

Whiting Petroleum Corp.

Weld County, CO

Sec 7-T10N-R57W

Horsetail #07F-1838D

Hz

Plan: Design #1

Standard Planning Report

29 January, 2015





Database:	LandmarkEDM	Local Co-ordinate Reference:	Well Horsetail #07F-1838D
Company:	Whiting Petroleum Corp.	TVD Reference:	KBE @ 4942.70usft (Original Well Elev)
Project:	Weld County, CO	MD Reference:	KBE @ 4942.70usft (Original Well Elev)
Site:	Sec 7-T10N-R57W	North Reference:	True
Well:	Horsetail #07F-1838D	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hz		
Design:	Design #1		

Project	Weld County, CO		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site		Sec 7-T10N-R57W			
Site Position:		Northing:	1,558,450.14 usft	Latitude:	40° 51' 14.300 N
From:	Lat/Long	Easting:	3,469,810.15 usft	Longitude:	103° 48' 5.960 W
Position Uncertainty:	0.00 usft	Slot Radius:	13.200 in	Grid Convergence:	1.10 °

Well	Horsetail #07F-1838D					
Well Position	+N/-S	-82.92 usft	Northing:	1,558,396.35 usft	Latitude:	40° 51' 13.480 N
	+E/-W	1,519.99 usft	Easting:	3,471,331.45 usft	Longitude:	103° 47' 46.180 W
Position Uncertainty		0.00 usft	Wellhead Elevation:		Ground Level:	4,925.70 usft

Wellbore	Hz				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	1/5/2015	7.88	67.44	53,087

Design	Design #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	183.24

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	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	
650.00	7.00	303.00	649.13	11.63	-17.91	2.00	2.00	0.00	303.00	
4,750.00	7.00	303.00	4,718.57	283.77	-436.96	0.00	0.00	0.00	0.00	
5,100.00	0.00	0.00	5,067.70	295.40	-454.87	2.00	-2.00	0.00	180.00	
5,560.43	0.00	0.00	5,528.13	295.40	-454.87	0.00	0.00	0.00	0.00	
6,378.61	90.00	179.97	6,049.00	-225.47	-454.63	11.00	11.00	0.00	179.97	PBHL 1838D
14,119.09	90.00	179.97	6,049.00	-7,965.95	-451.00	0.00	0.00	0.00	0.00	PBHL 1838D



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Site:	Sec 7-T10N-R57W	North Reference:	True
Well:	Horsetail #07F-1838D	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hz		
Design:	Design #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
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
Build 2°/100'									
400.00	2.00	303.00	399.98	0.95	-1.46	-0.87	2.00	2.00	0.00
500.00	4.00	303.00	499.84	3.80	-5.85	-3.46	2.00	2.00	0.00
600.00	6.00	303.00	599.45	8.55	-13.16	-7.79	2.00	2.00	0.00
650.00	7.00	303.00	649.13	11.63	-17.91	-10.60	2.00	2.00	0.00
Hold 7° Inc									
700.00	7.00	303.00	698.76	14.95	-23.02	-13.62	0.00	0.00	0.00
800.00	7.00	303.00	798.01	21.59	-33.24	-19.67	0.00	0.00	0.00
900.00	7.00	303.00	897.27	28.22	-43.46	-25.72	0.00	0.00	0.00
1,000.00	7.00	303.00	996.52	34.86	-53.68	-31.77	0.00	0.00	0.00
1,100.00	7.00	303.00	1,095.78	41.50	-63.90	-37.82	0.00	0.00	0.00
1,200.00	7.00	303.00	1,195.03	48.14	-74.12	-43.87	0.00	0.00	0.00
1,300.00	7.00	303.00	1,294.28	54.77	-84.34	-49.92	0.00	0.00	0.00
1,400.00	7.00	303.00	1,393.54	61.41	-94.56	-55.97	0.00	0.00	0.00
1,500.00	7.00	303.00	1,492.79	68.05	-104.79	-62.02	0.00	0.00	0.00
1,557.64	7.00	303.00	1,550.00	71.87	-110.68	-65.50	0.00	0.00	0.00
Upper Pierre									
1,600.00	7.00	303.00	1,592.05	74.69	-115.01	-68.07	0.00	0.00	0.00
1,700.00	7.00	303.00	1,691.30	81.32	-125.23	-74.12	0.00	0.00	0.00
1,800.00	7.00	303.00	1,790.56	87.96	-135.45	-80.16	0.00	0.00	0.00
1,900.00	7.00	303.00	1,889.81	94.60	-145.67	-86.21	0.00	0.00	0.00
2,000.00	7.00	303.00	1,989.07	101.24	-155.89	-92.26	0.00	0.00	0.00
2,100.00	7.00	303.00	2,088.32	107.87	-166.11	-98.31	0.00	0.00	0.00
2,200.00	7.00	303.00	2,187.58	114.51	-176.33	-104.36	0.00	0.00	0.00
2,300.00	7.00	303.00	2,286.83	121.15	-186.55	-110.41	0.00	0.00	0.00
2,400.00	7.00	303.00	2,386.09	127.79	-196.77	-116.46	0.00	0.00	0.00
2,500.00	7.00	303.00	2,485.34	134.42	-206.99	-122.51	0.00	0.00	0.00
2,600.00	7.00	303.00	2,584.60	141.06	-217.21	-128.56	0.00	0.00	0.00
2,700.00	7.00	303.00	2,683.85	147.70	-227.44	-134.61	0.00	0.00	0.00
2,800.00	7.00	303.00	2,783.10	154.34	-237.66	-140.66	0.00	0.00	0.00
2,900.00	7.00	303.00	2,882.36	160.97	-247.88	-146.70	0.00	0.00	0.00
3,000.00	7.00	303.00	2,981.61	167.61	-258.10	-152.75	0.00	0.00	0.00
3,100.00	7.00	303.00	3,080.87	174.25	-268.32	-158.80	0.00	0.00	0.00
3,200.00	7.00	303.00	3,180.12	180.89	-278.54	-164.85	0.00	0.00	0.00
3,300.00	7.00	303.00	3,279.38	187.52	-288.76	-170.90	0.00	0.00	0.00
3,400.00	7.00	303.00	3,378.63	194.16	-298.98	-176.95	0.00	0.00	0.00
3,500.00	7.00	303.00	3,477.89	200.80	-309.20	-183.00	0.00	0.00	0.00
3,522.28	7.00	303.00	3,500.00	202.28	-311.48	-184.35	0.00	0.00	0.00
Hygiene									
3,600.00	7.00	303.00	3,577.14	207.44	-319.42	-189.05	0.00	0.00	0.00
3,673.41	7.00	303.00	3,650.00	212.31	-326.93	-193.49	0.00	0.00	0.00
Lower Pierre									
3,700.00	7.00	303.00	3,676.40	214.07	-329.64	-195.10	0.00	0.00	0.00
3,800.00	7.00	303.00	3,775.65	220.71	-339.86	-201.15	0.00	0.00	0.00
3,900.00	7.00	303.00	3,874.91	227.35	-350.09	-207.20	0.00	0.00	0.00
4,000.00	7.00	303.00	3,974.16	233.99	-360.31	-213.25	0.00	0.00	0.00
4,100.00	7.00	303.00	4,073.41	240.62	-370.53	-219.29	0.00	0.00	0.00
4,200.00	7.00	303.00	4,172.67	247.26	-380.75	-225.34	0.00	0.00	0.00
4,300.00	7.00	303.00	4,271.92	253.90	-390.97	-231.39	0.00	0.00	0.00
4,400.00	7.00	303.00	4,371.18	260.54	-401.19	-237.44	0.00	0.00	0.00



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Well:	Horsetail #07F-1838D	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hz		
Design:	Design #1		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
4,500.00	7.00	303.00	4,470.43	267.17	-411.41	-243.49	0.00	0.00	0.00	
4,600.00	7.00	303.00	4,569.69	273.81	-421.63	-249.54	0.00	0.00	0.00	
4,700.00	7.00	303.00	4,668.94	280.45	-431.85	-255.59	0.00	0.00	0.00	
4,750.00	7.00	303.00	4,718.57	283.77	-436.96	-258.61	0.00	0.00	0.00	
Drop 2°/100'										
4,800.00	6.00	303.00	4,768.25	286.85	-441.71	-261.42	2.00	-2.00	0.00	
4,900.00	4.00	303.00	4,867.86	291.60	-449.02	-265.75	2.00	-2.00	0.00	
5,000.00	2.00	303.00	4,967.72	294.45	-453.41	-268.35	2.00	-2.00	0.00	
5,100.00	0.00	0.00	5,067.70	295.40	-454.87	-269.21	2.00	-2.00	0.00	
Hold Vertical										
5,200.00	0.00	0.00	5,167.70	295.40	-454.87	-269.21	0.00	0.00	0.00	
5,300.00	0.00	0.00	5,267.70	295.40	-454.87	-269.21	0.00	0.00	0.00	
5,400.00	0.00	0.00	5,367.70	295.40	-454.87	-269.21	0.00	0.00	0.00	
5,500.00	0.00	0.00	5,467.70	295.40	-454.87	-269.21	0.00	0.00	0.00	
5,547.30	0.00	0.00	5,515.00	295.40	-454.87	-269.21	0.00	0.00	0.00	
P200 Marker										
5,560.43	0.00	0.00	5,528.13	295.40	-454.87	-269.21	0.00	0.00	0.00	
KOP, Build 11°/100'										
5,562.30	0.21	179.97	5,530.00	295.39	-454.87	-269.21	11.00	11.00	0.00	
P300 Marker										
5,582.31	2.41	179.97	5,550.00	294.94	-454.87	-268.75	11.00	11.00	0.00	
P350 Marker										
5,600.00	4.35	179.97	5,567.66	293.89	-454.87	-267.71	11.00	11.00	0.00	
5,650.00	9.85	179.97	5,617.26	287.71	-454.87	-261.54	11.00	11.00	0.00	
5,700.00	15.35	179.97	5,666.04	276.81	-454.86	-250.66	11.00	11.00	0.00	
5,737.70	19.50	179.97	5,702.00	265.52	-454.86	-239.38	11.00	11.00	0.00	
Sharon Springs										
5,743.02	20.08	179.97	5,707.00	263.72	-454.86	-237.59	11.00	11.00	0.00	
Niobrara										
5,750.00	20.85	179.97	5,713.54	261.28	-454.86	-235.15	11.00	11.00	0.00	
5,764.48	22.45	179.97	5,727.00	255.94	-454.85	-229.82	11.00	11.00	0.00	
Top A Chalk										
5,800.00	26.35	179.97	5,759.34	241.27	-454.85	-215.17	11.00	11.00	0.00	
5,805.21	26.93	179.97	5,764.00	238.93	-454.84	-212.84	11.00	11.00	0.00	
Top A Marl										
5,826.75	29.30	179.97	5,783.00	228.78	-454.84	-202.70	11.00	11.00	0.00	
A Marl										
5,837.13	30.44	179.97	5,792.00	223.61	-454.84	-197.54	11.00	11.00	0.00	
Top Upper B										
5,850.00	31.85	179.97	5,803.01	216.96	-454.83	-190.90	11.00	11.00	0.00	
5,870.25	34.08	179.97	5,820.00	205.94	-454.83	-179.90	11.00	11.00	0.00	
Base Upper B										
5,891.06	36.37	179.97	5,837.00	193.94	-454.82	-167.92	11.00	11.00	0.00	
Top Lower B										
5,900.00	37.35	179.97	5,844.15	188.57	-454.82	-162.56	11.00	11.00	0.00	
5,916.36	39.15	179.97	5,857.00	178.44	-454.82	-152.45	11.00	11.00	0.00	
Base Lower B										
5,925.45	40.15	179.97	5,864.00	172.64	-454.81	-146.66	11.00	11.00	0.00	
Top B Marl										
5,950.00	42.85	179.97	5,882.38	156.38	-454.81	-130.42	11.00	11.00	0.00	
5,994.99	47.80	179.97	5,914.00	124.40	-454.79	-98.49	11.00	11.00	0.00	
Top C Chalk										

WOG
Planning Report



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Project:	Weld County, CO	MD Reference:	KBE @ 4942.70usft (Original Well Elev)
Site:	Sec 7-T10N-R57W	North Reference:	True
Well:	Horsetail #07F-1838D	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hz		
Design:	Design #1		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
6,000.00	48.35	179.97	5,917.35	120.67	-454.79	-94.77	11.00	11.00	0.00	
6,007.05	49.13	179.97	5,922.00	115.37	-454.79	-89.47	11.00	11.00	0.00	
Middle C Chalk										
6,028.99	51.54	179.97	5,936.00	98.48	-454.78	-72.62	11.00	11.00	0.00	
Middle C Marl										
6,050.00	53.85	179.97	5,948.73	81.77	-454.77	-55.93	11.00	11.00	0.00	
6,060.78	55.04	179.97	5,955.00	73.00	-454.77	-47.18	11.00	11.00	0.00	
Lower C Chalk										
6,093.70	58.66	179.97	5,973.00	45.44	-454.75	-19.66	11.00	11.00	0.00	
Lower C Marl										
6,100.00	59.35	179.97	5,976.25	40.04	-454.75	-14.27	11.00	11.00	0.00	
6,150.00	64.85	179.97	5,999.63	-4.13	-454.73	29.83	11.00	11.00	0.00	
6,160.51	66.01	179.97	6,004.00	-13.69	-454.73	39.37	11.00	11.00	0.00	
Lower C Marker										
6,173.15	67.40	179.97	6,009.00	-25.30	-454.72	50.96	11.00	11.00	0.00	
Top Ft. Hays										
6,200.00	70.35	179.97	6,018.67	-50.34	-454.71	75.96	11.00	11.00	0.00	
6,233.81	74.07	179.97	6,029.00	-82.53	-454.69	108.10	11.00	11.00	0.00	
Ft. Hays Marker										
6,250.00	75.85	179.97	6,033.20	-98.17	-454.69	123.71	11.00	11.00	0.00	
6,300.00	81.35	179.97	6,043.08	-147.16	-454.66	172.63	11.00	11.00	0.00	
6,350.00	86.85	179.97	6,048.21	-196.88	-454.64	222.26	11.00	11.00	0.00	
6,378.61	90.00	179.97	6,049.00	-225.47	-454.63	250.81	11.00	11.00	0.00	
LP @ 90° Inc, Hold - Top Codell - 7"										
6,400.00	90.00	179.97	6,049.00	-246.86	-454.62	272.17	0.00	0.00	0.00	
6,500.00	90.00	179.97	6,049.00	-346.86	-454.57	372.00	0.00	0.00	0.00	
6,600.00	90.00	179.97	6,049.00	-446.86	-454.52	471.84	0.00	0.00	0.00	
6,700.00	90.00	179.97	6,049.00	-546.86	-454.48	571.68	0.00	0.00	0.00	
6,800.00	90.00	179.97	6,049.00	-646.86	-454.43	671.52	0.00	0.00	0.00	
6,900.00	90.00	179.97	6,049.00	-746.86	-454.38	771.35	0.00	0.00	0.00	
7,000.00	90.00	179.97	6,049.00	-846.86	-454.34	871.19	0.00	0.00	0.00	
7,100.00	90.00	179.97	6,049.00	-946.86	-454.29	971.03	0.00	0.00	0.00	
7,200.00	90.00	179.97	6,049.00	-1,046.86	-454.24	1,070.87	0.00	0.00	0.00	
7,300.00	90.00	179.97	6,049.00	-1,146.86	-454.20	1,170.70	0.00	0.00	0.00	
7,400.00	90.00	179.97	6,049.00	-1,246.86	-454.15	1,270.54	0.00	0.00	0.00	
7,500.00	90.00	179.97	6,049.00	-1,346.86	-454.10	1,370.38	0.00	0.00	0.00	
7,600.00	90.00	179.97	6,049.00	-1,446.86	-454.05	1,470.21	0.00	0.00	0.00	
7,700.00	90.00	179.97	6,049.00	-1,546.86	-454.01	1,570.05	0.00	0.00	0.00	
7,800.00	90.00	179.97	6,049.00	-1,646.86	-453.96	1,669.89	0.00	0.00	0.00	
7,900.00	90.00	179.97	6,049.00	-1,746.86	-453.91	1,769.73	0.00	0.00	0.00	
8,000.00	90.00	179.97	6,049.00	-1,846.86	-453.87	1,869.56	0.00	0.00	0.00	
8,100.00	90.00	179.97	6,049.00	-1,946.86	-453.82	1,969.40	0.00	0.00	0.00	
8,200.00	90.00	179.97	6,049.00	-2,046.86	-453.77	2,069.24	0.00	0.00	0.00	
8,300.00	90.00	179.97	6,049.00	-2,146.86	-453.73	2,169.08	0.00	0.00	0.00	
8,400.00	90.00	179.97	6,049.00	-2,246.86	-453.68	2,268.91	0.00	0.00	0.00	
8,500.00	90.00	179.97	6,049.00	-2,346.86	-453.63	2,368.75	0.00	0.00	0.00	
8,600.00	90.00	179.97	6,049.00	-2,446.86	-453.59	2,468.59	0.00	0.00	0.00	
8,700.00	90.00	179.97	6,049.00	-2,546.86	-453.54	2,568.43	0.00	0.00	0.00	
8,800.00	90.00	179.97	6,049.00	-2,646.86	-453.49	2,668.26	0.00	0.00	0.00	
8,900.00	90.00	179.97	6,049.00	-2,746.86	-453.45	2,768.10	0.00	0.00	0.00	
9,000.00	90.00	179.97	6,049.00	-2,846.86	-453.40	2,867.94	0.00	0.00	0.00	
9,100.00	90.00	179.97	6,049.00	-2,946.86	-453.35	2,967.78	0.00	0.00	0.00	
9,200.00	90.00	179.97	6,049.00	-3,046.86	-453.31	3,067.61	0.00	0.00	0.00	

WOG
Planning Report



Database:	LandmarkEDM	Local Co-ordinate Reference:	Well Horsetail #07F-1838D
Company:	Whiting Petroleum Corp.	TVD Reference:	KBE @ 4942.70usft (Original Well Elev)
Project:	Weld County, CO	MD Reference:	KBE @ 4942.70usft (Original Well Elev)
Site:	Sec 7-T10N-R57W	North Reference:	True
Well:	Horsetail #07F-1838D	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hz		
Design:	Design #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
9,300.00	90.00	179.97	6,049.00	-3,146.86	-453.26	3,167.45	0.00	0.00	0.00
9,400.00	90.00	179.97	6,049.00	-3,246.86	-453.21	3,267.29	0.00	0.00	0.00
9,500.00	90.00	179.97	6,049.00	-3,346.86	-453.16	3,367.13	0.00	0.00	0.00
9,600.00	90.00	179.97	6,049.00	-3,446.86	-453.12	3,466.96	0.00	0.00	0.00
9,700.00	90.00	179.97	6,049.00	-3,546.86	-453.07	3,566.80	0.00	0.00	0.00
9,800.00	90.00	179.97	6,049.00	-3,646.86	-453.02	3,666.64	0.00	0.00	0.00
9,900.00	90.00	179.97	6,049.00	-3,746.86	-452.98	3,766.48	0.00	0.00	0.00
10,000.00	90.00	179.97	6,049.00	-3,846.86	-452.93	3,866.31	0.00	0.00	0.00
10,100.00	90.00	179.97	6,049.00	-3,946.86	-452.88	3,966.15	0.00	0.00	0.00
10,200.00	90.00	179.97	6,049.00	-4,046.86	-452.84	4,065.99	0.00	0.00	0.00
10,300.00	90.00	179.97	6,049.00	-4,146.86	-452.79	4,165.83	0.00	0.00	0.00
10,400.00	90.00	179.97	6,049.00	-4,246.86	-452.74	4,265.66	0.00	0.00	0.00
10,500.00	90.00	179.97	6,049.00	-4,346.86	-452.70	4,365.50	0.00	0.00	0.00
10,600.00	90.00	179.97	6,049.00	-4,446.86	-452.65	4,465.34	0.00	0.00	0.00
10,700.00	90.00	179.97	6,049.00	-4,546.86	-452.60	4,565.18	0.00	0.00	0.00
10,800.00	90.00	179.97	6,049.00	-4,646.86	-452.56	4,665.01	0.00	0.00	0.00
10,900.00	90.00	179.97	6,049.00	-4,746.86	-452.51	4,764.85	0.00	0.00	0.00
11,000.00	90.00	179.97	6,049.00	-4,846.86	-452.46	4,864.69	0.00	0.00	0.00
11,100.00	90.00	179.97	6,049.00	-4,946.86	-452.41	4,964.53	0.00	0.00	0.00
11,200.00	90.00	179.97	6,049.00	-5,046.86	-452.37	5,064.36	0.00	0.00	0.00
11,300.00	90.00	179.97	6,049.00	-5,146.86	-452.32	5,164.20	0.00	0.00	0.00
11,400.00	90.00	179.97	6,049.00	-5,246.86	-452.27	5,264.04	0.00	0.00	0.00
11,500.00	90.00	179.97	6,049.00	-5,346.86	-452.23	5,363.88	0.00	0.00	0.00
11,600.00	90.00	179.97	6,049.00	-5,446.86	-452.18	5,463.71	0.00	0.00	0.00
11,700.00	90.00	179.97	6,049.00	-5,546.86	-452.13	5,563.55	0.00	0.00	0.00
11,800.00	90.00	179.97	6,049.00	-5,646.86	-452.09	5,663.39	0.00	0.00	0.00
11,900.00	90.00	179.97	6,049.00	-5,746.86	-452.04	5,763.23	0.00	0.00	0.00
12,000.00	90.00	179.97	6,049.00	-5,846.86	-451.99	5,863.06	0.00	0.00	0.00
12,100.00	90.00	179.97	6,049.00	-5,946.86	-451.95	5,962.90	0.00	0.00	0.00
12,200.00	90.00	179.97	6,049.00	-6,046.86	-451.90	6,062.74	0.00	0.00	0.00
12,300.00	90.00	179.97	6,049.00	-6,146.86	-451.85	6,162.58	0.00	0.00	0.00
12,400.00	90.00	179.97	6,049.00	-6,246.86	-451.81	6,262.41	0.00	0.00	0.00
12,500.00	90.00	179.97	6,049.00	-6,346.86	-451.76	6,362.25	0.00	0.00	0.00
12,600.00	90.00	179.97	6,049.00	-6,446.86	-451.71	6,462.09	0.00	0.00	0.00
12,700.00	90.00	179.97	6,049.00	-6,546.86	-451.66	6,561.93	0.00	0.00	0.00
12,800.00	90.00	179.97	6,049.00	-6,646.86	-451.62	6,661.76	0.00	0.00	0.00
12,900.00	90.00	179.97	6,049.00	-6,746.86	-451.57	6,761.60	0.00	0.00	0.00
13,000.00	90.00	179.97	6,049.00	-6,846.86	-451.52	6,861.44	0.00	0.00	0.00
13,100.00	90.00	179.97	6,049.00	-6,946.86	-451.48	6,961.28	0.00	0.00	0.00
13,200.00	90.00	179.97	6,049.00	-7,046.86	-451.43	7,061.11	0.00	0.00	0.00
13,300.00	90.00	179.97	6,049.00	-7,146.86	-451.38	7,160.95	0.00	0.00	0.00
13,400.00	90.00	179.97	6,049.00	-7,246.86	-451.34	7,260.79	0.00	0.00	0.00
13,500.00	90.00	179.97	6,049.00	-7,346.86	-451.29	7,360.62	0.00	0.00	0.00
13,600.00	90.00	179.97	6,049.00	-7,446.86	-451.24	7,460.46	0.00	0.00	0.00
13,700.00	90.00	179.97	6,049.00	-7,546.86	-451.20	7,560.30	0.00	0.00	0.00
13,800.00	90.00	179.97	6,049.00	-7,646.86	-451.15	7,660.14	0.00	0.00	0.00
13,900.00	90.00	179.97	6,049.00	-7,746.86	-451.10	7,759.97	0.00	0.00	0.00
14,000.00	90.00	179.97	6,049.00	-7,846.86	-451.06	7,859.81	0.00	0.00	0.00
14,100.00	90.00	179.97	6,049.00	-7,946.86	-451.01	7,959.65	0.00	0.00	0.00
14,119.09	90.00	179.97	6,049.00	-7,965.95	-451.00	7,978.71	0.00	0.00	0.00
TD at 14119.14' MD - PBHL 1838D									



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Project:	Weld County, CO	MD Reference:	KBE @ 4942.70usft (Original Well Elev)
Site:	Sec 7-T10N-R57W	North Reference:	True
Well:	Horsetail #07F-1838D	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hz		
Design:	Design #1		

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									
PBHL 1838D	0.00	0.00	6,049.00	-7,965.95	-451.00	1,550,423.20	3,471,033.58	40° 49' 54.770 N	103° 47' 52.047 W
- plan hits target center									
- Point									

Casing Points					
Measured Depth	Vertical Depth	Name		Casing Diameter	Hole Diameter
(usft)	(usft)			(in)	(in)
6,378.61	6,049.00	7"		7.000	8.750

Formations						
Measured Depth	Vertical Depth	Name	Lithology	Dip	Dip Direction	
(usft)	(usft)			(°)	(°)	
1,557.64	1,550.00	Upper Pierre				
3,522.28	3,500.00	Hygiene				
3,673.41	3,650.00	Lower Pierre				
5,547.30	5,515.00	P200 Marker				
5,562.30	5,530.00	P300 Marker				
5,582.31	5,550.00	P350 Marker				
5,737.70	5,702.00	Sharon Springs				
5,743.02	5,707.00	Niobrara				
5,764.48	5,727.00	Top A Chalk				
5,805.21	5,764.00	Top A Marl				
5,826.75	5,783.00	A Marl				
5,837.13	5,792.00	Top Upper B				
5,870.25	5,820.00	Base Upper B				
5,891.06	5,837.00	Top Lower B				
5,916.36	5,857.00	Base Lower B				
5,925.45	5,864.00	Top B Marl				
5,994.99	5,914.00	Top C Chalk				
6,007.05	5,922.00	Middle C Chalk				
6,028.99	5,936.00	Middle C Marl				
6,060.78	5,955.00	Lower C Chalk				
6,093.70	5,973.00	Lower C Marl				
6,160.51	6,004.00	Lower C Marker				
6,173.15	6,009.00	Top Ft. Hays				
6,233.81	6,029.00	Ft. Hays Marker				
6,378.61	6,049.00	Top Codell				



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Project:	Weld County, CO	MD Reference:	KBE @ 4942.70usft (Original Well Elev)
Site:	Sec 7-T10N-R57W	North Reference:	True
Well:	Horsetail #07F-1838D	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hz		
Design:	Design #1		

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
300.00	300.00	0.00	0.00	Build 2°/100'
650.00	649.13	11.63	-17.91	Hold 7° Inc
4,750.00	4,718.57	283.77	-436.96	Drop 2°/100'
5,100.00	5,067.70	295.40	-454.87	Hold Vertical
5,560.43	5,528.13	295.40	-454.87	KOP, Build 11°/100'
6,378.61	6,049.00	-225.47	-452.96	LP @ 90° Inc, Hold
14,119.14	6,049.00	-7,965.95	-424.57	TD at 14119.14' MD