

US ROCKIES WATTENBERG PLANNING

WELD-NAD83-UTMFT13N

2N-67W-21 COWBOY 24-21HZ PAD

COWBOY 21-3HZ

Plan A

Plan: Permit Rev-1

SHL Lat/Long: 40.124675/-104.889414

Survey Program: MWD+IFR

Standard Planning Report

08 December, 2017

Project: WELD-NAD83-UTMFT13N
Site: 2N-67W-21 COWBOY 24-21HZ PAD
Well: COWBOY 21-3HZ
Wellbore: Plan A
Design: Permit Rev-1

US ROCKIES WATTENBERG PLANNING

CASING DETAILS			WELL DETAILS: COWBOY 21-3HZ GL = 5041' RKB = 17' @ 5058.00usft (Drilling Rig)
TVD	MD	Size	
1500.00 7516.00	1522.64 8036.27	9-5/8 5-1/2	

SECTION DETAILS

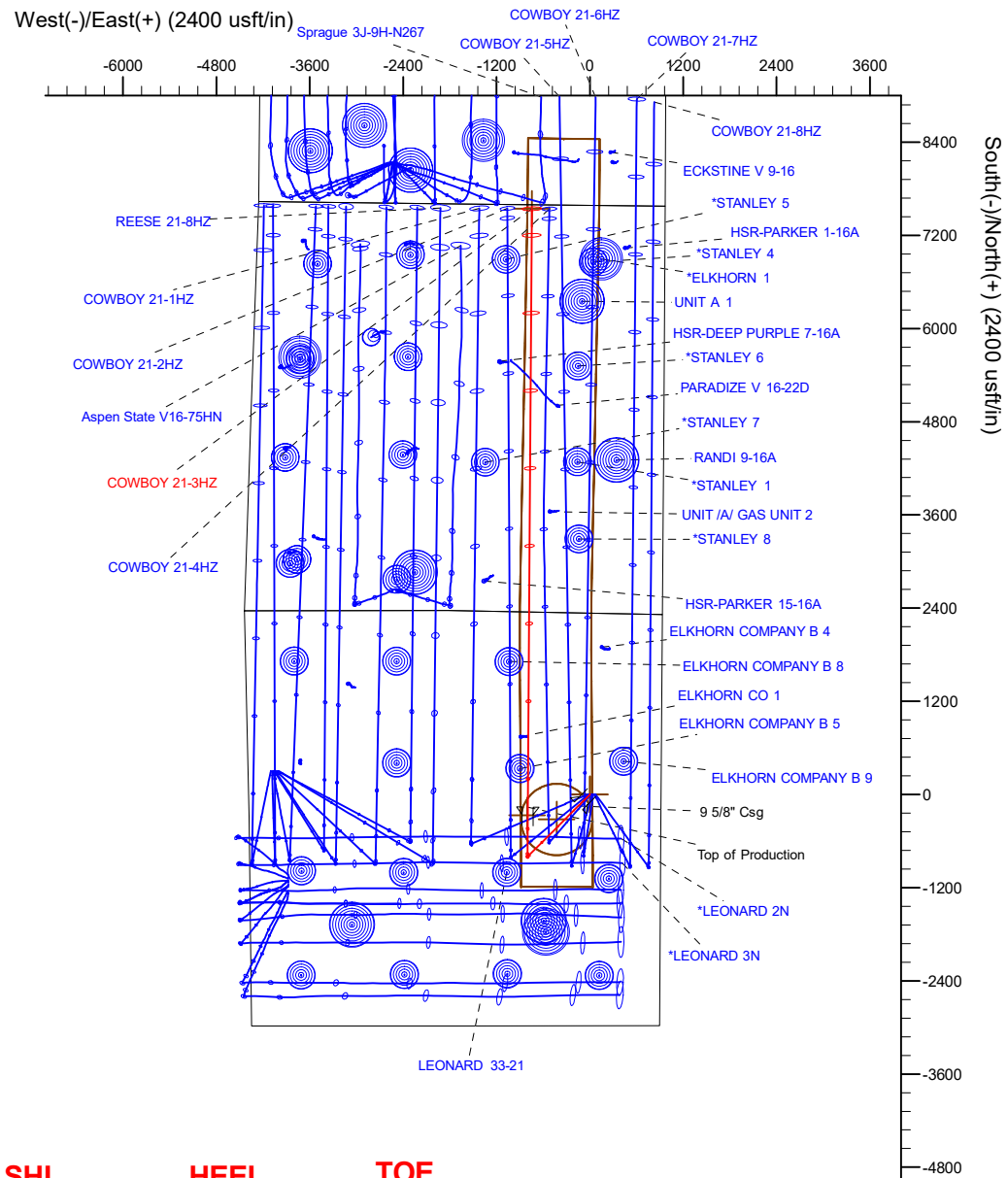
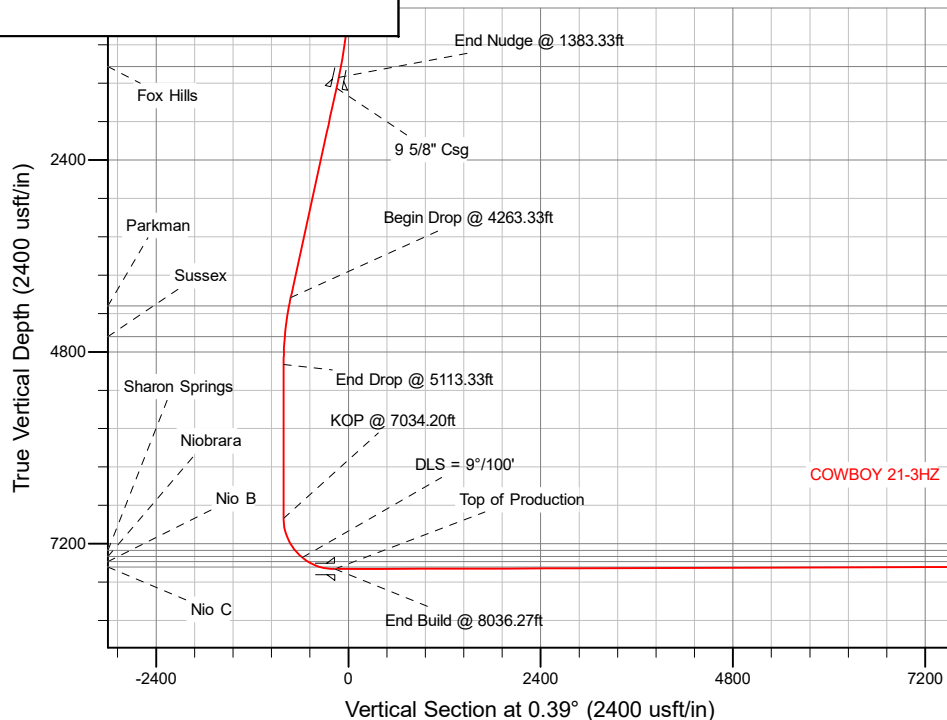
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	250.00	0.00	0.00	250.00	0.00	0.00	0.00	0.00	0.00	
3	1383.33	17.00	225.00	1366.78	-118.02	-118.02	1.50	225.00	-118.82	
4	4263.33	17.00	225.00	4120.94	-713.42	-713.42	0.00	0.00	-718.26	
5	5113.33	0.00	0.00	4958.52	-801.94	-801.94	2.00	180.00	-807.38	
6	7034.20	0.00	0.00	6879.39	-801.94	-801.94	0.00	0.00	-807.38	
7	8036.27	90.19	0.39	7516.00	-163.27	-797.63	9.00	0.39	-168.69	
8	15742.35	90.19	0.39	7491.00	7542.60	-745.60	0.00	0.00	7537.35	COWBOY 21-3HZ_BHL

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
COWBOY 21-3HZ_SHL	0.00	0.00	0.00	40.124675	-104.889414
COWBOY 21-3HZ_BHL	7491.00	7542.60	-745.60	40.145388	-104.892082

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
1232.00	1243.15	Fox Hills
4224.00	4370.52	Parkman
4609.00	4762.94	Sussex
7283.00	7471.37	Sharon Springs
7360.00	7578.88	Niobrara
7423.00	7685.75	Nio B
7491.00	7855.18	Nio C



SHL
2335' FNL
916' FEL

HEEL
2520' FNL
1713' FEL

TOE
50' FNL
1708' FEL

Plan: Permit Rev-1 (COWBOY 21-3HZ/Plan A)

Created By: _____ Date: 12/7/2017
Reviewed: _____ Date: _____

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-67W-21 COWBOY 24-21HZ PAD		
Site Position:		Northing:	14,572,152.72 usft
From:	Lat/Long	Easting:	1,671,300.07 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	40.124676
		Longitude:	-104.889521
		Grid Convergence:	0.07 °

Well	COWBOY 21-3HZ		
Well Position	+N/-S	-0.36 usft	Northing:
	+E/-W	29.91 usft	Easting:
Position Uncertainty	3.28 usft		Wellhead Elevation:
			Ground Level:
			5,041.00 usft

Wellbore	Plan A				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	11/30/2017	8.04	66.58	52,292.74728542

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	0.39

Plan Survey Tool Program	Date	12/7/2017		
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	1,500.00	Permit Rev-1 (Plan A)	APC_ISCWSA REV 2 MWD+II
				Fixed:v2:crustal field declination
2	1,500.00	15,742.35	Permit Rev-1 (Plan A)	APC_ISCWSA REV 2 MWD+II
				Fixed:v2:crustal field declination

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	
1,383.33	17.00	225.00	1,366.78	-118.02	-118.02	1.50	1.50	0.00	225.00	
4,263.33	17.00	225.00	4,120.94	-713.42	-713.42	0.00	0.00	0.00	0.00	
5,113.33	0.00	0.00	4,958.52	-801.94	-801.94	2.00	-2.00	15.88	180.00	
7,034.20	0.00	0.00	6,879.39	-801.94	-801.94	0.00	0.00	0.00	0.00	
8,036.27	90.19	0.39	7,516.00	-163.27	-797.63	9.00	9.00	0.04	0.39	
15,742.35	90.19	0.39	7,491.00	7,542.60	-745.60	0.00	0.00	0.00	0.00	COWBOY 21-3HZ_BI

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	225.00	300.00	-0.23	-0.23	-0.23	1.50	1.50	0.00
400.00	2.25	225.00	399.96	-2.08	-2.08	-2.10	1.50	1.50	0.00
500.00	3.75	225.00	499.82	-5.78	-5.78	-5.82	1.50	1.50	0.00
600.00	5.25	225.00	599.51	-11.33	-11.33	-11.41	1.50	1.50	0.00
700.00	6.75	225.00	698.96	-18.72	-18.72	-18.85	1.50	1.50	0.00
800.00	8.25	225.00	798.10	-27.95	-27.95	-28.14	1.50	1.50	0.00
900.00	9.75	225.00	896.87	-39.01	-39.01	-39.28	1.50	1.50	0.00
1,000.00	11.25	225.00	995.19	-51.90	-51.90	-52.25	1.50	1.50	0.00
1,100.00	12.75	225.00	1,093.00	-66.60	-66.60	-67.05	1.50	1.50	0.00
1,200.00	14.25	225.00	1,190.24	-83.11	-83.11	-83.67	1.50	1.50	0.00
1,243.15	14.90	225.00	1,232.00	-90.78	-90.78	-91.40	1.50	1.50	0.00
Fox Hills									
1,300.00	15.75	225.00	1,286.83	-101.41	-101.41	-102.09	1.50	1.50	0.00
1,383.33	17.00	225.00	1,366.78	-118.02	-118.02	-118.82	1.50	1.50	0.00
End Nudge @ 1383.33ft									
1,400.00	17.00	225.00	1,382.72	-121.46	-121.46	-122.29	0.00	0.00	0.00
1,500.00	17.00	225.00	1,478.35	-142.14	-142.14	-143.10	0.00	0.00	0.00
1,522.64	17.00	225.00	1,500.00	-146.82	-146.82	-147.82	0.00	0.00	0.00
9 5/8" Csg									
1,600.00	17.00	225.00	1,573.98	-162.81	-162.81	-163.92	0.00	0.00	0.00
1,700.00	17.00	225.00	1,669.61	-183.49	-183.49	-184.73	0.00	0.00	0.00
1,800.00	17.00	225.00	1,765.24	-204.16	-204.16	-205.54	0.00	0.00	0.00
1,900.00	17.00	225.00	1,860.87	-224.83	-224.83	-226.36	0.00	0.00	0.00
2,000.00	17.00	225.00	1,956.50	-245.51	-245.51	-247.17	0.00	0.00	0.00
2,100.00	17.00	225.00	2,052.13	-266.18	-266.18	-267.99	0.00	0.00	0.00
2,200.00	17.00	225.00	2,147.76	-286.85	-286.85	-288.80	0.00	0.00	0.00
2,300.00	17.00	225.00	2,243.39	-307.53	-307.53	-309.61	0.00	0.00	0.00
2,400.00	17.00	225.00	2,339.02	-328.20	-328.20	-330.43	0.00	0.00	0.00
2,500.00	17.00	225.00	2,434.65	-348.88	-348.88	-351.24	0.00	0.00	0.00
2,600.00	17.00	225.00	2,530.28	-369.55	-369.55	-372.06	0.00	0.00	0.00
2,700.00	17.00	225.00	2,625.91	-390.22	-390.22	-392.87	0.00	0.00	0.00
2,800.00	17.00	225.00	2,721.54	-410.90	-410.90	-413.68	0.00	0.00	0.00
2,900.00	17.00	225.00	2,817.17	-431.57	-431.57	-434.50	0.00	0.00	0.00
3,000.00	17.00	225.00	2,912.80	-452.25	-452.25	-455.31	0.00	0.00	0.00
3,100.00	17.00	225.00	3,008.43	-472.92	-472.92	-476.13	0.00	0.00	0.00
3,200.00	17.00	225.00	3,104.06	-493.59	-493.59	-496.94	0.00	0.00	0.00
3,300.00	17.00	225.00	3,199.70	-514.27	-514.27	-517.76	0.00	0.00	0.00
3,400.00	17.00	225.00	3,295.33	-534.94	-534.94	-538.57	0.00	0.00	0.00
3,500.00	17.00	225.00	3,390.96	-555.61	-555.61	-559.38	0.00	0.00	0.00
3,600.00	17.00	225.00	3,486.59	-576.29	-576.29	-580.20	0.00	0.00	0.00
3,700.00	17.00	225.00	3,582.22	-596.96	-596.96	-601.01	0.00	0.00	0.00
3,800.00	17.00	225.00	3,677.85	-617.64	-617.64	-621.83	0.00	0.00	0.00
3,900.00	17.00	225.00	3,773.48	-638.31	-638.31	-642.64	0.00	0.00	0.00
4,000.00	17.00	225.00	3,869.11	-658.98	-658.98	-663.45	0.00	0.00	0.00
4,100.00	17.00	225.00	3,964.74	-679.66	-679.66	-684.27	0.00	0.00	0.00
4,200.00	17.00	225.00	4,060.37	-700.33	-700.33	-705.08	0.00	0.00	0.00
4,263.33	17.00	225.00	4,120.94	-713.42	-713.42	-718.26	0.00	0.00	0.00
Begin Drop @ 4263.33ft									
4,300.00	16.27	225.00	4,156.07	-720.85	-720.85	-725.74	2.00	-2.00	0.00
4,370.52	14.86	225.00	4,224.00	-734.22	-734.22	-739.20	2.00	-2.00	0.00
Parkman									
4,400.00	14.27	225.00	4,252.53	-739.46	-739.46	-744.48	2.00	-2.00	0.00
4,500.00	12.27	225.00	4,349.86	-755.69	-755.69	-760.82	2.00	-2.00	0.00
4,600.00	10.27	225.00	4,447.93	-769.50	-769.50	-774.72	2.00	-2.00	0.00
4,700.00	8.27	225.00	4,546.62	-780.89	-780.89	-786.19	2.00	-2.00	0.00
4,762.94	7.01	225.00	4,609.00	-786.80	-786.80	-792.14	2.00	-2.00	0.00
Sussex									
4,800.00	6.27	225.00	4,645.81	-789.83	-789.83	-795.19	2.00	-2.00	0.00
4,900.00	4.27	225.00	4,745.38	-796.32	-796.32	-801.73	2.00	-2.00	0.00
5,000.00	2.27	225.00	4,845.21	-800.35	-800.35	-805.78	2.00	-2.00	0.00
5,100.00	0.27	225.00	4,945.19	-801.92	-801.92	-807.36	2.00	-2.00	0.00

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)
5,113.33	0.00	0.00	4,958.52	-801.94	-801.94	-807.38	2.00	-2.00	1,012.49
End Drop @ 5113.33ft									
5,200.00	0.00	0.00	5,045.19	-801.94	-801.94	-807.38	0.00	0.00	0.00
5,300.00	0.00	0.00	5,145.19	-801.94	-801.94	-807.38	0.00	0.00	0.00
5,400.00	0.00	0.00	5,245.19	-801.94	-801.94	-807.38	0.00	0.00	0.00
5,500.00	0.00	0.00	5,345.19	-801.94	-801.94	-807.38	0.00	0.00	0.00
5,600.00	0.00	0.00	5,445.19	-801.94	-801.94	-807.38	0.00	0.00	0.00
5,700.00	0.00	0.00	5,545.19	-801.94	-801.94	-807.38	0.00	0.00	0.00
5,800.00	0.00	0.00	5,645.19	-801.94	-801.94	-807.38	0.00	0.00	0.00
5,900.00	0.00	0.00	5,745.19	-801.94	-801.94	-807.38	0.00	0.00	0.00
6,000.00	0.00	0.00	5,845.19	-801.94	-801.94	-807.38	0.00	0.00	0.00
6,100.00	0.00	0.00	5,945.19	-801.94	-801.94	-807.38	0.00	0.00	0.00
6,200.00	0.00	0.00	6,045.19	-801.94	-801.94	-807.38	0.00	0.00	0.00
6,300.00	0.00	0.00	6,145.19	-801.94	-801.94	-807.38	0.00	0.00	0.00
6,400.00	0.00	0.00	6,245.19	-801.94	-801.94	-807.38	0.00	0.00	0.00
6,500.00	0.00	0.00	6,345.19	-801.94	-801.94	-807.38	0.00	0.00	0.00
6,600.00	0.00	0.00	6,445.19	-801.94	-801.94	-807.38	0.00	0.00	0.00
6,700.00	0.00	0.00	6,545.19	-801.94	-801.94	-807.38	0.00	0.00	0.00
6,800.00	0.00	0.00	6,645.19	-801.94	-801.94	-807.38	0.00	0.00	0.00
6,900.00	0.00	0.00	6,745.19	-801.94	-801.94	-807.38	0.00	0.00	0.00
7,000.00	0.00	0.00	6,845.19	-801.94	-801.94	-807.38	0.00	0.00	0.00
7,034.20	0.00	0.00	6,879.39	-801.94	-801.94	-807.38	0.00	0.00	0.00
KOP @ 7034.20ft									
7,100.00	5.92	0.39	6,945.07	-798.54	-801.92	-803.98	9.00	9.00	0.59
7,200.00	14.92	0.39	7,043.32	-780.47	-801.79	-785.91	9.00	9.00	0.00
7,300.00	23.92	0.39	7,137.53	-747.25	-801.57	-752.69	9.00	9.00	0.00
7,400.00	32.92	0.39	7,225.39	-699.71	-801.25	-705.14	9.00	9.00	0.00
7,471.37	39.35	0.39	7,283.00	-657.64	-800.96	-663.08	9.00	9.00	0.00
Sharon Springs									
7,500.00	41.92	0.39	7,304.72	-639.00	-800.84	-644.44	9.00	9.00	0.00
7,578.88	49.02	0.39	7,360.00	-582.81	-800.46	-588.24	9.00	9.00	0.00
Niobrara									
7,600.00	50.92	0.39	7,373.59	-566.63	-800.35	-572.07	9.00	9.00	0.00
DLS = 9°/100'									
7,685.75	58.64	0.39	7,423.00	-496.64	-799.88	-502.07	9.00	9.00	0.00
Nio B									
7,700.00	59.92	0.39	7,430.28	-484.39	-799.79	-489.82	9.00	9.00	0.00
7,800.00	68.92	0.39	7,473.41	-394.28	-799.19	-399.71	9.00	9.00	0.00
7,855.18	73.89	0.39	7,491.00	-342.00	-798.83	-347.43	9.00	9.00	0.00
Nio C									
7,900.00	77.92	0.39	7,501.91	-298.54	-798.54	-303.97	9.00	9.00	0.00
8,000.00	86.92	0.39	7,515.09	-199.52	-797.87	-204.94	9.00	9.00	0.00
8,036.27	90.19	0.39	7,516.00	-163.26	-797.63	-168.69	9.00	9.00	0.00
End Build @ 8036.27ft - Top of Production									
8,100.00	90.19	0.39	7,515.80	-99.53	-797.20	-104.96	0.00	0.00	0.00
8,200.00	90.19	0.39	7,515.47	0.46	-796.52	-4.96	0.00	0.00	0.00
8,300.00	90.19	0.39	7,515.15	100.46	-795.85	95.04	0.00	0.00	0.00
8,400.00	90.19	0.39	7,514.82	200.46	-795.17	195.04	0.00	0.00	0.00
8,500.00	90.19	0.39	7,514.50	300.45	-794.50	295.04	0.00	0.00	0.00
8,600.00	90.19	0.39	7,514.17	400.45	-793.82	395.04	0.00	0.00	0.00
8,700.00	90.19	0.39	7,513.85	500.45	-793.15	495.04	0.00	0.00	0.00
8,800.00	90.19	0.39	7,513.52	600.45	-792.47	595.04	0.00	0.00	0.00
8,900.00	90.19	0.39	7,513.20	700.44	-791.79	695.04	0.00	0.00	0.00
9,000.00	90.19	0.39	7,512.88	800.44	-791.12	795.04	0.00	0.00	0.00
9,100.00	90.19	0.39	7,512.55	900.44	-790.44	895.04	0.00	0.00	0.00
9,200.00	90.19	0.39	7,512.23	1,000.43	-789.77	995.04	0.00	0.00	0.00
9,300.00	90.19	0.39	7,511.90	1,100.43	-789.09	1,095.04	0.00	0.00	0.00
9,400.00	90.19	0.39	7,511.58	1,200.43	-788.42	1,195.03	0.00	0.00	0.00
9,500.00	90.19	0.39	7,511.25	1,300.43	-787.74	1,295.03	0.00	0.00	0.00
9,600.00	90.19	0.39	7,510.93	1,400.42	-787.07	1,395.03	0.00	0.00	0.00
9,700.00	90.19	0.39	7,510.60	1,500.42	-786.39	1,495.03	0.00	0.00	0.00
9,800.00	90.19	0.39	7,510.28	1,600.42	-785.72	1,595.03	0.00	0.00	0.00
9,900.00	90.19	0.39	7,509.96	1,700.42	-785.04	1,695.03	0.00	0.00	0.00
10,000.00	90.19	0.39	7,509.63	1,800.41	-784.37	1,795.03	0.00	0.00	0.00
10,100.00	90.19	0.39	7,509.31	1,900.41	-783.69	1,895.03	0.00	0.00	0.00

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)
10,200.00	90.19	0.39	7,508.98	2,000.41	-783.02	1,995.03	0.00	0.00	0.00
10,300.00	90.19	0.39	7,508.66	2,100.40	-782.34	2,095.03	0.00	0.00	0.00
10,400.00	90.19	0.39	7,508.33	2,200.40	-781.67	2,195.03	0.00	0.00	0.00
10,500.00	90.19	0.39	7,508.01	2,300.40	-780.99	2,295.03	0.00	0.00	0.00
10,600.00	90.19	0.39	7,507.68	2,400.40	-780.32	2,395.03	0.00	0.00	0.00
10,700.00	90.19	0.39	7,507.36	2,500.39	-779.64	2,495.03	0.00	0.00	0.00
10,800.00	90.19	0.39	7,507.04	2,600.39	-778.97	2,595.03	0.00	0.00	0.00
10,900.00	90.19	0.39	7,506.71	2,700.39	-778.29	2,695.03	0.00	0.00	0.00
11,000.00	90.19	0.39	7,506.39	2,800.38	-777.62	2,795.03	0.00	0.00	0.00
11,100.00	90.19	0.39	7,506.06	2,900.38	-776.94	2,895.03	0.00	0.00	0.00
11,200.00	90.19	0.39	7,505.74	3,000.38	-776.27	2,995.03	0.00	0.00	0.00
11,300.00	90.19	0.39	7,505.41	3,100.38	-775.59	3,095.02	0.00	0.00	0.00
11,400.00	90.19	0.39	7,505.09	3,200.37	-774.92	3,195.02	0.00	0.00	0.00
11,500.00	90.19	0.39	7,504.76	3,300.37	-774.24	3,295.02	0.00	0.00	0.00
11,600.00	90.19	0.39	7,504.44	3,400.37	-773.57	3,395.02	0.00	0.00	0.00
11,700.00	90.19	0.39	7,504.12	3,500.36	-772.89	3,495.02	0.00	0.00	0.00
11,800.00	90.19	0.39	7,503.79	3,600.36	-772.22	3,595.02	0.00	0.00	0.00
11,900.00	90.19	0.39	7,503.47	3,700.36	-771.54	3,695.02	0.00	0.00	0.00
12,000.00	90.19	0.39	7,503.14	3,800.36	-770.87	3,795.02	0.00	0.00	0.00
12,100.00	90.19	0.39	7,502.82	3,900.35	-770.19	3,895.02	0.00	0.00	0.00
12,200.00	90.19	0.39	7,502.49	4,000.35	-769.52	3,995.02	0.00	0.00	0.00
12,300.00	90.19	0.39	7,502.17	4,100.35	-768.84	4,095.02	0.00	0.00	0.00
12,400.00	90.19	0.39	7,501.84	4,200.34	-768.17	4,195.02	0.00	0.00	0.00
12,500.00	90.19	0.39	7,501.52	4,300.34	-767.49	4,295.02	0.00	0.00	0.00
12,600.00	90.19	0.39	7,501.20	4,400.34	-766.81	4,395.02	0.00	0.00	0.00
12,700.00	90.19	0.39	7,500.87	4,500.34	-766.14	4,495.02	0.00	0.00	0.00
12,800.00	90.19	0.39	7,500.55	4,600.33	-765.46	4,595.02	0.00	0.00	0.00
12,900.00	90.19	0.39	7,500.22	4,700.33	-764.79	4,695.02	0.00	0.00	0.00
13,000.00	90.19	0.39	7,499.90	4,800.33	-764.11	4,795.02	0.00	0.00	0.00
13,100.00	90.19	0.39	7,499.57	4,900.33	-763.44	4,895.02	0.00	0.00	0.00
13,200.00	90.19	0.39	7,499.25	5,000.32	-762.76	4,995.01	0.00	0.00	0.00
13,300.00	90.19	0.39	7,498.92	5,100.32	-762.09	5,095.01	0.00	0.00	0.00
13,400.00	90.19	0.39	7,498.60	5,200.32	-761.41	5,195.01	0.00	0.00	0.00
13,500.00	90.19	0.39	7,498.28	5,300.31	-760.74	5,295.01	0.00	0.00	0.00
13,600.00	90.19	0.39	7,497.95	5,400.31	-760.06	5,395.01	0.00	0.00	0.00
13,700.00	90.19	0.39	7,497.63	5,500.31	-759.39	5,495.01	0.00	0.00	0.00
13,800.00	90.19	0.39	7,497.30	5,600.31	-758.71	5,595.01	0.00	0.00	0.00
13,900.00	90.19	0.39	7,496.98	5,700.30	-758.04	5,695.01	0.00	0.00	0.00
14,000.00	90.19	0.39	7,496.65	5,800.30	-757.36	5,795.01	0.00	0.00	0.00
14,100.00	90.19	0.39	7,496.33	5,900.30	-756.69	5,895.01	0.00	0.00	0.00
14,200.00	90.19	0.39	7,496.00	6,000.29	-756.01	5,995.01	0.00	0.00	0.00
14,300.00	90.19	0.39	7,495.68	6,100.29	-755.34	6,095.01	0.00	0.00	0.00
14,400.00	90.19	0.39	7,495.36	6,200.29	-754.66	6,195.01	0.00	0.00	0.00
14,500.00	90.19	0.39	7,495.03	6,300.29	-753.99	6,295.01	0.00	0.00	0.00
14,600.00	90.19	0.39	7,494.71	6,400.28	-753.31	6,395.01	0.00	0.00	0.00
14,700.00	90.19	0.39	7,494.38	6,500.28	-752.64	6,495.01	0.00	0.00	0.00
14,800.00	90.19	0.39	7,494.06	6,600.28	-751.96	6,595.01	0.00	0.00	0.00
14,900.00	90.19	0.39	7,493.73	6,700.27	-751.29	6,695.01	0.00	0.00	0.00
15,000.00	90.19	0.39	7,493.41	6,800.27	-750.61	6,795.01	0.00	0.00	0.00
15,100.00	90.19	0.39	7,493.08	6,900.27	-749.94	6,895.00	0.00	0.00	0.00
15,200.00	90.19	0.39	7,492.76	7,000.27	-749.26	6,995.00	0.00	0.00	0.00
15,300.00	90.19	0.39	7,492.44	7,100.26	-748.59	7,095.00	0.00	0.00	0.00
15,400.00	90.19	0.39	7,492.11	7,200.26	-747.91	7,195.00	0.00	0.00	0.00
15,500.00	90.19	0.39	7,491.79	7,300.26	-747.24	7,295.00	0.00	0.00	0.00
15,600.00	90.19	0.39	7,491.46	7,400.26	-746.56	7,395.00	0.00	0.00	0.00
15,700.00	90.19	0.39	7,491.14	7,500.25	-745.89	7,495.00	0.00	0.00	0.00
15,742.35	90.19	0.39	7,491.00	7,542.60	-745.60	7,537.35	0.00	0.00	0.00

Casing Points					
	Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
	1,522.64	1,500.00	9 5/8" Csg	9-5/8	13-1/2
	8,036.27	7,516.00	Top of Production	5-1/2	7-7/8

Formations					
	Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°) Dip Direction (°)
	1,243.15	1,232.00	Fox Hills		
	4,370.52	4,224.00	Parkman		
	4,762.94	4,609.00	Sussex		
	7,471.37	7,283.00	Sharon Springs		
	7,578.88	7,360.00	Niobrara		
	7,685.75	7,423.00	Nio B		
	7,855.18	7,491.00	Nio C		

Plan Annotations					
	Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		
			+N/-S (usft)	+E/-W (usft)	Comment
	250.00	250.00	0.00	0.00	Begin Nudge @ 250.00ft
	1,383.33	1,366.78	-118.02	-118.02	End Nudge @ 1383.33ft
	4,263.33	4,120.94	-713.42	-713.42	Begin Drop @ 4263.33ft
	5,113.33	4,958.52	-801.94	-801.94	End Drop @ 5113.33ft
	7,034.20	6,879.39	-801.94	-801.94	KOP @ 7034.20ft
	7,600.00	7,373.59	-566.63	-800.35	DLS = 9°/100'
	8,036.27	7,516.00	-163.26	-797.63	End Build @ 8036.27ft
	15,742.35	7,491.00	7,542.60	-745.60	TD Well @ 15742.35ft