

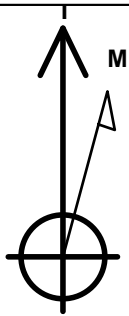
# Whiting Oil & Gas

## Well Name: Wolf #12L-0103

Surface Location: Wolf 12L Pad Sec.12-T10N-R59W  
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone  
Ground Elevation: 4952.6  
+N/-S +E/-W Northing Easting Latitude Longitude Slot  
0.0 0.0 1557393.51 3433013.10 40.852931 -103.934714  
Original Well Elev WELL @ 4969.9ft (Original Well Elev)

### WELLBORE TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 2558'FNL, 619'FWL, SEC.12	1.0	0.0	0.0	Point
BHL 600'FNL, 825'FWL, SEC.1	6139.0	7164.1	640.8	Point



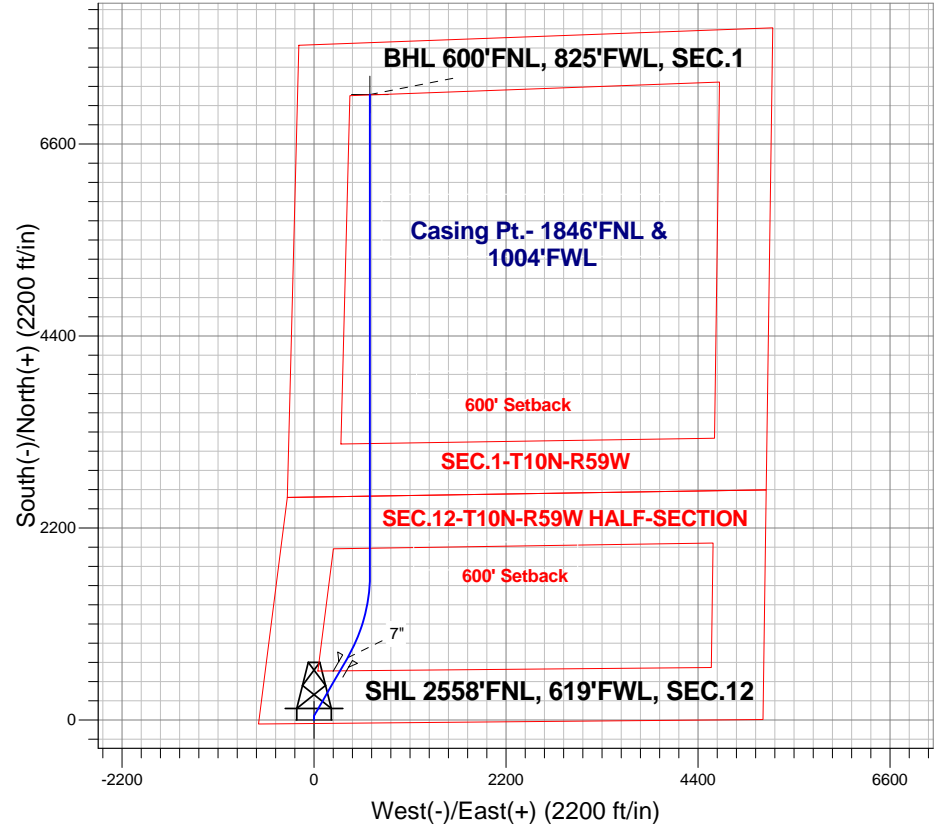
Azimuths to True North  
Magnetic North: 8.09°

Magnetic Field  
Strength: 53176.7snT  
Dip Angle: 67.46°  
Date: 1/16/2014  
Model: IGRF2010

### ANNOTATIONS

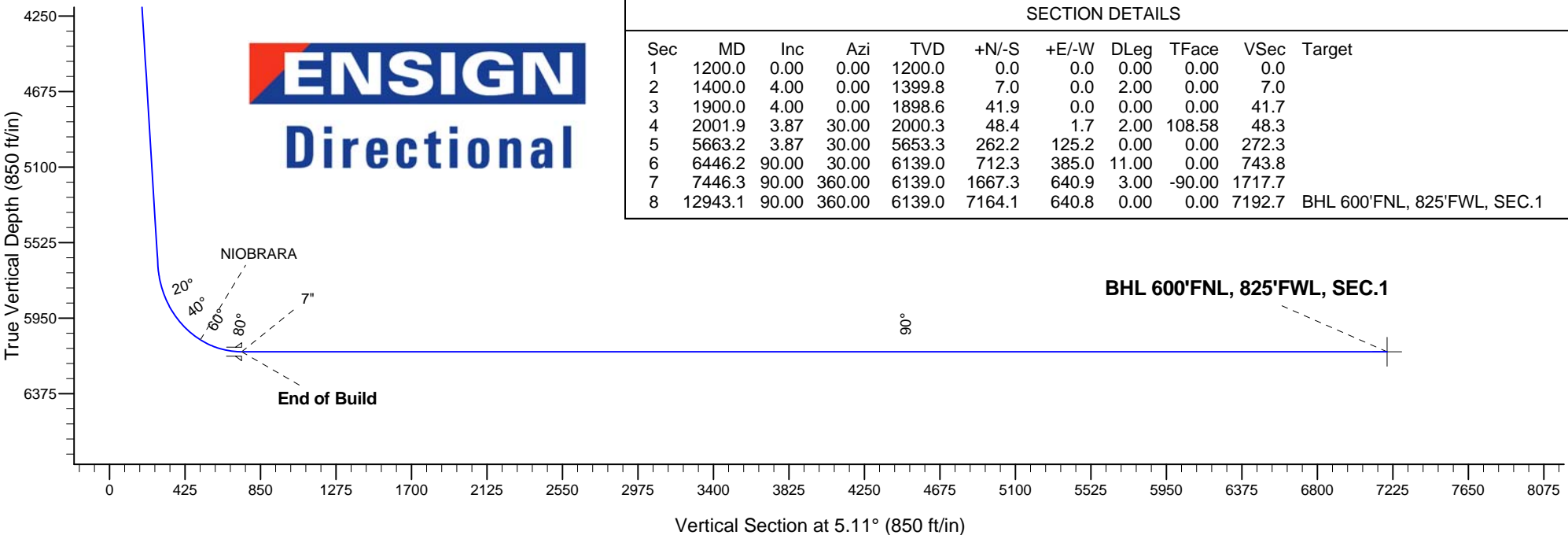
TVD	MD	Annotation
1200.0	1200.0	Tie-in Point
6139.0	6446.3	End of Build

Wolf 12L Pad Sec.12-T10N-R59W  
Wolf #12L-0103  
Plan #1 Sidetrack (1-16-14)  
13:20, January 17 2014



### SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	1200.0	0.00	0.00	1200.0	0.0	0.0	0.00	0.00	0.0	
2	1400.0	4.00	0.00	1399.8	7.0	0.0	2.00	0.00	7.0	
3	1900.0	4.00	0.00	1898.6	41.9	0.0	0.00	0.00	41.7	
4	2001.9	3.87	30.00	2000.3	48.4	1.7	2.00	108.58	48.3	
5	5663.2	3.87	30.00	5653.3	262.2	125.2	0.00	0.00	272.3	
6	6446.2	90.00	30.00	6139.0	712.3	385.0	11.00	0.00	743.8	
7	7446.3	90.00	360.00	6139.0	1667.3	640.9	3.00	-90.00	1717.7	
8	12943.1	90.00	360.00	6139.0	7164.1	640.8	0.00	0.00	7192.7	BHL 600'FNL, 825'FWL, SEC.1





## **Whiting Oil & Gas**

**Sec.12-T10N-R59W**

**Wolf 12L Pad Sec.12-T10N-R59W**

**Wolf #12L-0103**

**Wellbore #2**

**Plan: Plan #1 Sidetrack (1-16-14)**

## **Standard Planning Report**

**17 January, 2014**

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,400.0	4.00	0.00	1,399.8	7.0	0.0	2.00	2.00	0.00	0.00	
1,900.0	4.00	0.00	1,898.6	41.9	0.0	0.00	0.00	0.00	0.00	
2,001.9	3.87	30.00	2,000.3	48.4	1.7	2.00	-0.13	29.43	108.58	
5,663.2	3.87	30.00	5,653.3	262.2	125.2	0.00	0.00	0.00	0.00	
6,446.2	90.00	30.00	6,139.0	712.3	385.0	11.00	11.00	0.00	0.00	
7,446.3	90.00	360.00	6,139.0	1,667.3	640.9	3.00	0.00	-3.00	-90.00	
12,943.1	90.00	360.00	6,139.0	7,164.1	640.8	0.00	0.00	0.00	0.00	BHL 600'FNL, 825'

<b>Database:</b>	Landmark	<b>Local Co-ordinate Reference:</b>	Well Wolf #12L-0103
<b>Company:</b>	Whiting Oil & Gas	<b>TVD Reference:</b>	WELL @ 4969.9ft (Original Well Elev)
<b>Project:</b>	Sec.12-T10N-R59W	<b>MD Reference:</b>	WELL @ 4969.9ft (Original Well Elev)
<b>Site:</b>	Wolf 12L Pad Sec.12-T10N-R59W	<b>North Reference:</b>	True
<b>Well:</b>	Wolf #12L-0103	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #2		
<b>Design:</b>	Plan #1 Sidetrack (1-16-14)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>Tie-in Point - SHL 2558'FNL, 619'FWL, SEC.12</b>									
1,240.0	0.80	0.00	1,240.0	0.3	0.0	0.3	2.00	2.00	0.00
1,280.0	1.60	0.00	1,280.0	1.1	0.0	1.1	2.00	2.00	0.00
1,320.0	2.40	0.00	1,320.0	2.5	0.0	2.5	2.00	2.00	0.00
1,360.0	3.20	0.00	1,359.9	4.5	0.0	4.4	2.00	2.00	0.00
1,400.0	4.00	0.00	1,399.8	7.0	0.0	7.0	2.00	2.00	0.00
1,440.0	4.00	0.00	1,439.7	9.8	0.0	9.7	0.00	0.00	0.00
1,480.0	4.00	0.00	1,479.6	12.6	0.0	12.5	0.00	0.00	0.00
1,520.0	4.00	0.00	1,519.5	15.3	0.0	15.3	0.00	0.00	0.00
1,560.0	4.00	0.00	1,559.4	18.1	0.0	18.1	0.00	0.00	0.00
1,600.0	4.00	0.00	1,599.4	20.9	0.0	20.8	0.00	0.00	0.00
1,640.0	4.00	0.00	1,639.3	23.7	0.0	23.6	0.00	0.00	0.00
1,664.8	4.00	0.00	1,664.0	25.5	0.0	25.3	0.00	0.00	0.00
<b>PIERRE</b>									
1,680.0	4.00	0.00	1,679.2	26.5	0.0	26.4	0.00	0.00	0.00
1,720.0	4.00	0.00	1,719.1	29.3	0.0	29.2	0.00	0.00	0.00
1,760.0	4.00	0.00	1,759.0	32.1	0.0	32.0	0.00	0.00	0.00
1,800.0	4.00	0.00	1,798.9	34.9	0.0	34.7	0.00	0.00	0.00
1,840.0	4.00	0.00	1,838.8	37.7	0.0	37.5	0.00	0.00	0.00
1,880.0	4.00	0.00	1,878.7	40.5	0.0	40.3	0.00	0.00	0.00
1,900.0	4.00	0.00	1,898.6	41.9	0.0	41.7	0.00	0.00	0.00
1,920.0	3.89	5.60	1,918.6	43.2	0.1	43.1	2.00	-0.54	27.98
1,960.0	3.79	17.47	1,958.5	45.8	0.6	45.7	2.00	-0.25	29.68
2,000.0	3.86	29.44	1,998.4	48.3	1.7	48.2	2.00	0.17	29.92
2,001.9	3.87	30.00	2,000.3	48.4	1.7	48.3	2.00	0.38	29.13
2,040.0	3.87	30.00	2,038.3	50.6	3.0	50.7	0.00	0.00	0.00
2,080.0	3.87	30.00	2,078.2	52.9	4.4	53.1	0.00	0.00	0.00
2,120.0	3.87	30.00	2,118.1	55.3	5.7	55.6	0.00	0.00	0.00
2,160.0	3.87	30.00	2,158.0	57.6	7.0	58.0	0.00	0.00	0.00
2,200.0	3.87	30.00	2,197.9	60.0	8.4	60.5	0.00	0.00	0.00
2,240.0	3.87	30.00	2,237.8	62.3	9.7	62.9	0.00	0.00	0.00
2,280.0	3.87	30.00	2,277.8	64.6	11.1	65.4	0.00	0.00	0.00
2,320.0	3.87	30.00	2,317.7	67.0	12.4	67.8	0.00	0.00	0.00
2,360.0	3.87	30.00	2,357.6	69.3	13.8	70.3	0.00	0.00	0.00
2,400.0	3.87	30.00	2,397.5	71.6	15.1	72.7	0.00	0.00	0.00
2,440.0	3.87	30.00	2,437.4	74.0	16.5	75.2	0.00	0.00	0.00
2,480.0	3.87	30.00	2,477.3	76.3	17.8	77.6	0.00	0.00	0.00
2,520.0	3.87	30.00	2,517.2	78.6	19.2	80.0	0.00	0.00	0.00
2,560.0	3.87	30.00	2,557.1	81.0	20.5	82.5	0.00	0.00	0.00
2,600.0	3.87	30.00	2,597.0	83.3	21.9	84.9	0.00	0.00	0.00
2,640.0	3.87	30.00	2,636.9	85.7	23.2	87.4	0.00	0.00	0.00
2,680.0	3.87	30.00	2,676.8	88.0	24.6	89.8	0.00	0.00	0.00
2,720.0	3.87	30.00	2,716.8	90.3	25.9	92.3	0.00	0.00	0.00
2,760.0	3.87	30.00	2,756.7	92.7	27.3	94.7	0.00	0.00	0.00
2,800.0	3.87	30.00	2,796.6	95.0	28.6	97.2	0.00	0.00	0.00
2,840.0	3.87	30.00	2,836.5	97.3	30.0	99.6	0.00	0.00	0.00
2,880.0	3.87	30.00	2,876.4	99.7	31.3	102.1	0.00	0.00	0.00
2,920.0	3.87	30.00	2,916.3	102.0	32.7	104.5	0.00	0.00	0.00
2,960.0	3.87	30.00	2,956.2	104.3	34.0	107.0	0.00	0.00	0.00
3,000.0	3.87	30.00	2,996.1	106.7	35.4	109.4	0.00	0.00	0.00
3,040.0	3.87	30.00	3,036.0	109.0	36.7	111.9	0.00	0.00	0.00
3,080.0	3.87	30.00	3,075.9	111.4	38.1	114.3	0.00	0.00	0.00
3,120.0	3.87	30.00	3,115.8	113.7	39.4	116.8	0.00	0.00	0.00

<b>Database:</b>	Landmark	<b>Local Co-ordinate Reference:</b>	Well Wolf #12L-0103
<b>Company:</b>	Whiting Oil & Gas	<b>TVD Reference:</b>	WELL @ 4969.9ft (Original Well Elev)
<b>Project:</b>	Sec.12-T10N-R59W	<b>MD Reference:</b>	WELL @ 4969.9ft (Original Well Elev)
<b>Site:</b>	Wolf 12L Pad Sec.12-T10N-R59W	<b>North Reference:</b>	True
<b>Well:</b>	Wolf #12L-0103	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #2		
<b>Design:</b>	Plan #1 Sidetrack (1-16-14)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
3,160.0	3.87	30.00	3,155.8	116.0	40.8	119.2	0.00	0.00	0.00
3,200.0	3.87	30.00	3,195.7	118.4	42.1	121.6	0.00	0.00	0.00
3,240.0	3.87	30.00	3,235.6	120.7	43.5	124.1	0.00	0.00	0.00
3,280.0	3.87	30.00	3,275.5	123.0	44.8	126.5	0.00	0.00	0.00
3,320.0	3.87	30.00	3,315.4	125.4	46.2	129.0	0.00	0.00	0.00
3,360.0	3.87	30.00	3,355.3	127.7	47.5	131.4	0.00	0.00	0.00
3,400.0	3.87	30.00	3,395.2	130.0	48.9	133.9	0.00	0.00	0.00
3,440.0	3.87	30.00	3,435.1	132.4	50.2	136.3	0.00	0.00	0.00
3,480.0	3.87	30.00	3,475.0	134.7	51.6	138.8	0.00	0.00	0.00
3,520.0	3.87	30.00	3,514.9	137.1	52.9	141.2	0.00	0.00	0.00
3,560.0	3.87	30.00	3,554.8	139.4	54.2	143.7	0.00	0.00	0.00
3,600.0	3.87	30.00	3,594.8	141.7	55.6	146.1	0.00	0.00	0.00
3,640.0	3.87	30.00	3,634.7	144.1	56.9	148.6	0.00	0.00	0.00
3,680.0	3.87	30.00	3,674.6	146.4	58.3	151.0	0.00	0.00	0.00
3,720.0	3.87	30.00	3,714.5	148.7	59.6	153.5	0.00	0.00	0.00
3,760.0	3.87	30.00	3,754.4	151.1	61.0	155.9	0.00	0.00	0.00
3,800.0	3.87	30.00	3,794.3	153.4	62.3	158.4	0.00	0.00	0.00
3,840.0	3.87	30.00	3,834.2	155.7	63.7	160.8	0.00	0.00	0.00
3,880.0	3.87	30.00	3,874.1	158.1	65.0	163.2	0.00	0.00	0.00
3,920.0	3.87	30.00	3,914.0	160.4	66.4	165.7	0.00	0.00	0.00
3,960.0	3.87	30.00	3,953.9	162.8	67.7	168.1	0.00	0.00	0.00
4,000.0	3.87	30.00	3,993.8	165.1	69.1	170.6	0.00	0.00	0.00
4,040.0	3.87	30.00	4,033.8	167.4	70.4	173.0	0.00	0.00	0.00
4,080.0	3.87	30.00	4,073.7	169.8	71.8	175.5	0.00	0.00	0.00
4,120.0	3.87	30.00	4,113.6	172.1	73.1	177.9	0.00	0.00	0.00
4,160.0	3.87	30.00	4,153.5	174.4	74.5	180.4	0.00	0.00	0.00
4,200.0	3.87	30.00	4,193.4	176.8	75.8	182.8	0.00	0.00	0.00
4,240.0	3.87	30.00	4,233.3	179.1	77.2	185.3	0.00	0.00	0.00
4,280.0	3.87	30.00	4,273.2	181.4	78.5	187.7	0.00	0.00	0.00
4,320.0	3.87	30.00	4,313.1	183.8	79.9	190.2	0.00	0.00	0.00
4,360.0	3.87	30.00	4,353.0	186.1	81.2	192.6	0.00	0.00	0.00
4,400.0	3.87	30.00	4,392.9	188.5	82.6	195.1	0.00	0.00	0.00
4,440.0	3.87	30.00	4,432.8	190.8	83.9	197.5	0.00	0.00	0.00
4,480.0	3.87	30.00	4,472.7	193.1	85.3	200.0	0.00	0.00	0.00
4,520.0	3.87	30.00	4,512.7	195.5	86.6	202.4	0.00	0.00	0.00
4,560.0	3.87	30.00	4,552.6	197.8	88.0	204.9	0.00	0.00	0.00
4,600.0	3.87	30.00	4,592.5	200.1	89.3	207.3	0.00	0.00	0.00
4,640.0	3.87	30.00	4,632.4	202.5	90.7	209.7	0.00	0.00	0.00
4,680.0	3.87	30.00	4,672.3	204.8	92.0	212.2	0.00	0.00	0.00
4,720.0	3.87	30.00	4,712.2	207.1	93.4	214.6	0.00	0.00	0.00
4,760.0	3.87	30.00	4,752.1	209.5	94.7	217.1	0.00	0.00	0.00
4,800.0	3.87	30.00	4,792.0	211.8	96.1	219.5	0.00	0.00	0.00
4,840.0	3.87	30.00	4,831.9	214.2	97.4	222.0	0.00	0.00	0.00
4,880.0	3.87	30.00	4,871.8	216.5	98.8	224.4	0.00	0.00	0.00
4,920.0	3.87	30.00	4,911.7	218.8	100.1	226.9	0.00	0.00	0.00
4,960.0	3.87	30.00	4,951.7	221.2	101.5	229.3	0.00	0.00	0.00
5,000.0	3.87	30.00	4,991.6	223.5	102.8	231.8	0.00	0.00	0.00
5,040.0	3.87	30.00	5,031.5	225.8	104.1	234.2	0.00	0.00	0.00
5,080.0	3.87	30.00	5,071.4	228.2	105.5	236.7	0.00	0.00	0.00
5,120.0	3.87	30.00	5,111.3	230.5	106.8	239.1	0.00	0.00	0.00
5,160.0	3.87	30.00	5,151.2	232.8	108.2	241.6	0.00	0.00	0.00
5,200.0	3.87	30.00	5,191.1	235.2	109.5	244.0	0.00	0.00	0.00
5,240.0	3.87	30.00	5,231.0	237.5	110.9	246.5	0.00	0.00	0.00
5,280.0	3.87	30.00	5,270.9	239.9	112.2	248.9	0.00	0.00	0.00

<b>Database:</b>	Landmark	<b>Local Co-ordinate Reference:</b>	Well Wolf #12L-0103
<b>Company:</b>	Whiting Oil & Gas	<b>TVD Reference:</b>	WELL @ 4969.9ft (Original Well Elev)
<b>Project:</b>	Sec.12-T10N-R59W	<b>MD Reference:</b>	WELL @ 4969.9ft (Original Well Elev)
<b>Site:</b>	Wolf 12L Pad Sec.12-T10N-R59W	<b>North Reference:</b>	True
<b>Well:</b>	Wolf #12L-0103	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #2		
<b>Design:</b>	Plan #1 Sidetrack (1-16-14)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
5,320.0	3.87	30.00	5,310.8	242.2	113.6	251.3	0.00	0.00	0.00
5,360.0	3.87	30.00	5,350.7	244.5	114.9	253.8	0.00	0.00	0.00
5,400.0	3.87	30.00	5,390.7	246.9	116.3	256.2	0.00	0.00	0.00
5,440.0	3.87	30.00	5,430.6	249.2	117.6	258.7	0.00	0.00	0.00
5,480.0	3.87	30.00	5,470.5	251.5	119.0	261.1	0.00	0.00	0.00
5,520.0	3.87	30.00	5,510.4	253.9	120.3	263.6	0.00	0.00	0.00
5,560.0	3.87	30.00	5,550.3	256.2	121.7	266.0	0.00	0.00	0.00
5,600.0	3.87	30.00	5,590.2	258.5	123.0	268.5	0.00	0.00	0.00
5,640.0	3.87	30.00	5,630.1	260.9	124.4	270.9	0.00	0.00	0.00
5,663.2	3.87	30.00	5,653.3	262.2	125.2	272.3	0.00	0.00	0.00
5,680.0	5.71	30.00	5,670.0	263.5	125.9	273.6	11.00	11.00	0.01
5,720.0	10.11	30.00	5,709.6	268.2	128.6	278.6	11.00	11.00	0.00
5,760.0	14.51	30.00	5,748.7	275.6	132.9	286.4	11.00	11.00	0.00
5,800.0	18.91	30.00	5,787.0	285.6	138.6	296.8	11.00	11.00	0.00
5,840.0	23.31	30.00	5,824.3	298.0	145.8	309.9	11.00	11.00	0.00
5,880.0	27.71	30.00	5,860.4	313.0	154.4	325.5	11.00	11.00	0.00
5,920.0	32.11	30.00	5,895.0	330.2	164.4	343.6	11.00	11.00	0.00
5,960.0	36.51	30.00	5,928.1	349.8	175.7	364.0	11.00	11.00	0.00
6,000.0	40.91	30.00	5,959.3	371.4	188.2	386.7	11.00	11.00	0.00
6,040.0	45.31	30.00	5,988.5	395.1	201.9	411.5	11.00	11.00	0.00
6,080.0	49.71	30.00	6,015.5	420.6	216.6	438.3	11.00	11.00	0.00
6,120.0	54.11	30.00	6,040.1	447.9	232.3	466.8	11.00	11.00	0.00
6,160.0	58.51	30.00	6,062.3	476.7	249.0	497.0	11.00	11.00	0.00
6,179.1	60.62	30.00	6,072.0	491.0	257.2	511.9	11.00	11.00	0.00
<b>NIOBRARA</b>									
6,200.0	62.91	30.00	6,081.9	506.9	266.4	528.6	11.00	11.00	0.00
6,240.0	67.31	30.00	6,098.7	538.3	284.6	561.5	11.00	11.00	0.00
6,280.0	71.71	30.00	6,112.7	570.8	303.3	595.5	11.00	11.00	0.00
6,320.0	76.11	30.00	6,123.8	604.0	322.5	630.4	11.00	11.00	0.00
6,360.0	80.51	30.00	6,131.9	638.0	342.1	665.9	11.00	11.00	0.00
6,400.0	84.91	30.00	6,136.9	672.3	361.9	701.9	11.00	11.00	0.00
6,440.0	89.31	30.00	6,139.0	706.9	381.9	738.1	11.00	11.00	0.00
6,446.2	90.00	30.00	6,139.0	712.3	385.0	743.7	11.00	11.00	0.00
<b>7"</b>									
6,446.3	90.00	30.00	6,139.0	712.4	385.0	743.8	3.35	3.35	0.00
<b>End of Build</b>									
6,480.0	90.00	28.99	6,139.0	741.7	401.6	774.5	3.01	0.00	-3.01
6,520.0	90.00	27.79	6,139.0	776.9	420.6	811.3	3.00	0.00	-3.00
6,560.0	90.00	26.59	6,139.0	812.5	438.9	848.3	3.00	0.00	-3.00
6,600.0	90.00	25.39	6,139.0	848.4	456.4	885.7	3.00	0.00	-3.00
6,640.0	90.00	24.19	6,139.0	884.7	473.2	923.4	3.00	0.00	-3.00
6,680.0	90.00	22.99	6,139.0	921.4	489.2	961.3	3.00	0.00	-3.00
6,720.0	90.00	21.79	6,139.0	958.4	504.5	999.5	3.00	0.00	-3.00
6,760.0	90.00	20.59	6,139.0	995.7	518.9	1,037.9	3.00	0.00	-3.00
6,800.0	90.00	19.39	6,139.0	1,033.3	532.6	1,076.6	3.00	0.00	-3.00
6,840.0	90.00	18.19	6,139.0	1,071.1	545.5	1,115.5	3.00	0.00	-3.00
6,880.0	90.00	16.99	6,139.0	1,109.3	557.5	1,154.5	3.00	0.00	-3.00
6,920.0	90.00	15.79	6,139.0	1,147.6	568.8	1,193.7	3.00	0.00	-3.00
6,960.0	90.00	14.59	6,139.0	1,186.2	579.3	1,233.1	3.00	0.00	-3.00
7,000.0	90.00	13.39	6,139.0	1,225.0	589.0	1,272.6	3.00	0.00	-3.00
7,040.0	90.00	12.19	6,139.0	1,264.1	597.8	1,312.3	3.00	0.00	-3.00
7,080.0	90.00	10.99	6,139.0	1,303.2	605.9	1,352.0	3.00	0.00	-3.00
7,120.0	90.00	9.79	6,139.0	1,342.6	613.1	1,391.9	3.00	0.00	-3.00

<b>Database:</b>	Landmark	<b>Local Co-ordinate Reference:</b>	Well Wolf #12L-0103
<b>Company:</b>	Whiting Oil & Gas	<b>TVD Reference:</b>	WELL @ 4969.9ft (Original Well Elev)
<b>Project:</b>	Sec.12-T10N-R59W	<b>MD Reference:</b>	WELL @ 4969.9ft (Original Well Elev)
<b>Site:</b>	Wolf 12L Pad Sec.12-T10N-R59W	<b>North Reference:</b>	True
<b>Well:</b>	Wolf #12L-0103	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #2		
<b>Design:</b>	Plan #1 Sidetrack (1-16-14)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
7,160.0	90.00	8.59	6,139.0	1,382.1	619.5	1,431.8	3.00	0.00	-3.00
7,200.0	90.00	7.39	6,139.0	1,421.7	625.0	1,471.7	3.00	0.00	-3.00
7,240.0	90.00	6.19	6,139.0	1,461.4	629.7	1,511.7	3.00	0.00	-3.00
7,280.0	90.00	4.99	6,139.0	1,501.2	633.6	1,551.7	3.00	0.00	-3.00
7,320.0	90.00	3.79	6,139.0	1,541.1	636.7	1,591.7	3.00	0.00	-3.00
7,360.0	90.00	2.59	6,139.0	1,581.0	638.9	1,631.7	3.00	0.00	-3.00
7,400.0	90.00	1.39	6,139.0	1,621.0	640.3	1,671.6	3.00	0.00	-3.00
7,440.0	90.00	0.19	6,139.0	1,661.0	640.9	1,711.5	3.00	0.00	-3.00
7,446.3	90.00	360.00	6,139.0	1,667.3	640.9	1,717.7	3.00	0.00	-3.00
7,480.0	90.00	360.00	6,139.0	1,701.0	640.9	1,751.3	0.00	0.00	0.00
7,520.0	90.00	360.00	6,139.0	1,741.0	640.9	1,791.2	0.00	0.00	0.00
7,560.0	90.00	360.00	6,139.0	1,781.0	640.9	1,831.0	0.00	0.00	0.00
7,600.0	90.00	360.00	6,139.0	1,821.0	640.9	1,870.9	0.00	0.00	0.00
7,640.0	90.00	360.00	6,139.0	1,861.0	640.9	1,910.7	0.00	0.00	0.00
7,680.0	90.00	360.00	6,139.0	1,901.0	640.9	1,950.5	0.00	0.00	0.00
7,720.0	90.00	360.00	6,139.0	1,941.0	640.9	1,990.4	0.00	0.00	0.00
7,760.0	90.00	360.00	6,139.0	1,981.0	640.9	2,030.2	0.00	0.00	0.00
7,800.0	90.00	360.00	6,139.0	2,021.0	640.9	2,070.1	0.00	0.00	0.00
7,840.0	90.00	360.00	6,139.0	2,061.0	640.9	2,109.9	0.00	0.00	0.00
7,880.0	90.00	360.00	6,139.0	2,101.0	640.9	2,149.7	0.00	0.00	0.00
7,920.0	90.00	360.00	6,139.0	2,141.0	640.9	2,189.6	0.00	0.00	0.00
7,960.0	90.00	360.00	6,139.0	2,181.0	640.9	2,229.4	0.00	0.00	0.00
8,000.0	90.00	360.00	6,139.0	2,221.0	640.9	2,269.3	0.00	0.00	0.00
8,040.0	90.00	360.00	6,139.0	2,261.0	640.9	2,309.1	0.00	0.00	0.00
8,080.0	90.00	360.00	6,139.0	2,301.0	640.9	2,348.9	0.00	0.00	0.00
8,120.0	90.00	360.00	6,139.0	2,341.0	640.9	2,388.8	0.00	0.00	0.00
8,160.0	90.00	360.00	6,139.0	2,381.0	640.9	2,428.6	0.00	0.00	0.00
8,200.0	90.00	360.00	6,139.0	2,421.0	640.9	2,468.5	0.00	0.00	0.00
8,240.0	90.00	360.00	6,139.0	2,461.0	640.9	2,508.3	0.00	0.00	0.00
8,280.0	90.00	360.00	6,139.0	2,501.0	640.9	2,548.1	0.00	0.00	0.00
8,320.0	90.00	360.00	6,139.0	2,541.0	640.9	2,588.0	0.00	0.00	0.00
8,360.0	90.00	360.00	6,139.0	2,581.0	640.9	2,627.8	0.00	0.00	0.00
8,400.0	90.00	360.00	6,139.0	2,621.0	640.9	2,667.7	0.00	0.00	0.00
8,440.0	90.00	360.00	6,139.0	2,661.0	640.9	2,707.5	0.00	0.00	0.00
8,480.0	90.00	360.00	6,139.0	2,701.0	640.9	2,747.4	0.00	0.00	0.00
8,520.0	90.00	360.00	6,139.0	2,741.0	640.9	2,787.2	0.00	0.00	0.00
8,560.0	90.00	360.00	6,139.0	2,781.0	640.9	2,827.0	0.00	0.00	0.00
8,600.0	90.00	360.00	6,139.0	2,821.0	640.9	2,866.9	0.00	0.00	0.00
8,640.0	90.00	360.00	6,139.0	2,861.0	640.9	2,906.7	0.00	0.00	0.00
8,680.0	90.00	360.00	6,139.0	2,901.0	640.9	2,946.6	0.00	0.00	0.00
8,720.0	90.00	360.00	6,139.0	2,941.0	640.9	2,986.4	0.00	0.00	0.00
8,760.0	90.00	360.00	6,139.0	2,981.0	640.9	3,026.2	0.00	0.00	0.00
8,800.0	90.00	360.00	6,139.0	3,021.0	640.9	3,066.1	0.00	0.00	0.00
8,840.0	90.00	360.00	6,139.0	3,061.0	640.9	3,105.9	0.00	0.00	0.00
8,880.0	90.00	360.00	6,139.0	3,101.0	640.9	3,145.8	0.00	0.00	0.00
8,920.0	90.00	360.00	6,139.0	3,141.0	640.9	3,185.6	0.00	0.00	0.00
8,960.0	90.00	360.00	6,139.0	3,181.0	640.9	3,225.4	0.00	0.00	0.00
9,000.0	90.00	360.00	6,139.0	3,221.0	640.9	3,265.3	0.00	0.00	0.00
9,040.0	90.00	360.00	6,139.0	3,261.0	640.9	3,305.1	0.00	0.00	0.00
9,080.0	90.00	360.00	6,139.0	3,301.0	640.9	3,345.0	0.00	0.00	0.00
9,120.0	90.00	360.00	6,139.0	3,341.0	640.9	3,384.8	0.00	0.00	0.00
9,160.0	90.00	360.00	6,139.0	3,381.0	640.9	3,424.6	0.00	0.00	0.00
9,200.0	90.00	360.00	6,139.0	3,421.0	640.9	3,464.5	0.00	0.00	0.00
9,240.0	90.00	360.00	6,139.0	3,461.0	640.9	3,504.3	0.00	0.00	0.00

<b>Database:</b>	Landmark	<b>Local Co-ordinate Reference:</b>	Well Wolf #12L-0103
<b>Company:</b>	Whiting Oil & Gas	<b>TVD Reference:</b>	WELL @ 4969.9ft (Original Well Elev)
<b>Project:</b>	Sec.12-T10N-R59W	<b>MD Reference:</b>	WELL @ 4969.9ft (Original Well Elev)
<b>Site:</b>	Wolf 12L Pad Sec.12-T10N-R59W	<b>North Reference:</b>	True
<b>Well:</b>	Wolf #12L-0103	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #2		
<b>Design:</b>	Plan #1 Sidetrack (1-16-14)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
9,280.0	90.00	360.00	6,139.0	3,501.0	640.8	3,544.2	0.00	0.00	0.00
9,320.0	90.00	360.00	6,139.0	3,541.0	640.8	3,584.0	0.00	0.00	0.00
9,360.0	90.00	360.00	6,139.0	3,581.0	640.8	3,623.9	0.00	0.00	0.00
9,400.0	90.00	360.00	6,139.0	3,621.0	640.8	3,663.7	0.00	0.00	0.00
9,440.0	90.00	360.00	6,139.0	3,661.0	640.8	3,703.5	0.00	0.00	0.00
9,480.0	90.00	360.00	6,139.0	3,701.0	640.8	3,743.4	0.00	0.00	0.00
9,520.0	90.00	360.00	6,139.0	3,741.0	640.8	3,783.2	0.00	0.00	0.00
9,560.0	90.00	360.00	6,139.0	3,781.0	640.8	3,823.1	0.00	0.00	0.00
9,600.0	90.00	360.00	6,139.0	3,821.0	640.8	3,862.9	0.00	0.00	0.00
9,640.0	90.00	360.00	6,139.0	3,861.0	640.8	3,902.7	0.00	0.00	0.00
9,680.0	90.00	360.00	6,139.0	3,901.0	640.8	3,942.6	0.00	0.00	0.00
9,720.0	90.00	360.00	6,139.0	3,941.0	640.8	3,982.4	0.00	0.00	0.00
9,760.0	90.00	360.00	6,139.0	3,981.0	640.8	4,022.3	0.00	0.00	0.00
9,800.0	90.00	360.00	6,139.0	4,021.0	640.8	4,062.1	0.00	0.00	0.00
9,840.0	90.00	360.00	6,139.0	4,061.0	640.8	4,101.9	0.00	0.00	0.00
9,880.0	90.00	360.00	6,139.0	4,101.0	640.8	4,141.8	0.00	0.00	0.00
9,920.0	90.00	360.00	6,139.0	4,141.0	640.8	4,181.6	0.00	0.00	0.00
9,960.0	90.00	360.00	6,139.0	4,181.0	640.8	4,221.5	0.00	0.00	0.00
10,000.0	90.00	360.00	6,139.0	4,221.0	640.8	4,261.3	0.00	0.00	0.00
10,040.0	90.00	360.00	6,139.0	4,261.0	640.8	4,301.1	0.00	0.00	0.00
10,080.0	90.00	360.00	6,139.0	4,301.0	640.8	4,341.0	0.00	0.00	0.00
10,120.0	90.00	360.00	6,139.0	4,341.0	640.8	4,380.8	0.00	0.00	0.00
10,160.0	90.00	360.00	6,139.0	4,381.0	640.8	4,420.7	0.00	0.00	0.00
10,200.0	90.00	360.00	6,139.0	4,421.0	640.8	4,460.5	0.00	0.00	0.00
10,240.0	90.00	360.00	6,139.0	4,461.0	640.8	4,500.4	0.00	0.00	0.00
10,280.0	90.00	360.00	6,139.0	4,501.0	640.8	4,540.2	0.00	0.00	0.00
10,320.0	90.00	360.00	6,139.0	4,541.0	640.8	4,580.0	0.00	0.00	0.00
10,360.0	90.00	360.00	6,139.0	4,581.0	640.8	4,619.9	0.00	0.00	0.00
10,400.0	90.00	360.00	6,139.0	4,621.0	640.8	4,659.7	0.00	0.00	0.00
10,440.0	90.00	360.00	6,139.0	4,661.0	640.8	4,699.6	0.00	0.00	0.00
10,480.0	90.00	360.00	6,139.0	4,701.0	640.8	4,739.4	0.00	0.00	0.00
10,520.0	90.00	360.00	6,139.0	4,741.0	640.8	4,779.2	0.00	0.00	0.00
10,560.0	90.00	360.00	6,139.0	4,781.0	640.8	4,819.1	0.00	0.00	0.00
10,600.0	90.00	360.00	6,139.0	4,821.0	640.8	4,858.9	0.00	0.00	0.00
10,640.0	90.00	360.00	6,139.0	4,861.0	640.8	4,898.8	0.00	0.00	0.00
10,680.0	90.00	360.00	6,139.0	4,901.0	640.8	4,938.6	0.00	0.00	0.00
10,720.0	90.00	360.00	6,139.0	4,941.0	640.8	4,978.4	0.00	0.00	0.00
10,760.0	90.00	360.00	6,139.0	4,981.0	640.8	5,018.3	0.00	0.00	0.00
10,800.0	90.00	360.00	6,139.0	5,021.0	640.8	5,058.1	0.00	0.00	0.00
10,840.0	90.00	360.00	6,139.0	5,061.0	640.8	5,098.0	0.00	0.00	0.00
10,880.0	90.00	360.00	6,139.0	5,101.0	640.8	5,137.8	0.00	0.00	0.00
10,920.0	90.00	360.00	6,139.0	5,141.0	640.8	5,177.6	0.00	0.00	0.00
10,960.0	90.00	360.00	6,139.0	5,181.0	640.8	5,217.5	0.00	0.00	0.00
11,000.0	90.00	360.00	6,139.0	5,221.0	640.8	5,257.3	0.00	0.00	0.00
11,040.0	90.00	360.00	6,139.0	5,261.0	640.8	5,297.2	0.00	0.00	0.00
11,080.0	90.00	360.00	6,139.0	5,301.0	640.8	5,337.0	0.00	0.00	0.00
11,120.0	90.00	360.00	6,139.0	5,341.0	640.8	5,376.9	0.00	0.00	0.00
11,160.0	90.00	360.00	6,139.0	5,381.0	640.8	5,416.7	0.00	0.00	0.00
11,200.0	90.00	360.00	6,139.0	5,421.0	640.8	5,456.5	0.00	0.00	0.00
11,240.0	90.00	360.00	6,139.0	5,461.0	640.8	5,496.4	0.00	0.00	0.00
11,280.0	90.00	360.00	6,139.0	5,501.0	640.8	5,536.2	0.00	0.00	0.00
11,320.0	90.00	360.00	6,139.0	5,541.0	640.8	5,576.1	0.00	0.00	0.00
11,360.0	90.00	360.00	6,139.0	5,581.0	640.8	5,615.9	0.00	0.00	0.00
11,400.0	90.00	360.00	6,139.0	5,621.0	640.8	5,655.7	0.00	0.00	0.00

<b>Database:</b>	Landmark	<b>Local Co-ordinate Reference:</b>	Well Wolf #12L-0103
<b>Company:</b>	Whiting Oil & Gas	<b>TVD Reference:</b>	WELL @ 4969.9ft (Original Well Elev)
<b>Project:</b>	Sec.12-T10N-R59W	<b>MD Reference:</b>	WELL @ 4969.9ft (Original Well Elev)
<b>Site:</b>	Wolf 12L Pad Sec.12-T10N-R59W	<b>North Reference:</b>	True
<b>Well:</b>	Wolf #12L-0103	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #2		
<b>Design:</b>	Plan #1 Sidetrack (1-16-14)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
11,440.0	90.00	360.00	6,139.0	5,661.0	640.8	5,695.6	0.00	0.00	0.00
11,480.0	90.00	360.00	6,139.0	5,701.0	640.8	5,735.4	0.00	0.00	0.00
11,520.0	90.00	360.00	6,139.0	5,741.0	640.8	5,775.3	0.00	0.00	0.00
11,560.0	90.00	360.00	6,139.0	5,781.0	640.8	5,815.1	0.00	0.00	0.00
11,600.0	90.00	360.00	6,139.0	5,821.0	640.8	5,854.9	0.00	0.00	0.00
11,640.0	90.00	360.00	6,139.0	5,861.0	640.8	5,894.8	0.00	0.00	0.00
11,680.0	90.00	360.00	6,139.0	5,901.0	640.8	5,934.6	0.00	0.00	0.00
11,720.0	90.00	360.00	6,139.0	5,941.0	640.8	5,974.5	0.00	0.00	0.00
11,760.0	90.00	360.00	6,139.0	5,981.0	640.8	6,014.3	0.00	0.00	0.00
11,800.0	90.00	360.00	6,139.0	6,021.0	640.8	6,054.1	0.00	0.00	0.00
11,840.0	90.00	360.00	6,139.0	6,061.0	640.8	6,094.0	0.00	0.00	0.00
11,880.0	90.00	360.00	6,139.0	6,101.0	640.8	6,133.8	0.00	0.00	0.00
11,920.0	90.00	360.00	6,139.0	6,141.0	640.8	6,173.7	0.00	0.00	0.00
11,960.0	90.00	360.00	6,139.0	6,181.0	640.8	6,213.5	0.00	0.00	0.00
12,000.0	90.00	360.00	6,139.0	6,221.0	640.8	6,253.4	0.00	0.00	0.00
12,040.0	90.00	360.00	6,139.0	6,261.0	640.8	6,293.2	0.00	0.00	0.00
12,080.0	90.00	360.00	6,139.0	6,301.0	640.8	6,333.0	0.00	0.00	0.00
12,120.0	90.00	360.00	6,139.0	6,341.0	640.8	6,372.9	0.00	0.00	0.00
12,160.0	90.00	360.00	6,139.0	6,381.0	640.8	6,412.7	0.00	0.00	0.00
12,200.0	90.00	360.00	6,139.0	6,421.0	640.8	6,452.6	0.00	0.00	0.00
12,240.0	90.00	360.00	6,139.0	6,461.0	640.8	6,492.4	0.00	0.00	0.00
12,280.0	90.00	360.00	6,139.0	6,501.0	640.8	6,532.2	0.00	0.00	0.00
12,320.0	90.00	360.00	6,139.0	6,541.0	640.8	6,572.1	0.00	0.00	0.00
12,360.0	90.00	360.00	6,139.0	6,581.0	640.8	6,611.9	0.00	0.00	0.00
12,400.0	90.00	360.00	6,139.0	6,621.0	640.8	6,651.8	0.00	0.00	0.00
12,440.0	90.00	360.00	6,139.0	6,661.0	640.8	6,691.6	0.00	0.00	0.00
12,480.0	90.00	360.00	6,139.0	6,701.0	640.8	6,731.4	0.00	0.00	0.00
12,520.0	90.00	360.00	6,139.0	6,741.0	640.8	6,771.3	0.00	0.00	0.00
12,560.0	90.00	360.00	6,139.0	6,781.0	640.8	6,811.1	0.00	0.00	0.00
12,600.0	90.00	360.00	6,139.0	6,821.0	640.8	6,851.0	0.00	0.00	0.00
12,640.0	90.00	360.00	6,139.0	6,861.0	640.8	6,890.8	0.00	0.00	0.00
12,680.0	90.00	360.00	6,139.0	6,901.0	640.8	6,930.6	0.00	0.00	0.00
12,720.0	90.00	360.00	6,139.0	6,941.0	640.8	6,970.5	0.00	0.00	0.00
12,760.0	90.00	360.00	6,139.0	6,981.0	640.8	7,010.3	0.00	0.00	0.00
12,800.0	90.00	360.00	6,139.0	7,021.0	640.8	7,050.2	0.00	0.00	0.00
12,840.0	90.00	360.00	6,139.0	7,061.0	640.8	7,090.0	0.00	0.00	0.00
12,880.0	90.00	360.00	6,139.0	7,101.0	640.8	7,129.9	0.00	0.00	0.00
12,920.0	90.00	360.00	6,139.0	7,141.0	640.8	7,169.7	0.00	0.00	0.00
12,943.1	90.00	360.00	6,139.0	7,164.1	640.8	7,192.7	0.00	0.00	0.00
BHL 600'FNL, 825'FWL, SEC.1									

Casing Points				
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
6,446.2	6,139.0	7"	7	7-1/2

<b>Database:</b>	Landmark	<b>Local Co-ordinate Reference:</b>	Well Wolf #12L-0103
<b>Company:</b>	Whiting Oil & Gas	<b>TVD Reference:</b>	WELL @ 4969.9ft (Original Well Elev)
<b>Project:</b>	Sec.12-T10N-R59W	<b>MD Reference:</b>	WELL @ 4969.9ft (Original Well Elev)
<b>Site:</b>	Wolf 12L Pad Sec.12-T10N-R59W	<b>North Reference:</b>	True
<b>Well:</b>	Wolf #12L-0103	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #2		
<b>Design:</b>	Plan #1 Sidetrack (1-16-14)		

Formations					
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,664.8	1,664.0	PIERRE		0.00	
6,179.1	6,072.0	NIOBRARA		0.00	

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
1,200.0	1,200.0	0.0	0.0	Tie-in Point	
6,446.3	6,139.0	712.4	385.0	End of Build	



## **Whiting Oil & Gas**

**Sec.12-T10N-R59W**

**Wolf 12L Pad Sec.12-T10N-R59W**

**Wolf #12L-0103**

**Wellbore #2**

**Plan #1 Sidetrack (1-16-14)**

## **Anticollision Report**

**17 January, 2014**



Wolf 12L Pad Sec.12-T10N-R59W - Wolf #12L-0103 - Wellbore #1 - Plan #1 Pilot Hole (1-16-14)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning	
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
2,700.0	2,696.8	2,696.8	2,696.8	3.5	3.4	165.79	0.0	0.0	92.7	86.0	6.70	13.833		
2,800.0	2,796.6	2,796.6	2,796.6	3.8	3.6	166.74	0.0	0.0	99.2	92.1	7.15	13.882		
2,900.0	2,896.3	2,896.3	2,896.3	4.0	3.8	167.58	0.0	0.0	105.8	98.2	7.60	13.929		
3,000.0	2,996.1	2,996.1	2,996.1	4.3	4.0	168.32	0.0	0.0	112.4	104.4	8.04	13.973		
3,100.0	3,095.9	3,095.9	3,095.9	4.5	4.3	168.98	0.0	0.0	119.0	110.5	8.49	14.013		
3,200.0	3,195.7	3,195.7	3,195.7	4.8	4.5	169.57	0.0	0.0	125.6	116.7	8.94	14.050		
3,300.0	3,295.4	3,295.4	3,295.4	5.0	4.7	170.10	0.0	0.0	132.3	122.9	9.39	14.085		
3,400.0	3,395.2	3,395.2	3,395.2	5.3	4.9	170.57	0.0	0.0	138.9	129.1	9.84	14.117		
3,500.0	3,495.0	3,495.0	3,495.0	5.5	5.2	171.01	0.0	0.0	145.6	135.3	10.29	14.148		
3,600.0	3,594.8	3,594.8	3,594.8	5.8	5.4	171.40	0.0	0.0	152.2	141.5	10.74	14.175		
3,700.0	3,694.5	3,694.5	3,694.5	6.0	5.6	171.77	0.0	0.0	158.9	147.7	11.19	14.202		
3,800.0	3,794.3	3,794.3	3,794.3	6.3	5.8	172.10	0.0	0.0	165.6	154.0	11.64	14.226		
3,900.0	3,894.1	3,894.1	3,894.1	6.5	6.1	172.41	0.0	0.0	172.3	160.2	12.09	14.249		
4,000.0	3,993.8	3,993.8	3,993.8	6.8	6.3	172.70	0.0	0.0	179.0	166.4	12.54	14.270		
4,100.0	4,093.6	4,093.6	4,093.6	7.0	6.5	172.96	0.0	0.0	185.7	172.7	12.99	14.290		
4,200.0	4,193.4	4,193.4	4,193.4	7.3	6.7	173.21	0.0	0.0	192.4	178.9	13.44	14.309		
4,300.0	4,293.2	4,293.2	4,293.2	7.6	7.0	173.44	0.0	0.0	199.0	185.2	13.89	14.326		
4,400.0	4,392.9	4,392.9	4,392.9	7.8	7.2	173.65	0.0	0.0	205.8	191.4	14.35	14.343		
4,500.0	4,492.7	4,492.7	4,492.7	8.1	7.4	173.85	0.0	0.0	212.5	197.7	14.80	14.359		
4,600.0	4,592.5	4,592.5	4,592.5	8.3	7.6	174.04	0.0	0.0	219.2	203.9	15.25	14.374		
4,700.0	4,692.2	4,692.2	4,692.2	8.6	7.8	174.22	0.0	0.0	225.9	210.2	15.70	14.388		
4,800.0	4,792.0	4,792.0	4,792.0	8.8	8.1	174.39	0.0	0.0	232.6	216.4	16.15	14.401		
4,900.0	4,891.8	4,891.8	4,891.8	9.1	8.3	174.54	0.0	0.0	239.3	222.7	16.60	14.413		
5,000.0	4,991.6	4,991.6	4,991.6	9.3	8.5	174.69	0.0	0.0	246.0	229.0	17.05	14.425		
5,100.0	5,091.3	5,091.3	5,091.3	9.6	8.7	174.83	0.0	0.0	252.7	235.2	17.51	14.437		
5,200.0	5,191.1	5,191.1	5,191.1	9.8	9.0	174.97	0.0	0.0	259.4	241.5	17.96	14.448		
5,300.0	5,290.9	5,290.9	5,290.9	10.1	9.2	175.10	0.0	0.0	266.2	247.8	18.41	14.458		
5,400.0	5,390.7	5,390.7	5,390.7	10.3	9.4	175.22	0.0	0.0	272.9	254.0	18.86	14.468		
5,500.0	5,490.4	5,490.4	5,490.4	10.6	9.6	175.33	0.0	0.0	279.6	260.3	19.31	14.477		
5,600.0	5,590.2	5,590.2	5,590.2	10.8	9.9	175.44	0.0	0.0	286.3	266.6	19.77	14.486		
5,700.0	5,689.9	5,689.9	5,689.9	11.1	10.1	175.53	0.0	0.0	294.3	274.2	20.13	14.620		
5,800.0	5,787.0	5,787.0	5,787.0	11.5	10.3	175.66	0.0	0.0	317.4	297.6	19.89	15.961		
5,900.0	5,877.9	5,877.9	5,877.9	12.0	10.5	175.81	0.0	0.0	358.6	339.6	18.97	18.901		
6,000.0	5,959.3	5,959.3	5,959.3	12.7	10.7	175.86	0.0	0.0	416.4	398.9	17.45	23.865		
6,100.0	6,028.1	6,028.1	6,028.1	13.6	10.9	175.68	0.0	0.0	488.6	473.2	15.43	31.660		
6,200.0	6,081.9	6,081.9	6,081.9	14.7	11.0	175.01	0.0	0.0	572.7	559.5	13.15	43.553		
6,300.0	6,118.6	6,118.6	6,118.6	16.0	11.1	172.97	0.0	0.0	665.4	654.4	11.08	60.075		
6,400.0	6,136.9	6,136.9	6,136.9	17.5	11.1	161.43	0.0	0.0	763.5	751.1	12.43	61.445		
6,500.0	6,139.0	6,139.0	6,139.0	19.0	11.1	-90.00	0.0	0.0	863.5	833.4	30.10	28.688		
6,600.0	6,139.0	6,139.0	6,139.0	20.4	11.1	-90.00	0.0	0.0	963.4	931.9	31.48	30.600		

Wolf 12L Pad Sec.12-T10N-R59W - Wolf 12L-1304 - Wellbore #1 - Plan #1 (1-16-14)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
0.0	0.0	0.0	0.0	0.0	0.0	142.28	-39.7	30.7	50.2					
100.0	100.0	100.0	100.0	0.1	0.1	142.28	-39.7	30.7	50.2	50.0	0.22	223.332		
200.0	200.0	200.0	200.0	0.3	0.3	142.28	-39.7	30.7	50.2	49.5	0.67	74.444		
300.0	300.0	300.0	300.0	0.6	0.6	142.28	-39.7	30.7	50.2	49.1	1.12	44.666		
400.0	400.0	400.0	400.0	0.8	0.8	142.28	-39.7	30.7	50.2	48.6	1.57	31.905		
500.0	500.0	500.0	500.0	1.0	1.0	142.28	-39.7	30.7	50.2	48.2	2.02	24.815		
600.0	600.0	600.0	600.0	1.2	1.2	142.28	-39.7	30.7	50.2	47.7	2.47	20.303		
700.0	700.0	700.0	700.0	1.5	1.5	142.28	-39.7	30.7	50.2	47.3	2.92	17.179		
800.0	800.0	800.0	800.0	1.7	1.7	142.28	-39.7	30.7	50.2	46.8	3.37	14.889		
900.0	900.0	900.0	900.0	1.9	1.9	142.28	-39.7	30.7	50.2	46.4	3.82	13.137		
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	142.28	-39.7	30.7	50.2	45.9	4.27	11.754		
1,100.0	1,100.0	1,100.0	1,100.0	2.4	2.4	142.28	-39.7	30.7	50.2	45.5	4.72	10.635		
1,200.0	1,200.0	1,200.0	1,200.0	2.6	2.6	142.28	-39.7	30.7	50.2	45.0	5.17	9.710	CC, ES	
1,300.0	1,300.0	1,300.0	1,300.0	2.8	2.8	143.45	-39.7	30.7	51.6	46.0	5.62	9.183	SF	
1,400.0	1,399.8	1,399.8	1,399.8	3.0	3.0	146.60	-39.7	30.7	55.9	49.8	6.06	9.218		
1,500.0	1,499.6	1,499.6	1,499.6	3.3	3.3	150.16	-39.7	30.7	61.8	55.3	6.51	9.496		
1,600.0	1,599.4	1,599.4	1,599.4	3.5	3.5	153.09	-39.7	30.7	68.0	61.0	6.96	9.765		
1,700.0	1,699.1	1,699.1	1,699.1	3.7	3.7	155.52	-39.7	30.7	74.3	66.8	7.41	10.019		
1,800.0	1,798.9	1,798.9	1,798.9	4.0	3.9	157.57	-39.7	30.7	80.7	72.8	7.86	10.259		
1,900.0	1,898.6	1,898.6	1,898.6	4.2	4.2	159.32	-39.7	30.7	87.2	78.8	8.31	10.482		
2,000.0	1,998.4	1,998.4	1,998.4	4.4	4.4	132.23	-39.7	30.7	92.7	83.9	8.76	10.582		
2,100.0	2,098.2	2,094.9	2,094.9	4.6	4.6	134.47	-41.2	31.2	98.9	89.7	9.16	10.798		
2,200.0	2,197.9	2,190.9	2,190.8	4.9	4.7	136.71	-45.7	32.9	108.7	99.1	9.56	11.373		
2,300.0	2,297.7	2,289.8	2,289.4	5.1	4.9	138.51	-52.2	35.2	120.5	110.6	9.96	12.103		
2,400.0	2,397.5	2,389.0	2,388.4	5.4	5.1	139.99	-58.7	37.6	132.5	122.2	10.37	12.782		
2,500.0	2,497.3	2,488.2	2,487.4	5.6	5.3	141.22	-65.2	40.0	144.6	133.8	10.78	13.412		
2,600.0	2,597.0	2,587.5	2,586.4	5.9	5.5	142.26	-71.7	42.3	156.7	145.5	11.20	13.995		
2,700.0	2,696.8	2,686.7	2,685.3	6.1	5.7	143.15	-78.2	44.7	168.8	157.2	11.62	14.536		
2,800.0	2,796.6	2,787.6	2,786.0	6.3	5.9	144.26	-84.3	46.0	180.5	168.5	12.05	14.984		
2,900.0	2,896.3	2,886.8	2,885.1	6.6	6.1	145.43	-90.1	46.7	191.9	179.4	12.47	15.388		
3,000.0	2,996.1	2,986.1	2,984.2	6.8	6.3	146.46	-95.9	47.3	203.3	190.4	12.89	15.769		
3,100.0	3,095.9	3,085.4	3,083.3	7.1	6.5	147.38	-101.7	47.9	214.8	201.5	13.32	16.128		
3,200.0	3,195.7	3,184.7	3,182.4	7.3	6.7	148.21	-107.5	48.5	226.3	212.6	13.75	16.465		
3,300.0	3,295.4	3,284.0	3,281.6	7.6	6.9	148.96	-113.3	49.1	237.9	223.7	14.17	16.783		
3,400.0	3,395.2	3,383.2	3,380.7	7.8	7.2	149.64	-119.0	49.7	249.5	234.9	14.61	17.082		
3,500.0	3,495.0	3,482.5	3,479.8	8.1	7.4	150.26	-124.8	50.3	261.2	246.1	15.04	17.365		
3,600.0	3,594.8	3,581.8	3,578.9	8.3	7.6	150.83	-130.6	50.9	272.8	257.4	15.47	17.631		
3,700.0	3,694.5	3,681.1	3,678.0	8.6	7.8	151.34	-136.4	51.5	284.5	268.6	15.91	17.883		
3,800.0	3,794.3	3,780.4	3,777.1	8.8	8.1	151.82	-142.2	52.1	296.3	279.9	16.35	18.121		
3,900.0	3,894.1	3,879.6	3,876.2	9.1	8.3	152.27	-148.0	52.7	308.0	291.2	16.79	18.347		
4,000.0	3,993.8	3,978.9	3,975.3	9.3	8.5	152.67	-153.7	53.3	319.8	302.5	17.23	18.561		
4,100.0	4,093.6	4,078.2	4,074.4	9.6	8.7	153.06	-159.5	54.0	331.5	313.9	17.67	18.764		
4,200.0	4,193.4	4,177.5	4,173.6	9.8	9.0	153.41	-165.3	54.6	343.3	325.2	18.11	18.956		
4,300.0	4,293.2	4,276.8	4,272.7	10.1	9.2	153.74	-171.1	55.2	355.1	336.6	18.55	19.140		
4,400.0	4,392.9	4,376.1	4,371.8	10.3	9.4	154.05	-176.9	55.8	366.9	347.9	19.00	19.314		
4,500.0	4,492.7	4,475.3	4,470.9	10.6	9.7	154.34	-182.7	56.4	378.7	359.3	19.44	19.480		
4,600.0	4,592.5	4,574.6	4,570.0	10.8	9.9	154.61	-188.4	57.0	390.6	370.7	19.89	19.638		
4,700.0	4,692.2	4,673.9	4,669.1	11.1	10.2	154.87	-194.2	57.6	402.4	382.1	20.33	19.790		
4,800.0	4,792.0	4,773.2	4,768.2	11.3	10.4	155.11	-200.0	58.2	414.2	393.5	20.78	19.934		
4,900.0	4,891.8	4,872.5	4,867.3	11.6	10.6	155.34	-205.8	58.8	426.1	404.9	21.23	20.072		
5,000.0	4,991.6	4,971.7	4,966.4	11.8	10.9	155.56	-211.6	59.4	438.0	416.3	21.68	20.204		
5,100.0	5,091.3	5,071.0	5,065.6	12.1	11.1	155.76	-217.4	60.0	449.8	427.7	22.12	20.331		

COMPASS 2003.21 Build 46

<b>Company:</b>	Whiting Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well Wolf #12L-0103
<b>Project:</b>	Sec.12-T10N-R59W	<b>TVD Reference:</b>	WELL @ 4969.9ft (Original Well Elev)
<b>Reference Site:</b>	Wolf 12L Pad Sec.12-T10N-R59W	<b>MD Reference:</b>	WELL @ 4969.9ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Wolf #12L-0103	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #2	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 Sidetrack (1-16-14)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b> Wolf 12L Pad Sec.12-T10N-R59W - Wolf 12L-1304 - Wellbore #1 - Plan #1 (1-16-14)												<b>Offset Site Error:</b>	0.0 ft
Survey Program: 0-MWD												<b>Offset Well Error:</b>	0.0 ft
Reference	Offset	Semi Major Axis		Distance									
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,200.0	5,191.1	5,170.3	5,164.7	12.3	11.3	155.96	-223.1	60.6	461.7	439.1	22.57	20.452	
5,300.0	5,290.9	5,269.6	5,263.8	12.6	11.6	156.14	-228.9	61.3	473.6	450.5	23.02	20.569	
5,400.0	5,390.7	5,368.9	5,362.9	12.9	11.8	156.32	-234.7	61.9	485.4	462.0	23.47	20.680	
5,500.0	5,490.4	5,468.1	5,462.0	13.1	12.1	156.48	-240.5	62.5	497.3	473.4	23.92	20.788	
5,600.0	5,590.2	5,567.4	5,561.1	13.4	12.3	156.64	-246.3	63.1	509.2	484.8	24.37	20.891	
5,700.0	5,689.9	5,666.5	5,660.0	13.6	12.5	156.60	-252.0	63.7	522.3	497.5	24.72	21.128	
5,800.0	5,787.0	5,762.4	5,755.7	14.0	12.8	156.21	-257.6	64.3	549.2	524.7	24.48	22.428	
5,900.0	5,877.9	5,800.0	5,793.2	14.5	12.9	154.38	-260.4	64.6	595.4	571.7	23.68	25.140	
6,000.0	5,959.3	5,850.0	5,842.6	15.2	13.0	151.23	-268.0	65.4	661.5	638.7	22.78	29.037	
6,100.0	6,028.1	5,869.1	5,861.3	16.1	13.1	143.80	-272.2	65.8	742.8	720.1	22.68	32.750	
6,200.0	6,081.9	5,883.5	5,875.2	17.1	13.2	127.99	-275.8	66.2	833.9	808.4	25.51	32.687	
6,300.0	6,118.6	5,900.0	5,891.1	18.4	13.2	96.12	-280.3	66.7	930.2	899.0	31.14	29.872	

<b>Company:</b>	Whiting Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well Wolf #12L-0103
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<b>Reference Site:</b>	Wolf 12L Pad Sec.12-T10N-R59W	<b>MD Reference:</b>	WELL @ 4969.9ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Wolf #12L-0103	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #2	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 Sidetrack (1-16-14)	<b>Offset TVD Reference:</b>	Offset Datum

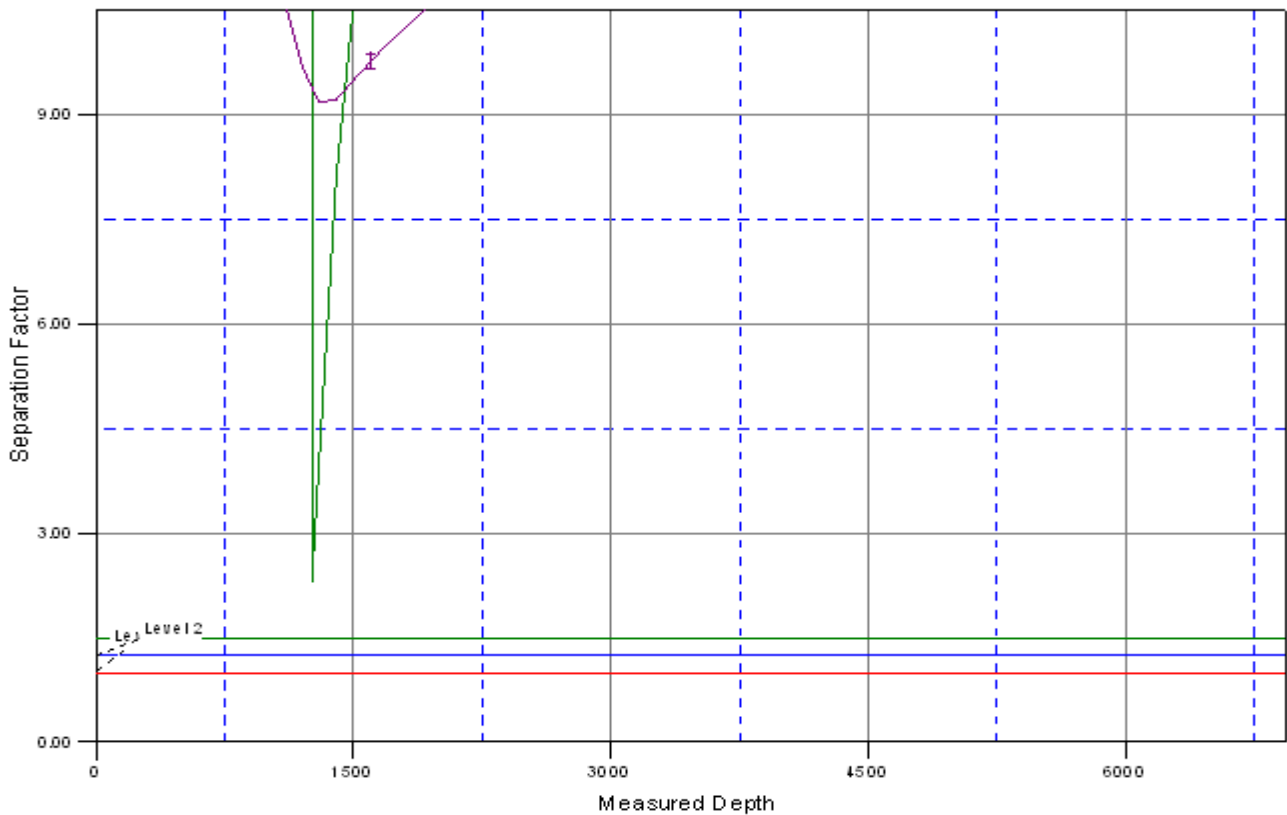
Reference Depths are relative to WELL @ 4969.9ft (Original Well Elev) Coordinates are relative to: Wolf #12L-0103  
 Offset Depths are relative to Offset Datum  
 Central Meridian is -105.500000 °  
 Coordinate System is US State Plane 1983, Colorado Northern Zone  
 Grid Convergence at Surface is: 1.01°



<b>Company:</b>	Whiting Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well Wolf #12L-0103
<b>Project:</b>	Sec.12-T10N-R59W	<b>TVD Reference:</b>	WELL @ 4969.9ft (Original Well Elev)
<b>Reference Site:</b>	Wolf 12L Pad Sec.12-T10N-R59W	<b>MD Reference:</b>	WELL @ 4969.9ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Wolf #12L-0103	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #2	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 Sidetrack (1-16-14)	<b>Offset TVD Reference:</b>	Offset Datum

Reference Depths are relative to WELL @ 4969.9ft (Original Well Elev) Coordinates are relative to: Wolf #12L-0103  
Offset Depths are relative to Offset Datum Coordinate System is US State Plane 1983, Colorado Northern Zone  
Central Meridian is -105.500000 ° Grid Convergence at Surface is: 1.01°

### Separation Factor Plot



### LEGEND

03, Wellbore #1, Plan #1 Pilot Hole (1-16-14) \00 Wolf 12L-1304, Wellbore #1, Plan #1 (1-16-14) \00