316.10	3,120.84	3,118.79	0.00	0.00	0.00	
11,900.00	90.20	90.36	6,807.19	315.47	3,220.84	3,218.79	0.00	0.00	0.00	
12,000.00	90.20	90.36	6,806.84	314.85	3,320.83	3,318.79	0.00	0.00	0.00	
12,100.00	90.20	90.36	6,806.50	314.22	3,420.83	3,418.79	0.00	0.00	0.00	
12,200.00	90.20	90.36	6,806.16	313.59	3,520.83	3,518.79	0.00	0.00	0.00	
12,300.00	90.20	90.36	6,805.81	312.96	3,620.83	3,618.79	0.00	0.00	0.00	
12,400.00	90.20	90.36	6,805.47	312.34	3,720.82	3,718.79	0.00	0.00	0.00	
12,500.00	90.20	90.36	6,805.12	311.71	3,820.82	3,818.79	0.00	0.00	0.00	
12,600.00	90.20	90.36	6,804.78	311.08	3,920.82	3,918.79	0.00	0.00	0.00	
12,700.00	90.20	90.36	6,804.44	310.46	4,020.81	4,018.78	0.00	0.00	0.00	
12,800.00	90.20	90.36	6,804.09	309.83	4,120.81	4,118.78	0.00	0.00	0.00	
12,900.00	90.20	90.36	6,803.75	309.20	4,220.81	4,218.78	0.00	0.00	0.00	
13,000.00	90.20	90.36	6,803.40	308.57	4,320.81	4,318.78	0.00	0.00	0.00	
13,100.00	90.20	90.36	6,803.06	307.95	4,420.80	4,418.78	0.00	0.00	0.00	
13,200.00	90.20	90.36	6,802.71	307.32	4,520.80	4,518.78	0.00	0.00	0.00	
13,300.00	90.20	90.36	6,802.37	306.69	4,620.80	4,618.78	0.00	0.00	0.00	
13,400.00	90.20	90.36	6,802.03	306.07	4,720.80	4,718.78	0.00	0.00	0.00	

Corporate Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well CUMMINGS 19-5HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 4873.00usft (Drilling Rig)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4873.00usft (Drilling Rig)
Site:	5N-67W-19 CUMMINGS 18-19HZ PAD	North Reference:	True
Well:	CUMMINGS 19-5HZ	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)	
13,500.00	90.20	90.36	6,801.68	305.44	4,820.79	4,818.78	0.00	0.00	0.00	
13,600.00	90.20	90.36	6,801.34	304.81	4,920.79	4,918.78	0.00	0.00	0.00	
13,700.00	90.20	90.36	6,800.99	304.18	5,020.79	5,018.78	0.00	0.00	0.00	
13,800.00	90.20	90.36	6,800.65	303.56	5,120.79	5,118.78	0.00	0.00	0.00	
13,900.00	90.20	90.36	6,800.31	302.93	5,220.78	5,218.78	0.00	0.00	0.00	
14,000.00	90.20	90.36	6,799.96	302.30	5,320.78	5,318.78	0.00	0.00	0.00	
14,100.00	90.20	90.36	6,799.62	301.67	5,420.78	5,418.78	0.00	0.00	0.00	
14,200.00	90.20	90.36	6,799.27	301.05	5,520.78	5,518.78	0.00	0.00	0.00	
14,300.00	90.20	90.36	6,798.93	300.42	5,620.77	5,618.78	0.00	0.00	0.00	
14,400.00	90.20	90.36	6,798.59	299.79	5,720.77	5,718.77	0.00	0.00	0.00	
14,500.00	90.20	90.36	6,798.24	299.17	5,820.77	5,818.77	0.00	0.00	0.00	
14,600.00	90.20	90.36	6,797.90	298.54	5,920.77	5,918.77	0.00	0.00	0.00	
14,700.00	90.20	90.36	6,797.55	297.91	6,020.76	6,018.77	0.00	0.00	0.00	
14,800.00	90.20	90.36	6,797.21	297.28	6,120.76	6,118.77	0.00	0.00	0.00	
14,900.00	90.20	90.36	6,796.87	296.66	6,220.76	6,218.77	0.00	0.00	0.00	
15,000.00	90.20	90.36	6,796.52	296.03	6,320.76	6,318.77	0.00	0.00	0.00	
15,100.00	90.20	90.36	6,796.18	295.40	6,420.75	6,418.77	0.00	0.00	0.00	
15,200.00	90.20	90.36	6,795.83	294.77	6,520.75	6,518.77	0.00	0.00	0.00	
15,300.00	90.20	90.36	6,795.49	294.15	6,620.75	6,618.77	0.00	0.00	0.00	
15,400.00	90.20	90.36	6,795.15	293.52	6,720.75	6,718.77	0.00	0.00	0.00	
15,500.00	90.20	90.36	6,794.80	292.89	6,820.74	6,818.77	0.00	0.00	0.00	
15,600.00	90.20	90.36	6,794.46	292.27	6,920.74	6,918.77	0.00	0.00	0.00	
15,700.00	90.20	90.36	6,794.11	291.64	7,020.74	7,018.77	0.00	0.00	0.00	
15,800.00	90.20	90.36	6,793.77	291.01	7,120.74	7,118.77	0.00	0.00	0.00	
15,900.00	90.20	90.36	6,793.43	290.38	7,220.73	7,218.77	0.00	0.00	0.00	
16,000.00	90.20	90.36	6,793.08	289.76	7,320.73	7,318.77	0.00	0.00	0.00	
16,100.00	90.20	90.36	6,792.74	289.13	7,420.73	7,418.76	0.00	0.00	0.00	
16,200.00	90.20	90.36	6,792.39	288.50	7,520.73	7,518.76	0.00	0.00	0.00	
16,300.00	90.20	90.36	6,792.05	287.87	7,620.72	7,618.76	0.00	0.00	0.00	
16,400.00	90.20	90.36	6,791.71	287.25	7,720.72	7,718.76	0.00	0.00	0.00	
16,500.00	90.20	90.36	6,791.36	286.62	7,820.72	7,818.76	0.00	0.00	0.00	
16,600.00	90.20	90.36	6,791.02	285.99	7,920.72	7,918.76	0.00	0.00	0.00	
16,700.00	90.20	90.36	6,790.67	285.37	8,020.71	8,018.76	0.00	0.00	0.00	
16,800.00	90.20	90.36	6,790.33	284.74	8,120.71	8,118.76	0.00	0.00	0.00	
16,900.00	90.20	90.36	6,789.98	284.11	8,220.71	8,218.76	0.00	0.00	0.00	
17,000.00	90.20	90.36	6,789.64	283.48	8,320.70	8,318.76	0.00	0.00	0.00	
17,100.00	90.20	90.36	6,789.30	282.86	8,420.70	8,418.76	0.00	0.00	0.00	
17,200.00	90.20	90.36	6,788.95	282.23	8,520.70	8,518.76	0.00	0.00	0.00	
17,300.00	90.20	90.36	6,788.61	281.60	8,620.70	8,618.76	0.00	0.00	0.00	
17,400.00	90.20	90.36	6,788.26	280.98	8,720.69	8,718.76	0.00	0.00	0.00	
17,476.90	90.20	90.36	6,788.00	280.49	8,797.59	8,795.65	0.00	0.00	0.00	
TD Well @ 17476.90ft										

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
1,526.50	1,500.00	9 5/8" Csg	9-5/8	13-1/2	
7,595.86	6,822.00	Top of Production	5-1/2	7-7/8	

Corporate
Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well CUMMINGS 19-5HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 4873.00usft (Drilling Rig)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4873.00usft (Drilling Rig)
Site:	5N-67W-19 CUMMINGS 18-19HZ PAD	North Reference:	True
Well:	CUMMINGS 19-5HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan A		
Design:	Permit Rev-1		

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
869.42	866.00	Fox Hills				
3,578.14	3,362.00	Parkman				
4,143.22	3,873.00	Sussex				
7,146.44	6,687.00	Sharon Springs				
7,212.35	6,723.00	Niobrara				
7,362.18	6,785.00	Nio B				

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
200.00	200.00	0.00	0.00	Begin Nudge @ 200.00ft	
1,884.67	1,830.58	69.12	-358.93	Hold Tangent @ 1884.67ft	
4,684.67	4,362.64	295.14	-1,532.64	Begin Drop @ 4684.67ft	
5,948.17	5,585.57	346.98	-1,801.84	Hold Vertical @ 5948.17ft	
6,468.40	6,105.80	346.98	-1,801.84	KOP @ 6468.40ft :: DLS = 8°/100'	
7,595.86	6,822.00	342.47	-1,083.19	End Build @ 7595.86ft	
17,476.90	6,788.00	280.49	8,797.59	TD Well @ 17476.90ft	