

US ROCKIES WATTENBERG PLANNING

**WELD-NAD83-UTMFT13N
3N-67W-04 SWARTZ 2-4HZ PAD
SWARTZ 4-13HZ**

Plan A

Plan: Permit Rev-1

Standard Planning Report

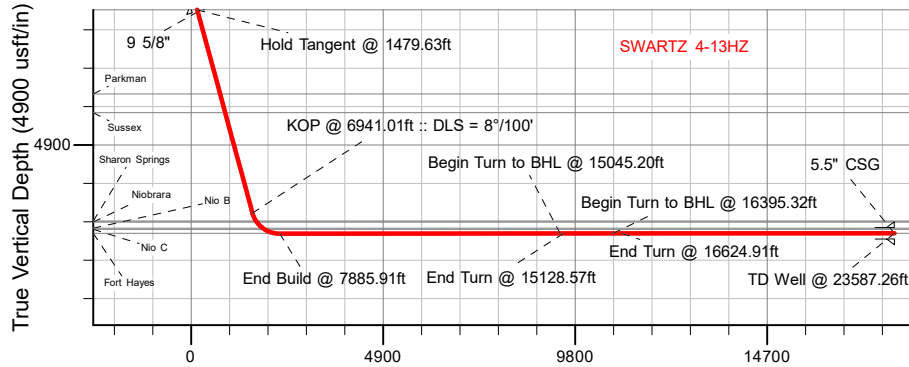
16 December, 2021

Project: WELD-NAD83-UTMFT13N
Site: 3N-67W-04 SWARTZ 2-4HZ PAD
Well: SWARTZ 4-13HZ
Wellbore: Plan A
Design: Permit Rev-1

US ROCKIES WATTENBERG PLANNING

CASING DETAILS

TVD	MD	Name	Size
1500.00	1523.36	9 5/8"	9-5/8
7154.00	23587.26	5.5" CSG	5-1/2



SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
250.30	0.00	0.00	250.30	0.00	0.00	0.00	0.00	0.00	
1479.63	18.44	234.95	1458.52	-112.63	-160.56	1.50	234.95	159.75	
6941.01	18.44	234.95	6639.49	-1104.72	-1574.77	0.00	0.00	1566.83	
7885.91	90.04	272.87	7166.00	-1177.85	-2273.38	8.00	39.38	2264.89	
15045.20	90.04	272.87	7160.53	-820.00	-9423.71	0.00	0.00	9417.60	SWARTZ 4-13HZ_Lat Tgt
15128.57	90.04	271.20	7160.47	-817.05	-9507.03	2.00	-90.00	9500.94	
16395.32	90.04	271.20	7159.50	-790.61	-10773.50	0.00	0.00	10767.57	SWARTZ 4-13HZ_Lat Tgt 2
16624.91	90.04	267.75	7159.32	-792.72	-11003.05	1.50	-90.00	10997.10	
23587.26	90.04	267.75	7154.00	-1065.83	-17960.03	0.00	0.00	17951.95	SWARTZ 4-13HZ_BHL

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	Northing	Easting	Latitude	Longitude
SWARTZ 4-13HZ_SHL	0.00	14621458.74	1670593.72	40.260077	-104.891833
SWARTZ 4-13HZ_LP	7166.00	14620278.12	1668321.78	40.256843	-104.899981
SWARTZ 4-13HZ_BHL	7154.00	14620371.00	1652635.00	40.257133	-104.956206

SHL
752' FNL
1611' FEL

LP
1967' FNL
1367' FWL

BHL
2082' FNL
1270' FWL

WELL DETAILS: SWARTZ 4-13HZ

GL = 4825'

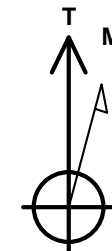
RKB = 17' @ 4842.00usft (RIG)

Plan: Permit Rev-1 (SWARTZ 4-13HZ/Plan A)

Date: 12/16/2021

FORMATION TOP DETAILS

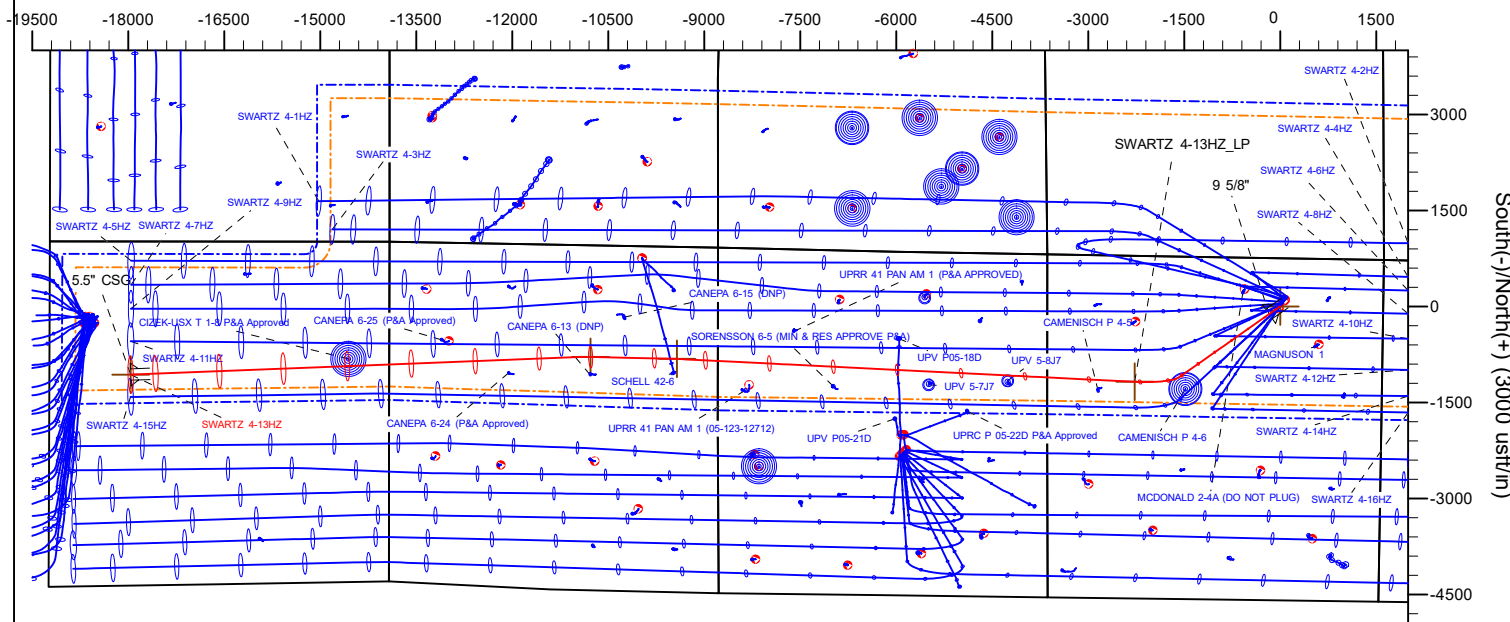
TVDPath	MDPath	Formation
707.00	708.10	Fox Hills
3598.00	3734.91	Parkman
4080.00	4243.00	Sussex
6841.00	7166.17	Sharon Springs
6871.00	7203.09	Niobrara
7023.00	7419.94	Nio B
7055.00	7476.98	Nio C
7157.00	7770.50	Fort Hayes



Azimuths to True North
Magnetic North: 7.86°

Magnetic Field
Strength: 51820.0nT
Dip Angle: 66.50°
Date: 11/26/2021
Model: IGRF2020

West(-)/East(+) (3000 usft/in)



Planning Report

Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well SWARTZ 4-13HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 4842.00usft (RIG)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4842.00usft (RIG)
Site:	3N-67W-04 SWARTZ 2-4HZ PAD	North Reference:	True
Well:	SWARTZ 4-13HZ	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		3N-67W-04 SWARTZ 2-4HZ PAD			
Site Position:		Northing:	14,621,599.90 usft	Latitude:	40.260465
From:	Map	Easting:	1,670,705.29 usft	Longitude:	-104.891433
Position Uncertainty:		0.00 usft	Slot Radius:	13-3/16 "	

Well		SWARTZ 4-13HZ				
Well Position	+N/-S	0.00 usft	Northing:	14,621,458.74 usft	Latitude:	40.260078
	+E/-W	0.00 usft	Easting:	1,670,593.72 usft	Longitude:	-104.891833
Position Uncertainty		3.28 usft	Wellhead Elevation:	usft	Ground Level:	4,825.00 usft
Grid Convergence:		0.07 °				

Wellbore	Plan A				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF202013	11/26/2021	7.86	66.50	51,820.03806600

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	270.41	

Plan Survey Tool Program	Date	12/15/2021			
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks	
1	0.00	2,000.00	Permit Rev-1 (Plan A)	APC_ISCWSA REV 2 MWD	
				Fixed:v2:standard declination	
2	2,000.00	23,587.26	Permit Rev-1 (Plan A)	APC_ISCWSA REV 2 MWD+I	
				Fixed:v2:Rockies, crustal dec +	

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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	
250.30	0.00	0.00	250.30	0.00	0.00	0.00	0.00	0.00	0.00	
1,479.63	18.44	234.95	1,458.52	-112.63	-160.56	1.50	1.50	0.00	234.95	
6,941.01	18.44	234.95	6,639.49	-1,104.72	-1,574.77	0.00	0.00	0.00	0.00	
7,885.91	90.04	272.87	7,166.00	-1,177.85	-2,273.38	8.00	7.58	4.01	39.38	
15,045.20	90.04	272.87	7,160.53	-820.00	-9,423.71	0.00	0.00	0.00	0.00	SWARTZ 4-13HZ_La
15,128.57	90.04	271.20	7,160.47	-817.05	-9,507.03	2.00	0.00	-2.00	-90.00	
16,395.32	90.04	271.20	7,159.50	-790.61	-10,773.50	0.00	0.00	0.00	0.00	SWARTZ 4-13HZ_La
16,624.91	90.04	267.75	7,159.32	-792.72	-11,003.05	1.50	0.00	-1.50	-90.00	
23,587.26	90.04	267.75	7,154.00	-1,065.83	-17,960.03	0.00	0.00	0.00	0.00	SWARTZ 4-13HZ_BH

Planning Report

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Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4842.00usft (RIG)
Site:	3N-67W-04 SWARTZ 2-4HZ PAD	North Reference:	True
Well:	SWARTZ 4-13HZ	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)
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
250.30	0.00	0.00	250.30	0.00	0.00	0.00	0.00	0.00	0.00
Begin Nudge @ 250.30ft									
300.00	0.75	234.95	300.00	-0.19	-0.26	0.26	1.50	1.50	0.00
400.00	2.25	234.95	399.96	-1.68	-2.40	2.39	1.50	1.50	0.00
500.00	3.75	234.95	499.82	-4.69	-6.68	6.65	1.50	1.50	0.00
600.00	5.25	234.95	599.51	-9.19	-13.10	13.03	1.50	1.50	0.00
700.00	6.75	234.95	698.96	-15.18	-21.65	21.54	1.50	1.50	0.00
708.10	6.87	234.95	707.00	-15.74	-22.43	22.32	1.50	1.50	0.00
Fox Hills									
800.00	8.25	234.95	798.10	-22.68	-32.33	32.16	1.50	1.50	0.00
900.00	9.75	234.95	896.87	-31.66	-45.12	44.90	1.50	1.50	0.00
1,000.00	11.25	234.95	995.20	-42.12	-60.04	59.73	1.50	1.50	0.00
1,100.00	12.75	234.95	1,093.01	-54.05	-77.05	76.66	1.50	1.50	0.00
1,200.00	14.25	234.95	1,190.25	-67.45	-96.16	95.67	1.50	1.50	0.00
1,300.00	15.75	234.95	1,286.84	-82.31	-117.34	116.74	1.50	1.50	0.00
1,400.00	17.25	234.95	1,382.72	-98.62	-140.58	139.87	1.50	1.50	0.00
1,479.63	18.44	234.95	1,458.52	-112.63	-160.56	159.75	1.50	1.50	0.00
Hold Tangent @ 1479.63ft									
1,500.00	18.44	234.95	1,477.84	-116.33	-165.83	164.99	0.00	0.00	0.00
1,523.36	18.44	234.95	1,500.00	-120.57	-171.88	171.01	0.00	0.00	0.00
9 5/8"									
1,600.00	18.44	234.95	1,572.71	-134.50	-191.72	190.76	0.00	0.00	0.00
1,700.00	18.44	234.95	1,667.57	-152.66	-217.62	216.52	0.00	0.00	0.00
1,800.00	18.44	234.95	1,762.44	-170.83	-243.51	242.29	0.00	0.00	0.00
1,900.00	18.44	234.95	1,857.30	-188.99	-269.41	268.05	0.00	0.00	0.00
2,000.00	18.44	234.95	1,952.17	-207.16	-295.30	293.81	0.00	0.00	0.00
2,100.00	18.44	234.95	2,047.03	-225.32	-321.20	319.58	0.00	0.00	0.00
2,200.00	18.44	234.95	2,141.90	-243.49	-347.09	345.34	0.00	0.00	0.00
2,300.00	18.44	234.95	2,236.77	-261.65	-372.99	371.11	0.00	0.00	0.00
2,400.00	18.44	234.95	2,331.63	-279.82	-398.88	396.87	0.00	0.00	0.00
2,500.00	18.44	234.95	2,426.50	-297.99	-424.78	422.63	0.00	0.00	0.00
2,600.00	18.44	234.95	2,521.36	-316.15	-450.67	448.40	0.00	0.00	0.00
2,700.00	18.44	234.95	2,616.23	-334.32	-476.57	474.16	0.00	0.00	0.00
2,800.00	18.44	234.95	2,711.09	-352.48	-502.46	499.93	0.00	0.00	0.00
2,900.00	18.44	234.95	2,805.96	-370.65	-528.36	525.69	0.00	0.00	0.00
3,000.00	18.44	234.95	2,900.82	-388.81	-554.25	551.46	0.00	0.00	0.00
3,100.00	18.44	234.95	2,995.69	-406.98	-580.15	577.22	0.00	0.00	0.00
3,200.00	18.44	234.95	3,090.56	-425.14	-606.04	602.98	0.00	0.00	0.00
3,300.00	18.44	234.95	3,185.42	-443.31	-631.94	628.75	0.00	0.00	0.00
3,400.00	18.44	234.95	3,280.29	-461.47	-657.83	654.51	0.00	0.00	0.00
3,500.00	18.44	234.95	3,375.15	-479.64	-683.73	680.28	0.00	0.00	0.00
3,600.00	18.44	234.95	3,470.02	-497.81	-709.62	706.04	0.00	0.00	0.00
3,700.00	18.44	234.95	3,564.88	-515.97	-735.52	731.81	0.00	0.00	0.00
3,734.91	18.44	234.95	3,598.00	-522.31	-744.56	740.80	0.00	0.00	0.00
Parkman									
3,800.00	18.44	234.95	3,659.75	-534.14	-761.41	757.57	0.00	0.00	0.00
3,900.00	18.44	234.95	3,754.61	-552.30	-787.31	783.33	0.00	0.00	0.00
4,000.00	18.44	234.95	3,849.48	-570.47	-813.20	809.10	0.00	0.00	0.00
4,100.00	18.44	234.95	3,944.35	-588.63	-839.10	834.86	0.00	0.00	0.00
4,200.00	18.44	234.95	4,039.21	-606.80	-864.99	860.63	0.00	0.00	0.00
4,243.00	18.44	234.95	4,080.00	-614.61	-876.12	871.70	0.00	0.00	0.00

Planning Report

Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well SWARTZ 4-13HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 4842.00usft (RIG)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4842.00usft (RIG)
Site:	3N-67W-04 SWARTZ 2-4HZ PAD	North Reference:	True
Well:	SWARTZ 4-13HZ	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)
Sussex									
4,300.00	18.44	234.95	4,134.08	-624.96	-890.89	886.39	0.00	0.00	0.00
4,400.00	18.44	234.95	4,228.94	-643.13	-916.78	912.16	0.00	0.00	0.00
4,500.00	18.44	234.95	4,323.81	-661.30	-942.68	937.92	0.00	0.00	0.00
4,600.00	18.44	234.95	4,418.67	-679.46	-968.57	963.68	0.00	0.00	0.00
4,700.00	18.44	234.95	4,513.54	-697.63	-994.47	989.45	0.00	0.00	0.00
4,800.00	18.44	234.95	4,608.40	-715.79	-1,020.36	1,015.21	0.00	0.00	0.00
4,900.00	18.44	234.95	4,703.27	-733.96	-1,046.25	1,040.98	0.00	0.00	0.00
5,000.00	18.44	234.95	4,798.14	-752.12	-1,072.15	1,066.74	0.00	0.00	0.00
5,100.00	18.44	234.95	4,893.00	-770.29	-1,098.04	1,092.50	0.00	0.00	0.00
5,200.00	18.44	234.95	4,987.87	-788.45	-1,123.94	1,118.27	0.00	0.00	0.00
5,300.00	18.44	234.95	5,082.73	-806.62	-1,149.83	1,144.03	0.00	0.00	0.00
5,400.00	18.44	234.95	5,177.60	-824.78	-1,175.73	1,169.80	0.00	0.00	0.00
5,500.00	18.44	234.95	5,272.46	-842.95	-1,201.62	1,195.56	0.00	0.00	0.00
5,600.00	18.44	234.95	5,367.33	-861.12	-1,227.52	1,221.33	0.00	0.00	0.00
5,700.00	18.44	234.95	5,462.19	-879.28	-1,253.41	1,247.09	0.00	0.00	0.00
5,800.00	18.44	234.95	5,557.06	-897.45	-1,279.31	1,272.85	0.00	0.00	0.00
5,900.00	18.44	234.95	5,651.93	-915.61	-1,305.20	1,298.62	0.00	0.00	0.00
6,000.00	18.44	234.95	5,746.79	-933.78	-1,331.10	1,324.38	0.00	0.00	0.00
6,100.00	18.44	234.95	5,841.66	-951.94	-1,356.99	1,350.15	0.00	0.00	0.00
6,200.00	18.44	234.95	5,936.52	-970.11	-1,382.89	1,375.91	0.00	0.00	0.00
6,300.00	18.44	234.95	6,031.39	-988.27	-1,408.78	1,401.68	0.00	0.00	0.00
6,400.00	18.44	234.95	6,126.25	-1,006.44	-1,434.68	1,427.44	0.00	0.00	0.00
6,500.00	18.44	234.95	6,221.12	-1,024.60	-1,460.57	1,453.20	0.00	0.00	0.00
6,600.00	18.44	234.95	6,315.98	-1,042.77	-1,486.47	1,478.97	0.00	0.00	0.00
6,700.00	18.44	234.95	6,410.85	-1,060.94	-1,512.36	1,504.73	0.00	0.00	0.00
6,800.00	18.44	234.95	6,505.72	-1,079.10	-1,538.26	1,530.50	0.00	0.00	0.00
6,900.00	18.44	234.95	6,600.58	-1,097.27	-1,564.15	1,556.26	0.00	0.00	0.00
6,941.01	18.44	234.95	6,639.49	-1,104.72	-1,574.77	1,566.83	0.00	0.00	0.00
KOP @ 6941.01ft :: DLS = 8°/100'									
6,950.00	19.00	236.35	6,648.00	-1,106.34	-1,577.15	1,569.20	8.00	6.24	15.59
7,000.00	22.28	242.86	6,694.79	-1,115.18	-1,592.37	1,584.35	8.00	6.56	13.02
7,050.00	25.76	247.74	6,740.46	-1,123.63	-1,610.87	1,602.79	8.00	6.95	9.75
7,100.00	29.36	251.50	6,784.78	-1,131.63	-1,632.56	1,624.42	8.00	7.20	7.53
7,150.00	33.05	254.50	6,827.54	-1,139.17	-1,657.33	1,649.14	8.00	7.37	6.00
7,166.17	34.25	255.35	6,841.00	-1,141.50	-1,665.98	1,657.77	8.00	7.46	5.23
Sharon Springs									
7,200.00	36.79	256.96	6,868.53	-1,146.19	-1,685.07	1,676.82	8.00	7.51	4.76
7,203.09	37.03	257.10	6,871.00	-1,146.61	-1,686.87	1,678.63	8.00	7.54	4.45
Niobrara									
7,250.00	40.58	259.02	6,907.56	-1,152.67	-1,715.63	1,707.34	8.00	7.58	4.10
7,300.00	44.40	260.78	6,944.42	-1,158.57	-1,748.88	1,740.54	8.00	7.64	3.53
7,350.00	48.24	262.32	6,978.94	-1,163.87	-1,784.64	1,776.26	8.00	7.69	3.07
7,400.00	52.10	263.68	7,010.96	-1,168.54	-1,822.74	1,814.34	8.00	7.72	2.73
7,419.94	53.65	264.18	7,023.00	-1,170.22	-1,838.56	1,830.14	8.00	7.74	2.53
Nio B									
7,450.00	55.98	264.91	7,040.32	-1,172.55	-1,863.01	1,854.57	8.00	7.75	2.40
7,476.98	58.07	265.52	7,055.00	-1,174.44	-1,885.56	1,877.11	8.00	7.77	2.28
Nio C									
7,500.00	59.86	266.03	7,066.87	-1,175.89	-1,905.23	1,896.77	8.00	7.78	2.19
7,550.00	63.76	267.06	7,090.48	-1,178.54	-1,949.21	1,940.73	8.00	7.79	2.07
7,600.00	67.66	268.03	7,111.05	-1,180.48	-1,994.74	1,986.24	8.00	7.80	1.93
7,650.00	71.57	268.94	7,128.46	-1,181.72	-2,041.58	2,033.07	8.00	7.81	1.83

Planning Report

Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well SWARTZ 4-13HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 4842.00usft (RIG)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4842.00usft (RIG)
Site:	3N-67W-04 SWARTZ 2-4HZ PAD	North Reference:	True
Well:	SWARTZ 4-13HZ	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)
7,700.00	75.48	269.81	7,142.64	-1,182.23	-2,089.51	2,081.00	8.00	7.82	1.75
7,750.00	79.39	270.66	7,153.51	-1,182.03	-2,138.31	2,129.79	8.00	7.83	1.69
7,770.50	81.00	271.00	7,157.00	-1,181.74	-2,158.50	2,149.99	8.00	7.83	1.65
Fort Hayes									
7,800.00	83.31	271.48	7,161.03	-1,181.11	-2,187.72	2,179.21	8.00	7.83	1.64
7,850.00	87.23	272.29	7,165.15	-1,179.47	-2,237.51	2,229.02	8.00	7.84	1.62
7,885.91	90.04	272.87	7,166.00	-1,177.85	-2,273.38	2,264.89	8.00	7.84	1.61
End Build @ 7885.91ft									
7,900.00	90.04	272.87	7,165.99	-1,177.15	-2,287.44	2,278.96	0.00	0.00	0.00
8,000.00	90.04	272.87	7,165.92	-1,172.15	-2,387.32	2,378.87	0.00	0.00	0.00
8,100.00	90.04	272.87	7,165.84	-1,167.15	-2,487.19	2,478.78	0.00	0.00	0.00
8,200.00	90.04	272.87	7,165.76	-1,162.15	-2,587.07	2,578.69	0.00	0.00	0.00
8,300.00	90.04	272.87	7,165.69	-1,157.16	-2,686.94	2,678.60	0.00	0.00	0.00
8,400.00	90.04	272.87	7,165.61	-1,152.16	-2,786.82	2,778.50	0.00	0.00	0.00
8,500.00	90.04	272.87	7,165.53	-1,147.16	-2,886.69	2,878.41	0.00	0.00	0.00
8,600.00	90.04	272.87	7,165.46	-1,142.16	-2,986.57	2,978.32	0.00	0.00	0.00
8,700.00	90.04	272.87	7,165.38	-1,137.16	-3,086.44	3,078.23	0.00	0.00	0.00
8,800.00	90.04	272.87	7,165.30	-1,132.16	-3,186.32	3,178.14	0.00	0.00	0.00
8,900.00	90.04	272.87	7,165.23	-1,127.17	-3,286.19	3,278.04	0.00	0.00	0.00
9,000.00	90.04	272.87	7,165.15	-1,122.17	-3,386.07	3,377.95	0.00	0.00	0.00
9,100.00	90.04	272.87	7,165.08	-1,117.17	-3,485.94	3,477.86	0.00	0.00	0.00
9,200.00	90.04	272.87	7,165.00	-1,112.17	-3,585.82	3,577.77	0.00	0.00	0.00
9,300.00	90.04	272.87	7,164.92	-1,107.17	-3,685.69	3,677.68	0.00	0.00	0.00
9,400.00	90.04	272.87	7,164.85	-1,102.17	-3,785.57	3,777.59	0.00	0.00	0.00
9,500.00	90.04	272.87	7,164.77	-1,097.17	-3,885.44	3,877.49	0.00	0.00	0.00
9,600.00	90.04	272.87	7,164.69	-1,092.18	-3,985.32	3,977.40	0.00	0.00	0.00
9,700.00	90.04	272.87	7,164.62	-1,087.18	-4,085.19	4,077.31	0.00	0.00	0.00
9,800.00	90.04	272.87	7,164.54	-1,082.18	-4,185.07	4,177.22	0.00	0.00	0.00
9,900.00	90.04	272.87	7,164.46	-1,077.18	-4,284.94	4,277.13	0.00	0.00	0.00
10,000.00	90.04	272.87	7,164.39	-1,072.18	-4,384.82	4,377.03	0.00	0.00	0.00
10,100.00	90.04	272.87	7,164.31	-1,067.18	-4,484.69	4,476.94	0.00	0.00	0.00
10,200.00	90.04	272.87	7,164.23	-1,062.19	-4,584.57	4,576.85	0.00	0.00	0.00
10,300.00	90.04	272.87	7,164.16	-1,057.19	-4,684.44	4,676.76	0.00	0.00	0.00
10,400.00	90.04	272.87	7,164.08	-1,052.19	-4,784.32	4,776.67	0.00	0.00	0.00
10,500.00	90.04	272.87	7,164.00	-1,047.19	-4,884.19	4,876.58	0.00	0.00	0.00
10,600.00	90.04	272.87	7,163.93	-1,042.19	-4,984.07	4,976.48	0.00	0.00	0.00
10,700.00	90.04	272.87	7,163.85	-1,037.19	-5,083.94	5,076.39	0.00	0.00	0.00
10,800.00	90.04	272.87	7,163.78	-1,032.19	-5,183.82	5,176.30	0.00	0.00	0.00
10,900.00	90.04	272.87	7,163.70	-1,027.20	-5,283.69	5,276.21	0.00	0.00	0.00
11,000.00	90.04	272.87	7,163.62	-1,022.20	-5,383.57	5,376.12	0.00	0.00	0.00
11,100.00	90.04	272.87	7,163.55	-1,017.20	-5,483.44	5,476.02	0.00	0.00	0.00
11,200.00	90.04	272.87	7,163.47	-1,012.20	-5,583.32	5,575.93	0.00	0.00	0.00
11,300.00	90.04	272.87	7,163.39	-1,007.20	-5,683.19	5,675.84	0.00	0.00	0.00
11,400.00	90.04	272.87	7,163.32	-1,002.20	-5,783.07	5,775.75	0.00	0.00	0.00
11,500.00	90.04	272.87	7,163.24	-997.21	-5,882.94	5,875.66	0.00	0.00	0.00
11,600.00	90.04	272.87	7,163.16	-992.21	-5,982.82	5,975.57	0.00	0.00	0.00
11,700.00	90.04	272.87	7,163.09	-987.21	-6,082.69	6,075.47	0.00	0.00	0.00
11,800.00	90.04	272.87	7,163.01	-982.21	-6,182.57	6,175.38	0.00	0.00	0.00
11,900.00	90.04	272.87	7,162.93	-977.21	-6,282.44	6,275.29	0.00	0.00	0.00
12,000.00	90.04	272.87	7,162.86	-972.21	-6,382.32	6,375.20	0.00	0.00	0.00
12,100.00	90.04	272.87	7,162.78	-967.21	-6,482.19	6,475.11	0.00	0.00	0.00
12,200.00	90.04	272.87	7,162.71	-962.22	-6,582.07	6,575.01	0.00	0.00	0.00
12,300.00	90.04	272.87	7,162.63	-957.22	-6,681.94	6,674.92	0.00	0.00	0.00
12,400.00	90.04	272.87	7,162.55	-952.22	-6,781.82	6,774.83	0.00	0.00	0.00

Planning Report

Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well SWARTZ 4-13HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 4842.00usft (RIG)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4842.00usft (RIG)
Site:	3N-67W-04 SWARTZ 2-4HZ PAD	North Reference:	True
Well:	SWARTZ 4-13HZ	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)
12,500.00	90.04	272.87	7,162.48	-947.22	-6,881.69	6,874.74	0.00	0.00	0.00
12,600.00	90.04	272.87	7,162.40	-942.22	-6,981.57	6,974.65	0.00	0.00	0.00
12,700.00	90.04	272.87	7,162.32	-937.22	-7,081.44	7,074.56	0.00	0.00	0.00
12,800.00	90.04	272.87	7,162.25	-932.23	-7,181.32	7,174.46	0.00	0.00	0.00
12,900.00	90.04	272.87	7,162.17	-927.23	-7,281.19	7,274.37	0.00	0.00	0.00
13,000.00	90.04	272.87	7,162.09	-922.23	-7,381.07	7,374.28	0.00	0.00	0.00
13,100.00	90.04	272.87	7,162.02	-917.23	-7,480.94	7,474.19	0.00	0.00	0.00
13,200.00	90.04	272.87	7,161.94	-912.23	-7,580.82	7,574.10	0.00	0.00	0.00
13,300.00	90.04	272.87	7,161.86	-907.23	-7,680.69	7,674.00	0.00	0.00	0.00
13,400.00	90.04	272.87	7,161.79	-902.23	-7,780.57	7,773.91	0.00	0.00	0.00
13,500.00	90.04	272.87	7,161.71	-897.24	-7,880.44	7,873.82	0.00	0.00	0.00
13,600.00	90.04	272.87	7,161.63	-892.24	-7,980.32	7,973.73	0.00	0.00	0.00
13,700.00	90.04	272.87	7,161.56	-887.24	-8,080.19	8,073.64	0.00	0.00	0.00
13,800.00	90.04	272.87	7,161.48	-882.24	-8,180.07	8,173.55	0.00	0.00	0.00
13,900.00	90.04	272.87	7,161.41	-877.24	-8,279.94	8,273.45	0.00	0.00	0.00
14,000.00	90.04	272.87	7,161.33	-872.24	-8,379.82	8,373.36	0.00	0.00	0.00
14,100.00	90.04	272.87	7,161.25	-867.25	-8,479.69	8,473.27	0.00	0.00	0.00
14,200.00	90.04	272.87	7,161.18	-862.25	-8,579.57	8,573.18	0.00	0.00	0.00
14,300.00	90.04	272.87	7,161.10	-857.25	-8,679.44	8,673.09	0.00	0.00	0.00
14,400.00	90.04	272.87	7,161.02	-852.25	-8,779.32	8,772.99	0.00	0.00	0.00
14,500.00	90.04	272.87	7,160.95	-847.25	-8,879.19	8,872.90	0.00	0.00	0.00
14,600.00	90.04	272.87	7,160.87	-842.25	-8,979.07	8,972.81	0.00	0.00	0.00
14,700.00	90.04	272.87	7,160.79	-837.25	-9,078.94	9,072.72	0.00	0.00	0.00
14,800.00	90.04	272.87	7,160.72	-832.26	-9,178.82	9,172.63	0.00	0.00	0.00
14,900.00	90.04	272.87	7,160.64	-827.26	-9,278.69	9,272.54	0.00	0.00	0.00
15,000.00	90.04	272.87	7,160.56	-822.26	-9,378.57	9,372.44	0.00	0.00	0.00
15,045.20	90.04	272.87	7,160.53	-820.00	-9,423.71	9,417.60	0.00	0.00	0.00
Begin Turn to BHL @ 15045.20ft									
15,100.00	90.04	271.77	7,160.49	-817.79	-9,478.47	9,472.37	2.00	0.00	-2.00
15,128.57	90.04	271.20	7,160.47	-817.05	-9,507.03	9,500.94	2.00	0.00	-2.00
End Turn @ 15128.57ft									
15,200.00	90.04	271.20	7,160.41	-815.56	-9,578.44	9,572.36	0.00	0.00	0.00
15,300.00	90.04	271.20	7,160.34	-813.47	-9,678.42	9,672.35	0.00	0.00	0.00
15,400.00	90.04	271.20	7,160.26	-811.38	-9,778.40	9,772.34	0.00	0.00	0.00
15,500.00	90.04	271.20	7,160.18	-809.29	-9,878.37	9,872.33	0.00	0.00	0.00
15,600.00	90.04	271.20	7,160.11	-807.21	-9,978.35	9,972.32	0.00	0.00	0.00
15,700.00	90.04	271.20	7,160.03	-805.12	-10,078.33	10,072.31	0.00	0.00	0.00
15,800.00	90.04	271.20	7,159.95	-803.03	-10,178.31	10,172.30	0.00	0.00	0.00
15,900.00	90.04	271.20	7,159.88	-800.95	-10,278.29	10,272.29	0.00	0.00	0.00
16,000.00	90.04	271.20	7,159.80	-798.86	-10,378.27	10,372.28	0.00	0.00	0.00
16,100.00	90.04	271.20	7,159.73	-796.77	-10,478.24	10,472.27	0.00	0.00	0.00
16,200.00	90.04	271.20	7,159.65	-794.69	-10,578.22	10,572.26	0.00	0.00	0.00
16,300.00	90.04	271.20	7,159.57	-792.60	-10,678.20	10,672.26	0.00	0.00	0.00
16,395.32	90.04	271.20	7,159.50	-790.61	-10,773.50	10,767.57	0.00	0.00	0.00
Begin Turn to BHL @ 16395.32ft									
16,400.00	90.04	271.13	7,159.50	-790.52	-10,778.18	10,772.25	1.50	0.00	-1.50
16,500.00	90.04	269.63	7,159.42	-789.86	-10,878.17	10,872.24	1.50	0.00	-1.50
16,600.00	90.04	268.13	7,159.34	-791.82	-10,978.15	10,972.20	1.50	0.00	-1.50
16,624.91	90.04	267.75	7,159.32	-792.72	-11,003.05	10,997.10	1.50	0.00	-1.50
End Turn @ 16624.91ft									
16,700.00	90.04	267.75	7,159.27	-795.66	-11,078.08	11,072.10	0.00	0.00	0.00
16,800.00	90.04	267.75	7,159.19	-799.59	-11,178.00	11,171.99	0.00	0.00	0.00
16,900.00	90.04	267.75	7,159.11	-803.51	-11,277.92	11,271.89	0.00	0.00	0.00

Planning Report

Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well SWARTZ 4-13HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 4842.00usft (RIG)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4842.00usft (RIG)
Site:	3N-67W-04 SWARTZ 2-4HZ PAD	North Reference:	True
Well:	SWARTZ 4-13HZ	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)
17,000.00	90.04	267.75	7,159.04	-807.43	-11,377.85	11,371.78	0.00	0.00	0.00
17,100.00	90.04	267.75	7,158.96	-811.35	-11,477.77	11,471.67	0.00	0.00	0.00
17,200.00	90.04	267.75	7,158.88	-815.28	-11,577.69	11,571.56	0.00	0.00	0.00
17,300.00	90.04	267.75	7,158.81	-819.20	-11,677.62	11,671.45	0.00	0.00	0.00
17,400.00	90.04	267.75	7,158.73	-823.12	-11,777.54	11,771.35	0.00	0.00	0.00
17,500.00	90.04	267.75	7,158.66	-827.04	-11,877.46	11,871.24	0.00	0.00	0.00
17,600.00	90.04	267.75	7,158.58	-830.97	-11,977.38	11,971.13	0.00	0.00	0.00
17,700.00	90.04	267.75	7,158.50	-834.89	-12,077.31	12,071.02	0.00	0.00	0.00
17,800.00	90.04	267.75	7,158.43	-838.81	-12,177.23	12,170.92	0.00	0.00	0.00
17,900.00	90.04	267.75	7,158.35	-842.74	-12,277.15	12,270.81	0.00	0.00	0.00
18,000.00	90.04	267.75	7,158.27	-846.66	-12,377.08	12,370.70	0.00	0.00	0.00
18,100.00	90.04	267.75	7,158.20	-850.58	-12,477.00	12,470.59	0.00	0.00	0.00
18,200.00	90.04	267.75	7,158.12	-854.50	-12,576.92	12,570.49	0.00	0.00	0.00
18,300.00	90.04	267.75	7,158.04	-858.43	-12,676.85	12,670.38	0.00	0.00	0.00
18,400.00	90.04	267.75	7,157.97	-862.35	-12,776.77	12,770.27	0.00	0.00	0.00
18,500.00	90.04	267.75	7,157.89	-866.27	-12,876.69	12,870.16	0.00	0.00	0.00
18,600.00	90.04	267.75	7,157.81	-870.19	-12,976.61	12,970.06	0.00	0.00	0.00
18,700.00	90.04	267.75	7,157.74	-874.12	-13,076.54	13,069.95	0.00	0.00	0.00
18,800.00	90.04	267.75	7,157.66	-878.04	-13,176.46	13,169.84	0.00	0.00	0.00
18,900.00	90.04	267.75	7,157.58	-881.96	-13,276.38	13,269.73	0.00	0.00	0.00
19,000.00	90.04	267.75	7,157.51	-885.88	-13,376.31	13,369.63	0.00	0.00	0.00
19,100.00	90.04	267.75	7,157.43	-889.81	-13,476.23	13,469.52	0.00	0.00	0.00
19,200.00	90.04	267.75	7,157.36	-893.73	-13,576.15	13,569.41	0.00	0.00	0.00
19,300.00	90.04	267.75	7,157.28	-897.65	-13,676.08	13,669.30	0.00	0.00	0.00
19,400.00	90.04	267.75	7,157.20	-901.58	-13,776.00	13,769.19	0.00	0.00	0.00
19,500.00	90.04	267.75	7,157.13	-905.50	-13,875.92	13,869.09	0.00	0.00	0.00
19,600.00	90.04	267.75	7,157.05	-909.42	-13,975.84	13,968.98	0.00	0.00	0.00
19,700.00	90.04	267.75	7,156.97	-913.34	-14,075.77	14,068.87	0.00	0.00	0.00
19,800.00	90.04	267.75	7,156.90	-917.27	-14,175.69	14,168.76	0.00	0.00	0.00
19,900.00	90.04	267.75	7,156.82	-921.19	-14,275.61	14,268.66	0.00	0.00	0.00
20,000.00	90.04	267.75	7,156.74	-925.11	-14,375.54	14,368.55	0.00	0.00	0.00
20,100.00	90.04	267.75	7,156.67	-929.03	-14,475.46	14,468.44	0.00	0.00	0.00
20,200.00	90.04	267.75	7,156.59	-932.96	-14,575.38	14,568.33	0.00	0.00	0.00
20,300.00	90.04	267.75	7,156.51	-936.88	-14,675.31	14,668.23	0.00	0.00	0.00
20,400.00	90.04	267.75	7,156.44	-940.80	-14,775.23	14,768.12	0.00	0.00	0.00
20,500.00	90.04	267.75	7,156.36	-944.72	-14,875.15	14,868.01	0.00	0.00	0.00
20,600.00	90.04	267.75	7,156.28	-948.65	-14,975.07	14,967.90	0.00	0.00	0.00
20,700.00	90.04	267.75	7,156.21	-952.57	-15,075.00	15,067.80	0.00	0.00	0.00
20,800.00	90.04	267.75	7,156.13	-956.49	-15,174.92	15,167.69	0.00	0.00	0.00
20,900.00	90.04	267.75	7,156.06	-960.42	-15,274.84	15,267.58	0.00	0.00	0.00
21,000.00	90.04	267.75	7,155.98	-964.34	-15,374.77	15,367.47	0.00	0.00	0.00
21,100.00	90.04	267.75	7,155.90	-968.26	-15,474.69	15,467.37	0.00	0.00	0.00
21,200.00	90.04	267.75	7,155.83	-972.18	-15,574.61	15,567.26	0.00	0.00	0.00
21,300.00	90.04	267.75	7,155.75	-976.11	-15,674.54	15,667.15	0.00	0.00	0.00
21,400.00	90.04	267.75	7,155.67	-980.03	-15,774.46	15,767.04	0.00	0.00	0.00
21,500.00	90.04	267.75	7,155.60	-983.95	-15,874.38	15,866.93	0.00	0.00	0.00
21,600.00	90.04	267.75	7,155.52	-987.87	-15,974.30	15,966.83	0.00	0.00	0.00
21,700.00	90.04	267.75	7,155.44	-991.80	-16,074.23	16,066.72	0.00	0.00	0.00
21,800.00	90.04	267.75	7,155.37	-995.72	-16,174.15	16,166.61	0.00	0.00	0.00
21,900.00	90.04	267.75	7,155.29	-999.64	-16,274.07	16,266.50	0.00	0.00	0.00
22,000.00	90.04	267.75	7,155.21	-1,003.56	-16,374.00	16,366.40	0.00	0.00	0.00
22,100.00	90.04	267.75	7,155.14	-1,007.49	-16,473.92	16,466.29	0.00	0.00	0.00
22,200.00	90.04	267.75	7,155.06	-1,011.41	-16,573.84	16,566.18	0.00	0.00	0.00
22,300.00	90.04	267.75	7,154.98	-1,015.33	-16,673.77	16,666.07	0.00	0.00	0.00

Planning Report

Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well SWARTZ 4-13HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 4842.00usft (RIG)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4842.00usft (RIG)
Site:	3N-67W-04 SWARTZ 2-4HZ PAD	North Reference:	True
Well:	SWARTZ 4-13HZ	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)	
22,400.00	90.04	267.75	7,154.91	-1,019.26	-16,773.69	16,765.97	0.00	0.00	0.00	
22,500.00	90.04	267.75	7,154.83	-1,023.18	-16,873.61	16,865.86	0.00	0.00	0.00	
22,600.00	90.04	267.75	7,154.76	-1,027.10	-16,973.53	16,965.75	0.00	0.00	0.00	
22,700.00	90.04	267.75	7,154.68	-1,031.02	-17,073.46	17,065.64	0.00	0.00	0.00	
22,800.00	90.04	267.75	7,154.60	-1,034.95	-17,173.38	17,165.54	0.00	0.00	0.00	
22,900.00	90.04	267.75	7,154.53	-1,038.87	-17,273.30	17,265.43	0.00	0.00	0.00	
23,000.00	90.04	267.75	7,154.45	-1,042.79	-17,373.23	17,365.32	0.00	0.00	0.00	
23,100.00	90.04	267.75	7,154.37	-1,046.71	-17,473.15	17,465.21	0.00	0.00	0.00	
23,200.00	90.04	267.75	7,154.30	-1,050.64	-17,573.07	17,565.10	0.00	0.00	0.00	
23,300.00	90.04	267.75	7,154.22	-1,054.56	-17,673.00	17,665.00	0.00	0.00	0.00	
23,400.00	90.04	267.75	7,154.14	-1,058.48	-17,772.92	17,764.89	0.00	0.00	0.00	
23,500.00	90.04	267.75	7,154.07	-1,062.40	-17,872.84	17,864.78	0.00	0.00	0.00	
23,587.26	90.04	267.75	7,154.00	-1,065.83	-17,960.03	17,951.95	0.00	0.00	0.00	
TD Well @ 23587.26ft										

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
1,523.36	1,500.00	9 5/8"	9-5/8	13-1/2	
23,587.26	7,154.00	5.5" CSG	5-1/2	7-7/8	

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
708.10	707.00	Fox Hills				
3,734.91	3,598.00	Parkman				
4,243.00	4,080.00	Sussex				
7,166.17	6,841.00	Sharon Springs				
7,203.09	6,871.00	Niobrara				
7,419.94	7,023.00	Nio B				
7,476.98	7,055.00	Nio C				
7,770.50	7,157.00	Fort Hayes				

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
250.30	250.30	0.00	0.00	Begin Nudge @ 250.30ft	
1,479.63	1,458.52	-112.63	-160.56	Hold Tangent @ 1479.63ft	
6,941.01	6,639.49	-1,104.72	-1,574.77	KOP @ 6941.01ft :: DLS = 8°/100'	
7,885.91	7,166.00	-1,177.85	-2,273.38	End Build @ 7885.91ft	
15,045.20	7,160.53	-820.00	-9,423.71	Begin Turn to BHL @ 15045.20ft	
15,128.57	7,160.47	-817.05	-9,507.03	End Turn @ 15128.57ft	
16,395.32	7,159.50	-790.61	-10,773.50	Begin Turn to BHL @ 16395.32ft	
16,624.91	7,159.32	-792.72	-11,003.05	End Turn @ 16624.91ft	
23,587.26	7,154.00	-1,065.83	-17,960.03	TD Well @ 23587.26ft	