



Project: Weld County, CO  
Site: Sec 29-T10N-R57W  
Well: Horsetail #29F-2038  
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



Azimuths to True North  
Magnetic North: 7.85°

Magnetic Field  
Strength: 52868.0snT  
Dip Angle: 67.37°  
Date: 1/15/2016  
Model: IGRF2015

WELL DETAILS: Horsetail #29F-2038

+N/-S	+E/-W	Northing	Ground Level:	4698.00	Latitude	Longitude	Slot
0.00	0.00	1542760.55	Easting	3476854.11	40° 48' 37.960 N	103° 46' 38.280 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	877.98	11.56	212.73	874.07	-48.88	-31.41	2.00	212.73	-46.95	
4	4420.70	11.56	212.73	4344.93	-646.12	-415.21	0.00	0.00	-620.60	
5	4998.68	0.00	0.00	4919.00	-695.00	-446.62	2.00	180.00	-667.55	
6	5198.68	0.00	0.00	5119.00	-695.00	-446.62	0.00	0.00	-667.55	
7	6017.07	90.00	360.00	5640.00	-174.00	-446.62	11.00	360.00	-147.45	
8	13777.46	90.00	360.00	5640.00	7586.39	-446.62	0.00	0.00	7599.53	PBHL 29F-2038

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
1550.00	1567.91	Upper Pierre
3500.00	3558.28	Hygiene
3650.00	3711.38	Lower Pierre
5355.00	5443.61	P200 Marker
5375.00	5466.30	P300 Marker
5391.00	5484.86	P350 Marker
5405.00	5501.44	Sharon Springs
5409.00	5506.24	Niobrara
5426.00	5526.98	Top A Chalk
5456.00	5565.17	Top A Marl
5468.00	5581.11	A Marl
5476.00	5591.99	Top Upper B
5500.00	5626.01	Base Upper B
5516.00	5650.07	Top Lower B
5545.00	5697.45	Base Lower B
5558.00	5720.79	Top B Marl
5600.00	5811.58	Top C Chalk
5608.00	5833.52	Middle C Chalk
5622.00	5879.72	Middle C Marl
5640.00	6017.07	Lower C Chalk

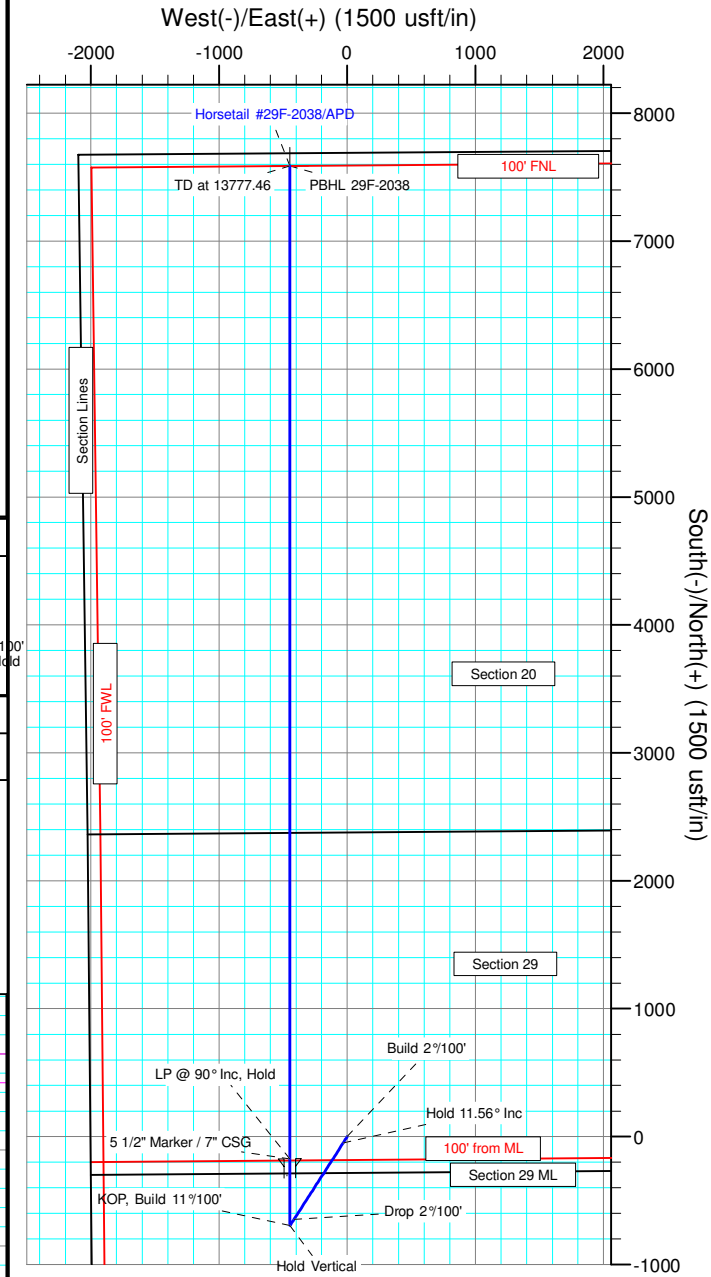
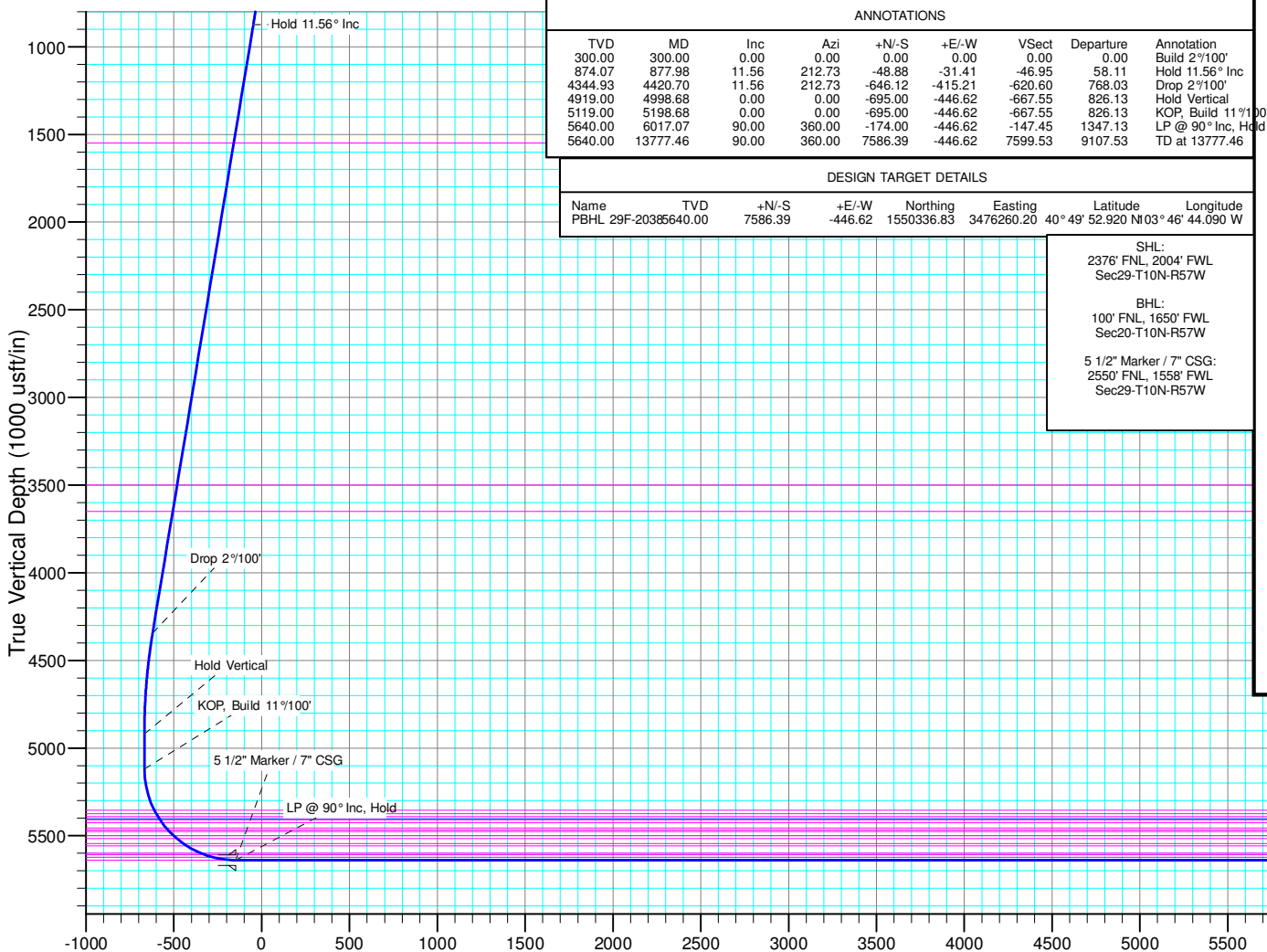
ANNOTATIONS

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'
874.07	877.98	11.56	212.73	-48.88	-31.41	-46.95	58.11	Hold 11.56° Inc
4344.93	4420.70	11.56	212.73	-646.12	-415.21	-620.60	768.03	Drop 2°/100'
4919.00	4998.68	0.00	0.00	-695.00	-446.62	-667.55	826.13	Hold Vertical
5119.00	5198.68	0.00	0.00	-695.00	-446.62	-667.55	826.13	KOP, Build 11°/100'
5640.00	6017.07	90.00	360.00	-174.00	-446.62	-147.45	1347.13	LP @ 90° Inc, Hold
5640.00	13777.46	90.00	360.00	7586.39	-446.62	7599.53	9107.53	TD at 13777.46

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
PBHL 29F-2038	5640.00	7586.39	-446.62	1550336.83	3476260.20	40° 49' 52.920 N	103° 46' 44.090 W

SHL:  
2376' FNL, 2004' FWL  
Sec29-T10N-R57W  
  
BHL:  
100' FNL, 1650' FWL  
Sec20-T10N-R57W  
  
5 1/2" Marker / 7" CSG:  
2550' FNL, 1558' FWL  
Sec29-T10N-R57W





# **Whiting Petroleum Corp.**

**Weld County, CO  
Sec 29-T10N-R57W  
Horsetail #29F-2038**

**Hz**

**Plan: APD**

## **Standard Planning Report**

**19 January, 2016**



# WOG

## Planning Report

<b>Database:</b>	LandmarkEDM	<b>Local Co-ordinate Reference:</b>	Well Horsetail #29F-2038
<b>Company:</b>	Whiting Petroleum Corp.	<b>TVD Reference:</b>	KBE @ 4719.00usft
<b>Project:</b>	Weld County, CO	<b>MD Reference:</b>	KBE @ 4719.00usft
<b>Site:</b>	Sec 29-T10N-R57W	<b>North Reference:</b>	True
<b>Well:</b>	Horsetail #29F-2038	<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 29-T10N-R57W			
<b>Site Position:</b>		<b>Northing:</b>	1,545,081.96 usft	<b>Latitude:</b> 40° 49' 1.290 N
<b>From:</b>	Lat/Long	<b>Easting:</b>	3,474,781.92 usft	<b>Longitude:</b> 103° 47' 4.639 W
<b>Position Uncertainty:</b>	0.00 usft	<b>Slot Radius:</b>	13.200 in	<b>Grid Convergence:</b> 1.11 °

<b>Well</b>	Horsetail #29F-2038			
<b>Well Position</b>	<b>+N/-S</b>	-2,361.05 usft	<b>Northing:</b>	1,542,760.55 usft
	<b>+E/-W</b>	2,026.90 usft	<b>Easting:</b>	3,476,854.11 usft
<b>Position Uncertainty</b>	0.00 usft	<b>Wellhead Elevation:</b>	0.00 usft	<b>Ground Level:</b> 4,698.00 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>
	IGRF2015	1/15/2016	7.85	67.37	52,868

<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	356.63

<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	
877.98	11.56	212.73	874.07	-48.88	-31.41	2.00	2.00	0.00	212.73	
4,420.70	11.56	212.73	4,344.93	-646.12	-415.21	0.00	0.00	0.00	0.00	
4,998.68	0.00	0.00	4,919.00	-695.00	-446.62	2.00	-2.00	0.00	180.00	
5,198.68	0.00	0.00	5,119.00	-695.00	-446.62	0.00	0.00	0.00	0.00	
6,017.07	90.00	360.00	5,640.00	-174.00	-446.62	11.00	11.00	0.00	360.00	
13,777.46	90.00	360.00	5,640.00	7,586.40	-446.62	0.00	0.00	0.00	0.00	PBHL 29F-2038



# WOG

## Planning Report

<b>Database:</b>	LandmarkEDM	<b>Local Co-ordinate Reference:</b>	Well Horsetail #29F-2038
<b>Company:</b>	Whiting Petroleum Corp.	<b>TVD Reference:</b>	KBE @ 4719.00usft
<b>Project:</b>	Weld County, CO	<b>MD Reference:</b>	KBE @ 4719.00usft
<b>Site:</b>	Sec 29-T10N-R57W	<b>North Reference:</b>	True
<b>Well:</b>	Horsetail #29F-2038	<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	212.73	399.98	-1.47	-0.94	-1.41	2.00	2.00	0.00
500.00	4.00	212.73	499.84	-5.87	-3.77	-5.64	2.00	2.00	0.00
600.00	6.00	212.73	599.45	-13.20	-8.48	-12.68	2.00	2.00	0.00
700.00	8.00	212.73	698.70	-23.45	-15.07	-22.53	2.00	2.00	0.00
800.00	10.00	212.73	797.47	-36.61	-23.53	-35.17	2.00	2.00	0.00
877.98	11.56	212.73	874.07	-48.88	-31.41	-46.95	2.00	2.00	0.00
<b>Hold 11.56° Inc</b>									
900.00	11.56	212.73	895.64	-52.60	-33.80	-50.52	0.00	0.00	0.00
1,000.00	11.56	212.73	993.61	-69.45	-44.63	-66.71	0.00	0.00	0.00
1,100.00	11.56	212.73	1,091.58	-86.31	-55.47	-82.90	0.00	0.00	0.00
1,200.00	11.56	212.73	1,189.56	-103.17	-66.30	-99.10	0.00	0.00	0.00
1,300.00	11.56	212.73	1,287.53	-120.03	-77.13	-115.29	0.00	0.00	0.00
1,400.00	11.56	212.73	1,385.50	-136.89	-87.97	-131.48	0.00	0.00	0.00
1,500.00	11.56	212.73	1,483.47	-153.74	-98.80	-147.67	0.00	0.00	0.00
1,567.91	11.56	212.73	1,550.00	-165.19	-106.16	-158.67	0.00	0.00	0.00
<b>Upper Pierre</b>									
1,600.00	11.56	212.73	1,581.44	-170.60	-109.63	-163.86	0.00	0.00	0.00
1,700.00	11.56	212.73	1,679.41	-187.46	-120.47	-180.06	0.00	0.00	0.00
1,800.00	11.56	212.73	1,777.39	-204.32	-131.30	-196.25	0.00	0.00	0.00
1,900.00	11.56	212.73	1,875.36	-221.18	-142.13	-212.44	0.00	0.00	0.00
2,000.00	11.56	212.73	1,973.33	-238.03	-152.97	-228.63	0.00	0.00	0.00
2,100.00	11.56	212.73	2,071.30	-254.89	-163.80	-244.82	0.00	0.00	0.00
2,200.00	11.56	212.73	2,169.27	-271.75	-174.63	-261.02	0.00	0.00	0.00
2,300.00	11.56	212.73	2,267.24	-288.61	-185.47	-277.21	0.00	0.00	0.00
2,400.00	11.56	212.73	2,365.22	-305.47	-196.30	-293.40	0.00	0.00	0.00
2,500.00	11.56	212.73	2,463.19	-322.32	-207.13	-309.59	0.00	0.00	0.00
2,600.00	11.56	212.73	2,561.16	-339.18	-217.97	-325.79	0.00	0.00	0.00
2,700.00	11.56	212.73	2,659.13	-356.04	-228.80	-341.98	0.00	0.00	0.00
2,800.00	11.56	212.73	2,757.10	-372.90	-239.63	-358.17	0.00	0.00	0.00
2,900.00	11.56	212.73	2,855.07	-389.76	-250.47	-374.36	0.00	0.00	0.00
3,000.00	11.56	212.73	2,953.05	-406.61	-261.30	-390.55	0.00	0.00	0.00
3,100.00	11.56	212.73	3,051.02	-423.47	-272.13	-406.75	0.00	0.00	0.00
3,200.00	11.56	212.73	3,148.99	-440.33	-282.97	-422.94	0.00	0.00	0.00
3,300.00	11.56	212.73	3,246.96	-457.19	-293.80	-439.13	0.00	0.00	0.00
3,400.00	11.56	212.73	3,344.93	-474.05	-304.63	-455.32	0.00	0.00	0.00
3,500.00	11.56	212.73	3,442.90	-490.90	-315.47	-471.52	0.00	0.00	0.00
3,558.28	11.56	212.73	3,500.00	-500.73	-321.78	-480.95	0.00	0.00	0.00
<b>Hygiene</b>									
3,600.00	11.56	212.73	3,540.88	-507.76	-326.30	-487.71	0.00	0.00	0.00
3,700.00	11.56	212.73	3,638.85	-524.62	-337.13	-503.90	0.00	0.00	0.00
3,711.38	11.56	212.73	3,650.00	-526.54	-338.37	-505.74	0.00	0.00	0.00
<b>Lower Pierre</b>									
3,800.00	11.56	212.73	3,736.82	-541.48	-347.97	-520.09	0.00	0.00	0.00
3,900.00	11.56	212.73	3,834.79	-558.34	-358.80	-536.28	0.00	0.00	0.00
4,000.00	11.56	212.73	3,932.76	-575.19	-369.63	-552.48	0.00	0.00	0.00
4,100.00	11.56	212.73	4,030.73	-592.05	-380.47	-568.67	0.00	0.00	0.00
4,200.00	11.56	212.73	4,128.71	-608.91	-391.30	-584.86	0.00	0.00	0.00
4,300.00	11.56	212.73	4,226.68	-625.77	-402.13	-601.05	0.00	0.00	0.00
4,400.00	11.56	212.73	4,324.65	-642.63	-412.97	-617.25	0.00	0.00	0.00



# WOG

## Planning Report

<b>Database:</b>	LandmarkEDM	<b>Local Co-ordinate Reference:</b>	Well Horsetail #29F-2038
<b>Company:</b>	Whiting Petroleum Corp.	<b>TVD Reference:</b>	KBE @ 4719.00usft
<b>Project:</b>	Weld County, CO	<b>MD Reference:</b>	KBE @ 4719.00usft
<b>Site:</b>	Sec 29-T10N-R57W	<b>North Reference:</b>	True
<b>Well:</b>	Horsetail #29F-2038	<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)
4,420.70	11.56	212.73	4,344.93	-646.12	-415.21	-620.60	0.00	0.00	0.00
<b>Drop 2°/100'</b>									
4,500.00	9.97	212.73	4,422.83	-658.58	-423.22	-632.57	2.00	-2.00	0.00
4,600.00	7.97	212.73	4,521.60	-671.70	-431.65	-645.17	2.00	-2.00	0.00
4,700.00	5.97	212.73	4,620.86	-681.91	-438.21	-654.98	2.00	-2.00	0.00
4,800.00	3.97	212.73	4,720.47	-689.21	-442.90	-661.99	2.00	-2.00	0.00
4,900.00	1.97	212.73	4,820.33	-693.57	-445.71	-666.18	2.00	-2.00	0.00
4,998.68	0.00	0.00	4,919.00	-695.00	-446.62	-667.55	2.00	-2.00	0.00
<b>Hold Vertical</b>									
5,000.00	0.00	0.00	4,920.32	-695.00	-446.62	-667.55	0.00	0.00	0.00
5,100.00	0.00	0.00	5,020.32	-695.00	-446.62	-667.55	0.00	0.00	0.00
5,198.68	0.00	0.00	5,119.00	-695.00	-446.62	-667.55	0.00	0.00	0.00
<b>KOP, Build 11°/100'</b>									
5,200.00	0.14	0.00	5,120.32	-695.00	-446.62	-667.55	11.00	11.00	0.00
5,300.00	11.14	360.00	5,219.68	-685.18	-446.62	-657.75	11.00	11.00	0.00
5,400.00	22.14	360.00	5,315.34	-656.59	-446.62	-629.20	11.00	11.00	0.00
5,443.61	26.93	360.00	5,355.00	-638.48	-446.62	-611.13	11.00	11.00	0.00
<b>P200 Marker</b>									
5,466.30	29.43	360.00	5,375.00	-627.77	-446.62	-600.43	11.00	11.00	0.00
<b>P300 Marker</b>									
5,484.86	31.47	360.00	5,391.00	-618.36	-446.62	-591.04	11.00	11.00	0.00
<b>P350 Marker</b>									
5,500.00	33.14	360.00	5,403.80	-610.27	-446.62	-582.97	11.00	11.00	0.00
5,501.44	33.29	360.00	5,405.00	-609.48	-446.62	-582.18	11.00	11.00	0.00
<b>Sharon Springs</b>									
5,506.24	33.82	360.00	5,409.00	-606.83	-446.62	-579.53	11.00	11.00	0.00
<b>Niobrara</b>									
5,526.98	36.10	360.00	5,426.00	-594.94	-446.62	-567.67	11.00	11.00	0.00
<b>Top A Chalk</b>									
5,565.17	40.30	360.00	5,456.00	-571.33	-446.62	-544.10	11.00	11.00	0.00
<b>Top A Marl</b>									
5,581.11	42.06	360.00	5,468.00	-560.83	-446.62	-533.62	11.00	11.00	0.00
<b>A Marl</b>									
5,591.99	43.25	360.00	5,476.00	-553.46	-446.62	-526.26	11.00	11.00	0.00
<b>Top Upper B</b>									
5,600.00	44.13	360.00	5,481.79	-547.93	-446.62	-520.74	11.00	11.00	0.00
5,626.01	46.99	360.00	5,500.00	-529.36	-446.62	-502.20	11.00	11.00	0.00
<b>Base Upper B</b>									
5,650.07	49.63	360.00	5,516.00	-511.39	-446.62	-484.26	10.96	10.96	0.00
<b>Top Lower B</b>									
5,697.45	54.85	360.00	5,545.00	-473.94	-446.62	-446.87	11.01	11.01	0.00
<b>Base Lower B</b>									
5,700.00	55.13	360.00	5,546.46	-471.86	-446.62	-444.79	11.00	11.00	0.00
5,720.79	57.42	360.00	5,558.00	-454.57	-446.62	-427.54	11.00	11.00	0.00
<b>Top B Marl</b>									
5,800.00	66.13	360.00	5,595.43	-384.84	-446.62	-357.93	11.00	11.00	0.00
5,811.58	67.40	360.00	5,600.00	-374.20	-446.62	-347.30	11.00	11.00	0.00
<b>Top C Chalk</b>									
5,833.52	69.81	360.00	5,608.00	-353.78	-446.62	-326.92	11.00	11.00	0.00
<b>Middle C Chalk</b>									
5,879.72	74.90	360.00	5,622.00	-309.76	-446.62	-282.98	11.00	11.00	0.00



# WOG

## Planning Report

<b>Database:</b>	LandmarkEDM	<b>Local Co-ordinate Reference:</b>	Well Horsetail #29F-2038
<b>Company:</b>	Whiting Petroleum Corp.	<b>TVD Reference:</b>	KBE @ 4719.00usft
<b>Project:</b>	Weld County, CO	<b>MD Reference:</b>	KBE @ 4719.00usft
<b>Site:</b>	Sec 29-T10N-R57W	<b>North Reference:</b>	True
<b>Well:</b>	Horsetail #29F-2038	<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)
<b>Middle C Marl</b>									
5,900.00	77.13	360.00	5,626.90	-290.09	-446.62	-263.34	11.00	11.00	0.00
6,000.00	88.12	360.00	5,639.72	-191.07	-446.62	-164.49	11.00	11.00	0.00
6,017.07	90.00	360.00	5,640.00	-174.00	-446.62	-147.45	11.00	11.00	0.00
<b>LP @ 90° Inc, Hold - Lower C Chalk - 5 1/2" Marker / 7" CSG</b>									
6,100.00	90.00	360.00	5,640.00	-91.07	-446.62	-64.66	0.00	0.00	0.00
6,200.00	90.00	360.00	5,640.00	8.93	-446.62	35.16	0.00	0.00	0.00
6,300.00	90.00	360.00	5,640.00	108.93	-446.62	134.99	0.00	0.00	0.00
6,400.00	90.00	360.00	5,640.00	208.93	-446.62	234.82	0.00	0.00	0.00
6,500.00	90.00	360.00	5,640.00	308.93	-446.62	334.64	0.00	0.00	0.00
6,600.00	90.00	360.00	5,640.00	408.93	-446.62	434.47	0.00	0.00	0.00
6,700.00	90.00	360.00	5,640.00	508.93	-446.62	534.30	0.00	0.00	0.00
6,800.00	90.00	360.00	5,640.00	608.93	-446.62	634.13	0.00	0.00	0.00
6,900.00	90.00	360.00	5,640.00	708.93	-446.62	733.95	0.00	0.00	0.00
7,000.00	90.00	360.00	5,640.00	808.93	-446.62	833.78	0.00	0.00	0.00
7,100.00	90.00	360.00	5,640.00	908.93	-446.62	933.61	0.00	0.00	0.00
7,200.00	90.00	360.00	5,640.00	1,008.93	-446.62	1,033.43	0.00	0.00	0.00
7,300.00	90.00	360.00	5,640.00	1,108.93	-446.62	1,133.26	0.00	0.00	0.00
7,400.00	90.00	360.00	5,640.00	1,208.93	-446.62	1,233.09	0.00	0.00	0.00
7,500.00	90.00	360.00	5,640.00	1,308.93	-446.62	1,332.92	0.00	0.00	0.00
7,600.00	90.00	360.00	5,640.00	1,408.93	-446.62	1,432.74	0.00	0.00	0.00
7,700.00	90.00	360.00	5,640.00	1,508.93	-446.62	1,532.57	0.00	0.00	0.00
7,800.00	90.00	360.00	5,640.00	1,608.93	-446.62	1,632.40	0.00	0.00	0.00
7,900.00	90.00	360.00	5,640.00	1,708.93	-446.62	1,732.22	0.00	0.00	0.00
8,000.00	90.00	360.00	5,640.00	1,808.93	-446.62	1,832.05	0.00	0.00	0.00
8,100.00	90.00	360.00	5,640.00	1,908.93	-446.62	1,931.88	0.00	0.00	0.00
8,200.00	90.00	360.00	5,640.00	2,008.93	-446.62	2,031.71	0.00	0.00	0.00
8,300.00	90.00	360.00	5,640.00	2,108.93	-446.62	2,131.53	0.00	0.00	0.00
8,400.00	90.00	360.00	5,640.00	2,208.93	-446.62	2,231.36	0.00	0.00	0.00
8,500.00	90.00	360.00	5,640.00	2,308.93	-446.62	2,331.19	0.00	0.00	0.00
8,600.00	90.00	360.00	5,640.00	2,408.93	-446.62	2,431.01	0.00	0.00	0.00
8,700.00	90.00	360.00	5,640.00	2,508.93	-446.62	2,530.84	0.00	0.00	0.00
8,800.00	90.00	360.00	5,640.00	2,608.93	-446.62	2,630.67	0.00	0.00	0.00
8,900.00	90.00	360.00	5,640.00	2,708.93	-446.62	2,730.50	0.00	0.00	0.00
9,000.00	90.00	360.00	5,640.00	2,808.93	-446.62	2,830.32	0.00	0.00	0.00
9,100.00	90.00	360.00	5,640.00	2,908.93	-446.62	2,930.15	0.00	0.00	0.00
9,200.00	90.00	360.00	5,640.00	3,008.93	-446.62	3,029.98	0.00	0.00	0.00
9,300.00	90.00	360.00	5,640.00	3,108.93	-446.62	3,129.80	0.00	0.00	0.00
9,400.00	90.00	360.00	5,640.00	3,208.93	-446.62	3,229.63	0.00	0.00	0.00
9,500.00	90.00	360.00	5,640.00	3,308.93	-446.62	3,329.46	0.00	0.00	0.00
9,600.00	90.00	360.00	5,640.00	3,408.93	-446.62	3,429.29	0.00	0.00	0.00
9,700.00	90.00	360.00	5,640.00	3,508.93	-446.62	3,529.11	0.00	0.00	0.00
9,800.00	90.00	360.00	5,640.00	3,608.93	-446.62	3,628.94	0.00	0.00	0.00
9,900.00	90.00	360.00	5,640.00	3,708.93	-446.62	3,728.77	0.00	0.00	0.00
10,000.00	90.00	360.00	5,640.00	3,808.93	-446.62	3,828.60	0.00	0.00	0.00
10,100.00	90.00	360.00	5,640.00	3,908.93	-446.62	3,928.42	0.00	0.00	0.00
10,200.00	90.00	360.00	5,640.00	4,008.93	-446.62	4,028.25	0.00	0.00	0.00
10,300.00	90.00	360.00	5,640.00	4,108.93	-446.62	4,128.08	0.00	0.00	0.00
10,400.00	90.00	360.00	5,640.00	4,208.93	-446.62	4,227.90	0.00	0.00	0.00
10,500.00	90.00	360.00	5,640.00	4,308.93	-446.62	4,327.73	0.00	0.00	0.00
10,600.00	90.00	360.00	5,640.00	4,408.93	-446.62	4,427.56	0.00	0.00	0.00
10,700.00	90.00	360.00	5,640.00	4,508.93	-446.62	4,527.39	0.00	0.00	0.00
10,800.00	90.00	360.00	5,640.00	4,608.93	-446.62	4,627.21	0.00	0.00	0.00
10,900.00	90.00	360.00	5,640.00	4,708.93	-446.62	4,727.04	0.00	0.00	0.00



# WOG

## Planning Report

<b>Database:</b>	LandmarkEDM	<b>Local Co-ordinate Reference:</b>	Well Horsetail #29F-2038
<b>Company:</b>	Whiting Petroleum Corp.	<b>TVD Reference:</b>	KBE @ 4719.00usft
<b>Project:</b>	Weld County, CO	<b>MD Reference:</b>	KBE @ 4719.00usft
<b>Site:</b>	Sec 29-T10N-R57W	<b>North Reference:</b>	True
<b>Well:</b>	Horsetail #29F-2038	<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)	
11,000.00	90.00	360.00	5,640.00	4,808.93	-446.62	4,826.87	0.00	0.00	0.00	
11,100.00	90.00	360.00	5,640.00	4,908.93	-446.62	4,926.69	0.00	0.00	0.00	
11,200.00	90.00	360.00	5,640.00	5,008.93	-446.62	5,026.52	0.00	0.00	0.00	
11,300.00	90.00	360.00	5,640.00	5,108.93	-446.62	5,126.35	0.00	0.00	0.00	
11,400.00	90.00	360.00	5,640.00	5,208.93	-446.62	5,226.18	0.00	0.00	0.00	
11,500.00	90.00	360.00	5,640.00	5,308.93	-446.62	5,326.00	0.00	0.00	0.00	
11,600.00	90.00	360.00	5,640.00	5,408.93	-446.62	5,425.83	0.00	0.00	0.00	
11,700.00	90.00	360.00	5,640.00	5,508.93	-446.62	5,525.66	0.00	0.00	0.00	
11,800.00	90.00	360.00	5,640.00	5,608.93	-446.62	5,625.48	0.00	0.00	0.00	
11,900.00	90.00	360.00	5,640.00	5,708.93	-446.62	5,725.31	0.00	0.00	0.00	
12,000.00	90.00	360.00	5,640.00	5,808.93	-446.62	5,825.14	0.00	0.00	0.00	
12,100.00	90.00	360.00	5,640.00	5,908.93	-446.62	5,924.97	0.00	0.00	0.00	
12,200.00	90.00	360.00	5,640.00	6,008.93	-446.62	6,024.79	0.00	0.00	0.00	
12,300.00	90.00	360.00	5,640.00	6,108.93	-446.62	6,124.62	0.00	0.00	0.00	
12,400.00	90.00	360.00	5,640.00	6,208.93	-446.62	6,224.45	0.00	0.00	0.00	
12,500.00	90.00	360.00	5,640.00	6,308.93	-446.62	6,324.27	0.00	0.00	0.00	
12,600.00	90.00	360.00	5,640.00	6,408.93	-446.62	6,424.10	0.00	0.00	0.00	
12,700.00	90.00	360.00	5,640.00	6,508.93	-446.62	6,523.93	0.00	0.00	0.00	
12,800.00	90.00	360.00	5,640.00	6,608.93	-446.62	6,623.76	0.00	0.00	0.00	
12,900.00	90.00	360.00	5,640.00	6,708.93	-446.62	6,723.58	0.00	0.00	0.00	
13,000.00	90.00	360.00	5,640.00	6,808.93	-446.62	6,823.41	0.00	0.00	0.00	
13,100.00	90.00	360.00	5,640.00	6,908.93	-446.62	6,923.24	0.00	0.00	0.00	
13,200.00	90.00	360.00	5,640.00	7,008.93	-446.62	7,023.06	0.00	0.00	0.00	
13,300.00	90.00	360.00	5,640.00	7,108.93	-446.62	7,122.89	0.00	0.00	0.00	
13,400.00	90.00	360.00	5,640.00	7,208.93	-446.62	7,222.72	0.00	0.00	0.00	
13,500.00	90.00	360.00	5,640.00	7,308.93	-446.62	7,322.55	0.00	0.00	0.00	
13,600.00	90.00	360.00	5,640.00	7,408.93	-446.62	7,422.37	0.00	0.00	0.00	
13,700.00	90.00	360.00	5,640.00	7,508.93	-446.62	7,522.20	0.00	0.00	0.00	
13,777.46	90.00	360.00	5,640.00	7,586.40	-446.62	7,599.53	0.00	0.00	0.00	
TD at 13777.46										

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 29F-2038	0.00	0.00	5,640.00	7,586.40	-446.62	1,550,336.84	3,476,260.20	40° 49' 52.920 N		103° 46' 44.090 W
- plan hits target center										
- Point										

Casing Points						
Measured Depth (usft)	Vertical Depth (usft)	Name			Casing Diameter (in)	Hole Diameter (in)
6,017.07	5,640.00	5 1/2" Marker / 7" CSG			5.500	8.750



**WOG**  
Planning Report

<b>Database:</b>	LandmarkEDM	<b>Local Co-ordinate Reference:</b>	Well Horsetail #29F-2038
<b>Company:</b>	Whiting Petroleum Corp.	<b>TVD Reference:</b>	KBE @ 4719.00usft
<b>Project:</b>	Weld County, CO	<b>MD Reference:</b>	KBE @ 4719.00usft
<b>Site:</b>	Sec 29-T10N-R57W	<b>North Reference:</b>	True
<b>Well:</b>	Horsetail #29F-2038	<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 (°)	
1,567.91	1,550.00	Upper Pierre				
3,558.28	3,500.00	Hygiene				
3,711.38	3,650.00	Lower Pierre				
5,443.61	5,355.00	P200 Marker				
5,466.30	5,375.00	P300 Marker				
5,484.86	5,391.00	P350 Marker				
5,501.44	5,405.00	Sharon Springs				
5,506.24	5,409.00	Niobrara				
5,526.98	5,426.00	Top A Chalk				
5,565.17	5,456.00	Top A Marl				
5,581.11	5,468.00	A Marl				
5,591.99	5,476.00	Top Upper B				
5,626.01	5,500.00	Base Upper B				
5,650.07	5,516.00	Top Lower B				
5,697.45	5,545.00	Base Lower B				
5,720.79	5,558.00	Top B Marl				
5,811.58	5,600.00	Top C Chalk				
5,833.52	5,608.00	Middle C Chalk				
5,879.72	5,622.00	Middle C Marl				
6,017.07	5,640.00	Lower C Chalk				

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'	
877.98	874.07	-48.88	-31.41	Hold 11.56° Inc	
4,420.70	4,344.93	-646.12	-415.21	Drop 2°/100'	
4,998.68	4,919.00	-695.00	-446.62	Hold Vertical	
5,198.68	5,119.00	-695.00	-446.62	KOP, Build 11°/100'	
6,017.07	5,640.00	-174.00	-446.62	LP @ 90° Inc, Hold	
13,777.46	5,640.00	7,586.40	-446.62	TD at 13777.46	