

US ROCKIES WATTENBERG PLANNING

**WELD-NAD83-UTMFT13N
1N-67W-22 Marrs 6-22HZ Pad
MARRS 3N-10HZ**

Plan A

Plan: Permit Rev-1

Standard Survey Report

15 March, 2016

Project: WELD-NAD83-UTMFT13N
Site: 1N-67W-22 Marrs 6-22HZ Pad
Well: MARRS 3N-10HZ
Wellbore: Plan A
Design: Permit Rev-1

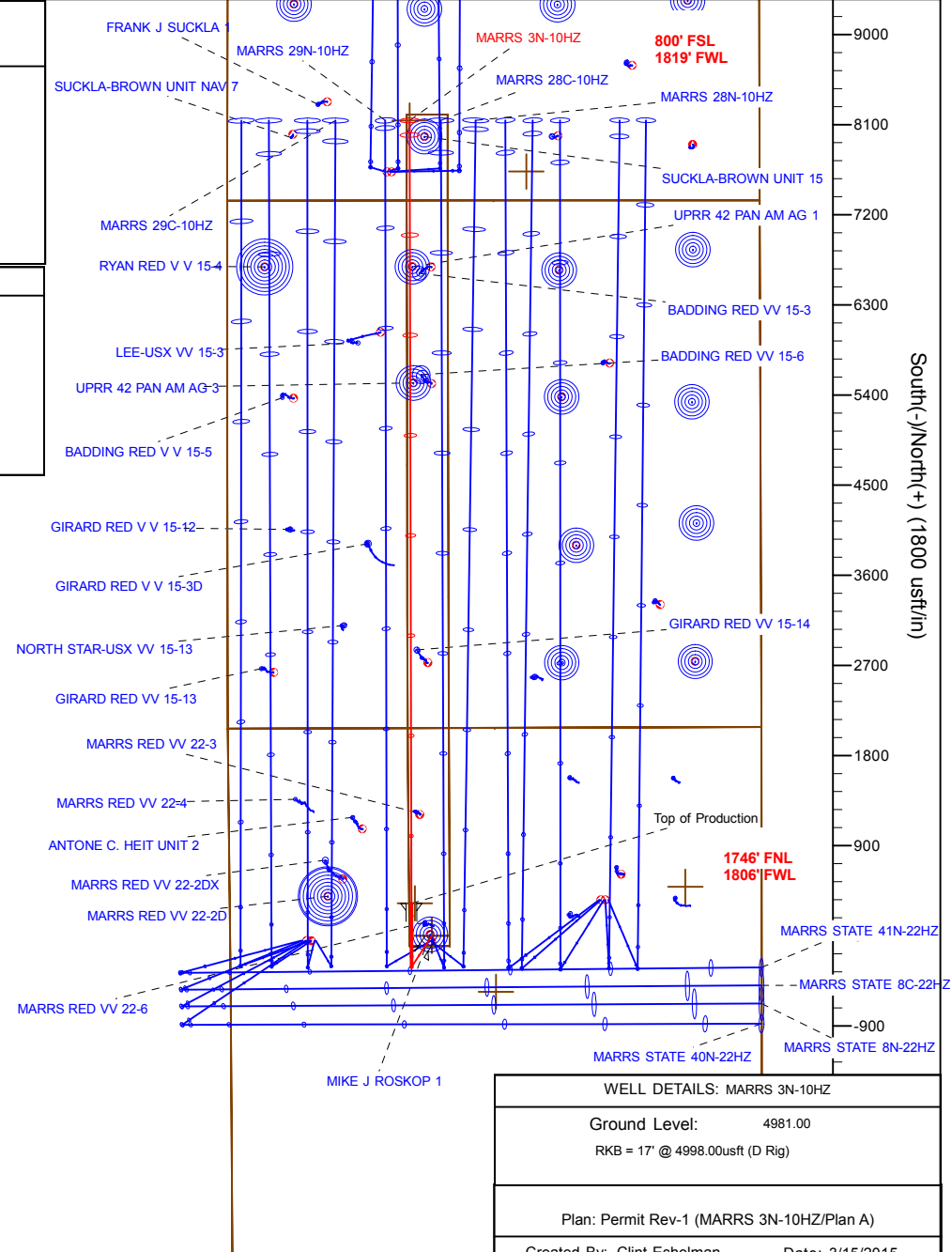
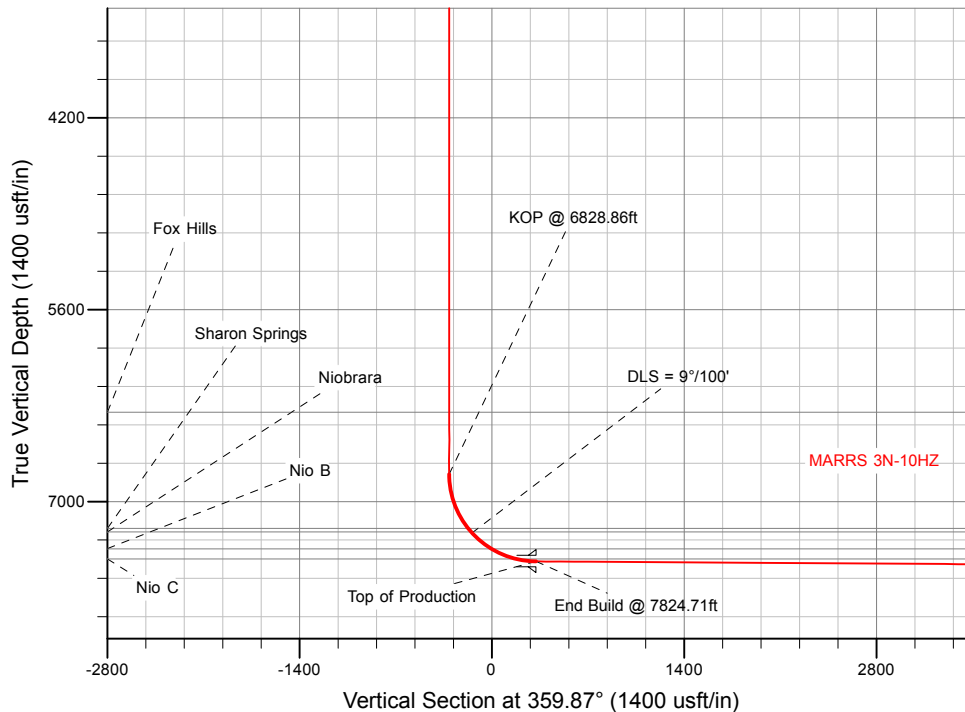
US ROCKIES WATTENBERG PLANNING

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	
3	866.67	10.00	213.00	863.29	-48.67	-31.61	1.50	213.00	-48.60	
4	2416.67	10.00	213.00	2389.74	-274.40	-178.20	0.00	0.00	-274.00	
5	2916.67	0.00	0.00	2887.20	-310.90	-201.90	2.00	180.00	-310.44	
6	6828.86	0.00	0.00	6799.39	-310.90	-201.90	0.00	0.00	-310.44	
7	7824.71	89.63	359.87	7436.00	321.57	-203.34	9.00	359.87	322.03	
8	15645.59	89.63	359.87	7487.00	8142.26	-221.09	0.00	0.00	8142.74	MARRS 3N-10HZ_BHL

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
MARRS 3N-10HZ_SHL	0.00	0.00	0.00	40.038111	-104.879028	Point
MARRS 3N-10HZ_BHL	7487.00	8142.26	-221.09	40.060471	-104.879818	Point



WELL DETAILS: MARRS 3N-10HZ

Ground Level: 4981.00
RKB = 17' @ 4998.00usft (D Rig)

Plan: Permit Rev-1 (MARRS 3N-10HZ/Plan A)

Created By: Clint Eshelman Date: 3/15/2015
Reviewed: Date:

Anadarko

Survey Report

Company:	US ROCKIES WATTENBERG PLANNING	Local Co-ordinate Reference:	Well MARRS 3N-10HZ
Project:	WELD-NAD83-UTMFT13N	TVD Reference:	RKB = 17' @ 4998.00usft (D Rig)
Site:	1N-67W-22 Marrs 6-22HZ Pad	MD Reference:	RKB = 17' @ 4998.00usft (D Rig)
Well:	MARRS 3N-10HZ	North Reference:	True
Wellbore:	Plan A	Survey Calculation Method:	Minimum Curvature
Design:	Permit Rev-1	Database:	PLANNING

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		1N-67W-22 Marrs 6-22HZ Pad			
Site Position:		Northing:	14,540,634.27 usft	Latitude:	40.038111
From:	Lat/Long	Easting:	1,674,276.15 usft	Longitude:	-104.879028
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.08 °

Well		MARRS 3N-10HZ				
Well Position	+N/-S	0.00 usft	Northing:	14,540,634.27 usft	Latitude:	40.038111
	+E/-W	0.00 usft	Easting:	1,674,276.15 usft	Longitude:	-104.879028
Position Uncertainty		3.28 usft	Wellhead Elevation:	0.00 usft	Ground Level:	4,981.00 usft

Wellbore	Plan A				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	3/10/2016	8.26	66.58	52,429

Design	Permit Rev-1				
Audit Notes:					
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.00	
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	359.87	

Survey Tool Program	Date	3/15/2016			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.00	1,800.00	Permit Rev-1 (Plan A)	APC_ISCWSA REV 2 MWD	Fixed:v2:standard declination	
1,800.00	15,645.59	Permit Rev-1 (Plan A)	APC_ISCWSA REV 2 MWD+	Fixed:v2:Rockies, crustal dec + 3-axis correction	

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	
Begin Nudge @ 200.00ft										
300.00	1.50	213.00	299.99	-1.10	-0.71	-1.10	1.50	1.50	0.00	
400.00	3.00	213.00	399.91	-4.39	-2.85	-4.38	1.50	1.50	0.00	
500.00	4.50	213.00	499.69	-9.88	-6.41	-9.86	1.50	1.50	0.00	
600.00	6.00	213.00	599.27	-17.55	-11.40	-17.52	1.50	1.50	0.00	
700.00	7.50	213.00	698.57	-27.41	-17.80	-27.37	1.50	1.50	0.00	
800.00	9.00	213.00	797.54	-39.44	-25.61	-39.38	1.50	1.50	0.00	

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Survey Report

Company:	US ROCKIES WATTENBERG PLANNING	Local Co-ordinate Reference:	Well MARRS 3N-10HZ
Project:	WELD-NAD83-UTMFT13N	TVD Reference:	RKB = 17' @ 4998.00usft (D Rig)
Site:	1N-67W-22 Marrs 6-22HZ Pad	MD Reference:	RKB = 17' @ 4998.00usft (D Rig)
Well:	MARRS 3N-10HZ	North Reference:	True
Wellbore:	Plan A	Survey Calculation Method:	Minimum Curvature
Design:	Permit Rev-1	Database:	PLANNING

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)
866.67	10.00	213.00	863.29	-48.67	-31.61	-48.60	1.50	1.50	0.00
End Nudge @ 866.67ft									
900.00	10.00	213.00	896.11	-53.52	-34.76	-53.44	0.00	0.00	0.00
1,000.00	10.00	213.00	994.59	-68.09	-44.22	-67.99	0.00	0.00	0.00
1,100.00	10.00	213.00	1,093.08	-82.65	-53.67	-82.53	0.00	0.00	0.00
1,200.00	10.00	213.00	1,191.56	-97.21	-63.13	-97.07	0.00	0.00	0.00
1,300.00	10.00	213.00	1,290.04	-111.78	-72.59	-111.61	0.00	0.00	0.00
1,400.00	10.00	213.00	1,388.52	-126.34	-82.05	-126.15	0.00	0.00	0.00
1,500.00	10.00	213.00	1,487.00	-140.90	-91.50	-140.69	0.00	0.00	0.00
1,600.00	10.00	213.00	1,585.48	-155.47	-100.96	-155.24	0.00	0.00	0.00
1,700.00	10.00	213.00	1,683.96	-170.03	-110.42	-169.78	0.00	0.00	0.00
1,800.00	10.00	213.00	1,782.44	-184.59	-119.88	-184.32	0.00	0.00	0.00
1,817.83	10.00	213.00	1,800.00	-187.19	-121.56	-186.91	0.00	0.00	0.00
9 5/8"									
1,900.00	10.00	213.00	1,880.92	-199.16	-129.33	-198.86	0.00	0.00	0.00
2,000.00	10.00	213.00	1,979.40	-213.72	-138.79	-213.40	0.00	0.00	0.00
2,100.00	10.00	213.00	2,077.88	-228.28	-148.25	-227.95	0.00	0.00	0.00
2,200.00	10.00	213.00	2,176.36	-242.85	-157.71	-242.49	0.00	0.00	0.00
2,300.00	10.00	213.00	2,274.85	-257.41	-167.16	-257.03	0.00	0.00	0.00
2,400.00	10.00	213.00	2,373.33	-271.97	-176.62	-271.57	0.00	0.00	0.00
2,416.67	10.00	213.00	2,389.74	-274.40	-178.20	-274.00	0.00	0.00	0.00
Begin Drop @ 2416.67ft									
2,500.00	8.33	213.00	2,472.01	-285.53	-185.43	-285.11	2.00	-2.00	0.00
2,600.00	6.33	213.00	2,571.18	-296.24	-192.38	-295.80	2.00	-2.00	0.00
2,700.00	4.33	213.00	2,670.74	-304.03	-197.44	-303.58	2.00	-2.00	0.00
2,800.00	2.33	213.00	2,770.57	-308.91	-200.61	-308.45	2.00	-2.00	0.00
2,900.00	0.33	213.00	2,870.54	-310.86	-201.88	-310.40	2.00	-2.00	0.00
2,916.67	0.00	0.00	2,887.21	-310.90	-201.90	-310.44	2.00	-2.00	0.00
End Drop @ 2916.67ft									
3,000.00	0.00	0.00	2,970.54	-310.90	-201.90	-310.44	0.00	0.00	0.00
3,100.00	0.00	0.00	3,070.54	-310.90	-201.90	-310.44	0.00	0.00	0.00
3,200.00	0.00	0.00	3,170.54	-310.90	-201.90	-310.44	0.00	0.00	0.00
3,300.00	0.00	0.00	3,270.54	-310.90	-201.90	-310.44	0.00	0.00	0.00
3,400.00	0.00	0.00	3,370.54	-310.90	-201.90	-310.44	0.00	0.00	0.00
3,500.00	0.00	0.00	3,470.54	-310.90	-201.90	-310.44	0.00	0.00	0.00
3,600.00	0.00	0.00	3,570.54	-310.90	-201.90	-310.44	0.00	0.00	0.00
3,700.00	0.00	0.00	3,670.54	-310.90	-201.90	-310.44	0.00	0.00	0.00
3,800.00	0.00	0.00	3,770.54	-310.90	-201.90	-310.44	0.00	0.00	0.00
3,900.00	0.00	0.00	3,870.54	-310.90	-201.90	-310.44	0.00	0.00	0.00
4,000.00	0.00	0.00	3,970.54	-310.90	-201.90	-310.44	0.00	0.00	0.00
4,100.00	0.00	0.00	4,070.54	-310.90	-201.90	-310.44	0.00	0.00	0.00
4,200.00	0.00	0.00	4,170.54	-310.90	-201.90	-310.44	0.00	0.00	0.00
4,300.00	0.00	0.00	4,270.54	-310.90	-201.90	-310.44	0.00	0.00	0.00
4,400.00	0.00	0.00	4,370.54	-310.90	-201.90	-310.44	0.00	0.00	0.00

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Survey Report

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Wellbore:	Plan A	Survey Calculation Method:	Minimum Curvature
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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)
4,500.00	0.00	0.00	4,470.54	-310.90	-201.90	-310.44	0.00	0.00	0.00
4,600.00	0.00	0.00	4,570.54	-310.90	-201.90	-310.44	0.00	0.00	0.00
4,700.00	0.00	0.00	4,670.54	-310.90	-201.90	-310.44	0.00	0.00	0.00
4,800.00	0.00	0.00	4,770.54	-310.90	-201.90	-310.44	0.00	0.00	0.00
4,900.00	0.00	0.00	4,870.54	-310.90	-201.90	-310.44	0.00	0.00	0.00
5,000.00	0.00	0.00	4,970.54	-310.90	-201.90	-310.44	0.00	0.00	0.00
5,100.00	0.00	0.00	5,070.54	-310.90	-201.90	-310.44	0.00	0.00	0.00
5,200.00	0.00	0.00	5,170.54	-310.90	-201.90	-310.44	0.00	0.00	0.00
5,300.00	0.00	0.00	5,270.54	-310.90	-201.90	-310.44	0.00	0.00	0.00
5,400.00	0.00	0.00	5,370.54	-310.90	-201.90	-310.44	0.00	0.00	0.00
5,500.00	0.00	0.00	5,470.54	-310.90	-201.90	-310.44	0.00	0.00	0.00
5,600.00	0.00	0.00	5,570.54	-310.90	-201.90	-310.44	0.00	0.00	0.00
5,700.00	0.00	0.00	5,670.54	-310.90	-201.90	-310.44	0.00	0.00	0.00
5,800.00	0.00	0.00	5,770.54	-310.90	-201.90	-310.44	0.00	0.00	0.00
5,900.00	0.00	0.00	5,870.54	-310.90	-201.90	-310.44	0.00	0.00	0.00
6,000.00	0.00	0.00	5,970.54	-310.90	-201.90	-310.44	0.00	0.00	0.00
6,100.00	0.00	0.00	6,070.54	-310.90	-201.90	-310.44	0.00	0.00	0.00
6,200.00	0.00	0.00	6,170.54	-310.90	-201.90	-310.44	0.00	0.00	0.00
6,300.00	0.00	0.00	6,270.54	-310.90	-201.90	-310.44	0.00	0.00	0.00
6,377.46	0.00	0.00	6,348.00	-310.90	-201.90	-310.44	0.00	0.00	0.00
Fox Hills									
6,400.00	0.00	0.00	6,370.54	-310.90	-201.90	-310.44	0.00	0.00	0.00
6,500.00	0.00	0.00	6,470.54	-310.90	-201.90	-310.44	0.00	0.00	0.00
6,600.00	0.00	0.00	6,570.54	-310.90	-201.90	-310.44	0.00	0.00	0.00
6,700.00	0.00	0.00	6,670.54	-310.90	-201.90	-310.44	0.00	0.00	0.00
6,800.00	0.00	0.00	6,770.54	-310.90	-201.90	-310.44	0.00	0.00	0.00
6,828.86	0.00	0.00	6,799.40	-310.90	-201.90	-310.44	0.00	0.00	0.00
KOP @ 6828.86ft									
6,900.00	6.40	359.87	6,870.39	-306.93	-201.91	-306.47	9.00	9.00	0.00
7,000.00	15.40	359.87	6,968.48	-288.04	-201.95	-287.58	9.00	9.00	0.00
7,100.00	24.40	359.87	7,062.41	-254.03	-202.03	-253.57	9.00	9.00	0.00
7,200.00	33.40	359.87	7,149.87	-205.74	-202.14	-205.29	9.00	9.00	0.00
7,257.02	38.53	359.87	7,196.00	-172.27	-202.22	-171.81	9.00	9.00	0.00
Sharon Springs									
7,289.66	41.47	359.87	7,221.00	-151.29	-202.26	-150.83	9.00	9.00	0.00
Niobrara									
7,300.00	42.40	359.87	7,228.69	-144.38	-202.28	-143.92	9.00	9.00	0.00
DLS = 9°/100'									
7,400.00	51.40	359.87	7,296.95	-71.43	-202.45	-70.97	9.00	9.00	0.00
7,482.31	58.81	359.87	7,344.00	-3.96	-202.60	-3.50	9.00	9.00	0.00
Nio B									
7,500.00	60.40	359.87	7,352.95	11.29	-202.63	11.75	9.00	9.00	0.00
7,600.00	69.40	359.87	7,395.32	101.76	-202.84	102.22	9.00	9.00	0.00
7,681.34	76.72	359.87	7,419.00	179.52	-203.01	179.98	9.00	9.00	0.00

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Survey Report

Company:	US ROCKIES WATTENBERG PLANNING	Local Co-ordinate Reference:	Well MARRS 3N-10HZ
Project:	WELD-NAD83-UTMFT13N	TVD Reference:	RKB = 17' @ 4998.00usft (D Rig)
Site:	1N-67W-22 Marrs 6-22HZ Pad	MD Reference:	RKB = 17' @ 4998.00usft (D Rig)
Well:	MARRS 3N-10HZ	North Reference:	True
Wellbore:	Plan A	Survey Calculation Method:	Minimum Curvature
Design:	Permit Rev-1	Database:	PLANNING

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)
Nio C									
7,700.00	78.40	359.87	7,423.02	197.74	-203.06	198.20	9.00	9.00	0.00
7,800.00	87.40	359.87	7,435.36	296.87	-203.28	297.33	9.00	9.00	0.00
7,824.71	89.63	359.87	7,436.00	321.57	-203.34	322.03	9.00	9.00	0.00
End Build @ 7824.71ft - Top of Production									
7,900.00	89.63	359.87	7,436.49	396.86	-203.51	397.32	0.00	0.00	0.00
8,000.00	89.63	359.87	7,437.14	496.86	-203.74	497.32	0.00	0.00	0.00
8,100.00	89.63	359.87	7,437.80	596.85	-203.96	597.31	0.00	0.00	0.00
8,200.00	89.63	359.87	7,438.45	696.85	-204.19	697.31	0.00	0.00	0.00
8,300.00	89.63	359.87	7,439.10	796.85	-204.42	797.31	0.00	0.00	0.00
8,400.00	89.63	359.87	7,439.75	896.85	-204.64	897.31	0.00	0.00	0.00
8,500.00	89.63	359.87	7,440.40	996.84	-204.87	997.31	0.00	0.00	0.00
8,600.00	89.63	359.87	7,441.06	1,096.84	-205.10	1,097.30	0.00	0.00	0.00
8,700.00	89.63	359.87	7,441.71	1,196.84	-205.32	1,197.30	0.00	0.00	0.00
8,800.00	89.63	359.87	7,442.36	1,296.84	-205.55	1,297.30	0.00	0.00	0.00
8,900.00	89.63	359.87	7,443.01	1,396.83	-205.78	1,397.30	0.00	0.00	0.00
9,000.00	89.63	359.87	7,443.66	1,496.83	-206.01	1,497.30	0.00	0.00	0.00
9,100.00	89.63	359.87	7,444.32	1,596.83	-206.23	1,597.29	0.00	0.00	0.00
9,200.00	89.63	359.87	7,444.97	1,696.83	-206.46	1,697.29	0.00	0.00	0.00
9,300.00	89.63	359.87	7,445.62	1,796.83	-206.69	1,797.29	0.00	0.00	0.00
9,400.00	89.63	359.87	7,446.27	1,896.82	-206.91	1,897.29	0.00	0.00	0.00
9,500.00	89.63	359.87	7,446.93	1,996.82	-207.14	1,997.29	0.00	0.00	0.00
9,600.00	89.63	359.87	7,447.58	2,096.82	-207.37	2,097.28	0.00	0.00	0.00
9,700.00	89.63	359.87	7,448.23	2,196.82	-207.59	2,197.28	0.00	0.00	0.00
9,800.00	89.63	359.87	7,448.88	2,296.81	-207.82	2,297.28	0.00	0.00	0.00
9,900.00	89.63	359.87	7,449.53	2,396.81	-208.05	2,397.28	0.00	0.00	0.00
10,000.00	89.63	359.87	7,450.19	2,496.81	-208.28	2,497.27	0.00	0.00	0.00
10,100.00	89.63	359.87	7,450.84	2,596.81	-208.50	2,597.27	0.00	0.00	0.00
10,200.00	89.63	359.87	7,451.49	2,696.80	-208.73	2,697.27	0.00	0.00	0.00
10,300.00	89.63	359.87	7,452.14	2,796.80	-208.96	2,797.27	0.00	0.00	0.00
10,400.00	89.63	359.87	7,452.79	2,896.80	-209.18	2,897.27	0.00	0.00	0.00
10,500.00	89.63	359.87	7,453.45	2,996.80	-209.41	2,997.26	0.00	0.00	0.00
10,600.00	89.63	359.87	7,454.10	3,096.79	-209.64	3,097.26	0.00	0.00	0.00
10,700.00	89.63	359.87	7,454.75	3,196.79	-209.86	3,197.26	0.00	0.00	0.00
10,800.00	89.63	359.87	7,455.40	3,296.79	-210.09	3,297.26	0.00	0.00	0.00
10,900.00	89.63	359.87	7,456.05	3,396.79	-210.32	3,397.26	0.00	0.00	0.00
11,000.00	89.63	359.87	7,456.71	3,496.78	-210.54	3,497.25	0.00	0.00	0.00
11,100.00	89.63	359.87	7,457.36	3,596.78	-210.77	3,597.25	0.00	0.00	0.00
11,200.00	89.63	359.87	7,458.01	3,696.78	-211.00	3,697.25	0.00	0.00	0.00
11,300.00	89.63	359.87	7,458.66	3,796.78	-211.23	3,797.25	0.00	0.00	0.00
11,400.00	89.63	359.87	7,459.32	3,896.78	-211.45	3,897.24	0.00	0.00	0.00
11,500.00	89.63	359.87	7,459.97	3,996.77	-211.68	3,997.24	0.00	0.00	0.00
11,600.00	89.63	359.87	7,460.62	4,096.77	-211.91	4,097.24	0.00	0.00	0.00
11,700.00	89.63	359.87	7,461.27	4,196.77	-212.13	4,197.24	0.00	0.00	0.00

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Survey Report

Company:	US ROCKIES WATTENBERG PLANNING	Local Co-ordinate Reference:	Well MARRS 3N-10HZ
Project:	WELD-NAD83-UTMFT13N	TVD Reference:	RKB = 17' @ 4998.00usft (D Rig)
Site:	1N-67W-22 Marrs 6-22HZ Pad	MD Reference:	RKB = 17' @ 4998.00usft (D Rig)
Well:	MARRS 3N-10HZ	North Reference:	True
Wellbore:	Plan A	Survey Calculation Method:	Minimum Curvature
Design:	Permit Rev-1	Database:	PLANNING

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)
11,800.00	89.63	359.87	7,461.92	4,296.77	-212.36	4,297.24	0.00	0.00	0.00
11,900.00	89.63	359.87	7,462.58	4,396.76	-212.59	4,397.23	0.00	0.00	0.00
12,000.00	89.63	359.87	7,463.23	4,496.76	-212.81	4,497.23	0.00	0.00	0.00
12,100.00	89.63	359.87	7,463.88	4,596.76	-213.04	4,597.23	0.00	0.00	0.00
12,200.00	89.63	359.87	7,464.53	4,696.76	-213.27	4,697.23	0.00	0.00	0.00
12,300.00	89.63	359.87	7,465.18	4,796.75	-213.50	4,797.23	0.00	0.00	0.00
12,400.00	89.63	359.87	7,465.84	4,896.75	-213.72	4,897.22	0.00	0.00	0.00
12,500.00	89.63	359.87	7,466.49	4,996.75	-213.95	4,997.22	0.00	0.00	0.00
12,600.00	89.63	359.87	7,467.14	5,096.75	-214.18	5,097.22	0.00	0.00	0.00
12,700.00	89.63	359.87	7,467.79	5,196.74	-214.40	5,197.22	0.00	0.00	0.00
12,800.00	89.63	359.87	7,468.44	5,296.74	-214.63	5,297.22	0.00	0.00	0.00
12,900.00	89.63	359.87	7,469.10	5,396.74	-214.86	5,397.21	0.00	0.00	0.00
13,000.00	89.63	359.87	7,469.75	5,496.74	-215.08	5,497.21	0.00	0.00	0.00
13,100.00	89.63	359.87	7,470.40	5,596.73	-215.31	5,597.21	0.00	0.00	0.00
13,200.00	89.63	359.87	7,471.05	5,696.73	-215.54	5,697.21	0.00	0.00	0.00
13,300.00	89.63	359.87	7,471.70	5,796.73	-215.77	5,797.20	0.00	0.00	0.00
13,400.00	89.63	359.87	7,472.36	5,896.73	-215.99	5,897.20	0.00	0.00	0.00
13,500.00	89.63	359.87	7,473.01	5,996.72	-216.22	5,997.20	0.00	0.00	0.00
13,600.00	89.63	359.87	7,473.66	6,096.72	-216.45	6,097.20	0.00	0.00	0.00
13,700.00	89.63	359.87	7,474.31	6,196.72	-216.67	6,197.20	0.00	0.00	0.00
13,800.00	89.63	359.87	7,474.97	6,296.72	-216.90	6,297.19	0.00	0.00	0.00
13,900.00	89.63	359.87	7,475.62	6,396.72	-217.13	6,397.19	0.00	0.00	0.00
14,000.00	89.63	359.87	7,476.27	6,496.71	-217.35	6,497.19	0.00	0.00	0.00
14,100.00	89.63	359.87	7,476.92	6,596.71	-217.58	6,597.19	0.00	0.00	0.00
14,200.00	89.63	359.87	7,477.57	6,696.71	-217.81	6,697.19	0.00	0.00	0.00
14,300.00	89.63	359.87	7,478.23	6,796.71	-218.04	6,797.18	0.00	0.00	0.00
14,400.00	89.63	359.87	7,478.88	6,896.70	-218.26	6,897.18	0.00	0.00	0.00
14,500.00	89.63	359.87	7,479.53	6,996.70	-218.49	6,997.18	0.00	0.00	0.00
14,600.00	89.63	359.87	7,480.18	7,096.70	-218.72	7,097.18	0.00	0.00	0.00
14,700.00	89.63	359.87	7,480.83	7,196.70	-218.94	7,197.17	0.00	0.00	0.00
14,800.00	89.63	359.87	7,481.49	7,296.69	-219.17	7,297.17	0.00	0.00	0.00
14,900.00	89.63	359.87	7,482.14	7,396.69	-219.40	7,397.17	0.00	0.00	0.00
15,000.00	89.63	359.87	7,482.79	7,496.69	-219.62	7,497.17	0.00	0.00	0.00
15,100.00	89.63	359.87	7,483.44	7,596.69	-219.85	7,597.17	0.00	0.00	0.00
15,200.00	89.63	359.87	7,484.09	7,696.68	-220.08	7,697.16	0.00	0.00	0.00
15,300.00	89.63	359.87	7,484.75	7,796.68	-220.31	7,797.16	0.00	0.00	0.00
15,400.00	89.63	359.87	7,485.40	7,896.68	-220.53	7,897.16	0.00	0.00	0.00
15,500.00	89.63	359.87	7,486.05	7,996.68	-220.76	7,997.16	0.00	0.00	0.00
15,600.00	89.63	359.87	7,486.70	8,096.67	-220.99	8,097.16	0.00	0.00	0.00
15,645.59	89.63	359.87	7,487.00	8,142.26	-221.09	8,142.74	0.00	0.00	0.00

TD Well @ 15645.59ft

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Survey Report

Company:	US ROCKIES WATTENBERG PLANNING	Local Co-ordinate Reference:	Well MARRS 3N-10HZ
Project:	WELD-NAD83-UTMFT13N	TVD Reference:	RKB = 17' @ 4998.00usft (D Rig)
Site:	1N-67W-22 Marrs 6-22HZ Pad	MD Reference:	RKB = 17' @ 4998.00usft (D Rig)
Well:	MARRS 3N-10HZ	North Reference:	True
Wellbore:	Plan A	Survey Calculation Method:	Minimum Curvature
Design:	Permit Rev-1	Database:	PLANNING

Design Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
- Shape									
MARRS 3N-10HZ_Heel	0.00	0.00	0.00	324.09	-169.33	14,540,958.12	1,674,106.38	40.039001	-104.879633
- plan misses target center by 365.66usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Point									
MARRS 3N-10HZ_SHL	0.00	0.00	0.00	0.00	0.00	14,540,634.27	1,674,276.15	40.038111	-104.879028
- plan hits target center									
- Point									
MARRS 3N-10HZ_Hardl	0.00	0.00	0.00	0.00	0.00	14,540,634.27	1,674,276.15	40.038111	-104.879028
- plan hits target center									
- Polygon									
Point 1		0.00	-104.37	-223.49		14,540,529.60	1,674,052.80		
Point 2		0.00	753.34	-230.73		14,541,387.30	1,674,044.40		
Point 3		0.00	2,070.16	-241.84		14,542,704.10	1,674,031.50		
Point 4		0.00	3,388.26	-243.95		14,544,022.20	1,674,027.60		
Point 5		0.00	4,705.27	-245.56		14,545,339.20	1,674,024.20		
Point 6		0.00	6,022.67	-248.07		14,546,656.60	1,674,019.90		
Point 7		0.00	7,340.08	-250.68		14,547,974.00	1,674,015.50		
Point 8		0.00	8,200.98	-250.41		14,548,834.90	1,674,014.60		
Point 9		0.00	8,201.22	156.59		14,548,835.70	1,674,421.60		
Point 10		0.00	7,340.52	157.32		14,547,975.00	1,674,423.50		
Point 11		0.00	6,023.32	160.43		14,546,657.80	1,674,428.40		
Point 12		0.00	4,706.21	163.04		14,545,340.70	1,674,432.80		
Point 13		0.00	3,389.41	166.05		14,544,023.90	1,674,437.60		
Point 14		0.00	2,071.70	169.06		14,542,706.20	1,674,442.40		
Point 15		0.00	754.99	175.37		14,541,389.50	1,674,450.50		
Point 16		0.00	-102.51	179.51		14,540,532.00	1,674,455.80		
1N-R67W-Sec. 22_Secti	0.00	0.00	13.00	-560.36	638.88	14,540,074.78	1,674,915.79	40.036572	-104.876746
- plan misses target center by 849.80usft at 13.00usft MD (13.00 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1		13.00	2,627.78	-2,674.22		14,542,698.93	1,672,238.00		
Point 2		13.00	2,636.63	-12.49		14,542,711.39	1,674,899.72		
Point 3		13.00	2,645.60	2,649.28		14,542,723.98	1,677,561.47		
Point 4		13.00	9.73	2,650.67		14,540,088.11	1,677,566.44		
Point 5		13.00	-2,626.39	2,652.38		14,537,452.00	1,677,571.74		
Point 6		13.00	-2,631.96	12.48		14,537,442.84	1,674,931.85		
Point 7		13.00	-2,637.68	-2,626.99		14,537,433.53	1,672,292.39		
Point 8		13.00	-9.70	-2,642.90		14,540,061.49	1,672,272.91		
1N-R67W-Sec. 15_Secti	0.00	0.00	13.00	489.54	2,528.53	14,541,127.24	1,676,804.01	40.039455	-104.869994
- plan misses target center by 2575.48usft at 13.00usft MD (13.00 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1		13.00	6,851.58	-4,568.26		14,547,972.61	1,672,226.45		
Point 2		13.00	6,853.93	-1,913.35		14,547,978.57	1,674,881.35		
Point 3		13.00	6,855.16	741.27		14,547,983.40	1,677,535.97		
Point 4		13.00	4,225.46	750.46		14,545,353.72	1,677,548.73		
Point 5		13.00	1,595.89	759.53		14,542,724.16	1,677,561.37		
Point 6		13.00	1,586.93	-1,902.25		14,542,711.59	1,674,899.61		
Point 7		13.00	1,578.07	-4,563.97		14,542,699.11	1,672,237.90		
Point 8		13.00	4,213.91	-4,566.57		14,545,334.94	1,672,231.72		
1N-R67W-Sec. 10_Secti	0.00	0.00	-82.00	7,631.75	942.12	14,548,267.29	1,675,207.90	40.059069	-104.875661
- plan misses target center by 7654.22usft at 15083.09usft MD (7483.33 TVD, 7579.78 N, -219.81 E)									
- Polygon									
Point 1		-82.00	4,992.86	-2,976.12		14,553,256.10	1,672,225.00		
Point 2		-82.00	4,994.59	-331.69		14,553,261.42	1,674,869.43		
Point 3		-82.00	4,996.25	2,313.07		14,553,266.68	1,677,514.18		
Point 4		-82.00	2,354.63	2,320.05		14,550,625.07	1,677,524.75		
Point 5		-82.00	-287.06	2,326.97		14,547,983.39	1,677,535.26		
Point 6		-82.00	-288.46	-327.65		14,547,978.39	1,674,880.65		

Anadarko

Survey Report

Company:	US ROCKIES WATTENBERG PLANNING	Local Co-ordinate Reference:	Well MARRS 3N-10HZ
Project:	WELD-NAD83-UTMFT13N	TVD Reference:	RKB = 17' @ 4998.00usft (D Rig)
Site:	1N-67W-22 Marrs 6-22HZ Pad	MD Reference:	RKB = 17' @ 4998.00usft (D Rig)
Well:	MARRS 3N-10HZ	North Reference:	True
Wellbore:	Plan A	Survey Calculation Method:	Minimum Curvature
Design:	Permit Rev-1	Database:	PLANNING

Point 7			-82.00	-290.97	-2,982.55	14,547,972.27	1,672,225.75		
MARRS 3N-10HZ_BHL	0.00	0.00	7,487.00	8,142.26	-221.09	14,548,776.22	1,674,044.00	40.060471	-104.879818
- plan hits target center									
- Point									

Casing Points						
Measured Depth (usft)	Vertical Depth (usft)	Name		Casing Diameter (")	Hole Diameter (")	
1,817.83	1,800.00	9 5/8"		9-5/8	13-1/2	
7,824.71	7,436.00	Top of Production		5-1/2	7-7/8	

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
6,377.46	6,348.00	Fox Hills				
7,257.02	7,196.00	Sharon Springs				
7,289.66	7,221.00	Niobrara				
7,482.31	7,344.00	Nio B				
7,681.34	7,419.00	Nio C				

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
200	200	0	0	Begin Nudge @ 200.00ft	
867	863	-49	-32	End Nudge @ 866.67ft	
2417	2390	-274	-178	Begin Drop @ 2416.67ft	
2917	2887	-311	-202	End Drop @ 2916.67ft	
6829	6799	-311	-202	KOP @ 6828.86ft	
7300	7229	-144	-202	DLS = 9°/100'	
7825	7436	322	-203	End Build @ 7824.71ft	
15,646	7487	8142	-221	TD Well @ 15645.59ft	

Checked By: _____ Approved By: _____ Date: _____