

US ROCKIES WATTENBERG PLANNING

WELD-NAD83-UTMFT13N

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

CASTLE PINES 19-16HZ

Plan A

Plan: Permit Rev-2

SHL Lat/Long: 40.117677/-104.813862

Survey Program: MWD+IFR+MSA

Standard Planning Report

23 January, 2018

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

US ROCKIES WATTENBERG PLANNING

CASING DETAILS

TVD	MD	Size
1500.00	1519.24	9-5/8
7393.00	7897.90	5-1/2

WELL DETAILS: CASTLE PINES 19-16HZ

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	1183.33	14.00	23.00	1174.07	104.44	44.33	1.50	23.00	-104.34	
4	3985.00	14.00	23.00	3892.52	728.35	309.16	0.00	0.00	-727.64	
5	4685.00	0.00	0.00	4585.57	806.68	342.41	2.00	180.00	-805.90	
6	6776.24	0.00	0.00	6676.81	806.68	342.41	0.00	0.00	-805.90	
7	7897.90	89.73	179.87	7393.00	93.82	343.98	8.00	179.87	-93.04	
8	18831.13	89.73	179.87	7444.00	-10839.27	368.00	0.00	0.00	10840.07	CASTLE PINES 19-16HZ_BHL

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
CASTLE PINES 19-16HZ_SHL	0.00	0.00	0.00	40.117677	-104.813862
CASTLE PINES 19-16HZ_BHL	7444.00	-10839.27	368.00	40.087911	-104.812546

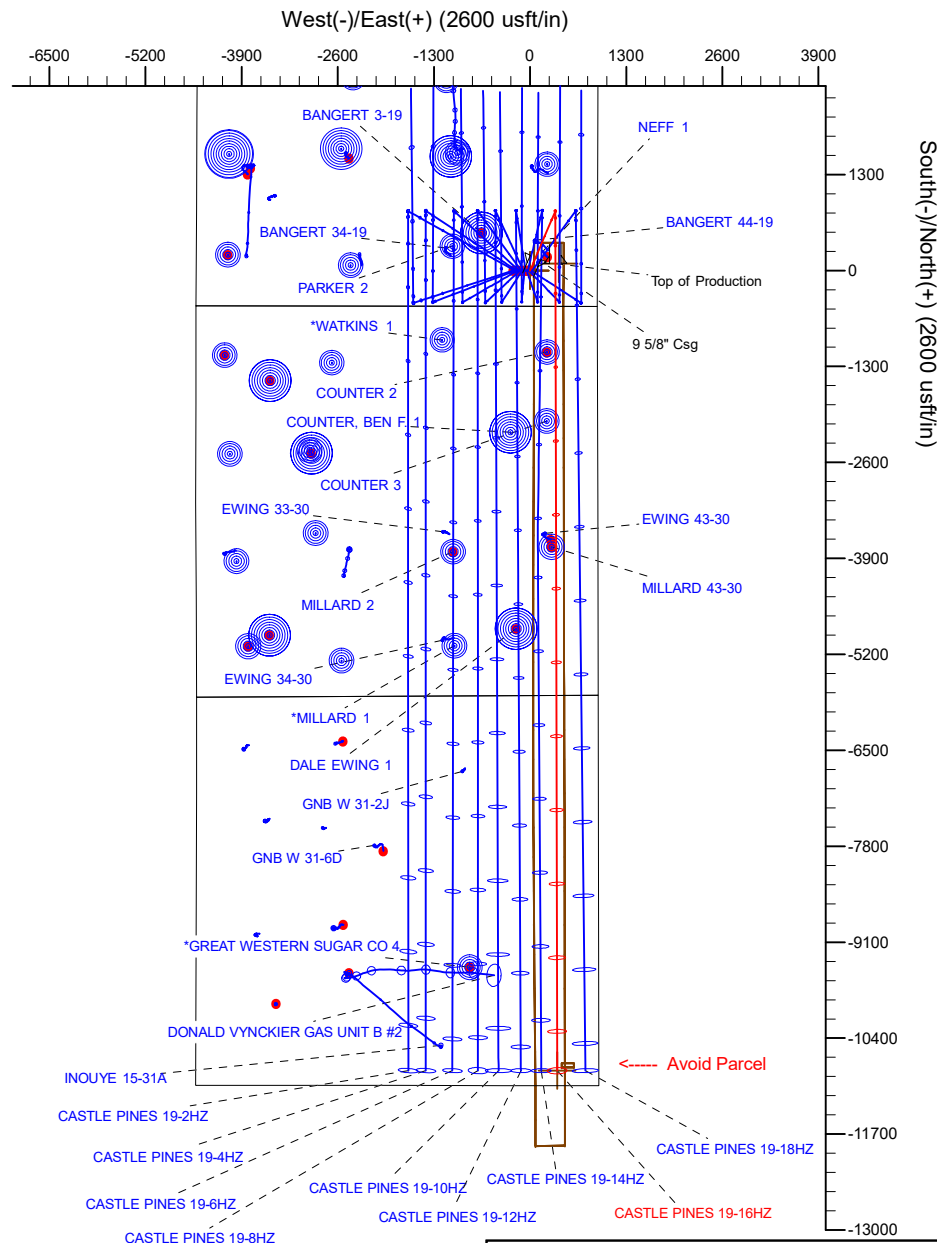
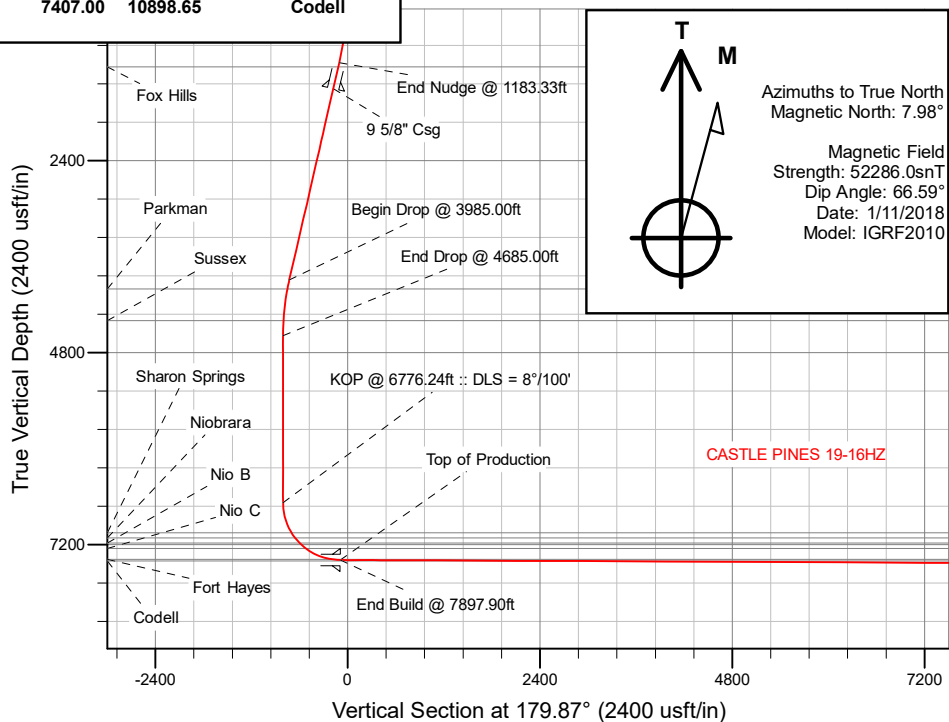
FORMATION TOP DETAILS

TVDPath	MDPath	Formation
1226.00	1236.85	Fox Hills
4002.00	4097.31	Parkman
4398.00	4497.29	Sussex
7050.00	7168.79	Sharon Springs
7115.00	7247.76	Niobrara
7182.00	7336.99	Nio B
7249.00	7439.08	Nio C
7385.00	7794.02	Fort Hayes
7407.00	10898.65	Codell

SHL
483' FSL
913' FEL

HEEL
578' FSL
565' FEL

TOE
202' FSL
564' FEL



Plan: Permit Rev-2 (CASTLE PINES 19-16HZ/Plan A)

Created By: _____ Date: 1/23/2018
Reviewed: _____ Date: _____

Corporate Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well CASTLE PINES 19-16HZ
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 19-16HZ	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 19-16HZ					
Well Position	+N/-S	-1.82 usft	Northing:	14,569,639.33 usft	Latitude:	40.117677
	+E/-W	224.77 usft	Easting:	1,692,455.21 usft	Longitude:	-104.813862
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	52,286.03660115

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	179.87

Plan Survey Tool Program	Date	1/23/2018		
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	18,831.13	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 19-16HZ	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	
1,183.33	14.00	23.00	1,174.07	104.44	44.33	1.50	1.50	0.00	23.00	
3,985.00	14.00	23.00	3,892.52	728.35	309.16	0.00	0.00	0.00	0.00	
4,685.00	0.00	0.00	4,585.57	806.68	342.41	2.00	-2.00	0.00	180.00	
6,776.24	0.00	0.00	6,676.81	806.68	342.41	0.00	0.00	0.00	0.00	
7,897.90	89.73	179.87	7,393.00	93.82	343.98	8.00	8.00	16.04	179.87	
18,831.13	89.73	179.87	7,444.00	-10,839.27	368.00	0.00	0.00	0.00	0.00	CASTLE PINES 19-16

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 19-16HZ	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	23.00	300.00	0.30	0.13	-0.30	1.50	1.50	0.00
400.00	2.25	23.00	399.96	2.71	1.15	-2.71	1.50	1.50	0.00
500.00	3.75	23.00	499.82	7.53	3.20	-7.52	1.50	1.50	0.00
600.00	5.25	23.00	599.51	14.75	6.26	-14.74	1.50	1.50	0.00
700.00	6.75	23.00	698.96	24.37	10.35	-24.35	1.50	1.50	0.00
800.00	8.25	23.00	798.10	36.39	15.45	-36.35	1.50	1.50	0.00
900.00	9.75	23.00	896.87	50.79	21.56	-50.74	1.50	1.50	0.00
1,000.00	11.25	23.00	995.19	67.56	28.68	-67.50	1.50	1.50	0.00
1,100.00	12.75	23.00	1,093.00	86.70	36.80	-86.61	1.50	1.50	0.00
1,183.33	14.00	23.00	1,174.07	104.44	44.33	-104.34	1.50	1.50	0.00
End Nudge @ 1183.33ft									
1,200.00	14.00	23.00	1,190.25	108.15	45.91	-108.05	0.00	0.00	0.00
1,236.85	14.00	23.00	1,226.00	116.36	49.39	-116.25	0.00	0.00	0.00
Fox Hills									
1,300.00	14.00	23.00	1,287.27	130.42	55.36	-130.30	0.00	0.00	0.00
1,400.00	14.00	23.00	1,384.30	152.69	64.81	-152.54	0.00	0.00	0.00
1,500.00	14.00	23.00	1,481.33	174.96	74.27	-174.79	0.00	0.00	0.00
1,519.24	14.00	23.00	1,500.00	179.24	76.08	-179.07	0.00	0.00	0.00
9 5/8" Csg									
1,600.00	14.00	23.00	1,578.36	197.23	83.72	-197.04	0.00	0.00	0.00
1,700.00	14.00	23.00	1,675.39	219.50	93.17	-219.29	0.00	0.00	0.00
1,800.00	14.00	23.00	1,772.42	241.77	102.62	-241.53	0.00	0.00	0.00
1,900.00	14.00	23.00	1,869.45	264.04	112.08	-263.78	0.00	0.00	0.00
2,000.00	14.00	23.00	1,966.48	286.31	121.53	-286.03	0.00	0.00	0.00
2,100.00	14.00	23.00	2,063.51	308.58	130.98	-308.28	0.00	0.00	0.00
2,200.00	14.00	23.00	2,160.54	330.84	140.43	-330.52	0.00	0.00	0.00
2,300.00	14.00	23.00	2,257.57	353.11	149.89	-352.77	0.00	0.00	0.00
2,400.00	14.00	23.00	2,354.60	375.38	159.34	-375.02	0.00	0.00	0.00
2,500.00	14.00	23.00	2,451.63	397.65	168.79	-397.27	0.00	0.00	0.00
2,600.00	14.00	23.00	2,548.66	419.92	178.25	-419.51	0.00	0.00	0.00
2,700.00	14.00	23.00	2,645.69	442.19	187.70	-441.76	0.00	0.00	0.00
2,800.00	14.00	23.00	2,742.72	464.46	197.15	-464.01	0.00	0.00	0.00
2,900.00	14.00	23.00	2,839.75	486.73	206.60	-486.26	0.00	0.00	0.00
3,000.00	14.00	23.00	2,936.78	509.00	216.06	-508.50	0.00	0.00	0.00
3,100.00	14.00	23.00	3,033.81	531.27	225.51	-530.75	0.00	0.00	0.00
3,200.00	14.00	23.00	3,130.84	553.53	234.96	-553.00	0.00	0.00	0.00
3,300.00	14.00	23.00	3,227.87	575.80	244.41	-575.25	0.00	0.00	0.00
3,400.00	14.00	23.00	3,324.90	598.07	253.87	-597.49	0.00	0.00	0.00
3,500.00	14.00	23.00	3,421.93	620.34	263.32	-619.74	0.00	0.00	0.00
3,600.00	14.00	23.00	3,518.95	642.61	272.77	-641.99	0.00	0.00	0.00
3,700.00	14.00	23.00	3,615.98	664.88	282.22	-664.24	0.00	0.00	0.00
3,800.00	14.00	23.00	3,713.01	687.15	291.68	-686.48	0.00	0.00	0.00
3,900.00	14.00	23.00	3,810.04	709.42	301.13	-708.73	0.00	0.00	0.00
3,985.00	14.00	23.00	3,892.52	728.35	309.16	-727.64	0.00	0.00	0.00
Begin Drop @ 3985.00ft									
4,000.00	13.70	23.00	3,907.08	731.65	310.57	-730.94	2.00	-2.00	0.00
4,097.31	11.75	23.00	4,002.00	751.38	318.94	-750.66	2.00	-2.00	0.00
Parkman									

Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well CASTLE PINES 19-16HZ
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 19-16HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan A		
Design:	Permit Rev-2		

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)
4,100.00	11.70	23.00	4,004.63	751.89	319.16	-751.16	2.00	-2.00	0.00
4,200.00	9.70	23.00	4,102.89	768.98	326.41	-768.23	2.00	-2.00	0.00
4,300.00	7.70	23.00	4,201.73	782.90	332.32	-782.14	2.00	-2.00	0.00
4,400.00	5.70	23.00	4,301.04	793.64	336.88	-792.87	2.00	-2.00	0.00
4,497.29	3.75	23.00	4,398.00	801.02	340.01	-800.25	2.00	-2.00	0.00
Sussex									
4,500.00	3.70	23.00	4,400.70	801.18	340.08	-800.41	2.00	-2.00	0.00
4,600.00	1.70	23.00	4,500.59	805.52	341.92	-804.74	2.00	-2.00	0.00
4,685.00	0.00	0.00	4,585.57	806.68	342.41	-805.90	2.00	-2.00	0.00
End Drop @ 4685.00ft									
4,700.00	0.00	0.00	4,600.57	806.68	342.41	-805.90	0.00	0.00	0.00
4,800.00	0.00	0.00	4,700.57	806.68	342.41	-805.90	0.00	0.00	0.00
4,900.00	0.00	0.00	4,800.57	806.68	342.41	-805.90	0.00	0.00	0.00
5,000.00	0.00	0.00	4,900.57	806.68	342.41	-805.90	0.00	0.00	0.00
5,100.00	0.00	0.00	5,000.57	806.68	342.41	-805.90	0.00	0.00	0.00
5,200.00	0.00	0.00	5,100.57	806.68	342.41	-805.90	0.00	0.00	0.00
5,300.00	0.00	0.00	5,200.57	806.68	342.41	-805.90	0.00	0.00	0.00
5,400.00	0.00	0.00	5,300.57	806.68	342.41	-805.90	0.00	0.00	0.00
5,500.00	0.00	0.00	5,400.57	806.68	342.41	-805.90	0.00	0.00	0.00
5,600.00	0.00	0.00	5,500.57	806.68	342.41	-805.90	0.00	0.00	0.00
5,700.00	0.00	0.00	5,600.57	806.68	342.41	-805.90	0.00	0.00	0.00
5,800.00	0.00	0.00	5,700.57	806.68	342.41	-805.90	0.00	0.00	0.00
5,900.00	0.00	0.00	5,800.57	806.68	342.41	-805.90	0.00	0.00	0.00
6,000.00	0.00	0.00	5,900.57	806.68	342.41	-805.90	0.00	0.00	0.00
6,100.00	0.00	0.00	6,000.57	806.68	342.41	-805.90	0.00	0.00	0.00
6,200.00	0.00	0.00	6,100.57	806.68	342.41	-805.90	0.00	0.00	0.00
6,300.00	0.00	0.00	6,200.57	806.68	342.41	-805.90	0.00	0.00	0.00
6,400.00	0.00	0.00	6,300.57	806.68	342.41	-805.90	0.00	0.00	0.00
6,500.00	0.00	0.00	6,400.57	806.68	342.41	-805.90	0.00	0.00	0.00
6,600.00	0.00	0.00	6,500.57	806.68	342.41	-805.90	0.00	0.00	0.00
6,700.00	0.00	0.00	6,600.57	806.68	342.41	-805.90	0.00	0.00	0.00
6,776.24	0.00	0.00	6,676.81	806.68	342.41	-805.90	0.00	0.00	0.00
KOP @ 6776.24ft :: DLS = 8°/100'									
6,800.00	1.90	179.87	6,700.57	806.28	342.42	-805.50	8.00	8.00	0.00
6,900.00	9.90	179.87	6,799.96	796.01	342.44	-795.23	8.00	8.00	0.00
7,000.00	17.90	179.87	6,896.95	772.01	342.49	-771.23	8.00	8.00	0.00
7,100.00	25.90	179.87	6,989.66	734.74	342.57	-733.96	8.00	8.00	0.00
7,168.79	31.40	179.87	7,050.00	701.77	342.64	-700.99	8.00	8.00	0.00
Sharon Springs									
7,200.00	33.90	179.87	7,076.28	684.93	342.68	-684.15	8.00	8.00	0.00
7,247.76	37.72	179.87	7,115.00	656.99	342.74	-656.21	8.00	8.00	0.00
Niobrara									
7,300.00	41.90	179.87	7,155.12	623.55	342.82	-622.77	8.00	8.00	0.00
7,336.99	44.86	179.87	7,182.00	598.15	342.87	-597.37	8.00	8.00	0.00
Nio B									
7,400.00	49.90	179.87	7,224.66	551.79	342.97	-551.01	8.00	8.00	0.00
7,439.08	53.03	179.87	7,249.00	521.23	343.04	-520.45	8.00	8.00	0.00
Nio C									
7,500.00	57.90	179.87	7,283.53	471.06	343.15	-470.28	8.00	8.00	0.00
7,600.00	65.90	179.87	7,330.59	382.92	343.35	-382.14	8.00	8.00	0.00
7,700.00	73.90	179.87	7,364.92	289.08	343.55	-288.30	8.00	8.00	0.00
7,794.02	81.42	179.87	7,385.00	197.30	343.75	-196.52	8.00	8.00	0.00
Fort Hayes									

Corporate Planning Report

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Site:	2N-66W-19 CASTLE PINES 16-19HZ PAD	North Reference:	True
Well:	CASTLE PINES 19-16HZ	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)
7,800.00	81.90	179.87	7,385.87	191.39	343.77	-190.60	8.00	8.00	0.00
7,897.90	89.73	179.87	7,393.00	93.82	343.98	-93.04	8.00	8.00	0.00
End Build @ 7897.90ft - Top of Production									
7,900.00	89.73	179.87	7,393.01	91.72	343.99	-90.94	0.00	0.00	0.00
8,000.00	89.73	179.87	7,393.48	-8.28	344.20	9.06	0.00	0.00	0.00
8,100.00	89.73	179.87	7,393.95	-108.27	344.42	109.06	0.00	0.00	0.00
8,200.00	89.73	179.87	7,394.41	-208.27	344.64	209.06	0.00	0.00	0.00
8,300.00	89.73	179.87	7,394.88	-308.27	344.86	309.05	0.00	0.00	0.00
8,400.00	89.73	179.87	7,395.35	-408.27	345.08	409.05	0.00	0.00	0.00
8,500.00	89.73	179.87	7,395.81	-508.27	345.30	509.05	0.00	0.00	0.00
8,600.00	89.73	179.87	7,396.28	-608.27	345.52	609.05	0.00	0.00	0.00
8,700.00	89.73	179.87	7,396.74	-708.27	345.74	709.05	0.00	0.00	0.00
8,800.00	89.73	179.87	7,397.21	-808.27	345.96	809.05	0.00	0.00	0.00
8,900.00	89.73	179.87	7,397.68	-908.26	346.18	909.05	0.00	0.00	0.00
9,000.00	89.73	179.87	7,398.14	-1,008.26	346.40	1,009.05	0.00	0.00	0.00
9,100.00	89.73	179.87	7,398.61	-1,108.26	346.62	1,109.05	0.00	0.00	0.00
9,200.00	89.73	179.87	7,399.08	-1,208.26	346.84	1,209.04	0.00	0.00	0.00
9,300.00	89.73	179.87	7,399.54	-1,308.26	347.06	1,309.04	0.00	0.00	0.00
9,400.00	89.73	179.87	7,400.01	-1,408.26	347.28	1,409.04	0.00	0.00	0.00
9,500.00	89.73	179.87	7,400.48	-1,508.26	347.50	1,509.04	0.00	0.00	0.00
9,600.00	89.73	179.87	7,400.94	-1,608.26	347.72	1,609.04	0.00	0.00	0.00
9,700.00	89.73	179.87	7,401.41	-1,708.25	347.94	1,709.04	0.00	0.00	0.00
9,800.00	89.73	179.87	7,401.88	-1,808.25	348.16	1,809.04	0.00	0.00	0.00
9,900.00	89.73	179.87	7,402.34	-1,908.25	348.38	1,909.04	0.00	0.00	0.00
10,000.00	89.73	179.87	7,402.81	-2,008.25	348.60	2,009.04	0.00	0.00	0.00
10,100.00	89.73	179.87	7,403.27	-2,108.25	348.82	2,109.03	0.00	0.00	0.00
10,200.00	89.73	179.87	7,403.74	-2,208.25	349.04	2,209.03	0.00	0.00	0.00
10,300.00	89.73	179.87	7,404.21	-2,308.25	349.26	2,309.03	0.00	0.00	0.00
10,400.00	89.73	179.87	7,404.67	-2,408.24	349.48	2,409.03	0.00	0.00	0.00
10,500.00	89.73	179.87	7,405.14	-2,508.24	349.70	2,509.03	0.00	0.00	0.00
10,600.00	89.73	179.87	7,405.61	-2,608.24	349.92	2,609.03	0.00	0.00	0.00
10,700.00	89.73	179.87	7,406.07	-2,708.24	350.14	2,709.03	0.00	0.00	0.00
10,800.00	89.73	179.87	7,406.54	-2,808.24	350.36	2,809.03	0.00	0.00	0.00
10,898.65	89.73	179.87	7,407.00	-2,906.89	350.57	2,907.68	0.00	0.00	0.00
Codell									
10,900.00	89.73	179.87	7,407.01	-2,908.24	350.58	2,909.03	0.00	0.00	0.00
11,000.00	89.73	179.87	7,407.47	-3,008.24	350.80	3,009.02	0.00	0.00	0.00
11,100.00	89.73	179.87	7,407.94	-3,108.24	351.02	3,109.02	0.00	0.00	0.00
11,200.00	89.73	179.87	7,408.41	-3,208.23	351.24	3,209.02	0.00	0.00	0.00
11,300.00	89.73	179.87	7,408.87	-3,308.23	351.45	3,309.02	0.00	0.00	0.00
11,400.00	89.73	179.87	7,409.34	-3,408.23	351.67	3,409.02	0.00	0.00	0.00
11,500.00	89.73	179.87	7,409.81	-3,508.23	351.89	3,509.02	0.00	0.00	0.00
11,600.00	89.73	179.87	7,410.27	-3,608.23	352.11	3,609.02	0.00	0.00	0.00
11,700.00	89.73	179.87	7,410.74	-3,708.23	352.33	3,709.02	0.00	0.00	0.00
11,800.00	89.73	179.87	7,411.20	-3,808.23	352.55	3,809.02	0.00	0.00	0.00
11,900.00	89.73	179.87	7,411.67	-3,908.22	352.77	3,909.01	0.00	0.00	0.00
12,000.00	89.73	179.87	7,412.14	-4,008.22	352.99	4,009.01	0.00	0.00	0.00
12,100.00	89.73	179.87	7,412.60	-4,108.22	353.21	4,109.01	0.00	0.00	0.00
12,200.00	89.73	179.87	7,413.07	-4,208.22	353.43	4,209.01	0.00	0.00	0.00
12,300.00	89.73	179.87	7,413.54	-4,308.22	353.65	4,309.01	0.00	0.00	0.00
12,400.00	89.73	179.87	7,414.00	-4,408.22	353.87	4,409.01	0.00	0.00	0.00
12,500.00	89.73	179.87	7,414.47	-4,508.22	354.09	4,509.01	0.00	0.00	0.00
12,600.00	89.73	179.87	7,414.94	-4,608.22	354.31	4,609.01	0.00	0.00	0.00
12,700.00	89.73	179.87	7,415.40	-4,708.21	354.53	4,709.01	0.00	0.00	0.00

Corporate
Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well CASTLE PINES 19-16HZ
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 19-16HZ	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	89.73	179.87	7,415.87	-4,808.21	354.75	4,809.01	0.00	0.00	0.00
12,900.00	89.73	179.87	7,416.34	-4,908.21	354.97	4,909.00	0.00	0.00	0.00
13,000.00	89.73	179.87	7,416.80	-5,008.21	355.19	5,009.00	0.00	0.00	0.00
13,100.00	89.73	179.87	7,417.27	-5,108.21	355.41	5,109.00	0.00	0.00	0.00
13,200.00	89.73	179.87	7,417.73	-5,208.21	355.63	5,209.00	0.00	0.00	0.00
13,300.00	89.73	179.87	7,418.20	-5,308.21	355.85	5,309.00	0.00	0.00	0.00
13,400.00	89.73	179.87	7,418.67	-5,408.20	356.07	5,409.00	0.00	0.00	0.00
13,500.00	89.73	179.87	7,419.13	-5,508.20	356.29	5,509.00	0.00	0.00	0.00
13,600.00	89.73	179.87	7,419.60	-5,608.20	356.51	5,609.00	0.00	0.00	0.00
13,700.00	89.73	179.87	7,420.07	-5,708.20	356.73	5,709.00	0.00	0.00	0.00
13,800.00	89.73	179.87	7,420.53	-5,808.20	356.95	5,808.99	0.00	0.00	0.00
13,900.00	89.73	179.87	7,421.00	-5,908.20	357.17	5,908.99	0.00	0.00	0.00
14,000.00	89.73	179.87	7,421.47	-6,008.20	357.39	6,008.99	0.00	0.00	0.00
14,100.00	89.73	179.87	7,421.93	-6,108.20	357.61	6,108.99	0.00	0.00	0.00
14,200.00	89.73	179.87	7,422.40	-6,208.19	357.83	6,208.99	0.00	0.00	0.00
14,300.00	89.73	179.87	7,422.87	-6,308.19	358.05	6,308.99	0.00	0.00	0.00
14,400.00	89.73	179.87	7,423.33	-6,408.19	358.27	6,408.99	0.00	0.00	0.00
14,500.00	89.73	179.87	7,423.80	-6,508.19	358.48	6,508.99	0.00	0.00	0.00
14,600.00	89.73	179.87	7,424.26	-6,608.19	358.70	6,608.99	0.00	0.00	0.00
14,700.00	89.73	179.87	7,424.73	-6,708.19	358.92	6,708.98	0.00	0.00	0.00
14,800.00	89.73	179.87	7,425.20	-6,808.19	359.14	6,808.98	0.00	0.00	0.00
14,900.00	89.73	179.87	7,425.66	-6,908.18	359.36	6,908.98	0.00	0.00	0.00
15,000.00	89.73	179.87	7,426.13	-7,008.18	359.58	7,008.98	0.00	0.00	0.00
15,100.00	89.73	179.87	7,426.60	-7,108.18	359.80	7,108.98	0.00	0.00	0.00
15,200.00	89.73	179.87	7,427.06	-7,208.18	360.02	7,208.98	0.00	0.00	0.00
15,300.00	89.73	179.87	7,427.53	-7,308.18	360.24	7,308.98	0.00	0.00	0.00
15,400.00	89.73	179.87	7,428.00	-7,408.18	360.46	7,408.98	0.00	0.00	0.00
15,500.00	89.73	179.87	7,428.46	-7,508.18	360.68	7,508.98	0.00	0.00	0.00
15,600.00	89.73	179.87	7,428.93	-7,608.18	360.90	7,608.97	0.00	0.00	0.00
15,700.00	89.73	179.87	7,429.40	-7,708.17	361.12	7,708.97	0.00	0.00	0.00
15,800.00	89.73	179.87	7,429.86	-7,808.17	361.34	7,808.97	0.00	0.00	0.00
15,900.00	89.73	179.87	7,430.33	-7,908.17	361.56	7,908.97	0.00	0.00	0.00
16,000.00	89.73	179.87	7,430.79	-8,008.17	361.78	8,008.97	0.00	0.00	0.00
16,100.00	89.73	179.87	7,431.26	-8,108.17	362.00	8,108.97	0.00	0.00	0.00
16,200.00	89.73	179.87	7,431.73	-8,208.17	362.22	8,208.97	0.00	0.00	0.00
16,300.00	89.73	179.87	7,432.19	-8,308.17	362.44	8,308.97	0.00	0.00	0.00
16,400.00	89.73	179.87	7,432.66	-8,408.16	362.66	8,408.97	0.00	0.00	0.00
16,500.00	89.73	179.87	7,433.13	-8,508.16	362.88	8,508.96	0.00	0.00	0.00
16,600.00	89.73	179.87	7,433.59	-8,608.16	363.10	8,608.96	0.00	0.00	0.00
16,700.00	89.73	179.87	7,434.06	-8,708.16	363.32	8,708.96	0.00	0.00	0.00
16,800.00	89.73	179.87	7,434.53	-8,808.16	363.54	8,808.96	0.00	0.00	0.00
16,900.00	89.73	179.87	7,434.99	-8,908.16	363.76	8,908.96	0.00	0.00	0.00
17,000.00	89.73	179.87	7,435.46	-9,008.16	363.98	9,008.96	0.00	0.00	0.00
17,100.00	89.73	179.87	7,435.93	-9,108.16	364.20	9,108.96	0.00	0.00	0.00
17,200.00	89.73	179.87	7,436.39	-9,208.15	364.42	9,208.96	0.00	0.00	0.00
17,300.00	89.73	179.87	7,436.86	-9,308.15	364.64	9,308.96	0.00	0.00	0.00
17,400.00	89.73	179.87	7,437.32	-9,408.15	364.86	9,408.96	0.00	0.00	0.00
17,500.00	89.73	179.87	7,437.79	-9,508.15	365.08	9,508.95	0.00	0.00	0.00
17,600.00	89.73	179.87	7,438.26	-9,608.15	365.30	9,608.95	0.00	0.00	0.00
17,700.00	89.73	179.87	7,438.72	-9,708.15	365.51	9,708.95	0.00	0.00	0.00
17,800.00	89.73	179.87	7,439.19	-9,808.15	365.73	9,808.95	0.00	0.00	0.00
17,900.00	89.73	179.87	7,439.66	-9,908.14	365.95	9,908.95	0.00	0.00	0.00
18,000.00	89.73	179.87	7,440.12	-10,008.14	366.17	10,008.95	0.00	0.00	0.00
18,100.00	89.73	179.87	7,440.59	-10,108.14	366.39	10,108.95	0.00	0.00	0.00

Corporate Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well CASTLE PINES 19-16HZ
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 19-16HZ	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	89.73	179.87	7,441.06	-10,208.14	366.61	10,208.95	0.00	0.00	0.00
18,300.00	89.73	179.87	7,441.52	-10,308.14	366.83	10,308.95	0.00	0.00	0.00
18,400.00	89.73	179.87	7,441.99	-10,408.14	367.05	10,408.94	0.00	0.00	0.00
18,500.00	89.73	179.87	7,442.46	-10,508.14	367.27	10,508.94	0.00	0.00	0.00
18,600.00	89.73	179.87	7,442.92	-10,608.14	367.49	10,608.94	0.00	0.00	0.00
18,700.00	89.73	179.87	7,443.39	-10,708.13	367.71	10,708.94	0.00	0.00	0.00
18,800.00	89.73	179.87	7,443.85	-10,808.13	367.93	10,808.94	0.00	0.00	0.00
18,831.13	89.73	179.87	7,444.00	-10,839.26	368.00	10,840.07	0.00	0.00	0.00
TD Well @ 18831.13ft									

Casing Points				
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,519.24	1,500.00	9 5/8" Csg	9-5/8	13-1/2
7,897.90	7,393.00	Top of Production	5-1/2	7-7/8

Formations					
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,236.85	1,226.00	Fox Hills			
4,097.31	4,002.00	Parkman			
4,497.29	4,398.00	Sussex			
7,168.79	7,050.00	Sharon Springs			
7,247.76	7,115.00	Niobrara			
7,336.99	7,182.00	Nio B			
7,439.08	7,249.00	Nio C			
7,794.02	7,385.00	Fort Hayes			
10,898.65	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
1,183.33	1,174.07	104.44	44.33	End Nudge @ 1183.33ft
3,985.00	3,892.52	728.35	309.16	Begin Drop @ 3985.00ft
4,685.00	4,585.57	806.68	342.41	End Drop @ 4685.00ft
6,776.24	6,676.81	806.68	342.41	KOP @ 6776.24ft :: DLS = 8°/100'
7,897.90	7,393.00	93.82	343.98	End Build @ 7897.90ft
18,831.13	7,444.00	-10,839.26	368.00	TD Well @ 18831.13ft