



Project: COLORADO NORTHERN ZONE - 83
Site: BUFFALO & BADGER 4C-15HZ PAD
Well: BUFFALO 35C-15HZ
Wellbore: OH
Design: PLAN #2 PRELIMINARY

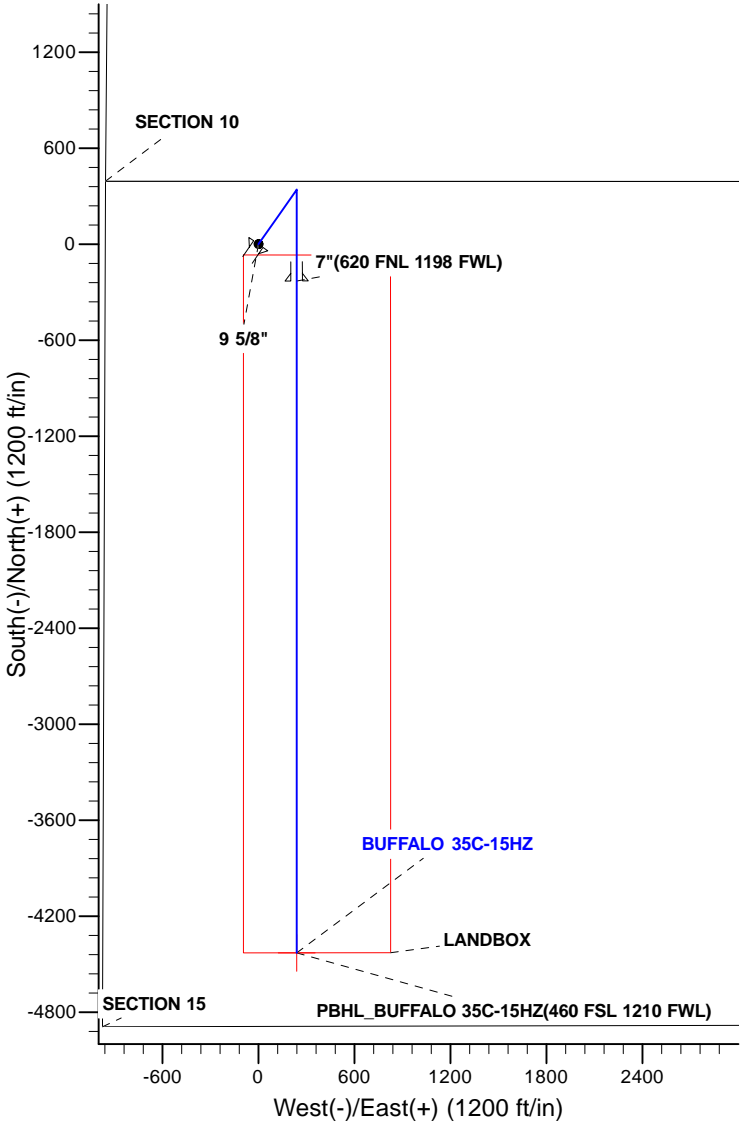
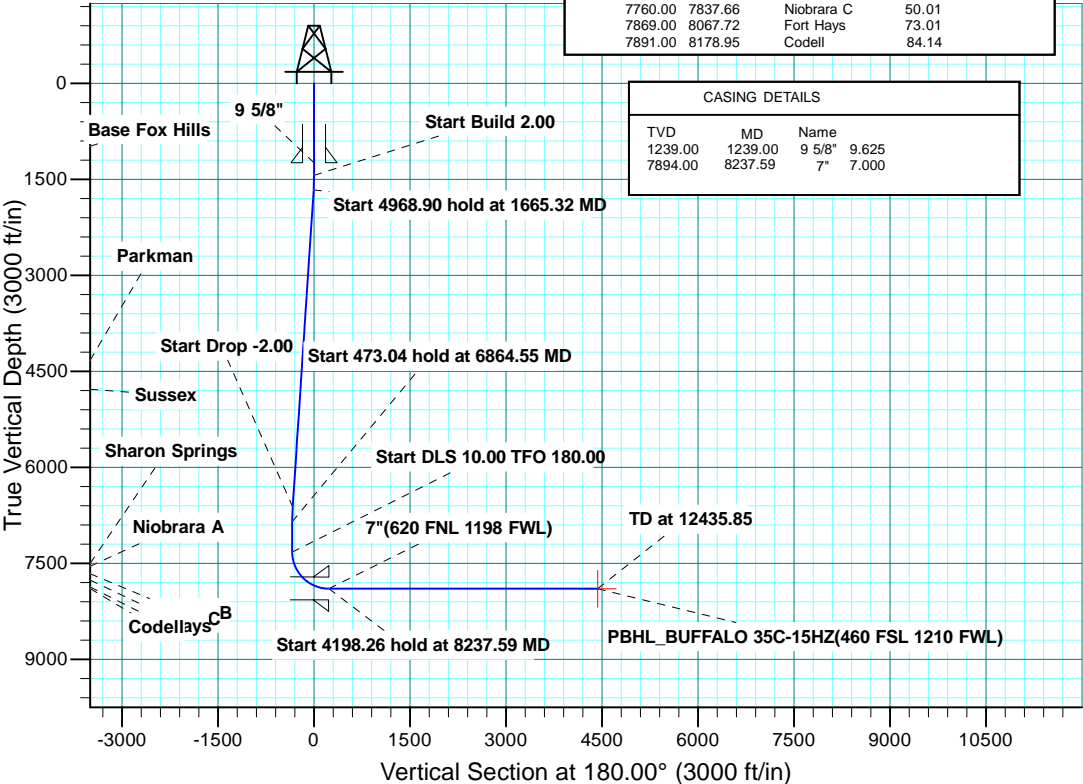


WELL DETAILS: BUFFALO 35C-15HZ								
GL 5138 & KB 21 @ 5159.00ft (UNIT 403)								
			+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
			0.00	0.00	1264136.10	3141160.78	40.0573409	-104.9957040
SECTION DETAILS								
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1435.00	0.00	0.00	1435.00	0.00	0.00	0.00	0.00	0.00
1665.32	4.61	35.01	1665.08	7.58	5.31	2.00	35.01	-7.58
6634.22	4.61	35.01	6617.92	334.42	234.27	0.00	0.00	-334.42
6864.55	0.00	0.00	6848.00	342.00	239.58	2.00	180.00	-342.00
7337.59	0.00	0.00	7321.04	342.00	239.58	0.00	0.00	-342.00
8237.59	90.00	180.00	7894.00	-230.96	239.58	10.00	180.00	230.96
12435.85	90.00	180.00	7894.00	-4429.22	239.58	0.00	0.00	4429.22
PBHL_BUFFALO 35C-15HZ(460 FSL 1210 FWL)								
DESIGN TARGET DETAILS								
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
PBHL 7894.00	-4429.22	239.58	1259708.32	3141425.55	40.0451820	-104.9948483		Point
- plan hits target center								

PROJECT DETAILS: COLORADO NORTHERN ZONE - 83	
Geodetic System: US State Plane 1983	
Datum: North American Datum 1983	
Ellipsoid: GRS 1980	
Zone: Colorado Northern Zone	
Location: SECTION 15 T1N R68W	
System Datum: Mean Sea Level	

FORMATION TOP DETAILS			
TVDPath	MDPath	Formation	Inc
979.00	979.00	Base Fox Hills	0.00
4321.00	4329.85	Parkman	4.61
4779.00	4789.34	Sussex	4.61
7498.00	7517.49	Sharon Springs	17.99
7544.00	7566.60	Niobrara A	22.90
7662.00	7702.78	Niobrara B	36.52
7760.00	7837.66	Niobrara C	50.01
7869.00	8067.72	Fort Hays	73.01
7891.00	8178.95	Codell	84.14

CASING DETAILS			
TVD	MD	Name	
1239.00	1239.00	9 5/8"	9.625
7894.00	8237.59	7"	7.000





Scientific Drilling

US ROCKIES REGION PLANNING

**COLORADO NORTHERN ZONE - 83
BUFFALO & BADGER 4C-15HZ PAD
BUFFALO 35C-15HZ**

OH

Plan: PLAN #2 PRELIMINARY

Standard Planning Report

03 October, 2014

Database:	Denver Sales	Local Co-ordinate Reference:	Well BUFFALO 35C-15HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 5138 & KB 21 @ 5159.00ft (UNIT 403)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5138 & KB 21 @ 5159.00ft (UNIT 403)
Site:	BUFFALO & BADGER 4C-15HZ PAD	North Reference:	True
Well:	BUFFALO 35C-15HZ	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 4C-15HZ PAD, SECTION 15 T1N R68W			
Site Position:		Northing:	1,264,136.65 usft	Latitude: 40.0573420
From:	Lat/Long	Easting:	3,141,190.73 usft	Longitude: -104.9955970
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in	Grid Convergence: 0.33 °

Well	BUFFALO 35C-15HZ, 393' FNL 959' FWL			
Well Position	+N/-S	-0.38 ft	Northing:	1,264,136.10 usft
	+E/-W	-29.95 ft	Easting:	3,141,160.79 usft
Position Uncertainty	0.00 ft	Wellhead Elevation:	0.00 ft	Ground Level: 5,138.00 ft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2013	6/5/2014	8.61	66.62	52,525

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	180.00

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	
1,435.00	0.00	0.00	1,435.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,665.32	4.61	35.01	1,665.08	7.58	5.31	2.00	2.00	0.00	35.01	
6,634.22	4.61	35.01	6,617.92	334.42	234.27	0.00	0.00	0.00	0.00	
6,864.55	0.00	0.00	6,848.00	342.00	239.58	2.00	-2.00	0.00	180.00	
7,337.59	0.00	0.00	7,321.04	342.00	239.58	0.00	0.00	0.00	0.00	
8,237.59	90.00	180.00	7,894.00	-230.96	239.58	10.00	10.00	20.00	180.00	
12,435.85	90.00	180.00	7,894.00	-4,429.22	239.58	0.00	0.00	0.00	0.00	PBHL_BUFFALO 35C

Database:	Denver Sales	Local Co-ordinate Reference:	Well BUFFALO 35C-15HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 5138 & KB 21 @ 5159.00ft (UNIT 403)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5138 & KB 21 @ 5159.00ft (UNIT 403)
Site:	BUFFALO & BADGER 4C-15HZ PAD	North Reference:	True
Well:	BUFFALO 35C-15HZ	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
979.00	0.00	0.00	979.00	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
1,239.00	0.00	0.00	1,239.00	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
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,435.00	0.00	0.00	1,435.00	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 2.00									
1,500.00	1.30	35.01	1,499.99	0.60	0.42	-0.60	2.00	2.00	0.00
1,600.00	3.30	35.01	1,599.91	3.89	2.73	-3.89	2.00	2.00	0.00
1,665.32	4.61	35.01	1,665.08	7.58	5.31	-7.58	2.00	2.00	0.00
Start 4968.90 hold at 1665.32 MD									
1,700.00	4.61	35.01	1,699.64	9.86	6.91	-9.86	0.00	0.00	0.00
1,800.00	4.61	35.01	1,799.32	16.44	11.52	-16.44	0.00	0.00	0.00
1,900.00	4.61	35.01	1,898.99	23.02	16.12	-23.02	0.00	0.00	0.00
2,000.00	4.61	35.01	1,998.67	29.59	20.73	-29.59	0.00	0.00	0.00
2,100.00	4.61	35.01	2,098.35	36.17	25.34	-36.17	0.00	0.00	0.00
2,200.00	4.61	35.01	2,198.02	42.75	29.95	-42.75	0.00	0.00	0.00
2,300.00	4.61	35.01	2,297.70	49.33	34.55	-49.33	0.00	0.00	0.00
2,400.00	4.61	35.01	2,397.38	55.90	39.16	-55.90	0.00	0.00	0.00
2,500.00	4.61	35.01	2,497.06	62.48	43.77	-62.48	0.00	0.00	0.00
2,600.00	4.61	35.01	2,596.73	69.06	48.38	-69.06	0.00	0.00	0.00
2,700.00	4.61	35.01	2,696.41	75.64	52.99	-75.64	0.00	0.00	0.00
2,800.00	4.61	35.01	2,796.09	82.22	57.59	-82.22	0.00	0.00	0.00
2,900.00	4.61	35.01	2,895.76	88.79	62.20	-88.79	0.00	0.00	0.00
3,000.00	4.61	35.01	2,995.44	95.37	66.81	-95.37	0.00	0.00	0.00
3,100.00	4.61	35.01	3,095.12	101.95	71.42	-101.95	0.00	0.00	0.00
3,200.00	4.61	35.01	3,194.79	108.53	76.03	-108.53	0.00	0.00	0.00
3,300.00	4.61	35.01	3,294.47	115.10	80.63	-115.10	0.00	0.00	0.00
3,400.00	4.61	35.01	3,394.15	121.68	85.24	-121.68	0.00	0.00	0.00
3,500.00	4.61	35.01	3,493.83	128.26	89.85	-128.26	0.00	0.00	0.00
3,600.00	4.61	35.01	3,593.50	134.84	94.46	-134.84	0.00	0.00	0.00
3,700.00	4.61	35.01	3,693.18	141.42	99.06	-141.42	0.00	0.00	0.00
3,800.00	4.61	35.01	3,792.86	147.99	103.67	-147.99	0.00	0.00	0.00
3,900.00	4.61	35.01	3,892.53	154.57	108.28	-154.57	0.00	0.00	0.00
4,000.00	4.61	35.01	3,992.21	161.15	112.89	-161.15	0.00	0.00	0.00
4,100.00	4.61	35.01	4,091.89	167.73	117.50	-167.73	0.00	0.00	0.00
4,200.00	4.61	35.01	4,191.56	174.30	122.10	-174.30	0.00	0.00	0.00
4,300.00	4.61	35.01	4,291.24	180.88	126.71	-180.88	0.00	0.00	0.00
4,329.86	4.61	35.01	4,321.00	182.85	128.09	-182.85	0.00	0.00	0.00
Parkman									

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Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 5138 & KB 21 @ 5159.00ft (UNIT 403)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5138 & KB 21 @ 5159.00ft (UNIT 403)
Site:	BUFFALO & BADGER 4C-15HZ PAD	North Reference:	True
Well:	BUFFALO 35C-15HZ	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	4.61	35.01	4,390.92	187.46	131.32	-187.46	0.00	0.00	0.00
4,500.00	4.61	35.01	4,490.60	194.04	135.93	-194.04	0.00	0.00	0.00
4,600.00	4.61	35.01	4,590.27	200.61	140.54	-200.61	0.00	0.00	0.00
4,700.00	4.61	35.01	4,689.95	207.19	145.14	-207.19	0.00	0.00	0.00
4,789.34	4.61	35.01	4,779.00	213.07	149.26	-213.07	0.00	0.00	0.00
Sussex									
4,800.00	4.61	35.01	4,789.63	213.77	149.75	-213.77	0.00	0.00	0.00
4,900.00	4.61	35.01	4,889.30	220.35	154.36	-220.35	0.00	0.00	0.00
5,000.00	4.61	35.01	4,988.98	226.93	158.97	-226.93	0.00	0.00	0.00
5,100.00	4.61	35.01	5,088.66	233.50	163.58	-233.50	0.00	0.00	0.00
5,200.00	4.61	35.01	5,188.33	240.08	168.18	-240.08	0.00	0.00	0.00
5,300.00	4.61	35.01	5,288.01	246.66	172.79	-246.66	0.00	0.00	0.00
5,400.00	4.61	35.01	5,387.69	253.24	177.40	-253.24	0.00	0.00	0.00
5,500.00	4.61	35.01	5,487.37	259.81	182.01	-259.81	0.00	0.00	0.00
5,600.00	4.61	35.01	5,587.04	266.39	186.61	-266.39	0.00	0.00	0.00
5,700.00	4.61	35.01	5,686.72	272.97	191.22	-272.97	0.00	0.00	0.00
5,800.00	4.61	35.01	5,786.40	279.55	195.83	-279.55	0.00	0.00	0.00
5,900.00	4.61	35.01	5,886.07	286.13	200.44	-286.13	0.00	0.00	0.00
6,000.00	4.61	35.01	5,985.75	292.70	205.05	-292.70	0.00	0.00	0.00
6,100.00	4.61	35.01	6,085.43	299.28	209.65	-299.28	0.00	0.00	0.00
6,200.00	4.61	35.01	6,185.10	305.86	214.26	-305.86	0.00	0.00	0.00
6,300.00	4.61	35.01	6,284.78	312.44	218.87	-312.44	0.00	0.00	0.00
6,400.00	4.61	35.01	6,384.46	319.01	223.48	-319.01	0.00	0.00	0.00
6,500.00	4.61	35.01	6,484.14	325.59	228.09	-325.59	0.00	0.00	0.00
6,600.00	4.61	35.01	6,583.81	332.17	232.69	-332.17	0.00	0.00	0.00
6,634.22	4.61	35.01	6,617.92	334.42	234.27	-334.42	0.00	0.00	0.00
Start Drop -2.00									
6,700.00	3.29	35.01	6,683.54	338.13	236.87	-338.13	2.00	-2.00	0.00
6,800.00	1.29	35.01	6,783.46	341.40	239.16	-341.40	2.00	-2.00	0.00
6,864.55	0.00	0.00	6,848.00	342.00	239.58	-342.00	2.00	-2.00	0.00
Start 473.04 hold at 6864.55 MD									
6,900.00	0.00	0.00	6,883.45	342.00	239.58	-342.00	0.00	0.00	0.00
7,000.00	0.00	0.00	6,983.45	342.00	239.58	-342.00	0.00	0.00	0.00
7,100.00	0.00	0.00	7,083.45	342.00	239.58	-342.00	0.00	0.00	0.00
7,200.00	0.00	0.00	7,183.45	342.00	239.58	-342.00	0.00	0.00	0.00
7,300.00	0.00	0.00	7,283.45	342.00	239.58	-342.00	0.00	0.00	0.00
7,337.59	0.00	0.00	7,321.04	342.00	239.58	-342.00	0.00	0.00	0.00
Start DLS 10.00 TFO 180.00									
7,400.00	6.24	180.00	7,383.33	338.60	239.58	-338.60	10.00	10.00	0.00
7,500.00	16.24	180.00	7,481.29	319.13	239.58	-319.13	10.00	10.00	0.00
7,517.49	17.99	180.00	7,498.00	313.99	239.58	-313.99	10.00	10.00	0.00
Sharon Springs									
7,566.60	22.90	180.00	7,544.00	296.84	239.58	-296.84	10.00	10.00	0.00
Niobrara A									
7,600.00	26.24	180.00	7,574.38	282.95	239.58	-282.95	10.00	10.00	0.00
7,700.00	36.24	180.00	7,659.77	231.15	239.58	-231.15	10.00	10.00	0.00
7,702.78	36.52	180.00	7,662.00	229.51	239.58	-229.51	10.00	10.00	0.00
Niobrara B									
7,800.00	46.24	180.00	7,734.86	165.31	239.58	-165.31	10.00	10.00	0.00
7,837.66	50.01	180.00	7,760.00	137.27	239.58	-137.27	10.00	10.00	0.00
Niobrara C									
7,900.00	56.24	180.00	7,797.39	87.43	239.58	-87.43	10.00	10.00	0.00
8,000.00	66.24	180.00	7,845.44	-0.12	239.58	0.12	10.00	10.00	0.00

Database:	Denver Sales	Local Co-ordinate Reference:	Well BUFFALO 35C-15HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 5138 & KB 21 @ 5159.00ft (UNIT 403)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5138 & KB 21 @ 5159.00ft (UNIT 403)
Site:	BUFFALO & BADGER 4C-15HZ PAD	North Reference:	True
Well:	BUFFALO 35C-15HZ	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)
8,067.72	73.01	180.00	7,869.00	-63.56	239.58	63.56	10.00	10.00	0.00
Fort Hays									
8,100.00	76.24	180.00	7,877.56	-94.69	239.58	94.69	10.00	10.00	0.00
8,178.95	84.14	180.00	7,891.00	-172.42	239.58	172.42	10.00	10.00	0.00
Codell									
8,200.00	86.24	180.00	7,892.77	-193.40	239.58	193.40	10.00	10.00	0.00
8,237.59	90.00	180.00	7,894.00	-230.96	239.58	230.96	10.00	10.00	0.00
Start 4198.26 hold at 8237.59 MD - 7"(620 FNL 1198 FWL)									
8,300.00	90.00	180.00	7,894.00	-293.37	239.58	293.37	0.00	0.00	0.00
8,400.00	90.00	180.00	7,894.00	-393.37	239.58	393.37	0.00	0.00	0.00
8,500.00	90.00	180.00	7,894.00	-493.37	239.58	493.37	0.00	0.00	0.00
8,600.00	90.00	180.00	7,894.00	-593.37	239.58	593.37	0.00	0.00	0.00
8,700.00	90.00	180.00	7,894.00	-693.37	239.58	693.37	0.00	0.00	0.00
8,800.00	90.00	180.00	7,894.00	-793.37	239.58	793.37	0.00	0.00	0.00
8,900.00	90.00	180.00	7,894.00	-893.37	239.58	893.37	0.00	0.00	0.00
9,000.00	90.00	180.00	7,894.00	-993.37	239.58	993.37	0.00	0.00	0.00
9,100.00	90.00	180.00	7,894.00	-1,093.37	239.58	1,093.37	0.00	0.00	0.00
9,200.00	90.00	180.00	7,894.00	-1,193.37	239.58	1,193.37	0.00	0.00	0.00
9,300.00	90.00	180.00	7,894.00	-1,293.37	239.58	1,293.37	0.00	0.00	0.00
9,400.00	90.00	180.00	7,894.00	-1,393.37	239.58	1,393.37	0.00	0.00	0.00
9,500.00	90.00	180.00	7,894.00	-1,493.37	239.58	1,493.37	0.00	0.00	0.00
9,600.00	90.00	180.00	7,894.00	-1,593.37	239.58	1,593.37	0.00	0.00	0.00
9,700.00	90.00	180.00	7,894.00	-1,693.37	239.58	1,693.37	0.00	0.00	0.00
9,800.00	90.00	180.00	7,894.00	-1,793.37	239.58	1,793.37	0.00	0.00	0.00
9,900.00	90.00	180.00	7,894.00	-1,893.37	239.58	1,893.37	0.00	0.00	0.00
10,000.00	90.00	180.00	7,894.00	-1,993.37	239.58	1,993.37	0.00	0.00	0.00
10,100.00	90.00	180.00	7,894.00	-2,093.37	239.58	2,093.37	0.00	0.00	0.00
10,200.00	90.00	180.00	7,894.00	-2,193.37	239.58	2,193.37	0.00	0.00	0.00
10,300.00	90.00	180.00	7,894.00	-2,293.37	239.58	2,293.37	0.00	0.00	0.00
10,400.00	90.00	180.00	7,894.00	-2,393.37	239.58	2,393.37	0.00	0.00	0.00
10,500.00	90.00	180.00	7,894.00	-2,493.37	239.58	2,493.37	0.00	0.00	0.00
10,600.00	90.00	180.00	7,894.00	-2,593.37	239.58	2,593.37	0.00	0.00	0.00
10,700.00	90.00	180.00	7,894.00	-2,693.37	239.58	2,693.37	0.00	0.00	0.00
10,800.00	90.00	180.00	7,894.00	-2,793.37	239.58	2,793.37	0.00	0.00	0.00
10,900.00	90.00	180.00	7,894.00	-2,893.37	239.58	2,893.37	0.00	0.00	0.00
11,000.00	90.00	180.00	7,894.00	-2,993.37	239.58	2,993.37	0.00	0.00	0.00
11,100.00	90.00	180.00	7,894.00	-3,093.37	239.58	3,093.37	0.00	0.00	0.00
11,200.00	90.00	180.00	7,894.00	-3,193.37	239.58	3,193.37	0.00	0.00	0.00
11,300.00	90.00	180.00	7,894.00	-3,293.37	239.58	3,293.37	0.00	0.00	0.00
11,400.00	90.00	180.00	7,894.00	-3,393.37	239.58	3,393.37	0.00	0.00	0.00
11,500.00	90.00	180.00	7,894.00	-3,493.37	239.58	3,493.37	0.00	0.00	0.00
11,600.00	90.00	180.00	7,894.00	-3,593.37	239.58	3,593.37	0.00	0.00	0.00
11,700.00	90.00	180.00	7,894.00	-3,693.37	239.58	3,693.37	0.00	0.00	0.00
11,800.00	90.00	180.00	7,894.00	-3,793.37	239.58	3,793.37	0.00	0.00	0.00
11,900.00	90.00	180.00	7,894.00	-3,893.37	239.58	3,893.37	0.00	0.00	0.00
12,000.00	90.00	180.00	7,894.00	-3,993.37	239.58	3,993.37	0.00	0.00	0.00
12,100.00	90.00	180.00	7,894.00	-4,093.37	239.58	4,093.37	0.00	0.00	0.00
12,200.00	90.00	180.00	7,894.00	-4,193.37	239.58	4,193.37	0.00	0.00	0.00
12,300.00	90.00	180.00	7,894.00	-4,293.37	239.58	4,293.37	0.00	0.00	0.00
12,400.00	90.00	180.00	7,894.00	-4,393.37	239.58	4,393.37	0.00	0.00	0.00
12,435.85	90.00	180.00	7,894.00	-4,429.22	239.58	4,429.22	0.00	0.00	0.00
TD at 12435.85 - PBHL_BUFFALO 35C-15HZ(460 FSL 1210 FWL)									

Database:	Denver Sales	Local Co-ordinate Reference:	Well BUFFALO 35C-15HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 5138 & KB 21 @ 5159.00ft (UNIT 403)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5138 & KB 21 @ 5159.00ft (UNIT 403)
Site:	BUFFALO & BADGER 4C-15HZ PAD	North Reference:	True
Well:	BUFFALO 35C-15HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	PLAN #2 PRELIMINARY		

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_BUFFALO 35C-1	0.00	0.00	7,894.00	-4,429.22	239.58	1,259,708.32	3,141,425.55	40.0451820	-104.9948482
- plan hits target center									
- Point									

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)	
1,239.00	1,239.00	9 5/8"	9.625	12.250	
8,237.59	7,894.00	7"(620 FNL 1198 FWL)	7.000	7.500	

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
979.00	979.00	Base Fox Hills				
4,329.86	4,321.00	Parkman				
4,789.34	4,779.00	Sussex				
7,517.49	7,498.00	Sharon Springs				
7,566.60	7,544.00	Niobrara A				
7,702.78	7,662.00	Niobrara B				
7,837.66	7,760.00	Niobrara C				
8,067.72	7,869.00	Fort Hays				
8,178.95	7,891.00	Codell				

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
1,435.00	1,435.00	0.00	0.00	Start Build 2.00	
1,665.32	1,665.08	7.58	5.31	Start 4968.90 hold at 1665.32 MD	
6,634.22	6,617.92	334.42	234.27	Start Drop -2.00	
6,864.55	6,848.00	342.00	239.58	Start 473.04 hold at 6864.55 MD	
7,337.59	7,321.04	342.00	239.58	Start DLS 10.00 TFO 180.00	
8,237.59	7,894.00	-230.96	239.58	Start 4198.26 hold at 8237.59 MD	
12,435.85	7,894.00	-4,429.22	239.58	TD at 12435.85	