



B.P.

La Plata County, CO NAD83

Horther Pad

Horther 31-03-03

OH

Plan: Plan #2

Standard Planning Report

25 September, 2015





Database:	Grand Junction District	Local Co-ordinate Reference:	Well Horther 31-03-03
Company:	B.P.	TVD Reference:	GL 6464.67 & RKB 11' @ 6475.66usft (Aztec 507)
Project:	La Plata County, CO NAD83	MD Reference:	GL 6464.67 & RKB 11' @ 6475.66usft (Aztec 507)
Site:	Horther Pad	North Reference:	Grid
Well:	Horther 31-03-03	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #2		

Project	La Plata County, CO NAD83		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Southern Zone		

Site		Horther Pad			
Site Position:		Northing:	1,153,982.32 usft	Latitude:	37.0715979
From:	Map	Easting:	2,403,089.22 usft	Longitude:	-107.5460032
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence:	-1.25 °

Well	Horther 31-03-03					
Well Position	+N/-S	152.56 usft	Northing:	1,154,134.88 usft	Latitude:	37.0719898
	+E/-W	-449.19 usft	Easting:	2,402,640.03 usft	Longitude:	-107.5475538
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	6,464.67 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	6/22/2015	9.33	63.65	50,321

Design	Plan #2			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	136.40

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	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	
440.00	0.00	0.00	440.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,139.42	13.99	136.40	1,132.49	-61.52	58.59	2.00	2.00	0.00	136.40	
3,270.11	13.99	136.40	3,200.00	-434.51	413.76	0.00	0.00	0.00	0.00	Horther PBHL



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Wellbore:	OH		
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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)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
11.00	0.00	0.00	11.00	0.00	0.00	0.00	0.00	0.00	0.00	
Animas										
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	
350.00	0.00	0.00	350.00	0.00	0.00	0.00	0.00	0.00	0.00	
Surface Casing										
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00	
440.00	0.00	0.00	440.00	0.00	0.00	0.00	0.00	0.00	0.00	
500.00	1.20	136.40	500.00	-0.46	0.43	0.63	2.00	2.00	0.00	
600.00	3.20	136.40	599.92	-3.23	3.08	4.47	2.00	2.00	0.00	
700.00	5.20	136.40	699.64	-8.54	8.13	11.79	2.00	2.00	0.00	
800.00	7.20	136.40	799.05	-16.36	15.58	22.59	2.00	2.00	0.00	
900.00	9.20	136.40	898.03	-26.69	25.41	36.85	2.00	2.00	0.00	
1,000.00	11.20	136.40	996.44	-39.51	37.62	54.56	2.00	2.00	0.00	
1,100.00	13.20	136.40	1,094.18	-54.81	52.20	75.69	2.00	2.00	0.00	
1,139.42	13.99	136.40	1,132.49	-61.52	58.59	84.96	2.00	2.00	0.00	
1,200.00	13.99	136.40	1,191.28	-72.13	68.68	99.60	0.00	0.00	0.00	
1,300.00	13.99	136.40	1,288.31	-89.63	85.35	123.77	0.00	0.00	0.00	
1,400.00	13.99	136.40	1,385.34	-107.14	102.02	147.94	0.00	0.00	0.00	
1,500.00	13.99	136.40	1,482.38	-124.65	118.69	172.12	0.00	0.00	0.00	
1,600.00	13.99	136.40	1,579.41	-142.15	135.36	196.29	0.00	0.00	0.00	
1,700.00	13.99	136.40	1,676.45	-159.66	152.03	220.46	0.00	0.00	0.00	
1,739.73	13.99	136.40	1,715.00	-166.61	158.65	230.06	0.00	0.00	0.00	
Lwr. Animas										
1,800.00	13.99	136.40	1,773.48	-177.16	168.70	244.63	0.00	0.00	0.00	
1,900.00	13.99	136.40	1,870.52	-194.67	185.37	268.81	0.00	0.00	0.00	
2,000.00	13.99	136.40	1,967.55	-212.17	202.04	292.98	0.00	0.00	0.00	
2,047.86	13.99	136.40	2,014.00	-220.55	210.02	304.55	0.00	0.00	0.00	
Kirtland Sh										
2,100.00	13.99	136.40	2,064.59	-229.68	218.71	317.15	0.00	0.00	0.00	
2,200.00	13.99	136.40	2,161.62	-247.18	235.38	341.32	0.00	0.00	0.00	
2,279.74	13.99	136.40	2,239.00	-261.14	248.67	360.60	0.00	0.00	0.00	
Farmington Ss										
2,300.00	13.99	136.40	2,258.66	-264.69	252.05	365.50	0.00	0.00	0.00	
2,400.00	13.99	136.40	2,355.69	-282.19	268.72	389.67	0.00	0.00	0.00	
2,500.00	13.99	136.40	2,452.72	-299.70	285.39	413.84	0.00	0.00	0.00	
2,600.00	13.99	136.40	2,549.76	-317.20	302.06	438.01	0.00	0.00	0.00	
2,617.76	13.99	136.40	2,566.99	-320.31	305.02	442.31	0.00	0.00	0.00	
Lwr. Kirtland Sh										
2,700.00	13.99	136.40	2,646.79	-334.71	318.73	462.19	0.00	0.00	0.00	
2,800.00	13.99	136.40	2,743.83	-352.21	335.39	486.36	0.00	0.00	0.00	
2,822.84	13.99	136.40	2,765.99	-356.21	339.20	491.88	0.00	0.00	0.00	
Fruitland Coal										
2,837.27	13.99	136.40	2,779.99	-358.74	341.61	495.37	0.00	0.00	0.00	
Lemon Seam										
2,848.98	13.99	136.40	2,791.36	-360.79	343.56	498.20	0.00	0.00	0.00	
Horther BTV										
2,900.00	13.99	136.40	2,840.86	-369.72	352.06	510.53	0.00	0.00	0.00	
2,934.14	13.99	136.40	2,873.99	-375.70	357.76	518.79	0.00	0.00	0.00	



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Wellbore:	OH		
Design:	Plan #2		

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)
Lwr Lemon Seam									
2,974.34	13.99	136.40	2,912.99	-382.73	364.46	528.50	0.00	0.00	0.00
Ignacio Seam									
3,000.00	13.99	136.40	2,937.90	-387.23	368.73	534.70	0.00	0.00	0.00
3,009.38	13.99	136.40	2,946.99	-388.87	370.30	536.97	0.00	0.00	0.00
Pictured Cliffs Ss									
3,100.00	13.99	136.40	3,034.93	-404.73	385.40	558.88	0.00	0.00	0.00
3,200.00	13.99	136.40	3,131.97	-422.24	402.07	583.05	0.00	0.00	0.00
3,270.11	13.99	136.40	3,200.00	-434.51	413.76	600.00	0.00	0.00	0.00
Horther PBHL									

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Horther PBHL - plan hits target center - Point	0.00	0.00	3,200.00	-434.51	413.76	1,153,700.37	2,403,053.79	37.0708216	-107.5461035

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (in)	Hole Diameter (in)
350.00	350.00	Surface Casing	9.63	12.25

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
11.00	11.00	Animas		0.00	360.00
1,739.73	1,715.00	Lwr. Animas		0.00	360.00
2,047.86	2,014.00	Kirtland Sh		0.00	360.00
2,279.74	2,239.00	Farmington Ss		0.00	360.00
2,617.76	2,566.99	Lwr. Kirtland Sh		0.00	360.00
2,822.84	2,765.99	Fruitland Coal		0.00	360.00
2,837.27	2,779.99	Lemon Seam		0.00	360.00
2,934.14	2,873.99	Lwr Lemon Seam		0.00	360.00
2,974.34	2,912.99	Ignacio Seam		0.00	360.00
3,009.38	2,946.99	Pictured Cliffs Ss		0.00	360.00