

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

Project: Weld County, Colorado (NAD 83)
Site: Sec.12-T10N-R58W
Well: Razor FED #12F-1305A
Wellbore: OH / Job# 1524099
Design: Plan 2 08-04-15
Rig: Unit 409

WELL DETAILS

+N/-S	+E/-W	Northing	Ground Level: Easting	Latitude	Longitude
0.00	0.00	1558540.625	4936.80 3465308.298	40.854456	-103.817919

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Target	Annotation
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	433.53	2.67	74.66	433.49	0.82	3.00	2.00	74.66	-0.79		Begin 2°/100' Build
4	2165.97	2.67	74.66	2164.04	22.18	80.85	0.00	0.00	-21.35		Hold 2.67° Inc @ 74.66° Azm
5	2299.51	0.00	0.00	2297.53	23.00	83.85	2.00	180.00	-22.15		Begin 2°/100' Drop
6	5377.11	0.00	0.00	5375.13	23.00	83.85	0.00	0.00	-22.15		Begin Vertical Hold
7	6195.29	90.00	180.00	5896.00	-497.87	83.85	11.00	180.00	498.70		KOP, Begin 11°/100' Build
8	13938.81	90.00	180.00	5896.00	-8241.39	83.79	0.00	0.00	8241.81	BHL_#12F-1305Av2	LP, Hold 90° Inc @ 180° Azm

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
BHL_#12F-1305Av2	5896.00	-8241.39	83.79	1550302.310	3465548.390	40.831836	-103.817617	Point

LEGEND

- Razor FED #12F-1305A, OH / Job# 1524099, Surveys (Unit 409) V0
- Razor FED #12F-1308B, Wellbore #1 / Job #1523835, Surveys (Unit 409) V0
- Razor #12F-0105A, OH / Job# 1524095, Surveys (Unit 409) V0
- Razor #12F-0106B, OH / Job# 1524096, Plan 3 11-09-15 V0
- Razor FED #12F-1302B, OH / Job# 1524098, Surveys (Unit 409) V0
- Razor #12F-0104B, Wellbore #1 / Job #1523838, Surveys (Unit 409) V0
- Razor FED #12F-1303A, Wellbore #3 / Job # 1523837, Surveys (Unit 409) V0
- Razor #12F-0107A, Wellbore #2 / Job #1523840, Surveys (Unit 409) V0
- Razor #12F-0107A, Wellbore #1 / Job #1523840, Surveys (Unit 409) V0
- Razor #12F-0103A, OH / Job #1523839, Surveys (Unit 409) V0
- Razor #12F-0102B, OH / Job# 1524094, Surveys (Unit 409) V0
- Razor #12F-0108B, Wellbore #1 / Job #1523841, Surveys (Unit 409) V0
- Razor FED #12F-1307A, Wellbore #1 / Job #1523836, Surveys (Unit 409) V0
- Razor FED #12F-1303A, Wellbore #2 / Job #1523837, Surveys (Unit 409) V0
- Razor FED #12F-1303A, Wellbore #1 / Job #1523837, Surveys (Unit 409) V0
- Razor FED #12F-1301A, OH / Job# 1524097, Surveys (Unit 409) V0
- Razor FED #12F-1304B, Wellbore #1, Surveys V0
- Razor #12F-0101A, OH / Job# 1524093, Surveys (Unit 409) V0
- Razor #12F-0101A, ST01 / Job #1524093, Surveys (Unit 409) V0
- Razor FED #12F-1306B, OH / Job# 1524100, Plan 3 09-25-15 V0
- Razor #12F-0103A, ST01 / Job #1523839, Surveys (Unit 409) V0
- Plan 2 08-04-15

FORMATION TOP DETAILS

TVDPath	MDPath	Formation	DipAngle	DipDir
1600.00	1601.32	Upper Pierre	0.00	179.42
3500.00	3501.98	Hygiene	0.00	179.42
3650.00	3651.98	Lower Pierre	0.00	179.42
5705.00	5734.33	P200 Marker	0.00	179.42
5734.00	5773.01	P300 Marker	0.00	179.42
5751.00	5797.00	P350 Marker	0.00	179.42
5761.00	5811.66	Sharon Springs	0.00	179.42
5768.00	5822.20	Niobrara	0.00	179.42
5797.00	5868.83	Top A Chalk	0.00	179.42
5832.00	5934.36	Top B Marl	0.00	179.42
5853.00	5982.15	A Marl	0.00	179.42
5862.00	6006.05	Top Upper B	0.00	179.42
5886.00	6093.05	Base Upper B	0.00	179.42
5896.00	6193.75	Top Lower B	0.00	179.42

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-1305A, True North

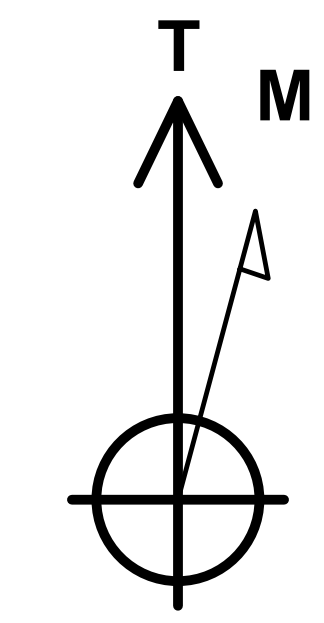
Latitude: 40.854456
Longitude: -103.817919

Grid East: 3465308.298
Grid North: 1558540.625
Scale Factor: 1.000

Geomagnetic Model: USER DEFINED
Sample Date: 12-Nov-15
Magnetic Declination: 7.24°
Dip Angle from Horizontal: 67.18°
Magnetic Field Strength: 52865

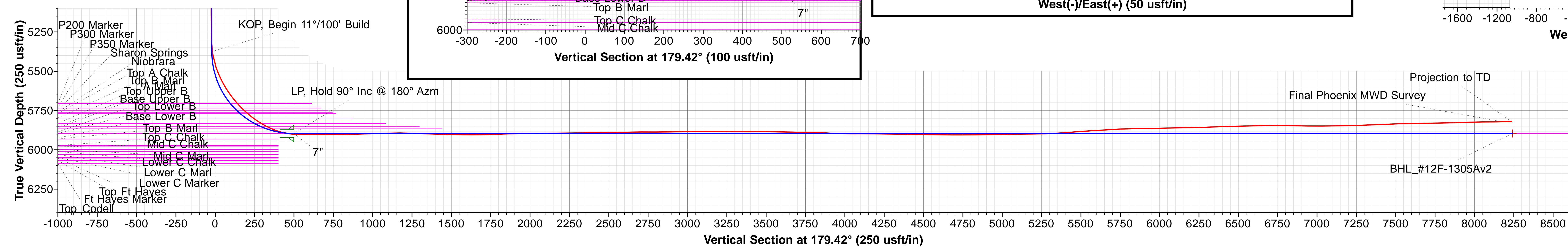
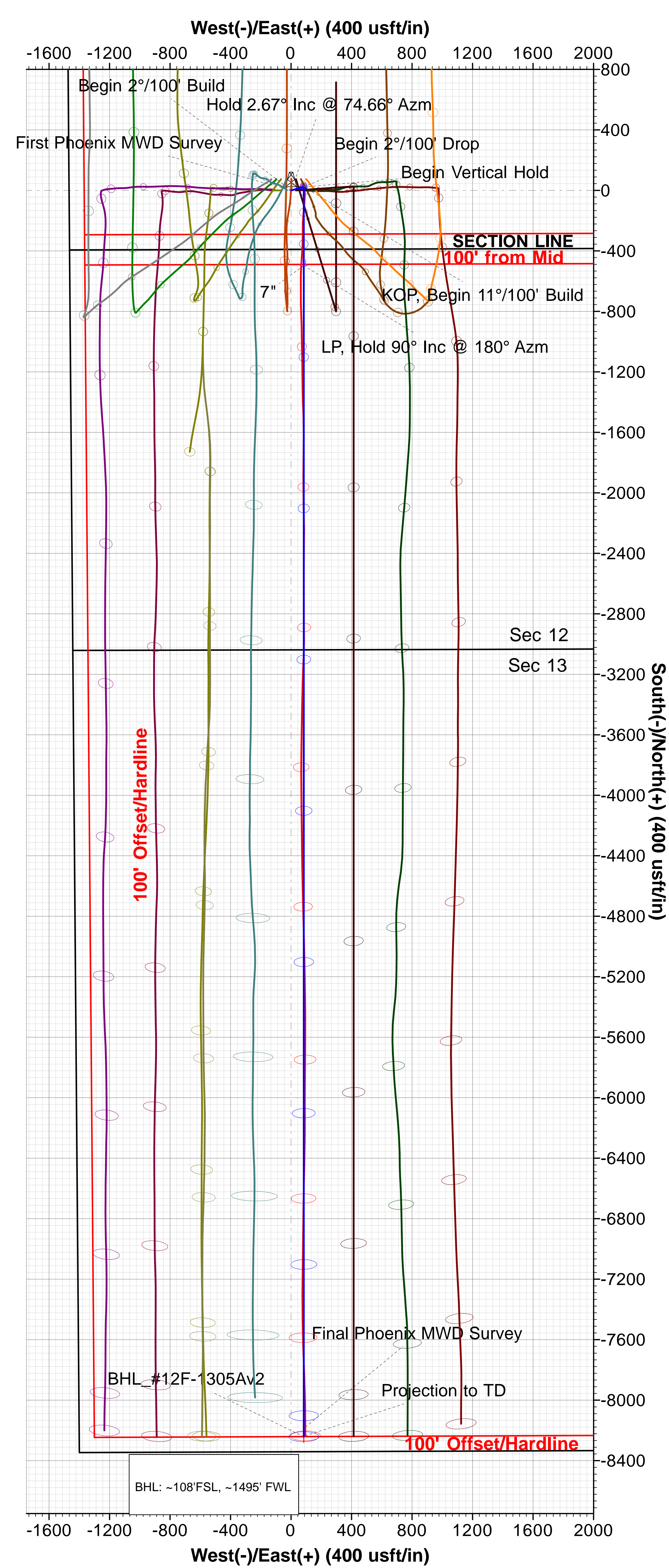
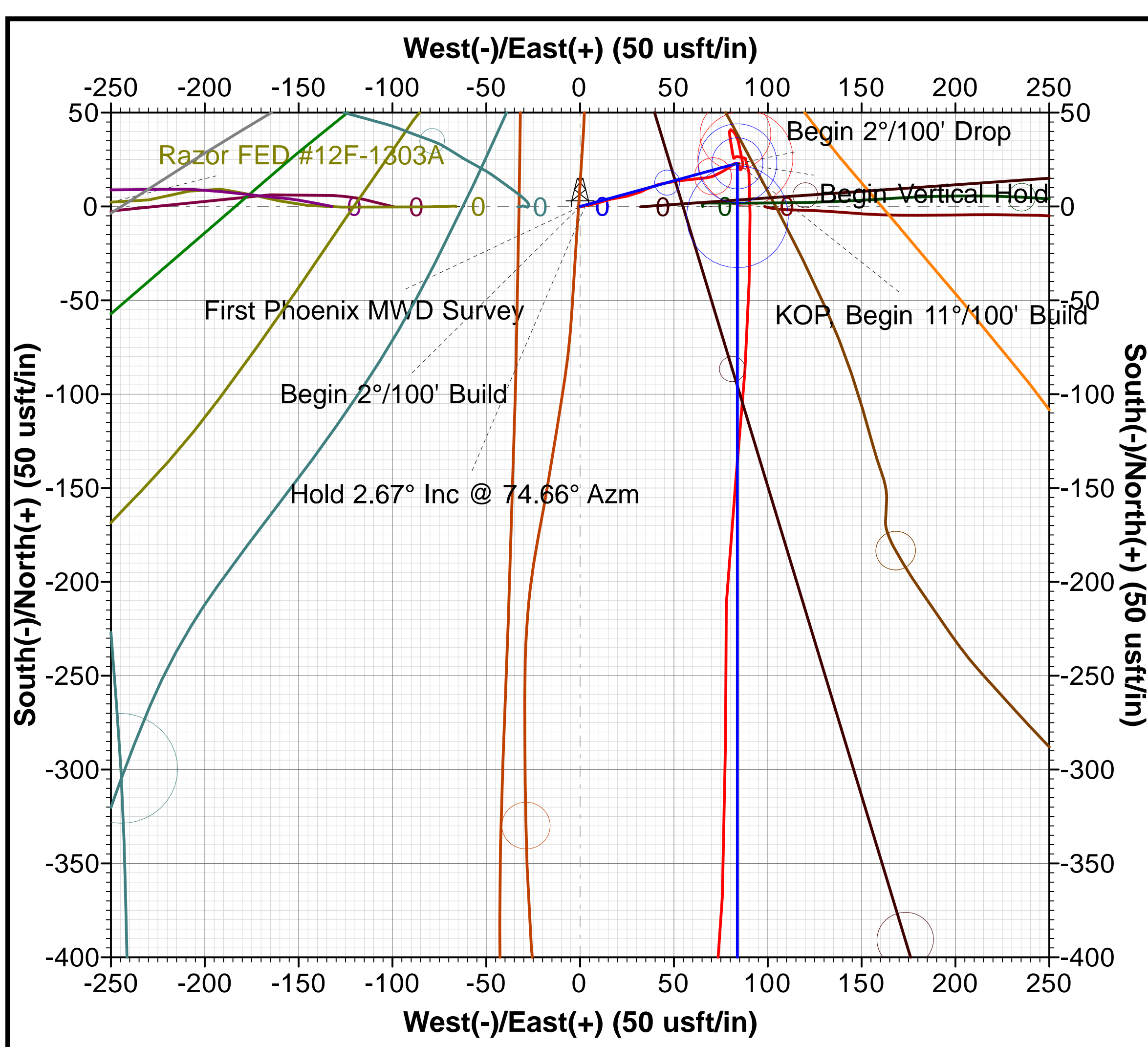
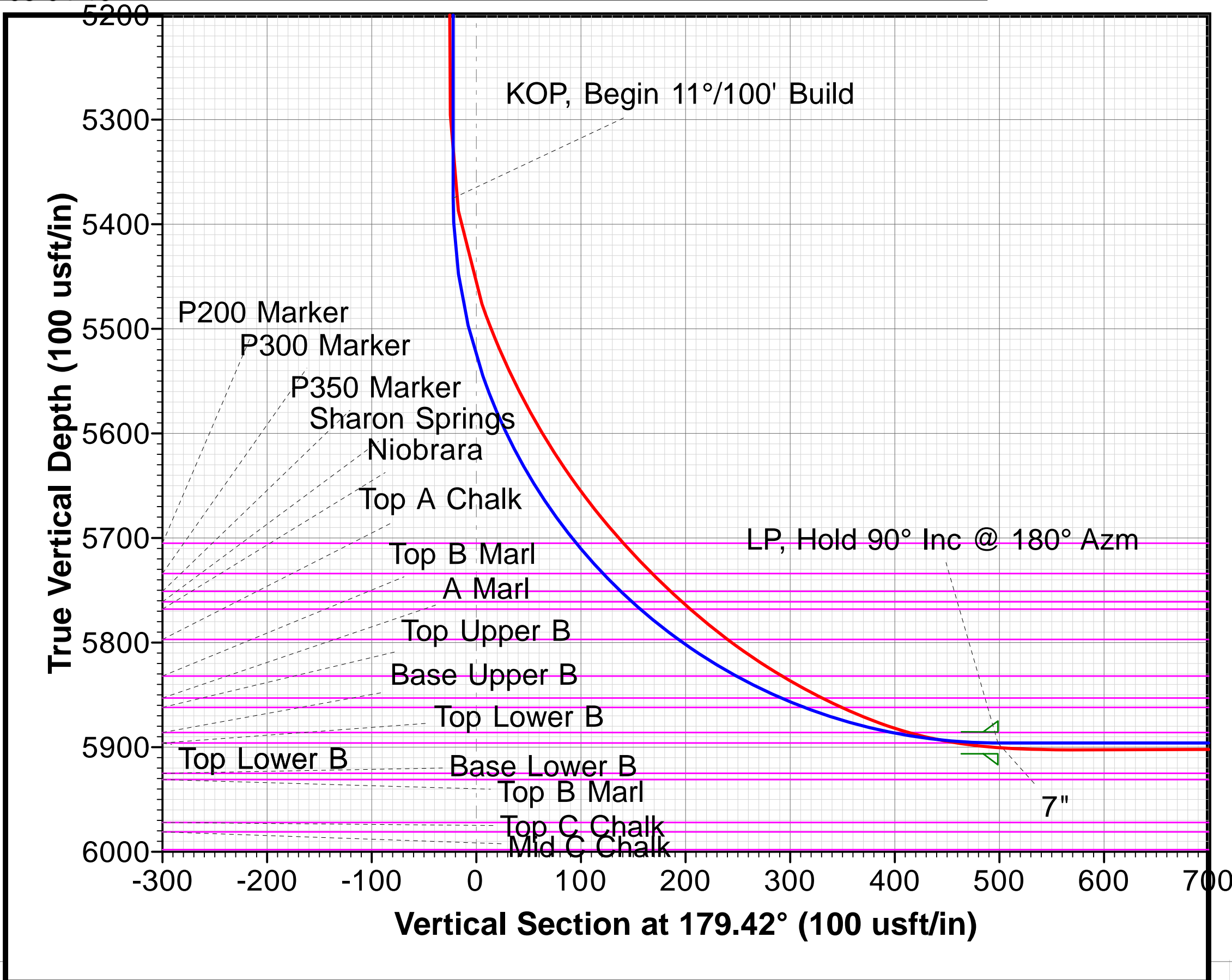
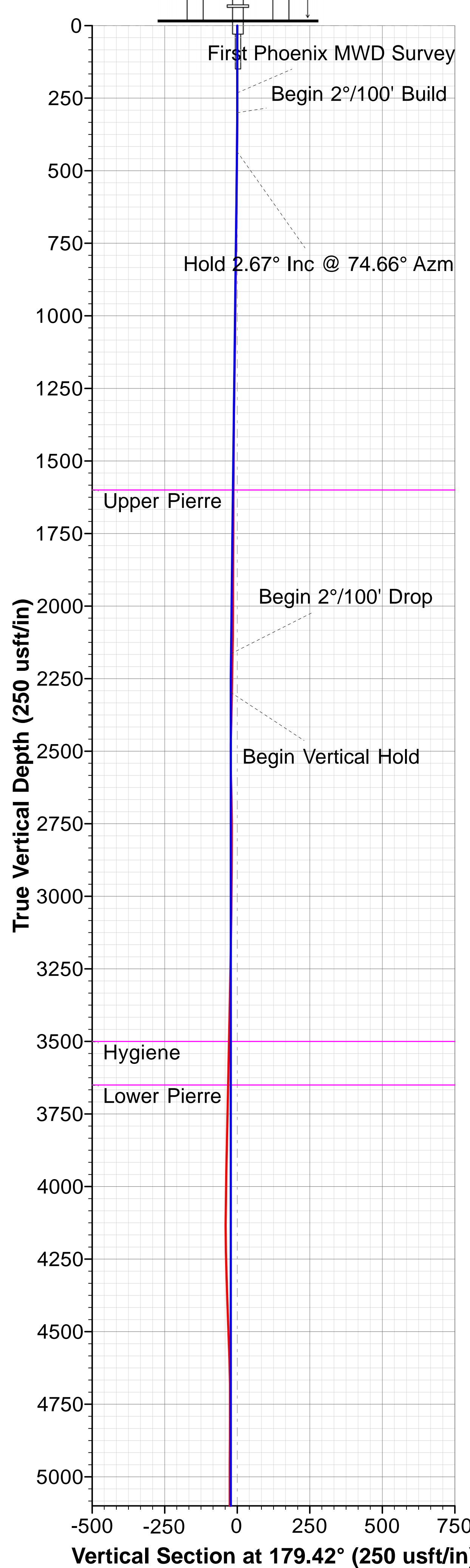
To convert a Magnetic Direction to a Grid Direction, Add 6.15°
To convert a Magnetic Direction to a True Direction, Add 7.24° East
To convert a True Direction to a Grid Direction, Subtract 1.09°

PHOENIX
TECHNOLOGY SERVICES



Azimuths to True North
Magnetic North: 7.24°

Magnetic Field
Strength: 52865.0snT
Dip Angle: 67.18°
Date: 11/12/2015
Model: USER DEFINED





Whiting Oil & Gas Corporation

Weld County, Colorado (NAD 83)

Sec.12-T10N-R58W

Razor FED #12F-1305A

OH / Job# 1524099

Survey: Phoenix MWD Surveys

Standard Survey Report

18 November, 2015





Phoenix Technology Services LP

Survey Report



Company:	Whiting Oil & Gas Corporation	Local Co-ordinate Reference:	Well Razor FED #12F-1305A
Project:	Weld County, Colorado (NAD 83)	TVD Reference:	RKB @ 4957.80usft (Unit 409)
Site:	Sec.12-T10N-R58W	MD Reference:	RKB @ 4957.80usft (Unit 409)
Well:	Razor FED #12F-1305A	North Reference:	True
Wellbore:	OH / Job# 1524099	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Unit 409)	Database:	Compass 5000 RMR

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		

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-1305A				
Well Position	+N/-S	0.00 usft	Northing:	1,558,540.625 usft	Latitude:	40.854456
	+E/-W	0.00 usft	Easting:	3,465,308.298 usft	Longitude:	-103.817920
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	4,936.80 usft

Wellbore	OH / Job# 1524099				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	User Defined	11/12/2015	7.24	67.18	52,865

Design	Surveys (Unit 409)				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	179.42	

Survey Program	Date	11/18/2015			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
232.00	13,910.00	Phoenix MWD Surveys (OH / Job# 152409	PHX+MWD+IFR1+MS	PHX+OWSG MWD + IFR1 + Multi-Station Correction	

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
232.00	0.42	241.30	232.00	-0.41	-0.75	0.40	0.18	0.18	0.00
First Phoenix MWD Survey									
324.00	2.20	74.40	323.98	-0.10	0.66	0.10	2.84	1.93	-181.41
416.00	2.22	80.30	415.91	0.68	4.12	-0.64	0.25	0.02	6.41
508.00	2.85	77.16	507.82	1.49	8.10	-1.41	0.70	0.68	-3.41
601.00	2.65	70.63	600.71	2.72	12.39	-2.59	0.40	-0.22	-7.02
693.00	2.80	77.22	692.61	3.92	16.58	-3.75	0.38	0.16	7.16
878.00	2.46	82.19	877.41	5.46	24.92	-5.20	0.22	-0.18	2.69
1,063.00	2.40	62.70	1,062.25	7.77	32.30	-7.45	0.45	-0.03	-10.54
1,155.00	2.13	64.66	1,154.18	9.39	35.56	-9.03	0.31	-0.29	2.13



Phoenix Technology Services LP

Survey Report



Company:	Whiting Oil & Gas Corporation	Local Co-ordinate Reference:	Well Razor FED #12F-1305A
Project:	Weld County, Colorado (NAD 83)	TVD Reference:	RKB @ 4957.80usft (Unit 409)
Site:	Sec.12-T10N-R58W	MD Reference:	RKB @ 4957.80usft (Unit 409)
Well:	Razor FED #12F-1305A	North Reference:	True
Wellbore:	OH / Job# 1524099	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Unit 409)	Database:	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)
1,340.00	2.17	74.17	1,339.05	11.81	42.03	-11.39	0.19	0.02	5.14
1,616.00	2.19	85.11	1,614.85	13.69	52.31	-13.16	0.15	0.01	3.96
1,708.00	2.02	84.22	1,706.79	14.00	55.68	-13.44	0.19	-0.18	-0.97
1,928.00	2.33	83.31	1,926.63	14.91	63.98	-14.27	0.14	0.14	-0.41
2,021.00	2.10	85.32	2,019.56	15.27	67.55	-14.59	0.26	-0.25	2.16
2,113.00	2.18	66.07	2,111.50	16.12	70.83	-15.40	0.78	0.09	-20.92
2,202.00	2.24	62.26	2,200.43	17.62	73.92	-16.87	0.18	0.07	-4.28
2,294.00	2.15	61.56	2,292.36	19.28	77.03	-18.50	0.10	-0.10	-0.76
2,387.00	2.04	53.03	2,385.30	21.10	79.89	-20.29	0.36	-0.12	-9.17
2,478.00	2.27	54.88	2,476.24	23.11	82.65	-22.28	0.26	0.25	2.03
2,570.00	1.41	162.31	2,568.21	23.08	84.49	-22.23	3.27	-0.93	116.77
2,662.00	1.58	170.99	2,660.18	20.75	85.03	-19.89	0.31	0.18	9.43
2,755.00	0.22	79.31	2,753.17	19.52	85.41	-18.65	1.72	-1.46	-98.58
2,847.00	0.44	30.50	2,845.16	19.86	85.76	-18.99	0.37	0.24	-53.05
2,939.00	0.42	36.76	2,937.16	20.43	86.14	-19.56	0.06	-0.02	6.80
3,031.00	0.67	27.27	3,029.16	21.18	86.59	-20.30	0.29	0.27	-10.32
3,123.00	0.85	351.65	3,121.15	22.33	86.74	-21.45	0.54	0.20	-38.72
3,215.00	0.76	351.59	3,213.14	23.61	86.55	-22.73	0.10	-0.10	-0.07
3,307.00	1.14	352.65	3,305.13	25.12	86.34	-24.25	0.41	0.41	1.15
3,767.00	1.38	343.86	3,765.02	34.98	84.22	-34.13	0.07	0.05	-1.91
3,951.00	0.99	328.82	3,948.98	38.47	82.78	-37.63	0.27	-0.21	-8.17
4,043.00	1.17	316.24	4,040.96	39.83	81.72	-39.00	0.32	0.20	-13.67
4,135.00	1.02	300.37	4,132.94	40.92	80.36	-40.10	0.37	-0.16	-17.25
4,227.00	1.66	180.48	4,224.93	40.00	79.64	-39.19	2.55	0.70	-130.32
4,319.00	1.63	172.18	4,316.89	37.37	79.81	-36.56	0.26	-0.03	-9.02
4,411.00	2.07	169.53	4,408.84	34.44	80.29	-33.63	0.49	0.48	-2.88
4,503.00	1.91	170.60	4,500.79	31.30	80.84	-30.48	0.18	-0.17	1.16
4,595.00	2.50	171.19	4,592.72	27.80	81.40	-26.97	0.64	0.64	0.64
4,686.00	0.29	125.36	4,683.69	25.71	81.89	-24.88	2.54	-2.43	-50.36
4,778.00	0.19	41.71	4,775.69	25.68	82.18	-24.85	0.36	-0.11	-90.92
4,870.00	0.41	38.94	4,867.69	26.05	82.49	-25.22	0.24	0.24	-3.01
4,961.00	0.40	64.01	4,958.69	26.45	82.98	-25.61	0.19	-0.01	27.55
5,053.00	0.45	90.96	5,050.68	26.58	83.63	-25.73	0.22	0.05	29.29
5,146.00	0.61	100.81	5,143.68	26.48	84.48	-25.63	0.20	0.17	10.59
5,238.00	1.65	103.80	5,235.66	26.07	86.25	-25.20	1.13	1.13	3.25
5,298.00	1.88	100.14	5,295.63	25.70	88.06	-24.80	0.43	0.38	-6.10
5,390.00	9.15	176.62	5,387.21	18.11	89.98	-17.20	9.67	7.90	83.13
5,482.00	19.33	179.42	5,476.26	-4.48	90.57	5.39	11.09	11.07	3.04
5,574.00	27.06	181.79	5,560.76	-40.67	90.07	41.58	8.46	8.40	2.58
5,666.00	34.82	183.45	5,639.61	-87.88	87.83	88.76	8.48	8.43	1.80
5,758.00	42.91	185.86	5,711.19	-145.35	83.04	146.19	8.94	8.79	2.62
5,850.00	49.57	183.10	5,774.79	-211.55	77.94	212.33	7.56	7.24	-3.00
5,942.00	58.62	177.91	5,828.71	-285.95	77.48	286.72	10.84	9.84	-5.64



Phoenix Technology Services LP

Survey Report



Company:	Whiting Oil & Gas Corporation	Local Co-ordinate Reference:	Well Razor FED #12F-1305A
Project:	Weld County, Colorado (NAD 83)	TVD Reference:	RKB @ 4957.80usft (Unit 409)
Site:	Sec.12-T10N-R58W	MD Reference:	RKB @ 4957.80usft (Unit 409)
Well:	Razor FED #12F-1305A	North Reference:	True
Wellbore:	OH / Job# 1524099	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Unit 409)	Database:	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)
6,034.00	67.43	184.13	5,870.44	-367.79	75.85	368.54	11.31	9.58	6.76
6,126.00	80.79	183.82	5,895.57	-455.86	69.74	456.54	14.53	14.52	-0.34
6,181.00	87.31	182.78	5,901.27	-510.44	66.59	511.09	12.00	11.85	-1.89
6,238.00	89.94	181.25	5,902.63	-567.38	64.59	568.01	5.34	4.61	-2.68
6,426.00	90.34	178.53	5,902.18	-755.37	64.95	755.98	1.46	0.21	-1.45
6,519.00	91.20	177.88	5,900.93	-848.31	67.86	848.95	1.16	0.92	-0.70
6,612.00	91.40	179.35	5,898.82	-941.26	70.11	941.92	1.59	0.22	1.58
6,705.00	91.85	178.52	5,896.18	-1,034.20	71.84	1,034.88	1.01	0.48	-0.89
6,797.00	91.29	179.24	5,893.66	-1,126.15	73.64	1,126.84	0.99	-0.61	0.78
6,890.00	88.18	179.30	5,894.09	-1,219.13	74.82	1,219.82	3.34	-3.34	0.06
6,983.00	88.10	179.17	5,897.11	-1,312.07	76.06	1,312.77	0.16	-0.09	-0.14
7,076.00	88.52	178.22	5,899.85	-1,405.01	78.18	1,405.73	1.12	0.45	-1.02
7,169.00	88.35	177.57	5,902.39	-1,497.91	81.59	1,498.66	0.72	-0.18	-0.70
7,262.00	89.24	179.91	5,904.34	-1,590.86	83.64	1,591.62	2.69	0.96	2.52
7,355.00	91.20	181.24	5,903.99	-1,683.85	82.70	1,684.60	2.55	2.11	1.43
7,448.00	92.50	179.91	5,900.99	-1,776.79	81.77	1,777.53	2.00	1.40	-1.43
7,541.00	90.92	180.29	5,898.21	-1,869.74	81.61	1,870.47	1.75	-1.70	0.41
7,633.00	90.81	179.48	5,896.82	-1,961.73	81.79	1,962.46	0.89	-0.12	-0.88
7,726.00	90.67	179.57	5,895.62	-2,054.72	82.56	2,055.45	0.18	-0.15	0.10
7,819.00	91.01	178.51	5,894.26	-2,147.70	84.12	2,148.44	1.20	0.37	-1.14
7,912.00	89.83	179.32	5,893.58	-2,240.68	85.88	2,241.43	1.54	-1.27	0.87
8,005.00	91.90	181.09	5,892.17	-2,333.66	85.55	2,334.40	2.93	2.23	1.90
8,098.00	90.11	179.91	5,890.54	-2,426.63	84.74	2,427.37	2.31	-1.92	-1.27
8,191.00	90.81	180.23	5,889.79	-2,519.63	84.63	2,520.36	0.83	0.75	0.34
8,284.00	91.56	180.15	5,887.87	-2,612.61	84.32	2,613.33	0.81	0.81	-0.09
8,377.00	89.97	180.04	5,886.63	-2,705.60	84.16	2,706.31	1.71	-1.71	-0.12
8,469.00	89.83	179.38	5,886.79	-2,797.59	84.63	2,798.31	0.73	-0.15	-0.72
8,562.00	91.29	179.61	5,885.88	-2,890.58	85.45	2,891.30	1.59	1.57	0.25
8,655.00	90.50	180.39	5,884.43	-2,983.57	85.45	2,984.28	1.19	-0.85	0.84
8,747.00	90.22	182.23	5,883.85	-3,075.54	83.35	3,076.23	2.02	-0.30	2.00
8,840.00	89.69	182.41	5,883.92	-3,168.46	79.58	3,169.11	0.60	-0.57	0.19
8,932.00	89.91	181.90	5,884.24	-3,260.40	76.12	3,261.00	0.60	0.24	-0.55
9,024.00	89.36	180.27	5,884.83	-3,352.38	74.38	3,352.96	1.87	-0.60	-1.77
9,117.00	91.12	181.99	5,884.44	-3,445.35	72.55	3,445.91	2.65	1.89	1.85
9,209.00	88.46	180.25	5,884.78	-3,537.32	70.75	3,537.86	3.45	-2.89	-1.89
9,301.00	88.91	181.22	5,886.89	-3,629.29	69.57	3,629.81	1.16	0.49	1.05
9,393.00	89.94	181.04	5,887.81	-3,721.26	67.75	3,721.76	1.14	1.12	-0.20
9,486.00	87.76	180.07	5,889.68	-3,814.23	66.85	3,814.71	2.57	-2.34	-1.04
9,579.00	86.58	179.07	5,894.27	-3,907.11	67.55	3,907.60	1.66	-1.27	-1.08
9,672.00	89.64	179.93	5,897.34	-4,000.05	68.36	4,000.54	3.42	3.29	0.92
9,764.00	90.00	179.36	5,897.63	-4,092.05	68.93	4,092.53	0.73	0.39	-0.62
9,856.00	89.30	179.23	5,898.19	-4,184.04	70.06	4,184.53	0.77	-0.76	-0.14
9,948.00	89.08	179.34	5,899.49	-4,276.02	71.21	4,276.52	0.27	-0.24	0.12



Phoenix Technology Services LP

Survey Report



Company:	Whiting Oil & Gas Corporation	Local Co-ordinate Reference:	Well Razor FED #12F-1305A
Project:	Weld County, Colorado (NAD 83)	TVD Reference:	RKB @ 4957.80usft (Unit 409)
Site:	Sec.12-T10N-R58W	MD Reference:	RKB @ 4957.80usft (Unit 409)
Well:	Razor FED #12F-1305A	North Reference:	True
Wellbore:	OH / Job# 1524099	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Unit 409)	Database:	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)
10,040.00	89.39	179.18	5,900.72	-4,368.00	72.40	4,368.51	0.38	0.34	-0.17
10,132.00	89.14	179.14	5,901.90	-4,459.99	73.75	4,460.50	0.28	-0.27	-0.04
10,224.00	88.99	178.68	5,903.40	-4,551.96	75.50	4,552.49	0.53	-0.16	-0.50
10,316.00	89.27	178.81	5,904.79	-4,643.92	77.51	4,644.47	0.34	0.30	0.14
10,409.00	90.17	178.63	5,905.25	-4,736.90	79.59	4,737.46	0.99	0.97	-0.19
10,501.00	90.61	178.51	5,904.62	-4,828.87	81.88	4,829.45	0.50	0.48	-0.13
10,593.00	91.26	178.57	5,903.12	-4,920.83	84.23	4,921.43	0.71	0.71	0.07
10,777.00	90.81	178.80	5,899.80	-5,104.75	88.45	5,105.38	0.27	-0.24	0.13
10,869.00	90.00	179.13	5,899.15	-5,196.73	90.11	5,197.37	0.95	-0.88	0.36
10,961.00	92.21	179.06	5,897.37	-5,288.69	91.56	5,289.35	2.40	2.40	-0.08
11,053.00	94.06	179.29	5,892.34	-5,380.54	92.89	5,381.21	2.03	2.01	0.25
11,145.00	94.99	179.69	5,885.08	-5,472.25	93.70	5,472.92	1.10	1.01	0.43
11,237.00	92.72	180.28	5,878.90	-5,564.04	93.73	5,564.70	2.55	-2.47	0.64
11,329.00	94.09	180.39	5,873.44	-5,655.87	93.19	5,656.52	1.49	1.49	0.12
11,421.00	92.79	180.20	5,867.92	-5,747.70	92.72	5,748.35	1.43	-1.41	-0.21
11,513.00	90.11	180.79	5,865.59	-5,839.66	91.92	5,840.29	2.98	-2.91	0.64
11,605.00	90.95	180.14	5,864.74	-5,931.65	91.18	5,932.27	1.15	0.91	-0.71
11,697.00	92.38	180.04	5,862.06	-6,023.61	91.03	6,024.22	1.56	1.55	-0.11
11,789.00	90.31	179.92	5,859.90	-6,115.58	91.06	6,116.19	2.25	-2.25	-0.13
11,881.00	91.40	180.21	5,858.53	-6,207.57	90.96	6,208.17	1.23	1.18	0.32
11,973.00	91.65	181.33	5,856.08	-6,299.53	89.72	6,300.11	1.25	0.27	1.22
12,065.00	92.99	180.62	5,852.36	-6,391.43	88.16	6,392.00	1.65	1.46	-0.77
12,157.00	90.22	181.40	5,849.78	-6,483.37	86.54	6,483.92	3.13	-3.01	0.85
12,248.00	91.81	180.81	5,848.17	-6,574.34	84.78	6,574.86	1.86	1.75	-0.65
12,340.00	91.62	181.28	5,845.42	-6,666.28	83.11	6,666.78	0.55	-0.21	0.51
12,432.00	89.50	180.93	5,844.52	-6,758.26	81.33	6,758.73	2.34	-2.30	-0.38
12,524.00	88.10	180.38	5,846.44	-6,850.23	80.28	6,850.69	1.63	-1.52	-0.60
12,615.00	89.50	180.53	5,848.35	-6,941.20	79.56	6,941.65	1.55	1.54	0.16
12,707.00	90.31	181.06	5,848.50	-7,033.19	78.28	7,033.62	1.05	0.88	0.58
12,800.00	91.04	180.69	5,847.41	-7,126.17	76.86	7,126.59	0.88	0.78	-0.40
12,892.00	91.34	180.77	5,845.50	-7,218.15	75.69	7,218.54	0.34	0.33	0.09
12,984.00	92.27	179.86	5,842.60	-7,310.10	75.18	7,310.48	1.41	1.01	-0.99
13,076.00	91.96	179.57	5,839.20	-7,402.03	75.64	7,402.42	0.46	-0.34	-0.32
13,168.00	92.83	178.85	5,835.36	-7,493.94	76.91	7,494.34	1.23	0.95	-0.78
13,261.00	90.59	178.50	5,832.58	-7,586.87	79.06	7,587.28	2.44	-2.41	-0.38
13,353.00	91.09	178.60	5,831.23	-7,678.83	81.39	7,679.26	0.55	0.54	0.11
13,445.00	90.84	178.00	5,829.69	-7,770.78	84.11	7,771.23	0.71	-0.27	-0.65
13,537.00	91.51	177.85	5,827.80	-7,862.70	87.45	7,863.18	0.75	0.73	-0.16
13,628.00	92.29	177.67	5,824.78	-7,953.58	91.00	7,954.09	0.88	0.86	-0.20
13,721.00	90.39	179.83	5,822.61	-8,046.52	93.03	8,047.05	3.09	-2.04	2.32
13,813.00	90.36	179.49	5,822.00	-8,138.52	93.57	8,139.05	0.37	-0.03	-0.37
13,853.00	90.81	179.83	5,821.60	-8,178.51	93.81	8,179.04	1.41	1.13	0.85
Final Phoenix MWD Survey									
13,910.00	90.81	179.83	5,820.79	-8,235.51	93.98	8,236.04	0.00	0.00	0.00



Phoenix Technology Services LP

Survey Report



Company:	Whiting Oil & Gas Corporation	Local Co-ordinate Reference:	Well Razor FED #12F-1305A
Project:	Weld County, Colorado (NAD 83)	TVD Reference:	RKB @ 4957.80usft (Unit 409)
Site:	Sec.12-T10N-R58W	MD Reference:	RKB @ 4957.80usft (Unit 409)
Well:	Razor FED #12F-1305A	North Reference:	True
Wellbore:	OH / Job# 1524099	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Unit 409)	Database:	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)
Projection to TD									

Survey Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
232.00	232.00	-0.41	-0.75	First Phoenix MWD Survey
13,853.00	5,821.60	-8,178.51	93.81	Final Phoenix MWD Survey
13,910.00	5,820.79	-8,235.51	93.98	Projection to TD

Checked By: _____	Approved By: _____	Date: _____
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