



Project: Weld County, CO
Site: Sec 30-T10N-R57W
Well: Horsetail #30H-3116
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: 7.79°
Magnetic Field
Strength: 53002.4nT
Dip Angle: 67.38°
Date: 8/17/2015
Model: IGRF2010

WELL DETAILS: Horsetail #30H-3116

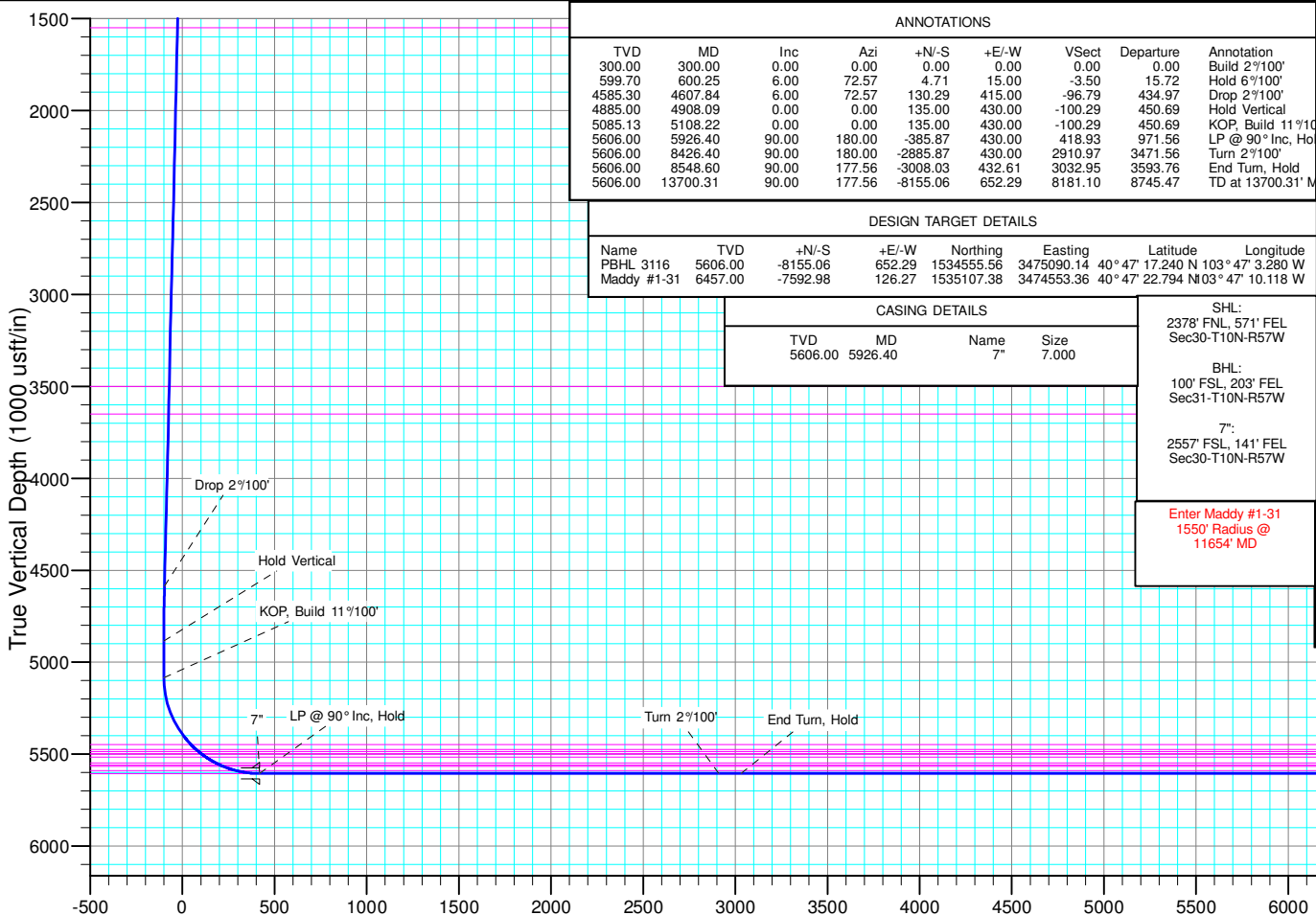
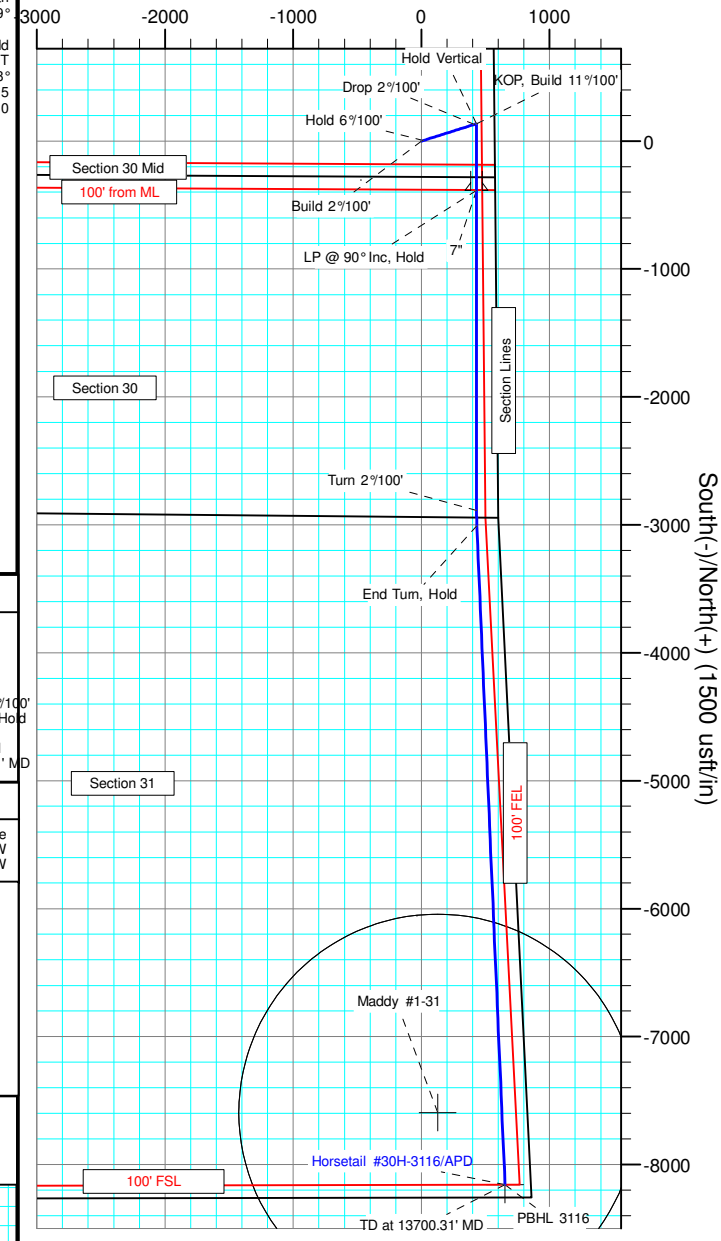
	+N/-S	+E/-W	Northing	Ground Level:	4724.00	Longitude	Slot
	0.00	0.00	1542696.50	Easting	3474280.41	40° 48' 37.820 N	103° 47' 11.760 W

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	600.25	6.00	72.57	599.70	4.71	15.00	2.00	72.57	3.50	
4	4607.84	6.00	72.57	4585.30	130.29	415.00	0.00	0.00	-96.79	
5	4908.09	0.00	0.00	4885.00	135.00	430.00	2.00	180.00	-100.29	
6	5108.22	0.00	0.00	5085.13	135.00	430.00	0.00	0.00	-100.29	
7	5926.40	90.00	180.00	5606.00	-385.87	430.00	11.00	180.00	418.93	
8	8426.40	90.00	180.00	5606.00	-2885.87	430.00	0.00	0.00	2910.97	
9	8548.60	90.00	177.56	5606.00	-3008.03	432.61	2.00	-90.00	3032.95	PBHL 3116
10	13700.31	90.00	177.56	5606.00	-8155.06	652.29	0.00	0.00	8181.10	PBHL 3116

TVDPath	MDPath	Formation
1550.00	1555.79	Upper Pierre
3500.00	3516.55	Hygiene
3650.00	3667.38	Lower Pierre
5448.00	5509.67	P200 Marker
5475.00	5548.77	P300 Marker
5486.00	5565.67	P350 Marker
5498.00	5584.89	Sharon Springs
5500.00	5588.19	Niobrara
5516.00	5615.61	Top A Chalk
5548.00	5678.25	Top A Marl
5560.00	5705.85	A Marl
5566.00	5720.94	Top Upper B
5590.00	5796.96	Base Upper B
5606.00	5926.40	Top Lower B

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



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'
599.70	600.25	6.00	72.57	4.71	15.00	-3.50	15.72	Hold 6°/100'
4585.30	4607.84	6.00	72.57	130.29	415.00	-96.79	434.97	Drop 2°/100'
4885.00	4908.09	0.00	0.00	135.00	430.00	-100.29	450.69	Hold Vertical
5085.13	5108.22	0.00	0.00	135.00	430.00	-100.29	450.69	KOP, Build 11°/100'
5606.00	5926.40	90.00	180.00	-385.87	430.00	418.93	971.56	LP @ 90° Inc, Hold
5606.00	8426.40	90.00	180.00	-2885.87	430.00	2910.97	3471.56	Turn 2°/100'
5606.00	8548.60	90.00	177.56	-3008.03	432.61	3032.95	3593.76	End Turn, Hold
5606.00	13700.31	90.00	177.56	-8155.06	652.29	8181.10	8745.47	TD at 13700.31' MD

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
PBHL 3116	5606.00	-8155.06	652.29	1534555.56	3475090.14	40° 47' 17.240 N	103° 47' 3.280 W
Maddy #1-31	6457.00	-7592.98	126.27	1535107.38	3474553.36	40° 47' 22.794 N	103° 47' 10.118 W

CASING DETAILS

TVD	MD	Name	Size
5606.00	5926.40	7"	7.000

SHL:
2378' FNL, 571' FEL
Sec30-T10N-R57W

BHL:
100' FSL, 203' FEL
Sec31-T10N-R57W

7":
2557' FSL, 141' FEL
Sec30-T10N-R57W

Enter Maddy #1-31
1550' Radius @
11654' MD

Vertical Section at 175.43° (1000 usft/in)



Whiting Petroleum Corp.

**Weld County, CO
Sec 30-T10N-R57W
Horsetail #30H-3116**

Hz

Plan: APD

Standard Planning Report

13 October, 2015



WOG

Planning Report

Database:	LandmarkEDM	Local Co-ordinate Reference:	Well Horsetail #30H-3116
Company:	Whiting Petroleum Corp.	TVD Reference:	KBe @ 4742.00usft
Project:	Weld County, CO	MD Reference:	KBe @ 4742.00usft
Site:	Sec 30-T10N-R57W	North Reference:	True
Well:	Horsetail #30H-3116	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hz		
Design:	APD		

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

Well	Horsetail #30H-3116					
Well Position	+N/-S	-2,397.10 usft	Northing:	1,542,696.50 usft	Latitude:	40° 48' 37.820 N
	+E/-W	4,677.49 usft	Easting:	3,474,280.41 usft	Longitude:	103° 47' 11.760 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	4,721.00 usft

Wellbore	Hz				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	8/17/2015	7.79	67.38	53,002

Design	APD			
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	175.43

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	
600.25	6.00	72.57	599.70	4.71	15.00	2.00	2.00	0.00	72.57	
4,607.84	6.00	72.57	4,585.30	130.29	415.00	0.00	0.00	0.00	0.00	
4,908.09	0.00	0.00	4,885.00	135.00	430.00	2.00	-2.00	0.00	180.00	
5,108.22	0.00	0.00	5,085.13	135.00	430.00	0.00	0.00	0.00	0.00	
5,926.40	90.00	180.00	5,606.00	-385.87	430.00	11.00	11.00	0.00	180.00	
8,426.40	90.00	180.00	5,606.00	-2,885.87	430.00	0.00	0.00	0.00	0.00	
8,548.60	90.00	177.56	5,606.00	-3,008.03	432.61	2.00	0.00	-2.00	-90.00	PBHL 3116
13,700.31	90.00	177.56	5,606.00	-8,155.05	652.29	0.00	0.00	0.00	0.00	PBHL 3116



WOG

Planning Report

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Company:	Whiting Petroleum Corp.	TVD Reference:	KBe @ 4742.00usft
Project:	Weld County, CO	MD Reference:	KBe @ 4742.00usft
Site:	Sec 30-T10N-R57W	North Reference:	True
Well:	Horsetail #30H-3116	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	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
Build 2°/100'									
400.00	2.00	72.57	399.98	0.52	1.67	-0.39	2.00	2.00	0.00
500.00	4.00	72.57	499.84	2.09	6.66	-1.55	2.00	2.00	0.00
600.25	6.00	72.57	599.70	4.71	15.00	-3.50	2.00	2.00	0.00
Hold 6°/100'									
700.00	6.00	72.57	698.90	7.83	24.95	-5.82	0.00	0.00	0.00
800.00	6.00	72.57	798.35	10.97	34.94	-8.15	0.00	0.00	0.00
900.00	6.00	72.57	897.81	14.10	44.92	-10.48	0.00	0.00	0.00
1,000.00	6.00	72.57	997.26	17.24	54.90	-12.80	0.00	0.00	0.00
1,100.00	6.00	72.57	1,096.71	20.37	64.88	-15.13	0.00	0.00	0.00
1,200.00	6.00	72.57	1,196.16	23.50	74.86	-17.46	0.00	0.00	0.00
1,300.00	6.00	72.57	1,295.61	26.64	84.84	-19.79	0.00	0.00	0.00
1,400.00	6.00	72.57	1,395.06	29.77	94.82	-22.11	0.00	0.00	0.00
1,500.00	6.00	72.57	1,494.51	32.90	104.80	-24.44	0.00	0.00	0.00
1,555.79	6.00	72.57	1,550.00	34.65	110.37	-25.74	0.00	0.00	0.00
Upper Pierre									
1,600.00	6.00	72.57	1,593.96	36.04	114.78	-26.77	0.00	0.00	0.00
1,700.00	6.00	72.57	1,693.42	39.17	124.77	-29.10	0.00	0.00	0.00
1,800.00	6.00	72.57	1,792.87	42.30	134.75	-31.43	0.00	0.00	0.00
1,900.00	6.00	72.57	1,892.32	45.44	144.73	-33.75	0.00	0.00	0.00
2,000.00	6.00	72.57	1,991.77	48.57	154.71	-36.08	0.00	0.00	0.00
2,100.00	6.00	72.57	2,091.22	51.71	164.69	-38.41	0.00	0.00	0.00
2,200.00	6.00	72.57	2,190.67	54.84	174.67	-40.74	0.00	0.00	0.00
2,300.00	6.00	72.57	2,290.12	57.97	184.65	-43.07	0.00	0.00	0.00
2,400.00	6.00	72.57	2,389.58	61.11	194.63	-45.39	0.00	0.00	0.00
2,500.00	6.00	72.57	2,489.03	64.24	204.62	-47.72	0.00	0.00	0.00
2,600.00	6.00	72.57	2,588.48	67.37	214.60	-50.05	0.00	0.00	0.00
2,700.00	6.00	72.57	2,687.93	70.51	224.58	-52.38	0.00	0.00	0.00
2,800.00	6.00	72.57	2,787.38	73.64	234.56	-54.70	0.00	0.00	0.00
2,900.00	6.00	72.57	2,886.83	76.77	244.54	-57.03	0.00	0.00	0.00
3,000.00	6.00	72.57	2,986.28	79.91	254.52	-59.36	0.00	0.00	0.00
3,100.00	6.00	72.57	3,085.73	83.04	264.50	-61.69	0.00	0.00	0.00
3,200.00	6.00	72.57	3,185.19	86.17	274.48	-64.02	0.00	0.00	0.00
3,300.00	6.00	72.57	3,284.64	89.31	284.46	-66.34	0.00	0.00	0.00
3,400.00	6.00	72.57	3,384.09	92.44	294.45	-68.67	0.00	0.00	0.00
3,500.00	6.00	72.57	3,483.54	95.58	304.43	-71.00	0.00	0.00	0.00
3,516.55	6.00	72.57	3,500.00	96.09	306.08	-71.38	0.00	0.00	0.00
Hygiene									
3,600.00	6.00	72.57	3,582.99	98.71	314.41	-73.33	0.00	0.00	0.00
3,667.38	6.00	72.57	3,650.00	100.82	321.13	-74.90	0.00	0.00	0.00
Lower Pierre									
3,700.00	6.00	72.57	3,682.44	101.84	324.39	-75.65	0.00	0.00	0.00
3,800.00	6.00	72.57	3,781.89	104.98	334.37	-77.98	0.00	0.00	0.00
3,900.00	6.00	72.57	3,881.34	108.11	344.35	-80.31	0.00	0.00	0.00
4,000.00	6.00	72.57	3,980.80	111.24	354.33	-82.64	0.00	0.00	0.00
4,100.00	6.00	72.57	4,080.25	114.38	364.31	-84.97	0.00	0.00	0.00
4,200.00	6.00	72.57	4,179.70	117.51	374.29	-87.29	0.00	0.00	0.00
4,300.00	6.00	72.57	4,279.15	120.64	384.28	-89.62	0.00	0.00	0.00
4,400.00	6.00	72.57	4,378.60	123.78	394.26	-91.95	0.00	0.00	0.00
4,500.00	6.00	72.57	4,478.05	126.91	404.24	-94.28	0.00	0.00	0.00



WOG Planning Report

Database:	LandmarkEDM	Local Co-ordinate Reference:	Well Horsetail #30H-3116
Company:	Whiting Petroleum Corp.	TVD Reference:	KBe @ 4742.00usft
Project:	Weld County, CO	MD Reference:	KBe @ 4742.00usft
Site:	Sec 30-T10N-R57W	North Reference:	True
Well:	Horsetail #30H-3116	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hz		
Design:	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)
4,607.84	6.00	72.57	4,585.30	130.29	415.00	-96.79	0.00	0.00	0.00
Drop 2°/100'									
4,700.00	4.16	72.57	4,677.09	132.74	422.79	-98.60	2.00	-2.00	0.00
4,800.00	2.16	72.57	4,776.94	134.39	428.05	-99.83	2.00	-2.00	0.00
4,908.09	0.00	0.00	4,885.00	135.00	430.00	-100.29	2.00	-2.00	-67.14
Hold Vertical									
5,000.00	0.00	0.00	4,976.91	135.00	430.00	-100.29	0.00	0.00	0.00
5,108.22	0.00	0.00	5,085.13	135.00	430.00	-100.29	0.00	0.00	0.00
KOP, Build 11°/100'									
5,150.00	4.60	180.00	5,126.87	133.33	430.00	-98.62	11.00	11.00	0.00
5,200.00	10.10	180.00	5,176.44	126.93	430.00	-92.25	11.00	11.00	0.00
5,250.00	15.60	180.00	5,225.17	115.82	430.00	-81.17	11.00	11.00	0.00
5,300.00	21.10	180.00	5,272.61	100.09	430.00	-65.49	11.00	11.00	0.00
5,350.00	26.60	180.00	5,318.32	79.88	430.00	-45.35	11.00	11.00	0.00
5,400.00	32.10	180.00	5,361.89	55.39	430.00	-20.93	11.00	11.00	0.00
5,450.00	37.60	180.00	5,402.91	26.83	430.00	7.54	11.00	11.00	0.00
5,500.00	43.10	180.00	5,441.00	-5.53	430.00	39.79	11.00	11.00	0.00
5,509.67	44.16	180.00	5,448.00	-12.20	430.00	46.44	11.00	11.00	0.00
P200 Marker									
5,548.77	48.46	180.00	5,475.00	-40.46	430.00	74.62	11.00	11.00	0.00
P300 Marker									
5,550.00	48.60	180.00	5,475.82	-41.38	430.00	75.54	11.00	11.00	0.00
5,565.67	50.32	180.00	5,486.00	-53.29	430.00	87.41	11.00	11.00	0.00
P350 Marker									
5,584.89	52.43	180.00	5,498.00	-68.31	430.00	102.38	11.00	11.00	0.00
Sharon Springs									
5,588.19	52.80	180.00	5,500.00	-70.93	430.00	104.99	11.00	11.00	0.00
Niobrara									
5,600.00	54.10	180.00	5,507.03	-80.42	430.00	114.45	11.00	11.00	0.00
5,615.61	55.81	180.00	5,516.00	-93.20	430.00	127.19	11.00	11.00	0.00
Top A Chalk									
5,650.00	59.60	180.00	5,534.37	-122.26	430.00	156.16	11.00	11.00	0.00
5,678.25	62.70	180.00	5,548.00	-147.00	430.00	180.82	11.00	11.00	0.00
Top A Marl									
5,700.00	65.10	180.00	5,557.57	-166.53	430.00	200.29	11.00	11.00	0.00
5,705.85	65.74	180.00	5,560.00	-171.85	430.00	205.59	11.00	11.00	0.00
A Marl									
5,720.94	67.40	180.00	5,566.00	-185.70	430.00	219.39	11.00	11.00	0.00
Top Upper B									
5,750.00	70.60	180.00	5,576.41	-212.82	430.00	246.43	11.00	11.00	0.00
5,796.96	75.76	180.00	5,590.00	-257.76	430.00	291.23	11.00	11.00	0.00
Base Upper B									
5,800.00	76.10	180.00	5,590.74	-260.71	430.00	294.16	11.00	11.00	0.00
5,850.00	81.60	180.00	5,600.41	-309.74	430.00	343.04	11.00	11.00	0.00
5,900.00	87.10	180.00	5,605.33	-359.48	430.00	392.62	11.00	11.00	0.00
5,926.40	90.00	180.00	5,606.00	-385.87	430.00	418.93	11.00	11.00	0.00
LP @ 90° Inc, Hold - Top Lower B - 7"									
6,000.00	90.00	180.00	5,606.00	-459.47	430.00	492.29	0.00	0.00	0.00
6,100.00	90.00	180.00	5,606.00	-559.47	430.00	591.97	0.00	0.00	0.00
6,200.00	90.00	180.00	5,606.00	-659.47	430.00	691.66	0.00	0.00	0.00
6,300.00	90.00	180.00	5,606.00	-759.47	430.00	791.34	0.00	0.00	0.00
6,400.00	90.00	180.00	5,606.00	-859.47	430.00	891.02	0.00	0.00	0.00



WOG

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Site:	Sec 30-T10N-R57W	North Reference:	True
Well:	Horsetail #30H-3116	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hz		
Design:	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)
6,500.00	90.00	180.00	5,606.00	-959.47	430.00	990.70	0.00	0.00	0.00
6,600.00	90.00	180.00	5,606.00	-1,059.47	430.00	1,090.38	0.00	0.00	0.00
6,700.00	90.00	180.00	5,606.00	-1,159.47	430.00	1,190.06	0.00	0.00	0.00
6,800.00	90.00	180.00	5,606.00	-1,259.47	430.00	1,289.75	0.00	0.00	0.00
6,900.00	90.00	180.00	5,606.00	-1,359.47	430.00	1,389.43	0.00	0.00	0.00
7,000.00	90.00	180.00	5,606.00	-1,459.47	430.00	1,489.11	0.00	0.00	0.00
7,100.00	90.00	180.00	5,606.00	-1,559.47	430.00	1,588.79	0.00	0.00	0.00
7,200.00	90.00	180.00	5,606.00	-1,659.47	430.00	1,688.47	0.00	0.00	0.00
7,300.00	90.00	180.00	5,606.00	-1,759.47	430.00	1,788.15	0.00	0.00	0.00
7,400.00	90.00	180.00	5,606.00	-1,859.47	430.00	1,887.83	0.00	0.00	0.00
7,500.00	90.00	180.00	5,606.00	-1,959.47	430.00	1,987.52	0.00	0.00	0.00
7,600.00	90.00	180.00	5,606.00	-2,059.47	430.00	2,087.20	0.00	0.00	0.00
7,700.00	90.00	180.00	5,606.00	-2,159.47	430.00	2,186.88	0.00	0.00	0.00
7,800.00	90.00	180.00	5,606.00	-2,259.47	430.00	2,286.56	0.00	0.00	0.00
7,900.00	90.00	180.00	5,606.00	-2,359.47	430.00	2,386.24	0.00	0.00	0.00
8,000.00	90.00	180.00	5,606.00	-2,459.47	430.00	2,485.92	0.00	0.00	0.00
8,100.00	90.00	180.00	5,606.00	-2,559.47	430.00	2,585.61	0.00	0.00	0.00
8,200.00	90.00	180.00	5,606.00	-2,659.47	430.00	2,685.29	0.00	0.00	0.00
8,300.00	90.00	180.00	5,606.00	-2,759.47	430.00	2,784.97	0.00	0.00	0.00
8,400.00	90.00	180.00	5,606.00	-2,859.47	430.00	2,884.65	0.00	0.00	0.00
8,426.40	90.00	180.00	5,606.00	-2,885.87	430.00	2,910.97	0.00	0.00	0.00
Turn 2°/100'									
8,500.00	90.00	178.53	5,606.00	-2,959.46	430.95	2,984.40	2.00	0.00	-2.00
8,548.60	90.00	177.56	5,606.00	-3,008.03	432.61	3,032.95	2.00	0.00	-2.00
End Turn, Hold									
8,600.00	90.00	177.56	5,606.00	-3,059.39	434.80	3,084.31	0.00	0.00	0.00
8,700.00	90.00	177.56	5,606.00	-3,159.30	439.06	3,184.24	0.00	0.00	0.00
8,800.00	90.00	177.56	5,606.00	-3,259.20	443.33	3,284.18	0.00	0.00	0.00
8,900.00	90.00	177.56	5,606.00	-3,359.11	447.59	3,384.11	0.00	0.00	0.00
9,000.00	90.00	177.56	5,606.00	-3,459.02	451.85	3,484.04	0.00	0.00	0.00
9,100.00	90.00	177.56	5,606.00	-3,558.93	456.12	3,583.97	0.00	0.00	0.00
9,200.00	90.00	177.56	5,606.00	-3,658.84	460.38	3,683.90	0.00	0.00	0.00
9,300.00	90.00	177.56	5,606.00	-3,758.75	464.65	3,783.83	0.00	0.00	0.00
9,400.00	90.00	177.56	5,606.00	-3,858.66	468.91	3,883.76	0.00	0.00	0.00
9,500.00	90.00	177.56	5,606.00	-3,958.57	473.18	3,983.69	0.00	0.00	0.00
9,600.00	90.00	177.56	5,606.00	-4,058.48	477.44	4,083.62	0.00	0.00	0.00
9,700.00	90.00	177.56	5,606.00	-4,158.39	481.71	4,183.55	0.00	0.00	0.00
9,800.00	90.00	177.56	5,606.00	-4,258.29	485.97	4,283.49	0.00	0.00	0.00
9,900.00	90.00	177.56	5,606.00	-4,358.20	490.23	4,383.42	0.00	0.00	0.00
10,000.00	90.00	177.56	5,606.00	-4,458.11	494.50	4,483.35	0.00	0.00	0.00
10,100.00	90.00	177.56	5,606.00	-4,558.02	498.76	4,583.28	0.00	0.00	0.00
10,200.00	90.00	177.56	5,606.00	-4,657.93	503.03	4,683.21	0.00	0.00	0.00
10,300.00	90.00	177.56	5,606.00	-4,757.84	507.29	4,783.14	0.00	0.00	0.00
10,400.00	90.00	177.56	5,606.00	-4,857.75	511.56	4,883.07	0.00	0.00	0.00
10,500.00	90.00	177.56	5,606.00	-4,957.66	515.82	4,983.00	0.00	0.00	0.00
10,600.00	90.00	177.56	5,606.00	-5,057.57	520.08	5,082.93	0.00	0.00	0.00
10,700.00	90.00	177.56	5,606.00	-5,157.48	524.35	5,182.86	0.00	0.00	0.00
10,800.00	90.00	177.56	5,606.00	-5,257.39	528.61	5,282.79	0.00	0.00	0.00
10,900.00	90.00	177.56	5,606.00	-5,357.29	532.88	5,382.73	0.00	0.00	0.00
11,000.00	90.00	177.56	5,606.00	-5,457.20	537.14	5,482.66	0.00	0.00	0.00
11,100.00	90.00	177.56	5,606.00	-5,557.11	541.41	5,582.59	0.00	0.00	0.00
11,200.00	90.00	177.56	5,606.00	-5,657.02	545.67	5,682.52	0.00	0.00	0.00
11,300.00	90.00	177.56	5,606.00	-5,756.93	549.93	5,782.45	0.00	0.00	0.00
11,400.00	90.00	177.56	5,606.00	-5,856.84	554.20	5,882.38	0.00	0.00	0.00



WOG

Planning Report

Database:	LandmarkEDM	Local Co-ordinate Reference:	Well Horsetail #30H-3116
Company:	Whiting Petroleum Corp.	TVD Reference:	KBe @ 4742.00usft
Project:	Weld County, CO	MD Reference:	KBe @ 4742.00usft
Site:	Sec 30-T10N-R57W	North Reference:	True
Well:	Horsetail #30H-3116	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hz		
Design:	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	177.56	5,606.00	-5,956.75	558.46	5,982.31	0.00	0.00	0.00
11,600.00	90.00	177.56	5,606.00	-6,056.66	562.73	6,082.24	0.00	0.00	0.00
11,700.00	90.00	177.56	5,606.00	-6,156.57	566.99	6,182.17	0.00	0.00	0.00
11,800.00	90.00	177.56	5,606.00	-6,256.48	571.26	6,282.10	0.00	0.00	0.00
11,900.00	90.00	177.56	5,606.00	-6,356.38	575.52	6,382.04	0.00	0.00	0.00
12,000.00	90.00	177.56	5,606.00	-6,456.29	579.78	6,481.97	0.00	0.00	0.00
12,100.00	90.00	177.56	5,606.00	-6,556.20	584.05	6,581.90	0.00	0.00	0.00
12,200.00	90.00	177.56	5,606.00	-6,656.11	588.31	6,681.83	0.00	0.00	0.00
12,300.00	90.00	177.56	5,606.00	-6,756.02	592.58	6,781.76	0.00	0.00	0.00
12,400.00	90.00	177.56	5,606.00	-6,855.93	596.84	6,881.69	0.00	0.00	0.00
12,500.00	90.00	177.56	5,606.00	-6,955.84	601.11	6,981.62	0.00	0.00	0.00
12,600.00	90.00	177.56	5,606.00	-7,055.75	605.37	7,081.55	0.00	0.00	0.00
12,700.00	90.00	177.56	5,606.00	-7,155.66	609.63	7,181.48	0.00	0.00	0.00
12,800.00	90.00	177.56	5,606.00	-7,255.57	613.90	7,281.41	0.00	0.00	0.00
12,900.00	90.00	177.56	5,606.00	-7,355.48	618.16	7,381.35	0.00	0.00	0.00
13,000.00	90.00	177.56	5,606.00	-7,455.38	622.43	7,481.28	0.00	0.00	0.00
13,100.00	90.00	177.56	5,606.00	-7,555.29	626.69	7,581.21	0.00	0.00	0.00
13,200.00	90.00	177.56	5,606.00	-7,655.20	630.96	7,681.14	0.00	0.00	0.00
13,300.00	90.00	177.56	5,606.00	-7,755.11	635.22	7,781.07	0.00	0.00	0.00
13,400.00	90.00	177.56	5,606.00	-7,855.02	639.48	7,881.00	0.00	0.00	0.00
13,500.00	90.00	177.56	5,606.00	-7,954.93	643.75	7,980.93	0.00	0.00	0.00
13,600.00	90.00	177.56	5,606.00	-8,054.84	648.01	8,080.86	0.00	0.00	0.00
13,700.31	90.00	177.56	5,606.00	-8,155.05	652.29	8,181.10	0.00	0.00	0.00
TD at 13700.31' 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 3116	0.00	0.00	5,603.00	-8,155.05	652.29	1,534,555.57	3,475,090.14	40° 47' 17.240 N	103° 47' 3.280 W
- plan misses target center by 3.00usft at 13700.31usft MD (5606.00 TVD, -8155.05 N, 652.29 E)									
- Point									
Maddy #1-31	0.00	0.00	6,454.00	-7,592.97	126.27	1,535,107.38	3,474,553.36	40° 47' 22.794 N	103° 47' 10.118 W
- plan misses target center by 985.23usft at 13116.31usft MD (5606.00 TVD, -7571.58 N, 627.39 E)									
- Circle (radius 1,550.00)									

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (in)	Hole Diameter (in)	
5,926.40	5,606.00	7"	7.000	8.750	



WOG

Planning Report

Database:	LandmarkEDM	Local Co-ordinate Reference:	Well Horsetail #30H-3116
Company:	Whiting Petroleum Corp.	TVD Reference:	KBe @ 4742.00usft
Project:	Weld County, CO	MD Reference:	KBe @ 4742.00usft
Site:	Sec 30-T10N-R57W	North Reference:	True
Well:	Horsetail #30H-3116	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hz		
Design:	APD		

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
1,555.79	1,550.00	Upper Pierre				
3,516.55	3,500.00	Hygiene				
3,667.38	3,650.00	Lower Pierre				
5,509.67	5,448.00	P200 Marker				
5,548.77	5,475.00	P300 Marker				
5,565.67	5,486.00	P350 Marker				
5,584.89	5,498.00	Sharon Springs				
5,588.19	5,500.00	Niobrara				
5,615.61	5,516.00	Top A Chalk				
5,678.25	5,548.00	Top A Marl				
5,705.85	5,560.00	A Marl				
5,720.94	5,566.00	Top Upper B				
5,796.96	5,590.00	Base Upper B				
5,926.40	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'	
600.25	599.70	4.71	15.00	Hold 6°/100'	
4,607.84	4,585.30	130.29	415.00	Drop 2°/100'	
4,908.09	4,885.00	135.00	430.00	Hold Vertical	
5,108.22	5,085.13	135.00	430.00	KOP, Build 11°/100'	
5,926.40	5,606.00	-385.87	430.00	LP @ 90° Inc, Hold	
8,426.40	5,606.00	-2,885.87	430.00	Turn 2°/100'	
8,548.60	5,606.00	-3,008.03	432.61	End Turn, Hold	
13,700.31	5,606.00	-8,155.05	652.29	TD at 13700.31' MD	