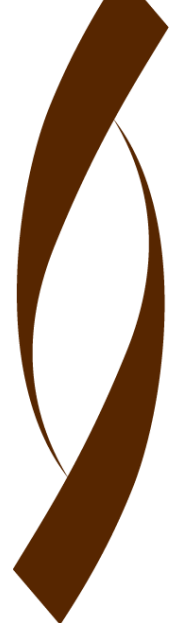
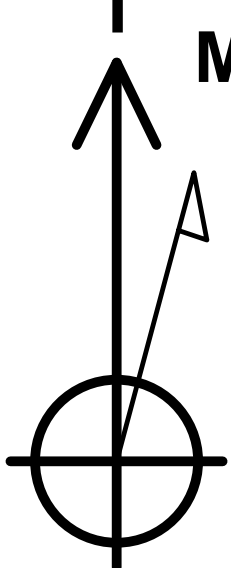




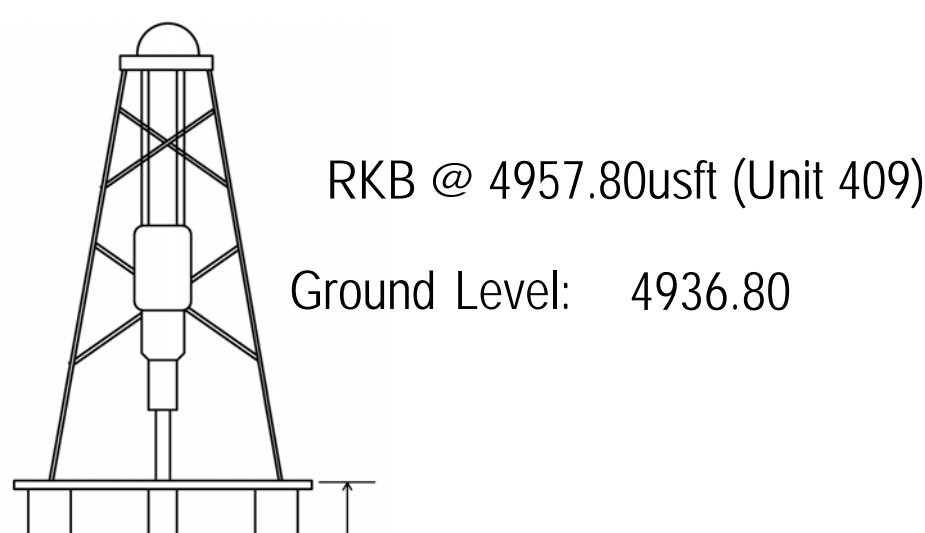
Project: Weld County, Colorado (NAD 83)  
Site: Sec.12-T10N-R58W  
Well: Razor FED #12F-1308B  
Wellbore: Wellbore #1 / Job #1523835  
Design: Plan 2 07-06-15  
Rig: Unit 409



PHOENIX  
TECHNOLOGY SERVICES



Azimuths to True North  
Magnetic North: 7.62°  
Magnetic Field  
Strength: 52948.5snT  
Dip Angle: 67.35°  
Date: 6/24/2015  
Model: HDGM



RKB @ 4957.80usft (Unit 409)  
Ground Level: 4936.80

WELL DETAILS						
+N/-S	+E/-W	Northing	Ground Level: Easting	4936.80	Latitude	Longitude
0.00	0.00	1558542.499	3465406.637		40.854456	-103.817564

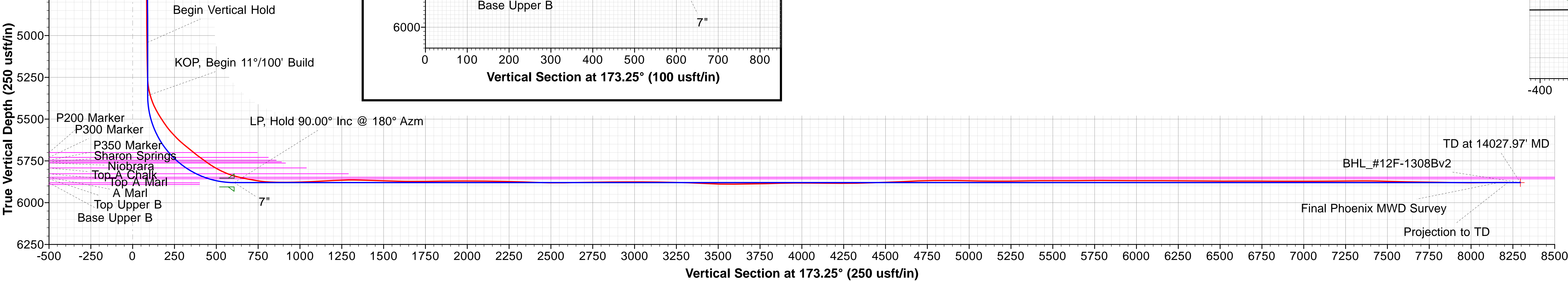
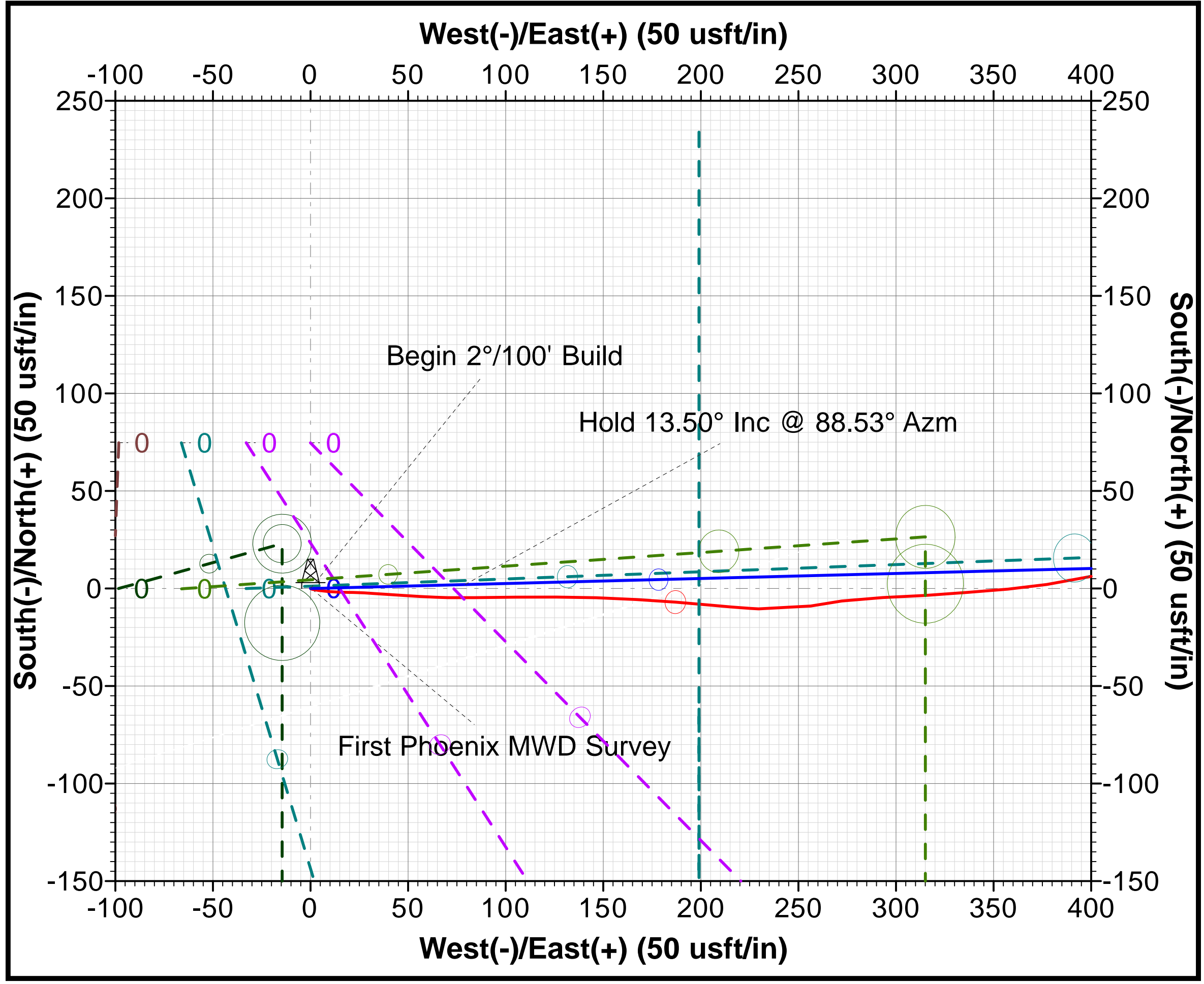
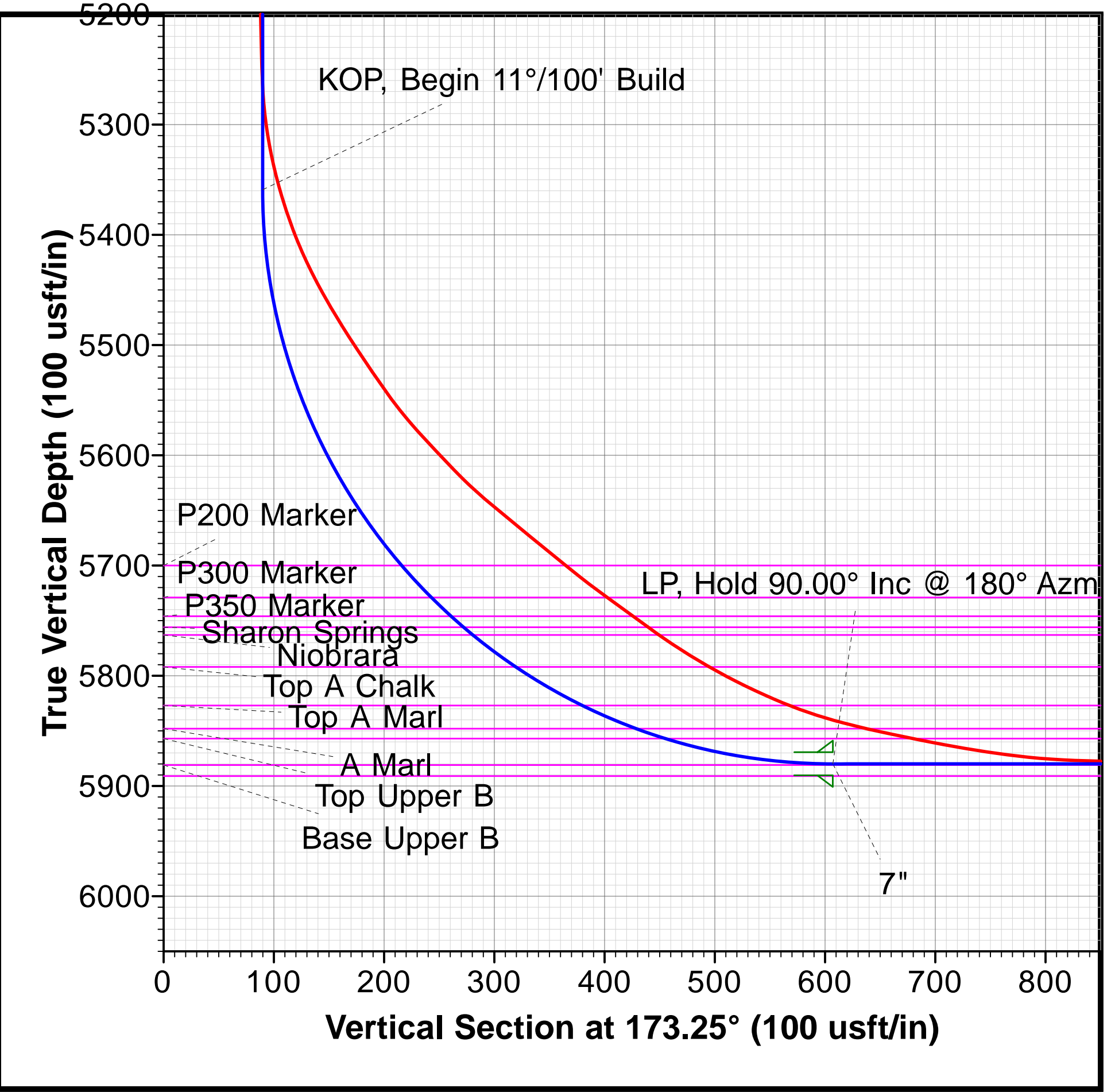
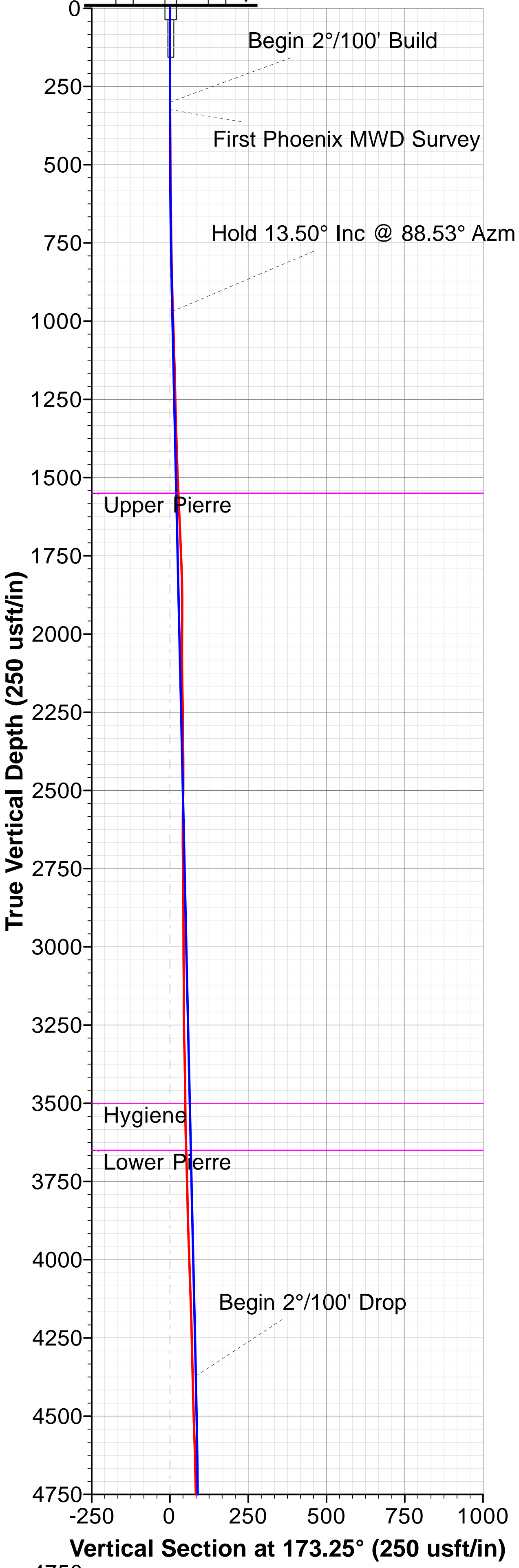
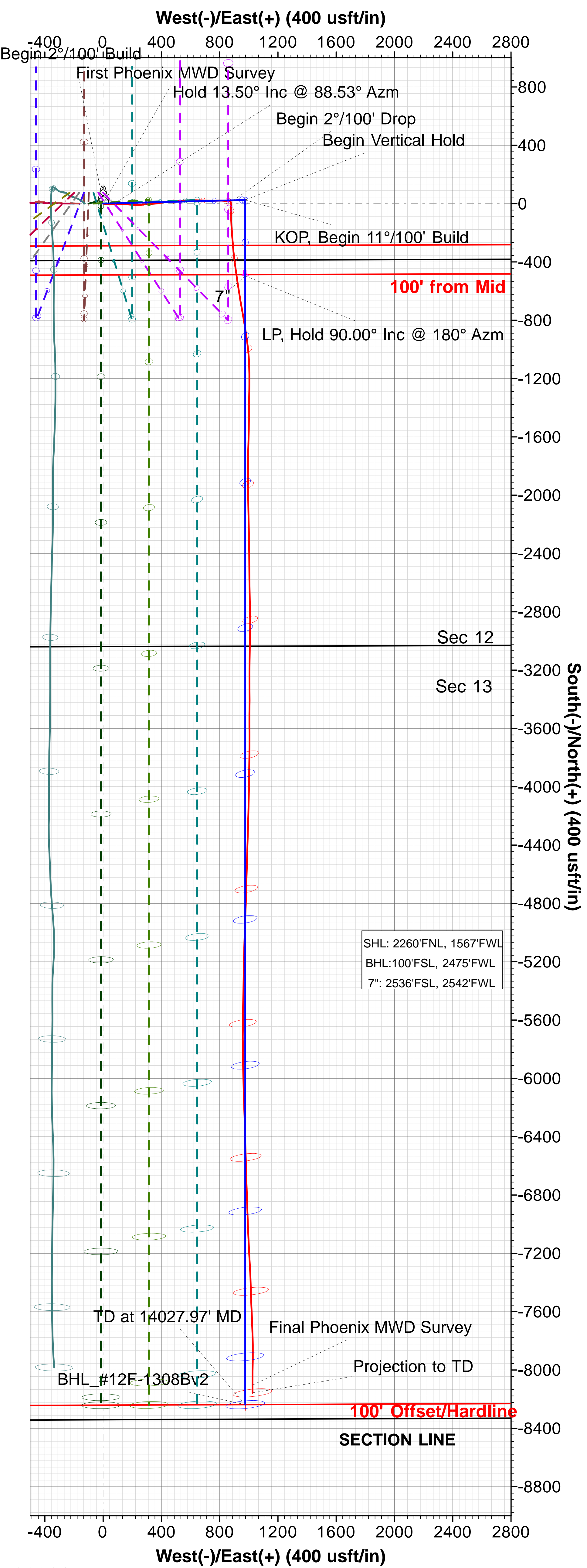
SECTION DETAILS												
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target	Annotation	
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		Begin 2°/100' Build	
2	300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00		Hold 13.50° Inc @ 88.53° Azm	
3	975.14	13.50	88.53	968.91	2.03	79.16	2.00	88.53	7.29		Begin 2°/100' Drop	
4	4474.90	13.50	88.53	4371.93	22.97	896.06	0.00	0.00	82.57		Begin Vertical Hold	
5	5150.04	0.00	0.00	5040.84	25.00	975.22	2.00	180.00	89.86		KOP, Begin 11°/100' Build	
6	5468.33	0.00	0.00	5359.13	25.00	975.22	0.00	0.00	89.86		LP, Hold 90.00° Inc @ 180° Azm	
7	6286.51	90.00	180.00	5880.00	-495.87	975.24	11.00	180.00	607.12		LP, Hold 90.00° Inc @ 180° Azm	
8	14027.97	90.00	180.00	5880.00	-8237.33	975.50	0.00	0.00	8294.89	BHL_#12F-1308Bv2	TD at 14027.97' MD	

DESIGN TARGET DETAILS							
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
BHL_#12F-1308Bv2	5880.00	-8237.33	975.50	1550325.160	3466538.240	40.831847	-103.814039

LEGEND	
---	Razor FED #12F-1305A, Wellbore #1, Plan 1 V0
---	Razor FED #12F-1308B, Wellbore #1 / Job #1523835, Surveys (Unit 409) V0
---	Razor FED #12F-0105A, Wellbore #1, Plan 1 V0
---	Razor FED #12F-0106B, Wellbore #1, Plan 1 V0
---	Razor FED #12F-1302B, Wellbore #1, Plan 1 V0
---	Razor FED #12F-0104B, Wellbore #1 / Job #1523838, Plan 1 06-24-15 V0
---	Razor FED #12F-0108B, Wellbore #1 / Job #1523841, Plan 1 06-24-15 V0
---	Razor FED #12F-1307A, Wellbore #1 / Job #1523836, Plan 1 06-24-15 V0
---	Razor FED #12F-1303A, Wellbore #1 / Job #1523837, Plan 1 06-24-15 V0
---	Razor FED #12F-0107A, Wellbore #1 / Job #1523840, Plan 1 06-24-15 V0
---	Razor FED #12F-1301A, Wellbore #1, Plan 1 V0
---	Razor FED #12F-1304B, Wellbore #1, Surveys V0
---	Razor FED #12F-0101A, Wellbore #1, Plan 1 V0
---	Razor FED #12F-1306B, Wellbore #1, Plan 1 V0
---	Razor FED #12F-0103A, Wellbore #1 / Job #1523839, Plan 1 06-24-15 V0
---	Razor FED #12F-0102B, Wellbore #1, Plan 1 V0
---	Plan 2 07-06-15

FORMATION TOP DETAILS				
TVDPath	MDPath	Formation	DipAngle	DipDir
1550.00	1572.75	Upper Pierre	0.00	173.25
3500.00	3578.18	Hygiene	0.00	173.25
3650.00	3732.45	Lower Pierre	0.00	173.25
5700.00	5839.93	P200 Marker	0.00	173.25
5729.00	5879.63	P300 Marker	0.00	173.25
5746.00	5904.38	P350 Marker	0.00	173.25
5756.00	5919.56	Sharon Springs	0.00	173.25
5763.00	5930.51	Niobrara	0.00	173.25
5792.00	5979.31	Top A Chalk	0.00	173.25
5827.00	6049.50	Top A Marl	0.00	173.25
5848.00	6102.99	A Marl	0.00	173.25
5857.00	6131.15	Top Upper B	0.00	173.25

Map System: US State Plane 1983  
Datum: North American Datum 1983  
Ellipsoid: GRS 1980  
Zone Name: Colorado Northern Zone  
  
Local Origin: Well Razor FED #12F-1308B, True North  
  
Latitude: 40.854456  
Longitude: -103.817564  
  
Grid East: 3465406.637  
Grid North: 1558542.499  
Scale Factor: 1.000  
  
Geomagnetic Model: HDGM  
Sample Date: 24-Jun-15  
Magnetic Declination: 7.62°  
Dip Angle from Horizontal: 67.35°  
Magnetic Field Strength: 52949  
  
To convert a Magnetic Direction to a Grid Direction, Add 6.53°  
To convert a Magnetic Direction to a True Direction, Add 7.62° East  
To convert a True Direction to a Grid Direction, Subtract 1.09°







# **Whiting Oil & Gas Corporation**

**Weld County, Colorado (NAD 83)**

**Sec.12-T10N-R58W**

**Razor FED #12F-1308B**

**Wellbore #1 / Job #1523835**

**Survey: Phoenix MWD Surveys**

## **Standard Survey Report**

**17 July, 2015**



## Survey Report

<b>Company:</b>	Whiting Oil & Gas Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor FED #12F-1308B
<b>Project:</b>	Weld County, Colorado (NAD 83)	<b>TVD Reference:</b>	RKB @ 4957.80usft (Unit 409)
<b>Site:</b>	Sec.12-T10N-R58W	<b>MD Reference:</b>	RKB @ 4957.80usft (Unit 409)
<b>Well:</b>	Razor FED #12F-1308B	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1 / Job #1523835	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys (Unit 409)	<b>Database:</b>	Compass 5000 RMR

<b>Project</b>	Weld County, Colorado (NAD 83)		
<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		

Site		Sec.12-T10N-R58W				
Site Position:		Northing:	1,558,542.326	usft	Latitude:	40.854456
From:	Lat/Long	Easting:	3,465,406.640	usft	Longitude:	-103.817564
Position Uncertainty:		0.00	usft	Slot Radius:	13-3/16	"
				Grid Convergence:	1.09	°

Well	Razor FED #12F-1308B					
Well Position	+N/-S	0.00 usft	Northing:	1,558,542.499 usft	Latitude:	40.854456
	+E/-W	0.00 usft	Easting:	3,465,406.637 usft	Longitude:	-103.817564
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	4,936.80 usft

<b>Wellbore</b>	Wellbore #1 / Job #1523835				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	HDGM	6/24/2015	7.62	67.35	52,949

<b>Design</b>	Surveys (Unit 409)				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<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	173.25	

<b>Survey Program</b>	<b>Date</b>	7/17/2015			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
324.00	13,836.00	Phoenix MWD Surveys (Wellbore #1 / Job	PHX+MWD+HDGM	PHX+OWSG MWD + HDGM	

<b>Survey</b>										
<b>Measured Depth (usft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Vertical Section (usft)</b>	<b>Dogleg Rate (°/100usft)</b>	<b>Build Rate (°/100usft)</b>	<b>Turn Rate (°/100usft)</b>	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
324.00	0.34	111.54	324.00	-0.35	0.89	0.46	0.10	0.10	0.00	
<b>First Phoenix MWD Survey</b>										
417.00	0.78	101.57	416.99	-0.58	1.77	0.79	0.48	0.47	-10.72	
509.00	1.73	96.90	508.97	-0.87	3.76	1.31	1.04	1.03	-5.08	
601.00	3.13	97.50	600.89	-1.37	7.63	2.26	1.52	1.52	0.65	
694.00	4.15	91.98	693.70	-1.82	13.51	3.39	1.16	1.10	-5.94	
786.00	6.36	91.05	785.30	-2.02	21.94	4.59	2.40	2.40	-1.01	
879.00	8.17	94.18	877.55	-2.60	33.68	6.54	1.99	1.95	3.37	
971.00	9.45	93.93	968.47	-3.59	47.73	9.18	1.39	1.39	-0.27	
1,064.00	11.09	92.30	1,059.97	-4.48	64.29	12.00	1.79	1.76	-1.75	



## Survey Report

<b>Company:</b>	Whiting Oil & Gas Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor FED #12F-1308B
<b>Project:</b>	Weld County, Colorado (NAD 83)	<b>TVD Reference:</b>	RKB @ 4957.80usft (Unit 409)
<b>Site:</b>	Sec.12-T10N-R58W	<b>MD Reference:</b>	RKB @ 4957.80usft (Unit 409)
<b>Well:</b>	Razor FED #12F-1308B	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1 / Job #1523835	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys (Unit 409)	<b>Database:</b>	Compass 5000 RMR

### 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)
1,156.00	13.65	89.10	1,149.83	-4.66	83.99	14.50	2.88	2.78	-3.48
1,248.00	13.17	89.76	1,239.32	-4.45	105.32	16.80	0.55	-0.52	0.72
1,340.00	12.83	89.96	1,328.97	-4.40	126.02	19.18	0.37	-0.37	0.22
1,432.00	12.79	92.00	1,418.68	-4.74	146.41	21.92	0.49	-0.04	2.22
1,524.00	12.80	93.05	1,508.39	-5.64	166.76	25.20	0.25	0.01	1.14
1,616.00	12.64	94.37	1,598.13	-6.95	186.98	28.88	0.36	-0.17	1.43
1,709.00	12.07	95.72	1,688.98	-8.70	206.80	32.94	0.69	-0.61	1.45
1,801.00	11.14	93.37	1,779.10	-10.18	225.24	36.58	1.13	-1.01	-2.55
1,824.00	10.96	92.71	1,801.67	-10.41	229.64	37.33	0.96	-0.78	-2.87
1,982.00	8.64	79.56	1,957.38	-8.97	256.32	39.04	2.03	-1.47	-8.32
2,074.00	11.59	81.58	2,047.94	-6.36	272.27	38.32	3.23	3.21	2.20
2,167.00	14.50	88.27	2,138.53	-4.64	293.15	39.07	3.52	3.13	7.19
2,259.00	13.64	85.85	2,227.77	-3.51	315.48	40.57	1.13	-0.93	-2.63
2,350.00	13.41	85.86	2,316.25	-1.97	336.71	41.54	0.25	-0.25	0.01
2,442.00	12.77	85.03	2,405.86	-0.32	357.48	42.34	0.73	-0.70	-0.90
2,534.00	12.29	81.06	2,495.67	2.08	377.28	42.28	1.07	-0.52	-4.32
2,626.00	11.64	78.42	2,585.67	5.47	396.05	41.12	0.92	-0.71	-2.87
2,718.00	14.79	86.25	2,675.23	8.10	416.86	40.96	3.93	3.42	8.51
2,810.00	14.17	86.51	2,764.31	9.55	439.82	42.21	0.68	-0.67	0.28
2,902.00	13.81	84.44	2,853.58	11.30	461.99	43.08	0.67	-0.39	-2.25
2,994.00	13.12	82.63	2,943.05	13.70	483.27	43.19	0.88	-0.75	-1.97
3,086.00	15.31	85.52	3,032.23	15.99	505.74	43.56	2.50	2.38	3.14
3,178.00	14.39	84.30	3,121.15	18.08	529.23	44.25	1.06	-1.00	-1.33
3,270.00	12.65	81.52	3,210.60	20.70	550.57	44.16	2.02	-1.89	-3.02
3,362.00	12.26	92.28	3,300.45	21.79	570.29	45.39	2.55	-0.42	11.70
3,454.00	10.69	88.32	3,390.61	21.66	588.58	47.68	1.91	-1.71	-4.30
3,546.00	9.38	85.17	3,481.20	22.54	604.58	48.68	1.54	-1.42	-3.42
3,730.00	10.97	92.86	3,662.31	22.93	637.01	52.11	1.13	0.86	4.18
3,822.00	10.15	90.92	3,752.75	22.36	653.86	54.65	0.97	-0.89	-2.11
3,914.00	9.61	90.72	3,843.38	22.13	669.65	56.73	0.59	-0.59	-0.22
4,006.00	11.19	92.89	3,933.87	21.59	686.24	59.22	1.77	1.72	2.36
4,098.00	13.77	92.63	4,023.69	20.63	706.10	62.50	2.81	2.80	-0.28
4,190.00	13.62	90.69	4,113.07	20.00	727.87	65.69	0.53	-0.16	-2.11
4,281.00	13.18	90.52	4,201.60	19.78	748.96	68.39	0.49	-0.48	-0.19
4,373.00	13.54	88.35	4,291.11	19.99	770.21	70.67	0.67	0.39	-2.36
4,465.00	12.80	88.72	4,380.69	20.53	791.16	72.60	0.81	-0.80	0.40
4,557.00	10.84	92.11	4,470.73	20.44	810.00	74.91	2.26	-2.13	3.68
4,649.00	8.69	96.75	4,561.40	19.30	825.55	77.86	2.49	-2.34	5.04
4,741.00	7.03	91.66	4,652.53	18.32	838.08	80.31	1.95	-1.80	-5.53
4,833.00	7.36	96.33	4,743.81	17.51	849.56	82.47	0.73	0.36	5.08
4,925.00	4.76	86.39	4,835.29	17.10	859.23	84.01	3.04	-2.83	-10.80
5,017.00	3.63	86.55	4,927.04	17.52	865.95	84.39	1.23	-1.23	0.17
5,109.00	1.23	116.82	5,018.95	17.25	869.74	85.10	2.87	-2.61	32.90



## Survey Report

<b>Company:</b>	Whiting Oil & Gas Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor FED #12F-1308B
<b>Project:</b>	Weld County, Colorado (NAD 83)	<b>TVD Reference:</b>	RKB @ 4957.80usft (Unit 409)
<b>Site:</b>	Sec.12-T10N-R58W	<b>MD Reference:</b>	RKB @ 4957.80usft (Unit 409)
<b>Well:</b>	Razor FED #12F-1308B	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1 / Job #1523835	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys (Unit 409)	<b>Database:</b>	Compass 5000 RMR

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)
5,201.00	1.29	126.48	5,110.93	16.19	871.45	86.36	0.24	0.07	10.50
5,293.00	1.71	127.30	5,202.90	14.74	873.38	88.02	0.46	0.46	0.89
5,338.00	2.33	128.58	5,247.87	13.76	874.63	89.14	1.38	1.38	2.84
5,385.00	6.36	164.60	5,294.73	10.65	876.07	92.39	9.96	8.57	76.64
5,430.00	13.70	174.52	5,339.02	2.93	877.24	100.19	16.70	16.31	22.04
5,477.00	18.85	178.36	5,384.12	-10.20	877.99	113.33	11.19	10.96	8.17
5,522.00	25.84	182.07	5,425.72	-27.29	877.84	130.28	15.84	15.53	8.24
5,569.00	30.84	179.30	5,467.07	-49.59	877.62	152.40	11.00	10.64	-5.89
5,614.00	33.60	178.32	5,505.14	-73.58	878.12	176.28	6.24	6.13	-2.18
5,661.00	35.51	177.45	5,543.85	-100.21	879.11	202.85	4.20	4.06	-1.85
5,706.00	42.43	177.73	5,578.81	-128.47	880.30	231.05	15.38	15.38	0.62
5,753.00	44.00	176.77	5,613.06	-160.62	881.84	263.15	3.62	3.34	-2.04
5,798.00	50.20	175.72	5,643.68	-193.49	884.02	296.06	13.88	13.78	-2.33
5,845.00	50.72	175.53	5,673.60	-229.63	886.78	332.27	1.15	1.11	-0.40
5,890.00	51.07	175.41	5,701.99	-264.44	889.54	367.16	0.80	0.78	-0.27
5,937.00	54.10	175.14	5,730.54	-301.64	892.62	404.47	6.46	6.45	-0.57
5,982.00	53.95	174.96	5,766.97	-337.92	895.76	440.86	0.46	-0.33	-0.40
6,029.00	58.46	172.30	5,783.11	-376.72	900.11	479.91	10.69	9.60	-5.66
6,074.00	63.13	172.64	5,805.06	-415.65	905.26	519.17	10.40	10.38	0.76
6,122.00	67.67	171.74	5,825.04	-458.88	911.19	562.80	9.61	9.46	-1.88
6,166.00	74.10	172.52	5,839.44	-500.04	916.88	604.34	14.71	14.61	1.77
6,215.00	77.77	171.17	5,851.35	-547.08	923.62	651.85	7.95	7.49	-2.76
6,260.00	79.48	171.05	5,860.22	-590.66	930.44	695.93	3.81	3.80	-0.27
6,307.00	80.59	170.77	5,868.36	-636.37	937.75	742.18	2.43	2.36	-0.60
6,392.00	87.93	169.73	5,876.85	-719.67	952.07	826.58	8.72	8.64	-1.22
6,485.00	90.28	170.61	5,878.30	-811.28	967.94	919.43	2.70	2.53	0.95
6,578.00	92.04	171.32	5,876.42	-903.10	982.55	1,012.33	2.04	1.89	0.76
6,671.00	92.80	173.77	5,872.49	-995.23	994.60	1,105.23	2.76	0.82	2.63
6,765.00	93.50	177.66	5,867.33	-1,088.81	1,001.61	1,198.99	4.20	0.74	4.14
6,858.00	90.20	179.45	5,864.32	-1,181.71	1,003.96	1,291.52	4.04	-3.55	1.92
6,951.00	88.29	181.18	5,865.55	-1,274.69	1,003.45	1,383.80	2.77	-2.05	1.86
7,044.00	88.38	181.03	5,868.25	-1,367.64	1,001.65	1,475.89	0.19	0.10	-0.16
7,137.00	88.01	179.92	5,871.18	-1,460.59	1,000.88	1,568.10	1.26	-0.40	-1.19
7,230.00	89.78	181.59	5,872.97	-1,553.55	999.66	1,660.28	2.62	1.90	1.80
7,323.00	90.50	181.36	5,872.75	-1,646.52	997.26	1,752.32	0.81	0.77	-0.25
7,417.00	91.15	180.83	5,871.39	-1,740.49	995.47	1,845.43	0.89	0.69	-0.56
7,509.00	89.80	180.06	5,870.63	-1,832.49	994.75	1,936.70	1.69	-1.47	-0.84
7,602.00	90.06	180.06	5,870.74	-1,925.48	994.65	2,029.05	0.28	0.28	0.00
7,696.00	89.27	178.63	5,871.29	-2,019.47	995.73	2,122.51	1.74	-0.84	-1.52
7,789.00	88.77	178.88	5,872.88	-2,112.44	997.75	2,215.07	0.60	-0.54	0.27
7,882.00	88.32	178.89	5,875.25	-2,205.39	999.56	2,307.59	0.48	-0.48	0.01
7,975.00	87.71	178.80	5,878.47	-2,298.31	1,001.43	2,400.09	0.66	-0.66	-0.10
8,068.00	89.08	179.27	5,881.07	-2,391.26	1,003.00	2,492.58	1.56	1.47	0.51



## Survey Report

<b>Company:</b>	Whiting Oil & Gas Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor FED #12F-1308B
<b>Project:</b>	Weld County, Colorado (NAD 83)	<b>TVD Reference:</b>	RKB @ 4957.80usft (Unit 409)
<b>Site:</b>	Sec.12-T10N-R58W	<b>MD Reference:</b>	RKB @ 4957.80usft (Unit 409)
<b>Well:</b>	Razor FED #12F-1308B	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1 / Job #1523835	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys (Unit 409)	<b>Database:</b>	Compass 5000 RMR

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)	
8,160.00	91.12	180.05	5,880.91	-2,483.26	1,003.54	2,584.00	2.37	2.22	0.85	
8,253.00	90.95	179.09	5,879.23	-2,576.24	1,004.24	2,676.42	1.05	-0.18	-1.03	
8,346.00	90.90	179.09	5,877.73	-2,669.21	1,005.72	2,768.92	0.05	-0.05	0.00	
8,439.00	90.70	178.80	5,876.43	-2,762.19	1,007.43	2,861.45	0.38	-0.22	-0.31	
8,532.00	90.11	178.80	5,875.77	-2,855.16	1,009.38	2,954.01	0.63	-0.63	0.00	
8,625.00	89.78	181.48	5,875.86	-2,948.16	1,009.15	3,046.33	2.90	-0.35	2.88	
8,718.00	88.91	181.14	5,876.93	-3,041.12	1,007.02	3,138.41	1.00	-0.94	-0.37	
8,810.00	88.94	180.83	5,878.65	-3,133.09	1,005.44	3,229.55	0.34	0.03	-0.34	
8,902.00	88.15	180.02	5,880.99	-3,225.06	1,004.76	3,320.80	1.23	-0.86	-0.88	
8,995.00	87.20	179.52	5,884.76	-3,317.98	1,005.13	3,413.12	1.15	-1.02	-0.54	
9,087.00	88.01	180.04	5,888.61	-3,409.90	1,005.49	3,504.45	1.05	0.88	0.57	
9,179.00	91.23	181.32	5,889.22	-3,501.88	1,004.39	3,595.66	3.77	3.50	1.39	
9,271.00	90.34	178.75	5,887.96	-3,593.86	1,004.34	3,687.00	2.96	-0.97	-2.79	
9,364.00	91.62	180.59	5,886.37	-3,686.84	1,004.87	3,779.39	2.41	1.38	1.98	
9,456.00	91.34	180.38	5,883.99	-3,778.80	1,004.10	3,870.63	0.38	-0.30	-0.23	
9,549.00	90.20	180.79	5,882.74	-3,871.79	1,003.15	3,962.86	1.30	-1.23	0.44	
9,641.00	89.66	180.95	5,882.85	-3,963.78	1,001.75	4,054.05	0.61	-0.59	0.17	
9,734.00	89.30	181.00	5,883.70	-4,056.76	1,000.17	4,146.20	0.39	-0.39	0.05	
9,826.00	89.78	181.48	5,884.43	-4,148.74	998.18	4,237.30	0.74	0.52	0.52	
9,918.00	91.20	181.73	5,883.65	-4,240.69	995.60	4,328.32	1.57	1.54	0.27	
10,010.00	92.24	181.60	5,880.89	-4,332.61	992.93	4,419.29	1.14	1.13	-0.14	
10,102.00	91.60	181.73	5,877.80	-4,424.52	990.26	4,510.25	0.71	-0.70	0.14	
10,194.00	92.74	181.70	5,874.32	-4,516.41	987.50	4,601.18	1.24	1.24	-0.03	
10,287.00	92.60	181.55	5,869.99	-4,609.27	984.87	4,693.08	0.22	-0.15	-0.16	
10,379.00	90.00	181.56	5,867.90	-4,701.21	982.37	4,784.09	2.83	-2.83	0.01	
10,472.00	90.31	181.97	5,867.65	-4,794.16	979.51	4,876.06	0.55	0.33	0.44	
10,564.00	88.49	181.93	5,868.61	-4,886.10	976.38	4,967.00	1.98	-1.98	-0.04	
10,656.00	89.11	182.28	5,870.54	-4,978.02	973.00	5,057.88	0.77	0.67	0.38	
10,748.00	89.72	181.82	5,871.48	-5,069.96	969.71	5,148.79	0.83	0.66	-0.50	
10,840.00	90.36	181.31	5,871.41	-5,161.92	967.20	5,239.82	0.89	0.70	-0.55	
10,932.00	91.48	180.95	5,869.94	-5,253.89	965.38	5,330.94	1.28	1.22	-0.39	
11,024.00	90.28	180.69	5,868.52	-5,345.87	964.07	5,422.13	1.33	-1.30	-0.28	
11,116.00	89.75	181.66	5,868.50	-5,437.85	962.18	5,513.25	1.20	-0.58	1.05	
11,208.00	89.86	180.33	5,868.81	-5,529.83	960.58	5,604.40	1.45	0.12	-1.45	
11,300.00	91.04	181.35	5,868.09	-5,621.81	959.23	5,695.59	1.70	1.28	1.11	
11,392.00	89.75	179.51	5,867.46	-5,713.80	958.54	5,786.86	2.44	-1.40	-2.00	
11,484.00	89.50	179.14	5,868.06	-5,805.79	959.63	5,878.34	0.49	-0.27	-0.40	
11,576.00	89.64	179.17	5,868.75	-5,897.78	960.99	5,969.85	0.16	0.15	0.03	
11,668.00	90.50	178.63	5,868.64	-5,989.76	962.75	6,061.40	1.10	0.93	-0.59	
11,759.00	89.41	178.34	5,868.71	-6,080.73	965.16	6,152.02	1.24	-1.20	-0.32	
11,851.00	89.72	178.27	5,869.41	-6,172.69	967.88	6,243.66	0.35	0.34	-0.08	
11,943.00	89.83	177.94	5,869.77	-6,264.64	970.92	6,335.33	0.38	0.12	-0.36	
12,036.00	89.13	178.45	5,870.61	-6,357.59	973.85	6,427.98	0.93	-0.75	0.55	
12,128.00	89.94	178.67	5,871.36	-6,449.55	976.16	6,519.58	0.91	0.88	0.24	



## Survey Report

<b>Company:</b>	Whiting Oil & Gas Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor FED #12F-1308B
<b>Project:</b>	Weld County, Colorado (NAD 83)	<b>TVD Reference:</b>	RKB @ 4957.80usft (Unit 409)
<b>Site:</b>	Sec.12-T10N-R58W	<b>MD Reference:</b>	RKB @ 4957.80usft (Unit 409)
<b>Well:</b>	Razor FED #12F-1308B	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1 / Job #1523835	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys (Unit 409)	<b>Database:</b>	Compass 5000 RMR

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)
12,220.00	90.73	178.48	5,870.82	-6,541.52	978.45	6,611.18	0.88	0.86	-0.21
12,312.00	89.25	177.89	5,870.84	-6,633.47	981.36	6,702.84	1.73	-1.61	-0.64
12,404.00	89.66	177.87	5,871.71	-6,725.41	984.77	6,794.53	0.45	0.45	-0.02
12,496.00	90.20	178.27	5,871.82	-6,817.35	987.86	6,886.21	0.73	0.59	0.43
12,587.00	89.72	178.27	5,871.89	-6,908.31	990.61	6,976.86	0.53	-0.53	0.00
12,679.00	90.36	178.13	5,871.82	-7,000.27	993.50	7,068.52	0.71	0.70	-0.15
12,771.00	90.34	177.23	5,871.26	-7,092.19	997.23	7,160.24	0.98	-0.02	-0.98
12,863.00	90.39	177.04	5,870.68	-7,184.07	1,001.82	7,252.03	0.21	0.05	-0.21
12,955.00	90.50	176.56	5,869.96	-7,275.92	1,006.96	7,343.85	0.54	0.12	-0.52
13,047.00	88.60	178.09	5,870.68	-7,367.81	1,011.25	7,435.60	2.65	-2.07	1.66
13,139.00	88.43	178.18	5,873.07	-7,459.73	1,014.25	7,527.24	0.21	-0.18	0.10
13,231.00	88.80	177.83	5,875.29	-7,551.65	1,017.45	7,618.89	0.55	0.40	-0.38
13,323.00	89.30	177.48	5,876.82	-7,643.56	1,021.21	7,710.61	0.66	0.54	-0.38
13,415.00	89.05	177.73	5,878.14	-7,735.47	1,025.06	7,802.33	0.38	-0.27	0.27
13,507.00	88.88	179.28	5,879.80	-7,827.42	1,027.46	7,893.93	1.69	-0.18	1.68
13,599.00	89.92	181.00	5,880.77	-7,919.41	1,027.23	7,985.26	2.18	1.13	1.87
13,691.00	90.81	180.84	5,880.18	-8,011.40	1,025.75	8,076.43	0.98	0.97	-0.17
13,783.00	90.28	179.68	5,879.31	-8,103.39	1,025.34	8,167.74	1.39	-0.58	-1.26
Final Phoenix MWD Survey									
13,836.00	90.28	179.68	5,879.05	-8,156.39	1,025.63	8,220.40	0.00	0.00	0.00
Projection to TD									

Survey Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
324.00	324.00	-0.35	0.89	First Phoenix MWD Survey
13,783.00	5,879.31	-8,103.39	1,025.34	Final Phoenix MWD Survey
13,836.00	5,879.05	-8,156.39	1,025.63	Projection to TD

Checked By: _____	Approved By: _____	Date: _____
-------------------	--------------------	-------------