

US ROCKIES WATTENBERG PLANNING

WELD-NAD83-UTMFT13N

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

CASTLE PINES 19-10HZ

Plan A

Plan: Permit Rev-2

SHL Lat/Long: 40.117679/-104.814183

Survey Program: MWD+IFR+MSA

Standard Planning Report

21 February, 2018

Project: WELD-NAD83-UTMFT13N
Site: 2N-66W-19 CASTLE PINES 16-19HZ PAD
Well: CASTLE PINES 19-10HZ
Wellbore: Plan A
Design: Permit Rev-2

US ROCKIES WATTENBERG PLANNING

CASING DETAILS

TVD	MD	Size
1500.00	1520.08	9-5/8
7423.00	7935.46	5-1/2

WELL DETAILS: CASTLE PINES 19-10HZ

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	1223.33	14.60	335.00	1212.83	111.79	-52.13	1.50	335.00	-111.98	
4	3923.33	14.60	335.00	3825.65	728.61	-339.76	0.00	0.00	-729.85	
5	4653.33	0.00	0.00	4547.77	812.45	-378.85	2.00	180.00	-813.83	
6	6812.36	0.00	0.00	6706.80	812.45	-378.85	0.00	0.00	-813.83	
7	7935.46	89.85	179.79	7423.00	98.15	-376.29	8.00	179.79	-99.53	
8	18873.91	89.85	179.79	7452.00	-10840.19	-337.12	0.00	0.00	10838.88	CASTLE PINES 19-10HZ_BHL

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
CASTLE PINES 19-10HZ_SHL	0.00	0.00	0.00	40.117679	-104.814183
CASTLE PINES 19-10HZ_BHL	7452.00	-10840.19	-337.12	40.087910	-104.815388

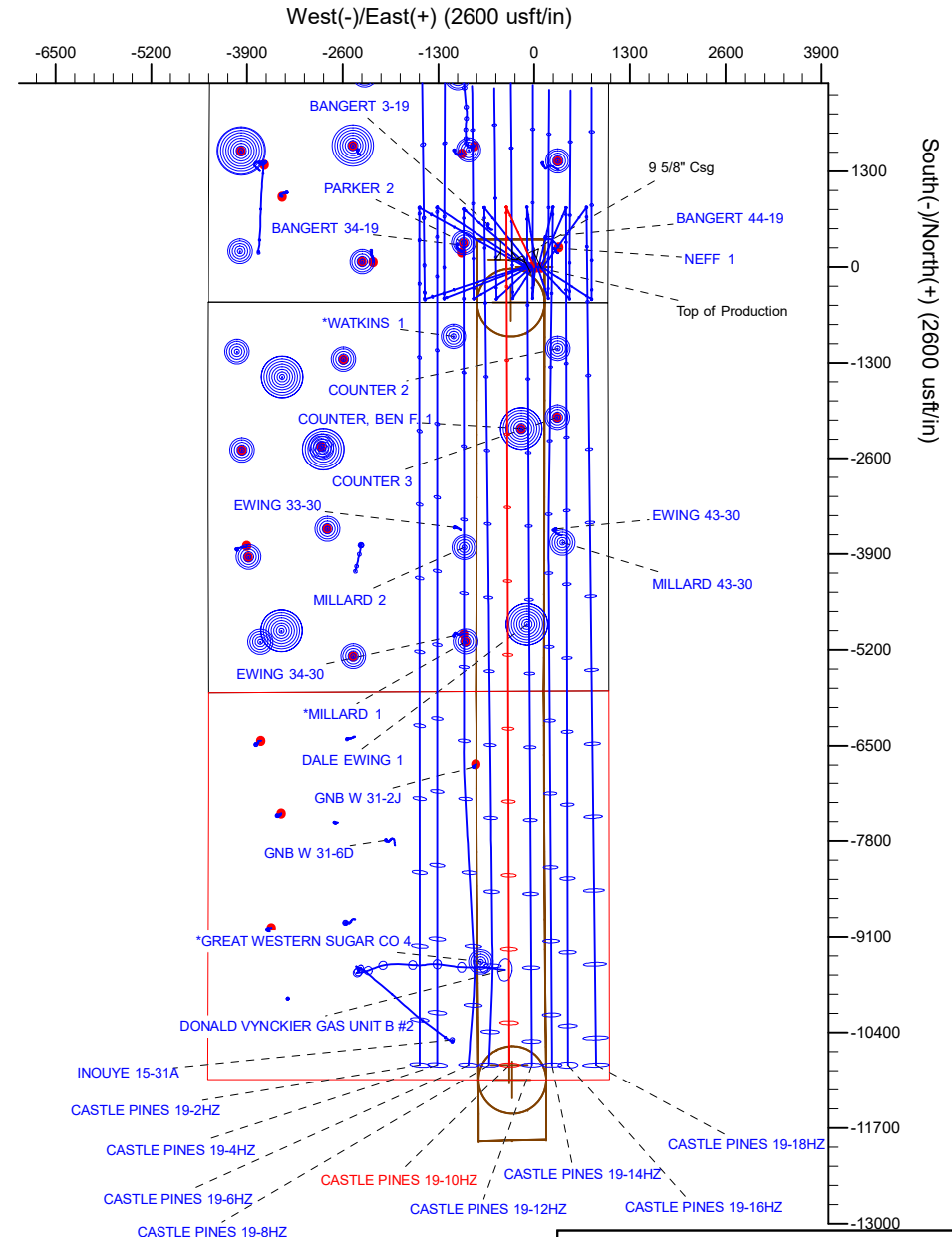
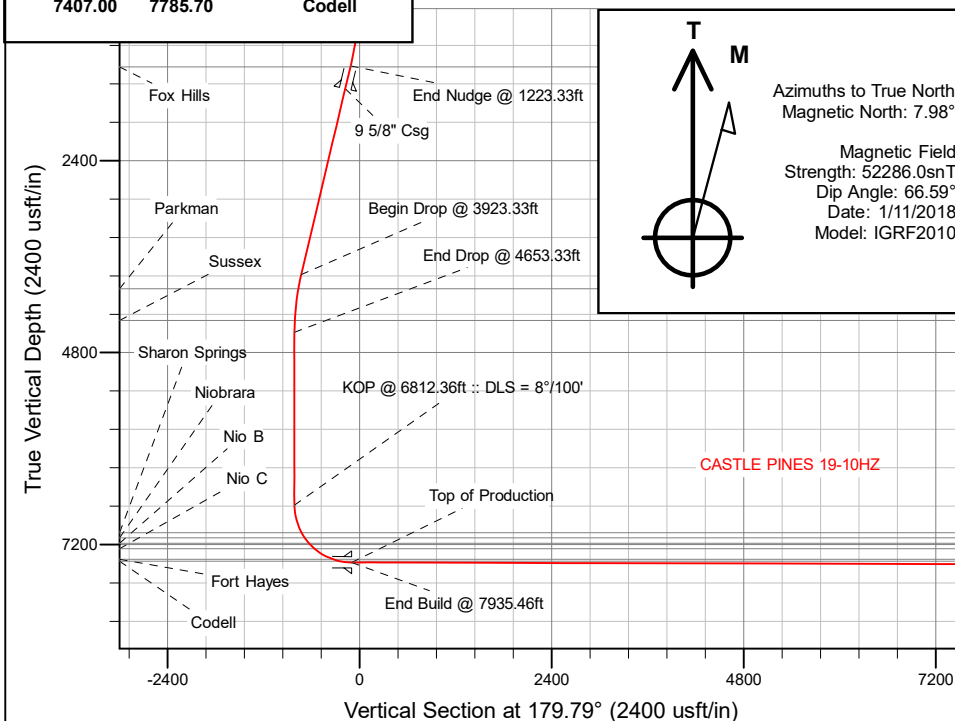
FORMATION TOP DETAILS

TVDPath	MDPath	Formation
1226.00	1236.94	Fox Hills
4002.00	4104.20	Parkman
4398.00	4503.49	Sussex
7050.00	7170.27	Sharon Springs
7115.00	7246.70	Niobrara
7182.00	7331.95	Nio B
7249.00	7427.42	Nio C
7385.00	7703.02	Fort Hayes
7407.00	7785.70	Codell

SHL
484' FSL
1003' FEL

HEEL
578' FSL
1378' FEL

TOE
203' FSL
1359' FEL



Plan: Permit Rev-2 (CASTLE PINES 19-10HZ/Plan A)

Created By: _____ Date: 2/21/2018
Reviewed: _____ Date: _____

Corporate Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well CASTLE PINES 19-10HZ
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 19-10HZ	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 19-10HZ					
Well Position	+N/-S	-1.09 usft	Northing:	14,569,639.87 usft	Latitude:	40.117679
	+E/-W	135.03 usft	Easting:	1,692,365.47 usft	Longitude:	-104.814183
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	52,286.00506250

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	179.79	

Plan Survey Tool Program		Date	2/21/2018		
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	18,873.91	Permit Rev-2 (Plan A)	APC_ISCWSA REV 2 MWD+II Fixed:v2:Rockies, crustal dec +	

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 19-10HZ	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	
1,223.33	14.60	335.00	1,212.83	111.79	-52.13	1.50	1.50	0.00	335.00	
3,923.33	14.60	335.00	3,825.65	728.61	-339.76	0.00	0.00	0.00	0.00	
4,653.33	0.00	0.00	4,547.77	812.45	-378.85	2.00	-2.00	0.00	180.00	
6,812.36	0.00	0.00	6,706.80	812.45	-378.85	0.00	0.00	0.00	0.00	
7,935.46	89.85	179.79	7,423.00	98.15	-376.29	8.00	8.00	16.01	179.79	
18,873.91	89.85	179.79	7,452.00	-10,840.19	-337.12	0.00	0.00	0.00	0.00	CASTLE PINES 19-10

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 19-10HZ	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	335.00	300.00	0.30	-0.14	-0.30	1.50	1.50	0.00
400.00	2.25	335.00	399.96	2.67	-1.24	-2.67	1.50	1.50	0.00
500.00	3.75	335.00	499.82	7.41	-3.46	-7.42	1.50	1.50	0.00
600.00	5.25	335.00	599.51	14.52	-6.77	-14.55	1.50	1.50	0.00
700.00	6.75	335.00	698.96	24.00	-11.19	-24.04	1.50	1.50	0.00
800.00	8.25	335.00	798.10	35.83	-16.71	-35.89	1.50	1.50	0.00
900.00	9.75	335.00	896.87	50.00	-23.32	-50.09	1.50	1.50	0.00
1,000.00	11.25	335.00	995.19	66.52	-31.02	-66.63	1.50	1.50	0.00
1,100.00	12.75	335.00	1,093.00	85.36	-39.80	-85.51	1.50	1.50	0.00
1,200.00	14.25	335.00	1,190.24	106.52	-49.67	-106.70	1.50	1.50	0.00
1,223.33	14.60	335.00	1,212.83	111.79	-52.13	-111.98	1.50	1.50	0.00
End Nudge @ 1223.33ft									
1,236.94	14.60	335.00	1,226.00	114.89	-53.58	-115.09	0.00	0.00	0.00
Fox Hills									
1,300.00	14.60	335.00	1,287.03	129.30	-60.29	-129.52	0.00	0.00	0.00
1,400.00	14.60	335.00	1,383.80	152.15	-70.95	-152.40	0.00	0.00	0.00
1,500.00	14.60	335.00	1,480.57	174.99	-81.60	-175.29	0.00	0.00	0.00
1,520.08	14.60	335.00	1,500.00	179.58	-83.74	-179.88	0.00	0.00	0.00
9 5/8" Csg									
1,600.00	14.60	335.00	1,577.34	197.84	-92.25	-198.17	0.00	0.00	0.00
1,700.00	14.60	335.00	1,674.11	220.68	-102.91	-221.06	0.00	0.00	0.00
1,800.00	14.60	335.00	1,770.88	243.53	-113.56	-243.94	0.00	0.00	0.00
1,900.00	14.60	335.00	1,867.65	266.37	-124.21	-266.83	0.00	0.00	0.00
2,000.00	14.60	335.00	1,964.42	289.22	-134.86	-289.71	0.00	0.00	0.00
2,100.00	14.60	335.00	2,061.19	312.06	-145.52	-312.59	0.00	0.00	0.00
2,200.00	14.60	335.00	2,157.96	334.91	-156.17	-335.48	0.00	0.00	0.00
2,300.00	14.60	335.00	2,254.73	357.75	-166.82	-358.36	0.00	0.00	0.00
2,400.00	14.60	335.00	2,351.51	380.60	-177.48	-381.25	0.00	0.00	0.00
2,500.00	14.60	335.00	2,448.28	403.44	-188.13	-404.13	0.00	0.00	0.00
2,600.00	14.60	335.00	2,545.05	426.29	-198.78	-427.01	0.00	0.00	0.00
2,700.00	14.60	335.00	2,641.82	449.13	-209.43	-449.90	0.00	0.00	0.00
2,800.00	14.60	335.00	2,738.59	471.98	-220.09	-472.78	0.00	0.00	0.00
2,900.00	14.60	335.00	2,835.36	494.82	-230.74	-495.67	0.00	0.00	0.00
3,000.00	14.60	335.00	2,932.13	517.67	-241.39	-518.55	0.00	0.00	0.00
3,100.00	14.60	335.00	3,028.90	540.51	-252.05	-541.43	0.00	0.00	0.00
3,200.00	14.60	335.00	3,125.67	563.36	-262.70	-564.32	0.00	0.00	0.00
3,300.00	14.60	335.00	3,222.44	586.21	-273.35	-587.20	0.00	0.00	0.00
3,400.00	14.60	335.00	3,319.21	609.05	-284.00	-610.09	0.00	0.00	0.00
3,500.00	14.60	335.00	3,415.99	631.90	-294.66	-632.97	0.00	0.00	0.00
3,600.00	14.60	335.00	3,512.76	654.74	-305.31	-655.86	0.00	0.00	0.00
3,700.00	14.60	335.00	3,609.53	677.59	-315.96	-678.74	0.00	0.00	0.00
3,800.00	14.60	335.00	3,706.30	700.43	-326.62	-701.62	0.00	0.00	0.00
3,900.00	14.60	335.00	3,803.07	723.28	-337.27	-724.51	0.00	0.00	0.00
3,923.33	14.60	335.00	3,825.65	728.61	-339.76	-729.85	0.00	0.00	0.00
Begin Drop @ 3923.33ft									
4,000.00	13.07	335.00	3,900.09	745.22	-347.50	-746.49	2.00	-2.00	0.00
4,100.00	11.07	335.00	3,997.88	764.17	-356.34	-765.47	2.00	-2.00	0.00
4,104.20	10.98	335.00	4,002.00	764.89	-356.68	-766.20	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 19-10HZ	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	9.07	335.00	4,096.33	780.01	-363.72	-781.33	2.00	-2.00	0.00	
4,300.00	7.07	335.00	4,195.34	792.72	-369.65	-794.07	2.00	-2.00	0.00	
4,400.00	5.07	335.00	4,294.77	802.30	-374.12	-803.67	2.00	-2.00	0.00	
4,500.00	3.07	335.00	4,394.51	808.73	-377.12	-810.11	2.00	-2.00	0.00	
4,503.49	3.00	335.00	4,398.00	808.90	-377.19	-810.27	2.00	-2.00	0.00	
Sussex										
4,600.00	1.07	335.00	4,494.44	812.00	-378.64	-813.38	2.00	-2.00	0.00	
4,653.33	0.00	0.00	4,547.77	812.45	-378.85	-813.83	2.00	-2.00	0.00	
End Drop @ 4653.33ft										
4,700.00	0.00	0.00	4,594.44	812.45	-378.85	-813.83	0.00	0.00	0.00	
4,800.00	0.00	0.00	4,694.44	812.45	-378.85	-813.83	0.00	0.00	0.00	
4,900.00	0.00	0.00	4,794.44	812.45	-378.85	-813.83	0.00	0.00	0.00	
5,000.00	0.00	0.00	4,894.44	812.45	-378.85	-813.83	0.00	0.00	0.00	
5,100.00	0.00	0.00	4,994.44	812.45	-378.85	-813.83	0.00	0.00	0.00	
5,200.00	0.00	0.00	5,094.44	812.45	-378.85	-813.83	0.00	0.00	0.00	
5,300.00	0.00	0.00	5,194.44	812.45	-378.85	-813.83	0.00	0.00	0.00	
5,400.00	0.00	0.00	5,294.44	812.45	-378.85	-813.83	0.00	0.00	0.00	
5,500.00	0.00	0.00	5,394.44	812.45	-378.85	-813.83	0.00	0.00	0.00	
5,600.00	0.00	0.00	5,494.44	812.45	-378.85	-813.83	0.00	0.00	0.00	
5,700.00	0.00	0.00	5,594.44	812.45	-378.85	-813.83	0.00	0.00	0.00	
5,800.00	0.00	0.00	5,694.44	812.45	-378.85	-813.83	0.00	0.00	0.00	
5,900.00	0.00	0.00	5,794.44	812.45	-378.85	-813.83	0.00	0.00	0.00	
6,000.00	0.00	0.00	5,894.44	812.45	-378.85	-813.83	0.00	0.00	0.00	
6,100.00	0.00	0.00	5,994.44	812.45	-378.85	-813.83	0.00	0.00	0.00	
6,200.00	0.00	0.00	6,094.44	812.45	-378.85	-813.83	0.00	0.00	0.00	
6,300.00	0.00	0.00	6,194.44	812.45	-378.85	-813.83	0.00	0.00	0.00	
6,400.00	0.00	0.00	6,294.44	812.45	-378.85	-813.83	0.00	0.00	0.00	
6,500.00	0.00	0.00	6,394.44	812.45	-378.85	-813.83	0.00	0.00	0.00	
6,600.00	0.00	0.00	6,494.44	812.45	-378.85	-813.83	0.00	0.00	0.00	
6,700.00	0.00	0.00	6,594.44	812.45	-378.85	-813.83	0.00	0.00	0.00	
6,800.00	0.00	0.00	6,694.44	812.45	-378.85	-813.83	0.00	0.00	0.00	
6,812.36	0.00	0.00	6,706.80	812.45	-378.85	-813.83	0.00	0.00	0.00	
KOP @ 6812.36ft :: DLS = 8°/100'										
6,900.00	7.01	179.79	6,794.22	807.09	-378.83	-808.47	8.00	8.00	0.00	
7,000.00	15.01	179.79	6,892.30	788.01	-378.76	-789.39	8.00	8.00	0.00	
7,100.00	23.01	179.79	6,986.77	755.46	-378.65	-756.84	8.00	8.00	0.00	
7,170.27	28.63	179.79	7,050.00	724.86	-378.54	-726.24	8.00	8.00	0.00	
Sharon Springs										
7,200.00	31.01	179.79	7,075.79	710.08	-378.48	-711.46	8.00	8.00	0.00	
7,246.70	34.75	179.79	7,115.00	684.73	-378.39	-686.12	8.00	8.00	0.00	
Niobrara										
7,300.00	39.01	179.79	7,157.63	652.75	-378.28	-654.13	8.00	8.00	0.00	
7,331.95	41.57	179.79	7,182.00	632.09	-378.20	-633.47	8.00	8.00	0.00	
Nio B										
7,400.00	47.01	179.79	7,230.69	584.59	-378.03	-585.98	8.00	8.00	0.00	
7,427.42	49.21	179.79	7,249.00	564.18	-377.96	-565.56	8.00	8.00	0.00	
Nio C										
7,500.00	55.01	179.79	7,293.56	506.93	-377.76	-508.31	8.00	8.00	0.00	
7,600.00	63.01	179.79	7,345.00	421.27	-377.45	-422.65	8.00	8.00	0.00	
7,700.00	71.01	179.79	7,384.02	329.29	-377.12	-330.67	8.00	8.00	0.00	
7,703.02	71.25	179.79	7,385.00	326.44	-377.11	-327.82	8.00	8.00	0.00	
Fort Hayes										

Corporate Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well CASTLE PINES 19-10HZ
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Site:	2N-66W-19 CASTLE PINES 16-19HZ PAD	North Reference:	True
Well:	CASTLE PINES 19-10HZ	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)
7,785.70	77.87	179.79	7,407.00	246.78	-376.82	-248.16	8.00	8.00	0.00
Codell									
7,800.00	79.01	179.79	7,409.87	232.77	-376.77	-234.15	8.00	8.00	0.00
7,900.00	87.01	179.79	7,422.02	133.60	-376.42	-134.98	8.00	8.00	0.00
7,935.46	89.85	179.79	7,423.00	98.15	-376.29	-99.53	8.00	8.00	0.00
End Build @ 7935.46ft - Top of Production									
8,000.00	89.85	179.79	7,423.17	33.61	-376.06	-34.99	0.00	0.00	0.00
8,100.00	89.85	179.79	7,423.43	-66.38	-375.70	65.01	0.00	0.00	0.00
8,200.00	89.85	179.79	7,423.70	-166.38	-375.35	165.01	0.00	0.00	0.00
8,300.00	89.85	179.79	7,423.96	-266.38	-374.99	265.01	0.00	0.00	0.00
8,400.00	89.85	179.79	7,424.23	-366.38	-374.63	365.01	0.00	0.00	0.00
8,500.00	89.85	179.79	7,424.49	-466.38	-374.27	465.01	0.00	0.00	0.00
8,600.00	89.85	179.79	7,424.76	-566.38	-373.91	565.01	0.00	0.00	0.00
8,700.00	89.85	179.79	7,425.02	-666.38	-373.55	665.00	0.00	0.00	0.00
8,800.00	89.85	179.79	7,425.29	-766.38	-373.20	765.00	0.00	0.00	0.00
8,900.00	89.85	179.79	7,425.55	-866.38	-372.84	865.00	0.00	0.00	0.00
9,000.00	89.85	179.79	7,425.82	-966.38	-372.48	965.00	0.00	0.00	0.00
9,100.00	89.85	179.79	7,426.08	-1,066.37	-372.12	1,065.00	0.00	0.00	0.00
9,200.00	89.85	179.79	7,426.35	-1,166.37	-371.76	1,165.00	0.00	0.00	0.00
9,300.00	89.85	179.79	7,426.61	-1,266.37	-371.41	1,265.00	0.00	0.00	0.00
9,400.00	89.85	179.79	7,426.88	-1,366.37	-371.05	1,365.00	0.00	0.00	0.00
9,500.00	89.85	179.79	7,427.14	-1,466.37	-370.69	1,465.00	0.00	0.00	0.00
9,600.00	89.85	179.79	7,427.41	-1,566.37	-370.33	1,565.00	0.00	0.00	0.00
9,700.00	89.85	179.79	7,427.67	-1,666.37	-369.97	1,665.00	0.00	0.00	0.00
9,800.00	89.85	179.79	7,427.94	-1,766.37	-369.62	1,765.00	0.00	0.00	0.00
9,900.00	89.85	179.79	7,428.21	-1,866.37	-369.26	1,865.00	0.00	0.00	0.00
10,000.00	89.85	179.79	7,428.47	-1,966.37	-368.90	1,965.00	0.00	0.00	0.00
10,100.00	89.85	179.79	7,428.74	-2,066.36	-368.54	2,065.00	0.00	0.00	0.00
10,200.00	89.85	179.79	7,429.00	-2,166.36	-368.18	2,165.00	0.00	0.00	0.00
10,300.00	89.85	179.79	7,429.27	-2,266.36	-367.83	2,265.00	0.00	0.00	0.00
10,400.00	89.85	179.79	7,429.53	-2,366.36	-367.47	2,365.00	0.00	0.00	0.00
10,500.00	89.85	179.79	7,429.80	-2,466.36	-367.11	2,465.00	0.00	0.00	0.00
10,600.00	89.85	179.79	7,430.06	-2,566.36	-366.75	2,565.00	0.00	0.00	0.00
10,700.00	89.85	179.79	7,430.33	-2,666.36	-366.39	2,665.00	0.00	0.00	0.00
10,800.00	89.85	179.79	7,430.59	-2,766.36	-366.03	2,765.00	0.00	0.00	0.00
10,900.00	89.85	179.79	7,430.86	-2,866.36	-365.68	2,865.00	0.00	0.00	0.00
11,000.00	89.85	179.79	7,431.12	-2,966.36	-365.32	2,965.00	0.00	0.00	0.00
11,100.00	89.85	179.79	7,431.39	-3,066.35	-364.96	3,065.00	0.00	0.00	0.00
11,200.00	89.85	179.79	7,431.65	-3,166.35	-364.60	3,165.00	0.00	0.00	0.00
11,300.00	89.85	179.79	7,431.92	-3,266.35	-364.24	3,265.00	0.00	0.00	0.00
11,400.00	89.85	179.79	7,432.18	-3,366.35	-363.89	3,365.00	0.00	0.00	0.00
11,500.00	89.85	179.79	7,432.45	-3,466.35	-363.53	3,465.00	0.00	0.00	0.00
11,600.00	89.85	179.79	7,432.71	-3,566.35	-363.17	3,564.99	0.00	0.00	0.00
11,700.00	89.85	179.79	7,432.98	-3,666.35	-362.81	3,664.99	0.00	0.00	0.00
11,800.00	89.85	179.79	7,433.24	-3,766.35	-362.45	3,764.99	0.00	0.00	0.00
11,900.00	89.85	179.79	7,433.51	-3,866.35	-362.10	3,864.99	0.00	0.00	0.00
12,000.00	89.85	179.79	7,433.77	-3,966.35	-361.74	3,964.99	0.00	0.00	0.00
12,100.00	89.85	179.79	7,434.04	-4,066.34	-361.38	4,064.99	0.00	0.00	0.00
12,200.00	89.85	179.79	7,434.30	-4,166.34	-361.02	4,164.99	0.00	0.00	0.00
12,300.00	89.85	179.79	7,434.57	-4,266.34	-360.66	4,264.99	0.00	0.00	0.00
12,400.00	89.85	179.79	7,434.83	-4,366.34	-360.31	4,364.99	0.00	0.00	0.00
12,500.00	89.85	179.79	7,435.10	-4,466.34	-359.95	4,464.99	0.00	0.00	0.00
12,600.00	89.85	179.79	7,435.36	-4,566.34	-359.59	4,564.99	0.00	0.00	0.00
12,700.00	89.85	179.79	7,435.63	-4,666.34	-359.23	4,664.99	0.00	0.00	0.00

Corporate Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well CASTLE PINES 19-10HZ
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 19-10HZ	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)
12,800.00	89.85	179.79	7,435.89	-4,766.34	-358.87	4,764.99	0.00	0.00	0.00
12,900.00	89.85	179.79	7,436.16	-4,866.34	-358.52	4,864.99	0.00	0.00	0.00
13,000.00	89.85	179.79	7,436.42	-4,966.34	-358.16	4,964.99	0.00	0.00	0.00
13,100.00	89.85	179.79	7,436.69	-5,066.33	-357.80	5,064.99	0.00	0.00	0.00
13,200.00	89.85	179.79	7,436.96	-5,166.33	-357.44	5,164.99	0.00	0.00	0.00
13,300.00	89.85	179.79	7,437.22	-5,266.33	-357.08	5,264.99	0.00	0.00	0.00
13,400.00	89.85	179.79	7,437.49	-5,366.33	-356.72	5,364.99	0.00	0.00	0.00
13,500.00	89.85	179.79	7,437.75	-5,466.33	-356.37	5,464.99	0.00	0.00	0.00
13,600.00	89.85	179.79	7,438.02	-5,566.33	-356.01	5,564.99	0.00	0.00	0.00
13,700.00	89.85	179.79	7,438.28	-5,666.33	-355.65	5,664.99	0.00	0.00	0.00
13,800.00	89.85	179.79	7,438.55	-5,766.33	-355.29	5,764.99	0.00	0.00	0.00
13,900.00	89.85	179.79	7,438.81	-5,866.33	-354.93	5,864.99	0.00	0.00	0.00
14,000.00	89.85	179.79	7,439.08	-5,966.33	-354.58	5,964.99	0.00	0.00	0.00
14,100.00	89.85	179.79	7,439.34	-6,066.33	-354.22	6,064.99	0.00	0.00	0.00
14,200.00	89.85	179.79	7,439.61	-6,166.32	-353.86	6,164.99	0.00	0.00	0.00
14,300.00	89.85	179.79	7,439.87	-6,266.32	-353.50	6,264.99	0.00	0.00	0.00
14,400.00	89.85	179.79	7,440.14	-6,366.32	-353.14	6,364.99	0.00	0.00	0.00
14,500.00	89.85	179.79	7,440.40	-6,466.32	-352.79	6,464.98	0.00	0.00	0.00
14,600.00	89.85	179.79	7,440.67	-6,566.32	-352.43	6,564.98	0.00	0.00	0.00
14,700.00	89.85	179.79	7,440.93	-6,666.32	-352.07	6,664.98	0.00	0.00	0.00
14,800.00	89.85	179.79	7,441.20	-6,766.32	-351.71	6,764.98	0.00	0.00	0.00
14,900.00	89.85	179.79	7,441.46	-6,866.32	-351.35	6,864.98	0.00	0.00	0.00
15,000.00	89.85	179.79	7,441.73	-6,966.32	-351.00	6,964.98	0.00	0.00	0.00
15,100.00	89.85	179.79	7,441.99	-7,066.32	-350.64	7,064.98	0.00	0.00	0.00
15,200.00	89.85	179.79	7,442.26	-7,166.31	-350.28	7,164.98	0.00	0.00	0.00
15,300.00	89.85	179.79	7,442.52	-7,266.31	-349.92	7,264.98	0.00	0.00	0.00
15,400.00	89.85	179.79	7,442.79	-7,366.31	-349.56	7,364.98	0.00	0.00	0.00
15,500.00	89.85	179.79	7,443.05	-7,466.31	-349.21	7,464.98	0.00	0.00	0.00
15,600.00	89.85	179.79	7,443.32	-7,566.31	-348.85	7,564.98	0.00	0.00	0.00
15,700.00	89.85	179.79	7,443.58	-7,666.31	-348.49	7,664.98	0.00	0.00	0.00
15,800.00	89.85	179.79	7,443.85	-7,766.31	-348.13	7,764.98	0.00	0.00	0.00
15,900.00	89.85	179.79	7,444.11	-7,866.31	-347.77	7,864.98	0.00	0.00	0.00
16,000.00	89.85	179.79	7,444.38	-7,966.31	-347.41	7,964.98	0.00	0.00	0.00
16,100.00	89.85	179.79	7,444.64	-8,066.31	-347.06	8,064.98	0.00	0.00	0.00
16,200.00	89.85	179.79	7,444.91	-8,166.30	-346.70	8,164.98	0.00	0.00	0.00
16,300.00	89.85	179.79	7,445.18	-8,266.30	-346.34	8,264.98	0.00	0.00	0.00
16,400.00	89.85	179.79	7,445.44	-8,366.30	-345.98	8,364.98	0.00	0.00	0.00
16,500.00	89.85	179.79	7,445.71	-8,466.30	-345.62	8,464.98	0.00	0.00	0.00
16,600.00	89.85	179.79	7,445.97	-8,566.30	-345.27	8,564.98	0.00	0.00	0.00
16,700.00	89.85	179.79	7,446.24	-8,666.30	-344.91	8,664.98	0.00	0.00	0.00
16,800.00	89.85	179.79	7,446.50	-8,766.30	-344.55	8,764.98	0.00	0.00	0.00
16,900.00	89.85	179.79	7,446.77	-8,866.30	-344.19	8,864.98	0.00	0.00	0.00
17,000.00	89.85	179.79	7,447.03	-8,966.30	-343.83	8,964.98	0.00	0.00	0.00
17,100.00	89.85	179.79	7,447.30	-9,066.30	-343.48	9,064.98	0.00	0.00	0.00
17,200.00	89.85	179.79	7,447.56	-9,166.29	-343.12	9,164.98	0.00	0.00	0.00
17,300.00	89.85	179.79	7,447.83	-9,266.29	-342.76	9,264.97	0.00	0.00	0.00
17,400.00	89.85	179.79	7,448.09	-9,366.29	-342.40	9,364.97	0.00	0.00	0.00
17,500.00	89.85	179.79	7,448.36	-9,466.29	-342.04	9,464.97	0.00	0.00	0.00
17,600.00	89.85	179.79	7,448.62	-9,566.29	-341.69	9,564.97	0.00	0.00	0.00
17,700.00	89.85	179.79	7,448.89	-9,666.29	-341.33	9,664.97	0.00	0.00	0.00
17,800.00	89.85	179.79	7,449.15	-9,766.29	-340.97	9,764.97	0.00	0.00	0.00
17,900.00	89.85	179.79	7,449.42	-9,866.29	-340.61	9,864.97	0.00	0.00	0.00
18,000.00	89.85	179.79	7,449.68	-9,966.29	-340.25	9,964.97	0.00	0.00	0.00
18,100.00	89.85	179.79	7,449.95	-10,066.29	-339.90	10,064.97	0.00	0.00	0.00

Corporate Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well CASTLE PINES 19-10HZ
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 19-10HZ	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)
18,200.00	89.85	179.79	7,450.21	-10,166.28	-339.54	10,164.97	0.00	0.00	0.00
18,300.00	89.85	179.79	7,450.48	-10,266.28	-339.18	10,264.97	0.00	0.00	0.00
18,400.00	89.85	179.79	7,450.74	-10,366.28	-338.82	10,364.97	0.00	0.00	0.00
18,500.00	89.85	179.79	7,451.01	-10,466.28	-338.46	10,464.97	0.00	0.00	0.00
18,600.00	89.85	179.79	7,451.27	-10,566.28	-338.10	10,564.97	0.00	0.00	0.00
18,700.00	89.85	179.79	7,451.54	-10,666.28	-337.75	10,664.97	0.00	0.00	0.00
18,800.00	89.85	179.79	7,451.80	-10,766.28	-337.39	10,764.97	0.00	0.00	0.00
18,873.91	89.85	179.79	7,452.00	-10,840.19	-337.12	10,838.88	0.00	0.00	0.00
TD Well @ 18873.91ft									

Casing Points				
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,520.08	1,500.00	9 5/8" Csg	9-5/8	13-1/2
7,935.46	7,423.00	Top of Production	5-1/2	7-7/8

Formations					
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,236.94	1,226.00	Fox Hills			
4,104.20	4,002.00	Parkman			
4,503.49	4,398.00	Sussex			
7,170.27	7,050.00	Sharon Springs			
7,246.70	7,115.00	Niobrara			
7,331.95	7,182.00	Nio B			
7,427.42	7,249.00	Nio C			
7,703.02	7,385.00	Fort Hayes			
7,785.70	7,407.00	Codell			

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
1,223.33	1,212.83	111.79	-52.13	End Nudge @ 1223.33ft
3,923.33	3,825.65	728.61	-339.76	Begin Drop @ 3923.33ft
4,653.33	4,547.77	812.45	-378.85	End Drop @ 4653.33ft
6,812.36	6,706.80	812.45	-378.85	KOP @ 6812.36ft :: DLS = 8°/100'
7,935.46	7,423.00	98.15	-376.29	End Build @ 7935.46ft
18,873.91	7,452.00	-10,840.19	-337.12	TD Well @ 18873.91ft