



Company: Whiting Oil & Gas
Site: Cottonwood 08E
Well: 0504
Project: Weld County, Colorado (NAD 83)
Rig: Pioneer 54



Azimuths to True North
Magnetic North: 7.90°

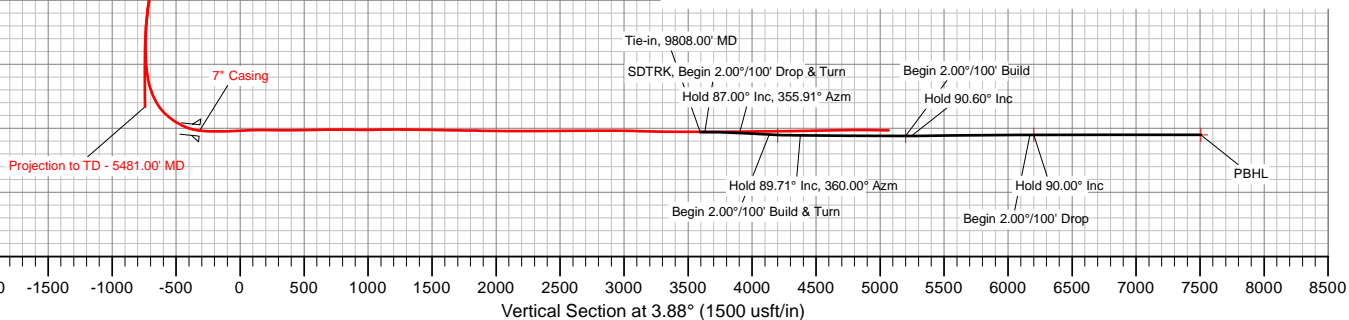
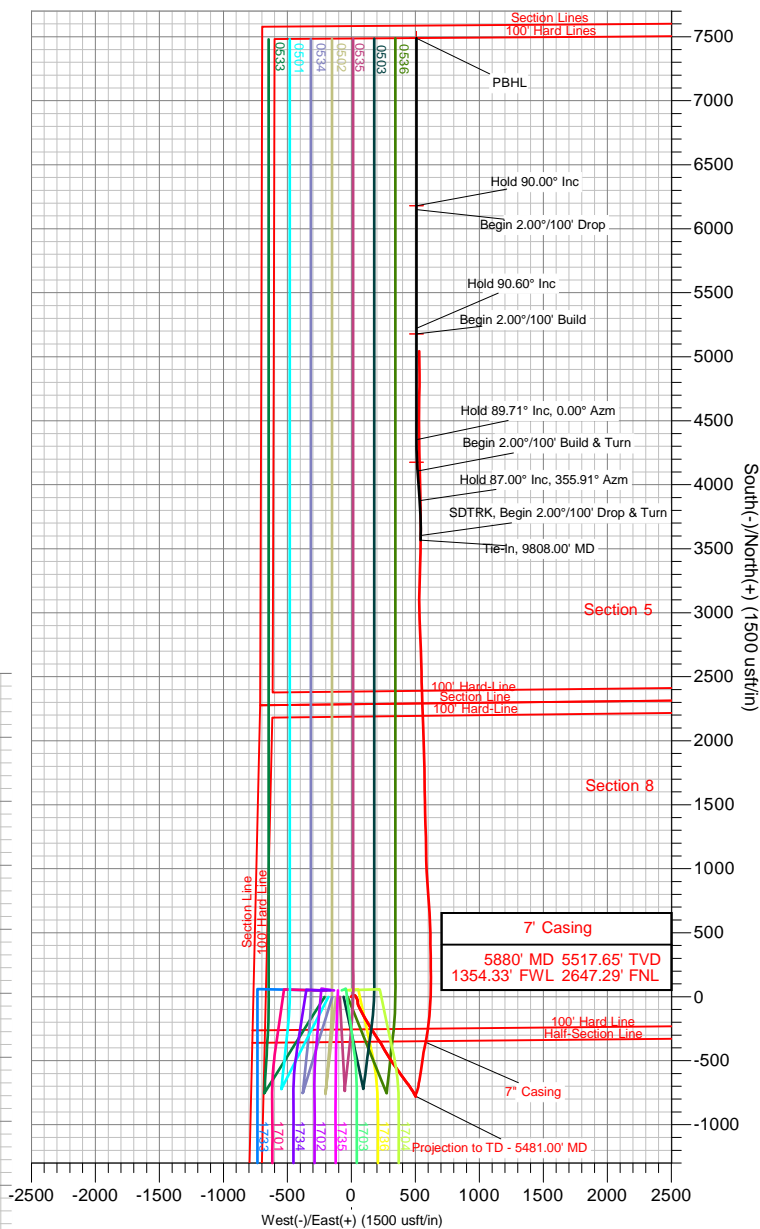
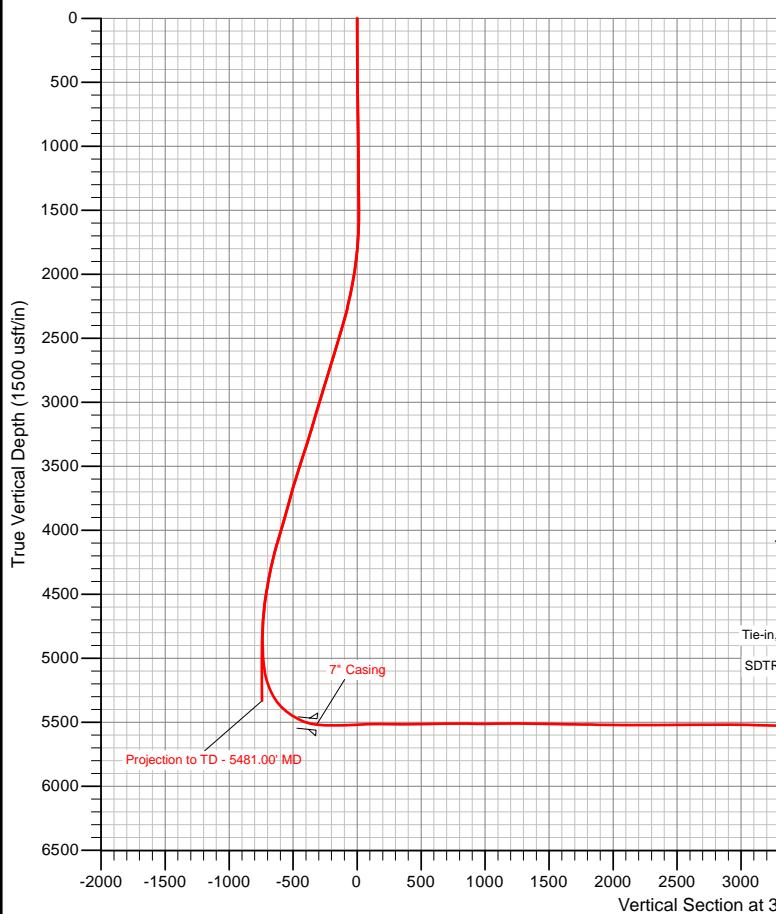
Magnetic Field
Strength: 53068.7snT
Dip Angle: 67.38°
Date: 11/2/2014
Model: WMM_2010

US State Plane 1983
Colorado Northern Zone

Created By: DLD
Date: 13:38, November 24 2014
Plan: Design #5

ANNOTATIONS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Vsect	Departure	Annotation
9808.00	89.20	0.90	5529.05	3566.76	541.53	3595.23	0.00	Tie-in, 9808.00' MD
9844.00	89.94	0.51	5529.32	3602.76	541.97	3631.17	36.00	SDTRK, Begin 2.00°/100' Drop & Turn
10116.87	87.00	355.91	5536.61	3875.29	533.46	3902.51	308.74	Hold 87.00° Inc, 355.91° Azm
10349.58	87.00	355.91	5548.78	4107.09	516.88	4132.66	541.14	Begin 2.00°/100' Build & Turn
10594.81	89.71	0.00	5555.82	4351.99	508.14	4376.40	786.24	Hold 89.71° Inc, 360.00° Azm
11420.31	89.71	0.00	5560.00	5177.48	508.14	5200.00	1611.73	Begin 2.00°/100' Build
11464.83	90.60	360.00	5559.88	5222.00	508.14	5244.42	1656.25	Hold 90.60° Inc
12392.65	90.60	360.00	5550.16	6149.77	508.14	6170.05	2584.01	Begin 2.00°/100' Drop
12422.67	90.00	0.00	5550.00	6179.78	508.14	6200.00	2614.03	Hold 90.00° Inc
13730.20	90.00	0.00	5550.00	7487.31	508.14	7504.54	3921.56	PBHL





Whiting Oil & Gas

**Weld County, Colorado (NAD 83)
Cottonwood 08E
0504**

Wellbore #2

Plan: Design #5

Standard Planning Report

23 November, 2014



Database:	Conroe Server	Local Co-ordinate Reference:	Well 0504
Company:	Whiting Oil & Gas	TVD Reference:	WELL @ 4737.30usft (Pioneer 54)
Project:	Weld County, Colorado (NAD 83)	MD Reference:	WELL @ 4737.30usft (Pioneer 54)
Site:	Cottonwood 08E	North Reference:	True
Well:	0504	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #2		
Design:	Design #5		

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	0504			
Well Position	+N/-S	1,914,058.37 usft	Northing:	1,526,894.98 usft
	+E/-W	3,278,926.89 usft	Easting:	3,476,143.36 usft
Position Uncertainty		0.00 usft	Wellhead Elevation:	
			Latitude:	40° 46' 1.358 N
			Longitude:	103° 46' 51.521 W
			Ground Level:	4,720.30 usft

Wellbore	Wellbore #2				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	WMM_2010	11/2/2014	7.90	67.38	53,069

Design	Design #5			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	9,808.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	3.88

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	
9,808.00	89.20	0.90	5,529.05	3,566.76	541.53	0.00	0.00	0.00	0.00		
9,844.00	89.94	0.51	5,529.32	3,602.76	541.97	2.32	2.06	-1.08	-27.79		
10,116.87	87.00	355.91	5,536.61	3,875.29	533.46	2.00	-1.08	-1.69	-122.63		
10,349.58	87.00	355.91	5,548.78	4,107.09	516.88	0.00	0.00	0.00	0.00		
10,594.81	89.71	0.00	5,555.82	4,351.99	508.14	2.00	1.10	1.67	56.55		
11,420.31	89.71	0.00	5,560.00	5,177.48	508.14	0.00	0.00	0.00	0.00	5200' VS v5 - Cotto	
11,464.83	90.60	360.00	5,559.88	5,222.00	508.14	2.00	2.00	0.00	0.00		
12,392.65	90.60	360.00	5,550.16	6,149.77	508.14	0.00	0.00	0.00	0.00		
12,422.67	90.00	0.00	5,550.00	6,179.78	508.14	2.00	-2.00	0.00	180.00		
13,730.20	90.00	0.00	5,550.00	7,487.31	508.14	0.00	0.00	0.00	0.00	PBHL v5 - Cottonw	



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Project:	Weld County, Colorado (NAD 83)	MD Reference:	WELL @ 4737.30usft (Pioneer 54)
Site:	Cottonwood 08E	North Reference:	True
Well:	0504	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #2		
Design:	Design #5		

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)
9,808.00	89.20	0.90	5,529.05	3,566.76	541.53	3,595.23	0.00	0.00	0.00
Tie-in, 9808.00' MD									
9,844.00	89.94	0.51	5,529.32	3,602.76	541.97	3,631.17	2.32	2.06	-1.08
SDTRK, Begin 2.00°/100' Drop & Turn									
9,900.00	89.34	359.57	5,529.67	3,658.75	542.01	3,687.04	2.00	-1.08	-1.68
10,000.00	88.26	357.88	5,531.77	3,758.70	539.78	3,786.61	2.00	-1.08	-1.69
10,100.00	87.18	356.19	5,535.75	3,858.48	534.62	3,885.82	2.00	-1.08	-1.69
10,116.87	87.00	355.91	5,536.61	3,875.29	533.46	3,902.51	2.00	-1.07	-1.69
Hold 87.00° Inc, 355.91° Azm									
10,200.00	87.00	355.91	5,540.96	3,958.10	527.54	3,984.72	0.00	0.00	0.00
10,300.00	87.00	355.91	5,546.19	4,057.71	520.42	4,083.62	0.00	0.00	0.00
10,349.58	87.00	355.91	5,548.78	4,107.09	516.88	4,132.66	0.00	0.00	0.00
Begin 2.00°/100' Build & Turn									
10,400.00	87.56	356.75	5,551.18	4,157.35	513.66	4,182.58	2.00	1.10	1.67
10,500.00	88.66	358.42	5,554.47	4,257.20	509.45	4,281.92	2.00	1.10	1.67
10,594.81	89.71	0.00	5,555.82	4,351.99	508.14	4,376.40	2.00	1.11	1.67
Hold 89.71° Inc, 360.00° Azm									
10,600.00	89.71	0.00	5,555.85	4,357.18	508.14	4,381.58	0.00	0.00	0.00
10,700.00	89.71	0.00	5,556.35	4,457.18	508.14	4,481.35	0.00	0.00	0.00
10,800.00	89.71	0.00	5,556.86	4,557.18	508.14	4,581.12	0.00	0.00	0.00
10,900.00	89.71	0.00	5,557.37	4,657.18	508.14	4,680.89	0.00	0.00	0.00
11,000.00	89.71	0.00	5,557.87	4,757.17	508.14	4,780.66	0.00	0.00	0.00
11,100.00	89.71	0.00	5,558.38	4,857.17	508.14	4,880.43	0.00	0.00	0.00
11,200.00	89.71	0.00	5,558.89	4,957.17	508.14	4,980.19	0.00	0.00	0.00
11,300.00	89.71	0.00	5,559.39	5,057.17	508.14	5,079.96	0.00	0.00	0.00
11,400.00	89.71	0.00	5,559.90	5,157.17	508.14	5,179.73	0.00	0.00	0.00
11,420.31	89.71	0.00	5,560.00	5,177.48	508.14	5,200.00	0.00	0.00	0.00
Begin 2.00°/100' Build									
11,464.83	90.60	360.00	5,559.88	5,222.00	508.14	5,244.42	2.00	2.00	0.00
Hold 90.60° Inc									
11,500.00	90.60	360.00	5,559.51	5,257.17	508.14	5,279.50	0.00	0.00	0.00
11,600.00	90.60	360.00	5,558.46	5,357.16	508.14	5,379.27	0.00	0.00	0.00
11,700.00	90.60	360.00	5,557.42	5,457.16	508.14	5,479.03	0.00	0.00	0.00
11,800.00	90.60	360.00	5,556.37	5,557.15	508.14	5,578.80	0.00	0.00	0.00
11,900.00	90.60	360.00	5,555.32	5,657.14	508.14	5,678.56	0.00	0.00	0.00
12,000.00	90.60	360.00	5,554.27	5,757.14	508.14	5,778.33	0.00	0.00	0.00
12,100.00	90.60	360.00	5,553.22	5,857.13	508.14	5,878.09	0.00	0.00	0.00
12,200.00	90.60	360.00	5,552.18	5,957.13	508.14	5,977.86	0.00	0.00	0.00
12,300.00	90.60	360.00	5,551.13	6,057.12	508.14	6,077.62	0.00	0.00	0.00
12,392.65	90.60	360.00	5,550.16	6,149.77	508.14	6,170.05	0.00	0.00	0.00
Begin 2.00°/100' Drop									
12,400.00	90.45	360.00	5,550.09	6,157.12	508.14	6,177.39	2.00	-2.00	0.00
12,422.67	90.00	0.00	5,550.00	6,179.78	508.14	6,200.00	2.00	-2.00	0.00
Hold 90.00° Inc									
12,500.00	90.00	0.00	5,550.00	6,257.12	508.14	6,277.16	0.00	0.00	0.00
12,600.00	90.00	0.00	5,550.00	6,357.12	508.14	6,376.93	0.00	0.00	0.00
12,700.00	90.00	0.00	5,550.00	6,457.12	508.14	6,476.70	0.00	0.00	0.00
12,800.00	90.00	0.00	5,550.00	6,557.12	508.14	6,576.47	0.00	0.00	0.00
12,900.00	90.00	0.00	5,550.00	6,657.12	508.14	6,676.24	0.00	0.00	0.00
13,000.00	90.00	0.00	5,550.00	6,757.12	508.14	6,776.01	0.00	0.00	0.00
13,100.00	90.00	0.00	5,550.00	6,857.12	508.14	6,875.79	0.00	0.00	0.00
13,200.00	90.00	0.00	5,550.00	6,957.12	508.14	6,975.56	0.00	0.00	0.00
13,300.00	90.00	0.00	5,550.00	7,057.12	508.14	7,075.33	0.00	0.00	0.00



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Site:	Cottonwood 08E	North Reference:	True
Well:	0504	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #2		
Design:	Design #5		

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)
13,400.00	90.00	0.00	5,550.00	7,157.12	508.14	7,175.10	0.00	0.00	0.00
13,500.00	90.00	0.00	5,550.00	7,257.12	508.14	7,274.87	0.00	0.00	0.00
13,600.00	90.00	0.00	5,550.00	7,357.12	508.14	7,374.64	0.00	0.00	0.00
13,700.00	90.00	0.00	5,550.00	7,457.12	508.14	7,474.41	0.00	0.00	0.00
13,730.20	90.00	0.00	5,550.00	7,487.31	508.14	7,504.54	0.00	0.00	0.00
PBHL									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
PBHL v5 - Cottonwo - plan hits target center - Point	0.00	0.00	5,550.00	7,487.31	508.14	1,534,390.73	3,476,506.28	40° 47' 15.340 N	103° 46' 44.915 W
6200' VS v5 - Cottonw - plan hits target center - Point	0.00	0.00	5,550.00	6,179.78	508.14	1,533,083.45	3,476,531.62	40° 47' 2.421 N	103° 46' 44.915 W
4200' VS v5 - Cottonw - plan misses target center by 5.49usft at 10418.16usft MD (5551.92 TVD, 4175.47 N, 512.68 E) - Point	0.00	0.00	5,555.00	4,175.18	508.14	1,531,079.22	3,476,570.48	40° 46' 42.613 N	103° 46' 44.916 W
5200' VS v5 - Cottonw - plan hits target center - Point	0.00	0.00	5,560.00	5,177.48	508.14	1,532,081.33	3,476,551.05	40° 46' 52.517 N	103° 46' 44.915 W

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
9,808.00	5,529.05	3,566.76	541.53	Tie-in, 9808.00' MD
9,844.00	5,529.32	3,602.76	541.97	SDTRK, Begin 2.00°/100' Drop & Turn
10,116.87	5,536.61	3,875.29	533.46	Hold 87.00° Inc, 355.91° Azm
10,349.58	5,548.78	4,107.09	516.88	Begin 2.00°/100' Build & Turn
10,594.81	5,555.82	4,351.99	508.14	Hold 89.71° Inc, 360.00° Azm
11,420.31	5,560.00	5,177.48	508.14	Begin 2.00°/100' Build
11,464.83	5,559.88	5,222.00	508.14	Hold 90.60° Inc
12,392.65	5,550.16	6,149.77	508.14	Begin 2.00°/100' Drop
12,422.67	5,550.00	6,179.78	508.14	Hold 90.00° Inc
13,730.20	5,550.00	7,487.31	508.14	PBHL