



Project: COLORADO NORTHERN ZONE - 83
Site: BUFFALO & BADGER 4W-15HZ PAD
Well: BADGER STATE 32C-3HZ
Wellbore: OH
Design: PLAN #2 PRELIMINARY



WELL DETAILS: BADGER STATE 32C-3HZ

GL 5141 & KB 21 @ 5161.00ft (UNIT 403)

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	1264130.89	3140950.87	40.0573299	-104.9964540

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1342.00	0.00	0.00	1342.00	0.00	0.00	0.00	0.00	0.00	
1760.48	8.37	211.50	1758.99	-26.02	-15.94	2.00	211.50	-26.02	
6771.87	8.37	211.50	6717.01	-647.98	-397.06	0.00	0.00	-647.98	
7190.35	0.00	0.00	7134.00	-674.00	-413.00	2.00	180.00	-674.00	
7390.39	0.00	0.00	7334.04	-674.00	-413.00	0.00	0.00	-674.00	
8290.39	90.00	360.00	7907.00	-101.04	-413.00	10.00	360.00	-101.04	
16313.03	90.00	360.00	7907.00	7921.60	-413.00	0.00	0.00	7921.60	PBHL_BADGER STATE 32C-3HZ(2200 FSL 280 FWL)

DESIGN TARGET DETAILS

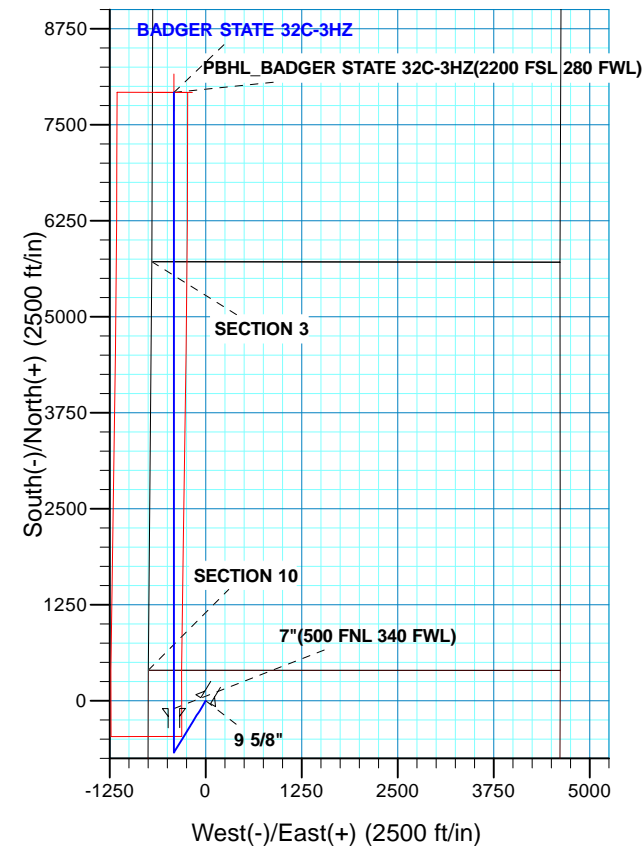
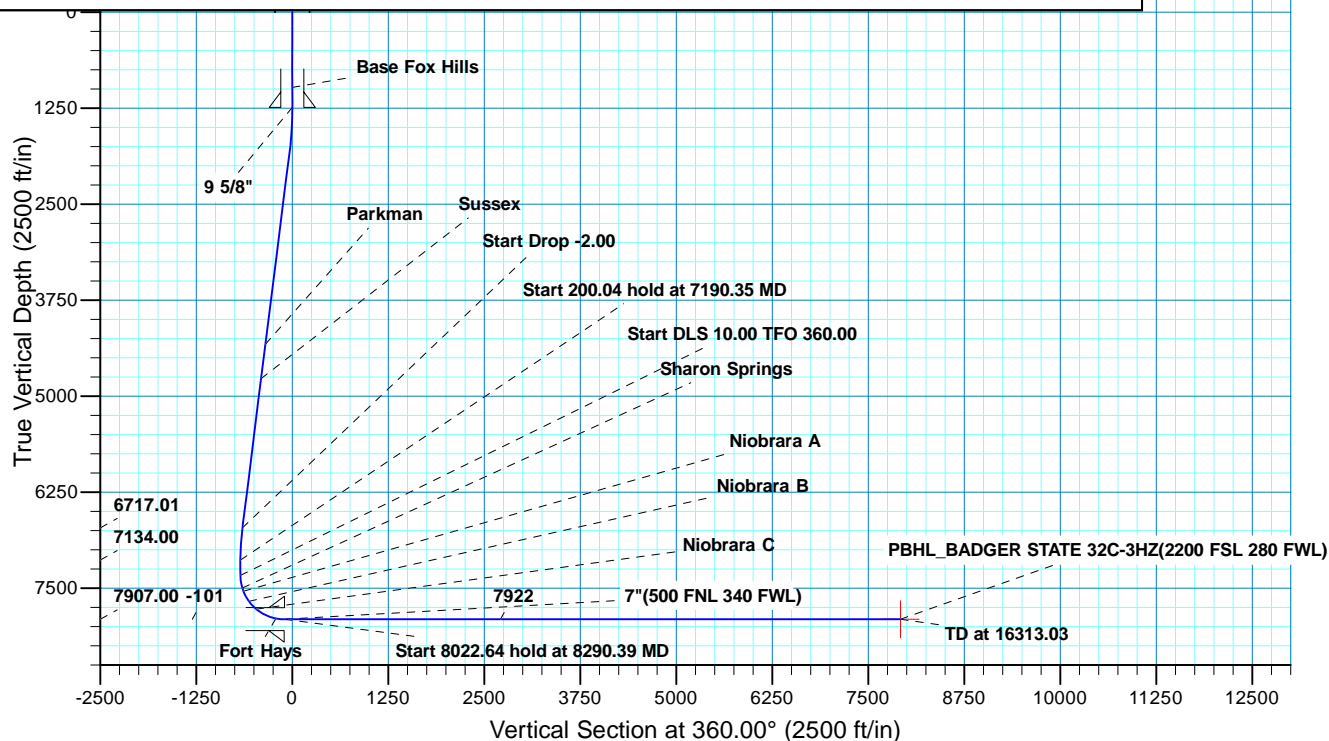
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
PBHL	7907.00	7921.60	-413.00	1272050.00	3140492.90	40.0790760	-104.9979299	Point
- plan hits target center								

FORMATION TOP DETAILS

TVDPath	MDPath	Formation	DipDirInc
982.00	982.00	Base Fox Hills	0.00
4324.00	4353.10	Parkman	8.37
4770.00	4803.90	Sussex	8.37
7498.00	7556.67	Sharon Springs	16.63
7542.00	7603.21	Niobrara A	21.28
7671.00	7750.61	Niobrara B	36.02
7773.00	7890.46	Niobrara C	50.01

CASING DETAILS

TVD	MD	Name	Size
1242.00	1242.00	9 5/8"	9.625
7907.00	8290.39	7"	7.000



Plan: PLAN #2 PRELIMINARY (BADGER STATE 32C-3HZ/OH)

Created By: RobertScott Date: 9:12, October 06 2014



Scientific Drilling

US ROCKIES REGION PLANNING

**COLORADO NORTHERN ZONE - 83
BUFFALO & BADGER 4W-15HZ PAD
BADGER STATE 32C-3HZ**

OH

Plan: PLAN #2 PRELIMINARY

Standard Planning Report

06 October, 2014

Database:	Denver Sales	Local Co-ordinate Reference:	Well BADGER STATE 32C-3HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 5141 & KB 21 @ 5161.00ft (UNIT 403)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5141 & KB 21 @ 5161.00ft (UNIT 403)
Site:	BUFFALO & BADGER 4W-15HZ PAD	North Reference:	True
Well:	BADGER STATE 32C-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 STATE 32C-3HZ, 397 FNL 749 FWL			
Well Position	+N/-S	1.07 ft	Northing:	1,264,130.89 usft
	+E/-W	59.90 ft	Easting:	3,140,950.87 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	360.00

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	
1,760.48	8.37	211.50	1,758.99	-26.02	-15.94	2.00	2.00	0.00	211.50	
6,771.87	8.37	211.50	6,717.01	-647.98	-397.06	0.00	0.00	0.00	0.00	
7,190.35	0.00	0.00	7,134.00	-674.00	-413.00	2.00	-2.00	0.00	180.00	
7,390.39	0.00	0.00	7,334.04	-674.00	-413.00	0.00	0.00	0.00	0.00	
8,290.39	90.00	360.00	7,907.00	-101.04	-413.00	10.00	10.00	0.00	360.00	
16,313.03	90.00	360.00	7,907.00	7,921.60	-413.00	0.00	0.00	0.00	0.00	PBHL_BADGER STA

Database:	Denver Sales	Local Co-ordinate Reference:	Well BADGER STATE 32C-3HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 5141 & KB 21 @ 5161.00ft (UNIT 403)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5141 & KB 21 @ 5161.00ft (UNIT 403)
Site:	BUFFALO & BADGER 4W-15HZ PAD	North Reference:	True
Well:	BADGER STATE 32C-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	211.50	1,400.00	-0.50	-0.31	-0.50	2.00	2.00	0.00
1,500.00	3.16	211.50	1,499.92	-3.71	-2.28	-3.71	2.00	2.00	0.00
1,600.00	5.16	211.50	1,599.65	-9.90	-6.07	-9.90	2.00	2.00	0.00
1,700.00	7.16	211.50	1,699.07	-19.05	-11.67	-19.05	2.00	2.00	0.00
1,760.48	8.37	211.50	1,758.99	-26.02	-15.94	-26.02	2.00	2.00	0.00
Start 5011.38 hold at 1760.48 MD									
1,800.00	8.37	211.50	1,798.09	-30.92	-18.95	-30.92	0.00	0.00	0.00
1,900.00	8.37	211.50	1,897.03	-43.33	-26.55	-43.33	0.00	0.00	0.00
2,000.00	8.37	211.50	1,995.96	-55.74	-34.16	-55.74	0.00	0.00	0.00
2,100.00	8.37	211.50	2,094.90	-68.15	-41.76	-68.15	0.00	0.00	0.00
2,200.00	8.37	211.50	2,193.83	-80.56	-49.37	-80.56	0.00	0.00	0.00
2,300.00	8.37	211.50	2,292.77	-92.98	-56.97	-92.98	0.00	0.00	0.00
2,400.00	8.37	211.50	2,391.70	-105.39	-64.58	-105.39	0.00	0.00	0.00
2,500.00	8.37	211.50	2,490.64	-117.80	-72.18	-117.80	0.00	0.00	0.00
2,600.00	8.37	211.50	2,589.57	-130.21	-79.79	-130.21	0.00	0.00	0.00
2,700.00	8.37	211.50	2,688.51	-142.62	-87.39	-142.62	0.00	0.00	0.00
2,800.00	8.37	211.50	2,787.44	-155.03	-95.00	-155.03	0.00	0.00	0.00
2,900.00	8.37	211.50	2,886.38	-167.44	-102.60	-167.44	0.00	0.00	0.00
3,000.00	8.37	211.50	2,985.31	-179.85	-110.21	-179.85	0.00	0.00	0.00
3,100.00	8.37	211.50	3,084.25	-192.26	-117.81	-192.26	0.00	0.00	0.00
3,200.00	8.37	211.50	3,183.18	-204.68	-125.42	-204.68	0.00	0.00	0.00
3,300.00	8.37	211.50	3,282.12	-217.09	-133.02	-217.09	0.00	0.00	0.00
3,400.00	8.37	211.50	3,381.05	-229.50	-140.63	-229.50	0.00	0.00	0.00
3,500.00	8.37	211.50	3,479.99	-241.91	-148.23	-241.91	0.00	0.00	0.00
3,600.00	8.37	211.50	3,578.92	-254.32	-155.84	-254.32	0.00	0.00	0.00
3,700.00	8.37	211.50	3,677.86	-266.73	-163.44	-266.73	0.00	0.00	0.00
3,800.00	8.37	211.50	3,776.79	-279.14	-171.05	-279.14	0.00	0.00	0.00
3,900.00	8.37	211.50	3,875.73	-291.55	-178.65	-291.55	0.00	0.00	0.00
4,000.00	8.37	211.50	3,974.66	-303.96	-186.26	-303.96	0.00	0.00	0.00
4,100.00	8.37	211.50	4,073.60	-316.38	-193.86	-316.38	0.00	0.00	0.00
4,200.00	8.37	211.50	4,172.53	-328.79	-201.47	-328.79	0.00	0.00	0.00
4,300.00	8.37	211.50	4,271.47	-341.20	-209.07	-341.20	0.00	0.00	0.00
4,353.10	8.37	211.50	4,324.00	-347.79	-213.11	-347.79	0.00	0.00	0.00
Parkman									

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Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5141 & KB 21 @ 5161.00ft (UNIT 403)
Site:	BUFFALO & BADGER 4W-15HZ PAD	North Reference:	True
Well:	BADGER STATE 32C-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	8.37	211.50	4,370.40	-353.61	-216.68	-353.61	0.00	0.00	0.00
4,500.00	8.37	211.50	4,469.34	-366.02	-224.28	-366.02	0.00	0.00	0.00
4,600.00	8.37	211.50	4,568.27	-378.43	-231.89	-378.43	0.00	0.00	0.00
4,700.00	8.37	211.50	4,667.21	-390.84	-239.49	-390.84	0.00	0.00	0.00
4,800.00	8.37	211.50	4,766.14	-403.25	-247.10	-403.25	0.00	0.00	0.00
4,803.90	8.37	211.50	4,770.00	-403.74	-247.39	-403.74	0.00	0.00	0.00
Sussex									
4,900.00	8.37	211.50	4,865.08	-415.67	-254.70	-415.67	0.00	0.00	0.00
5,000.00	8.37	211.50	4,964.01	-428.08	-262.31	-428.08	0.00	0.00	0.00
5,100.00	8.37	211.50	5,062.95	-440.49	-269.91	-440.49	0.00	0.00	0.00
5,200.00	8.37	211.50	5,161.88	-452.90	-277.52	-452.90	0.00	0.00	0.00
5,300.00	8.37	211.50	5,260.82	-465.31	-285.12	-465.31	0.00	0.00	0.00
5,400.00	8.37	211.50	5,359.75	-477.72	-292.73	-477.72	0.00	0.00	0.00
5,500.00	8.37	211.50	5,458.69	-490.13	-300.33	-490.13	0.00	0.00	0.00
5,600.00	8.37	211.50	5,557.62	-502.54	-307.94	-502.54	0.00	0.00	0.00
5,700.00	8.37	211.50	5,656.56	-514.95	-315.54	-514.95	0.00	0.00	0.00
5,800.00	8.37	211.50	5,755.49	-527.37	-323.15	-527.37	0.00	0.00	0.00
5,900.00	8.37	211.50	5,854.43	-539.78	-330.75	-539.78	0.00	0.00	0.00
6,000.00	8.37	211.50	5,953.36	-552.19	-338.36	-552.19	0.00	0.00	0.00
6,100.00	8.37	211.50	6,052.30	-564.60	-345.96	-564.60	0.00	0.00	0.00
6,200.00	8.37	211.50	6,151.23	-577.01	-353.57	-577.01	0.00	0.00	0.00
6,300.00	8.37	211.50	6,250.17	-589.42	-361.17	-589.42	0.00	0.00	0.00
6,400.00	8.37	211.50	6,349.10	-601.83	-368.78	-601.83	0.00	0.00	0.00
6,500.00	8.37	211.50	6,448.04	-614.24	-376.38	-614.24	0.00	0.00	0.00
6,600.00	8.37	211.50	6,546.97	-626.65	-383.99	-626.65	0.00	0.00	0.00
6,700.00	8.37	211.50	6,645.91	-639.07	-391.59	-639.07	0.00	0.00	0.00
6,771.87	8.37	211.50	6,717.01	-647.98	-397.06	-647.98	0.00	0.00	0.00
Start Drop -2.00									
6,800.00	7.81	211.50	6,744.86	-651.36	-399.13	-651.36	2.00	-2.00	0.00
6,900.00	5.81	211.50	6,844.15	-661.47	-405.32	-661.47	2.00	-2.00	0.00
7,000.00	3.81	211.50	6,943.79	-668.61	-409.70	-668.61	2.00	-2.00	0.00
7,100.00	1.81	211.50	7,043.67	-672.79	-412.26	-672.79	2.00	-2.00	0.00
7,190.35	0.00	0.00	7,134.00	-674.00	-413.00	-674.00	2.00	-2.00	0.00
Start 200.04 hold at 7190.35 MD									
7,200.00	0.00	0.00	7,143.65	-674.00	-413.00	-674.00	0.00	0.00	0.00
7,300.00	0.00	0.00	7,243.65	-674.00	-413.00	-674.00	0.00	0.00	0.00
7,390.39	0.00	0.00	7,334.04	-674.00	-413.00	-674.00	0.00	0.00	0.00
Start DLS 10.00 TFO 360.00									
7,400.00	0.96	360.00	7,343.65	-673.92	-413.00	-673.92	10.00	10.00	0.00
7,500.00	10.96	360.00	7,442.99	-663.55	-413.00	-663.55	10.00	10.00	0.00
7,556.67	16.63	360.00	7,498.00	-650.04	-413.00	-650.04	10.00	10.00	0.00
Sharon Springs									
7,600.00	20.96	360.00	7,539.01	-636.08	-413.00	-636.08	10.00	10.00	0.00
7,603.21	21.28	360.00	7,542.00	-634.93	-413.00	-634.93	10.00	10.00	0.00
Niobrara A									
7,700.00	30.96	360.00	7,628.80	-592.36	-413.00	-592.36	10.00	10.00	0.00
7,750.61	36.02	0.00	7,671.00	-564.44	-413.00	-564.44	10.00	10.00	0.00
Niobrara B									
7,800.00	40.96	360.00	7,709.64	-533.71	-413.00	-533.71	10.00	10.00	0.00
7,890.46	50.01	360.00	7,773.00	-469.27	-413.00	-469.27	10.00	10.00	0.00
Niobrara C									
7,900.00	50.96	360.00	7,779.07	-461.92	-413.00	-461.92	10.00	10.00	0.00
8,000.00	60.96	360.00	7,834.97	-379.16	-413.00	-379.16	10.00	10.00	0.00

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Site:	BUFFALO & BADGER 4W-15HZ PAD	North Reference:	True
Well:	BADGER STATE 32C-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	70.96	360.00	7,875.66	-287.94	-413.00	-287.94	10.00	10.00	0.00
8,177.95	78.76	360.00	7,896.00	-212.76	-413.00	-212.76	10.00	10.00	0.00
Fort Hays									
8,200.00	80.96	360.00	7,899.88	-191.05	-413.00	-191.05	10.00	10.00	0.00
8,290.39	90.00	360.00	7,907.00	-101.04	-413.00	-101.04	10.00	10.00	0.00
Start 8022.64 hold at 8290.39 MD - 7"(500 FNL 340 FWL)									
8,300.00	90.00	360.00	7,907.00	-91.43	-413.00	-91.43	0.00	0.00	0.00
8,400.00	90.00	360.00	7,907.00	8.57	-413.00	8.57	0.00	0.00	0.00
8,500.00	90.00	360.00	7,907.00	108.57	-413.00	108.57	0.00	0.00	0.00
8,600.00	90.00	360.00	7,907.00	208.57	-413.00	208.57	0.00	0.00	0.00
8,700.00	90.00	360.00	7,907.00	308.57	-413.00	308.57	0.00	0.00	0.00
8,800.00	90.00	360.00	7,907.00	408.57	-413.00	408.57	0.00	0.00	0.00
8,900.00	90.00	360.00	7,907.00	508.57	-413.00	508.57	0.00	0.00	0.00
9,000.00	90.00	360.00	7,907.00	608.57	-413.00	608.57	0.00	0.00	0.00
9,100.00	90.00	360.00	7,907.00	708.57	-413.00	708.57	0.00	0.00	0.00
9,200.00	90.00	360.00	7,907.00	808.57	-413.00	808.57	0.00	0.00	0.00
9,300.00	90.00	360.00	7,907.00	908.57	-413.00	908.57	0.00	0.00	0.00
9,400.00	90.00	360.00	7,907.00	1,008.57	-413.00	1,008.57	0.00	0.00	0.00
9,500.00	90.00	360.00	7,907.00	1,108.57	-413.00	1,108.57	0.00	0.00	0.00
9,600.00	90.00	360.00	7,907.00	1,208.57	-413.00	1,208.57	0.00	0.00	0.00
9,700.00	90.00	360.00	7,907.00	1,308.57	-413.00	1,308.57	0.00	0.00	0.00
9,800.00	90.00	360.00	7,907.00	1,408.57	-413.00	1,408.57	0.00	0.00	0.00
9,900.00	90.00	360.00	7,907.00	1,508.57	-413.00	1,508.57	0.00	0.00	0.00
10,000.00	90.00	360.00	7,907.00	1,608.57	-413.00	1,608.57	0.00	0.00	0.00
10,100.00	90.00	360.00	7,907.00	1,708.57	-413.00	1,708.57	0.00	0.00	0.00
10,200.00	90.00	360.00	7,907.00	1,808.57	-413.00	1,808.57	0.00	0.00	0.00
10,300.00	90.00	360.00	7,907.00	1,908.57	-413.00	1,908.57	0.00	0.00	0.00
10,400.00	90.00	360.00	7,907.00	2,008.57	-413.00	2,008.57	0.00	0.00	0.00
10,500.00	90.00	360.00	7,907.00	2,108.57	-413.00	2,108.57	0.00	0.00	0.00
10,600.00	90.00	360.00	7,907.00	2,208.57	-413.00	2,208.57	0.00	0.00	0.00
10,700.00	90.00	360.00	7,907.00	2,308.57	-413.00	2,308.57	0.00	0.00	0.00
10,800.00	90.00	360.00	7,907.00	2,408.57	-413.00	2,408.57	0.00	0.00	0.00
10,900.00	90.00	360.00	7,907.00	2,508.57	-413.00	2,508.57	0.00	0.00	0.00
11,000.00	90.00	360.00	7,907.00	2,608.57	-413.00	2,608.57	0.00	0.00	0.00
11,100.00	90.00	360.00	7,907.00	2,708.57	-413.00	2,708.57	0.00	0.00	0.00
11,200.00	90.00	360.00	7,907.00	2,808.57	-413.00	2,808.57	0.00	0.00	0.00
11,300.00	90.00	360.00	7,907.00	2,908.57	-413.00	2,908.57	0.00	0.00	0.00
11,400.00	90.00	360.00	7,907.00	3,008.57	-413.00	3,008.57	0.00	0.00	0.00
11,500.00	90.00	360.00	7,907.00	3,108.57	-413.00	3,108.57	0.00	0.00	0.00
11,600.00	90.00	360.00	7,907.00	3,208.57	-413.00	3,208.57	0.00	0.00	0.00
11,700.00	90.00	360.00	7,907.00	3,308.57	-413.00	3,308.57	0.00	0.00	0.00
11,800.00	90.00	360.00	7,907.00	3,408.57	-413.00	3,408.57	0.00	0.00	0.00
11,900.00	90.00	360.00	7,907.00	3,508.57	-413.00	3,508.57	0.00	0.00	0.00
12,000.00	90.00	360.00	7,907.00	3,608.57	-413.00	3,608.57	0.00	0.00	0.00
12,100.00	90.00	360.00	7,907.00	3,708.57	-413.00	3,708.57	0.00	0.00	0.00
12,200.00	90.00	360.00	7,907.00	3,808.57	-413.00	3,808.57	0.00	0.00	0.00
12,300.00	90.00	360.00	7,907.00	3,908.57	-413.00	3,908.57	0.00	0.00	0.00
12,400.00	90.00	360.00	7,907.00	4,008.57	-413.00	4,008.57	0.00	0.00	0.00
12,500.00	90.00	360.00	7,907.00	4,108.57	-413.00	4,108.57	0.00	0.00	0.00
12,600.00	90.00	360.00	7,907.00	4,208.57	-413.00	4,208.57	0.00	0.00	0.00
12,700.00	90.00	360.00	7,907.00	4,308.57	-413.00	4,308.57	0.00	0.00	0.00
12,800.00	90.00	360.00	7,907.00	4,408.57	-413.00	4,408.57	0.00	0.00	0.00
12,900.00	90.00	360.00	7,907.00	4,508.57	-413.00	4,508.57	0.00	0.00	0.00

Database:	Denver Sales	Local Co-ordinate Reference:	Well BADGER STATE 32C-3HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 5141 & KB 21 @ 5161.00ft (UNIT 403)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5141 & KB 21 @ 5161.00ft (UNIT 403)
Site:	BUFFALO & BADGER 4W-15HZ PAD	North Reference:	True
Well:	BADGER STATE 32C-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)
13,000.00	90.00	360.00	7,907.00	4,608.57	-413.00	4,608.57	0.00	0.00	0.00
13,100.00	90.00	360.00	7,907.00	4,708.57	-413.00	4,708.57	0.00	0.00	0.00
13,200.00	90.00	360.00	7,907.00	4,808.57	-413.00	4,808.57	0.00	0.00	0.00
13,300.00	90.00	360.00	7,907.00	4,908.57	-413.00	4,908.57	0.00	0.00	0.00
13,400.00	90.00	360.00	7,907.00	5,008.57	-413.00	5,008.57	0.00	0.00	0.00
13,500.00	90.00	360.00	7,907.00	5,108.57	-413.00	5,108.57	0.00	0.00	0.00
13,600.00	90.00	360.00	7,907.00	5,208.57	-413.00	5,208.57	0.00	0.00	0.00
13,700.00	90.00	360.00	7,907.00	5,308.57	-413.00	5,308.57	0.00	0.00	0.00
13,800.00	90.00	360.00	7,907.00	5,408.57	-413.00	5,408.57	0.00	0.00	0.00
13,900.00	90.00	360.00	7,907.00	5,508.57	-413.00	5,508.57	0.00	0.00	0.00
14,000.00	90.00	360.00	7,907.00	5,608.57	-413.00	5,608.57	0.00	0.00	0.00
14,100.00	90.00	360.00	7,907.00	5,708.57	-413.00	5,708.57	0.00	0.00	0.00
14,200.00	90.00	360.00	7,907.00	5,808.57	-413.00	5,808.57	0.00	0.00	0.00
14,300.00	90.00	360.00	7,907.00	5,908.57	-413.00	5,908.57	0.00	0.00	0.00
14,400.00	90.00	360.00	7,907.00	6,008.57	-413.00	6,008.57	0.00	0.00	0.00
14,500.00	90.00	360.00	7,907.00	6,108.57	-413.00	6,108.57	0.00	0.00	0.00
14,600.00	90.00	360.00	7,907.00	6,208.57	-413.00	6,208.57	0.00	0.00	0.00
14,700.00	90.00	360.00	7,907.00	6,308.57	-413.00	6,308.57	0.00	0.00	0.00
14,800.00	90.00	360.00	7,907.00	6,408.57	-413.00	6,408.57	0.00	0.00	0.00
14,900.00	90.00	360.00	7,907.00	6,508.57	-413.00	6,508.57	0.00	0.00	0.00
15,000.00	90.00	360.00	7,907.00	6,608.57	-413.00	6,608.57	0.00	0.00	0.00
15,100.00	90.00	360.00	7,907.00	6,708.57	-413.00	6,708.57	0.00	0.00	0.00
15,200.00	90.00	360.00	7,907.00	6,808.57	-413.00	6,808.57	0.00	0.00	0.00
15,300.00	90.00	360.00	7,907.00	6,908.57	-413.00	6,908.57	0.00	0.00	0.00
15,400.00	90.00	360.00	7,907.00	7,008.57	-413.00	7,008.57	0.00	0.00	0.00
15,500.00	90.00	360.00	7,907.00	7,108.57	-413.00	7,108.57	0.00	0.00	0.00
15,600.00	90.00	360.00	7,907.00	7,208.57	-413.00	7,208.57	0.00	0.00	0.00
15,700.00	90.00	360.00	7,907.00	7,308.57	-413.00	7,308.57	0.00	0.00	0.00
15,800.00	90.00	360.00	7,907.00	7,408.57	-413.00	7,408.57	0.00	0.00	0.00
15,900.00	90.00	360.00	7,907.00	7,508.57	-413.00	7,508.57	0.00	0.00	0.00
16,000.00	90.00	360.00	7,907.00	7,608.57	-413.00	7,608.57	0.00	0.00	0.00
16,100.00	90.00	360.00	7,907.00	7,708.57	-413.00	7,708.57	0.00	0.00	0.00
16,200.00	90.00	360.00	7,907.00	7,808.57	-413.00	7,808.57	0.00	0.00	0.00
16,300.00	90.00	360.00	7,907.00	7,908.57	-413.00	7,908.57	0.00	0.00	0.00
16,313.03	90.00	360.00	7,907.00	7,921.60	-413.00	7,921.60	0.00	0.00	0.00
TD at 16313.03 - PBHL_BADGER STATE 32C-3HZ(2200 FSL 280 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 STATE	0.00	0.00	7,907.00	7,921.60	-413.00	1,272,050.00	3,140,492.90	40.0790760	-104.9979299
- plan hits target center									
- Point									

Database:	Denver Sales	Local Co-ordinate Reference:	Well BADGER STATE 32C-3HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 5141 & KB 21 @ 5161.00ft (UNIT 403)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5141 & KB 21 @ 5161.00ft (UNIT 403)
Site:	BUFFALO & BADGER 4W-15HZ PAD	North Reference:	True
Well:	BADGER STATE 32C-3HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	PLAN #2 PRELIMINARY		

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	
8,290.39	7,907.00	7"(500 FNL 340 FWL)	7.000	8.750	

Formations					
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
982.00	982.00	Base Fox Hills			
4,353.10	4,324.00	Parkman			
4,803.90	4,770.00	Sussex			
7,556.67	7,498.00	Sharon Springs			
7,603.21	7,542.00	Niobrara A			
7,750.61	7,671.00	Niobrara B			
7,890.46	7,773.00	Niobrara C			
8,177.95	7,896.00	Fort Hays			

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
1,342.00	1,342.00	0.00	0.00	Start Build 2.00
1,760.48	1,758.99	-26.02	-15.94	Start 5011.38 hold at 1760.48 MD
6,771.87	6,717.01	-647.98	-397.06	Start Drop -2.00
7,190.35	7,134.00	-674.00	-413.00	Start 200.04 hold at 7190.35 MD
7,390.39	7,334.04	-674.00	-413.00	Start DLS 10.00 TFO 360.00
8,290.39	7,907.00	-101.04	-413.00	Start 8022.64 hold at 8290.39 MD
16,313.03	7,907.00	7,921.60	-413.00	TD at 16313.03