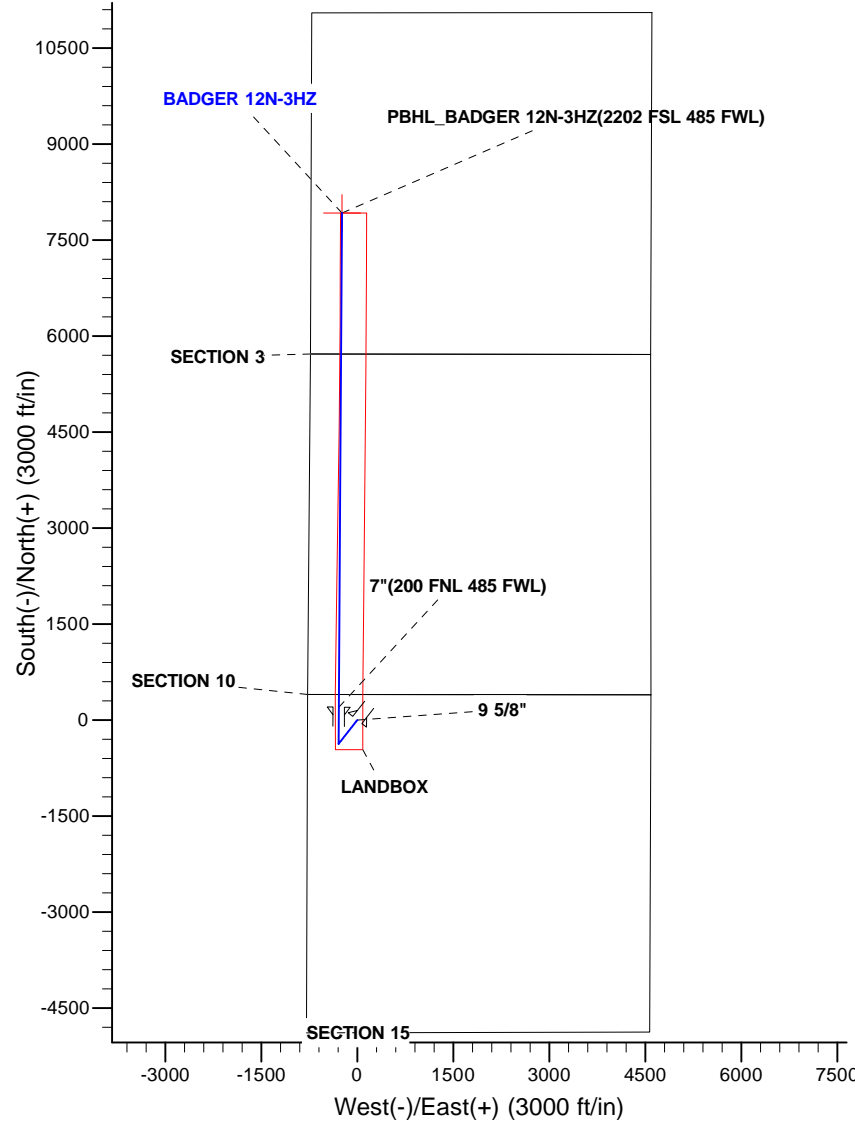
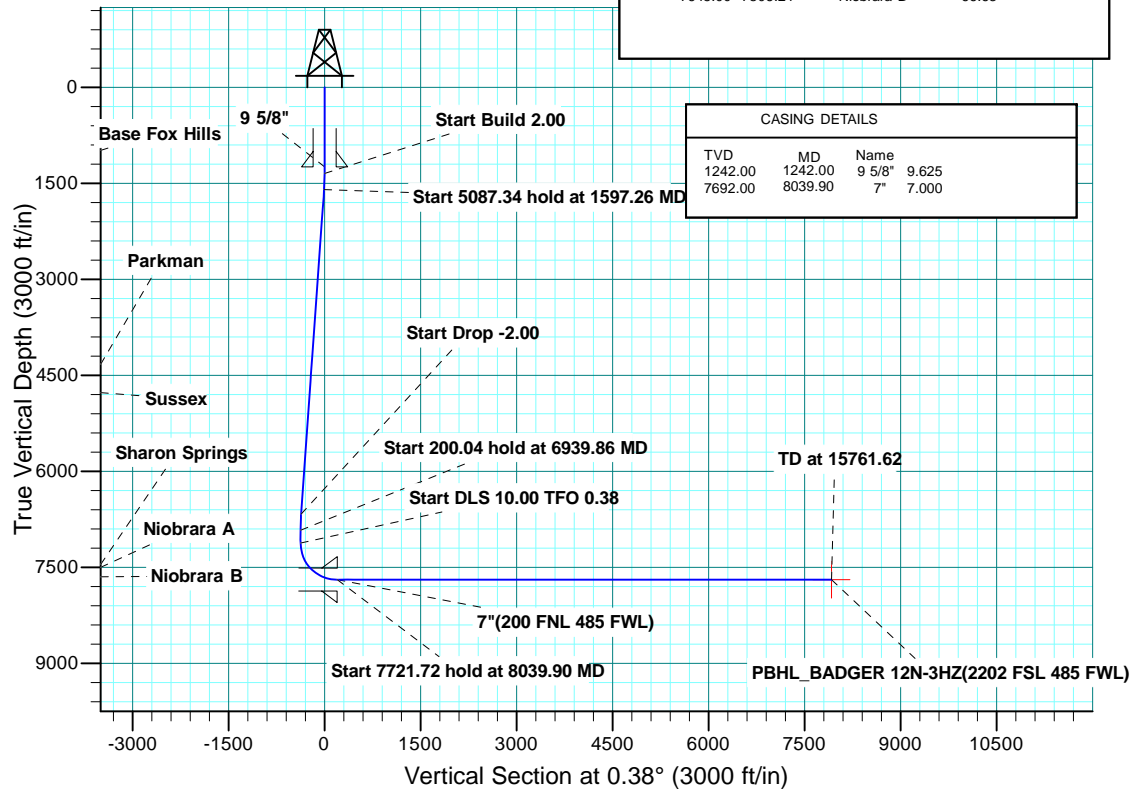




Project: COLORADO NORTHERN ZONE - 83
Site: BUFFALO & BADGER 4W-15HZ PAD
Well: BADGER 12N-3HZ
Wellbore: OH
Design: PLAN #2 PRELIMINARY



WELL DETAILS: BADGER 12N-3HZ									
GL 5141 & KB 21 @ 5162.00ft (UNIT 403)									
+N/-S		+E/-W		Northing	Easting	Latitude		Longitude	
0.00		0.00		1264131.80	3140980.82	40.0573319		-104.9963470	
SECTION DETAILS									
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1342.00	0.00	0.00	1342.00	0.00	0.00	0.00	0.00	0.00	
1597.26	5.11	218.12	1596.92	-8.94	-7.02	2.00	218.12	-8.99	
6684.60	5.11	218.12	6664.08	-365.06	-286.49	0.00	0.00	-366.95	
6939.86	0.00	0.00	6919.00	-374.00	-293.51	2.00	180.00	-375.94	
7139.90	0.00	0.00	7119.04	-374.00	-293.51	0.00	0.00	-375.94	
8039.90	90.00	0.38	7692.00	198.95	-289.71	10.00	0.38	197.02	
15761.62	90.00	0.38	7692.00	7920.50	-238.51	0.00	0.00	7918.74	PBHL_BADGER 12N-3HZ(2202 FSL 485 FWL)
DESIGN TARGET DETAILS									
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude		Longitude	Shape
PBHL	7692.00	7920.50	-238.51	1272050.80	3140697.33	40.0790750		-104.9971993	Point
- plan hits target center									
PROJECT DETAILS: COLORADO NORTHERN ZONE - 83					FORMATION TOP DETAILS				
Geodetic System: US State Plane 1983					TVDPath	MDPath	Formation	Inc	
Datum: North American Datum 1983					982.00	982.00	Base Fox Hills	0.00	
Ellipsoid: GRS 1980					4324.00	4335.20	Parkman	5.11	
Zone: Colorado Northern Zone					4770.00	4782.98	Sussex	5.11	
Location: SECTION 15 T1N R68W					7455.00	7498.89	Sharon Springs	35.90	
System Datum: Mean Sea Level					7498.00	7553.97	Niobrara A	41.41	
					7645.00	7806.21	Niobrara B	66.63	



Plan: PLAN #2 PRELIMINARY (BADGER 12N-3HZ/OH)

Created By: R.Scott Date: 11:43, October 03 2014



Scientific Drilling

US ROCKIES REGION PLANNING

**COLORADO NORTHERN ZONE - 83
BUFFALO & BADGER 4W-15HZ PAD
BADGER 12N-3HZ**

OH

Plan: PLAN #2 PRELIMINARY

Standard Planning Report

03 October, 2014

Database:	Denver Sales	Local Co-ordinate Reference:	Well BADGER 12N-3HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 5141 & KB 21 @ 5162.00ft (UNIT 403)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5141 & KB 21 @ 5162.00ft (UNIT 403)
Site:	BUFFALO & BADGER 4W-15HZ PAD	North Reference:	True
Well:	BADGER 12N-3HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	PLAN #2 PRELIMINARY		

Project	COLORADO NORTHERN ZONE - 83, KERR MCGEE OIL & GAS ONSHORE LP		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site	BUFFALO & BADGER 4W-15HZ PAD, SECTION 15 T1N R68W			
Site Position:		Northing:	1,264,129.48 usft	Latitude: 40.0573270
From:	Lat/Long	Easting:	3,140,890.98 usft	Longitude: -104.9966680
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in	Grid Convergence: 0.33 °

Well	BADGER 12N-3HZ, 396' FNL 779' FWL			
Well Position	+N/-S	1.80 ft	Northing:	1,264,131.79 usft
	+E/-W	89.85 ft	Easting:	3,140,980.82 usft
Position Uncertainty		0.00 ft	Wellhead Elevation:	0.00 ft
			Ground Level:	5,141.00 ft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2013	6/10/2014	8.61	66.62	52,524

Design	PLAN #2 PRELIMINARY			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	0.38

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	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	
1,342.00	0.00	0.00	1,342.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,597.26	5.11	218.12	1,596.92	-8.94	-7.02	2.00	2.00	0.00	218.12	
6,684.60	5.11	218.12	6,664.08	-365.06	-286.49	0.00	0.00	0.00	0.00	
6,939.86	0.00	0.00	6,919.00	-374.00	-293.51	2.00	-2.00	0.00	180.00	
7,139.90	0.00	0.00	7,119.04	-374.00	-293.51	0.00	0.00	0.00	0.00	
8,039.90	90.00	0.38	7,692.00	198.95	-289.71	10.00	10.00	0.04	0.38	
15,761.62	90.00	0.38	7,692.00	7,920.50	-238.51	0.00	0.00	0.00	0.00	PBHL_BADGER 12N

Database:	Denver Sales	Local Co-ordinate Reference:	Well BADGER 12N-3HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 5141 & KB 21 @ 5162.00ft (UNIT 403)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5141 & KB 21 @ 5162.00ft (UNIT 403)
Site:	BUFFALO & BADGER 4W-15HZ PAD	North Reference:	True
Well:	BADGER 12N-3HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	PLAN #2 PRELIMINARY		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	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
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
982.00	0.00	0.00	982.00	0.00	0.00	0.00	0.00	0.00	0.00
Base Fox Hills									
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,242.00	0.00	0.00	1,242.00	0.00	0.00	0.00	0.00	0.00	0.00
9 5/8"									
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,342.00	0.00	0.00	1,342.00	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 2.00									
1,400.00	1.16	218.12	1,400.00	-0.46	-0.36	-0.46	2.00	2.00	0.00
1,500.00	3.16	218.12	1,499.92	-3.43	-2.69	-3.44	2.00	2.00	0.00
1,597.26	5.11	218.12	1,596.92	-8.94	-7.02	-8.99	2.00	2.00	0.00
Start 5087.34 hold at 1597.26 MD									
1,600.00	5.11	218.12	1,599.65	-9.13	-7.17	-9.18	0.00	0.00	0.00
1,700.00	5.11	218.12	1,699.25	-16.13	-12.66	-16.22	0.00	0.00	0.00
1,800.00	5.11	218.12	1,798.86	-23.13	-18.15	-23.25	0.00	0.00	0.00
1,900.00	5.11	218.12	1,898.46	-30.13	-23.65	-30.29	0.00	0.00	0.00
2,000.00	5.11	218.12	1,998.06	-37.13	-29.14	-37.32	0.00	0.00	0.00
2,100.00	5.11	218.12	2,097.67	-44.13	-34.63	-44.36	0.00	0.00	0.00
2,200.00	5.11	218.12	2,197.27	-51.13	-40.13	-51.40	0.00	0.00	0.00
2,300.00	5.11	218.12	2,296.87	-58.13	-45.62	-58.43	0.00	0.00	0.00
2,400.00	5.11	218.12	2,396.48	-65.13	-51.12	-65.47	0.00	0.00	0.00
2,500.00	5.11	218.12	2,496.08	-72.13	-56.61	-72.51	0.00	0.00	0.00
2,600.00	5.11	218.12	2,595.68	-79.13	-62.10	-79.54	0.00	0.00	0.00
2,700.00	5.11	218.12	2,695.29	-86.13	-67.60	-86.58	0.00	0.00	0.00
2,800.00	5.11	218.12	2,794.89	-93.13	-73.09	-93.62	0.00	0.00	0.00
2,900.00	5.11	218.12	2,894.49	-100.13	-78.58	-100.65	0.00	0.00	0.00
3,000.00	5.11	218.12	2,994.10	-107.13	-84.08	-107.69	0.00	0.00	0.00
3,100.00	5.11	218.12	3,093.70	-114.13	-89.57	-114.73	0.00	0.00	0.00
3,200.00	5.11	218.12	3,193.30	-121.13	-95.06	-121.76	0.00	0.00	0.00
3,300.00	5.11	218.12	3,292.91	-128.13	-100.56	-128.80	0.00	0.00	0.00
3,400.00	5.11	218.12	3,392.51	-135.13	-106.05	-135.83	0.00	0.00	0.00
3,500.00	5.11	218.12	3,492.11	-142.13	-111.55	-142.87	0.00	0.00	0.00
3,600.00	5.11	218.12	3,591.72	-149.13	-117.04	-149.91	0.00	0.00	0.00
3,700.00	5.11	218.12	3,691.32	-156.13	-122.53	-156.94	0.00	0.00	0.00
3,800.00	5.11	218.12	3,790.92	-163.13	-128.03	-163.98	0.00	0.00	0.00
3,900.00	5.11	218.12	3,890.53	-170.13	-133.52	-171.02	0.00	0.00	0.00
4,000.00	5.11	218.12	3,990.13	-177.13	-139.01	-178.05	0.00	0.00	0.00
4,100.00	5.11	218.12	4,089.73	-184.13	-144.51	-185.09	0.00	0.00	0.00
4,200.00	5.11	218.12	4,189.34	-191.14	-150.00	-192.13	0.00	0.00	0.00
4,300.00	5.11	218.12	4,288.94	-198.14	-155.49	-199.16	0.00	0.00	0.00
4,335.20	5.11	218.12	4,324.00	-200.60	-157.43	-201.64	0.00	0.00	0.00
Parkman									

Database:	Denver Sales	Local Co-ordinate Reference:	Well BADGER 12N-3HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 5141 & KB 21 @ 5162.00ft (UNIT 403)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5141 & KB 21 @ 5162.00ft (UNIT 403)
Site:	BUFFALO & BADGER 4W-15HZ PAD	North Reference:	True
Well:	BADGER 12N-3HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	PLAN #2 PRELIMINARY		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,400.00	5.11	218.12	4,388.54	-205.14	-160.99	-206.20	0.00	0.00	0.00
4,500.00	5.11	218.12	4,488.15	-212.14	-166.48	-213.23	0.00	0.00	0.00
4,600.00	5.11	218.12	4,587.75	-219.14	-171.97	-220.27	0.00	0.00	0.00
4,700.00	5.11	218.12	4,687.35	-226.14	-177.47	-227.31	0.00	0.00	0.00
4,782.98	5.11	218.12	4,770.00	-231.94	-182.03	-233.15	0.00	0.00	0.00
Sussex									
4,800.00	5.11	218.12	4,786.96	-233.14	-182.96	-234.34	0.00	0.00	0.00
4,900.00	5.11	218.12	4,886.56	-240.14	-188.46	-241.38	0.00	0.00	0.00
5,000.00	5.11	218.12	4,986.16	-247.14	-193.95	-248.42	0.00	0.00	0.00
5,100.00	5.11	218.12	5,085.77	-254.14	-199.44	-255.45	0.00	0.00	0.00
5,200.00	5.11	218.12	5,185.37	-261.14	-204.94	-262.49	0.00	0.00	0.00
5,300.00	5.11	218.12	5,284.97	-268.14	-210.43	-269.53	0.00	0.00	0.00
5,400.00	5.11	218.12	5,384.58	-275.14	-215.92	-276.56	0.00	0.00	0.00
5,500.00	5.11	218.12	5,484.18	-282.14	-221.42	-283.60	0.00	0.00	0.00
5,600.00	5.11	218.12	5,583.78	-289.14	-226.91	-290.64	0.00	0.00	0.00
5,700.00	5.11	218.12	5,683.39	-296.14	-232.40	-297.67	0.00	0.00	0.00
5,800.00	5.11	218.12	5,782.99	-303.14	-237.90	-304.71	0.00	0.00	0.00
5,900.00	5.11	218.12	5,882.59	-310.14	-243.39	-311.74	0.00	0.00	0.00
6,000.00	5.11	218.12	5,982.20	-317.14	-248.88	-318.78	0.00	0.00	0.00
6,100.00	5.11	218.12	6,081.80	-324.14	-254.38	-325.82	0.00	0.00	0.00
6,200.00	5.11	218.12	6,181.40	-331.14	-259.87	-332.85	0.00	0.00	0.00
6,300.00	5.11	218.12	6,281.01	-338.14	-265.37	-339.89	0.00	0.00	0.00
6,400.00	5.11	218.12	6,380.61	-345.14	-270.86	-346.93	0.00	0.00	0.00
6,500.00	5.11	218.12	6,480.21	-352.14	-276.35	-353.96	0.00	0.00	0.00
6,600.00	5.11	218.12	6,579.82	-359.14	-281.85	-361.00	0.00	0.00	0.00
6,684.60	5.11	218.12	6,664.08	-365.06	-286.49	-366.95	0.00	0.00	0.00
Start Drop -2.00									
6,700.00	4.80	218.12	6,679.42	-366.11	-287.31	-368.00	2.00	-2.00	0.00
6,800.00	2.80	218.12	6,779.20	-371.31	-291.40	-373.24	2.00	-2.00	0.00
6,900.00	0.80	218.12	6,879.15	-373.78	-293.34	-375.72	2.00	-2.00	0.00
6,939.86	0.00	0.00	6,919.00	-374.00	-293.51	-375.94	2.00	-2.00	0.00
Start 200.04 hold at 6939.86 MD									
7,000.00	0.00	0.00	6,979.14	-374.00	-293.51	-375.94	0.00	0.00	0.00
7,100.00	0.00	0.00	7,079.14	-374.00	-293.51	-375.94	0.00	0.00	0.00
7,139.90	0.00	0.00	7,119.04	-374.00	-293.51	-375.94	0.00	0.00	0.00
Start DLS 10.00 TFO 0.38									
7,200.00	6.01	0.38	7,179.03	-370.85	-293.49	-372.79	10.00	10.00	0.00
7,300.00	16.01	0.38	7,277.07	-351.78	-293.36	-353.71	10.00	10.00	0.00
7,400.00	26.01	0.38	7,370.30	-315.97	-293.13	-317.91	10.00	10.00	0.00
7,498.89	35.90	0.38	7,455.00	-265.17	-292.79	-267.11	10.00	10.00	0.00
Sharon Springs									
7,500.00	36.01	0.38	7,455.90	-264.52	-292.78	-266.45	10.00	10.00	0.00
7,553.97	41.41	0.38	7,498.00	-230.78	-292.56	-232.71	10.00	10.00	0.00
Niobrara A									
7,600.00	46.01	0.38	7,531.26	-198.98	-292.35	-200.92	10.00	10.00	0.00
7,700.00	56.01	0.38	7,594.10	-121.36	-291.83	-123.29	10.00	10.00	0.00
7,800.00	66.01	0.38	7,642.51	-34.00	-291.26	-35.93	10.00	10.00	0.00
7,806.21	66.63	0.38	7,645.00	-28.31	-291.22	-30.24	10.00	10.00	0.00
Niobrara B									
7,900.00	76.01	0.38	7,675.00	60.44	-290.63	58.51	10.00	10.00	0.00
8,000.00	86.01	0.38	7,690.61	159.08	-289.98	157.16	10.00	10.00	0.00
8,039.90	90.00	0.38	7,692.00	198.95	-289.71	197.02	10.00	10.00	0.00
Start 7721.72 hold at 8039.90 MD - 7"(200 FNL 485 FWL)									

Database:	Denver Sales	Local Co-ordinate Reference:	Well BADGER 12N-3HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 5141 & KB 21 @ 5162.00ft (UNIT 403)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5141 & KB 21 @ 5162.00ft (UNIT 403)
Site:	BUFFALO & BADGER 4W-15HZ PAD	North Reference:	True
Well:	BADGER 12N-3HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	PLAN #2 PRELIMINARY		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
8,100.00	90.00	0.38	7,692.00	259.05	-289.31	257.12	0.00	0.00	0.00
8,200.00	90.00	0.38	7,692.00	359.05	-288.65	357.12	0.00	0.00	0.00
8,300.00	90.00	0.38	7,692.00	459.04	-287.99	457.12	0.00	0.00	0.00
8,400.00	90.00	0.38	7,692.00	559.04	-287.32	557.12	0.00	0.00	0.00
8,500.00	90.00	0.38	7,692.00	659.04	-286.66	657.12	0.00	0.00	0.00
8,600.00	90.00	0.38	7,692.00	759.04	-286.00	757.12	0.00	0.00	0.00
8,700.00	90.00	0.38	7,692.00	859.03	-285.33	857.12	0.00	0.00	0.00
8,800.00	90.00	0.38	7,692.00	959.03	-284.67	957.12	0.00	0.00	0.00
8,900.00	90.00	0.38	7,692.00	1,059.03	-284.01	1,057.12	0.00	0.00	0.00
9,000.00	90.00	0.38	7,692.00	1,159.03	-283.34	1,157.12	0.00	0.00	0.00
9,100.00	90.00	0.38	7,692.00	1,259.03	-282.68	1,257.12	0.00	0.00	0.00
9,200.00	90.00	0.38	7,692.00	1,359.02	-282.02	1,357.12	0.00	0.00	0.00
9,300.00	90.00	0.38	7,692.00	1,459.02	-281.36	1,457.12	0.00	0.00	0.00
9,400.00	90.00	0.38	7,692.00	1,559.02	-280.69	1,557.12	0.00	0.00	0.00
9,500.00	90.00	0.38	7,692.00	1,659.02	-280.03	1,657.12	0.00	0.00	0.00
9,600.00	90.00	0.38	7,692.00	1,759.01	-279.37	1,757.12	0.00	0.00	0.00
9,700.00	90.00	0.38	7,692.00	1,859.01	-278.70	1,857.12	0.00	0.00	0.00
9,800.00	90.00	0.38	7,692.00	1,959.01	-278.04	1,957.12	0.00	0.00	0.00
9,900.00	90.00	0.38	7,692.00	2,059.01	-277.38	2,057.12	0.00	0.00	0.00
10,000.00	90.00	0.38	7,692.00	2,159.01	-276.71	2,157.12	0.00	0.00	0.00
10,100.00	90.00	0.38	7,692.00	2,259.00	-276.05	2,257.12	0.00	0.00	0.00
10,200.00	90.00	0.38	7,692.00	2,359.00	-275.39	2,357.12	0.00	0.00	0.00
10,300.00	90.00	0.38	7,692.00	2,459.00	-274.72	2,457.12	0.00	0.00	0.00
10,400.00	90.00	0.38	7,692.00	2,559.00	-274.06	2,557.12	0.00	0.00	0.00
10,500.00	90.00	0.38	7,692.00	2,658.99	-273.40	2,657.12	0.00	0.00	0.00
10,600.00	90.00	0.38	7,692.00	2,758.99	-272.74	2,757.12	0.00	0.00	0.00
10,700.00	90.00	0.38	7,692.00	2,858.99	-272.07	2,857.12	0.00	0.00	0.00
10,800.00	90.00	0.38	7,692.00	2,958.99	-271.41	2,957.12	0.00	0.00	0.00
10,900.00	90.00	0.38	7,692.00	3,058.99	-270.75	3,057.12	0.00	0.00	0.00
11,000.00	90.00	0.38	7,692.00	3,158.98	-270.08	3,157.12	0.00	0.00	0.00
11,100.00	90.00	0.38	7,692.00	3,258.98	-269.42	3,257.12	0.00	0.00	0.00
11,200.00	90.00	0.38	7,692.00	3,358.98	-268.76	3,357.12	0.00	0.00	0.00
11,300.00	90.00	0.38	7,692.00	3,458.98	-268.09	3,457.12	0.00	0.00	0.00
11,400.00	90.00	0.38	7,692.00	3,558.97	-267.43	3,557.12	0.00	0.00	0.00
11,500.00	90.00	0.38	7,692.00	3,658.97	-266.77	3,657.12	0.00	0.00	0.00
11,600.00	90.00	0.38	7,692.00	3,758.97	-266.10	3,757.12	0.00	0.00	0.00
11,700.00	90.00	0.38	7,692.00	3,858.97	-265.44	3,857.12	0.00	0.00	0.00
11,800.00	90.00	0.38	7,692.00	3,958.97	-264.78	3,957.12	0.00	0.00	0.00
11,900.00	90.00	0.38	7,692.00	4,058.96	-264.12	4,057.12	0.00	0.00	0.00
12,000.00	90.00	0.38	7,692.00	4,158.96	-263.45	4,157.12	0.00	0.00	0.00
12,100.00	90.00	0.38	7,692.00	4,258.96	-262.79	4,257.12	0.00	0.00	0.00
12,200.00	90.00	0.38	7,692.00	4,358.96	-262.13	4,357.12	0.00	0.00	0.00
12,300.00	90.00	0.38	7,692.00	4,458.96	-261.46	4,457.12	0.00	0.00	0.00
12,400.00	90.00	0.38	7,692.00	4,558.95	-260.80	4,557.12	0.00	0.00	0.00
12,500.00	90.00	0.38	7,692.00	4,658.95	-260.14	4,657.12	0.00	0.00	0.00
12,600.00	90.00	0.38	7,692.00	4,758.95	-259.47	4,757.12	0.00	0.00	0.00
12,700.00	90.00	0.38	7,692.00	4,858.95	-258.81	4,857.12	0.00	0.00	0.00
12,800.00	90.00	0.38	7,692.00	4,958.94	-258.15	4,957.12	0.00	0.00	0.00
12,900.00	90.00	0.38	7,692.00	5,058.94	-257.48	5,057.12	0.00	0.00	0.00
13,000.00	90.00	0.38	7,692.00	5,158.94	-256.82	5,157.12	0.00	0.00	0.00
13,100.00	90.00	0.38	7,692.00	5,258.94	-256.16	5,257.12	0.00	0.00	0.00
13,200.00	90.00	0.38	7,692.00	5,358.94	-255.50	5,357.12	0.00	0.00	0.00
13,300.00	90.00	0.38	7,692.00	5,458.93	-254.83	5,457.12	0.00	0.00	0.00
13,400.00	90.00	0.38	7,692.00	5,558.93	-254.17	5,557.12	0.00	0.00	0.00

Database:	Denver Sales	Local Co-ordinate Reference:	Well BADGER 12N-3HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 5141 & KB 21 @ 5162.00ft (UNIT 403)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5141 & KB 21 @ 5162.00ft (UNIT 403)
Site:	BUFFALO & BADGER 4W-15HZ PAD	North Reference:	True
Well:	BADGER 12N-3HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	PLAN #2 PRELIMINARY		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
13,500.00	90.00	0.38	7,692.00	5,658.93	-253.51	5,657.12	0.00	0.00	0.00	
13,600.00	90.00	0.38	7,692.00	5,758.93	-252.84	5,757.12	0.00	0.00	0.00	
13,700.00	90.00	0.38	7,692.00	5,858.92	-252.18	5,857.12	0.00	0.00	0.00	
13,800.00	90.00	0.38	7,692.00	5,958.92	-251.52	5,957.12	0.00	0.00	0.00	
13,900.00	90.00	0.38	7,692.00	6,058.92	-250.85	6,057.12	0.00	0.00	0.00	
14,000.00	90.00	0.38	7,692.00	6,158.92	-250.19	6,157.12	0.00	0.00	0.00	
14,100.00	90.00	0.38	7,692.00	6,258.92	-249.53	6,257.12	0.00	0.00	0.00	
14,200.00	90.00	0.38	7,692.00	6,358.91	-248.86	6,357.12	0.00	0.00	0.00	
14,300.00	90.00	0.38	7,692.00	6,458.91	-248.20	6,457.12	0.00	0.00	0.00	
14,400.00	90.00	0.38	7,692.00	6,558.91	-247.54	6,557.12	0.00	0.00	0.00	
14,500.00	90.00	0.38	7,692.00	6,658.91	-246.88	6,657.12	0.00	0.00	0.00	
14,600.00	90.00	0.38	7,692.00	6,758.90	-246.21	6,757.12	0.00	0.00	0.00	
14,700.00	90.00	0.38	7,692.00	6,858.90	-245.55	6,857.12	0.00	0.00	0.00	
14,800.00	90.00	0.38	7,692.00	6,958.90	-244.89	6,957.12	0.00	0.00	0.00	
14,900.00	90.00	0.38	7,692.00	7,058.90	-244.22	7,057.12	0.00	0.00	0.00	
15,000.00	90.00	0.38	7,692.00	7,158.90	-243.56	7,157.12	0.00	0.00	0.00	
15,100.00	90.00	0.38	7,692.00	7,258.89	-242.90	7,257.12	0.00	0.00	0.00	
15,200.00	90.00	0.38	7,692.00	7,358.89	-242.23	7,357.12	0.00	0.00	0.00	
15,300.00	90.00	0.38	7,692.00	7,458.89	-241.57	7,457.12	0.00	0.00	0.00	
15,400.00	90.00	0.38	7,692.00	7,558.89	-240.91	7,557.12	0.00	0.00	0.00	
15,500.00	90.00	0.38	7,692.00	7,658.88	-240.24	7,657.12	0.00	0.00	0.00	
15,600.00	90.00	0.38	7,692.00	7,758.88	-239.58	7,757.12	0.00	0.00	0.00	
15,700.00	90.00	0.38	7,692.00	7,858.88	-238.92	7,857.12	0.00	0.00	0.00	
15,761.62	90.00	0.38	7,692.00	7,920.50	-238.51	7,918.74	0.00	0.00	0.00	
TD at 15761.62 - PBHL_BADGER 12N-3HZ(2202 FSL 485 FWL)										

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
PBHL_BADGER 12N-3H	0.00	0.00	7,692.00	7,920.50	-238.51	1,272,050.79	3,140,697.33	40.0790750	-104.9971993
- plan hits target center									
- Point									

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)	
1,242.00	1,242.00	9 5/8"	9.625	13.500	
8,039.90	7,692.00	7"(200 FNL 485 FWL)	7.000	8.750	

Database:	Denver Sales	Local Co-ordinate Reference:	Well BADGER 12N-3HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 5141 & KB 21 @ 5162.00ft (UNIT 403)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5141 & KB 21 @ 5162.00ft (UNIT 403)
Site:	BUFFALO & BADGER 4W-15HZ PAD	North Reference:	True
Well:	BADGER 12N-3HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	PLAN #2 PRELIMINARY		

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
982.00	973.00	Base Fox Hills				
4,335.20	4,315.00	Parkman				
4,782.98	4,761.00	Sussex				
7,498.89	7,446.00	Sharon Springs				
7,553.97	7,489.00	Niobrara A				
7,806.21	7,636.00	Niobrara B				

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
1,342.00	1,342.00	0.00	0.00	Start Build 2.00	
1,597.26	1,596.92	-8.94	-7.02	Start 5087.34 hold at 1597.26 MD	
6,684.60	6,664.08	-365.06	-286.49	Start Drop -2.00	
6,939.86	6,919.00	-374.00	-293.51	Start 200.04 hold at 6939.86 MD	
7,139.90	7,119.04	-374.00	-293.51	Start DLS 10.00 TFO 0.38	
8,039.90	7,692.00	198.95	-289.71	Start 7721.72 hold at 8039.90 MD	
15,761.62	7,692.00	7,920.50	-238.51	TD at 15761.62	