

US ROCKIES WATTENBERG PLANNING

WELD-NAD83-UTMFT13N

2N-66W-19 CASTLE PINES 16-19HZ PAD

CASTLE PINES 19-18HZ

Plan A

Plan: Permit Rev-2

SHL Lat/Long: 40.117676/-104.813754

Survey Program: MWD+IFR

Standard Planning Report

22 January, 2018

Project: WELD-NAD83-UTMFT13N
Site: 2N-66W-19 CASTLE PINES 16-19HZ PAD
Well: CASTLE PINES 19-18HZ
Wellbore: Plan A
Design: Permit Rev-2

US ROCKIES WATTENBERG PLANNING

CASING DETAILS

TVD	MD	Size
1500.00	1521.75	9-5/8
7296.00	7833.76	5-1/2

WELL DETAILS: CASTLE PINES 19-18HZ

GL = 4876'

RKB = 17' @ 4893.00usft (Drilling Rig)

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	V Sect	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	250.00	0.00	0.00	250.00	0.00	0.00	0.00	0.00	0.00	
3	1316.67	16.00	36.00	1302.86	119.71	86.97	1.50	36.00	-118.75	
4	4016.67	16.00	36.00	3898.27	721.80	524.42	0.00	0.00	-715.99	
5	4816.67	0.00	0.00	4687.91	811.58	589.65	2.00	-180.00	-805.05	
6	6708.56	0.00	0.00	6579.80	811.58	589.65	0.00	0.00	-805.05	
7	7833.76	90.02	179.37	7296.00	95.23	597.53	8.00	179.37	-88.65	
8	18769.21	90.02	179.37	7293.00	-10839.56	717.89	0.00	0.00	10846.79	CASTLE PINES 19-18HZ_BHL

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
CASTLE PINES 19-18HZ_SHL	0.00	0.00	0.00	40.117676	-104.813754
CASTLE PINES 19-18HZ_BHL	7293.00	-10839.56	717.89	40.087909	-104.811187

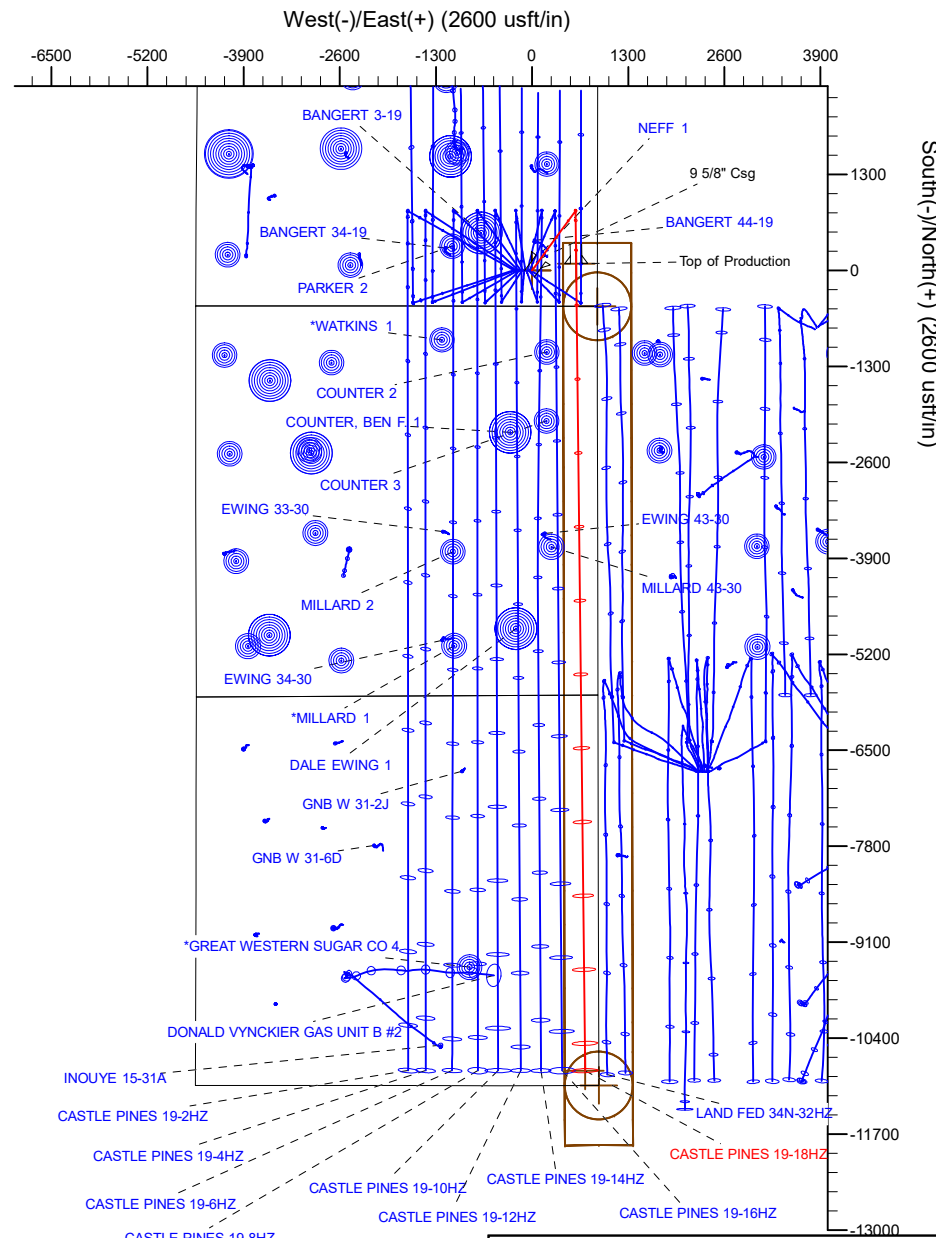
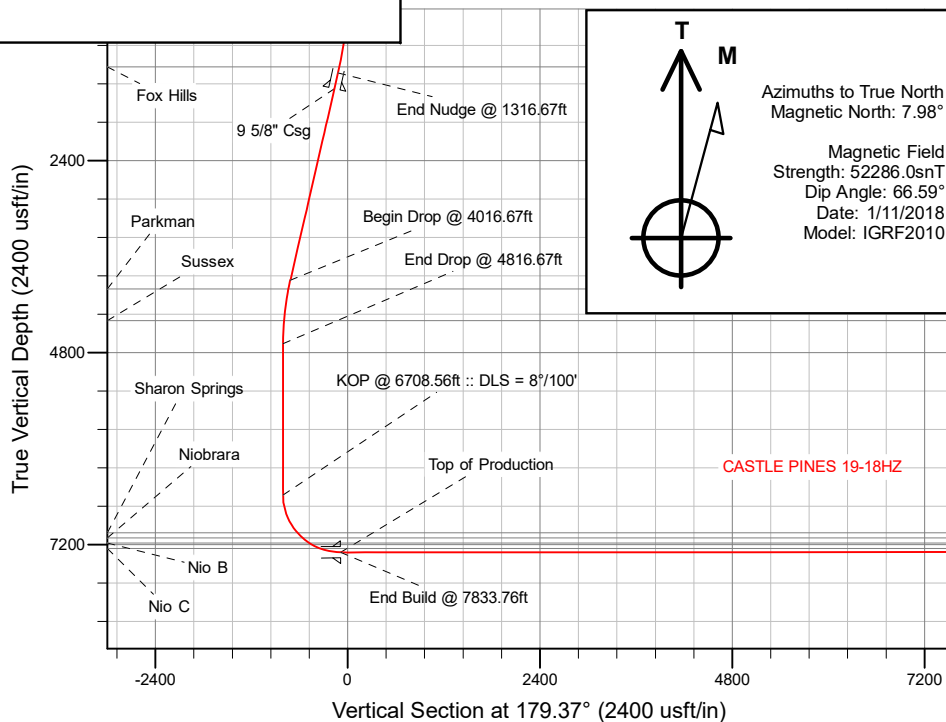
FORMATION TOP DETAILS

TVDPath	MDPath	Formation
1226.00	1236.94	Fox Hills
4002.00	4124.03	Parkman
4398.00	4526.26	Sussex
7050.00	7221.50	Sharon Springs
7115.00	7313.00	Niobrara
7182.00	7423.91	Nio B
7249.00	7572.66	Nio C

SHL
483' FSL
883' FEL

HEEL
578' FSL
285' FEL

TOE
200' FSL
183' FEL



Plan: Permit Rev-2 (CASTLE PINES 19-18HZ/Plan A)

Created By: _____ Date: 1/22/2018
Reviewed: _____ Date: _____

Corporate Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well CASTLE PINES 19-18HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 4893.00usft (Drilling Rig)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4893.00usft (Drilling Rig)
Site:	2N-66W-19 CASTLE PINES 16-19HZ PAD	North Reference:	True
Well:	CASTLE PINES 19-18HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan A		
Design:	Permit Rev-2		

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		2N-66W-19 CASTLE PINES 16-19HZ PAD			
Site Position:		Northing:	14,569,640.68 usft	Latitude:	40.117682
From:	Lat/Long	Easting:	1,692,230.43 usft	Longitude:	-104.814666
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.12 °

Well	CASTLE PINES 19-18HZ					
Well Position	+N/-S	-2.18 usft	Northing:	14,569,639.02 usft	Latitude:	40.117676
	+E/-W	254.97 usft	Easting:	1,692,485.40 usft	Longitude:	-104.813754
Position Uncertainty		3.28 usft	Wellhead Elevation:		Ground Level:	4,876.00 usft

Wellbore	Plan A				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	1/11/2018	7.98	66.59	52,286.04704040

Design	Permit Rev-2			
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	179.37

Plan Survey Tool Program	Date	1/22/2018		
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	1,500.00	Permit Rev-2 (Plan A)	APC_ISCWSA REV 2 MWD+II Fixed:v2:crustal field declinatio
2	1,500.00	18,769.21	Permit Rev-2 (Plan A)	APC_ISCWSA REV 2 MWD+II Fixed:v2:crustal field declinatio

Corporate
Planning Report

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Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4893.00usft (Drilling Rig)
Site:	2N-66W-19 CASTLE PINES 16-19HZ PAD	North Reference:	True
Well:	CASTLE PINES 19-18HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan A		
Design:	Permit Rev-2		

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	
1,316.67	16.00	36.00	1,302.86	119.71	86.97	1.50	1.50	0.00	36.00	
4,016.67	16.00	36.00	3,898.27	721.80	524.42	0.00	0.00	0.00	0.00	
4,816.67	0.00	0.00	4,687.91	811.58	589.65	2.00	-2.00	-4.50	-180.00	
6,708.56	0.00	0.00	6,579.80	811.58	589.65	0.00	0.00	0.00	0.00	
7,833.76	90.02	179.37	7,296.00	95.23	597.53	8.00	8.00	15.94	179.37	
18,769.21	90.02	179.37	7,293.00	-10,839.56	717.89	0.00	0.00	0.00	0.00	CASTLE PINES 19-18

Corporate Planning Report

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Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 4893.00usft (Drilling Rig)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4893.00usft (Drilling Rig)
Site:	2N-66W-19 CASTLE PINES 16-19HZ PAD	North Reference:	True
Well:	CASTLE PINES 19-18HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan A		
Design:	Permit Rev-2		

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
Begin Nudge @ 250.00ft									
300.00	0.75	36.00	300.00	0.26	0.19	-0.26	1.50	1.50	0.00
400.00	2.25	36.00	399.96	2.38	1.73	-2.36	1.50	1.50	0.00
500.00	3.75	36.00	499.82	6.62	4.81	-6.56	1.50	1.50	0.00
600.00	5.25	36.00	599.51	12.96	9.42	-12.86	1.50	1.50	0.00
700.00	6.75	36.00	698.96	21.42	15.56	-21.25	1.50	1.50	0.00
800.00	8.25	36.00	798.10	31.98	23.23	-31.72	1.50	1.50	0.00
900.00	9.75	36.00	896.87	44.63	32.43	-44.28	1.50	1.50	0.00
1,000.00	11.25	36.00	995.19	59.38	43.14	-58.90	1.50	1.50	0.00
1,100.00	12.75	36.00	1,093.00	76.20	55.36	-75.58	1.50	1.50	0.00
1,200.00	14.25	36.00	1,190.24	95.08	69.08	-94.32	1.50	1.50	0.00
1,236.95	14.80	36.00	1,226.00	102.58	74.53	-101.75	1.50	1.50	0.00
Fox Hills									
1,300.00	15.75	36.00	1,286.83	116.02	84.29	-115.09	1.50	1.50	0.00
1,316.67	16.00	36.00	1,302.86	119.71	86.97	-118.75	1.50	1.50	0.00
End Nudge @ 1316.67ft									
1,400.00	16.00	36.00	1,382.96	138.29	100.48	-137.18	0.00	0.00	0.00
1,500.00	16.00	36.00	1,479.09	160.59	116.68	-159.30	0.00	0.00	0.00
1,521.75	16.00	36.00	1,500.00	165.44	120.20	-164.11	0.00	0.00	0.00
9 5/8" Csg									
1,600.00	16.00	36.00	1,575.21	182.89	132.88	-181.42	0.00	0.00	0.00
1,700.00	16.00	36.00	1,671.34	205.19	149.08	-203.54	0.00	0.00	0.00
1,800.00	16.00	36.00	1,767.47	227.49	165.28	-225.66	0.00	0.00	0.00
1,900.00	16.00	36.00	1,863.59	249.79	181.48	-247.78	0.00	0.00	0.00
2,000.00	16.00	36.00	1,959.72	272.09	197.68	-269.90	0.00	0.00	0.00
2,100.00	16.00	36.00	2,055.85	294.39	213.89	-292.02	0.00	0.00	0.00
2,200.00	16.00	36.00	2,151.97	316.69	230.09	-314.14	0.00	0.00	0.00
2,300.00	16.00	36.00	2,248.10	338.99	246.29	-336.26	0.00	0.00	0.00
2,400.00	16.00	36.00	2,344.22	361.29	262.49	-358.38	0.00	0.00	0.00
2,500.00	16.00	36.00	2,440.35	383.59	278.69	-380.50	0.00	0.00	0.00
2,600.00	16.00	36.00	2,536.48	405.89	294.89	-402.62	0.00	0.00	0.00
2,700.00	16.00	36.00	2,632.60	428.19	311.10	-424.74	0.00	0.00	0.00
2,800.00	16.00	36.00	2,728.73	450.49	327.30	-446.86	0.00	0.00	0.00
2,900.00	16.00	36.00	2,824.85	472.79	343.50	-468.98	0.00	0.00	0.00
3,000.00	16.00	36.00	2,920.98	495.09	359.70	-491.10	0.00	0.00	0.00
3,100.00	16.00	36.00	3,017.11	517.38	375.90	-513.22	0.00	0.00	0.00
3,200.00	16.00	36.00	3,113.23	539.68	392.10	-535.34	0.00	0.00	0.00
3,300.00	16.00	36.00	3,209.36	561.98	408.31	-557.46	0.00	0.00	0.00
3,400.00	16.00	36.00	3,305.49	584.28	424.51	-579.58	0.00	0.00	0.00
3,500.00	16.00	36.00	3,401.61	606.58	440.71	-601.70	0.00	0.00	0.00
3,600.00	16.00	36.00	3,497.74	628.88	456.91	-623.82	0.00	0.00	0.00
3,700.00	16.00	36.00	3,593.86	651.18	473.11	-645.94	0.00	0.00	0.00
3,800.00	16.00	36.00	3,689.99	673.48	489.31	-668.06	0.00	0.00	0.00
3,900.00	16.00	36.00	3,786.12	695.78	505.51	-690.18	0.00	0.00	0.00
4,000.00	16.00	36.00	3,882.24	718.08	521.72	-712.30	0.00	0.00	0.00
4,016.67	16.00	36.00	3,898.27	721.80	524.42	-715.99	0.00	0.00	0.00
Begin Drop @ 4016.67ft									
4,100.00	14.33	36.00	3,978.69	739.44	537.23	-733.48	2.00	-2.00	0.00
4,124.03	13.85	36.00	4,002.00	744.17	540.67	-738.18	2.00	-2.00	0.00

Corporate Planning Report

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Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 4893.00usft (Drilling Rig)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4893.00usft (Drilling Rig)
Site:	2N-66W-19 CASTLE PINES 16-19HZ PAD	North Reference:	True
Well:	CASTLE PINES 19-18HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan A		
Design:	Permit Rev-2		

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									
4,200.00	12.33	36.00	4,075.99	758.09	550.79	-751.99	2.00	-2.00	0.00
4,300.00	10.33	36.00	4,174.04	773.99	562.34	-767.76	2.00	-2.00	0.00
4,400.00	8.33	36.00	4,272.71	787.11	571.87	-780.77	2.00	-2.00	0.00
4,500.00	6.33	36.00	4,371.88	797.44	579.37	-791.02	2.00	-2.00	0.00
4,526.26	5.81	36.00	4,398.00	799.68	581.00	-793.25	2.00	-2.00	0.00
Sussex									
4,600.00	4.33	36.00	4,471.45	804.95	584.83	-798.48	2.00	-2.00	0.00
4,700.00	2.33	36.00	4,571.27	809.66	588.25	-803.14	2.00	-2.00	0.00
4,800.00	0.33	36.00	4,671.24	811.54	589.62	-805.01	2.00	-2.00	0.00
4,816.67	0.00	0.00	4,687.91	811.58	589.65	-805.05	2.00	-2.00	-215.96
End Drop @ 4816.67ft									
4,900.00	0.00	0.00	4,771.24	811.58	589.65	-805.05	0.00	0.00	0.00
5,000.00	0.00	0.00	4,871.24	811.58	589.65	-805.05	0.00	0.00	0.00
5,100.00	0.00	0.00	4,971.24	811.58	589.65	-805.05	0.00	0.00	0.00
5,200.00	0.00	0.00	5,071.24	811.58	589.65	-805.05	0.00	0.00	0.00
5,300.00	0.00	0.00	5,171.24	811.58	589.65	-805.05	0.00	0.00	0.00
5,400.00	0.00	0.00	5,271.24	811.58	589.65	-805.05	0.00	0.00	0.00
5,500.00	0.00	0.00	5,371.24	811.58	589.65	-805.05	0.00	0.00	0.00
5,600.00	0.00	0.00	5,471.24	811.58	589.65	-805.05	0.00	0.00	0.00
5,700.00	0.00	0.00	5,571.24	811.58	589.65	-805.05	0.00	0.00	0.00
5,800.00	0.00	0.00	5,671.24	811.58	589.65	-805.05	0.00	0.00	0.00
5,900.00	0.00	0.00	5,771.24	811.58	589.65	-805.05	0.00	0.00	0.00
6,000.00	0.00	0.00	5,871.24	811.58	589.65	-805.05	0.00	0.00	0.00
6,100.00	0.00	0.00	5,971.24	811.58	589.65	-805.05	0.00	0.00	0.00
6,200.00	0.00	0.00	6,071.24	811.58	589.65	-805.05	0.00	0.00	0.00
6,300.00	0.00	0.00	6,171.24	811.58	589.65	-805.05	0.00	0.00	0.00
6,400.00	0.00	0.00	6,271.24	811.58	589.65	-805.05	0.00	0.00	0.00
6,500.00	0.00	0.00	6,371.24	811.58	589.65	-805.05	0.00	0.00	0.00
6,600.00	0.00	0.00	6,471.24	811.58	589.65	-805.05	0.00	0.00	0.00
6,700.00	0.00	0.00	6,571.24	811.58	589.65	-805.05	0.00	0.00	0.00
6,708.56	0.00	0.00	6,579.80	811.58	589.65	-805.05	0.00	0.00	0.00
KOP @ 6708.56ft :: DLS = 8°/100'									
6,800.00	7.32	179.37	6,670.99	805.75	589.71	-799.22	8.00	8.00	196.16
6,900.00	15.32	179.37	6,768.97	786.15	589.93	-779.61	8.00	8.00	0.00
7,000.00	23.32	179.37	6,863.26	753.10	590.29	-746.56	8.00	8.00	0.00
7,100.00	31.32	179.37	6,952.04	707.25	590.80	-700.71	8.00	8.00	0.00
7,200.00	39.32	179.37	7,033.57	649.49	591.43	-642.95	8.00	8.00	0.00
7,221.50	41.04	179.37	7,050.00	635.63	591.58	-629.08	8.00	8.00	0.00
Sharon Springs									
7,300.00	47.32	179.37	7,106.27	580.95	592.19	-574.41	8.00	8.00	0.00
7,313.00	48.36	179.37	7,115.00	571.32	592.29	-564.77	8.00	8.00	0.00
Niobrara									
7,400.00	55.32	179.37	7,168.73	502.96	593.04	-496.41	8.00	8.00	0.00
7,423.91	57.23	179.37	7,182.00	483.08	593.26	-476.53	8.00	8.00	0.00
Nio B									
7,500.00	63.32	179.37	7,219.72	417.04	593.99	-410.48	8.00	8.00	0.00
7,572.66	69.13	179.37	7,249.00	350.58	594.72	-344.02	8.00	8.00	0.00
Nio C									
7,600.00	71.32	179.37	7,258.25	324.85	595.00	-318.29	8.00	8.00	0.00
7,700.00	79.32	179.37	7,283.58	228.21	596.07	-221.64	8.00	8.00	0.00
7,800.00	87.32	179.37	7,295.21	128.97	597.16	-122.40	8.00	8.00	0.00
7,833.76	90.02	179.37	7,296.00	95.23	597.53	-88.65	8.00	8.00	0.00

Corporate Planning Report

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Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4893.00usft (Drilling Rig)
Site:	2N-66W-19 CASTLE PINES 16-19HZ PAD	North Reference:	True
Well:	CASTLE PINES 19-18HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan A		
Design:	Permit Rev-2		

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)
End Build @ 7833.76ft - Top of Production									
7,900.00	90.02	179.37	7,295.98	28.99	598.26	-22.41	0.00	0.00	0.00
8,000.00	90.02	179.37	7,295.95	-71.00	599.36	77.59	0.00	0.00	0.00
8,100.00	90.02	179.37	7,295.92	-171.00	600.46	177.59	0.00	0.00	0.00
8,200.00	90.02	179.37	7,295.90	-270.99	601.56	277.59	0.00	0.00	0.00
8,300.00	90.02	179.37	7,295.87	-370.99	602.66	377.59	0.00	0.00	0.00
8,400.00	90.02	179.37	7,295.84	-470.98	603.76	477.59	0.00	0.00	0.00
8,500.00	90.02	179.37	7,295.81	-570.97	604.87	577.59	0.00	0.00	0.00
8,600.00	90.02	179.37	7,295.79	-670.97	605.97	677.59	0.00	0.00	0.00
8,700.00	90.02	179.37	7,295.76	-770.96	607.07	777.59	0.00	0.00	0.00
8,800.00	90.02	179.37	7,295.73	-870.96	608.17	877.59	0.00	0.00	0.00
8,900.00	90.02	179.37	7,295.70	-970.95	609.27	977.59	0.00	0.00	0.00
9,000.00	90.02	179.37	7,295.68	-1,070.94	610.37	1,077.59	0.00	0.00	0.00
9,100.00	90.02	179.37	7,295.65	-1,170.94	611.47	1,177.59	0.00	0.00	0.00
9,200.00	90.02	179.37	7,295.62	-1,270.93	612.57	1,277.59	0.00	0.00	0.00
9,300.00	90.02	179.37	7,295.60	-1,370.92	613.67	1,377.59	0.00	0.00	0.00
9,400.00	90.02	179.37	7,295.57	-1,470.92	614.77	1,477.59	0.00	0.00	0.00
9,500.00	90.02	179.37	7,295.54	-1,570.91	615.87	1,577.59	0.00	0.00	0.00
9,600.00	90.02	179.37	7,295.51	-1,670.91	616.97	1,677.59	0.00	0.00	0.00
9,700.00	90.02	179.37	7,295.49	-1,770.90	618.07	1,777.59	0.00	0.00	0.00
9,800.00	90.02	179.37	7,295.46	-1,870.89	619.17	1,877.59	0.00	0.00	0.00
9,900.00	90.02	179.37	7,295.43	-1,970.89	620.27	1,977.59	0.00	0.00	0.00
10,000.00	90.02	179.37	7,295.40	-2,070.88	621.37	2,077.59	0.00	0.00	0.00
10,100.00	90.02	179.37	7,295.38	-2,170.88	622.47	2,177.59	0.00	0.00	0.00
10,200.00	90.02	179.37	7,295.35	-2,270.87	623.58	2,277.59	0.00	0.00	0.00
10,300.00	90.02	179.37	7,295.32	-2,370.86	624.68	2,377.59	0.00	0.00	0.00
10,400.00	90.02	179.37	7,295.29	-2,470.86	625.78	2,477.59	0.00	0.00	0.00
10,500.00	90.02	179.37	7,295.27	-2,570.85	626.88	2,577.59	0.00	0.00	0.00
10,600.00	90.02	179.37	7,295.24	-2,670.85	627.98	2,677.59	0.00	0.00	0.00
10,700.00	90.02	179.37	7,295.21	-2,770.84	629.08	2,777.59	0.00	0.00	0.00
10,800.00	90.02	179.37	7,295.18	-2,870.83	630.18	2,877.59	0.00	0.00	0.00
10,900.00	90.02	179.37	7,295.16	-2,970.83	631.28	2,977.59	0.00	0.00	0.00
11,000.00	90.02	179.37	7,295.13	-3,070.82	632.38	3,077.59	0.00	0.00	0.00
11,100.00	90.02	179.37	7,295.10	-3,170.82	633.48	3,177.59	0.00	0.00	0.00
11,200.00	90.02	179.37	7,295.07	-3,270.81	634.58	3,277.59	0.00	0.00	0.00
11,300.00	90.02	179.37	7,295.05	-3,370.80	635.68	3,377.59	0.00	0.00	0.00
11,400.00	90.02	179.37	7,295.02	-3,470.80	636.78	3,477.59	0.00	0.00	0.00
11,500.00	90.02	179.37	7,294.99	-3,570.79	637.88	3,577.59	0.00	0.00	0.00
11,600.00	90.02	179.37	7,294.96	-3,670.79	638.98	3,677.59	0.00	0.00	0.00
11,700.00	90.02	179.37	7,294.94	-3,770.78	640.08	3,777.59	0.00	0.00	0.00
11,800.00	90.02	179.37	7,294.91	-3,870.77	641.19	3,877.59	0.00	0.00	0.00
11,900.00	90.02	179.37	7,294.88	-3,970.77	642.29	3,977.59	0.00	0.00	0.00
12,000.00	90.02	179.37	7,294.86	-4,070.76	643.39	4,077.59	0.00	0.00	0.00
12,100.00	90.02	179.37	7,294.83	-4,170.76	644.49	4,177.59	0.00	0.00	0.00
12,200.00	90.02	179.37	7,294.80	-4,270.75	645.59	4,277.59	0.00	0.00	0.00
12,300.00	90.02	179.37	7,294.77	-4,370.74	646.69	4,377.59	0.00	0.00	0.00
12,400.00	90.02	179.37	7,294.75	-4,470.74	647.79	4,477.59	0.00	0.00	0.00
12,500.00	90.02	179.37	7,294.72	-4,570.73	648.89	4,577.59	0.00	0.00	0.00
12,600.00	90.02	179.37	7,294.69	-4,670.72	649.99	4,677.59	0.00	0.00	0.00
12,700.00	90.02	179.37	7,294.66	-4,770.72	651.09	4,777.59	0.00	0.00	0.00
12,800.00	90.02	179.37	7,294.64	-4,870.71	652.19	4,877.59	0.00	0.00	0.00
12,900.00	90.02	179.37	7,294.61	-4,970.71	653.29	4,977.59	0.00	0.00	0.00
13,000.00	90.02	179.37	7,294.58	-5,070.70	654.39	5,077.59	0.00	0.00	0.00

Corporate Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well CASTLE PINES 19-18HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 4893.00usft (Drilling Rig)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4893.00usft (Drilling Rig)
Site:	2N-66W-19 CASTLE PINES 16-19HZ PAD	North Reference:	True
Well:	CASTLE PINES 19-18HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan A		
Design:	Permit Rev-2		

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)	
13,100.00	90.02	179.37	7,294.55	-5,170.69	655.49	5,177.59	0.00	0.00	0.00	
13,200.00	90.02	179.37	7,294.53	-5,270.69	656.59	5,277.59	0.00	0.00	0.00	
13,300.00	90.02	179.37	7,294.50	-5,370.68	657.69	5,377.59	0.00	0.00	0.00	
13,400.00	90.02	179.37	7,294.47	-5,470.68	658.80	5,477.59	0.00	0.00	0.00	
13,500.00	90.02	179.37	7,294.44	-5,570.67	659.90	5,577.59	0.00	0.00	0.00	
13,600.00	90.02	179.37	7,294.42	-5,670.66	661.00	5,677.59	0.00	0.00	0.00	
13,700.00	90.02	179.37	7,294.39	-5,770.66	662.10	5,777.59	0.00	0.00	0.00	
13,800.00	90.02	179.37	7,294.36	-5,870.65	663.20	5,877.59	0.00	0.00	0.00	
13,900.00	90.02	179.37	7,294.33	-5,970.65	664.30	5,977.59	0.00	0.00	0.00	
14,000.00	90.02	179.37	7,294.31	-6,070.64	665.40	6,077.59	0.00	0.00	0.00	
14,100.00	90.02	179.37	7,294.28	-6,170.63	666.50	6,177.59	0.00	0.00	0.00	
14,200.00	90.02	179.37	7,294.25	-6,270.63	667.60	6,277.59	0.00	0.00	0.00	
14,300.00	90.02	179.37	7,294.23	-6,370.62	668.70	6,377.59	0.00	0.00	0.00	
14,400.00	90.02	179.37	7,294.20	-6,470.62	669.80	6,477.59	0.00	0.00	0.00	
14,500.00	90.02	179.37	7,294.17	-6,570.61	670.90	6,577.59	0.00	0.00	0.00	
14,600.00	90.02	179.37	7,294.14	-6,670.60	672.00	6,677.59	0.00	0.00	0.00	
14,700.00	90.02	179.37	7,294.12	-6,770.60	673.10	6,777.59	0.00	0.00	0.00	
14,800.00	90.02	179.37	7,294.09	-6,870.59	674.20	6,877.59	0.00	0.00	0.00	
14,900.00	90.02	179.37	7,294.06	-6,970.59	675.30	6,977.59	0.00	0.00	0.00	
15,000.00	90.02	179.37	7,294.03	-7,070.58	676.41	7,077.59	0.00	0.00	0.00	
15,100.00	90.02	179.37	7,294.01	-7,170.57	677.51	7,177.59	0.00	0.00	0.00	
15,200.00	90.02	179.37	7,293.98	-7,270.57	678.61	7,277.59	0.00	0.00	0.00	
15,300.00	90.02	179.37	7,293.95	-7,370.56	679.71	7,377.59	0.00	0.00	0.00	
15,400.00	90.02	179.37	7,293.92	-7,470.56	680.81	7,477.59	0.00	0.00	0.00	
15,500.00	90.02	179.37	7,293.90	-7,570.55	681.91	7,577.59	0.00	0.00	0.00	
15,600.00	90.02	179.37	7,293.87	-7,670.54	683.01	7,677.59	0.00	0.00	0.00	
15,700.00	90.02	179.37	7,293.84	-7,770.54	684.11	7,777.59	0.00	0.00	0.00	
15,800.00	90.02	179.37	7,293.81	-7,870.53	685.21	7,877.59	0.00	0.00	0.00	
15,900.00	90.02	179.37	7,293.79	-7,970.52	686.31	7,977.59	0.00	0.00	0.00	
16,000.00	90.02	179.37	7,293.76	-8,070.52	687.41	8,077.59	0.00	0.00	0.00	
16,100.00	90.02	179.37	7,293.73	-8,170.51	688.51	8,177.59	0.00	0.00	0.00	
16,200.00	90.02	179.37	7,293.70	-8,270.51	689.61	8,277.59	0.00	0.00	0.00	
16,300.00	90.02	179.37	7,293.68	-8,370.50	690.71	8,377.59	0.00	0.00	0.00	
16,400.00	90.02	179.37	7,293.65	-8,470.49	691.81	8,477.59	0.00	0.00	0.00	
16,500.00	90.02	179.37	7,293.62	-8,570.49	692.91	8,577.59	0.00	0.00	0.00	
16,600.00	90.02	179.37	7,293.59	-8,670.48	694.01	8,677.59	0.00	0.00	0.00	
16,700.00	90.02	179.37	7,293.57	-8,770.48	695.12	8,777.59	0.00	0.00	0.00	
16,800.00	90.02	179.37	7,293.54	-8,870.47	696.22	8,877.59	0.00	0.00	0.00	
16,900.00	90.02	179.37	7,293.51	-8,970.46	697.32	8,977.59	0.00	0.00	0.00	
17,000.00	90.02	179.37	7,293.49	-9,070.46	698.42	9,077.59	0.00	0.00	0.00	
17,100.00	90.02	179.37	7,293.46	-9,170.45	699.52	9,177.59	0.00	0.00	0.00	
17,200.00	90.02	179.37	7,293.43	-9,270.45	700.62	9,277.59	0.00	0.00	0.00	
17,300.00	90.02	179.37	7,293.40	-9,370.44	701.72	9,377.59	0.00	0.00	0.00	
17,400.00	90.02	179.37	7,293.38	-9,470.43	702.82	9,477.59	0.00	0.00	0.00	
17,500.00	90.02	179.37	7,293.35	-9,570.43	703.92	9,577.59	0.00	0.00	0.00	
17,600.00	90.02	179.37	7,293.32	-9,670.42	705.02	9,677.59	0.00	0.00	0.00	
17,700.00	90.02	179.37	7,293.29	-9,770.42	706.12	9,777.59	0.00	0.00	0.00	
17,800.00	90.02	179.37	7,293.27	-9,870.41	707.22	9,877.59	0.00	0.00	0.00	
17,900.00	90.02	179.37	7,293.24	-9,970.40	708.32	9,977.59	0.00	0.00	0.00	
18,000.00	90.02	179.37	7,293.21	-10,070.40	709.42	10,077.59	0.00	0.00	0.00	
18,100.00	90.02	179.37	7,293.18	-10,170.39	710.52	10,177.59	0.00	0.00	0.00	
18,200.00	90.02	179.37	7,293.16	-10,270.39	711.62	10,277.59	0.00	0.00	0.00	
18,300.00	90.02	179.37	7,293.13	-10,370.38	712.73	10,377.59	0.00	0.00	0.00	
18,400.00	90.02	179.37	7,293.10	-10,470.37	713.83	10,477.59	0.00	0.00	0.00	

Corporate Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well CASTLE PINES 19-18HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 4893.00usft (Drilling Rig)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4893.00usft (Drilling Rig)
Site:	2N-66W-19 CASTLE PINES 16-19HZ PAD	North Reference:	True
Well:	CASTLE PINES 19-18HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan A		
Design:	Permit Rev-2		

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)
18,500.00	90.02	179.37	7,293.07	-10,570.37	714.93	10,577.59	0.00	0.00	0.00
18,600.00	90.02	179.37	7,293.05	-10,670.36	716.03	10,677.59	0.00	0.00	0.00
18,700.00	90.02	179.37	7,293.02	-10,770.36	717.13	10,777.59	0.00	0.00	0.00
18,769.21	90.02	179.37	7,293.00	-10,839.56	717.89	10,846.79	0.00	0.00	0.00
TD Well @ 18769.21ft									

Casing Points				
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,521.75	1,500.00	9 5/8" Csg	9-5/8	13-1/2
7,833.76	7,296.00	Top of Production	5-1/2	7-7/8

Formations					
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,236.95	1,226.00	Fox Hills			
4,124.03	4,002.00	Parkman			
4,526.26	4,398.00	Sussex			
7,221.50	7,050.00	Sharon Springs			
7,313.00	7,115.00	Niobrara			
7,423.91	7,182.00	Nio B			
7,572.66	7,249.00	Nio C			

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
250.00	250.00	0.00	0.00	Begin Nudge @ 250.00ft
1,316.67	1,302.86	119.71	86.97	End Nudge @ 1316.67ft
4,016.67	3,898.27	721.80	524.42	Begin Drop @ 4016.67ft
4,816.67	4,687.91	811.58	589.65	End Drop @ 4816.67ft
6,708.56	6,579.80	811.58	589.65	KOP @ 6708.56ft :: DLS = 8°/100'
7,833.76	7,296.00	95.23	597.53	End Build @ 7833.76ft
18,769.21	7,293.00	-10,839.56	717.89	TD Well @ 18769.21ft