



Project: Weld County, CO  
Site: Sec 30-T10N-R57W  
Well: Horsetail #30E-1902  
Wellbore: Hz  
Design: APD

PROJECT DETAILS: Weld County, CO  
Geodetic System: US State Plane 1983  
Datum: North American Datum 1983  
Ellipsoid: GRS 1980  
Zone: Colorado Northern Zone  
System Datum: Mean Sea Level



Azinuths to True North  
Magnetic North: 7.81°  
Magnetic Field  
Strength: 53006.3snT  
Dip Angle: 67.38°  
Date: 7/28/2015  
Model: IGRF2010

#### WELL DETAILS: Horsetail #30E-1902

+N/-S	+E/-W	Northing	Ground Level:	4806.40	Easting	Latitude	Longitude	Slot
0.00	0.00	1542690.44	3470229.70	40° 48' 38.530 N	103° 48' 4.430 W			

#### SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	
3	844.61	10.89	194.91	841.34	-49.87	-13.28	2.00	194.91	-49.47	
4	4411.19	10.89	194.91	4343.66	-701.13	-186.72	0.00	0.00	-695.45	
5	4955.80	0.00	0.00	4885.00	-751.00	-200.00	2.00	180.00	-744.92	
6	5155.80	0.00	0.00	5085.00	-751.00	-200.00	0.00	0.00	-744.92	
7	5974.19	90.00	359.88	5606.00	-230.00	-201.06	11.00	359.88	-224.11	
8	13719.75	90.00	359.88	5606.00	7515.54	-216.78	0.00	0.00	7518.67	PBHL 1902

#### FORMATION TOP DETAILS

TVDPath	MDPath	Formation
1550.00	1566.28	Upper Pierre
3500.00	3552.05	Hygiene
3650.00	3704.80	Lower Pierre
5448.00	5557.41	P200 Marker
5475.00	5596.51	P300 Marker
5486.00	5613.41	P350 Marker
5498.00	5632.64	Sharon Springs
5500.00	5635.94	Niobrara
5516.00	5663.36	Top A Chalk
5548.00	5726.01	Top A Marl
5560.00	5753.61	A Marl
5566.00	5768.70	Top Upper B
5590.00	5844.74	Base Upper B
5606.00	5974.19	Top Lower B

#### ANNOTATIONS

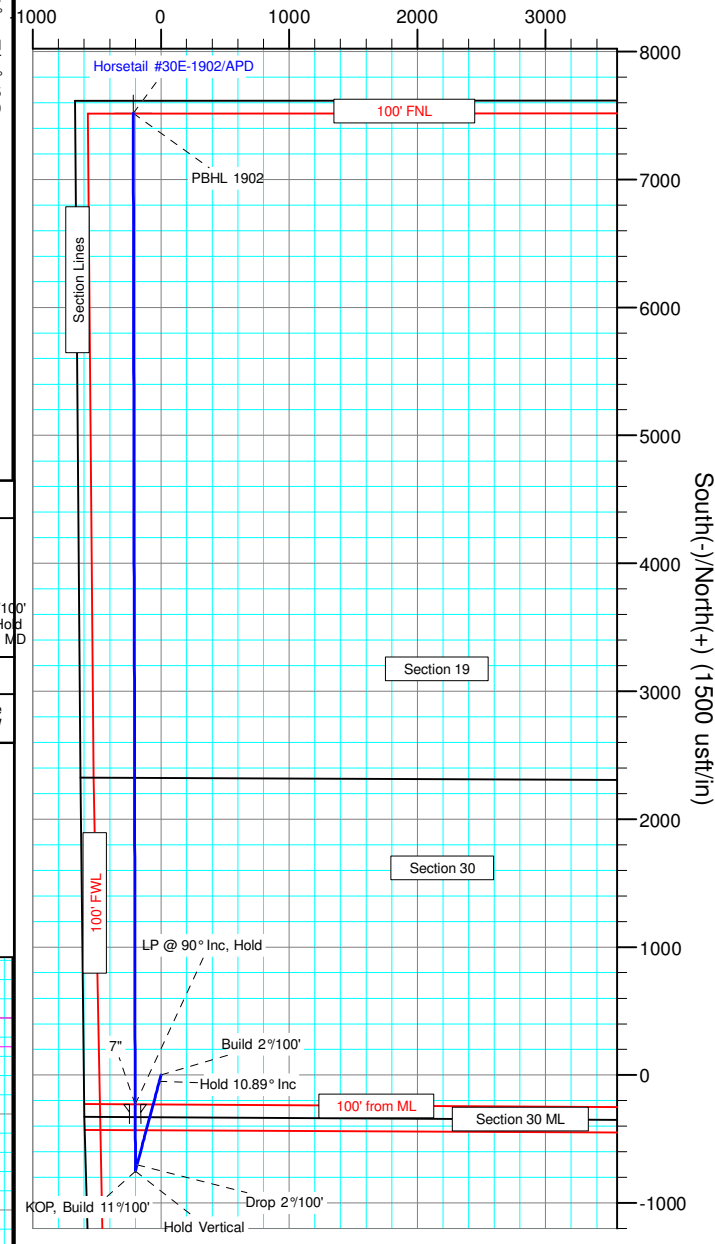
TVD	MD	Inc	Azi	+N/-S	+E/-W	VSec	Departure	Annotation
300.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	Build 2°/100'
841.34	844.61	10.89	194.91	-49.87	-13.28	-49.47	51.61	Hold 10.89° Inc
4343.66	4411.19	10.89	194.91	-701.13	-186.72	-695.45	725.56	Drop 2°/100'
4885.00	4955.80	0.00	0.00	-751.00	-200.00	-744.92	777.18	Hold Vertical
5085.00	5155.80	0.00	0.00	-751.00	-200.00	-744.92	777.18	KOP, Build 11°/100'
5606.00	5974.19	90.00	359.88	-230.00	-201.06	-224.11	1298.18	LP @ 90° Inc, Hold
5606.00	13719.75	90.00	359.88	7515.54	-216.78	7518.67	9043.73	TD at 13719.75' MD

#### DESIGN TARGET DETAILS

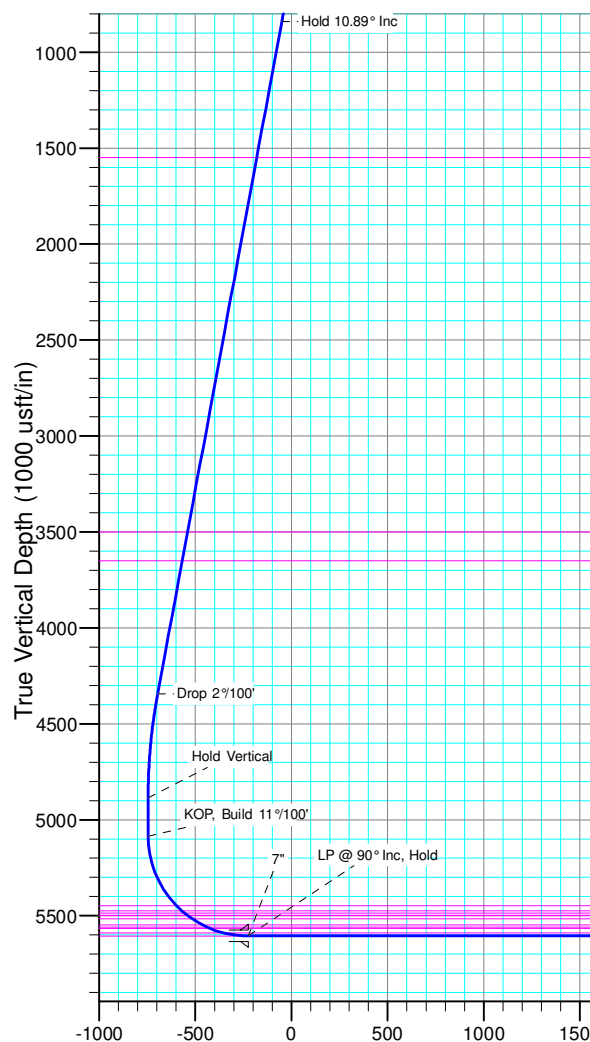
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
PBHL 1902	5606.00	7515.54	-216.78	1550200.45	3469868.99	40° 49' 52.790 N 103° 48' 7.250 W	

SHL:  
2323' FNL, 600' FWL  
Sec30-T10N-R57W  
BHL:  
100' FNL, 453' FWL  
Sec19-T10N-R57W  
7":  
2554' FNL, 399' FWL  
Sec30-T10N-R57W

West(-)/East(+) (1500 usft/in)



South(-)/North(+) (1500 usft/in)



Vertical Section at 358.35° (1000 usft/in)



# **Whiting Petroleum Corp.**

**Weld County, CO  
Sec 30-T10N-R57W  
Horsetail #30E-1902**

**Hz**

**Plan: APD**

## **Standard Planning Report**

**22 October, 2015**



# WOG

## Planning Report

<b>Database:</b>	LandmarkEDM	<b>Local Co-ordinate Reference:</b>	Well Horsetail #30E-1902
<b>Company:</b>	Whiting Petroleum Corp.	<b>TVD Reference:</b>	KBE @ 4827.40usft (Original Well Elev)
<b>Project:</b>	Weld County, CO	<b>MD Reference:</b>	KBE @ 4827.40usft (Original Well Elev)
<b>Site:</b>	Sec 30-T10N-R57W	<b>North Reference:</b>	True
<b>Well:</b>	Horsetail #30E-1902	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Hz		
<b>Design:</b>	APD		

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

<b>Site</b>	Sec 30-T10N-R57W			
<b>Site Position:</b>		<b>Northing:</b>	1,545,003.67 usft	<b>Latitude:</b> 40° 49' 1.510 N
<b>From:</b>	Lat/Long	<b>Easting:</b>	3,469,557.91 usft	<b>Longitude:</b> 103° 48' 12.589 W
<b>Position Uncertainty:</b>	0.00 usft	<b>Slot Radius:</b>	13.200 in	<b>Grid Convergence:</b> 1.10 °

<b>Well</b>	Horsetail #30E-1902			
<b>Well Position</b>	<b>+N/-S</b>	-2,325.66 usft	<b>Northing:</b>	1,542,690.44 usft
	<b>+E/-W</b>	627.40 usft	<b>Easting:</b>	3,470,229.69 usft
<b>Position Uncertainty</b>	0.00 usft	<b>Wellhead Elevation:</b>	0.00 usft	<b>Ground Level:</b> 4,806.40 usft

<b>Wellbore</b>	Hz				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	7/28/2015	7.81	67.38	53,006

<b>Design</b>	APD			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PROTOTYPE	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>
	0.00	0.00	0.00	358.35

<b>Plan Sections</b>										
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	
844.61	10.89	194.91	841.34	-49.87	-13.28	2.00	2.00	0.00	194.91	
4,411.19	10.89	194.91	4,343.66	-701.13	-186.72	0.00	0.00	0.00	0.00	
4,955.80	0.00	0.00	4,885.00	-751.00	-200.00	2.00	-2.00	0.00	180.00	
5,155.80	0.00	0.00	5,085.00	-751.00	-200.00	0.00	0.00	0.00	0.00	
5,974.19	90.00	359.88	5,606.00	-230.00	-201.06	11.00	11.00	0.00	359.88	
13,719.75	90.00	359.88	5,606.00	7,515.54	-216.78	0.00	0.00	0.00	0.00	PBHL 1902



# WOG

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<b>Company:</b>	Whiting Petroleum Corp.	<b>TVD Reference:</b>	KBE @ 4827.40usft (Original Well Elev)
<b>Project:</b>	Weld County, CO	<b>MD Reference:</b>	KBE @ 4827.40usft (Original Well Elev)
<b>Site:</b>	Sec 30-T10N-R57W	<b>North Reference:</b>	True
<b>Well:</b>	Horsetail #30E-1902	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	HZ		
<b>Design:</b>	APD		

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
<b>Build 2°/100'</b>									
400.00	2.00	194.91	399.98	-1.69	-0.45	-1.67	2.00	2.00	0.00
500.00	4.00	194.91	499.84	-6.74	-1.80	-6.69	2.00	2.00	0.00
600.00	6.00	194.91	599.45	-15.17	-4.04	-15.04	2.00	2.00	0.00
700.00	8.00	194.91	698.70	-26.94	-7.17	-26.72	2.00	2.00	0.00
800.00	10.00	194.91	797.47	-42.06	-11.20	-41.72	2.00	2.00	0.00
844.61	10.89	194.91	841.34	-49.87	-13.28	-49.47	2.00	2.00	0.00
<b>Hold 10.89° Inc</b>									
900.00	10.89	194.91	895.73	-59.99	-15.98	-59.50	0.00	0.00	0.00
1,000.00	10.89	194.91	993.93	-78.25	-20.84	-77.61	0.00	0.00	0.00
1,100.00	10.89	194.91	1,092.12	-96.51	-25.70	-95.73	0.00	0.00	0.00
1,200.00	10.89	194.91	1,190.32	-114.77	-30.56	-113.84	0.00	0.00	0.00
1,300.00	10.89	194.91	1,288.52	-133.03	-35.43	-131.95	0.00	0.00	0.00
1,400.00	10.89	194.91	1,386.72	-151.29	-40.29	-150.06	0.00	0.00	0.00
1,500.00	10.89	194.91	1,484.92	-169.55	-45.15	-168.17	0.00	0.00	0.00
1,566.28	10.89	194.91	1,550.00	-181.65	-48.37	-180.18	0.00	0.00	0.00
<b>Upper Pierre</b>									
1,600.00	10.89	194.91	1,583.12	-187.81	-50.01	-186.29	0.00	0.00	0.00
1,700.00	10.89	194.91	1,681.32	-206.07	-54.88	-204.40	0.00	0.00	0.00
1,800.00	10.89	194.91	1,779.51	-224.33	-59.74	-222.51	0.00	0.00	0.00
1,900.00	10.89	194.91	1,877.71	-242.59	-64.60	-240.62	0.00	0.00	0.00
2,000.00	10.89	194.91	1,975.91	-260.85	-69.47	-258.73	0.00	0.00	0.00
2,100.00	10.89	194.91	2,074.11	-279.11	-74.33	-276.85	0.00	0.00	0.00
2,200.00	10.89	194.91	2,172.31	-297.37	-79.19	-294.96	0.00	0.00	0.00
2,300.00	10.89	194.91	2,270.51	-315.63	-84.05	-313.07	0.00	0.00	0.00
2,400.00	10.89	194.91	2,368.70	-333.89	-88.92	-331.18	0.00	0.00	0.00
2,500.00	10.89	194.91	2,466.90	-352.15	-93.78	-349.29	0.00	0.00	0.00
2,600.00	10.89	194.91	2,565.10	-370.41	-98.64	-367.41	0.00	0.00	0.00
2,700.00	10.89	194.91	2,663.30	-388.67	-103.51	-385.52	0.00	0.00	0.00
2,800.00	10.89	194.91	2,761.50	-406.92	-108.37	-403.63	0.00	0.00	0.00
2,900.00	10.89	194.91	2,859.70	-425.18	-113.23	-421.74	0.00	0.00	0.00
3,000.00	10.89	194.91	2,957.89	-443.44	-118.09	-439.86	0.00	0.00	0.00
3,100.00	10.89	194.91	3,056.09	-461.70	-122.96	-457.97	0.00	0.00	0.00
3,200.00	10.89	194.91	3,154.29	-479.96	-127.82	-476.08	0.00	0.00	0.00
3,300.00	10.89	194.91	3,252.49	-498.22	-132.68	-494.19	0.00	0.00	0.00
3,400.00	10.89	194.91	3,350.69	-516.48	-137.55	-512.30	0.00	0.00	0.00
3,500.00	10.89	194.91	3,448.89	-534.74	-142.41	-530.42	0.00	0.00	0.00
3,552.05	10.89	194.91	3,500.00	-544.25	-144.94	-539.84	0.00	0.00	0.00
<b>Hygiene</b>									
3,600.00	10.89	194.91	3,547.08	-553.00	-147.27	-548.53	0.00	0.00	0.00
3,700.00	10.89	194.91	3,645.28	-571.26	-152.13	-566.64	0.00	0.00	0.00
3,704.80	10.89	194.91	3,650.00	-572.14	-152.37	-567.51	0.00	0.00	0.00
<b>Lower Pierre</b>									
3,800.00	10.89	194.91	3,743.48	-589.52	-157.00	-584.75	0.00	0.00	0.00
3,900.00	10.89	194.91	3,841.68	-607.78	-161.86	-602.86	0.00	0.00	0.00
4,000.00	10.89	194.91	3,939.88	-626.04	-166.72	-620.98	0.00	0.00	0.00
4,100.00	10.89	194.91	4,038.08	-644.30	-171.59	-639.09	0.00	0.00	0.00
4,200.00	10.89	194.91	4,136.28	-662.56	-176.45	-657.20	0.00	0.00	0.00
4,300.00	10.89	194.91	4,234.47	-680.82	-181.31	-675.31	0.00	0.00	0.00
4,400.00	10.89	194.91	4,332.67	-699.08	-186.17	-693.42	0.00	0.00	0.00



# WOG

## Planning Report

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<b>Company:</b>	Whiting Petroleum Corp.	<b>TVD Reference:</b>	KBE @ 4827.40usft (Original Well Elev)
<b>Project:</b>	Weld County, CO	<b>MD Reference:</b>	KBE @ 4827.40usft (Original Well Elev)
<b>Site:</b>	Sec 30-T10N-R57W	<b>North Reference:</b>	True
<b>Well:</b>	Horsetail #30E-1902	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	HZ		
<b>Design:</b>	APD		

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)
4,411.19	10.89	194.91	4,343.66	-701.13	-186.72	-695.45	0.00	0.00	0.00
<b>Drop 2°/100'</b>									
4,500.00	9.12	194.91	4,431.12	-716.03	-190.69	-710.24	2.00	-2.00	0.00
4,600.00	7.12	194.91	4,530.11	-729.68	-194.32	-723.77	2.00	-2.00	0.00
4,700.00	5.12	194.91	4,629.54	-739.97	-197.06	-733.98	2.00	-2.00	0.00
4,800.00	3.12	194.91	4,729.27	-746.91	-198.91	-740.86	2.00	-2.00	0.00
4,900.00	1.12	194.91	4,829.20	-750.47	-199.86	-744.40	2.00	-2.00	0.00
4,955.80	0.00	0.00	4,885.00	-751.00	-200.00	-744.92	2.00	-2.00	0.00
<b>Hold Vertical</b>									
5,000.00	0.00	0.00	4,929.20	-751.00	-200.00	-744.92	0.00	0.00	0.00
5,100.00	0.00	0.00	5,029.20	-751.00	-200.00	-744.92	0.00	0.00	0.00
5,155.80	0.00	0.00	5,085.00	-751.00	-200.00	-744.92	0.00	0.00	0.00
<b>KOP, Build 11°/100'</b>									
5,200.00	4.86	359.88	5,129.14	-749.13	-200.00	-743.05	11.00	11.00	0.00
5,250.00	10.36	359.88	5,178.68	-742.51	-200.02	-736.43	11.00	11.00	0.00
5,300.00	15.86	359.88	5,227.36	-731.17	-200.04	-725.10	11.00	11.00	0.00
5,350.00	21.36	359.88	5,274.73	-715.23	-200.07	-709.16	11.00	11.00	0.00
5,400.00	26.85	359.88	5,320.35	-694.81	-200.11	-688.75	11.00	11.00	0.00
5,450.00	32.35	359.88	5,363.81	-670.12	-200.16	-664.07	11.00	11.00	0.00
5,500.00	37.85	359.88	5,404.70	-641.38	-200.22	-635.34	11.00	11.00	0.00
5,550.00	43.35	359.88	5,442.65	-608.85	-200.29	-602.83	11.00	11.00	0.00
5,557.41	44.17	359.88	5,448.00	-603.73	-200.30	-597.70	11.00	11.00	0.00
<b>P200 Marker</b>									
5,596.51	48.47	359.88	5,475.00	-575.46	-200.36	-569.44	11.00	11.00	0.00
<b>P300 Marker</b>									
5,600.00	48.85	359.88	5,477.30	-572.84	-200.36	-566.82	11.00	11.00	0.00
5,613.41	50.32	359.88	5,486.00	-562.63	-200.38	-556.61	11.00	11.00	0.00
<b>P350 Marker</b>									
5,632.64	52.44	359.88	5,498.00	-547.60	-200.41	-541.60	11.00	11.00	0.00
<b>Sharon Springs</b>									
5,635.94	52.80	359.88	5,500.00	-544.99	-200.42	-538.98	11.00	11.00	0.00
<b>Niobrara</b>									
5,650.00	54.35	359.88	5,508.35	-533.67	-200.44	-527.67	11.00	11.00	0.00
5,663.36	55.82	359.88	5,516.00	-522.71	-200.46	-516.71	11.00	11.00	0.00
<b>Top A Chalk</b>									
5,700.00	59.85	359.88	5,535.50	-491.71	-200.53	-485.72	11.00	11.00	0.00
5,726.01	62.71	359.88	5,548.00	-468.90	-200.57	-462.92	11.00	11.00	0.00
<b>Top A Marl</b>									
5,750.00	65.35	359.88	5,558.51	-447.33	-200.62	-441.36	11.00	11.00	0.00
5,753.61	65.74	359.88	5,560.00	-444.05	-200.62	-438.08	11.00	11.00	0.00
<b>A Marl</b>									
5,768.70	67.40	359.88	5,566.00	-430.20	-200.65	-424.24	11.00	11.00	0.00
<b>Top Upper B</b>									
5,800.00	70.84	359.88	5,577.15	-400.96	-200.71	-395.01	11.00	11.00	0.00
5,844.74	75.76	359.88	5,590.00	-358.13	-200.80	-352.19	11.00	11.00	0.00
<b>Base Upper B</b>									
5,850.00	76.34	359.88	5,591.27	-353.02	-200.81	-347.08	11.00	11.00	0.00
5,900.00	81.84	359.88	5,600.73	-303.94	-200.91	-298.02	11.00	11.00	0.00
5,950.00	87.34	359.88	5,605.44	-254.18	-201.01	-248.28	11.00	11.00	0.00
5,974.19	90.00	359.88	5,606.00	-230.00	-201.06	-224.11	11.00	11.00	0.00
<b>LP @ 90° Inc, Hold - Top Lower B - 7"</b>									
6,000.00	90.00	359.88	5,606.00	-204.19	-201.11	-198.31	0.00	0.00	0.00



# WOG

## Planning Report

<b>Database:</b>	LandmarkEDM	<b>Local Co-ordinate Reference:</b>	Well Horsetail #30E-1902
<b>Company:</b>	Whiting Petroleum Corp.	<b>TVD Reference:</b>	KBE @ 4827.40usft (Original Well Elev)
<b>Project:</b>	Weld County, CO	<b>MD Reference:</b>	KBE @ 4827.40usft (Original Well Elev)
<b>Site:</b>	Sec 30-T10N-R57W	<b>North Reference:</b>	True
<b>Well:</b>	Horsetail #30E-1902	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	HZ		
<b>Design:</b>	APD		

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)
6,100.00	90.00	359.88	5,606.00	-104.19	-201.31	-98.34	0.00	0.00	0.00
6,200.00	90.00	359.88	5,606.00	-4.19	-201.52	1.62	0.00	0.00	0.00
6,300.00	90.00	359.88	5,606.00	95.81	-201.72	101.59	0.00	0.00	0.00
6,400.00	90.00	359.88	5,606.00	195.81	-201.92	201.55	0.00	0.00	0.00
6,500.00	90.00	359.88	5,606.00	295.81	-202.12	301.51	0.00	0.00	0.00
6,600.00	90.00	359.88	5,606.00	395.81	-202.33	401.48	0.00	0.00	0.00
6,700.00	90.00	359.88	5,606.00	495.81	-202.53	501.44	0.00	0.00	0.00
6,800.00	90.00	359.88	5,606.00	595.81	-202.73	601.41	0.00	0.00	0.00
6,900.00	90.00	359.88	5,606.00	695.81	-202.94	701.37	0.00	0.00	0.00
7,000.00	90.00	359.88	5,606.00	795.81	-203.14	801.33	0.00	0.00	0.00
7,100.00	90.00	359.88	5,606.00	895.81	-203.34	901.30	0.00	0.00	0.00
7,200.00	90.00	359.88	5,606.00	995.81	-203.55	1,001.26	0.00	0.00	0.00
7,300.00	90.00	359.88	5,606.00	1,095.81	-203.75	1,101.23	0.00	0.00	0.00
7,400.00	90.00	359.88	5,606.00	1,195.81	-203.95	1,201.19	0.00	0.00	0.00
7,500.00	90.00	359.88	5,606.00	1,295.81	-204.15	1,301.15	0.00	0.00	0.00
7,600.00	90.00	359.88	5,606.00	1,395.81	-204.36	1,401.12	0.00	0.00	0.00
7,700.00	90.00	359.88	5,606.00	1,495.81	-204.56	1,501.08	0.00	0.00	0.00
7,800.00	90.00	359.88	5,606.00	1,595.81	-204.76	1,601.05	0.00	0.00	0.00
7,900.00	90.00	359.88	5,606.00	1,695.81	-204.97	1,701.01	0.00	0.00	0.00
8,000.00	90.00	359.88	5,606.00	1,795.81	-205.17	1,800.97	0.00	0.00	0.00
8,100.00	90.00	359.88	5,606.00	1,895.81	-205.37	1,900.94	0.00	0.00	0.00
8,200.00	90.00	359.88	5,606.00	1,995.81	-205.58	2,000.90	0.00	0.00	0.00
8,300.00	90.00	359.88	5,606.00	2,095.81	-205.78	2,100.87	0.00	0.00	0.00
8,400.00	90.00	359.88	5,606.00	2,195.81	-205.98	2,200.83	0.00	0.00	0.00
8,500.00	90.00	359.88	5,606.00	2,295.81	-206.18	2,300.80	0.00	0.00	0.00
8,600.00	90.00	359.88	5,606.00	2,395.80	-206.39	2,400.76	0.00	0.00	0.00
8,700.00	90.00	359.88	5,606.00	2,495.80	-206.59	2,500.72	0.00	0.00	0.00
8,800.00	90.00	359.88	5,606.00	2,595.80	-206.79	2,600.69	0.00	0.00	0.00
8,900.00	90.00	359.88	5,606.00	2,695.80	-207.00	2,700.65	0.00	0.00	0.00
9,000.00	90.00	359.88	5,606.00	2,795.80	-207.20	2,800.62	0.00	0.00	0.00
9,100.00	90.00	359.88	5,606.00	2,895.80	-207.40	2,900.58	0.00	0.00	0.00
9,200.00	90.00	359.88	5,606.00	2,995.80	-207.60	3,000.54	0.00	0.00	0.00
9,300.00	90.00	359.88	5,606.00	3,095.80	-207.81	3,100.51	0.00	0.00	0.00
9,400.00	90.00	359.88	5,606.00	3,195.80	-208.01	3,200.47	0.00	0.00	0.00
9,500.00	90.00	359.88	5,606.00	3,295.80	-208.21	3,300.44	0.00	0.00	0.00
9,600.00	90.00	359.88	5,606.00	3,395.80	-208.42	3,400.40	0.00	0.00	0.00
9,700.00	90.00	359.88	5,606.00	3,495.80	-208.62	3,500.36	0.00	0.00	0.00
9,800.00	90.00	359.88	5,606.00	3,595.80	-208.82	3,600.33	0.00	0.00	0.00
9,900.00	90.00	359.88	5,606.00	3,695.80	-209.03	3,700.29	0.00	0.00	0.00
10,000.00	90.00	359.88	5,606.00	3,795.80	-209.23	3,800.26	0.00	0.00	0.00
10,100.00	90.00	359.88	5,606.00	3,895.80	-209.43	3,900.22	0.00	0.00	0.00
10,200.00	90.00	359.88	5,606.00	3,995.80	-209.63	4,000.18	0.00	0.00	0.00
10,300.00	90.00	359.88	5,606.00	4,095.80	-209.84	4,100.15	0.00	0.00	0.00
10,400.00	90.00	359.88	5,606.00	4,195.80	-210.04	4,200.11	0.00	0.00	0.00
10,500.00	90.00	359.88	5,606.00	4,295.80	-210.24	4,300.08	0.00	0.00	0.00
10,600.00	90.00	359.88	5,606.00	4,395.80	-210.45	4,400.04	0.00	0.00	0.00
10,700.00	90.00	359.88	5,606.00	4,495.80	-210.65	4,500.00	0.00	0.00	0.00
10,800.00	90.00	359.88	5,606.00	4,595.80	-210.85	4,599.97	0.00	0.00	0.00
10,900.00	90.00	359.88	5,606.00	4,695.80	-211.06	4,699.93	0.00	0.00	0.00
11,000.00	90.00	359.88	5,606.00	4,795.80	-211.26	4,799.90	0.00	0.00	0.00
11,100.00	90.00	359.88	5,606.00	4,895.80	-211.46	4,899.86	0.00	0.00	0.00
11,200.00	90.00	359.88	5,606.00	4,995.80	-211.66	4,999.83	0.00	0.00	0.00
11,300.00	90.00	359.88	5,606.00	5,095.80	-211.87	5,099.79	0.00	0.00	0.00
11,400.00	90.00	359.88	5,606.00	5,195.80	-212.07	5,199.75	0.00	0.00	0.00



# WOG

## Planning Report

<b>Database:</b>	LandmarkEDM	<b>Local Co-ordinate Reference:</b>	Well Horsetail #30E-1902
<b>Company:</b>	Whiting Petroleum Corp.	<b>TVD Reference:</b>	KBE @ 4827.40usft (Original Well Elev)
<b>Project:</b>	Weld County, CO	<b>MD Reference:</b>	KBE @ 4827.40usft (Original Well Elev)
<b>Site:</b>	Sec 30-T10N-R57W	<b>North Reference:</b>	True
<b>Well:</b>	Horsetail #30E-1902	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	HZ		
<b>Design:</b>	APD		

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)
11,500.00	90.00	359.88	5,606.00	5,295.80	-212.27	5,299.72	0.00	0.00	0.00
11,600.00	90.00	359.88	5,606.00	5,395.80	-212.48	5,399.68	0.00	0.00	0.00
11,700.00	90.00	359.88	5,606.00	5,495.80	-212.68	5,499.65	0.00	0.00	0.00
11,800.00	90.00	359.88	5,606.00	5,595.80	-212.88	5,599.61	0.00	0.00	0.00
11,900.00	90.00	359.88	5,606.00	5,695.80	-213.08	5,699.57	0.00	0.00	0.00
12,000.00	90.00	359.88	5,606.00	5,795.80	-213.29	5,799.54	0.00	0.00	0.00
12,100.00	90.00	359.88	5,606.00	5,895.80	-213.49	5,899.50	0.00	0.00	0.00
12,200.00	90.00	359.88	5,606.00	5,995.80	-213.69	5,999.47	0.00	0.00	0.00
12,300.00	90.00	359.88	5,606.00	6,095.80	-213.90	6,099.43	0.00	0.00	0.00
12,400.00	90.00	359.88	5,606.00	6,195.80	-214.10	6,199.39	0.00	0.00	0.00
12,500.00	90.00	359.88	5,606.00	6,295.80	-214.30	6,299.36	0.00	0.00	0.00
12,600.00	90.00	359.88	5,606.00	6,395.80	-214.51	6,399.32	0.00	0.00	0.00
12,700.00	90.00	359.88	5,606.00	6,495.80	-214.71	6,499.29	0.00	0.00	0.00
12,800.00	90.00	359.88	5,606.00	6,595.80	-214.91	6,599.25	0.00	0.00	0.00
12,900.00	90.00	359.88	5,606.00	6,695.80	-215.11	6,699.21	0.00	0.00	0.00
13,000.00	90.00	359.88	5,606.00	6,795.80	-215.32	6,799.18	0.00	0.00	0.00
13,100.00	90.00	359.88	5,606.00	6,895.80	-215.52	6,899.14	0.00	0.00	0.00
13,200.00	90.00	359.88	5,606.00	6,995.80	-215.72	6,999.11	0.00	0.00	0.00
13,300.00	90.00	359.88	5,606.00	7,095.80	-215.93	7,099.07	0.00	0.00	0.00
13,400.00	90.00	359.88	5,606.00	7,195.80	-216.13	7,199.03	0.00	0.00	0.00
13,500.00	90.00	359.88	5,606.00	7,295.79	-216.33	7,299.00	0.00	0.00	0.00
13,600.00	90.00	359.88	5,606.00	7,395.79	-216.54	7,398.96	0.00	0.00	0.00
13,700.00	90.00	359.88	5,606.00	7,495.79	-216.74	7,498.93	0.00	0.00	0.00
13,719.75	90.00	359.88	5,606.00	7,515.54	-216.78	7,518.67	0.00	0.00	0.00
TD at 13719.75' MD									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
PBHL 1902	0.00	0.00	5,606.00	7,515.54	-216.78	1,550,200.45	3,469,868.99	40° 49' 52.790 N	103° 48' 7.250 W
- plan hits target center									
- Point									

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (in)	Hole Diameter (in)	
5,974.19	5,606.00	7"	7.000	8.750	



**WOG**  
Planning Report

<b>Database:</b>	LandmarkEDM	<b>Local Co-ordinate Reference:</b>	Well Horsetail #30E-1902
<b>Company:</b>	Whiting Petroleum Corp.	<b>TVD Reference:</b>	KBE @ 4827.40usft (Original Well Elev)
<b>Project:</b>	Weld County, CO	<b>MD Reference:</b>	KBE @ 4827.40usft (Original Well Elev)
<b>Site:</b>	Sec 30-T10N-R57W	<b>North Reference:</b>	True
<b>Well:</b>	Horsetail #30E-1902	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Hz		
<b>Design:</b>	APD		

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
1,566.28	1,550.00	Upper Pierre				
3,552.05	3,500.00	Hygiene				
3,704.80	3,650.00	Lower Pierre				
5,557.41	5,448.00	P200 Marker				
5,596.51	5,475.00	P300 Marker				
5,613.41	5,486.00	P350 Marker				
5,632.64	5,498.00	Sharon Springs				
5,635.94	5,500.00	Niobrara				
5,663.36	5,516.00	Top A Chalk				
5,726.01	5,548.00	Top A Marl				
5,753.61	5,560.00	A Marl				
5,768.70	5,566.00	Top Upper B				
5,844.74	5,590.00	Base Upper B				
5,974.19	5,606.00	Top Lower B				

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
300.00	300.00	0.00	0.00	Build 2°/100'	
844.61	841.34	-49.87	-13.28	Hold 10.89° Inc	
4,411.19	4,343.66	-701.13	-186.72	Drop 2°/100'	
4,955.80	4,885.00	-751.00	-200.00	Hold Vertical	
5,155.80	5,085.00	-751.00	-200.00	KOP, Build 11°/100'	
5,974.19	5,606.00	-230.00	-201.06	LP @ 90° Inc, Hold	
13,719.75	5,606.00	7,515.54	-216.78	TD at 13719.75' MD	