

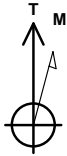


Company: Whiting Oil & Gas
Site: Horsetail 08D
Well: 1704
Project: Weld County, Colorado (NAD 83)
Rig: Pioneer 54



ANNOTATIONS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Vsect	Departure	Annotation
2412.00	0.00	0.00	2412.00	0.00	0.00	0.00	0.00	KOP, 2.00°/100' Build
3162.00	15.00	62.40	3153.46	45.22	86.51	-39.07	97.62	Hold 15.00° Inc, 62.40° Azm
5296.73	15.00	62.40	5215.46	301.20	576.14	-260.18	650.13	Begin 11.00°/100' Build & Turn
6177.52	90.00	180.00	5783.00	-215.91	710.93	265.08	1219.78	Begin 90.00° Lateral
16109.65	90.00	180.00	5783.00	-10148.04	711.21	10172.93	11151.92	PBHL

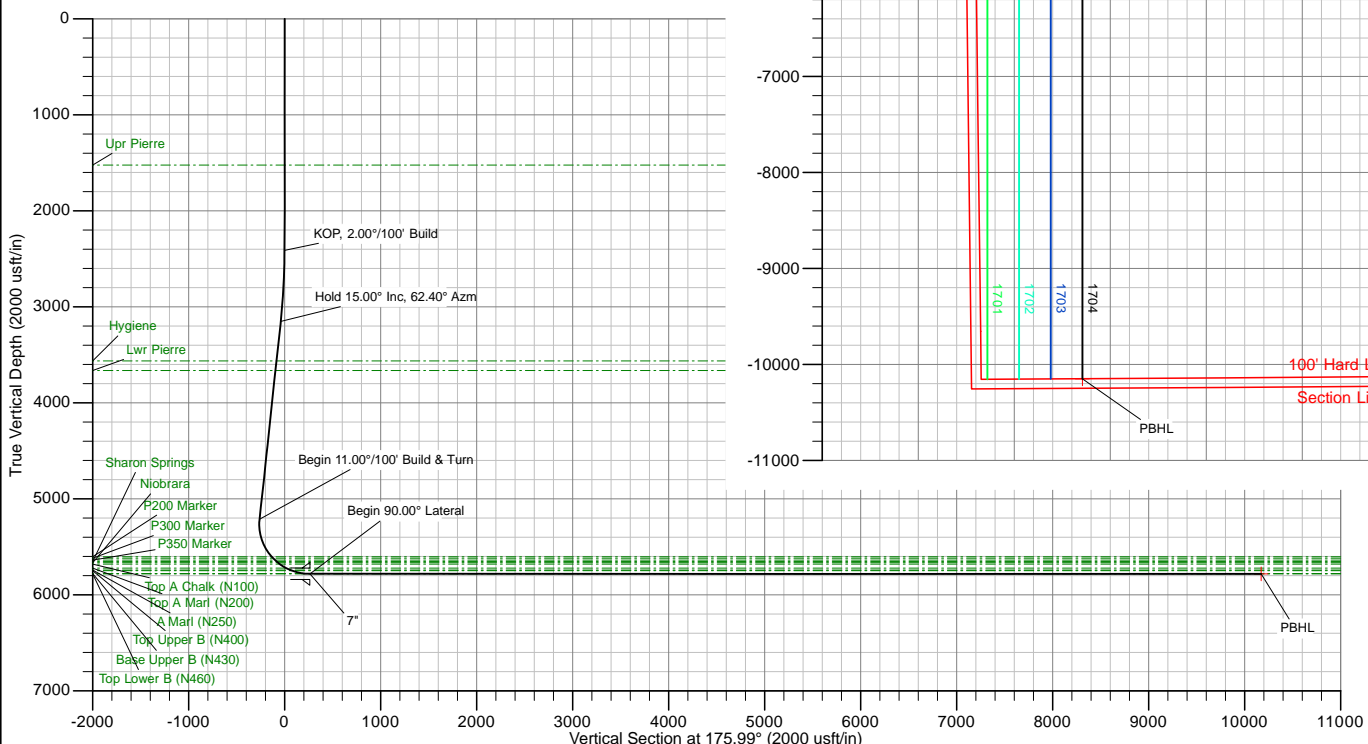
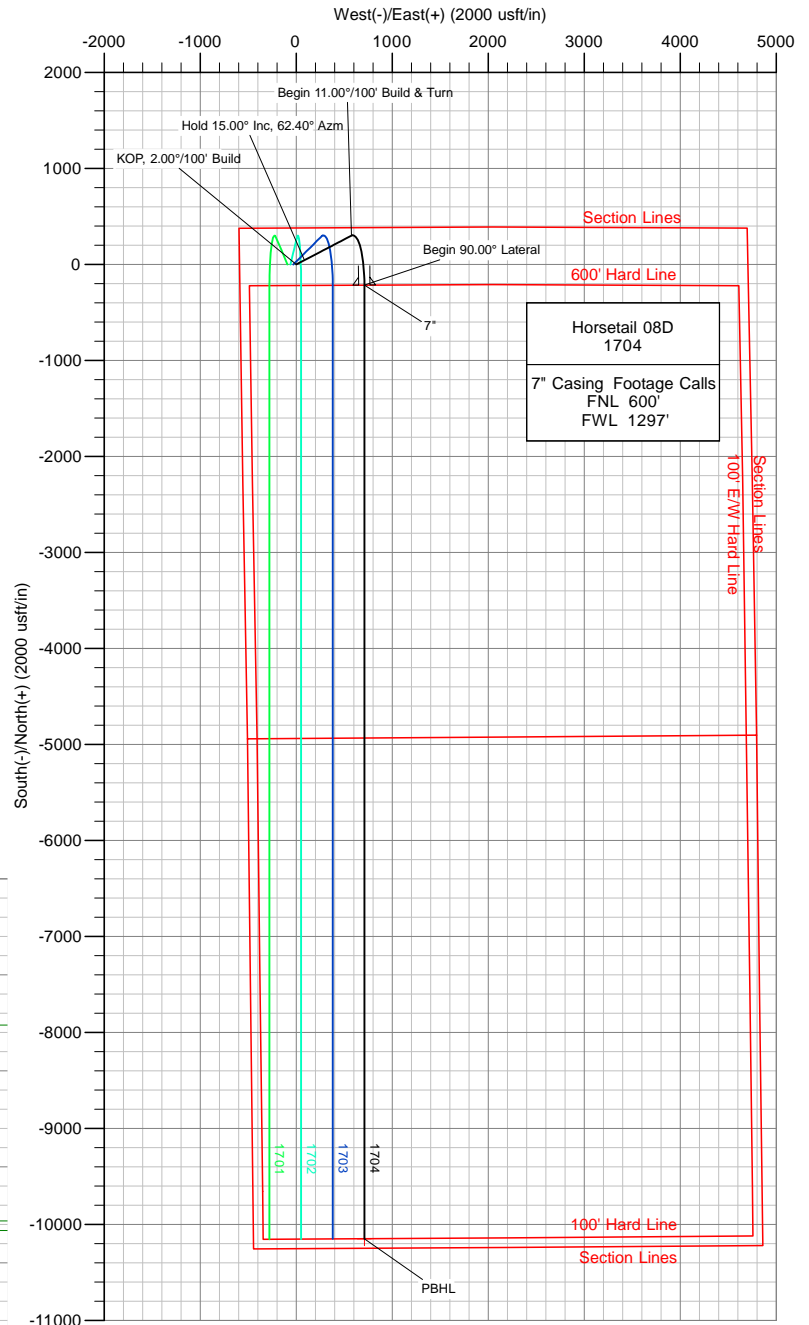


Azimuths to True North
Magnetic North: 7.91°

Magnetic Field
Strength: 53122.3snT
Dip Angle: 67.45°
Date: 10/6/2014
Model: WMM_2010

US State Plane 1983
Colorado Northern Zone

Created By: MEB
Date: 13:03, October 09 2014
Plan: Design #1



The customer should only rely on this document after independently verifying all paths, targets, coordinates, lease and hard lines represented.

Any decisions made or wells drilled utilizing this or any other information supplied by MS Energy are at the sole risk and responsibility of the customer. MS Energy is not responsible for the accuracy of this schematic or the information contained herein.



Company: Whiting Oil & Gas
Site: Horsetail 08D
Well: 1704
Project: Weld County, Colorado (NAD 83)
Rig: Pioneer 54



ANNOTATIONS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Vsect	Departure	Annotation
2412.00	0.00	0.00	2412.00	0.00	0.00	0.00	0.00	KOP, 2.00°/100' Build
3162.00	15.00	62.40	3153.46	45.22	86.51	-39.07	97.62	Hold 15.00° Inc, 62.40° Azm
5296.73	15.00	62.40	5215.46	301.20	576.14	-260.18	650.13	Begin 11.00°/100' Build & Turn
6177.52	90.00	180.00	5783.00	-215.91	710.93	265.08	1219.78	Begin 90.00° Lateral
16109.65	90.00	180.00	5783.00	-10148.04	711.21	10172.93	11151.92	PBHL

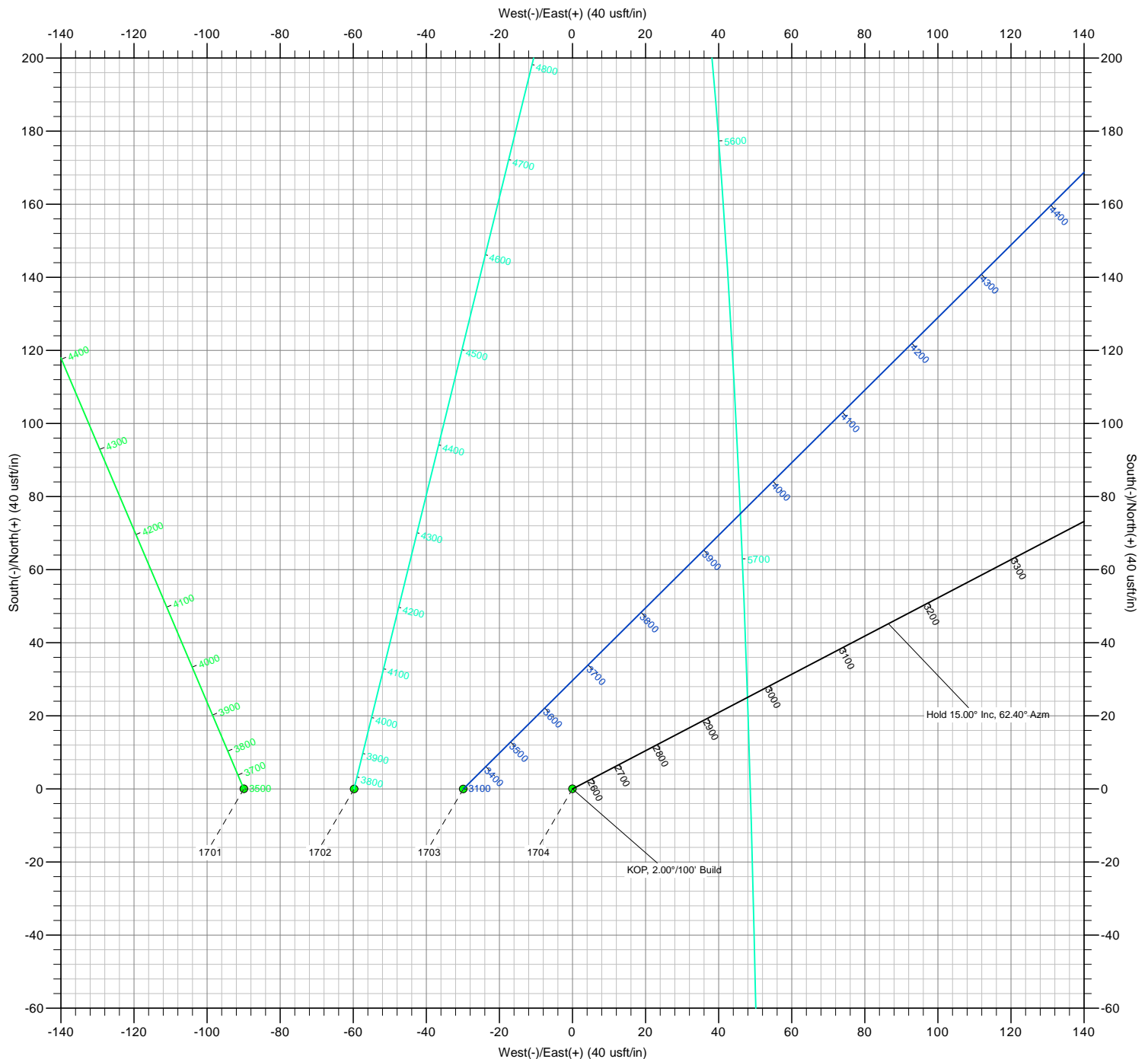


Azimuths to True North
Magnetic North: 7.91°

Magnetic Field
Strength: 53122.3snT
Dip Angle: 67.45°
Date: 10/6/2014
Model: WMM_2010

US State Plane 1983
Colorado Northern Zone

Created By: MEB
Date: 11:36, October 08 2014
Plan: Design #1





Whiting Oil & Gas

**Weld County, Colorado (NAD 83)
Horsetail 08D
1704**

Wellbore #1

Plan: Design #1

Standard Planning Report

08 October, 2014



Database:	EDM 5000.1 CONROE DB	Local Co-ordinate Reference:	Well 1704
Company:	Whiting Oil & Gas	TVD Reference:	WELL @ 4974.70usft (Pioneer 54)
Project:	Weld County, Colorado (NAD 83)	MD Reference:	WELL @ 4974.70usft (Pioneer 54)
Site:	Horsetail 08D	North Reference:	True
Well:	1704	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Project	Weld County, Colorado (NAD 83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Well	1704			
Well Position	+N/-S	1,947,451.48 usft	Northing:	1,560,656.76 usft
	+E/-W	3,273,786.18 usft	Easting:	3,474,851.61 usft
Position Uncertainty		0.00 usft	Wellhead Elevation:	
			Latitude:	40° 51' 35.139 N
			Longitude:	103° 46' 59.812 W
			Ground Level:	4,956.20 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	WMM_2010	10/6/2014	7.91	67.45	53,122

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	175.99

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	
2,412.00	0.00	0.00	2,412.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,162.00	15.00	62.40	3,153.46	45.22	86.51	2.00	2.00	0.00	62.40	
5,296.73	15.00	62.40	5,215.46	301.20	576.14	0.00	0.00	0.00	0.00	
6,177.52	90.00	180.00	5,783.00	-215.91	710.93	11.00	8.52	13.35	116.79	
16,109.65	90.00	180.00	5,783.00	-10,148.04	711.21	0.00	0.00	0.00	0.00	PBHL v1 - Horsetai



Database:	EDM 5000.1 CONROE DB	Local Co-ordinate Reference:	Well 1704
Company:	Whiting Oil & Gas	TVD Reference:	WELL @ 4974.70usft (Pioneer 54)
Project:	Weld County, Colorado (NAD 83)	MD Reference:	WELL @ 4974.70usft (Pioneer 54)
Site:	Horsetail 08D	North Reference:	True
Well:	1704	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

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
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
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,525.00	0.00	0.00	1,525.00	0.00	0.00	0.00	0.00	0.00	0.00
Upper Pierre									
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00
2,412.00	0.00	0.00	2,412.00	0.00	0.00	0.00	0.00	0.00	0.00
KOP, 2.00°/100' Build									
2,500.00	1.76	62.40	2,499.99	0.63	1.20	-0.54	2.00	2.00	0.00
2,600.00	3.76	62.40	2,599.87	2.86	5.46	-2.47	2.00	2.00	0.00
2,700.00	5.76	62.40	2,699.52	6.70	12.82	-5.79	2.00	2.00	0.00
2,800.00	7.76	62.40	2,798.81	12.15	23.25	-10.50	2.00	2.00	0.00
2,900.00	9.76	62.40	2,897.64	19.21	36.75	-16.59	2.00	2.00	0.00
3,000.00	11.76	62.40	2,995.88	27.86	53.29	-24.07	2.00	2.00	0.00
3,100.00	13.76	62.40	3,093.41	38.09	72.86	-32.90	2.00	2.00	0.00
3,162.00	15.00	62.40	3,153.46	45.22	86.51	-39.07	2.00	2.00	0.00
Hold 15.00° Inc, 62.40° Azm									
3,200.00	15.00	62.40	3,190.17	49.78	95.22	-43.00	0.00	0.00	0.00
3,300.00	15.00	62.40	3,286.76	61.77	118.16	-53.36	0.00	0.00	0.00
3,400.00	15.00	62.40	3,383.35	73.76	141.10	-63.72	0.00	0.00	0.00
3,500.00	15.00	62.40	3,479.94	85.75	164.03	-74.08	0.00	0.00	0.00
3,588.06	15.00	62.40	3,565.00	96.31	184.23	-83.20	0.00	0.00	0.00
Hygiene									
3,600.00	15.00	62.40	3,576.54	97.75	186.97	-84.43	0.00	0.00	0.00
3,691.58	15.00	62.40	3,665.00	108.73	207.98	-93.92	0.00	0.00	0.00
Lower Pierre									
3,700.00	15.00	62.40	3,673.13	109.74	209.91	-94.79	0.00	0.00	0.00
3,800.00	15.00	62.40	3,769.72	121.73	232.84	-105.15	0.00	0.00	0.00
3,900.00	15.00	62.40	3,866.32	133.72	255.78	-115.51	0.00	0.00	0.00
4,000.00	15.00	62.40	3,962.91	145.71	278.72	-125.87	0.00	0.00	0.00
4,100.00	15.00	62.40	4,059.50	157.70	301.65	-136.23	0.00	0.00	0.00
4,200.00	15.00	62.40	4,156.09	169.69	324.59	-146.58	0.00	0.00	0.00
4,300.00	15.00	62.40	4,252.69	181.68	347.53	-156.94	0.00	0.00	0.00



Database:	EDM 5000.1 CONROE DB	Local Co-ordinate Reference:	Well 1704
Company:	Whiting Oil & Gas	TVD Reference:	WELL @ 4974.70usft (Pioneer 54)
Project:	Weld County, Colorado (NAD 83)	MD Reference:	WELL @ 4974.70usft (Pioneer 54)
Site:	Horsetail 08D	North Reference:	True
Well:	1704	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

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)	
4,400.00	15.00	62.40	4,349.28	193.67	370.46	-167.30	0.00	0.00	0.00	
4,500.00	15.00	62.40	4,445.87	205.66	393.40	-177.66	0.00	0.00	0.00	
4,600.00	15.00	62.40	4,542.46	217.66	416.34	-188.02	0.00	0.00	0.00	
4,700.00	15.00	62.40	4,639.06	229.65	439.27	-198.37	0.00	0.00	0.00	
4,800.00	15.00	62.40	4,735.65	241.64	462.21	-208.73	0.00	0.00	0.00	
4,900.00	15.00	62.40	4,832.24	253.63	485.15	-219.09	0.00	0.00	0.00	
5,000.00	15.00	62.40	4,928.83	265.62	508.08	-229.45	0.00	0.00	0.00	
5,100.00	15.00	62.40	5,025.43	277.61	531.02	-239.81	0.00	0.00	0.00	
5,200.00	15.00	62.40	5,122.02	289.60	553.96	-250.16	0.00	0.00	0.00	
5,296.73	15.00	62.40	5,215.46	301.20	576.14	-260.18	0.00	0.00	0.00	
Begin 11.00°/100' Build & Turn										
5,300.00	14.84	63.65	5,218.61	301.58	576.89	-260.51	11.00	-4.85	38.34	
5,350.00	13.40	85.56	5,267.14	304.87	588.41	-262.99	11.00	-2.89	43.82	
5,400.00	14.07	108.70	5,315.74	303.37	599.96	-260.69	11.00	1.35	46.29	
5,450.00	16.62	127.27	5,363.98	297.09	611.41	-253.62	11.00	5.08	37.14	
5,500.00	20.33	140.15	5,411.42	286.08	622.68	-241.85	11.00	7.44	25.75	
5,550.00	24.70	148.92	5,457.61	270.45	633.65	-225.49	11.00	8.74	17.54	
5,600.00	29.43	155.11	5,502.13	250.35	644.22	-204.69	11.00	9.46	12.38	
5,650.00	34.38	159.69	5,544.57	225.94	654.30	-179.65	11.00	9.89	9.16	
5,700.00	39.45	163.23	5,584.54	197.48	663.79	-150.59	11.00	10.15	7.08	
5,725.70	42.09	164.76	5,604.00	181.34	668.41	-134.17	11.00	10.29	5.96	
P200 Marker										
5,746.27	44.22	165.88	5,619.00	167.74	671.97	-120.35	11.00	10.35	5.43	
P300 Marker										
5,750.00	44.61	166.07	5,621.67	165.20	672.61	-117.77	11.00	10.38	5.19	
5,774.91	47.21	167.30	5,639.00	147.79	676.72	-100.12	11.00	10.41	4.93	
P350 Marker										
5,797.50	49.57	168.33	5,654.00	131.28	680.29	-83.40	11.00	10.46	4.55	
Sharon Springs										
5,800.00	49.83	168.44	5,655.62	129.42	680.67	-81.51	11.00	10.48	4.37	
5,816.39	51.55	169.13	5,666.00	116.98	683.14	-68.93	11.00	10.50	4.25	
Niobrara										
5,841.24	54.17	170.13	5,681.00	97.49	686.70	-49.25	11.00	10.53	4.00	
Top A Chalk (N100)										
5,850.00	55.09	170.46	5,686.07	90.45	687.90	-42.14	11.00	10.55	3.82	
5,900.00	60.38	172.24	5,712.75	48.67	694.24	-0.01	11.00	10.58	3.56	
5,921.49	62.66	172.95	5,723.00	29.94	696.67	18.84	11.00	10.61	3.29	
Top A Marl (N200)										
5,950.00	65.69	173.84	5,735.42	4.45	699.62	44.48	11.00	10.63	3.14	
5,966.56	67.46	174.34	5,742.00	-10.67	701.19	59.66	11.00	10.65	3.02	
A Marl (N250)										
5,982.80	69.19	174.82	5,748.00	-25.70	702.61	74.75	11.00	10.65	2.94	
Top Upper B (N400)										
6,000.00	71.02	175.31	5,753.85	-41.80	704.00	90.92	11.00	10.66	2.87	
6,050.00	76.36	176.69	5,767.89	-89.66	707.34	138.89	11.00	10.68	2.76	
6,100.00	81.71	178.01	5,777.40	-138.67	709.59	187.94	11.00	10.69	2.64	
6,112.03	82.99	178.33	5,779.00	-150.59	709.98	199.86	11.00	10.70	2.59	
Base Upper B (N430)										
6,150.00	87.05	179.30	5,782.29	-188.40	710.76	237.63	11.00	10.70	2.56	
6,177.21	89.97	179.99	5,783.00	-215.60	710.93	264.77	11.00	10.70	2.54	
Top Lower B (N460)										
6,177.52	90.00	180.00	5,783.00	-215.91	710.93	265.08	11.00	10.70	2.54	



Database:	EDM 5000.1 CONROE DB	Local Co-ordinate Reference:	Well 1704
Company:	Whiting Oil & Gas	TVD Reference:	WELL @ 4974.70usft (Pioneer 54)
Project:	Weld County, Colorado (NAD 83)	MD Reference:	WELL @ 4974.70usft (Pioneer 54)
Site:	Horsetail 08D	North Reference:	True
Well:	1704	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

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)
Begin 90.00° Lateral - 7"									
6,200.00	90.00	180.00	5,783.00	-238.39	710.93	287.51	0.00	0.00	0.00
6,300.00	90.00	180.00	5,783.00	-338.39	710.93	387.26	0.00	0.00	0.00
6,400.00	90.00	180.00	5,783.00	-438.39	710.93	487.02	0.00	0.00	0.00
6,500.00	90.00	180.00	5,783.00	-538.39	710.94	586.77	0.00	0.00	0.00
6,600.00	90.00	180.00	5,783.00	-638.39	710.94	686.53	0.00	0.00	0.00
6,700.00	90.00	180.00	5,783.00	-738.39	710.94	786.28	0.00	0.00	0.00
6,800.00	90.00	180.00	5,783.00	-838.39	710.95	886.04	0.00	0.00	0.00
6,900.00	90.00	180.00	5,783.00	-938.39	710.95	985.80	0.00	0.00	0.00
7,000.00	90.00	180.00	5,783.00	-1,038.39	710.95	1,085.55	0.00	0.00	0.00
7,100.00	90.00	180.00	5,783.00	-1,138.39	710.95	1,185.31	0.00	0.00	0.00
7,200.00	90.00	180.00	5,783.00	-1,238.39	710.96	1,285.06	0.00	0.00	0.00
7,300.00	90.00	180.00	5,783.00	-1,338.39	710.96	1,384.82	0.00	0.00	0.00
7,400.00	90.00	180.00	5,783.00	-1,438.39	710.96	1,484.57	0.00	0.00	0.00
7,500.00	90.00	180.00	5,783.00	-1,538.39	710.97	1,584.33	0.00	0.00	0.00
7,600.00	90.00	180.00	5,783.00	-1,638.39	710.97	1,684.08	0.00	0.00	0.00
7,700.00	90.00	180.00	5,783.00	-1,738.39	710.97	1,783.84	0.00	0.00	0.00
7,800.00	90.00	180.00	5,783.00	-1,838.39	710.97	1,883.60	0.00	0.00	0.00
7,900.00	90.00	180.00	5,783.00	-1,938.39	710.98	1,983.35	0.00	0.00	0.00
8,000.00	90.00	180.00	5,783.00	-2,038.39	710.98	2,083.11	0.00	0.00	0.00
8,100.00	90.00	180.00	5,783.00	-2,138.39	710.98	2,182.86	0.00	0.00	0.00
8,200.00	90.00	180.00	5,783.00	-2,238.39	710.99	2,282.62	0.00	0.00	0.00
8,300.00	90.00	180.00	5,783.00	-2,338.39	710.99	2,382.37	0.00	0.00	0.00
8,400.00	90.00	180.00	5,783.00	-2,438.39	710.99	2,482.13	0.00	0.00	0.00
8,500.00	90.00	180.00	5,783.00	-2,538.39	710.99	2,581.88	0.00	0.00	0.00
8,600.00	90.00	180.00	5,783.00	-2,638.39	711.00	2,681.64	0.00	0.00	0.00
8,700.00	90.00	180.00	5,783.00	-2,738.39	711.00	2,781.39	0.00	0.00	0.00
8,800.00	90.00	180.00	5,783.00	-2,838.39	711.00	2,881.15	0.00	0.00	0.00
8,900.00	90.00	180.00	5,783.00	-2,938.39	711.01	2,980.91	0.00	0.00	0.00
9,000.00	90.00	180.00	5,783.00	-3,038.39	711.01	3,080.66	0.00	0.00	0.00
9,100.00	90.00	180.00	5,783.00	-3,138.39	711.01	3,180.42	0.00	0.00	0.00
9,200.00	90.00	180.00	5,783.00	-3,238.39	711.01	3,280.17	0.00	0.00	0.00
9,300.00	90.00	180.00	5,783.00	-3,338.39	711.02	3,379.93	0.00	0.00	0.00
9,400.00	90.00	180.00	5,783.00	-3,438.39	711.02	3,479.68	0.00	0.00	0.00
9,500.00	90.00	180.00	5,783.00	-3,538.39	711.02	3,579.44	0.00	0.00	0.00
9,600.00	90.00	180.00	5,783.00	-3,638.39	711.03	3,679.19	0.00	0.00	0.00
9,700.00	90.00	180.00	5,783.00	-3,738.39	711.03	3,778.95	0.00	0.00	0.00
9,800.00	90.00	180.00	5,783.00	-3,838.39	711.03	3,878.71	0.00	0.00	0.00
9,900.00	90.00	180.00	5,783.00	-3,938.39	711.03	3,978.46	0.00	0.00	0.00
10,000.00	90.00	180.00	5,783.00	-4,038.39	711.04	4,078.22	0.00	0.00	0.00
10,100.00	90.00	180.00	5,783.00	-4,138.39	711.04	4,177.97	0.00	0.00	0.00
10,200.00	90.00	180.00	5,783.00	-4,238.39	711.04	4,277.73	0.00	0.00	0.00
10,300.00	90.00	180.00	5,783.00	-4,338.39	711.05	4,377.48	0.00	0.00	0.00
10,400.00	90.00	180.00	5,783.00	-4,438.39	711.05	4,477.24	0.00	0.00	0.00
10,500.00	90.00	180.00	5,783.00	-4,538.39	711.05	4,576.99	0.00	0.00	0.00
10,600.00	90.00	180.00	5,783.00	-4,638.39	711.05	4,676.75	0.00	0.00	0.00
10,700.00	90.00	180.00	5,783.00	-4,738.39	711.06	4,776.51	0.00	0.00	0.00
10,800.00	90.00	180.00	5,783.00	-4,838.39	711.06	4,876.26	0.00	0.00	0.00
10,900.00	90.00	180.00	5,783.00	-4,938.39	711.06	4,976.02	0.00	0.00	0.00
11,000.00	90.00	180.00	5,783.00	-5,038.39	711.07	5,075.77	0.00	0.00	0.00
11,100.00	90.00	180.00	5,783.00	-5,138.39	711.07	5,175.53	0.00	0.00	0.00
11,200.00	90.00	180.00	5,783.00	-5,238.39	711.07	5,275.28	0.00	0.00	0.00
11,300.00	90.00	180.00	5,783.00	-5,338.39	711.07	5,375.04	0.00	0.00	0.00



Database:	EDM 5000.1 CONROE DB	Local Co-ordinate Reference:	Well 1704
Company:	Whiting Oil & Gas	TVD Reference:	WELL @ 4974.70usft (Pioneer 54)
Project:	Weld County, Colorado (NAD 83)	MD Reference:	WELL @ 4974.70usft (Pioneer 54)
Site:	Horsetail 08D	North Reference:	True
Well:	1704	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

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)
11,400.00	90.00	180.00	5,783.00	-5,438.39	711.08	5,474.79	0.00	0.00	0.00
11,500.00	90.00	180.00	5,783.00	-5,538.39	711.08	5,574.55	0.00	0.00	0.00
11,600.00	90.00	180.00	5,783.00	-5,638.39	711.08	5,674.30	0.00	0.00	0.00
11,700.00	90.00	180.00	5,783.00	-5,738.39	711.09	5,774.06	0.00	0.00	0.00
11,800.00	90.00	180.00	5,783.00	-5,838.39	711.09	5,873.82	0.00	0.00	0.00
11,900.00	90.00	180.00	5,783.00	-5,938.39	711.09	5,973.57	0.00	0.00	0.00
12,000.00	90.00	180.00	5,783.00	-6,038.39	711.09	6,073.33	0.00	0.00	0.00
12,100.00	90.00	180.00	5,783.00	-6,138.39	711.10	6,173.08	0.00	0.00	0.00
12,200.00	90.00	180.00	5,783.00	-6,238.39	711.10	6,272.84	0.00	0.00	0.00
12,300.00	90.00	180.00	5,783.00	-6,338.39	711.10	6,372.59	0.00	0.00	0.00
12,400.00	90.00	180.00	5,783.00	-6,438.39	711.11	6,472.35	0.00	0.00	0.00
12,500.00	90.00	180.00	5,783.00	-6,538.39	711.11	6,572.10	0.00	0.00	0.00
12,600.00	90.00	180.00	5,783.00	-6,638.39	711.11	6,671.86	0.00	0.00	0.00
12,700.00	90.00	180.00	5,783.00	-6,738.39	711.11	6,771.62	0.00	0.00	0.00
12,800.00	90.00	180.00	5,783.00	-6,838.39	711.12	6,871.37	0.00	0.00	0.00
12,900.00	90.00	180.00	5,783.00	-6,938.39	711.12	6,971.13	0.00	0.00	0.00
13,000.00	90.00	180.00	5,783.00	-7,038.39	711.12	7,070.88	0.00	0.00	0.00
13,100.00	90.00	180.00	5,783.00	-7,138.39	711.13	7,170.64	0.00	0.00	0.00
13,200.00	90.00	180.00	5,783.00	-7,238.39	711.13	7,270.39	0.00	0.00	0.00
13,300.00	90.00	180.00	5,783.00	-7,338.39	711.13	7,370.15	0.00	0.00	0.00
13,400.00	90.00	180.00	5,783.00	-7,438.39	711.13	7,469.90	0.00	0.00	0.00
13,500.00	90.00	180.00	5,783.00	-7,538.39	711.14	7,569.66	0.00	0.00	0.00
13,600.00	90.00	180.00	5,783.00	-7,638.39	711.14	7,669.42	0.00	0.00	0.00
13,700.00	90.00	180.00	5,783.00	-7,738.39	711.14	7,769.17	0.00	0.00	0.00
13,800.00	90.00	180.00	5,783.00	-7,838.39	711.15	7,868.93	0.00	0.00	0.00
13,900.00	90.00	180.00	5,783.00	-7,938.39	711.15	7,968.68	0.00	0.00	0.00
14,000.00	90.00	180.00	5,783.00	-8,038.39	711.15	8,068.44	0.00	0.00	0.00
14,100.00	90.00	180.00	5,783.00	-8,138.39	711.15	8,168.19	0.00	0.00	0.00
14,200.00	90.00	180.00	5,783.00	-8,238.39	711.16	8,267.95	0.00	0.00	0.00
14,300.00	90.00	180.00	5,783.00	-8,338.39	711.16	8,367.70	0.00	0.00	0.00
14,400.00	90.00	180.00	5,783.00	-8,438.39	711.16	8,467.46	0.00	0.00	0.00
14,500.00	90.00	180.00	5,783.00	-8,538.39	711.17	8,567.21	0.00	0.00	0.00
14,600.00	90.00	180.00	5,783.00	-8,638.39	711.17	8,666.97	0.00	0.00	0.00
14,700.00	90.00	180.00	5,783.00	-8,738.39	711.17	8,766.73	0.00	0.00	0.00
14,800.00	90.00	180.00	5,783.00	-8,838.39	711.17	8,866.48	0.00	0.00	0.00
14,900.00	90.00	180.00	5,783.00	-8,938.39	711.18	8,966.24	0.00	0.00	0.00
15,000.00	90.00	180.00	5,783.00	-9,038.39	711.18	9,065.99	0.00	0.00	0.00
15,100.00	90.00	180.00	5,783.00	-9,138.39	711.18	9,165.75	0.00	0.00	0.00
15,200.00	90.00	180.00	5,783.00	-9,238.39	711.19	9,265.50	0.00	0.00	0.00
15,300.00	90.00	180.00	5,783.00	-9,338.39	711.19	9,365.26	0.00	0.00	0.00
15,400.00	90.00	180.00	5,783.00	-9,438.39	711.19	9,465.01	0.00	0.00	0.00
15,500.00	90.00	180.00	5,783.00	-9,538.39	711.19	9,564.77	0.00	0.00	0.00
15,600.00	90.00	180.00	5,783.00	-9,638.39	711.20	9,664.53	0.00	0.00	0.00
15,700.00	90.00	180.00	5,783.00	-9,738.39	711.20	9,764.28	0.00	0.00	0.00
15,800.00	90.00	180.00	5,783.00	-9,838.39	711.20	9,864.04	0.00	0.00	0.00
15,900.00	90.00	180.00	5,783.00	-9,938.39	711.21	9,963.79	0.00	0.00	0.00
16,000.00	90.00	180.00	5,783.00	-10,038.39	711.21	10,063.55	0.00	0.00	0.00
16,109.65	90.00	180.00	5,783.00	-10,148.04	711.21	10,172.93	0.00	0.00	0.00
PBHL									



Database:	EDM 5000.1 CONROE DB	Local Co-ordinate Reference:	Well 1704
Company:	Whiting Oil & Gas	TVD Reference:	WELL @ 4974.70usft (Pioneer 54)
Project:	Weld County, Colorado (NAD 83)	MD Reference:	WELL @ 4974.70usft (Pioneer 54)
Site:	Horsetail 08D	North Reference:	True
Well:	1704	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Design Targets

Target Name

- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- Shape									
PBHL v1 - Horsetail 0	0.00	0.00	5,783.00	-10,148.04	711.21	1,550,524.38	3,475,759.14	40° 49' 54.869 N	103° 46' 50.560 W
- plan hits target center									
- Point									

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
6,177.52	5,783.00	7"	7	7-1/2

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,525.00	1,525.00	Upper Pierre		0.00	
3,588.06	3,565.00	Hygiene		0.00	
3,691.58	3,665.00	Lower Pierre		0.00	
5,725.70	5,604.00	P200 Marker		0.00	
5,746.27	5,619.00	P300 Marker		0.00	
5,774.91	5,639.00	P350 Marker		0.00	
5,797.50	5,654.00	Sharon Springs		0.00	
5,816.39	5,666.00	Niobrara		0.00	
5,841.24	5,681.00	Top A Chalk (N100)		0.00	
5,921.49	5,723.00	Top A Marl (N200)		0.00	
5,966.56	5,742.00	A Marl (N250)		0.00	
5,982.80	5,748.00	Top Upper B (N400)		0.00	
6,112.03	5,779.00	Base Upper B (N430)		0.00	
6,177.21	5,783.00	Top Lower B (N460)		0.00	

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
2,412.00	2,412.00	0.00	0.00	KOP, 2.00°/100' Build
3,162.00	3,153.46	45.22	86.51	Hold 15.00° Inc, 62.40° Azm
5,296.73	5,215.46	301.20	576.14	Begin 11.00°/100' Build & Turn
6,177.52	5,783.00	-215.91	710.93	Begin 90.00° Lateral
16,109.65	5,783.00	-10,148.04	711.21	PBHL