

Wellbore: OH
 Design: OH

PROJECT DETAILS: US Rockies Wattenberg Planning UTM83

WELL DETAILS: Marrs 29N-10HZ

Geodetic System: Universal Transverse Mercator (US Survey Feet)
 Datum: North American Datum 1983
 Ellipsoid: GRS 1980
 Zone: Zone 13N (108 W to 102 W)

GL 4981' & KB 17' @ 4998.00ft (Xtreme 24) 4981.00
 Northing 14540589.12 Easting 1674275.93 Latitude 40.0379870 Longitude -104.8790290

ANNOTATIONS

TVD	MD	Inc	Azi	+N/-S	+E/-W	Annotation
125.99	126.00	1.01	334.96	1.01	-0.47	First Total MWD Survey
1794.07	1836.00	16.44	236.26	-160.70	-275.75	Last Total MWD Survey
1899.66	1946.00	16.10	238.10	-177.40	-301.64	First SDI MWD Survey
6497.95	6589.00	0.94	331.90	-465.15	-453.99	First SDI MWD Curve Survey
6508.94	6600.00	2.03	349.81	-464.88	-454.06	Curve KOP
7183.64	7412.63	54.67	359.29	-60.34	-461.99	Enter Land Box : 7412.63' MD & 7183.64' TVD
7359.23	7919.00	85.11	0.86	408.74	-463.35	Last SDI MWD Curve Survey
7363.39	7980.00	87.06	0.66	469.58	-462.54	Landing Point : 1650' FNL 1548' FWL Sec 22
7364.61	8008.00	87.96	0.57	497.56	-462.24	First SDI MWD Lateral Survey
7379.92	8696.95	89.39	1.66	1186.10	-446.71	Exit 460' Circle : 8696.95' MD & 7379.92' TVD 934' FNL 1564' FWL
7440.11	14501.78	89.86	357.98	6988.21	-478.44	Enter 460' Circle : 14501.78' MD & 7440.11' TVD 399' FNL 1560' FWL
7413.65	15638.00	96.36	0.07	8123.53	-475.53	Last SDI MWD Survey
7406.89	15699.00	96.36	0.07	8184.16	-475.46	Projection to TD : 789' FSL 1572' FWL Sec 10

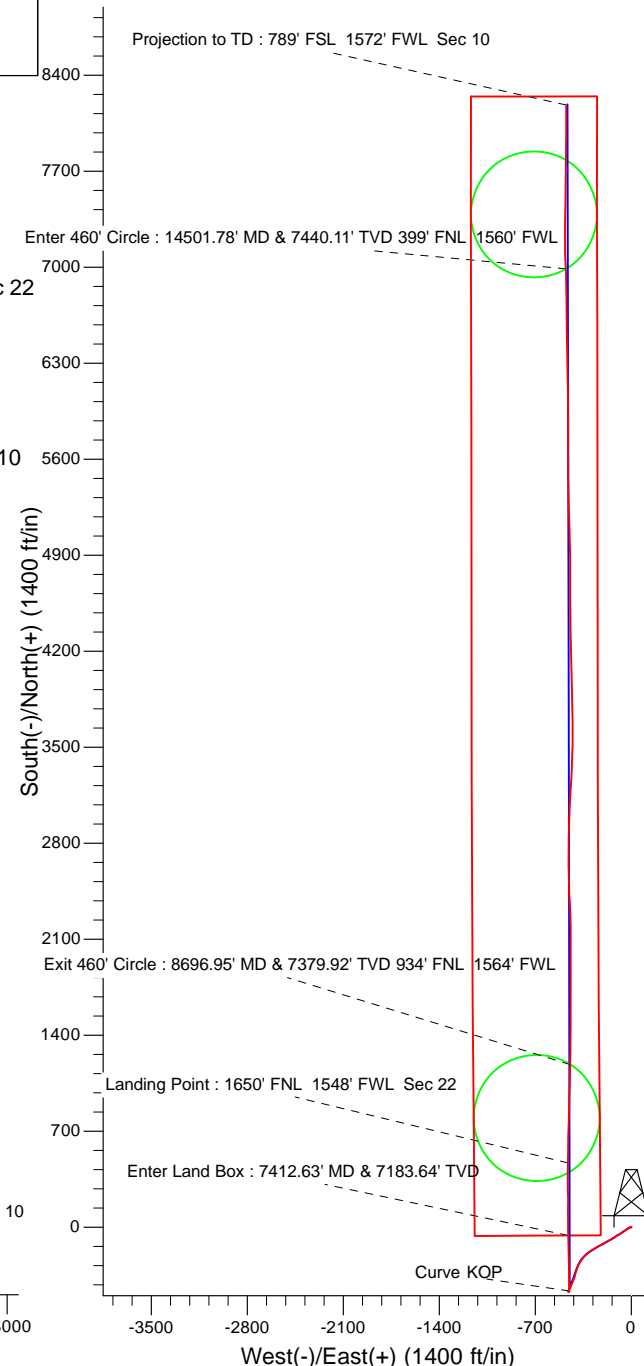
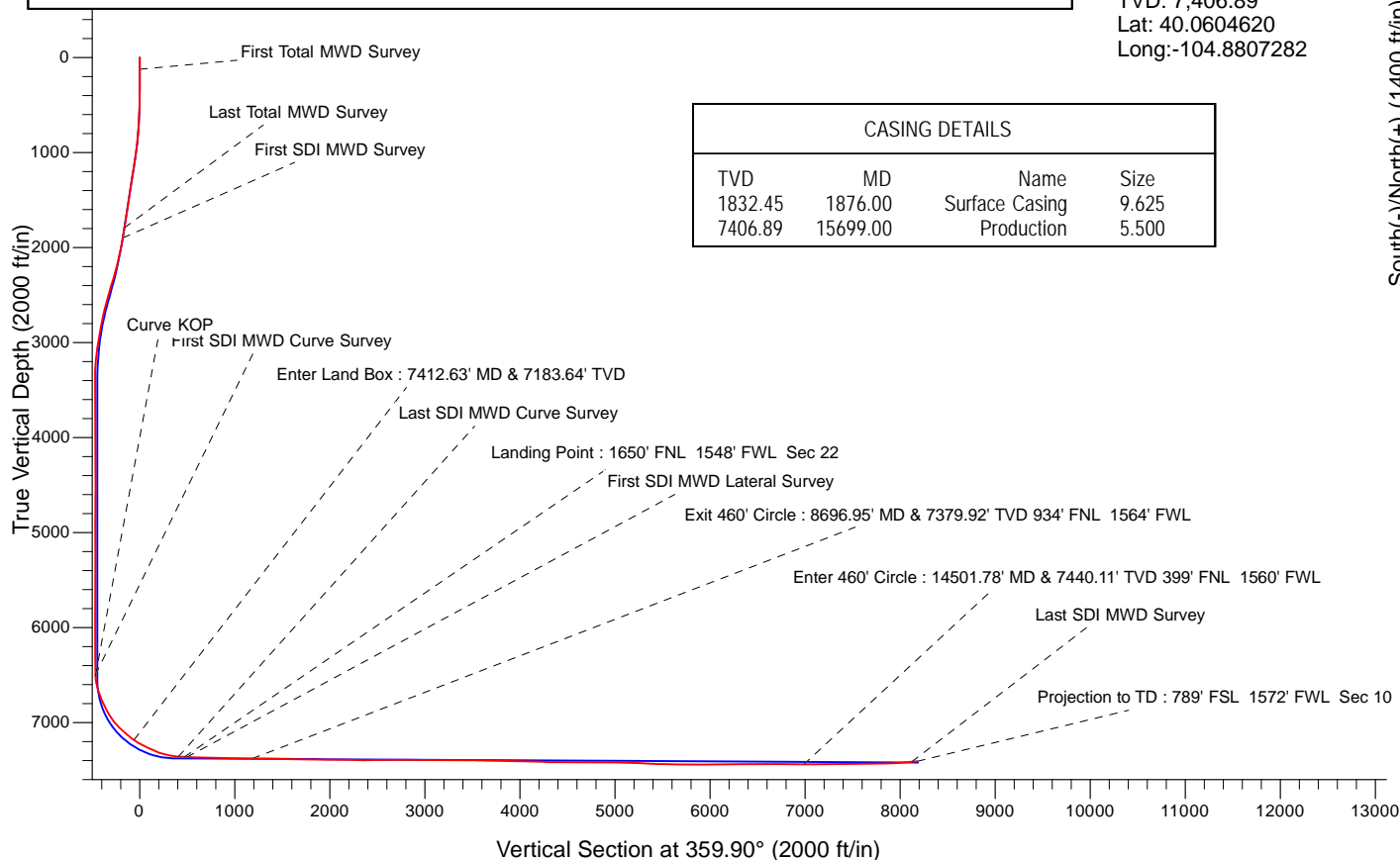
Surface Location:
 2120' FNL 2011' FWL
 Sec 22 T1N R67W

Landing Point:
 1650' FNL 1548' FWL Sec 22
 MD: 7,980.00
 TVD: 7,363.39
 Lat: 40.0392766
 Long: -104.8806816

BHL:
 789' FSL 1572' FWL Sec 10
 MD: 15,699.00
 TVD: 7,406.89
 Lat: 40.0604620
 Long: -104.8807282

CASING DETAILS

TVD	MD	Name	Size
1832.45	1876.00	Surface Casing	9.625
7406.89	15699.00	Production	5.500





US ROCKIES REGION PLANNING

US Rockies Wattenberg Planning UTM83

1N-67W-22 Marrs 6-22HZ Pad

Marrs 29N-10HZ

OH

Design: OH

Survey Report - Geographic

12 March, 2018



Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well Marrs 29N-10HZ
Project:	US Rockies Wattenberg Planning UTM83	TVD Reference:	GL 4981' & KB 17' @ 4998.00ft (Xtreme 24)
Site:	1N-67W-22 Marrs 6-22HZ Pad	MD Reference:	GL 4981' & KB 17' @ 4998.00ft (Xtreme 24)
Well:	Marrs 29N-10HZ	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Denver Sales Office

Project	US Rockies Wattenberg Planning UTM83		
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	1N-67W-22 Marrs 6-22HZ Pad, Site Center : Marrs 3N-10HZ		
Site Position:		Northing:	14,540,634.27 usft
From:	Lat/Long	Easting:	1,674,276.15 usft
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in
		Latitude:	40.0381110
		Longitude:	-104.8790280
		Grid Convergence:	0.08 °

Well	Marrs 29N-10HZ, 2120' FNL 2011' FWL Sec 22 T1N R67W		
Well Position	+N/-S	0.00 ft	Latitude: 40.0379870
	+E/-W	0.00 ft	Longitude: -104.8790290
Position Uncertainty	0.00 ft	Wellhead Elevation:	0.00 ft
		Ground Level:	4,981.00 ft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2016	2/20/2018	8.35	66.56	52,117

Design	OH				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.00	0.00	0.00		359.90

Survey Program	Date	3/12/2018			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
126.00	1,836.00	Survey #1 - Surface (OH)	APC_ISCWSA REV 2 MWD+	Fixed:v2:crustal field declination	
1,946.00	15,699.00	Survey #2 - Production (OH)	APC_ISCWSA REV 2 MWD+	Fixed:v2:Rockies, crustal dec + 3-axis correction	

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
0.00	0.00	0.00	0.00	0.00	0.00	14,540,589.11	1,674,275.93	40.0379870	-104.8790290	
126.00	1.01	334.96	125.99	1.01	-0.47	14,540,590.12	1,674,275.46	40.0379898	-104.8790307	
First Total MWD Survey										
158.00	0.92	295.06	157.99	1.37	-0.82	14,540,590.48	1,674,275.11	40.0379908	-104.8790319	
190.00	0.48	293.74	189.99	1.53	-1.18	14,540,590.64	1,674,274.75	40.0379912	-104.8790332	
222.00	0.83	256.38	221.98	1.53	-1.53	14,540,590.64	1,674,274.40	40.0379912	-104.8790344	
253.00	0.57	228.17	252.98	1.38	-1.86	14,540,590.49	1,674,274.07	40.0379908	-104.8790356	
285.00	0.79	241.44	284.98	1.17	-2.17	14,540,590.27	1,674,273.76	40.0379902	-104.8790367	
316.00	0.92	256.65	315.98	1.01	-2.60	14,540,590.11	1,674,273.33	40.0379898	-104.8790383	
348.00	1.01	267.11	347.97	0.93	-3.13	14,540,590.04	1,674,272.80	40.0379896	-104.8790402	
379.00	1.05	242.23	378.97	0.79	-3.66	14,540,589.89	1,674,272.27	40.0379892	-104.8790420	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well Marrs 29N-10HZ
Project:	US Rockies Wattenberg Planning UTM83	TVD Reference:	GL 4981' & KB 17' @ 4998.00ft (Xtreme 24)
Site:	1N-67W-22 Marrs 6-22HZ Pad	MD Reference:	GL 4981' & KB 17' @ 4998.00ft (Xtreme 24)
Well:	Marrs 29N-10HZ	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Denver Sales Office

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
411.00	1.54	247.24	410.96	0.48	-4.31	14,540,589.59	1,674,271.62	40.0379884	-104.8790444
442.00	2.15	244.34	441.94	0.07	-5.22	14,540,589.17	1,674,270.71	40.0379872	-104.8790476
474.00	2.59	249.79	473.92	-0.44	-6.44	14,540,588.66	1,674,269.49	40.0379858	-104.8790520
505.00	2.94	248.74	504.88	-0.97	-7.84	14,540,588.13	1,674,268.09	40.0379844	-104.8790570
537.00	3.82	244.78	536.82	-1.72	-9.57	14,540,587.38	1,674,266.37	40.0379823	-104.8790632
569.00	4.09	245.40	568.75	-2.65	-11.57	14,540,586.44	1,674,264.37	40.0379798	-104.8790703
601.00	4.79	250.76	600.65	-3.57	-13.87	14,540,585.53	1,674,262.07	40.0379772	-104.8790785
633.00	4.70	246.89	632.54	-4.52	-16.34	14,540,584.57	1,674,259.60	40.0379746	-104.8790873
664.00	6.11	241.71	663.40	-5.80	-18.96	14,540,583.28	1,674,256.98	40.0379711	-104.8790967
696.00	6.28	242.06	695.22	-7.43	-22.00	14,540,581.65	1,674,253.94	40.0379666	-104.8791076
728.00	7.38	237.31	726.99	-9.36	-25.28	14,540,579.72	1,674,250.67	40.0379613	-104.8791193
760.00	8.31	234.59	758.69	-11.81	-28.89	14,540,577.26	1,674,247.05	40.0379546	-104.8791322
791.00	9.18	236.52	789.33	-14.47	-32.78	14,540,574.60	1,674,243.17	40.0379473	-104.8791461
823.00	10.11	236.34	820.88	-17.44	-37.25	14,540,571.62	1,674,238.71	40.0379392	-104.8791621
855.00	10.81	235.99	852.34	-20.67	-42.07	14,540,568.38	1,674,233.89	40.0379303	-104.8791793
887.00	11.29	235.73	883.75	-24.11	-47.15	14,540,564.93	1,674,228.81	40.0379208	-104.8791974
918.00	11.87	234.76	914.12	-27.66	-52.26	14,540,561.38	1,674,223.71	40.0379111	-104.8792157
950.00	12.74	236.43	945.38	-31.51	-57.89	14,540,557.52	1,674,218.08	40.0379005	-104.8792358
982.00	13.40	236.61	976.56	-35.50	-63.93	14,540,553.52	1,674,212.05	40.0378895	-104.8792574
1,014.00	13.80	237.40	1,007.66	-39.60	-70.24	14,540,549.42	1,674,205.75	40.0378783	-104.8792799
1,045.00	14.33	237.75	1,037.73	-43.64	-76.60	14,540,545.37	1,674,199.39	40.0378672	-104.8793026
1,077.00	14.55	238.19	1,068.72	-47.87	-83.36	14,540,541.13	1,674,192.64	40.0378556	-104.8793268
1,109.00	15.12	238.19	1,099.65	-52.19	-90.32	14,540,536.80	1,674,185.68	40.0378437	-104.8793517
1,140.00	15.34	236.08	1,129.56	-56.61	-97.16	14,540,532.37	1,674,178.85	40.0378316	-104.8793761
1,172.00	16.26	238.63	1,160.35	-61.30	-104.50	14,540,527.67	1,674,171.51	40.0378187	-104.8794023
1,204.00	16.57	238.28	1,191.05	-66.03	-112.21	14,540,522.92	1,674,163.81	40.0378057	-104.8794299
1,236.00	16.88	238.45	1,221.70	-70.86	-120.05	14,540,518.08	1,674,155.98	40.0377924	-104.8794579
1,268.00	17.18	236.78	1,252.29	-75.89	-127.96	14,540,513.05	1,674,148.07	40.0377786	-104.8794861
1,299.00	17.62	236.70	1,281.87	-80.97	-135.71	14,540,507.96	1,674,140.33	40.0377647	-104.8795138
1,331.00	17.80	236.52	1,312.36	-86.33	-143.84	14,540,502.59	1,674,132.21	40.0377500	-104.8795429
1,363.00	17.09	239.33	1,342.89	-91.42	-151.96	14,540,497.48	1,674,124.09	40.0377360	-104.8795719
1,394.00	16.88	242.06	1,372.53	-95.86	-159.86	14,540,493.04	1,674,116.20	40.0377238	-104.8796001
1,426.00	17.23	241.79	1,403.13	-100.27	-168.14	14,540,488.61	1,674,107.93	40.0377117	-104.8796297
1,458.00	17.75	242.76	1,433.65	-104.75	-176.65	14,540,484.13	1,674,099.42	40.0376994	-104.8796601
1,490.00	18.46	242.94	1,464.06	-109.28	-185.50	14,540,479.58	1,674,090.58	40.0376869	-104.8796917
1,521.00	17.62	241.53	1,493.54	-113.75	-194.00	14,540,475.10	1,674,082.09	40.0376746	-104.8797221
1,553.00	17.09	241.97	1,524.08	-118.27	-202.40	14,540,470.57	1,674,073.69	40.0376622	-104.8797521
1,584.00	17.45	240.74	1,553.68	-122.68	-210.48	14,540,466.14	1,674,065.62	40.0376501	-104.8797810
1,616.00	18.19	242.06	1,584.15	-127.37	-219.08	14,540,461.44	1,674,057.03	40.0376373	-104.8798117
1,648.00	17.97	240.83	1,614.57	-132.12	-227.80	14,540,456.69	1,674,048.31	40.0376242	-104.8798428
1,680.00	18.06	241.09	1,645.00	-136.92	-236.45	14,540,451.87	1,674,039.66	40.0376110	-104.8798738
1,711.00	17.80	240.39	1,674.49	-141.58	-244.78	14,540,447.20	1,674,031.35	40.0375982	-104.8799035
1,743.00	17.67	239.68	1,704.97	-146.45	-253.22	14,540,442.32	1,674,022.91	40.0375848	-104.8799337
1,775.00	16.92	238.01	1,735.53	-151.37	-261.37	14,540,437.39	1,674,014.77	40.0375713	-104.8799628
1,807.00	15.95	236.87	1,766.22	-156.24	-269.00	14,540,432.51	1,674,007.15	40.0375580	-104.8799900
1,836.00	16.44	236.26	1,794.07	-160.70	-275.75	14,540,428.04	1,674,000.40	40.0375457	-104.8800141
Last Total MWD Survey									
1,946.00	16.10	238.10	1,899.66	-177.40	-301.64	14,540,411.30	1,673,974.53	40.0374998	-104.8801066
First SDI MWD Survey									
2,036.00	15.99	230.60	1,986.17	-191.87	-321.81	14,540,396.81	1,673,954.38	40.0374601	-104.8801787
2,124.00	16.70	223.45	2,070.62	-208.74	-339.88	14,540,379.91	1,673,936.34	40.0374138	-104.8802433
2,213.00	19.44	216.06	2,155.23	-230.01	-357.40	14,540,358.62	1,673,918.85	40.0373554	-104.8803058
2,302.00	18.20	213.53	2,239.47	-253.57	-373.79	14,540,335.04	1,673,902.48	40.0372907	-104.8803644
2,391.00	17.82	206.08	2,324.12	-277.39	-387.46	14,540,311.20	1,673,888.85	40.0372253	-104.8804133
2,479.00	17.14	197.77	2,408.07	-301.83	-397.34	14,540,286.74	1,673,879.00	40.0371581	-104.8804485

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well Marrs 29N-10HZ
Project:	US Rockies Wattenberg Planning UTM83	TVD Reference:	GL 4981' & KB 17' @ 4998.00ft (Xtreme 24)
Site:	1N-67W-22 Marrs 6-22HZ Pad	MD Reference:	GL 4981' & KB 17' @ 4998.00ft (Xtreme 24)
Well:	Marrs 29N-10HZ	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Denver Sales Office

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
2,568.00	16.53	194.63	2,493.26	-326.57	-404.54	14,540,261.99	1,673,871.84	40.0370902	-104.8804743
2,656.00	15.09	193.81	2,577.93	-349.81	-410.43	14,540,238.75	1,673,865.97	40.0370264	-104.8804953
2,745.00	14.40	201.26	2,664.01	-371.38	-417.21	14,540,217.18	1,673,859.22	40.0369672	-104.8805196
2,834.00	13.03	203.65	2,750.47	-390.88	-425.25	14,540,197.66	1,673,851.21	40.0369136	-104.8805483
2,923.00	11.69	201.74	2,837.40	-408.45	-432.62	14,540,180.09	1,673,843.87	40.0368654	-104.8805746
3,012.00	10.60	199.89	2,924.72	-424.52	-438.74	14,540,164.01	1,673,837.77	40.0368212	-104.8805965
3,100.00	9.70	205.45	3,011.35	-438.83	-444.68	14,540,149.69	1,673,831.85	40.0367819	-104.8806177
3,213.00	7.77	210.74	3,123.03	-453.99	-452.68	14,540,134.52	1,673,823.87	40.0367403	-104.8806462
3,302.00	5.18	201.88	3,211.46	-462.89	-457.25	14,540,125.61	1,673,819.31	40.0367158	-104.8806626
3,390.00	3.29	195.44	3,299.22	-469.01	-459.40	14,540,119.49	1,673,817.17	40.0366990	-104.8806703
3,479.00	0.90	348.33	3,388.17	-470.79	-460.22	14,540,117.71	1,673,816.35	40.0366942	-104.8806732
3,568.00	1.14	304.98	3,477.16	-469.60	-461.09	14,540,118.90	1,673,815.48	40.0366974	-104.8806763
3,745.00	1.25	300.63	3,654.12	-467.60	-464.20	14,540,120.89	1,673,812.37	40.0367029	-104.8806874
3,835.00	0.98	99.64	3,744.12	-467.23	-464.28	14,540,121.26	1,673,812.29	40.0367039	-104.8806877
3,924.00	1.16	92.23	3,833.10	-467.40	-462.63	14,540,121.10	1,673,813.94	40.0367035	-104.8806818
4,013.00	0.98	73.57	3,922.09	-467.22	-461.00	14,540,121.28	1,673,815.57	40.0367040	-104.8806760
4,102.00	0.80	58.76	4,011.08	-466.68	-459.74	14,540,121.82	1,673,816.83	40.0367054	-104.8806715
4,190.00	0.69	48.80	4,099.07	-466.01	-458.82	14,540,122.49	1,673,817.75	40.0367073	-104.8806682
4,279.00	0.51	39.93	4,188.06	-465.35	-458.16	14,540,123.15	1,673,818.41	40.0367091	-104.8806658
4,368.00	0.34	344.86	4,277.06	-464.80	-457.97	14,540,123.71	1,673,818.59	40.0367106	-104.8806652
4,457.00	0.00	8.11	4,366.06	-464.54	-458.04	14,540,123.96	1,673,818.52	40.0367113	-104.8806654
4,546.00	0.05	353.89	4,455.06	-464.50	-458.05	14,540,124.00	1,673,818.52	40.0367114	-104.8806654
4,635.00	0.12	248.91	4,544.06	-464.50	-458.14	14,540,124.00	1,673,818.43	40.0367114	-104.8806658
4,723.00	0.55	198.45	4,632.06	-464.93	-458.36	14,540,123.57	1,673,818.21	40.0367102	-104.8806665
4,812.00	0.73	221.27	4,721.05	-465.76	-458.87	14,540,122.74	1,673,817.70	40.0367080	-104.8806684
4,901.00	0.86	221.21	4,810.05	-466.69	-459.68	14,540,121.81	1,673,816.89	40.0367054	-104.8806713
4,990.00	0.55	70.61	4,899.04	-467.05	-459.72	14,540,121.45	1,673,816.85	40.0367044	-104.8806714
5,079.00	1.50	67.91	4,988.03	-466.47	-458.23	14,540,122.03	1,673,818.33	40.0367060	-104.8806661
5,168.00	1.21	85.21	5,077.00	-465.95	-456.22	14,540,122.55	1,673,820.35	40.0367074	-104.8806589
5,256.00	0.74	113.50	5,164.99	-466.10	-454.77	14,540,122.40	1,673,821.79	40.0367070	-104.8806537
5,434.00	0.72	101.32	5,342.98	-466.78	-452.62	14,540,121.73	1,673,823.95	40.0367052	-104.8806460
5,523.00	0.36	98.11	5,431.97	-466.93	-451.80	14,540,121.58	1,673,824.77	40.0367048	-104.8806431
5,612.00	0.24	114.50	5,520.97	-467.05	-451.35	14,540,121.46	1,673,825.22	40.0367044	-104.8806415
5,701.00	0.05	319.07	5,609.97	-467.10	-451.21	14,540,121.41	1,673,825.36	40.0367043	-104.8806410
5,789.00	0.15	238.86	5,697.97	-467.13	-451.33	14,540,121.38	1,673,825.24	40.0367042	-104.8806414
5,878.00	0.39	232.64	5,786.97	-467.37	-451.67	14,540,121.14	1,673,824.90	40.0367035	-104.8806426
5,967.00	0.55	242.21	5,875.97	-467.75	-452.29	14,540,120.76	1,673,824.28	40.0367025	-104.8806449
6,056.00	0.20	255.45	5,964.96	-467.99	-452.82	14,540,120.52	1,673,823.75	40.0367018	-104.8806467
6,145.00	0.05	199.19	6,053.96	-468.07	-452.98	14,540,120.44	1,673,823.59	40.0367016	-104.8806473
6,233.00	0.24	290.81	6,141.96	-468.04	-453.16	14,540,120.47	1,673,823.40	40.0367017	-104.8806480
6,322.00	0.30	352.77	6,230.96	-467.74	-453.37	14,540,120.77	1,673,823.20	40.0367025	-104.8806487
6,411.00	0.43	359.36	6,319.96	-467.18	-453.40	14,540,121.33	1,673,823.17	40.0367041	-104.8806488
6,500.00	0.69	347.09	6,408.96	-466.32	-453.52	14,540,122.19	1,673,823.04	40.0367064	-104.8806493
6,589.00	0.94	331.90	6,497.95	-465.15	-453.99	14,540,123.35	1,673,822.58	40.0367096	-104.8806509
First SDI MWD Curve Survey									
6,600.00	2.03	349.81	6,508.94	-464.88	-454.07	14,540,123.62	1,673,822.50	40.0367104	-104.8806512
Curve KOP									
6,678.00	10.27	1.34	6,586.43	-456.56	-454.15	14,540,131.95	1,673,822.41	40.0367332	-104.8806515
6,766.00	18.57	0.83	6,671.58	-434.67	-453.76	14,540,153.84	1,673,822.76	40.0367934	-104.8806501
6,855.00	23.65	0.43	6,754.58	-402.62	-453.42	14,540,185.88	1,673,823.06	40.0368813	-104.8806489
6,944.00	25.78	359.13	6,835.43	-365.42	-453.58	14,540,223.09	1,673,822.85	40.0369835	-104.8806495
7,032.00	30.17	358.77	6,913.12	-324.16	-454.35	14,540,264.34	1,673,822.03	40.0370968	-104.8806522
7,121.00	38.25	359.41	6,986.67	-274.16	-455.11	14,540,314.33	1,673,821.19	40.0372341	-104.8806550
7,209.00	45.53	358.27	7,052.13	-215.46	-456.34	14,540,373.03	1,673,819.88	40.0373953	-104.8806594
7,298.00	49.31	357.17	7,112.34	-149.99	-458.97	14,540,438.49	1,673,817.17	40.0375751	-104.8806687

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well Marrs 29N-10HZ
Project:	US Rockies Wattenberg Planning UTM83	TVD Reference:	GL 4981' & KB 17' @ 4998.00ft (Xtreme 24)
Site:	1N-67W-22 Marrs 6-22HZ Pad	MD Reference:	GL 4981' & KB 17' @ 4998.00ft (Xtreme 24)
Well:	Marrs 29N-10HZ	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Denver Sales Office

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
7,387.00	52.54	358.46	7,168.44	-80.96	-461.58	14,540,507.52	1,673,814.46	40.0377647	-104.8806781
7,412.63	54.67	359.29	7,183.64	-60.34	-461.99	14,540,528.15	1,673,814.03	40.0378213	-104.8806795
Enter Land Box : 7412.63' MD & 7183.64' TVD									
7,475.00	59.87	1.14	7,217.36	-7.89	-461.76	14,540,580.59	1,673,814.18	40.0379653	-104.8806787
7,564.00	65.19	0.25	7,258.40	71.04	-460.82	14,540,659.52	1,673,815.01	40.0381821	-104.8806754
7,652.00	65.56	359.94	7,295.06	151.03	-460.69	14,540,739.52	1,673,815.04	40.0384018	-104.8806749
7,741.00	72.68	357.52	7,326.77	234.11	-462.57	14,540,822.59	1,673,813.04	40.0386299	-104.8806816
7,830.00	80.05	0.26	7,347.74	320.51	-464.21	14,540,908.99	1,673,811.28	40.0388672	-104.8806875
7,919.00	85.11	0.86	7,359.23	408.74	-463.35	14,540,997.22	1,673,812.03	40.0391095	-104.8806844
Last SDI MWD Curve Survey									
7,980.00	87.06	0.66	7,363.39	469.58	-462.54	14,541,058.07	1,673,812.75	40.0392766	-104.8806816
Landing Point : 1650' FNL 1548' FWL Sec 22									
8,008.00	87.96	0.57	7,364.61	497.56	-462.24	14,541,086.04	1,673,813.02	40.0393534	-104.8806805
First SDI MWD Lateral Survey									
8,096.00	88.80	0.63	7,367.09	585.52	-461.32	14,541,174.00	1,673,813.82	40.0395949	-104.8806772
8,185.00	88.63	1.46	7,369.09	674.48	-459.70	14,541,262.96	1,673,815.32	40.0398392	-104.8806714
8,274.00	89.10	1.72	7,370.85	763.43	-457.23	14,541,351.91	1,673,817.67	40.0400835	-104.8806626
8,363.00	87.83	1.64	7,373.24	852.35	-454.62	14,541,440.84	1,673,820.15	40.0403277	-104.8806533
8,452.00	87.99	1.55	7,376.48	941.26	-452.14	14,541,529.75	1,673,822.51	40.0405719	-104.8806444
8,541.00	88.76	0.58	7,379.01	1,030.21	-450.49	14,541,618.70	1,673,824.04	40.0408161	-104.8806385
8,630.00	90.30	1.74	7,379.74	1,119.18	-448.69	14,541,707.68	1,673,825.72	40.0410605	-104.8806321
8,696.95	89.39	1.66	7,379.92	1,186.10	-446.71	14,541,774.60	1,673,827.62	40.0412443	-104.8806250
Exit 460' Circle : 8696.95' MD & 7379.92' TVD 934' FNL 1564' FWL									
8,718.00	89.10	1.63	7,380.20	1,207.14	-446.10	14,541,795.64	1,673,828.19	40.0413020	-104.8806229
8,807.00	90.03	0.62	7,380.87	1,296.12	-444.35	14,541,884.62	1,673,829.82	40.0415464	-104.8806166
8,896.00	88.13	0.77	7,382.30	1,385.10	-443.28	14,541,973.60	1,673,830.78	40.0417907	-104.8806128
8,985.00	89.50	0.29	7,384.14	1,474.07	-442.45	14,542,062.58	1,673,831.48	40.0420351	-104.8806098
9,074.00	88.30	359.79	7,385.85	1,563.05	-442.39	14,542,151.56	1,673,831.42	40.0422794	-104.8806096
9,163.00	89.10	359.85	7,387.87	1,652.03	-442.67	14,542,240.53	1,673,831.02	40.0425238	-104.8806106
9,251.00	90.63	359.50	7,388.08	1,740.02	-443.17	14,542,328.53	1,673,830.40	40.0427654	-104.8806124
9,340.00	89.06	0.28	7,388.32	1,829.02	-443.34	14,542,417.52	1,673,830.11	40.0430098	-104.8806130
9,428.00	88.63	0.12	7,390.09	1,917.00	-443.03	14,542,505.51	1,673,830.30	40.0432514	-104.8806119
9,517.00	89.20	0.06	7,391.78	2,005.99	-442.89	14,542,594.49	1,673,830.31	40.0434958	-104.8806114
9,606.00	90.03	359.89	7,392.38	2,094.98	-442.93	14,542,683.49	1,673,830.16	40.0437402	-104.8806116
9,695.00	88.69	359.30	7,393.37	2,183.97	-443.56	14,542,772.48	1,673,829.41	40.0439846	-104.8806138
9,784.00	88.70	359.01	7,395.40	2,272.94	-444.87	14,542,861.44	1,673,827.97	40.0442289	-104.8806185
9,872.00	89.16	357.90	7,397.04	2,360.89	-447.25	14,542,949.39	1,673,825.48	40.0444704	-104.8806270
9,961.00	90.47	357.42	7,397.33	2,449.81	-450.88	14,543,038.31	1,673,821.73	40.0447146	-104.8806400
10,050.00	91.61	356.72	7,395.71	2,538.68	-455.43	14,543,127.17	1,673,817.06	40.0449587	-104.8806563
10,138.00	90.20	359.92	7,394.32	2,626.62	-458.01	14,543,215.10	1,673,814.36	40.0452001	-104.8806655
10,227.00	91.20	359.88	7,393.23	2,715.61	-458.16	14,543,304.09	1,673,814.08	40.0454445	-104.8806660
10,316.00	89.37	1.12	7,392.79	2,804.60	-457.38	14,543,393.08	1,673,814.74	40.0456889	-104.8806633
10,405.00	89.97	0.94	7,393.30	2,893.58	-455.78	14,543,482.07	1,673,816.22	40.0459333	-104.8806576
10,493.00	89.43	2.44	7,393.77	2,981.54	-453.19	14,543,570.03	1,673,818.69	40.0461748	-104.8806483
10,582.00	88.36	3.13	7,395.48	3,070.42	-448.87	14,543,658.91	1,673,822.90	40.0464189	-104.8806329
10,671.00	89.67	3.51	7,397.01	3,159.25	-443.71	14,543,747.75	1,673,827.93	40.0466629	-104.8806144
10,760.00	90.97	3.53	7,396.51	3,248.08	-438.25	14,543,836.59	1,673,833.27	40.0469068	-104.8805949
10,849.00	89.40	2.12	7,396.23	3,336.97	-433.86	14,543,925.48	1,673,837.54	40.0471509	-104.8805793
10,938.00	89.47	1.25	7,397.10	3,425.93	-431.25	14,544,014.44	1,673,840.03	40.0473952	-104.8805699
11,026.00	90.03	1.49	7,397.49	3,513.90	-429.14	14,544,102.42	1,673,842.02	40.0476368	-104.8805624
11,115.00	87.12	359.44	7,399.70	3,602.85	-428.42	14,544,191.37	1,673,842.62	40.0478811	-104.8805598
11,204.00	88.20	359.14	7,403.34	3,691.77	-429.52	14,544,280.29	1,673,841.40	40.0481252	-104.8805638
11,293.00	90.27	359.03	7,404.52	3,780.75	-430.94	14,544,369.26	1,673,839.86	40.0483696	-104.8805689
11,382.00	90.17	359.19	7,404.18	3,869.74	-432.32	14,544,458.25	1,673,838.35	40.0486140	-104.8805738

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well Marrs 29N-10HZ
Project:	US Rockies Wattenberg Planning UTM83	TVD Reference:	GL 4981' & KB 17' @ 4998.00ft (Xtreme 24)
Site:	1N-67W-22 Marrs 6-22HZ Pad	MD Reference:	GL 4981' & KB 17' @ 4998.00ft (Xtreme 24)
Well:	Marrs 29N-10HZ	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Denver Sales Office

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
11,471.00	87.46	358.00	7,406.02	3,958.68	-434.51	14,544,547.19	1,673,836.05	40.0488582	-104.8805816
11,559.00	89.50	358.93	7,408.36	4,046.61	-436.86	14,544,635.12	1,673,833.57	40.0490997	-104.8805900
11,648.00	88.03	358.61	7,410.27	4,135.57	-438.77	14,544,724.07	1,673,831.54	40.0493440	-104.8805969
11,737.00	87.93	359.42	7,413.41	4,224.50	-440.30	14,544,813.00	1,673,829.89	40.0495882	-104.8806023
11,826.00	88.63	358.75	7,416.08	4,313.45	-441.72	14,544,901.95	1,673,828.35	40.0498325	-104.8806074
11,915.00	89.30	358.62	7,417.69	4,402.41	-443.76	14,544,990.90	1,673,826.19	40.0500768	-104.8806147
12,004.00	90.17	358.95	7,418.10	4,491.39	-445.65	14,545,079.88	1,673,824.18	40.0503211	-104.8806215
12,092.00	89.40	0.35	7,418.43	4,579.38	-446.19	14,545,167.87	1,673,823.52	40.0505628	-104.8806234
12,181.00	89.63	0.21	7,419.19	4,668.38	-445.75	14,545,256.87	1,673,823.84	40.0508071	-104.8806218
12,270.00	90.44	0.29	7,419.13	4,757.38	-445.36	14,545,345.87	1,673,824.11	40.0510516	-104.8806205
12,359.00	89.57	358.98	7,419.12	4,846.37	-445.93	14,545,434.86	1,673,823.42	40.0512959	-104.8806225
12,447.00	90.27	359.33	7,419.25	4,934.36	-447.23	14,545,522.85	1,673,822.00	40.0515376	-104.8806271
12,536.00	88.46	358.17	7,420.23	5,023.33	-449.17	14,545,611.82	1,673,819.94	40.0517819	-104.8806341
12,625.00	87.96	358.16	7,423.01	5,112.24	-452.02	14,545,700.72	1,673,816.97	40.0520261	-104.8806443
12,714.00	87.45	358.13	7,426.58	5,201.12	-454.90	14,545,789.60	1,673,813.97	40.0522701	-104.8806545
12,803.00	86.84	358.51	7,431.01	5,289.97	-457.50	14,545,878.45	1,673,811.24	40.0525141	-104.8806639
12,892.00	88.13	359.29	7,434.92	5,378.87	-459.21	14,545,967.34	1,673,809.42	40.0527583	-104.8806700
12,981.00	89.77	0.44	7,436.55	5,467.85	-459.42	14,546,056.32	1,673,809.09	40.0530026	-104.8806707
13,069.00	88.53	359.17	7,437.85	5,555.83	-459.72	14,546,144.30	1,673,808.67	40.0532442	-104.8806718
13,158.00	87.96	359.73	7,440.58	5,644.79	-460.57	14,546,233.26	1,673,807.69	40.0534885	-104.8806749
13,247.00	88.99	0.11	7,442.95	5,733.75	-460.70	14,546,322.22	1,673,807.45	40.0537328	-104.8806753
13,336.00	89.83	0.06	7,443.86	5,822.75	-460.57	14,546,411.22	1,673,807.46	40.0539772	-104.8806748
13,425.00	90.87	0.10	7,443.32	5,911.75	-460.44	14,546,500.21	1,673,807.46	40.0542216	-104.8806744
13,514.00	89.87	359.81	7,442.74	6,000.74	-460.51	14,546,589.21	1,673,807.27	40.0544660	-104.8806747
13,603.00	90.34	358.89	7,442.58	6,089.74	-461.52	14,546,678.20	1,673,806.14	40.0547104	-104.8806783
13,692.00	90.94	357.97	7,441.59	6,178.70	-463.96	14,546,767.16	1,673,803.58	40.0549547	-104.8806870
13,780.00	92.08	358.23	7,439.27	6,266.61	-466.88	14,546,855.07	1,673,800.55	40.0551962	-104.8806974
13,869.00	89.97	359.80	7,437.68	6,355.58	-468.40	14,546,944.04	1,673,798.90	40.0554405	-104.8807029
13,958.00	90.64	359.58	7,437.20	6,444.58	-468.89	14,547,033.03	1,673,798.29	40.0556849	-104.8807046
14,047.00	89.87	359.12	7,436.81	6,533.57	-469.90	14,547,122.02	1,673,797.16	40.0559293	-104.8807082
14,136.00	89.93	359.24	7,436.96	6,622.56	-471.17	14,547,211.01	1,673,795.77	40.0561736	-104.8807128
14,225.00	90.77	359.72	7,436.42	6,711.55	-471.98	14,547,300.00	1,673,794.84	40.0564180	-104.8807157
14,314.00	88.76	358.55	7,436.78	6,800.54	-473.32	14,547,388.98	1,673,793.38	40.0566624	-104.8807205
14,403.00	88.63	358.63	7,438.81	6,889.49	-475.51	14,547,477.93	1,673,791.06	40.0569067	-104.8807283
14,491.00	89.73	358.04	7,440.07	6,977.44	-478.07	14,547,565.88	1,673,788.39	40.0571482	-104.8807375
14,501.78	89.86	357.98	7,440.11	6,988.21	-478.44	14,547,576.65	1,673,788.00	40.0571778	-104.8807388
Enter 460' Circle : 14501.78' MD & 7440.11' TVD 399' FNL 1560' FWL									
14,580.00	90.80	357.58	7,439.66	7,066.37	-481.47	14,547,654.81	1,673,784.87	40.0573924	-104.8807496
14,668.00	89.90	359.03	7,439.12	7,154.33	-484.07	14,547,742.76	1,673,782.14	40.0576340	-104.8807589
14,758.00	90.10	0.74	7,439.12	7,244.32	-484.25	14,547,832.76	1,673,781.84	40.0578811	-104.8807596
14,846.00	91.28	0.26	7,438.06	7,332.31	-483.48	14,547,920.75	1,673,782.49	40.0581227	-104.8807568
14,935.00	90.77	1.58	7,436.47	7,421.28	-482.05	14,548,009.72	1,673,783.80	40.0583671	-104.8807517
15,024.00	91.24	1.15	7,434.91	7,510.25	-479.93	14,548,098.68	1,673,785.80	40.0586114	-104.8807442
15,113.00	89.83	0.27	7,434.08	7,599.23	-478.83	14,548,187.67	1,673,786.78	40.0588557	-104.8807402
15,202.00	90.03	0.45	7,434.18	7,688.23	-478.27	14,548,276.67	1,673,787.22	40.0591001	-104.8807382
15,291.00	91.17	0.71	7,433.25	7,777.22	-477.37	14,548,365.66	1,673,788.00	40.0593445	-104.8807350
15,380.00	91.88	0.78	7,430.88	7,866.18	-476.21	14,548,454.62	1,673,789.03	40.0595888	-104.8807309
15,469.00	92.99	0.19	7,427.10	7,955.09	-475.46	14,548,543.54	1,673,789.67	40.0598330	-104.8807282
15,557.00	94.53	359.82	7,421.33	8,042.90	-475.45	14,548,631.34	1,673,789.55	40.0600741	-104.8807282
15,638.00	96.36	0.07	7,413.65	8,123.53	-475.53	14,548,711.97	1,673,789.37	40.0602955	-104.8807285
Last SDI MWD Survey									
15,699.00	96.36	0.07	7,406.89	8,184.16	-475.46	14,548,772.60	1,673,789.36	40.0604620	-104.8807282
Projection to TD : 789' FSL 1572' FWL Sec 10									

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well Marrs 29N-10HZ
Project:	US Rockies Wattenberg Planning UTM83	TVD Reference:	GL 4981' & KB 17' @ 4998.00ft (Xtreme 24)
Site:	1N-67W-22 Marrs 6-22HZ Pad	MD Reference:	GL 4981' & KB 17' @ 4998.00ft (Xtreme 24)
Well:	Marrs 29N-10HZ	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Denver Sales Office

Casing Points				
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
1,876.00	1,832.45	Surface Casing	9.625	12.250
15,699.00	7,406.89	Production	5.500	8.500

Design Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
126.00	125.99	1.01	-0.47	First Total MWD Survey
1,836.00	1,794.07	-160.70	-275.75	Last Total MWD Survey
1,946.00	1,899.66	-177.40	-301.64	First SDI MWD Survey
6,589.00	6,497.95	-465.15	-453.99	First SDI MWD Curve Survey
6,600.00	6,508.94	-464.88	-454.07	Curve KOP
7,412.63	7,183.64	-60.34	-461.99	Enter Land Box : 7412.63' MD & 7183.64' TVD
7,919.00	7,359.23	408.74	-463.35	Last SDI MWD Curve Survey
7,980.00	7,363.39	469.58	-462.54	Landing Point : 1650' FNL 1548' FWL Sec 22
8,008.00	7,364.61	497.56	-462.24	First SDI MWD Lateral Survey
8,696.95	7,379.92	1,186.10	-446.71	Exit 460' Circle : 8696.95' MD & 7379.92' TVD 934' FNL 1564' FWL
14,501.78	7,440.11	6,988.21	-478.44	Enter 460' Circle : 14501.78' MD & 7440.11' TVD 399' FNL 1560' FWL
15,638.00	7,413.65	8,123.53	-475.53	Last SDI MWD Survey
15,699.00	7,406.89	8,184.16	-475.46	Projection to TD : 789' FSL 1572' FWL Sec 10

Checked By: _____	Approved By: _____	Date: _____
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