WHITING PETROLEUM CORPORATION

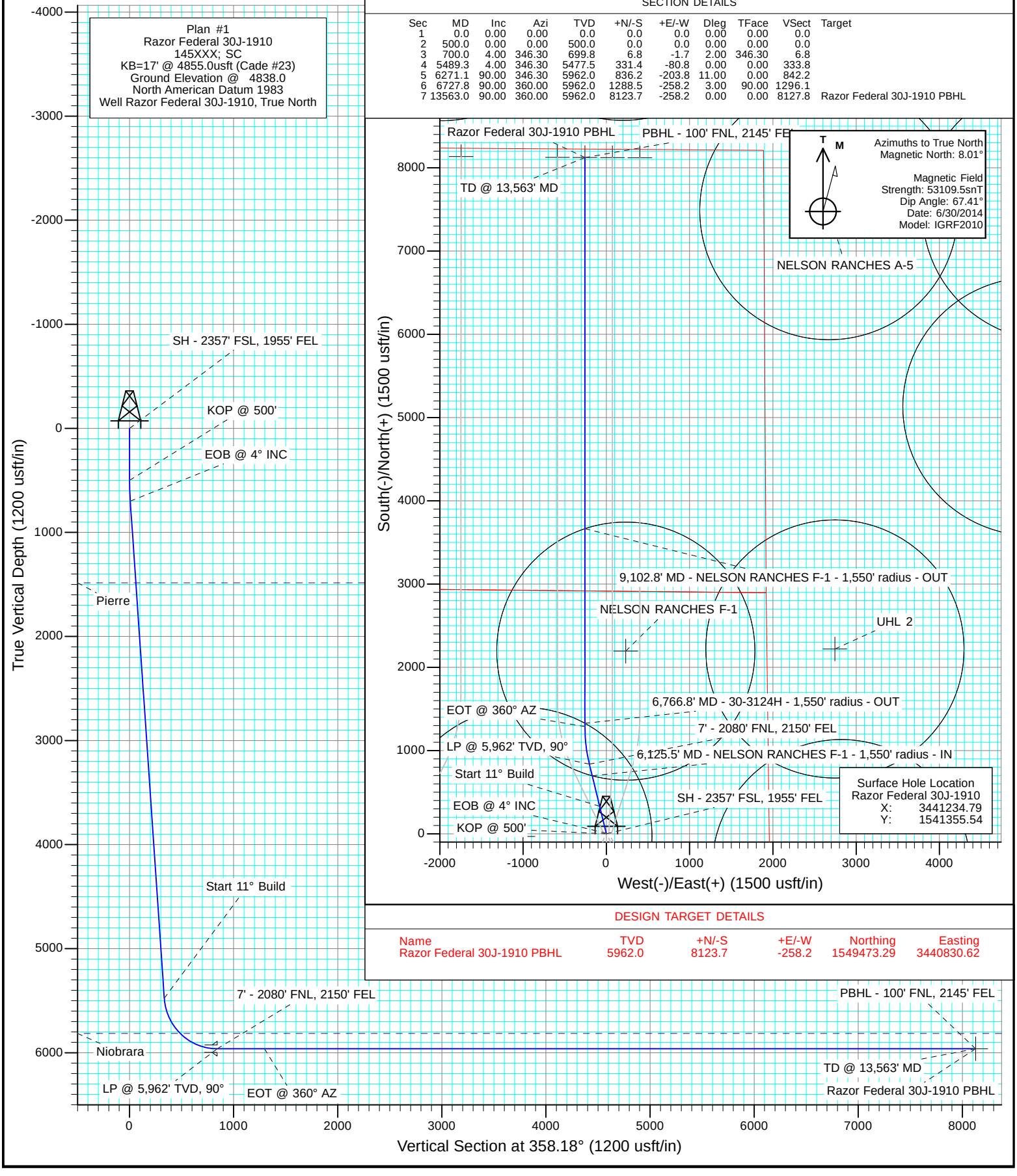
Project: Weld County, CO
Site: S30-T10N-R58W
Well: Razor Federal 30J-1910
Wellbore: HZ
Design: Plan #1

CATHEDRAL

Plan #1
Razor Federal 30J-1910
145XXX; SC
KB=17' @ 4855.0usft (Cade #23)
Ground Elevation @ 4838.0
North American Datum 1983
Well Razor Federal 30J-1910, True North

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	500.0	0.00	0.00	500.0	0.0	0.0	0.00	0.00	0.0	
3	700.0	4.00	346.30	699.8	6.8	-1.7	2.00	346.30	6.8	
4	5489.3	4.00	346.30	5477.5	331.4	-80.8	0.00	0.00	333.8	
5	6271.1	90.00	346.30	5962.0	836.2	-203.8	11.00	0.00	842.2	
6	6727.8	90.00	360.00	5962.0	1288.5	-258.2	3.00	90.00	1296.1	
7	13563.0	90.00	360.00	5962.0	8123.7	-258.2	0.00	0.00	8127.8	Razor Federal 30J-1910 PBHL



DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting
Razor Federal 30J-1910 PBHL	5962.0	8123.7	-258.2	1549473.29	3440830.62

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	**Local Co-ordinate Reference:**	Well Razor Federal 30J-1910
Company:	Whiting Petroleum Corporation	**TVD Reference:**	KB=17' @ 4855.0usft (Cade #23)
Project:	Weld County, CO	**MD Reference:**	KB=17' @ 4855.0usft (Cade #23)
Site:	S30-T10N-R58W	**North Reference:**	True
Well:	Razor Federal 30J-1910	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	HZ		
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Project Weld County, CO

Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site S30-T10N-R58W

Site Position:		**Northing:**	1,541,302.42 usft	**Latitude:**	40.808492
From:	Lat/Long	**Easting:**	3,438,779.30 usft	**Longitude:**	-103.914914
Position Uncertainty:	0.0 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	1.02 °

Well Razor Federal 30J-1910

Well Position	**+N/-S**	0.0 usft	**Northing:**	1,541,355.54 usft	**Latitude:**	40.808517
	+E/-W	0.0 usft	**Easting:**	3,441,234.79 usft	**Longitude:**	-103.906042
Position Uncertainty		0.0 usft	**Wellhead Elevation:**	0.0 usft	**Ground Level:**	4,838.0 usft

Wellbore HZ

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	6/30/2014	8.01	67.41	53,109

Design Plan #1

Audit Notes:

Version:		**Phase:**	PLAN	**Tie On Depth:**	0.0

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	358.18

Plan Sections

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
500.0	0.00	0.00	500.0	0.0	0.0	0.00	0.00	0.00	0.00	
700.0	4.00	346.30	699.8	6.8	-1.7	2.00	2.00	0.00	346.30	
5,489.3	4.00	346.30	5,477.5	331.4	-80.8	0.00	0.00	0.00	0.00	
6,271.1	90.00	346.30	5,962.0	836.2	-203.8	11.00	11.00	0.00	0.00	
6,727.8	90.00	360.00	5,962.0	1,288.5	-258.2	3.00	0.00	3.00	90.00	
13,563.0	90.00	360.00	5,962.0	8,123.7	-258.2	0.00	0.00	0.00	0.00	Razor Federal 30J-19

Database:	USA EDM 5000 Multi Users DB	**Local Co-ordinate Reference:**	Well Razor Federal 30J-1910
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Project:	Weld County, CO	**MD Reference:**	KB=17' @ 4855.0usft (Cade #23)
Site:	S30-T10N-R58W	**North Reference:**	True
Well:	Razor Federal 30J-1910	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft	Build Rate (°/100u	Comments / Formations
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
0.5	0.00	0.00	0.5	0.0	0.0	0.0	0.00	0.00	SH - 2357' FSL, 1955' FEL
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	KOP @ 500'
600.0	2.00	346.30	600.0	1.7	-0.4	1.7	2.00	2.00	
700.0	4.00	346.30	699.8	6.8	-1.7	6.8	2.00	2.00	EOB @ 4° INC
800.0	4.00	346.30	799.6	13.6	-3.3	13.7	0.00	0.00	
900.0	4.00	346.30	899.4	20.3	-5.0	20.5	0.00	0.00	
1,000.0	4.00	346.30	999.1	27.1	-6.6	27.3	0.00	0.00	
1,100.0	4.00	346.30	1,098.9	33.9	-8.3	34.1	0.00	0.00	
1,200.0	4.00	346.30	1,198.6	40.7	-9.9	41.0	0.00	0.00	
1,300.0	4.00	346.30	1,298.4	47.4	-11.6	47.8	0.00	0.00	
1,400.0	4.00	346.30	1,398.1	54.2	-13.2	54.6	0.00	0.00	
1,487.1	4.00	346.30	1,485.0	60.1	-14.7	60.6	0.00	0.00	Pierre
1,500.0	4.00	346.30	1,497.9	61.0	-14.9	61.4	0.00	0.00	
1,600.0	4.00	346.30	1,597.6	67.8	-16.5	68.3	0.00	0.00	
1,700.0	4.00	346.30	1,697.4	74.6	-18.2	75.1	0.00	0.00	
1,800.0	4.00	346.30	1,797.2	81.3	-19.8	81.9	0.00	0.00	
1,900.0	4.00	346.30	1,896.9	88.1	-21.5	88.7	0.00	0.00	
2,000.0	4.00	346.30	1,996.7	94.9	-23.1	95.6	0.00	0.00	
2,100.0	4.00	346.30	2,096.4	101.7	-24.8	102.4	0.00	0.00	
2,200.0	4.00	346.30	2,196.2	108.4	-26.4	109.2	0.00	0.00	
2,300.0	4.00	346.30	2,295.9	115.2	-28.1	116.0	0.00	0.00	
2,400.0	4.00	346.30	2,395.7	122.0	-29.7	122.9	0.00	0.00	
2,500.0	4.00	346.30	2,495.5	128.8	-31.4	129.7	0.00	0.00	
2,600.0	4.00	346.30	2,595.2	135.5	-33.0	136.5	0.00	0.00	
2,700.0	4.00	346.30	2,695.0	142.3	-34.7	143.4	0.00	0.00	
2,800.0	4.00	346.30	2,794.7	149.1	-36.3	150.2	0.00	0.00	
2,900.0	4.00	346.30	2,894.5	155.9	-38.0	157.0	0.00	0.00	
3,000.0	4.00	346.30	2,994.2	162.7	-39.7	163.8	0.00	0.00	
3,100.0	4.00	346.30	3,094.0	169.4	-41.3	170.7	0.00	0.00	
3,200.0	4.00	346.30	3,193.7	176.2	-43.0	177.5	0.00	0.00	
3,300.0	4.00	346.30	3,293.5	183.0	-44.6	184.3	0.00	0.00	
3,400.0	4.00	346.30	3,393.3	189.8	-46.3	191.1	0.00	0.00	
3,500.0	4.00	346.30	3,493.0	196.5	-47.9	198.0	0.00	0.00	
3,600.0	4.00	346.30	3,592.8	203.3	-49.6	204.8	0.00	0.00	
3,700.0	4.00	346.30	3,692.5	210.1	-51.2	211.6	0.00	0.00	
3,800.0	4.00	346.30	3,792.3	216.9	-52.9	218.4	0.00	0.00	
3,900.0	4.00	346.30	3,892.0	223.6	-54.5	225.3	0.00	0.00	
4,000.0	4.00	346.30	3,991.8	230.4	-56.2	232.1	0.00	0.00	
4,100.0	4.00	346.30	4,091.6	237.2	-57.8	238.9	0.00	0.00	
4,200.0	4.00	346.30	4,191.3	244.0	-59.5	245.7	0.00	0.00	
4,300.0	4.00	346.30	4,291.1	250.8	-61.1	252.6	0.00	0.00	
4,400.0	4.00	346.30	4,390.8	257.5	-62.8	259.4	0.00	0.00	
4,500.0	4.00	346.30	4,490.6	264.3	-64.4	266.2	0.00	0.00	
4,600.0	4.00	346.30	4,590.3	271.1	-66.1	273.1	0.00	0.00	
4,700.0	4.00	346.30	4,690.1	277.9	-67.7	279.9	0.00	0.00	
4,800.0	4.00	346.30	4,789.9	284.6	-69.4	286.7	0.00	0.00	
4,900.0	4.00	346.30	4,889.6	291.4	-71.0	293.5	0.00	0.00	

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Site:	S30-T10N-R58W	**North Reference:**	True
Well:	Razor Federal 30J-1910	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft	Build Rate (°/100u	Comments / Formations
5,000.0	4.00	346.30	4,989.4	298.2	-72.7	300.4	0.00	0.00	
5,100.0	4.00	346.30	5,089.1	305.0	-74.3	307.2	0.00	0.00	
5,200.0	4.00	346.30	5,188.9	311.8	-76.0	314.0	0.00	0.00	
5,300.0	4.00	346.30	5,288.6	318.5	-77.6	320.8	0.00	0.00	
5,400.0	4.00	346.30	5,388.4	325.3	-79.3	327.7	0.00	0.00	
5,489.3	4.00	346.30	5,477.5	331.4	-80.8	333.8	0.00	0.00	Start 11° Build
5,500.0	5.18	346.30	5,488.1	332.2	-81.0	334.6	11.00	11.00	
5,550.0	10.68	346.30	5,537.6	338.9	-82.6	341.3	11.00	11.00	
5,600.0	16.18	346.30	5,586.3	350.2	-85.4	352.7	11.00	11.00	
5,650.0	21.68	346.30	5,633.5	365.9	-89.2	368.6	11.00	11.00	
5,700.0	27.18	346.30	5,679.0	386.0	-94.1	388.8	11.00	11.00	
5,750.0	32.68	346.30	5,722.4	410.2	-100.0	413.2	11.00	11.00	
5,800.0	38.18	346.30	5,763.1	438.4	-106.9	441.5	11.00	11.00	
5,850.0	43.68	346.30	5,800.8	470.2	-114.6	473.6	11.00	11.00	
5,868.5	45.71	346.30	5,814.0	482.8	-117.7	486.3	11.00	11.00	Niobrara
5,900.0	49.18	346.30	5,835.3	505.4	-123.2	509.0	11.00	11.00	
5,950.0	54.68	346.30	5,866.1	543.6	-132.5	547.5	11.00	11.00	
6,000.0	60.18	346.30	5,893.0	584.5	-142.5	588.7	11.00	11.00	
6,050.0	65.68	346.30	5,915.8	627.7	-153.0	632.3	11.00	11.00	
6,100.0	71.18	346.30	5,934.2	672.9	-164.0	677.8	11.00	11.00	
6,125.5	73.98	346.30	5,941.8	696.5	-169.8	701.6	11.00	11.00	6,125.5' MD - NELSON RANCHES F-1 - 1,550'
6,150.0	76.68	346.30	5,948.0	719.6	-175.4	724.8	11.00	11.00	
6,200.0	82.18	346.30	5,957.2	767.3	-187.0	772.9	11.00	11.00	
6,250.0	87.68	346.30	5,961.6	815.7	-198.8	821.6	11.00	11.00	
6,271.1	90.00	346.30	5,962.0	836.2	-203.8	842.2	11.00	11.00	7' - 2080' FNL, 2150' FEL - LP @ 5,962' TVD, 9
6,300.0	90.00	347.17	5,962.0	864.3	-210.5	870.5	3.00	0.01	
6,400.0	90.00	350.17	5,962.0	962.3	-230.1	969.2	3.00	0.00	
6,500.0	90.00	353.17	5,962.0	1,061.3	-244.6	1,068.5	3.00	0.00	
6,600.0	90.00	356.17	5,962.0	1,160.8	-253.9	1,168.3	3.00	0.00	
6,700.0	90.00	359.17	5,962.0	1,260.7	-258.0	1,268.3	3.00	0.00	
6,727.8	90.00	360.00	5,962.0	1,288.5	-258.2	1,296.1	3.00	0.00	EOT @ 360° AZ
6,766.8	90.00	360.00	5,962.0	1,327.5	-258.2	1,335.1	0.00	0.00	6,766.8' MD - 30-3124H - 1,550' radius - OUT
6,800.0	90.00	360.00	5,962.0	1,360.7	-258.2	1,368.2	0.00	0.00	
6,900.0	90.00	360.00	5,962.0	1,460.7	-258.2	1,468.2	0.00	0.00	
7,000.0	90.00	360.00	5,962.0	1,560.7	-258.2	1,568.1	0.00	0.00	
7,100.0	90.00	360.00	5,962.0	1,660.7	-258.2	1,668.1	0.00	0.00	
7,200.0	90.00	360.00	5,962.0	1,760.7	-258.2	1,768.0	0.00	0.00	
7,300.0	90.00	360.00	5,962.0	1,860.7	-258.2	1,868.0	0.00	0.00	
7,400.0	90.00	360.00	5,962.0	1,960.7	-258.2	1,967.9	0.00	0.00	
7,500.0	90.00	360.00	5,962.0	2,060.7	-258.2	2,067.9	0.00	0.00	
7,600.0	90.00	360.00	5,962.0	2,160.7	-258.2	2,167.8	0.00	0.00	
7,700.0	90.00	360.00	5,962.0	2,260.7	-258.2	2,267.8	0.00	0.00	
7,800.0	90.00	360.00	5,962.0	2,360.7	-258.2	2,367.7	0.00	0.00	
7,900.0	90.00	360.00	5,962.0	2,460.7	-258.2	2,467.7	0.00	0.00	
8,000.0	90.00	360.00	5,962.0	2,560.7	-258.2	2,567.6	0.00	0.00	
8,100.0	90.00	360.00	5,962.0	2,660.7	-258.2	2,667.6	0.00	0.00	
8,200.0	90.00	360.00	5,962.0	2,760.7	-258.2	2,767.5	0.00	0.00	
8,300.0	90.00	360.00	5,962.0	2,860.7	-258.2	2,867.5	0.00	0.00	
8,400.0	90.00	360.00	5,962.0	2,960.7	-258.2	2,967.4	0.00	0.00	
8,500.0	90.00	360.00	5,962.0	3,060.7	-258.2	3,067.4	0.00	0.00	
8,600.0	90.00	360.00	5,962.0	3,160.7	-258.2	3,167.3	0.00	0.00	
8,700.0	90.00	360.00	5,962.0	3,260.7	-258.2	3,267.3	0.00	0.00	

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Project:	Weld County, CO	**MD Reference:**	KB=17' @ 4855.0usft (Cade #23)
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Well:	Razor Federal 30J-1910	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft	Build Rate (°/100u	Comments / Formations
8,800.0	90.00	360.00	5,962.0	3,360.7	-258.2	3,367.2	0.00	0.00	
8,900.0	90.00	360.00	5,962.0	3,460.7	-258.2	3,467.2	0.00	0.00	
9,000.0	90.00	360.00	5,962.0	3,560.7	-258.2	3,567.1	0.00	0.00	
9,100.0	90.00	360.00	5,962.0	3,660.7	-258.2	3,667.1	0.00	0.00	
9,102.8	90.00	360.00	5,962.0	3,663.5	-258.2	3,669.9	0.00	0.00	9,102.8' MD - NELSON RANCHES F-1 - 1,550'
9,200.0	90.00	360.00	5,962.0	3,760.7	-258.2	3,767.0	0.00	0.00	
9,300.0	90.00	360.00	5,962.0	3,860.7	-258.2	3,867.0	0.00	0.00	
9,400.0	90.00	360.00	5,962.0	3,960.7	-258.2	3,966.9	0.00	0.00	
9,500.0	90.00	360.00	5,962.0	4,060.7	-258.2	4,066.9	0.00	0.00	
9,600.0	90.00	360.00	5,962.0	4,160.7	-258.2	4,166.8	0.00	0.00	
9,700.0	90.00	360.00	5,962.0	4,260.7	-258.2	4,266.8	0.00	0.00	
9,800.0	90.00	360.00	5,962.0	4,360.7	-258.2	4,366.7	0.00	0.00	
9,900.0	90.00	360.00	5,962.0	4,460.7	-258.2	4,466.7	0.00	0.00	
10,000.0	90.00	360.00	5,962.0	4,560.7	-258.2	4,566.6	0.00	0.00	
10,100.0	90.00	360.00	5,962.0	4,660.7	-258.2	4,666.6	0.00	0.00	
10,200.0	90.00	360.00	5,962.0	4,760.7	-258.2	4,766.5	0.00	0.00	
10,300.0	90.00	360.00	5,962.0	4,860.7	-258.2	4,866.5	0.00	0.00	
10,400.0	90.00	360.00	5,962.0	4,960.7	-258.2	4,966.4	0.00	0.00	
10,500.0	90.00	360.00	5,962.0	5,060.7	-258.2	5,066.4	0.00	0.00	
10,600.0	90.00	360.00	5,962.0	5,160.7	-258.2	5,166.3	0.00	0.00	
10,700.0	90.00	360.00	5,962.0	5,260.7	-258.2	5,266.3	0.00	0.00	
10,800.0	90.00	360.00	5,962.0	5,360.7	-258.2	5,366.2	0.00	0.00	
10,900.0	90.00	360.00	5,962.0	5,460.7	-258.2	5,466.2	0.00	0.00	
11,000.0	90.00	360.00	5,962.0	5,560.7	-258.2	5,566.1	0.00	0.00	
11,100.0	90.00	360.00	5,962.0	5,660.7	-258.2	5,666.1	0.00	0.00	
11,200.0	90.00	360.00	5,962.0	5,760.7	-258.2	5,766.0	0.00	0.00	
11,300.0	90.00	360.00	5,962.0	5,860.7	-258.2	5,866.0	0.00	0.00	
11,400.0	90.00	360.00	5,962.0	5,960.7	-258.2	5,965.9	0.00	0.00	
11,500.0	90.00	360.00	5,962.0	6,060.7	-258.2	6,065.9	0.00	0.00	
11,600.0	90.00	360.00	5,962.0	6,160.7	-258.2	6,165.8	0.00	0.00	
11,700.0	90.00	360.00	5,962.0	6,260.7	-258.2	6,265.8	0.00	0.00	
11,800.0	90.00	360.00	5,962.0	6,360.7	-258.2	6,365.7	0.00	0.00	
11,900.0	90.00	360.00	5,962.0	6,460.7	-258.2	6,465.7	0.00	0.00	
12,000.0	90.00	360.00	5,962.0	6,560.7	-258.2	6,565.6	0.00	0.00	
12,100.0	90.00	360.00	5,962.0	6,660.7	-258.2	6,665.6	0.00	0.00	
12,200.0	90.00	360.00	5,962.0	6,760.7	-258.2	6,765.5	0.00	0.00	
12,300.0	90.00	360.00	5,962.0	6,860.7	-258.2	6,865.5	0.00	0.00	
12,400.0	90.00	360.00	5,962.0	6,960.7	-258.2	6,965.4	0.00	0.00	
12,500.0	90.00	360.00	5,962.0	7,060.7	-258.2	7,065.4	0.00	0.00	
12,600.0	90.00	360.00	5,962.0	7,160.7	-258.2	7,165.3	0.00	0.00	
12,700.0	90.00	360.00	5,962.0	7,260.7	-258.2	7,265.3	0.00	0.00	
12,800.0	90.00	360.00	5,962.0	7,360.7	-258.2	7,365.2	0.00	0.00	
12,900.0	90.00	360.00	5,962.0	7,460.7	-258.2	7,465.2	0.00	0.00	
13,000.0	90.00	360.00	5,962.0	7,560.7	-258.2	7,565.1	0.00	0.00	
13,100.0	90.00	360.00	5,962.0	7,660.7	-258.2	7,665.1	0.00	0.00	
13,200.0	90.00	360.00	5,962.0	7,760.7	-258.2	7,765.0	0.00	0.00	
13,300.0	90.00	360.00	5,962.0	7,860.7	-258.2	7,865.0	0.00	0.00	
13,400.0	90.00	360.00	5,962.0	7,960.7	-258.2	7,964.9	0.00	0.00	
13,500.0	90.00	360.00	5,962.0	8,060.7	-258.2	8,064.9	0.00	0.00	
13,563.0	90.00	360.00	5,962.0	8,123.7	-258.2	8,127.8	0.00	0.00	TD @ 13,563' MD - PBHL - 100' FNL, 2145' FE

Database:	USA EDM 5000 Multi Users DB	**Local Co-ordinate Reference:**	Well Razor Federal 30J-1910
Company:	Whiting Petroleum Corporation	**TVD Reference:**	KB=17' @ 4855.0usft (Cade #23)
Project:	Weld County, CO	**MD Reference:**	KB=17' @ 4855.0usft (Cade #23)
Site:	S30-T10N-R58W	**North Reference:**	True
Well:	Razor Federal 30J-1910	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Razor Federal 30J-1910 - plan hits target center - Point	0.00	0.00	5,962.0	8,123.7	-258.2	1,549,473.29	3,440,830.62	40.830814	-103.906975

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
6,271.1	5,962.0	7"	0	0

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,487.1	1,485.0	Pierre			
5,868.5	5,814.0	Niobrara			

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
0.5	0.5	0.0	0.0	SH - 2357' FSL, 1955' FEL
500.0	500.0	0.0	0.0	KOP @ 500'
700.0	699.8	6.8	-1.7	EOB @ 4° INC
5,489.3	5,477.5	331.4	-80.8	Start 11° Build
6,125.5	5,941.8	696.5	-169.8	6,125.5' MD - NELSON RANCHES F-1 - 1,550' radius - IN
6,271.1	5,962.0	836.2	-203.8	7' - 2080' FNL, 2150' FEL
6,271.1	5,962.0	836.2	-203.8	LP @ 5,962' TVD, 90°
6,727.8	5,962.0	1,288.5	-258.2	EOT @ 360° AZ
6,766.8	5,962.0	1,327.5	-258.2	6,766.8' MD - 30-3124H - 1,550' radius - OUT
9,102.8	5,962.0	3,663.5	-258.2	9,102.8' MD - NELSON RANCHES F-1 - 1,550' radius - OUT
13,563.0	5,962.0	8,123.7	-258.2	TD @ 13,563' MD
13,563.0	5,962.0	8,123.7	-258.2	PBHL - 100' FNL, 2145' FEL

Whiting Petroleum Corporation

Weld County, CO
S30-T10N-R58W
Razor Federal 30J-1910
HZ
Plan #1

Anticollision Report

01 July, 2014

Company:	Whiting Petroleum Corporation	**Local Co-ordinate Reference:**	Well Razor Federal 30J-1910
Project:	Weld County, CO	**TVD Reference:**	KB=17' @ 4855.0usft (Cade #23)
Reference Site:	S30-T10N-R58W	**MD Reference:**	KB=17' @ 4855.0usft (Cade #23)
Site Error:	0.0usft	**North Reference:**	True
Reference Well:	Razor Federal 30J-1910	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0usft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Reference Plan #1

Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 100.0usft	**Error Model:**	Systematic Ellipse
Depth Range:	Unlimited	**Scan Method:**	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 1,550.0usft	**Error Surface:**	Elliptical Conic
Warning Levels Evaluated at:	2.00 **Sigma**		

Survey Tool Program **Date** 6/30/2014

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.0	13,562.6	Plan #1 (HZ)	ISCWSA MWD	MWD - ISCWSA

Summary

Site Name Offset Well - Wellbore - Design	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
S30-T10N-R58W						
Razor 30J-3109 - HZ - Plan #1	500.0	500.0	58.8	56.8	29.628	CC, ES
Razor 30J-3109 - HZ - Plan #1	700.0	695.3	70.7	67.8	24.852	SF
Razor 30J-3110 - HZ - Plan #1	500.0	500.0	50.6	48.7	25.517	CC, ES
Razor 30J-3110 - HZ - Plan #1	600.0	598.1	54.1	51.6	22.381	SF
Razor 30J-3111 - HZ - Plan #1	500.0	500.0	59.0	57.0	29.706	CC, ES
Razor 30J-3111 - HZ - Plan #1	700.0	695.2	72.3	69.5	25.379	SF
Razor 30J-3112 - HZ - Plan #1	500.0	500.0	78.6	76.6	39.594	CC, ES
Razor 30J-3112 - HZ - Plan #1	5,400.0	5,348.9	732.3	708.2	30.473	SF
Razor Federal 30J-1909 - HZ - Plan #1	500.0	500.0	29.9	27.9	15.064	CC
Razor Federal 30J-1909 - HZ - Plan #1	600.0	599.5	30.2	27.8	12.440	ES
Razor Federal 30J-1909 - HZ - Plan #1	13,563.0	13,559.9	342.7	42.9	1.143	Level 2, SF
Razor Federal 30J-1911 - HZ - Plan #1	500.0	500.0	30.2	28.2	15.204	CC, ES
Razor Federal 30J-1911 - HZ - Plan #1	13,563.0	13,446.2	342.7	42.4	1.141	Level 2, SF
Razor Federal 30J-1912 - HZ - Plan #1	500.0	500.0	60.1	58.1	30.268	CC, ES
Razor Federal 30J-1912 - HZ - Plan #1	13,563.0	13,577.7	660.3	351.4	2.138	SF
Razor Federal 30L-1904 - HZ - Plan #2	13,563.0	13,655.6	1,486.7	1,175.8	4.782	CC, ES, SF

Company:	Whiting Petroleum Corporation	**Local Co-ordinate Reference:**	Well Razor Federal 30J-1910
Project:	Weld County, CO	**TVD Reference:**	KB=17' @ 4855.0usft (Cade #23)
Reference Site:	S30-T10N-R58W	**MD Reference:**	KB=17' @ 4855.0usft (Cade #23)
Site Error:	0.0usft	**North Reference:**	True
Reference Well:	Razor Federal 30J-1910	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0usft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design S30-T10N-R58W - Razor 30J-3109 - HZ - Plan #1

Offset Site Error: 0.0 usft

Survey Program: 0-ISCWSA MWD

Offset Well Error: 0.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-149.44	-50.6	-29.9	58.8				
100.0	100.0	100.0	100.0	0.1	0.1	-149.44	-50.6	-29.9	58.8	58.6	0.19	315.203	
200.0	200.0	200.0	200.0	0.3	0.3	-149.44	-50.6	-29.9	58.8	58.2	0.64	92.445	
300.0	300.0	300.0	300.0	0.5	0.5	-149.44	-50.6	-29.9	58.8	57.7	1.09	54.165	
400.0	400.0	400.0	400.0	0.8	0.8	-149.44	-50.6	-29.9	58.8	57.3	1.54	38.304	
500.0	500.0	500.0	500.0	1.0	1.0	-149.44	-50.6	-29.9	58.8	56.8	1.98	29.628	CC, ES
600.0	600.0	598.0	597.9	1.2	1.2	-137.25	-52.3	-30.3	61.7	59.3	2.41	25.596	
700.0	699.8	695.3	695.1	1.4	1.4	-141.01	-57.1	-31.5	70.7	67.8	2.84	24.852	SF
800.0	799.6	794.2	793.8	1.7	1.6	-144.95	-63.8	-33.2	83.1	79.8	3.28	25.369	
900.0	899.4	893.3	892.7	1.9	1.8	-147.86	-70.5	-34.9	95.9	92.1	3.71	25.835	
1,000.0	999.1	992.4	991.5	2.2	2.0	-150.09	-77.2	-36.5	108.8	104.6	4.15	26.212	
1,100.0	1,098.9	1,091.5	1,090.4	2.4	2.3	-151.84	-83.9	-38.2	121.8	117.2	4.59	26.520	
1,200.0	1,198.6	1,190.6	1,189.2	2.7	2.5	-153.25	-90.6	-39.9	135.0	129.9	5.04	26.775	
1,300.0	1,298.4	1,289.6	1,288.0	2.9	2.8	-154.41	-97.3	-41.6	148.2	142.7	5.49	26.988	
1,400.0	1,398.1	1,388.7	1,386.9	3.2	3.0	-155.38	-104.0	-43.3	161.4	155.5	5.94	27.169	
1,500.0	1,497.9	1,487.8	1,485.7	3.4	3.3	-156.21	-110.7	-44.9	174.7	168.4	6.40	27.325	
1,600.0	1,597.6	1,586.9	1,584.6	3.7	3.5	-156.91	-117.4	-46.6	188.1	181.2	6.85	27.460	
1,700.0	1,697.4	1,686.0	1,683.4	3.9	3.8	-157.52	-124.1	-48.3	201.4	194.1	7.30	27.579	
1,800.0	1,797.2	1,785.1	1,782.3	4.2	4.0	-158.06	-130.8	-50.0	214.8	207.0	7.76	27.685	
1,900.0	1,896.9	1,884.1	1,881.1	4.4	4.3	-158.54	-137.5	-51.6	228.2	220.0	8.21	27.779	
2,000.0	1,996.7	1,983.2	1,979.9	4.7	4.5	-158.96	-144.2	-53.3	241.6	232.9	8.67	27.863	
2,100.0	2,096.4	2,082.3	2,078.8	4.9	4.8	-159.33	-150.9	-55.0	255.0	245.9	9.13	27.940	
2,200.0	2,196.2	2,181.4	2,177.6	5.2	5.0	-159.67	-157.7	-56.7	268.4	258.9	9.58	28.010	
2,300.0	2,295.9	2,280.5	2,276.5	5.4	5.3	-159.98	-164.4	-58.4	281.9	271.8	10.04	28.074	
2,400.0	2,395.7	2,379.6	2,375.3	5.7	5.6	-160.26	-171.1	-60.0	295.3	284.8	10.50	28.133	
2,500.0	2,495.5	2,478.6	2,474.1	6.0	5.8	-160.51	-177.8	-61.7	308.8	297.8	10.95	28.188	
2,600.0	2,595.2	2,577.7	2,573.0	6.2	6.1	-160.75	-184.5	-63.4	322.2	310.8	11.41	28.239	
2,700.0	2,695.0	2,676.8	2,671.8	6.5	6.3	-160.96	-191.2	-65.1	335.7	323.8	11.87	28.287	
2,800.0	2,794.7	2,775.9	2,770.7	6.7	6.6	-161.16	-197.9	-66.7	349.1	336.8	12.32	28.332	
2,900.0	2,894.5	2,875.0	2,869.5	7.0	6.9	-161.34	-204.6	-68.4	362.6	349.8	12.78	28.374	
3,000.0	2,994.2	2,974.1	2,968.4	7.2	7.1	-161.52	-211.3	-70.1	376.1	362.8	13.24	28.414	
3,100.0	3,094.0	3,073.1	3,067.2	7.5	7.4	-161.67	-218.0	-71.8	389.5	375.9	13.69	28.452	
3,200.0	3,193.7	3,172.2	3,166.0	7.7	7.6	-161.82	-224.7	-73.5	403.0	388.9	14.15	28.488	
3,300.0	3,293.5	3,271.3	3,264.9	8.0	7.9	-161.96	-231.4	-75.1	416.5	401.9	14.60	28.522	
3,400.0	3,393.3	3,370.4	3,363.7	8.3	8.2	-162.09	-238.1	-76.8	430.0	414.9	15.06	28.555	
3,500.0	3,493.0	3,469.5	3,462.6	8.5	8.4	-162.21	-244.8	-78.5	443.5	427.9	15.51	28.586	
3,600.0	3,592.8	3,568.6	3,561.4	8.8	8.7	-162.33	-251.5	-80.2	456.9	441.0	15.97	28.617	
3,700.0	3,692.5	3,667.6	3,660.2	9.0	8.9	-162.43	-258.2	-81.8	470.4	454.0	16.42	28.646	
3,800.0	3,792.3	3,766.7	3,759.1	9.3	9.2	-162.54	-264.9	-83.5	483.9	467.0	16.88	28.674	
3,900.0	3,892.0	3,865.8	3,857.9	9.5	9.5	-162.63	-271.6	-85.2	497.4	480.1	17.33	28.701	
4,000.0	3,991.8	3,964.9	3,956.8	9.8	9.7	-162.72	-278.3	-86.9	510.9	493.1	17.78	28.727	
4,100.0	4,091.6	4,064.0	4,055.6	10.0	10.0	-162.81	-285.0	-88.6	524.4	506.1	18.24	28.753	
4,200.0	4,191.3	4,163.0	4,154.4	10.3	10.2	-162.89	-291.7	-90.2	537.9	519.2	18.69	28.778	
4,300.0	4,291.1	4,262.1	4,253.3	10.6	10.5	-162.97	-298.5	-91.9	551.4	532.2	19.14	28.802	
4,400.0	4,390.8	4,361.2	4,352.1	10.8	10.8	-163.05	-305.2	-93.6	564.9	545.3	19.60	28.825	
4,500.0	4,490.6	4,460.3	4,451.0	11.1	11.0	-163.12	-311.9	-95.3	578.4	558.3	20.05	28.843	
4,600.0	4,590.3	4,559.4	4,549.8	11.3	11.3	-163.19	-318.6	-96.9	591.9	571.3	20.51	28.855	
4,700.0	4,690.1	4,658.5	4,648.7	11.6	11.6	-163.25	-325.3	-98.6	605.4	584.4	20.97	28.867	
4,800.0	4,789.9	4,757.5	4,747.5	11.8	11.8	-163.31	-332.0	-100.3	618.8	597.4	21.43	28.878	
4,900.0	4,889.6	4,856.6	4,846.3	12.1	12.1	-163.37	-338.7	-102.0	632.3	610.5	21.89	28.888	
5,000.0	4,989.4	4,955.7	4,945.2	12.4	12.3	-163.43	-345.4	-103.7	645.8	623.5	22.35	28.899	
5,100.0	5,089.1	5,054.8	5,044.0	12.6	12.6	-163.48	-352.1	-105.3	659.3	636.5	22.81	28.908	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	Whiting Petroleum Corporation	**Local Co-ordinate Reference:**	Well Razor Federal 30J-1910
Project:	Weld County, CO	**TVD Reference:**	KB=17' @ 4855.0usft (Cade #23)
Reference Site:	S30-T10N-R58W	**MD Reference:**	KB=17' @ 4855.0usft (Cade #23)
Site Error:	0.0usft	**North Reference:**	True
Reference Well:	Razor Federal 30J-1910	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0usft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design S30-T10N-R58W - Razor 30J-3109 - HZ - Plan #1

Offset Site Error: 0.0 usft

Survey Program: 0-ISCWSA MWD

Offset Well Error: 0.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor	Warning
5,200.0	5,188.9	5,153.9	5,142.9	12.9	12.9	-163.54	-358.8	-107.0	672.8	649.6	23.27	28.918	
5,300.0	5,288.6	5,253.0	5,241.7	13.1	13.1	-163.59	-365.5	-108.7	686.3	662.6	23.73	28.927	
5,400.0	5,388.4	5,352.0	5,340.5	13.4	13.4	-163.63	-372.2	-110.4	699.8	675.7	24.19	28.935	
5,500.0	5,488.1	5,419.6	5,407.9	13.6	13.6	-163.60	-377.3	-111.6	714.7	690.1	24.54	29.121	
5,600.0	5,586.3	5,450.0	5,438.0	14.0	13.7	-162.53	-381.5	-112.7	747.1	723.0	24.10	30.996	
5,700.0	5,679.0	5,500.0	5,486.7	14.5	13.9	-160.54	-392.2	-115.4	801.9	778.8	23.05	34.792	
5,800.0	5,763.1	5,519.5	5,505.5	15.2	14.0	-156.50	-397.5	-116.7	874.8	853.1	21.63	40.444	
5,900.0	5,835.3	5,550.0	5,534.2	16.1	14.1	-148.95	-407.3	-119.2	961.0	939.9	21.11	45.521	
6,000.0	5,893.0	5,550.0	5,534.2	17.2	14.1	-128.81	-407.3	-119.2	1,055.0	1,029.5	25.52	41.345	
6,100.0	5,934.2	5,550.0	5,534.2	18.4	14.1	-80.24	-407.3	-119.2	1,152.7	1,120.3	32.40	35.577	
6,200.0	5,957.2	5,550.0	5,534.2	19.8	14.1	-39.06	-407.3	-119.2	1,250.3	1,227.8	22.47	55.631	
6,300.0	5,962.0	5,550.0	5,534.2	21.3	14.1	-24.33	-407.3	-119.2	1,344.7	1,328.9	15.81	85.032	
6,400.0	5,962.0	5,550.0	5,534.2	22.7	14.1	-16.24	-407.3	-119.2	1,439.2	1,426.8	12.41	116.009	
6,500.0	5,962.0	5,524.1	5,509.8	24.2	14.0	-5.94	-398.9	-117.1	1,533.9	1,525.3	8.62	177.922	

Company:	Whiting Petroleum Corporation	**Local Co-ordinate Reference:**	Well Razor Federal 30J-1910
Project:	Weld County, CO	**TVD Reference:**	KB=17' @ 4855.0usft (Cade #23)
Reference Site:	S30-T10N-R58W	**MD Reference:**	KB=17' @ 4855.0usft (Cade #23)
Site Error:	0.0usft	**North Reference:**	True
Reference Well:	Razor Federal 30J-1910	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0usft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design S30-T10N-R58W - Razor 30J-3110 - HZ - Plan #1

Offset Site Error: 0.0 usft

Survey Program: 0-ISCWSA MWD

Offset Well Error: 0.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	180.00	-50.6	0.0	50.6				
100.0	100.0	100.0	100.0	0.1	0.1	180.00	-50.6	0.0	50.6	50.5	0.19	271.463	
200.0	200.0	200.0	200.0	0.3	0.3	180.00	-50.6	0.0	50.6	50.0	0.64	79.616	
300.0	300.0	300.0	300.0	0.5	0.5	180.00	-50.6	0.0	50.6	49.6	1.09	46.649	
400.0	400.0	400.0	400.0	0.8	0.8	180.00	-50.6	0.0	50.6	49.1	1.54	32.989	
500.0	500.0	500.0	500.0	1.0	1.0	180.00	-50.6	0.0	50.6	48.7	1.98	25.517	CC, ES
600.0	600.0	598.1	598.1	1.2	1.2	-166.78	-52.3	0.1	54.1	51.6	2.42	22.381	SF
700.0	699.8	695.6	695.5	1.4	1.4	-167.93	-57.3	0.3	64.3	61.4	2.85	22.533	
800.0	799.6	794.5	794.1	1.7	1.6	-169.05	-64.2	0.5	78.0	74.8	3.28	23.807	
900.0	899.4	893.6	892.9	1.9	1.8	-169.83	-71.1	0.8	91.8	88.1	3.71	24.783	
1,000.0	999.1	992.6	991.7	2.2	2.0	-170.41	-78.0	1.1	105.7	101.5	4.14	25.520	
1,100.0	1,098.9	1,091.7	1,090.5	2.4	2.3	-170.86	-84.9	1.3	119.5	114.9	4.58	26.089	
1,200.0	1,198.6	1,190.7	1,189.3	2.7	2.5	-171.21	-91.8	1.6	133.3	128.3	5.02	26.540	
1,300.0	1,298.4	1,289.7	1,288.1	2.9	2.7	-171.50	-98.7	1.9	147.1	141.7	5.47	26.905	
1,400.0	1,398.1	1,388.8	1,386.9	3.2	3.0	-171.74	-105.6	2.2	161.0	155.1	5.92	27.206	
1,500.0	1,497.9	1,487.8	1,485.7	3.4	3.2	-171.94	-112.5	2.4	174.8	168.4	6.37	27.459	
1,600.0	1,597.6	1,586.8	1,584.5	3.7	3.5	-172.11	-119.4	2.7	188.6	181.8	6.82	27.674	
1,700.0	1,697.4	1,685.9	1,683.3	3.9	3.8	-172.25	-126.3	3.0	202.5	195.2	7.27	27.859	
1,800.0	1,797.2	1,784.9	1,782.1	4.2	4.0	-172.38	-133.2	3.2	216.3	208.6	7.72	28.020	
1,900.0	1,896.9	1,883.9	1,880.9	4.4	4.3	-172.49	-140.1	3.5	230.2	222.0	8.17	28.162	
2,000.0	1,996.7	1,983.0	1,979.7	4.7	4.5	-172.60	-147.0	3.8	244.0	235.4	8.63	28.288	
2,100.0	2,096.4	2,082.0	2,078.5	4.9	4.8	-172.68	-153.9	4.1	257.9	248.8	9.08	28.400	
2,200.0	2,196.2	2,181.1	2,177.3	5.2	5.0	-172.76	-160.8	4.3	271.7	262.2	9.53	28.502	
2,300.0	2,295.9	2,280.1	2,276.1	5.4	5.3	-172.84	-167.8	4.6	285.5	275.6	9.99	28.594	
2,400.0	2,395.7	2,379.1	2,374.9	5.7	5.6	-172.90	-174.7	4.9	299.4	288.9	10.44	28.678	
2,500.0	2,495.5	2,478.2	2,473.7	6.0	5.8	-172.96	-181.6	5.1	313.2	302.3	10.89	28.755	
2,600.0	2,595.2	2,577.2	2,572.5	6.2	6.1	-173.02	-188.5	5.4	327.1	315.7	11.35	28.826	
2,700.0	2,695.0	2,676.2	2,671.3	6.5	6.3	-173.07	-195.4	5.7	340.9	329.1	11.80	28.892	
2,800.0	2,794.7	2,775.3	2,770.1	6.7	6.6	-173.12	-202.3	6.0	354.8	342.5	12.25	28.953	
2,900.0	2,894.5	2,874.3	2,868.9	7.0	6.9	-173.16	-209.2	6.2	368.6	355.9	12.71	29.011	
3,000.0	2,994.2	2,973.3	2,967.6	7.2	7.1	-173.20	-216.1	6.5	382.5	369.3	13.16	29.064	
3,100.0	3,094.0	3,072.4	3,066.4	7.5	7.4	-173.24	-223.0	6.8	396.3	382.7	13.61	29.115	
3,200.0	3,193.7	3,171.4	3,165.2	7.7	7.6	-173.27	-229.9	7.0	410.1	396.1	14.06	29.163	
3,300.0	3,293.5	3,270.5	3,264.0	8.0	7.9	-173.30	-236.8	7.3	424.0	409.5	14.52	29.208	
3,400.0	3,393.3	3,369.5	3,362.8	8.3	8.2	-173.33	-243.7	7.6	437.8	422.9	14.97	29.251	
3,500.0	3,493.0	3,468.5	3,461.6	8.5	8.4	-173.36	-250.6	7.9	451.7	436.3	15.42	29.292	
3,600.0	3,592.8	3,567.6	3,560.4	8.8	8.7	-173.39	-257.5	8.1	465.5	449.7	15.87	29.332	
3,700.0	3,692.5	3,666.6	3,659.2	9.0	8.9	-173.41	-264.4	8.4	479.4	463.1	16.32	29.369	
3,800.0	3,792.3	3,765.6	3,758.0	9.3	9.2	-173.44	-271.3	8.7	493.2	476.5	16.77	29.405	
3,900.0	3,892.0	3,864.7	3,856.8	9.5	9.5	-173.46	-278.2	8.9	507.1	489.9	17.22	29.440	
4,000.0	3,991.8	3,963.7	3,955.6	9.8	9.7	-173.48	-285.1	9.2	520.9	503.2	17.67	29.473	
4,100.0	4,091.6	4,062.7	4,054.4	10.0	10.0	-173.50	-292.0	9.5	534.8	516.6	18.12	29.505	
4,200.0	4,191.3	4,161.8	4,153.2	10.3	10.2	-173.52	-298.9	9.8	548.6	530.0	18.57	29.536	
4,300.0	4,291.1	4,260.8	4,252.0	10.6	10.5	-173.54	-305.8	10.0	562.5	543.4	19.02	29.566	
4,400.0	4,390.8	4,359.9	4,350.8	10.8	10.8	-173.56	-312.7	10.3	576.3	556.8	19.47	29.595	
4,500.0	4,490.6	4,458.9	4,449.6	11.1	11.0	-173.57	-319.6	10.6	590.2	570.2	19.93	29.613	
4,600.0	4,590.3	4,557.9	4,548.4	11.3	11.3	-173.59	-326.5	10.8	604.0	583.6	20.39	29.630	
4,700.0	4,690.1	4,657.0	4,647.2	11.6	11.5	-173.60	-333.4	11.1	617.9	597.0	20.84	29.646	
4,800.0	4,789.9	4,756.0	4,746.0	11.8	11.8	-173.62	-340.3	11.4	631.7	610.4	21.30	29.661	
4,900.0	4,889.6	4,855.0	4,844.8	12.1	12.1	-173.63	-347.2	11.7	645.5	623.8	21.75	29.676	
5,000.0	4,989.4	4,954.1	4,943.6	12.4	12.3	-173.64	-354.1	11.9	659.4	637.2	22.21	29.690	
5,100.0	5,089.1	5,053.1	5,042.3	12.6	12.6	-173.66	-361.0	12.2	673.2	650.6	22.67	29.703	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	Whiting Petroleum Corporation	**Local Co-ordinate Reference:**	Well Razor Federal 30J-1910
Project:	Weld County, CO	**TVD Reference:**	KB=17' @ 4855.0usft (Cade #23)
Reference Site:	S30-T10N-R58W	**MD Reference:**	KB=17' @ 4855.0usft (Cade #23)
Site Error:	0.0usft	**North Reference:**	True
Reference Well:	Razor Federal 30J-1910	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0usft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design S30-T10N-R58W - Razor 30J-3110 - HZ - Plan #1

Offset Site Error: 0.0 usft

Survey Program: 0-ISCWSA MWD

Offset Well Error: 0.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor	Warning
5,200.0	5,188.9	5,152.1	5,141.1	12.9	12.9	-173.67	-367.9	12.5	687.1	664.0	23.12	29.716	
5,300.0	5,288.6	5,251.2	5,239.9	13.1	13.1	-173.68	-374.8	12.7	700.9	677.4	23.58	29.728	
5,400.0	5,388.4	5,350.2	5,338.7	13.4	13.4	-173.69	-381.7	13.0	714.8	690.7	24.03	29.740	
5,500.0	5,488.1	5,449.2	5,437.5	13.6	13.6	-173.68	-388.7	13.3	728.7	704.3	24.45	29.802	
5,600.0	5,586.3	5,500.0	5,488.1	14.0	13.8	-173.38	-392.3	13.4	755.4	731.4	23.98	31.507	
5,700.0	5,679.0	5,550.0	5,537.6	14.5	13.9	-172.73	-399.2	13.7	805.1	782.4	22.68	35.498	
5,800.0	5,763.1	5,574.6	5,561.7	15.2	14.0	-171.36	-404.3	13.9	874.8	854.2	20.60	42.463	
5,900.0	5,835.3	5,600.0	5,586.3	16.1	14.1	-168.61	-410.8	14.1	959.3	941.2	18.11	52.973	
6,000.0	5,893.0	5,600.0	5,586.3	17.2	14.1	-160.29	-410.8	14.1	1,053.2	1,036.3	16.89	62.341	
6,100.0	5,934.2	5,600.0	5,586.3	18.4	14.1	-106.04	-410.8	14.1	1,152.0	1,120.2	31.84	36.176	
6,200.0	5,957.2	5,600.0	5,586.3	19.8	14.1	-22.15	-410.8	14.1	1,251.4	1,236.8	14.57	85.887	
6,300.0	5,962.0	5,600.0	5,586.3	21.3	14.1	-9.70	-410.8	14.1	1,348.1	1,339.5	8.59	156.991	
6,400.0	5,962.0	5,600.0	5,586.3	22.7	14.1	0.94	-410.8	14.1	1,444.4	1,437.6	6.84	211.311	
6,500.0	5,962.0	5,600.0	5,586.3	24.2	14.1	12.28	-410.8	14.1	1,541.1	1,530.3	10.81	142.621	

Company:	Whiting Petroleum Corporation	**Local Co-ordinate Reference:**	Well Razor Federal 30J-1910
Project:	Weld County, CO	**TVD Reference:**	KB=17' @ 4855.0usft (Cade #23)
Reference Site:	S30-T10N-R58W	**MD Reference:**	KB=17' @ 4855.0usft (Cade #23)
Site Error:	0.0usft	**North Reference:**	True
Reference Well:	Razor Federal 30J-1910	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0usft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design S30-T10N-R58W - Razor 30J-3111 - HZ - Plan #1

Offset Site Error: 0.0 usft

Survey Program: 0-ISCWSA MWD

Offset Well Error: 0.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	149.22	-50.7	30.2	59.0				
100.0	100.0	100.0	100.0	0.1	0.1	149.22	-50.7	30.2	59.0	58.8	0.19	316.033	
200.0	200.0	200.0	200.0	0.3	0.3	149.22	-50.7	30.2	59.0	58.3	0.64	92.688	
300.0	300.0	300.0	300.0	0.5	0.5	149.22	-50.7	30.2	59.0	57.9	1.09	54.308	
400.0	400.0	400.0	400.0	0.8	0.8	149.22	-50.7	30.2	59.0	57.4	1.54	38.405	
500.0	500.0	500.0	500.0	1.0	1.0	149.22	-50.7	30.2	59.0	57.0	1.98	29.706	CC, ES
600.0	600.0	597.9	597.9	1.2	1.2	163.72	-52.3	30.7	62.3	59.9	2.41	25.802	
700.0	699.8	695.2	695.0	1.4	1.4	165.69	-57.0	32.1	72.3	69.5	2.85	25.379	SF
800.0	799.6	794.1	793.7	1.7	1.6	167.71	-63.6	34.2	86.0	82.7	3.28	26.237	
900.0	899.4	893.1	892.5	1.9	1.8	169.18	-70.2	36.2	99.7	96.0	3.70	26.908	
1,000.0	999.1	992.1	991.2	2.2	2.0	170.29	-76.8	38.2	113.4	109.3	4.14	27.410	
1,100.0	1,098.9	1,091.1	1,090.0	2.4	2.3	171.17	-83.4	40.2	127.2	122.7	4.58	27.793	
1,200.0	1,198.6	1,190.2	1,188.8	2.7	2.5	171.87	-90.0	42.3	141.0	136.0	5.02	28.095	
1,300.0	1,298.4	1,289.2	1,287.6	2.9	2.8	172.44	-96.6	44.3	154.9	149.4	5.47	28.337	
1,400.0	1,398.1	1,388.2	1,386.4	3.2	3.0	172.93	-103.2	46.3	168.7	162.8	5.91	28.535	
1,500.0	1,497.9	1,487.3	1,485.2	3.4	3.3	173.33	-109.8	48.4	182.6	176.2	6.36	28.701	
1,600.0	1,597.6	1,586.3	1,584.0	3.7	3.5	173.68	-116.4	50.4	196.4	189.6	6.81	28.842	
1,700.0	1,697.4	1,685.3	1,682.7	3.9	3.8	173.99	-123.0	52.4	210.3	203.1	7.26	28.962	
1,800.0	1,797.2	1,784.3	1,781.5	4.2	4.0	174.26	-129.6	54.5	224.2	216.5	7.71	29.067	
1,900.0	1,896.9	1,883.4	1,880.3	4.4	4.3	174.49	-136.2	56.5	238.1	229.9	8.16	29.159	
2,000.0	1,996.7	1,982.4	1,979.1	4.7	4.5	174.70	-142.8	58.5	252.0	243.3	8.62	29.241	
2,100.0	2,096.4	2,081.4	2,077.9	4.9	4.8	174.89	-149.4	60.6	265.8	256.8	9.07	29.314	
2,200.0	2,196.2	2,180.4	2,176.7	5.2	5.0	175.06	-156.0	62.6	279.7	270.2	9.52	29.380	
2,300.0	2,295.9	2,279.5	2,275.5	5.4	5.3	175.21	-162.6	64.6	293.6	283.6	9.97	29.441	
2,400.0	2,395.7	2,378.5	2,374.3	5.7	5.6	175.35	-169.2	66.7	307.5	297.1	10.43	29.496	
2,500.0	2,495.5	2,477.5	2,473.0	6.0	5.8	175.48	-175.8	68.7	321.4	310.5	10.88	29.546	
2,600.0	2,595.2	2,576.6	2,571.8	6.2	6.1	175.60	-182.4	70.7	335.3	324.0	11.33	29.593	
2,700.0	2,695.0	2,675.6	2,670.6	6.5	6.3	175.70	-189.0	72.7	349.2	337.4	11.78	29.637	
2,800.0	2,794.7	2,774.6	2,769.4	6.7	6.6	175.80	-195.6	74.8	363.1	350.9	12.23	29.678	
2,900.0	2,894.5	2,873.6	2,868.2	7.0	6.9	175.89	-202.2	76.8	377.0	364.3	12.69	29.717	
3,000.0	2,994.2	2,972.7	2,967.0	7.2	7.1	175.98	-208.8	78.8	390.9	377.8	13.14	29.753	
3,100.0	3,094.0	3,071.7	3,065.8	7.5	7.4	176.06	-215.4	80.9	404.8	391.2	13.59	29.787	
3,200.0	3,193.7	3,170.7	3,164.5	7.7	7.6	176.13	-222.1	82.9	418.7	404.7	14.04	29.820	
3,300.0	3,293.5	3,269.8	3,263.3	8.0	7.9	176.20	-228.7	84.9	432.6	418.1	14.49	29.851	
3,400.0	3,393.3	3,368.8	3,362.1	8.3	8.2	176.27	-235.3	87.0	446.5	431.6	14.94	29.881	
3,500.0	3,493.0	3,467.8	3,460.9	8.5	8.4	176.33	-241.9	89.0	460.4	445.0	15.39	29.910	
3,600.0	3,592.8	3,566.8	3,559.7	8.8	8.7	176.39	-248.5	91.0	474.3	458.5	15.84	29.937	
3,700.0	3,692.5	3,665.9	3,658.5	9.0	8.9	176.44	-255.1	93.1	488.2	471.9	16.29	29.964	
3,800.0	3,792.3	3,764.9	3,757.3	9.3	9.2	176.49	-261.7	95.1	502.1	485.4	16.74	29.990	
3,900.0	3,892.0	3,863.9	3,856.0	9.5	9.5	176.54	-268.3	97.1	516.0	498.8	17.19	30.014	
4,000.0	3,991.8	3,962.9	3,954.8	9.8	9.7	176.59	-274.9	99.2	529.9	512.3	17.64	30.038	
4,100.0	4,091.6	4,062.0	4,053.6	10.0	10.0	176.63	-281.5	101.2	543.8	525.7	18.09	30.062	
4,200.0	4,191.3	4,161.0	4,152.4	10.3	10.2	176.67	-288.1	103.2	557.7	539.2	18.54	30.085	
4,300.0	4,291.1	4,260.0	4,251.2	10.6	10.5	176.71	-294.7	105.2	571.6	552.7	18.99	30.104	
4,400.0	4,390.8	4,359.1	4,350.0	10.8	10.8	176.75	-301.3	107.3	585.5	566.1	19.44	30.115	
4,500.0	4,490.6	4,458.1	4,448.8	11.1	11.0	176.79	-307.9	109.3	599.5	579.6	19.90	30.126	
4,600.0	4,590.3	4,557.1	4,547.6	11.3	11.3	176.82	-314.5	111.3	613.4	593.0	20.35	30.135	
4,700.0	4,690.1	4,656.1	4,646.3	11.6	11.6	176.85	-321.1	113.4	627.3	606.5	20.81	30.145	
4,800.0	4,789.9	4,755.2	4,745.1	11.8	11.8	176.88	-327.7	115.4	641.2	619.9	21.26	30.154	
4,900.0	4,889.6	4,854.2	4,843.9	12.1	12.1	176.91	-334.3	117.4	655.1	633.4	21.72	30.162	
5,000.0	4,989.4	4,953.2	4,942.7	12.4	12.3	176.94	-340.9	119.5	669.0	646.8	22.17	30.170	
5,100.0	5,089.1	5,052.2	5,041.5	12.6	12.6	176.97	-347.5	121.5	682.9	660.3	22.63	30.178	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	Whiting Petroleum Corporation	**Local Co-ordinate Reference:**	Well Razor Federal 30J-1910
Project:	Weld County, CO	**TVD Reference:**	KB=17' @ 4855.0usft (Cade #23)
Reference Site:	S30-T10N-R58W	**MD Reference:**	KB=17' @ 4855.0usft (Cade #23)
Site Error:	0.0usft	**North Reference:**	True
Reference Well:	Razor Federal 30J-1910	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0usft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design S30-T10N-R58W - Razor 30J-3111 - HZ - Plan #1

Offset Site Error: 0.0 usft

Survey Program: 0-ISCWSA MWD

Offset Well Error: 0.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor	Warning
5,200.0	5,188.9	5,151.3	5,140.3	12.9	12.9	177.00	-354.1	123.5	696.8	673.7	23.08	30.185	
5,300.0	5,288.6	5,250.3	5,239.1	13.1	13.1	177.02	-360.7	125.6	710.7	687.2	23.54	30.192	
5,400.0	5,388.4	5,349.3	5,337.8	13.4	13.4	177.05	-367.3	127.6	724.6	700.6	23.99	30.199	
5,500.0	5,488.1	5,417.7	5,406.0	13.6	13.6	177.05	-372.3	129.1	739.7	715.4	24.34	30.385	
5,600.0	5,586.3	5,450.0	5,438.0	14.0	13.7	176.87	-376.7	130.5	772.6	748.7	23.83	32.423	
5,700.0	5,679.0	5,500.0	5,486.7	14.5	13.9	176.52	-387.2	133.7	828.6	806.1	22.52	36.790	
5,800.0	5,763.1	5,500.0	5,486.7	15.2	13.9	175.67	-387.2	133.7	903.2	882.8	20.33	44.426	
5,900.0	5,835.3	5,530.7	5,516.0	16.1	14.0	174.04	-395.8	136.4	990.6	973.0	17.58	56.345	
6,000.0	5,893.0	5,550.0	5,534.2	17.2	14.1	168.85	-402.1	138.3	1,086.7	1,071.7	14.96	72.618	
6,100.0	5,934.2	5,550.0	5,534.2	18.4	14.1	64.72	-402.1	138.3	1,186.1	1,156.3	29.82	39.770	
6,200.0	5,957.2	5,550.0	5,534.2	19.8	14.1	8.76	-402.1	138.3	1,285.3	1,276.6	8.70	147.674	
6,300.0	5,962.0	5,531.0	5,516.3	21.3	14.0	7.45	-395.9	136.4	1,380.9	1,373.3	7.64	180.780	
6,400.0	5,962.0	5,522.6	5,508.4	22.7	14.0	15.85	-393.3	135.6	1,475.6	1,463.6	11.97	123.258	

Company:	Whiting Petroleum Corporation	**Local Co-ordinate Reference:**	Well Razor Federal 30J-1910
Project:	Weld County, CO	**TVD Reference:**	KB=17' @ 4855.0usft (Cade #23)
Reference Site:	S30-T10N-R58W	**MD Reference:**	KB=17' @ 4855.0usft (Cade #23)
Site Error:	0.0usft	**North Reference:**	True
Reference Well:	Razor Federal 30J-1910	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0usft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design S30-T10N-R58W - Razor 30J-3112 - HZ - Plan #1

Offset Site Error: 0.0 usft

Survey Program: 0-ISCWSA MWD

Offset Well Error: 0.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	130.14	-50.7	60.1	78.6				
100.0	100.0	100.0	100.0	0.1	0.1	130.14	-50.7	60.1	78.6	78.4	0.19	421.222	
200.0	200.0	200.0	200.0	0.3	0.3	130.14	-50.7	60.1	78.6	77.9	0.64	123.539	
300.0	300.0	300.0	300.0	0.5	0.5	130.14	-50.7	60.1	78.6	77.5	1.09	72.384	
400.0	400.0	400.0	400.0	0.8	0.8	130.14	-50.7	60.1	78.6	77.0	1.54	51.188	
500.0	500.0	500.0	500.0	1.0	1.0	130.14	-50.7	60.1	78.6	76.6	1.98	39.594	CC, ES
600.0	600.0	597.4	597.4	1.2	1.2	144.94	-52.1	60.9	81.6	79.2	2.41	33.835	
700.0	699.8	694.1	694.0	1.4	1.4	147.78	-56.4	63.2	90.8	87.9	2.84	31.921	
800.0	799.6	793.0	792.6	1.7	1.6	150.99	-62.5	66.5	103.5	100.2	3.27	31.604	
900.0	899.4	892.0	891.4	1.9	1.8	153.50	-68.6	69.7	116.4	112.7	3.71	31.417	
1,000.0	999.1	991.1	990.2	2.2	2.0	155.51	-74.7	73.0	129.5	125.4	4.14	31.269	
1,100.0	1,098.9	1,090.1	1,089.0	2.4	2.3	157.14	-80.8	76.3	142.8	138.2	4.58	31.148	
1,200.0	1,198.6	1,189.2	1,187.8	2.7	2.5	158.50	-86.9	79.5	156.1	151.1	5.03	31.048	
1,300.0	1,298.4	1,288.2	1,286.6	2.9	2.8	159.65	-92.9	82.8	169.6	164.1	5.48	30.967	
1,400.0	1,398.1	1,387.2	1,385.4	3.2	3.0	160.62	-99.0	86.1	183.0	177.1	5.92	30.897	
1,500.0	1,497.9	1,486.3	1,484.2	3.4	3.3	161.46	-105.1	89.4	196.6	190.2	6.37	30.840	
1,600.0	1,597.6	1,585.3	1,583.0	3.7	3.5	162.20	-111.2	92.6	210.1	203.3	6.82	30.791	
1,700.0	1,697.4	1,684.4	1,681.8	3.9	3.8	162.84	-117.3	95.9	223.7	216.5	7.28	30.750	
1,800.0	1,797.2	1,783.4	1,780.6	4.2	4.0	163.41	-123.4	99.2	237.3	229.6	7.73	30.715	
1,900.0	1,896.9	1,882.5	1,879.4	4.4	4.3	163.92	-129.5	102.4	251.0	242.8	8.18	30.684	
2,000.0	1,996.7	1,981.5	1,978.2	4.7	4.5	164.38	-135.5	105.7	264.6	256.0	8.63	30.658	
2,100.0	2,096.4	2,080.5	2,077.0	4.9	4.8	164.79	-141.6	109.0	278.3	269.2	9.08	30.636	
2,200.0	2,196.2	2,179.6	2,175.8	5.2	5.1	165.16	-147.7	112.3	292.0	282.5	9.54	30.616	
2,300.0	2,295.9	2,278.6	2,274.6	5.4	5.3	165.50	-153.8	115.5	305.7	295.7	9.99	30.600	
2,400.0	2,395.7	2,377.7	2,373.4	5.7	5.6	165.81	-159.9	118.8	319.4	308.9	10.44	30.585	
2,500.0	2,495.5	2,476.7	2,472.2	6.0	5.8	166.09	-166.0	122.1	333.1	322.2	10.90	30.573	
2,600.0	2,595.2	2,575.8	2,571.0	6.2	6.1	166.36	-172.0	125.4	346.8	335.5	11.35	30.563	
2,700.0	2,695.0	2,674.8	2,669.8	6.5	6.3	166.60	-178.1	128.6	360.5	348.7	11.80	30.555	
2,800.0	2,794.7	2,773.8	2,768.6	6.7	6.6	166.82	-184.2	131.9	374.3	362.0	12.25	30.547	
2,900.0	2,894.5	2,872.9	2,867.4	7.0	6.9	167.03	-190.3	135.2	388.0	375.3	12.70	30.542	
3,000.0	2,994.2	2,971.9	2,966.2	7.2	7.1	167.23	-196.4	138.4	401.8	388.6	13.16	30.537	
3,100.0	3,094.0	3,071.0	3,065.0	7.5	7.4	167.41	-202.5	141.7	415.5	401.9	13.61	30.533	
3,200.0	3,193.7	3,170.0	3,163.8	7.7	7.6	167.58	-208.6	145.0	429.3	415.2	14.06	30.531	
3,300.0	3,293.5	3,269.0	3,262.6	8.0	7.9	167.74	-214.6	148.3	443.0	428.5	14.51	30.529	
3,400.0	3,393.3	3,368.1	3,361.4	8.3	8.2	167.89	-220.7	151.5	456.8	441.8	14.96	30.528	
3,500.0	3,493.0	3,467.1	3,460.2	8.5	8.4	168.03	-226.8	154.8	470.5	455.1	15.41	30.528	
3,600.0	3,592.8	3,566.2	3,559.0	8.8	8.7	168.16	-232.9	158.1	484.3	468.4	15.86	30.529	
3,700.0	3,692.5	3,665.2	3,657.8	9.0	8.9	168.29	-239.0	161.3	498.0	481.7	16.31	30.530	
3,800.0	3,792.3	3,764.3	3,756.6	9.3	9.2	168.40	-245.1	164.6	511.8	495.1	16.76	30.532	
3,900.0	3,892.0	3,863.3	3,855.4	9.5	9.5	168.52	-251.1	167.9	525.6	508.4	17.21	30.534	
4,000.0	3,991.8	3,962.3	3,954.2	9.8	9.7	168.62	-257.2	171.2	539.4	521.7	17.66	30.537	
4,100.0	4,091.6	4,061.4	4,053.0	10.0	10.0	168.73	-263.3	174.4	553.1	535.0	18.11	30.540	
4,200.0	4,191.3	4,160.4	4,151.8	10.3	10.3	168.82	-269.4	177.7	566.9	548.3	18.56	30.538	
4,300.0	4,291.1	4,259.5	4,250.6	10.6	10.5	168.91	-275.5	181.0	580.7	561.7	19.02	30.531	
4,400.0	4,390.8	4,358.5	4,349.4	10.8	10.8	169.00	-281.6	184.3	594.5	575.0	19.47	30.525	
4,500.0	4,490.6	4,457.6	4,448.2	11.1	11.0	169.09	-287.7	187.5	608.2	588.3	19.93	30.518	
4,600.0	4,590.3	4,556.6	4,547.0	11.3	11.3	169.17	-293.7	190.8	622.0	601.6	20.39	30.512	
4,700.0	4,690.1	4,655.6	4,645.8	11.6	11.6	169.24	-299.8	194.1	635.8	614.9	20.84	30.507	
4,800.0	4,789.9	4,754.7	4,744.6	11.8	11.8	169.32	-305.9	197.3	649.6	628.3	21.30	30.501	
4,900.0	4,889.6	4,853.7	4,843.4	12.1	12.1	169.39	-312.0	200.6	663.4	641.6	21.75	30.496	
5,000.0	4,989.4	4,952.8	4,942.2	12.4	12.3	169.45	-318.1	203.9	677.1	654.9	22.21	30.491	
5,100.0	5,089.1	5,051.8	5,041.0	12.6	12.6	169.52	-324.2	207.2	690.9	668.3	22.66	30.486	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	Whiting Petroleum Corporation	**Local Co-ordinate Reference:**	Well Razor Federal 30J-1910
Project:	Weld County, CO	**TVD Reference:**	KB=17' @ 4855.0usft (Cade #23)
Reference Site:	S30-T10N-R58W	**MD Reference:**	KB=17' @ 4855.0usft (Cade #23)
Site Error:	0.0usft	**North Reference:**	True
Reference Well:	Razor Federal 30J-1910	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0usft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design S30-T10N-R58W - Razor 30J-3112 - HZ - Plan #1

Offset Site Error: 0.0 usft

Survey Program: 0-ISCWSA MWD

Offset Well Error: 0.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor	Warning
5,200.0	5,188.9	5,150.9	5,139.9	12.9	12.9	169.58	-330.2	210.4	704.7	681.6	23.12	30.482	
5,300.0	5,288.6	5,249.9	5,238.7	13.1	13.1	169.64	-336.3	213.7	718.5	694.9	23.57	30.477	
5,400.0	5,388.4	5,348.9	5,337.5	13.4	13.4	169.70	-342.4	217.0	732.3	708.2	24.03	30.473	SF
5,500.0	5,488.1	5,448.0	5,436.2	13.6	13.7	169.72	-348.5	220.2	746.2	721.7	24.45	30.520	
5,600.0	5,586.3	5,500.0	5,488.1	14.0	13.8	169.25	-351.8	222.0	772.6	748.6	24.00	32.196	
5,700.0	5,679.0	5,550.0	5,537.6	14.5	14.0	168.26	-357.9	225.3	821.8	799.0	22.76	36.106	
5,800.0	5,763.1	5,573.1	5,560.3	15.2	14.1	166.13	-362.1	227.5	890.9	870.0	20.85	42.730	
5,900.0	5,835.3	5,600.0	5,586.3	16.1	14.2	161.97	-368.1	230.8	974.8	956.0	18.85	51.723	
6,000.0	5,893.0	5,600.0	5,586.3	17.2	14.2	150.08	-368.1	230.8	1,068.1	1,048.7	19.42	55.001	
6,100.0	5,934.2	5,600.0	5,586.3	18.4	14.2	101.22	-368.1	230.8	1,166.4	1,134.6	31.87	36.601	
6,200.0	5,957.2	5,600.0	5,586.3	19.8	14.2	33.91	-368.1	230.8	1,265.4	1,245.3	20.07	63.061	
6,300.0	5,962.0	5,600.0	5,586.3	21.3	14.2	22.61	-368.1	230.8	1,361.9	1,346.9	14.90	91.386	
6,400.0	5,962.0	5,600.0	5,586.3	22.7	14.2	31.13	-368.1	230.8	1,457.3	1,437.3	19.97	72.964	

Company:	Whiting Petroleum Corporation	**Local Co-ordinate Reference:**	Well Razor Federal 30J-1910
Project:	Weld County, CO	**TVD Reference:**	KB=17' @ 4855.0usft (Cade #23)
Reference Site:	S30-T10N-R58W	**MD Reference:**	KB=17' @ 4855.0usft (Cade #23)
Site Error:	0.0usft	**North Reference:**	True
Reference Well:	Razor Federal 30J-1910	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0usft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design S30-T10N-R58W - Razor Federal 30J-1909 - HZ - Plan #1

Offset Site Error: 0.0 usft

Survey Program: 0-ISCWSA MWD

Offset Well Error: 0.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-89.98	0.0	-29.9	29.9				
100.0	100.0	100.0	100.0	0.1	0.1	-89.98	0.0	-29.9	29.9	29.7	0.19	160.262	
200.0	200.0	200.0	200.0	0.3	0.3	-89.98	0.0	-29.9	29.9	29.3	0.64	47.003	
300.0	300.0	300.0	300.0	0.5	0.5	-89.98	0.0	-29.9	29.9	28.8	1.09	27.540	
400.0	400.0	400.0	400.0	0.8	0.8	-89.98	0.0	-29.9	29.9	28.4	1.54	19.475	
500.0	500.0	500.0	500.0	1.0	1.0	-89.98	0.0	-29.9	29.9	27.9	1.98	15.064	CC
600.0	600.0	599.5	599.5	1.2	1.2	-76.52	1.6	-30.6	30.2	27.8	2.43	12.440	ES
700.0	699.8	699.1	698.9	1.4	1.4	-77.20	6.2	-32.9	31.3	28.4	2.88	10.850	
800.0	799.6	799.1	798.7	1.7	1.7	-78.02	12.5	-35.9	32.6	29.3	3.35	9.751	
900.0	899.4	899.1	898.4	1.9	1.9	-78.78	18.8	-38.9	34.0	30.2	3.82	8.898	
1,000.0	999.1	999.1	998.2	2.2	2.2	-79.47	25.1	-41.9	35.4	31.1	4.31	8.220	
1,100.0	1,098.9	1,099.0	1,097.9	2.4	2.4	-80.11	31.4	-45.0	36.8	32.0	4.80	7.671	
1,200.0	1,198.6	1,199.0	1,197.7	2.7	2.7	-80.71	37.7	-48.0	38.2	32.9	5.29	7.219	
1,300.0	1,298.4	1,299.0	1,297.4	2.9	2.9	-81.26	44.0	-51.0	39.6	33.8	5.79	6.842	
1,400.0	1,398.1	1,399.0	1,397.1	3.2	3.2	-81.78	50.3	-54.0	41.0	34.7	6.29	6.522	
1,500.0	1,497.9	1,499.0	1,496.9	3.4	3.4	-82.26	56.5	-57.0	42.4	35.6	6.79	6.248	
1,600.0	1,597.6	1,599.0	1,596.6	3.7	3.7	-82.71	62.8	-60.1	43.8	36.5	7.29	6.010	
1,700.0	1,697.4	1,699.0	1,696.4	3.9	3.9	-83.13	69.1	-63.1	45.2	37.5	7.80	5.803	
1,800.0	1,797.2	1,799.0	1,796.1	4.2	4.2	-83.52	75.4	-66.1	46.7	38.4	8.30	5.621	
1,900.0	1,896.9	1,899.0	1,895.9	4.4	4.4	-83.90	81.7	-69.1	48.1	39.3	8.81	5.459	
2,000.0	1,996.7	1,998.9	1,995.6	4.7	4.7	-84.25	88.0	-72.1	49.5	40.2	9.32	5.314	
2,100.0	2,096.4	2,098.9	2,095.4	4.9	4.9	-84.58	94.3	-75.2	50.9	41.1	9.82	5.184	
2,200.0	2,196.2	2,198.9	2,195.1	5.2	5.2	-84.89	100.6	-78.2	52.4	42.0	10.33	5.067	
2,300.0	2,295.9	2,298.9	2,294.9	5.4	5.4	-85.19	106.8	-81.2	53.8	42.9	10.84	4.961	
2,400.0	2,395.7	2,398.9	2,394.6	5.7	5.7	-85.47	113.1	-84.2	55.2	43.9	11.35	4.864	
2,500.0	2,495.5	2,498.9	2,494.4	6.0	6.0	-85.74	119.4	-87.2	56.6	44.8	11.86	4.775	
2,600.0	2,595.2	2,598.9	2,594.1	6.2	6.2	-85.99	125.7	-90.3	58.1	45.7	12.37	4.694	
2,700.0	2,695.0	2,698.9	2,693.8	6.5	6.5	-86.24	132.0	-93.3	59.5	46.6	12.88	4.619	
2,800.0	2,794.7	2,798.9	2,793.6	6.7	6.7	-86.47	138.3	-96.3	60.9	47.5	13.39	4.550	
2,900.0	2,894.5	2,898.9	2,893.3	7.0	7.0	-86.69	144.6	-99.3	62.4	48.5	13.90	4.486	
3,000.0	2,994.2	2,998.8	2,993.1	7.2	7.2	-86.90	150.9	-102.3	63.8	49.4	14.41	4.426	
3,100.0	3,094.0	3,098.8	3,092.8	7.5	7.5	-87.10	157.1	-105.4	65.2	50.3	14.92	4.370	
3,200.0	3,193.7	3,198.8	3,192.6	7.7	7.8	-87.29	163.4	-108.4	66.7	51.2	15.44	4.319	
3,300.0	3,293.5	3,298.8	3,292.3	8.0	8.0	-87.47	169.7	-111.4	68.1	52.2	15.95	4.270	
3,400.0	3,393.3	3,398.8	3,392.1	8.3	8.3	-87.65	176.0	-114.4	69.5	53.1	16.46	4.225	
3,500.0	3,493.0	3,498.8	3,491.8	8.5	8.5	-87.82	182.3	-117.4	71.0	54.0	16.97	4.182	
3,600.0	3,592.8	3,598.8	3,591.6	8.8	8.8	-87.98	188.6	-120.4	72.4	54.9	17.48	4.142	
3,700.0	3,692.5	3,698.8	3,691.3	9.0	9.0	-88.14	194.9	-123.5	73.8	55.9	18.00	4.104	
3,800.0	3,792.3	3,798.8	3,791.0	9.3	9.3	-88.29	201.2	-126.5	75.3	56.8	18.51	4.068	
3,900.0	3,892.0	3,898.7	3,890.8	9.5	9.6	-88.43	207.4	-129.5	76.7	57.7	19.02	4.034	
4,000.0	3,991.8	3,998.7	3,990.5	9.8	9.8	-88.57	213.7	-132.5	78.2	58.6	19.53	4.002	
4,100.0	4,091.6	4,098.7	4,090.3	10.0	10.1	-88.71	220.0	-135.5	79.6	59.6	20.04	3.972	
4,200.0	4,191.3	4,198.7	4,190.0	10.3	10.3	-88.84	226.3	-138.6	81.0	60.5	20.56	3.943	
4,300.0	4,291.1	4,298.7	4,289.8	10.6	10.6	-88.96	232.6	-141.6	82.5	61.4	21.07	3.915	
4,400.0	4,390.8	4,398.7	4,389.5	10.8	10.8	-89.08	238.9	-144.6	83.9	62.3	21.58	3.889	
4,500.0	4,490.6	4,498.7	4,489.3	11.1	11.1	-89.20	245.2	-147.6	85.4	63.3	22.10	3.864	
4,600.0	4,590.3	4,598.7	4,589.0	11.3	11.3	-89.31	251.5	-150.6	86.8	64.2	22.61	3.840	
4,700.0	4,690.1	4,698.7	4,688.8	11.6	11.6	-89.42	257.7	-153.7	88.3	65.1	23.12	3.817	
4,800.0	4,789.9	4,798.7	4,788.5	11.8	11.9	-89.53	264.0	-156.7	89.7	66.1	23.63	3.796	
4,900.0	4,889.6	4,898.6	4,888.3	12.1	12.1	-89.63	270.3	-159.7	91.1	67.0	24.15	3.775	
5,000.0	4,989.4	4,998.6	4,988.0	12.4	12.4	-89.73	276.6	-162.7	92.6	67.9	24.66	3.755	
5,100.0	5,089.1	5,098.6	5,087.7	12.6	12.6	-89.82	282.9	-165.7	94.0	68.9	25.17	3.736	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	Whiting Petroleum Corporation	**Local Co-ordinate Reference:**	Well Razor Federal 30J-1910
Project:	Weld County, CO	**TVD Reference:**	KB=17' @ 4855.0usft (Cade #23)
Reference Site:	S30-T10N-R58W	**MD Reference:**	KB=17' @ 4855.0usft (Cade #23)
Site Error:	0.0usft	**North Reference:**	True
Reference Well:	Razor Federal 30J-1910	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0usft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design S30-T10N-R58W - Razor Federal 30J-1909 - HZ - Plan #1

Offset Site Error: 0.0 usft

Survey Program: 0-ISCWSA MWD

Offset Well Error: 0.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor	Warning
5,200.0	5,188.9	5,198.6	5,187.5	12.9	12.9	-89.92	289.2	-168.8	95.5	69.8	25.68	3.717	
5,300.0	5,288.6	5,298.6	5,287.2	13.1	13.1	-90.01	295.5	-171.8	96.9	70.7	26.20	3.700	
5,400.0	5,388.4	5,398.5	5,386.9	13.4	13.4	-90.09	301.8	-174.8	98.4	71.7	26.71	3.683	
5,500.0	5,488.1	5,493.6	5,480.6	13.6	13.7	-85.15	315.9	-181.6	102.2	75.0	27.21	3.755	
5,600.0	5,586.3	5,585.5	5,566.9	14.0	14.2	-77.24	343.9	-195.0	111.5	83.8	27.78	4.015	
5,700.0	5,679.0	5,674.9	5,644.4	14.5	14.8	-71.50	383.8	-214.2	125.0	96.6	28.44	4.395	
5,800.0	5,763.1	5,762.2	5,711.7	15.2	15.5	-67.74	433.8	-238.2	141.1	111.9	29.20	4.832	
5,900.0	5,835.3	5,850.0	5,769.2	16.1	16.4	-65.54	493.5	-266.9	158.6	128.4	30.17	5.257	
6,000.0	5,893.0	5,931.8	5,812.0	17.2	17.3	-64.47	556.3	-297.0	176.8	145.3	31.47	5.617	
6,100.0	5,934.2	6,015.0	5,843.8	18.4	18.5	-64.22	625.5	-330.3	195.1	161.8	33.29	5.859	
6,200.0	5,957.2	6,100.0	5,863.2	19.8	19.7	-64.65	700.0	-366.0	213.0	177.3	35.70	5.967	
6,300.0	5,962.0	6,181.4	5,869.0	21.3	21.0	-65.73	773.2	-401.2	230.9	192.3	38.54	5.990	
6,400.0	5,962.0	6,291.9	5,869.0	22.7	22.7	-67.79	874.1	-445.9	250.9	209.1	41.80	6.003	
6,500.0	5,962.0	6,403.9	5,869.0	24.2	24.4	-69.50	979.0	-485.2	270.7	225.7	45.02	6.013	
6,600.0	5,962.0	6,517.5	5,869.0	25.7	26.2	-70.94	1,087.6	-518.7	290.1	241.9	48.20	6.018	
6,700.0	5,962.0	6,632.7	5,869.0	27.2	28.1	-72.16	1,199.5	-546.1	308.9	257.6	51.29	6.022	
6,800.0	5,962.0	6,749.8	5,869.0	28.8	30.0	-73.24	1,314.6	-566.9	325.7	270.9	54.78	5.945	
6,900.0	5,962.0	6,868.9	5,869.0	30.4	31.9	-73.92	1,433.0	-580.8	336.9	278.4	58.47	5.762	
7,000.0	5,962.0	6,989.4	5,869.0	32.1	33.9	-74.23	1,553.2	-587.4	342.1	280.0	62.14	5.506	
7,100.0	5,962.0	7,096.9	5,869.0	33.8	35.6	-74.25	1,660.7	-587.8	342.5	277.0	65.55	5.225	
7,200.0	5,962.0	7,196.9	5,869.0	35.6	37.2	-74.25	1,760.7	-587.9	342.5	273.7	68.88	4.973	
7,300.0	5,962.0	7,296.9	5,869.0	37.3	38.9	-74.25	1,860.7	-587.9	342.5	270.3	72.24	4.742	
7,400.0	5,962.0	7,396.9	5,869.0	39.1	40.5	-74.25	1,960.7	-587.9	342.5	266.9	75.64	4.529	
7,500.0	5,962.0	7,496.9	5,869.0	40.9	42.2	-74.25	2,060.7	-587.9	342.5	263.5	79.06	4.333	
7,600.0	5,962.0	7,596.9	5,869.0	42.7	43.9	-74.25	2,160.7	-587.9	342.5	260.0	82.51	4.151	
7,700.0	5,962.0	7,696.9	5,869.0	44.5	45.7	-74.25	2,260.7	-587.9	342.6	256.6	85.98	3.984	
7,800.0	5,962.0	7,796.9	5,869.0	46.3	47.4	-74.25	2,360.7	-587.9	342.6	253.1	89.48	3.828	
7,900.0	5,962.0	7,896.9	5,869.0	48.1	49.2	-74.25	2,460.7	-587.9	342.6	249.6	92.99	3.684	
8,000.0	5,962.0	7,996.9	5,869.0	49.9	50.9	-74.25	2,560.7	-587.9	342.6	246.0	96.51	3.549	
8,100.0	5,962.0	8,096.9	5,869.0	51.8	52.7	-74.25	2,660.7	-587.9	342.6	242.5	100.05	3.424	
8,200.0	5,962.0	8,196.9	5,869.0	53.6	54.5	-74.25	2,760.7	-587.9	342.6	239.0	103.60	3.307	
8,300.0	5,962.0	8,296.9	5,869.0	55.4	56.3	-74.25	2,860.7	-587.9	342.6	235.4	107.17	3.197	
8,400.0	5,962.0	8,396.9	5,869.0	57.3	58.1	-74.25	2,960.7	-587.9	342.6	231.8	110.74	3.094	
8,500.0	5,962.0	8,496.9	5,869.0	59.1	59.9	-74.25	3,060.7	-587.9	342.6	228.3	114.32	2.997	
8,600.0	5,962.0	8,596.9	5,869.0	61.0	61.7	-74.25	3,160.7	-587.9	342.6	224.7	117.91	2.905	
8,700.0	5,962.0	8,696.9	5,869.0	62.9	63.5	-74.25	3,260.7	-587.9	342.6	221.1	121.51	2.819	
8,800.0	5,962.0	8,796.9	5,869.0	64.7	65.4	-74.25	3,360.7	-587.9	342.6	217.5	125.12	2.738	
8,900.0	5,962.0	8,896.9	5,869.0	66.6	67.2	-74.25	3,460.7	-587.9	342.6	213.9	128.73	2.661	
9,000.0	5,962.0	8,996.9	5,869.0	68.5	69.0	-74.25	3,560.7	-587.9	342.6	210.2	132.34	2.589	
9,100.0	5,962.0	9,096.9	5,869.0	70.3	70.9	-74.25	3,660.7	-587.9	342.6	206.6	135.97	2.520	
9,200.0	5,962.0	9,196.9	5,869.0	72.2	72.7	-74.25	3,760.7	-587.9	342.6	203.0	139.60	2.454	
9,300.0	5,962.0	9,296.9	5,869.0	74.1	74.6	-74.25	3,860.7	-587.9	342.6	199.4	143.23	2.392	
9,400.0	5,962.0	9,396.9	5,869.0	76.0	76.4	-74.25	3,960.7	-587.9	342.6	195.7	146.87	2.333	
9,500.0	5,962.0	9,496.9	5,869.0	77.9	78.3	-74.25	4,060.7	-587.9	342.6	192.1	150.51	2.276	
9,600.0	5,962.0	9,596.9	5,869.0	79.8	80.1	-74.25	4,160.7	-587.9	342.6	188.5	154.15	2.223	
9,700.0	5,962.0	9,696.9	5,869.0	81.6	82.0	-74.25	4,260.7	-587.9	342.6	184.8	157.80	2.171	
9,800.0	5,962.0	9,796.9	5,869.0	83.5	83.9	-74.25	4,360.7	-587.9	342.6	181.2	161.45	2.122	
9,900.0	5,962.0	9,896.9	5,869.0	85.4	85.7	-74.25	4,460.7	-587.9	342.6	177.5	165.10	2.075	
10,000.0	5,962.0	9,996.9	5,869.0	87.3	87.6	-74.25	4,560.7	-587.9	342.6	173.9	168.76	2.030	
10,100.0	5,962.0	10,096.9	5,869.0	89.2	89.5	-74.25	4,660.7	-588.0	342.6	170.2	172.42	1.987	
10,200.0	5,962.0	10,196.9	5,869.0	91.1	91.4	-74.25	4,760.7	-588.0	342.6	166.5	176.08	1.946	
10,300.0	5,962.0	10,296.9	5,869.0	93.0	93.2	-74.25	4,860.7	-588.0	342.6	162.9	179.75	1.906	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Cathedral Energy Services

Anticollision Report

Company:	Whiting Petroleum Corporation	**Local Co-ordinate Reference:**	Well Razor Federal 30J-1910
Project:	Weld County, CO	**TVD Reference:**	KB=17' @ 4855.0usft (Cade #23)
Reference Site:	S30-T10N-R58W	**MD Reference:**	KB=17' @ 4855.0usft (Cade #23)
Site Error:	0.0usft	**North Reference:**	True
Reference Well:	Razor Federal 30J-1910	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0usft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design S30-T10N-R58W - Razor Federal 30J-1909 - HZ - Plan #1

Offset Site Error: 0.0 usft

Survey Program: 0-ISCWSA MWD

Offset Well Error: 0.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor	Warning
10,400.0	5,962.0	10,396.9	5,869.0	94.9	95.1	-74.25	4,960.7	-588.0	342.6	159.2	183.41	1.868	
10,500.0	5,962.0	10,496.9	5,869.0	96.8	97.0	-74.25	5,060.7	-588.0	342.6	155.6	187.08	1.831	
10,600.0	5,962.0	10,596.9	5,869.0	98.7	98.9	-74.25	5,160.7	-588.0	342.6	151.9	190.75	1.796	
10,700.0	5,962.0	10,696.9	5,869.0	100.6	100.8	-74.25	5,260.7	-588.0	342.6	148.2	194.42	1.762	
10,800.0	5,962.0	10,796.9	5,869.0	102.5	102.6	-74.25	5,360.7	-588.0	342.6	144.6	198.10	1.730	
10,900.0	5,962.0	10,896.9	5,869.0	104.4	104.5	-74.25	5,460.7	-588.0	342.7	140.9	201.77	1.698	
11,000.0	5,962.0	10,996.9	5,869.0	106.3	106.4	-74.25	5,560.7	-588.0	342.7	137.2	205.45	1.668	
11,100.0	5,962.0	11,096.9	5,869.0	108.2	108.3	-74.25	5,660.7	-588.0	342.7	133.5	209.13	1.639	
11,200.0	5,962.0	11,196.9	5,869.0	110.1	110.2	-74.25	5,760.7	-588.0	342.7	129.9	212.81	1.610	
11,300.0	5,962.0	11,296.9	5,869.0	112.0	112.1	-74.25	5,860.7	-588.0	342.7	126.2	216.49	1.583	
11,400.0	5,962.0	11,396.9	5,869.0	113.9	114.0	-74.25	5,960.7	-588.0	342.7	122.5	220.17	1.556	
11,500.0	5,962.0	11,496.9	5,869.0	115.8	115.9	-74.25	6,060.7	-588.0	342.7	118.8	223.85	1.531	
11,600.0	5,962.0	11,596.9	5,869.0	117.7	117.8	-74.25	6,160.7	-588.0	342.7	115.1	227.54	1.506	
11,700.0	5,962.0	11,696.9	5,869.0	119.6	119.6	-74.25	6,260.7	-588.0	342.7	111.5	231.22	1.482	Level 3
11,800.0	5,962.0	11,796.9	5,869.0	121.5	121.5	-74.25	6,360.7	-588.0	342.7	107.8	234.91	1.459	Level 3
11,900.0	5,962.0	11,896.9	5,869.0	123.4	123.4	-74.25	6,460.7	-588.0	342.7	104.1	238.60	1.436	Level 3
12,000.0	5,962.0	11,996.9	5,869.0	125.3	125.3	-74.25	6,560.7	-588.0	342.7	100.4	242.29	1.414	Level 3
12,100.0	5,962.0	12,096.9	5,869.0	127.2	127.2	-74.25	6,660.7	-588.0	342.7	96.7	245.98	1.393	Level 3
12,200.0	5,962.0	12,196.9	5,869.0	129.1	129.1	-74.25	6,760.7	-588.0	342.7	93.0	249.67	1.373	Level 3
12,300.0	5,962.0	12,296.9	5,869.0	131.0	131.0	-74.25	6,860.7	-588.0	342.7	89.3	253.36	1.353	Level 3
12,400.0	5,962.0	12,396.9	5,869.0	133.0	132.9	-74.25	6,960.7	-588.0	342.7	85.6	257.05	1.333	Level 3
12,500.0	5,962.0	12,496.9	5,869.0	134.9	134.8	-74.25	7,060.7	-588.0	342.7	82.0	260.74	1.314	Level 3
12,600.0	5,962.0	12,596.9	5,869.0	136.8	136.7	-74.25	7,160.7	-588.0	342.7	78.3	264.44	1.296	Level 3
12,700.0	5,962.0	12,696.9	5,869.0	138.7	138.6	-74.25	7,260.7	-588.0	342.7	74.6	268.13	1.278	Level 3
12,800.0	5,962.0	12,796.9	5,869.0	140.6	140.5	-74.25	7,360.7	-588.0	342.7	70.9	271.83	1.261	Level 3
12,900.0	5,962.0	12,896.9	5,869.0	142.5	142.4	-74.25	7,460.7	-588.1	342.7	67.2	275.52	1.244	Level 2
13,000.0	5,962.0	12,996.9	5,869.0	144.4	144.3	-74.26	7,560.7	-588.1	342.7	63.5	279.22	1.227	Level 2
13,100.0	5,962.0	13,096.9	5,869.0	146.3	146.2	-74.26	7,660.7	-588.1	342.7	59.8	282.91	1.211	Level 2
13,200.0	5,962.0	13,196.9	5,869.0	148.2	148.1	-74.26	7,760.7	-588.1	342.7	56.1	286.61	1.196	Level 2
13,300.0	5,962.0	13,296.9	5,869.0	150.1	150.0	-74.26	7,860.7	-588.1	342.7	52.4	290.31	1.181	Level 2
13,400.0	5,962.0	13,396.9	5,869.0	152.0	151.9	-74.26	7,960.7	-588.1	342.7	48.7	294.01	1.166	Level 2
13,500.0	5,962.0	13,496.9	5,869.0	154.0	153.9	-74.26	8,060.7	-588.1	342.7	45.0	297.70	1.151	Level 2
13,563.0	5,962.0	13,559.9	5,869.0	154.9	155.1	-74.26	8,123.7	-588.1	342.7	42.9	299.82	1.143	Level 2, SF

Company:	Whiting Petroleum Corporation	**Local Co-ordinate Reference:**	Well Razor Federal 30J-1910
Project:	Weld County, CO	**TVD Reference:**	KB=17' @ 4855.0usft (Cade #23)
Reference Site:	S30-T10N-R58W	**MD Reference:**	KB=17' @ 4855.0usft (Cade #23)
Site Error:	0.0usft	**North Reference:**	True
Reference Well:	Razor Federal 30J-1910	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0usft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design S30-T10N-R58W - Razor Federal 30J-1911 - HZ - Plan #1

Offset Site Error: 0.0 usft

Survey Program: 0-ISCWSA MWD

Offset Well Error: 0.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	90.01	0.0	30.2	30.2				
100.0	100.0	100.0	100.0	0.1	0.1	90.01	0.0	30.2	30.2	30.0	0.19	161.746	
200.0	200.0	200.0	200.0	0.3	0.3	90.01	0.0	30.2	30.2	29.5	0.64	47.438	
300.0	300.0	300.0	300.0	0.5	0.5	90.01	0.0	30.2	30.2	29.1	1.09	27.795	
400.0	400.0	400.0	400.0	0.8	0.8	90.01	0.0	30.2	30.2	28.6	1.54	19.656	
500.0	500.0	500.0	500.0	1.0	1.0	90.01	0.0	30.2	30.2	28.2	1.98	15.204	CC, ES
600.0	600.0	599.9	599.9	1.2	1.2	103.62	1.7	30.3	30.7	28.2	2.43	12.607	
700.0	699.8	699.9	699.7	1.4	1.4	103.34	7.0	30.5	32.2	29.3	2.89	11.141	
800.0	799.6	799.9	799.5	1.7	1.7	103.04	13.9	30.8	34.1	30.8	3.35	10.176	
900.0	899.4	899.8	899.2	1.9	1.9	102.77	20.9	31.1	36.1	32.3	3.83	9.420	
1,000.0	999.1	999.8	998.9	2.2	2.2	102.53	27.9	31.5	38.1	33.8	4.32	8.817	
1,100.0	1,098.9	1,099.8	1,098.7	2.4	2.4	102.32	34.8	31.8	40.1	35.2	4.81	8.327	
1,200.0	1,198.6	1,199.8	1,198.4	2.7	2.7	102.12	41.8	32.1	42.0	36.7	5.31	7.923	
1,300.0	1,298.4	1,299.8	1,298.1	2.9	2.9	101.94	48.8	32.4	44.0	38.2	5.80	7.584	
1,400.0	1,398.1	1,399.7	1,397.9	3.2	3.2	101.78	55.7	32.8	46.0	39.7	6.30	7.296	
1,500.0	1,497.9	1,499.7	1,497.6	3.4	3.4	101.63	62.7	33.1	48.0	41.2	6.81	7.049	
1,600.0	1,597.6	1,599.7	1,597.4	3.7	3.7	101.49	69.7	33.4	50.0	42.6	7.31	6.834	
1,700.0	1,697.4	1,699.7	1,697.1	3.9	3.9	101.36	76.6	33.7	51.9	44.1	7.81	6.646	
1,800.0	1,797.2	1,799.7	1,796.8	4.2	4.2	101.25	83.6	34.0	53.9	45.6	8.32	6.481	
1,900.0	1,896.9	1,899.6	1,896.6	4.4	4.4	101.14	90.6	34.4	55.9	47.1	8.83	6.333	
2,000.0	1,996.7	1,999.6	1,996.3	4.7	4.7	101.03	97.5	34.7	57.9	48.5	9.33	6.202	
2,100.0	2,096.4	2,099.6	2,096.0	4.9	4.9	100.94	104.5	35.0	59.9	50.0	9.84	6.083	
2,200.0	2,196.2	2,199.6	2,195.8	5.2	5.2	100.85	111.5	35.3	61.8	51.5	10.35	5.976	
2,300.0	2,295.9	2,299.6	2,295.5	5.4	5.4	100.77	118.4	35.7	63.8	53.0	10.86	5.879	
2,400.0	2,395.7	2,399.5	2,395.2	5.7	5.7	100.69	125.4	36.0	65.8	54.4	11.36	5.790	
2,500.0	2,495.5	2,499.5	2,495.0	6.0	5.9	100.61	132.4	36.3	67.8	55.9	11.87	5.709	
2,600.0	2,595.2	2,599.5	2,594.7	6.2	6.2	100.54	139.3	36.6	69.8	57.4	12.38	5.634	
2,700.0	2,695.0	2,699.5	2,694.5	6.5	6.5	100.48	146.3	36.9	71.8	58.9	12.89	5.566	
2,800.0	2,794.7	2,799.5	2,794.2	6.7	6.7	100.41	153.3	37.3	73.7	60.3	13.40	5.502	
2,900.0	2,894.5	2,899.5	2,893.9	7.0	7.0	100.36	160.2	37.6	75.7	61.8	13.91	5.443	
3,000.0	2,994.2	2,999.4	2,993.7	7.2	7.2	100.30	167.2	37.9	77.7	63.3	14.42	5.388	
3,100.0	3,094.0	3,099.4	3,093.4	7.5	7.5	100.25	174.2	38.2	79.7	64.8	14.93	5.337	
3,200.0	3,193.7	3,199.4	3,193.1	7.7	7.7	100.20	181.1	38.6	81.7	66.2	15.44	5.289	
3,300.0	3,293.5	3,299.4	3,292.9	8.0	8.0	100.15	188.1	38.9	83.6	67.7	15.95	5.244	
3,400.0	3,393.3	3,399.4	3,392.6	8.3	8.2	100.10	195.1	39.2	85.6	69.2	16.46	5.202	
3,500.0	3,493.0	3,499.3	3,492.4	8.5	8.5	100.06	202.0	39.5	87.6	70.6	16.97	5.162	
3,600.0	3,592.8	3,599.3	3,592.1	8.8	8.8	100.01	209.0	39.8	89.6	72.1	17.48	5.125	
3,700.0	3,692.5	3,699.3	3,691.8	9.0	9.0	99.97	216.0	40.2	91.6	73.6	17.99	5.090	
3,800.0	3,792.3	3,799.3	3,791.6	9.3	9.3	99.94	222.9	40.5	93.6	75.1	18.50	5.056	
3,900.0	3,892.0	3,899.3	3,891.3	9.5	9.5	99.90	229.9	40.8	95.5	76.5	19.01	5.025	
4,000.0	3,991.8	3,999.2	3,991.0	9.8	9.8	99.86	236.9	41.1	97.5	78.0	19.53	4.995	
4,100.0	4,091.6	4,099.2	4,090.8	10.0	10.0	99.83	243.8	41.5	99.5	79.5	20.04	4.966	
4,200.0	4,191.3	4,199.2	4,190.5	10.3	10.3	99.80	250.8	41.8	101.5	80.9	20.55	4.939	
4,300.0	4,291.1	4,299.2	4,290.2	10.6	10.5	99.77	257.8	42.1	103.5	82.4	21.06	4.914	
4,400.0	4,390.8	4,399.2	4,390.0	10.8	10.8	99.73	264.7	42.4	105.5	83.9	21.57	4.889	
4,500.0	4,490.6	4,499.1	4,489.7	11.1	11.1	99.71	271.7	42.7	107.4	85.4	22.08	4.866	
4,600.0	4,590.3	4,599.1	4,589.5	11.3	11.3	99.68	278.7	43.1	109.4	86.8	22.59	4.844	
4,700.0	4,690.1	4,699.1	4,689.2	11.6	11.6	99.65	285.6	43.4	111.4	88.3	23.10	4.822	
4,800.0	4,789.9	4,799.1	4,788.9	11.8	11.8	99.62	292.6	43.7	113.4	89.8	23.61	4.802	
4,900.0	4,889.6	4,899.1	4,888.7	12.1	12.1	99.60	299.6	44.0	115.4	91.2	24.12	4.782	
5,000.0	4,989.4	4,999.0	4,988.4	12.4	12.3	99.57	306.5	44.4	117.4	92.7	24.64	4.764	
5,100.0	5,089.1	5,099.0	5,088.1	12.6	12.6	99.55	313.5	44.7	119.3	94.2	25.15	4.746	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	Whiting Petroleum Corporation	**Local Co-ordinate Reference:**	Well Razor Federal 30J-1910
Project:	Weld County, CO	**TVD Reference:**	KB=17' @ 4855.0usft (Cade #23)
Reference Site:	S30-T10N-R58W	**MD Reference:**	KB=17' @ 4855.0usft (Cade #23)
Site Error:	0.0usft	**North Reference:**	True
Reference Well:	Razor Federal 30J-1910	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0usft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design S30-T10N-R58W - Razor Federal 30J-1911 - HZ - Plan #1

Offset Site Error: 0.0 usft

Survey Program: 0-ISCWSA MWD

Offset Well Error: 0.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor	Warning
5,200.0	5,188.9	5,199.0	5,187.9	12.9	12.8	99.53	320.5	45.0	121.3	95.7	25.66	4.728	
5,300.0	5,288.6	5,299.0	5,287.6	13.1	13.1	99.51	327.4	45.3	123.3	97.1	26.17	4.712	
5,400.0	5,388.4	5,398.9	5,387.3	13.4	13.4	99.48	334.4	45.7	125.3	98.6	26.68	4.696	
5,500.0	5,488.1	5,494.8	5,481.8	13.6	13.7	95.31	350.3	46.4	128.8	101.6	27.26	4.725	
5,600.0	5,586.3	5,587.4	5,568.6	14.0	14.1	88.26	381.8	47.8	138.1	110.0	28.00	4.930	
5,700.0	5,679.0	5,677.0	5,646.2	14.5	14.7	82.50	426.5	49.9	153.2	124.2	28.94	5.293	
5,800.0	5,763.1	5,764.1	5,713.1	15.2	15.4	78.19	482.0	52.5	172.6	142.6	30.02	5.750	
5,900.0	5,835.3	5,850.0	5,769.2	16.1	16.2	75.12	546.9	55.5	195.0	163.7	31.28	6.233	
6,000.0	5,893.0	5,932.0	5,812.0	17.2	17.2	73.01	616.6	58.7	219.2	186.5	32.78	6.689	
6,100.0	5,934.2	6,013.8	5,843.4	18.4	18.2	71.61	692.0	62.2	244.5	209.9	34.58	7.070	
6,200.0	5,957.2	6,095.0	5,862.5	19.8	19.3	70.74	770.8	65.9	270.1	233.3	36.74	7.351	
6,300.0	5,962.0	6,177.9	5,869.0	21.3	20.5	71.04	853.2	69.7	295.4	256.0	39.38	7.501	
6,400.0	5,962.0	6,287.0	5,869.0	22.7	22.0	72.64	962.3	71.7	315.8	273.3	42.54	7.424	
6,500.0	5,962.0	6,386.0	5,869.0	24.2	23.5	73.51	1,061.3	71.7	329.7	284.1	45.61	7.228	
6,600.0	5,962.0	6,485.5	5,869.0	25.7	25.1	74.03	1,160.8	71.7	338.6	289.9	48.68	6.957	
6,700.0	5,962.0	6,585.4	5,869.0	27.2	26.8	74.25	1,260.7	71.7	342.5	290.9	51.68	6.628	
6,800.0	5,962.0	6,685.4	5,869.0	28.8	28.5	74.26	1,360.7	71.7	342.7	287.9	54.81	6.253	
6,900.0	5,962.0	6,785.4	5,869.0	30.4	30.2	74.26	1,460.7	71.7	342.7	284.6	58.09	5.900	
7,000.0	5,962.0	6,885.4	5,869.0	32.1	31.9	74.26	1,560.7	71.7	342.7	281.3	61.42	5.580	
7,100.0	5,962.0	6,985.4	5,869.0	33.8	33.7	74.26	1,660.7	71.7	342.7	277.9	64.79	5.290	
7,200.0	5,962.0	7,085.4	5,869.0	35.6	35.5	74.26	1,760.7	71.7	342.7	274.5	68.20	5.026	
7,300.0	5,962.0	7,185.4	5,869.0	37.3	37.2	74.26	1,860.7	71.7	342.7	271.1	71.64	4.784	
7,400.0	5,962.0	7,285.4	5,869.0	39.1	39.0	74.26	1,960.7	71.7	342.7	267.6	75.10	4.564	
7,500.0	5,962.0	7,385.4	5,869.0	40.9	40.9	74.26	2,060.7	71.7	342.7	264.1	78.59	4.361	
7,600.0	5,962.0	7,485.4	5,869.0	42.7	42.7	74.26	2,160.7	71.7	342.7	260.6	82.10	4.175	
7,700.0	5,962.0	7,585.4	5,869.0	44.5	44.5	74.26	2,260.7	71.7	342.7	257.1	85.63	4.003	
7,800.0	5,962.0	7,685.4	5,869.0	46.3	46.3	74.26	2,360.7	71.7	342.7	253.6	89.17	3.844	
7,900.0	5,962.0	7,785.4	5,869.0	48.1	48.2	74.26	2,460.7	71.7	342.7	250.0	92.73	3.696	
8,000.0	5,962.0	7,885.4	5,869.0	49.9	50.0	74.26	2,560.7	71.7	342.7	246.4	96.30	3.559	
8,100.0	5,962.0	7,985.4	5,869.0	51.8	51.9	74.26	2,660.7	71.7	342.7	242.9	99.88	3.432	
8,200.0	5,962.0	8,085.4	5,869.0	53.6	53.8	74.26	2,760.7	71.7	342.7	239.3	103.47	3.313	
8,300.0	5,962.0	8,185.4	5,869.0	55.4	55.6	74.26	2,860.7	71.7	342.7	235.7	107.06	3.201	
8,400.0	5,962.0	8,285.4	5,869.0	57.3	57.5	74.26	2,960.7	71.7	342.7	232.1	110.67	3.097	
8,500.0	5,962.0	8,385.4	5,869.0	59.1	59.4	74.26	3,060.7	71.7	342.7	228.4	114.28	2.999	
8,600.0	5,962.0	8,485.4	5,869.0	61.0	61.2	74.26	3,160.7	71.7	342.7	224.8	117.90	2.907	
8,700.0	5,962.0	8,585.4	5,869.0	62.9	63.1	74.26	3,260.7	71.7	342.7	221.2	121.53	2.820	
8,800.0	5,962.0	8,685.4	5,869.0	64.7	65.0	74.26	3,360.7	71.7	342.7	217.6	125.16	2.738	
8,900.0	5,962.0	8,785.4	5,869.0	66.6	66.9	74.26	3,460.7	71.7	342.7	213.9	128.80	2.661	
9,000.0	5,962.0	8,885.4	5,869.0	68.5	68.7	74.26	3,560.7	71.7	342.7	210.3	132.44	2.588	
9,100.0	5,962.0	8,985.4	5,869.0	70.3	70.6	74.26	3,660.7	71.7	342.7	206.6	136.09	2.519	
9,200.0	5,962.0	9,085.4	5,869.0	72.2	72.5	74.26	3,760.7	71.7	342.7	203.0	139.73	2.453	
9,300.0	5,962.0	9,185.4	5,869.0	74.1	74.4	74.26	3,860.7	71.7	342.7	199.3	143.39	2.390	
9,400.0	5,962.0	9,285.4	5,869.0	76.0	76.3	74.26	3,960.7	71.7	342.7	195.7	147.04	2.331	
9,500.0	5,962.0	9,385.4	5,869.0	77.9	78.2	74.26	4,060.7	71.7	342.7	192.0	150.70	2.274	
9,600.0	5,962.0	9,485.4	5,869.0	79.8	80.1	74.26	4,160.7	71.7	342.7	188.4	154.36	2.220	
9,700.0	5,962.0	9,585.4	5,869.0	81.6	82.0	74.26	4,260.7	71.7	342.7	184.7	158.03	2.169	
9,800.0	5,962.0	9,685.4	5,869.0	83.5	83.9	74.26	4,360.7	71.7	342.7	181.0	161.70	2.120	
9,900.0	5,962.0	9,785.4	5,869.0	85.4	85.8	74.26	4,460.7	71.7	342.7	177.4	165.37	2.073	
10,000.0	5,962.0	9,885.4	5,869.0	87.3	87.7	74.26	4,560.7	71.7	342.7	173.7	169.04	2.028	
10,100.0	5,962.0	9,985.4	5,869.0	89.2	89.6	74.26	4,660.7	71.7	342.7	170.0	172.71	1.984	
10,200.0	5,962.0	10,085.4	5,869.0	91.1	91.5	74.26	4,760.7	71.7	342.7	166.3	176.39	1.943	
10,300.0	5,962.0	10,185.4	5,869.0	93.0	93.4	74.26	4,860.7	71.7	342.7	162.7	180.06	1.903	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	Whiting Petroleum Corporation	**Local Co-ordinate Reference:**	Well Razor Federal 30J-1910
Project:	Weld County, CO	**TVD Reference:**	KB=17' @ 4855.0usft (Cade #23)
Reference Site:	S30-T10N-R58W	**MD Reference:**	KB=17' @ 4855.0usft (Cade #23)
Site Error:	0.0usft	**North Reference:**	True
Reference Well:	Razor Federal 30J-1910	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0usft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design S30-T10N-R58W - Razor Federal 30J-1911 - HZ - Plan #1

Offset Site Error: 0.0 usft

Survey Program: 0-ISCWSA MWD

Offset Well Error: 0.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor	Warning
10,400.0	5,962.0	10,285.4	5,869.0	94.9	95.3	74.26	4,960.7	71.7	342.7	159.0	183.74	1.865	
10,500.0	5,962.0	10,385.4	5,869.0	96.8	97.2	74.26	5,060.7	71.7	342.7	155.3	187.42	1.829	
10,600.0	5,962.0	10,485.4	5,869.0	98.7	99.1	74.26	5,160.7	71.7	342.7	151.6	191.11	1.793	
10,700.0	5,962.0	10,585.4	5,869.0	100.6	101.0	74.26	5,260.7	71.7	342.7	147.9	194.79	1.760	
10,800.0	5,962.0	10,685.4	5,869.0	102.5	102.9	74.26	5,360.7	71.7	342.7	144.3	198.47	1.727	
10,900.0	5,962.0	10,785.4	5,869.0	104.4	104.8	74.26	5,460.7	71.7	342.7	140.6	202.16	1.695	
11,000.0	5,962.0	10,885.4	5,869.0	106.3	106.7	74.26	5,560.7	71.7	342.7	136.9	205.85	1.665	
11,100.0	5,962.0	10,985.4	5,869.0	108.2	108.6	74.26	5,660.7	71.7	342.7	133.2	209.54	1.636	
11,200.0	5,962.0	11,085.4	5,869.0	110.1	110.5	74.26	5,760.7	71.7	342.7	129.5	213.23	1.607	
11,300.0	5,962.0	11,185.4	5,869.0	112.0	112.4	74.26	5,860.7	71.7	342.7	125.8	216.92	1.580	
11,400.0	5,962.0	11,285.4	5,869.0	113.9	114.3	74.26	5,960.7	71.7	342.7	122.1	220.61	1.554	
11,500.0	5,962.0	11,385.4	5,869.0	115.8	116.2	74.26	6,060.7	71.7	342.7	118.4	224.30	1.528	
11,600.0	5,962.0	11,485.4	5,869.0	117.7	118.1	74.26	6,160.7	71.7	342.7	114.7	227.99	1.503	
11,700.0	5,962.0	11,585.4	5,869.0	119.6	120.0	74.26	6,260.7	71.7	342.7	111.0	231.69	1.479	Level 3
11,800.0	5,962.0	11,685.4	5,869.0	121.5	122.0	74.26	6,360.7	71.7	342.7	107.4	235.38	1.456	Level 3
11,900.0	5,962.0	11,785.4	5,869.0	123.4	123.9	74.26	6,460.7	71.7	342.7	103.7	239.08	1.434	Level 3
12,000.0	5,962.0	11,885.4	5,869.0	125.3	125.8	74.26	6,560.7	71.7	342.7	100.0	242.77	1.412	Level 3
12,100.0	5,962.0	11,985.4	5,869.0	127.2	127.7	74.26	6,660.7	71.7	342.7	96.3	246.47	1.391	Level 3
12,200.0	5,962.0	12,085.4	5,869.0	129.1	129.6	74.26	6,760.7	71.7	342.7	92.6	250.17	1.370	Level 3
12,300.0	5,962.0	12,185.4	5,869.0	131.0	131.5	74.26	6,860.7	71.7	342.7	88.9	253.87	1.350	Level 3
12,400.0	5,962.0	12,285.4	5,869.0	133.0	133.4	74.26	6,960.7	71.7	342.7	85.2	257.57	1.331	Level 3
12,500.0	5,962.0	12,385.4	5,869.0	134.9	135.3	74.26	7,060.7	71.7	342.7	81.5	261.27	1.312	Level 3
12,600.0	5,962.0	12,485.4	5,869.0	136.8	137.2	74.26	7,160.7	71.7	342.7	77.8	264.97	1.294	Level 3
12,700.0	5,962.0	12,585.4	5,869.0	138.7	139.1	74.26	7,260.7	71.7	342.7	74.1	268.67	1.276	Level 3
12,800.0	5,962.0	12,685.4	5,869.0	140.6	141.1	74.26	7,360.7	71.7	342.7	70.4	272.37	1.258	Level 3
12,900.0	5,962.0	12,785.4	5,869.0	142.5	143.0	74.26	7,460.7	71.7	342.7	66.7	276.07	1.241	Level 2
13,000.0	5,962.0	12,885.4	5,869.0	144.4	144.9	74.26	7,560.7	71.7	342.7	63.0	279.77	1.225	Level 2
13,100.0	5,962.0	12,985.4	5,869.0	146.3	146.8	74.26	7,660.7	71.7	342.7	59.3	283.47	1.209	Level 2
13,200.0	5,962.0	13,085.4	5,869.0	148.2	148.7	74.26	7,760.7	71.7	342.7	55.6	287.18	1.193	Level 2
13,300.0	5,962.0	13,185.4	5,869.0	150.1	150.6	74.26	7,860.7	71.7	342.7	51.9	290.88	1.178	Level 2
13,400.0	5,962.0	13,285.4	5,869.0	152.0	152.5	74.26	7,960.7	71.7	342.7	48.2	294.58	1.163	Level 2
13,500.0	5,962.0	13,385.4	5,869.0	154.0	154.5	74.26	8,060.7	71.7	342.7	44.4	298.29	1.149	Level 2
13,546.3	5,962.0	13,431.7	5,869.0	154.7	155.3	74.26	8,107.0	71.7	342.7	42.9	299.84	1.143	Level 2
13,563.0	5,962.0	13,446.2	5,869.0	154.9	155.6	74.26	8,121.5	71.7	342.7	42.4	300.36	1.141	Level 2, SF

Company:	Whiting Petroleum Corporation	**Local Co-ordinate Reference:**	Well Razor Federal 30J-1910
Project:	Weld County, CO	**TVD Reference:**	KB=17' @ 4855.0usft (Cade #23)
Reference Site:	S30-T10N-R58W	**MD Reference:**	KB=17' @ 4855.0usft (Cade #23)
Site Error:	0.0usft	**North Reference:**	True
Reference Well:	Razor Federal 30J-1910	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0usft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design S30-T10N-R58W - Razor Federal 30J-1912 - HZ - Plan #1

Offset Site Error: 0.0 usft

Survey Program: 0-ISCWSA MWD

Offset Well Error: 0.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	90.01	0.0	60.1	60.1				
100.0	100.0	100.0	100.0	0.1	0.1	90.01	0.0	60.1	60.1	59.9	0.19	322.008	
200.0	200.0	200.0	200.0	0.3	0.3	90.01	0.0	60.1	60.1	59.4	0.64	94.441	
300.0	300.0	300.0	300.0	0.5	0.5	90.01	0.0	60.1	60.1	59.0	1.09	55.335	
400.0	400.0	400.0	400.0	0.8	0.8	90.01	0.0	60.1	60.1	58.5	1.54	39.131	
500.0	500.0	500.0	500.0	1.0	1.0	90.01	0.0	60.1	60.1	58.1	1.98	30.268	CC, ES
600.0	600.0	599.4	599.4	1.2	1.2	103.73	1.6	60.6	61.0	58.6	2.43	25.091	
700.0	699.8	698.7	698.5	1.4	1.4	103.78	6.6	62.1	63.8	60.9	2.88	22.124	
800.0	799.6	798.6	798.2	1.7	1.7	103.88	13.2	64.2	67.5	64.2	3.35	20.155	
900.0	899.4	898.5	897.9	1.9	1.9	103.96	19.9	66.3	71.2	67.4	3.83	18.618	
1,000.0	999.1	998.5	997.6	2.2	2.2	104.03	26.5	68.3	75.0	70.6	4.31	17.392	
1,100.0	1,098.9	1,098.4	1,097.3	2.4	2.4	104.10	33.2	70.4	78.7	73.9	4.80	16.396	
1,200.0	1,198.6	1,198.3	1,197.0	2.7	2.6	104.16	39.8	72.5	82.4	77.1	5.29	15.573	
1,300.0	1,298.4	1,298.3	1,296.7	2.9	2.9	104.22	46.5	74.5	86.1	80.3	5.79	14.884	
1,400.0	1,398.1	1,398.2	1,396.3	3.2	3.1	104.27	53.2	76.6	89.9	83.6	6.28	14.299	
1,500.0	1,497.9	1,498.1	1,496.0	3.4	3.4	104.32	59.8	78.7	93.6	86.8	6.78	13.797	
1,600.0	1,597.6	1,598.1	1,595.7	3.7	3.7	104.36	66.5	80.8	97.3	90.0	7.28	13.360	
1,700.0	1,697.4	1,698.0	1,695.4	3.9	3.9	104.40	73.1	82.8	101.0	93.2	7.78	12.977	
1,800.0	1,797.2	1,797.9	1,795.1	4.2	4.2	104.44	79.8	84.9	104.8	96.5	8.29	12.640	
1,900.0	1,896.9	1,897.9	1,894.8	4.4	4.4	104.47	86.4	87.0	108.5	99.7	8.79	12.340	
2,000.0	1,996.7	1,997.8	1,994.5	4.7	4.7	104.51	93.1	89.0	112.2	102.9	9.29	12.072	
2,100.0	2,096.4	2,097.7	2,094.1	4.9	4.9	104.54	99.7	91.1	115.9	106.1	9.80	11.831	
2,200.0	2,196.2	2,197.6	2,193.8	5.2	5.2	104.56	106.4	93.2	119.7	109.3	10.30	11.613	
2,300.0	2,295.9	2,297.6	2,293.5	5.4	5.4	104.59	113.1	95.2	123.4	112.6	10.81	11.415	
2,400.0	2,395.7	2,397.5	2,393.2	5.7	5.7	104.62	119.7	97.3	127.1	115.8	11.31	11.234	
2,500.0	2,495.5	2,497.4	2,492.9	6.0	5.9	104.64	126.4	99.4	130.8	119.0	11.82	11.069	
2,600.0	2,595.2	2,597.4	2,592.6	6.2	6.2	104.66	133.0	101.5	134.6	122.2	12.33	10.916	
2,700.0	2,695.0	2,697.3	2,692.3	6.5	6.4	104.68	139.7	103.5	138.3	125.4	12.83	10.776	
2,800.0	2,794.7	2,797.2	2,792.0	6.7	6.7	104.70	146.3	105.6	142.0	128.7	13.34	10.646	
2,900.0	2,894.5	2,897.2	2,891.6	7.0	7.0	104.72	153.0	107.7	145.7	131.9	13.84	10.526	
3,000.0	2,994.2	2,997.1	2,991.3	7.2	7.2	104.74	159.7	109.7	149.5	135.1	14.35	10.414	
3,100.0	3,094.0	3,097.0	3,091.0	7.5	7.5	104.76	166.3	111.8	153.2	138.3	14.86	10.309	
3,200.0	3,193.7	3,197.0	3,190.7	7.7	7.7	104.78	173.0	113.9	156.9	141.5	15.37	10.212	
3,300.0	3,293.5	3,296.9	3,290.4	8.0	8.0	104.79	179.6	116.0	160.6	144.8	15.87	10.120	
3,400.0	3,393.3	3,396.8	3,390.1	8.3	8.2	104.81	186.3	118.0	164.4	148.0	16.38	10.034	
3,500.0	3,493.0	3,496.7	3,489.8	8.5	8.5	104.82	192.9	120.1	168.1	151.2	16.89	9.953	
3,600.0	3,592.8	3,596.7	3,589.5	8.8	8.7	104.83	199.6	122.2	171.8	154.4	17.39	9.877	
3,700.0	3,692.5	3,696.6	3,689.1	9.0	9.0	104.85	206.2	124.2	175.5	157.6	17.90	9.805	
3,800.0	3,792.3	3,796.5	3,788.8	9.3	9.3	104.86	212.9	126.3	179.3	160.8	18.41	9.737	
3,900.0	3,892.0	3,896.5	3,888.5	9.5	9.5	104.87	219.6	128.4	183.0	164.1	18.92	9.673	
4,000.0	3,991.8	3,996.4	3,988.2	9.8	9.8	104.88	226.2	130.4	186.7	167.3	19.42	9.612	
4,100.0	4,091.6	4,096.3	4,087.9	10.0	10.0	104.90	232.9	132.5	190.4	170.5	19.93	9.554	
4,200.0	4,191.3	4,196.3	4,187.6	10.3	10.3	104.91	239.5	134.6	194.2	173.7	20.44	9.499	
4,300.0	4,291.1	4,296.2	4,287.3	10.6	10.5	104.92	246.2	136.7	197.9	176.9	20.95	9.447	
4,400.0	4,390.8	4,396.1	4,387.0	10.8	10.8	104.93	252.8	138.7	201.6	180.1	21.45	9.397	
4,500.0	4,490.6	4,496.0	4,486.6	11.1	11.0	104.94	259.5	140.8	205.3	183.4	21.96	9.349	
4,600.0	4,590.3	4,596.0	4,586.3	11.3	11.3	104.94	266.2	142.9	209.1	186.6	22.47	9.303	
4,700.0	4,690.1	4,695.9	4,686.0	11.6	11.6	104.95	272.8	144.9	212.8	189.8	22.98	9.260	
4,800.0	4,789.9	4,795.8	4,785.7	11.8	11.8	104.96	279.5	147.0	216.5	193.0	23.49	9.218	
4,900.0	4,889.6	4,895.8	4,885.4	12.1	12.1	104.97	286.1	149.1	220.2	196.2	23.99	9.178	
5,000.0	4,989.4	4,995.7	4,985.1	12.4	12.3	104.98	292.8	151.2	224.0	199.5	24.50	9.140	
5,100.0	5,089.1	5,095.6	5,084.8	12.6	12.6	104.99	299.4	153.2	227.7	202.7	25.01	9.103	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	Whiting Petroleum Corporation	**Local Co-ordinate Reference:**	Well Razor Federal 30J-1910
Project:	Weld County, CO	**TVD Reference:**	KB=17' @ 4855.0usft (Cade #23)
Reference Site:	S30-T10N-R58W	**MD Reference:**	KB=17' @ 4855.0usft (Cade #23)
Site Error:	0.0usft	**North Reference:**	True
Reference Well:	Razor Federal 30J-1910	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0usft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design S30-T10N-R58W - Razor Federal 30J-1912 - HZ - Plan #1

Offset Site Error: 0.0 usft

Survey Program: 0-ISCWSA MWD

Offset Well Error: 0.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor	Warning
5,200.0	5,188.9	5,195.6	5,184.4	12.9	12.8	104.99	306.1	155.3	231.4	205.9	25.52	9.068	
5,300.0	5,288.6	5,295.5	5,284.1	13.1	13.1	105.00	312.7	157.4	235.1	209.1	26.03	9.034	
5,400.0	5,388.4	5,395.4	5,383.8	13.4	13.3	105.01	319.4	159.4	238.9	212.3	26.53	9.001	
5,500.0	5,488.1	5,494.7	5,482.8	13.6	13.6	104.99	326.0	161.5	242.6	215.6	27.04	8.973	
5,600.0	5,586.3	5,582.9	5,569.8	14.0	13.9	104.43	339.8	165.8	251.9	224.3	27.62	9.121	
5,700.0	5,679.0	5,669.8	5,651.8	14.5	14.3	103.30	366.9	174.2	270.4	242.0	28.42	9.514	
5,800.0	5,763.1	5,754.9	5,726.5	15.2	14.8	101.60	405.7	186.3	297.2	267.7	29.49	10.080	
5,900.0	5,835.3	5,837.9	5,792.0	16.1	15.5	99.36	454.2	201.4	331.4	300.5	30.88	10.732	
6,000.0	5,893.0	5,918.8	5,847.4	17.2	16.2	96.62	510.5	218.9	371.7	339.1	32.60	11.400	
6,100.0	5,934.2	6,000.0	5,893.0	18.4	17.1	93.53	574.5	238.8	416.7	382.1	34.63	12.034	
6,200.0	5,957.2	6,077.3	5,926.4	19.8	18.0	90.08	641.0	259.5	465.1	428.2	36.84	12.624	
6,300.0	5,962.0	6,157.2	5,949.6	21.3	19.1	88.41	713.9	282.2	515.2	476.0	39.24	13.129	
6,400.0	5,962.0	6,243.2	5,961.3	22.7	20.3	89.91	795.1	307.4	562.9	521.1	41.85	13.453	
6,500.0	5,962.0	6,362.2	5,962.0	24.2	22.0	90.00	909.4	340.7	604.7	559.7	44.94	13.454	
6,600.0	5,962.0	6,503.2	5,962.0	25.7	23.9	90.00	1,047.0	371.0	635.2	586.8	48.46	13.108	
6,700.0	5,962.0	6,651.6	5,962.0	27.2	26.1	90.00	1,194.0	391.9	653.3	601.0	52.28	12.497	
6,800.0	5,962.0	6,803.7	5,962.0	28.8	28.5	90.00	1,345.7	401.4	659.8	603.5	56.24	11.731	
6,900.0	5,962.0	6,918.7	5,962.0	30.4	30.3	90.00	1,460.7	401.9	660.1	600.3	59.76	11.045	
7,000.0	5,962.0	7,018.7	5,962.0	32.1	31.9	90.00	1,560.7	401.9	660.1	597.0	63.12	10.458	
7,100.0	5,962.0	7,118.7	5,962.0	33.8	33.6	90.00	1,660.7	401.9	660.1	593.6	66.53	9.922	
7,200.0	5,962.0	7,218.7	5,962.0	35.6	35.2	90.00	1,760.7	401.9	660.1	590.1	69.99	9.432	
7,300.0	5,962.0	7,318.7	5,962.0	37.3	36.9	90.00	1,860.7	401.9	660.1	586.6	73.48	8.984	
7,400.0	5,962.0	7,418.7	5,962.0	39.1	38.7	90.00	1,960.7	401.9	660.1	583.1	77.01	8.572	
7,500.0	5,962.0	7,518.7	5,962.0	40.9	40.4	90.00	2,060.7	401.9	660.1	579.6	80.56	8.194	
7,600.0	5,962.0	7,618.7	5,962.0	42.7	42.2	90.00	2,160.7	401.9	660.1	576.0	84.14	7.846	
7,700.0	5,962.0	7,718.7	5,962.0	44.5	43.9	90.00	2,260.7	401.9	660.1	572.4	87.74	7.523	
7,800.0	5,962.0	7,818.7	5,962.0	46.3	45.7	90.00	2,360.7	402.0	660.1	568.8	91.36	7.225	
7,900.0	5,962.0	7,918.7	5,962.0	48.1	47.5	90.00	2,460.7	402.0	660.1	565.1	95.00	6.949	
8,000.0	5,962.0	8,018.7	5,962.0	49.9	49.3	90.00	2,560.7	402.0	660.1	561.5	98.66	6.691	
8,100.0	5,962.0	8,118.7	5,962.0	51.8	51.1	90.00	2,660.7	402.0	660.1	557.8	102.33	6.451	
8,200.0	5,962.0	8,218.7	5,962.0	53.6	53.0	90.00	2,760.7	402.0	660.1	554.1	106.01	6.227	
8,300.0	5,962.0	8,318.7	5,962.0	55.4	54.8	90.00	2,860.7	402.0	660.1	550.4	109.70	6.018	
8,400.0	5,962.0	8,418.7	5,962.0	57.3	56.6	90.00	2,960.7	402.0	660.1	546.7	113.40	5.821	
8,500.0	5,962.0	8,518.7	5,962.0	59.1	58.5	90.00	3,060.7	402.0	660.2	543.0	117.11	5.637	
8,600.0	5,962.0	8,618.7	5,962.0	61.0	60.3	90.00	3,160.7	402.0	660.2	539.3	120.83	5.464	
8,700.0	5,962.0	8,718.7	5,962.0	62.9	62.2	90.00	3,260.7	402.0	660.2	535.6	124.55	5.300	
8,800.0	5,962.0	8,818.7	5,962.0	64.7	64.0	90.00	3,360.7	402.0	660.2	531.9	128.29	5.146	
8,900.0	5,962.0	8,918.7	5,962.0	66.6	65.9	90.00	3,460.7	402.0	660.2	528.1	132.02	5.000	
9,000.0	5,962.0	9,018.7	5,962.0	68.5	67.7	90.00	3,560.7	402.0	660.2	524.4	135.77	4.862	
9,100.0	5,962.0	9,118.7	5,962.0	70.3	69.6	90.00	3,660.7	402.0	660.2	520.6	139.52	4.732	
9,200.0	5,962.0	9,218.7	5,962.0	72.2	71.5	90.00	3,760.7	402.0	660.2	516.9	143.27	4.608	
9,300.0	5,962.0	9,318.7	5,962.0	74.1	73.3	90.00	3,860.7	402.0	660.2	513.1	147.03	4.490	
9,400.0	5,962.0	9,418.7	5,962.0	76.0	75.2	90.00	3,960.7	402.0	660.2	509.4	150.80	4.378	
9,500.0	5,962.0	9,518.7	5,962.0	77.9	77.1	90.00	4,060.7	402.0	660.2	505.6	154.56	4.271	
9,600.0	5,962.0	9,618.7	5,962.0	79.8	79.0	90.00	4,160.7	402.0	660.2	501.8	158.33	4.170	
9,700.0	5,962.0	9,718.7	5,962.0	81.6	80.8	90.00	4,260.7	402.0	660.2	498.1	162.11	4.072	
9,800.0	5,962.0	9,818.7	5,962.0	83.5	82.7	90.00	4,360.7	402.0	660.2	494.3	165.89	3.980	
9,900.0	5,962.0	9,918.7	5,962.0	85.4	84.6	90.00	4,460.7	402.0	660.2	490.5	169.67	3.891	
10,000.0	5,962.0	10,018.7	5,962.0	87.3	86.5	90.00	4,560.7	402.0	660.2	486.7	173.45	3.806	
10,100.0	5,962.0	10,118.7	5,962.0	89.2	88.4	90.00	4,660.7	402.0	660.2	483.0	177.23	3.725	
10,200.0	5,962.0	10,218.7	5,962.0	91.1	90.2	90.00	4,760.7	402.0	660.2	479.2	181.02	3.647	
10,300.0	5,962.0	10,318.7	5,962.0	93.0	92.1	90.00	4,860.7	402.0	660.2	475.4	184.81	3.572	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Cathedral Energy Services

Anticollision Report

Company:	Whiting Petroleum Corporation	**Local Co-ordinate Reference:**	Well Razor Federal 30J-1910
Project:	Weld County, CO	**TVD Reference:**	KB=17' @ 4855.0usft (Cade #23)
Reference Site:	S30-T10N-R58W	**MD Reference:**	KB=17' @ 4855.0usft (Cade #23)
Site Error:	0.0usft	**North Reference:**	True
Reference Well:	Razor Federal 30J-1910	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0usft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design S30-T10N-R58W - Razor Federal 30J-1912 - HZ - Plan #1

Offset Site Error: 0.0 usft

Survey Program: 0-ISCWSA MWD

Offset Well Error: 0.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor	Warning
10,400.0	5,962.0	10,418.7	5,962.0	94.9	94.0	90.00	4,960.7	402.0	660.2	471.6	188.60	3.501	
10,500.0	5,962.0	10,518.7	5,962.0	96.8	95.9	90.00	5,060.7	402.0	660.2	467.8	192.40	3.432	
10,600.0	5,962.0	10,618.7	5,962.0	98.7	97.8	90.00	5,160.7	402.0	660.2	464.0	196.19	3.365	
10,700.0	5,962.0	10,718.7	5,962.0	100.6	99.7	90.00	5,260.7	402.0	660.2	460.2	199.99	3.301	
10,800.0	5,962.0	10,818.7	5,962.0	102.5	101.6	90.00	5,360.7	402.0	660.2	456.4	203.79	3.240	
10,900.0	5,962.0	10,918.7	5,962.0	104.4	103.5	90.00	5,460.7	402.0	660.2	452.6	207.59	3.180	
11,000.0	5,962.0	11,018.7	5,962.0	106.3	105.4	90.00	5,560.7	402.0	660.2	448.8	211.39	3.123	
11,100.0	5,962.0	11,118.7	5,962.0	108.2	107.3	90.00	5,660.7	402.0	660.2	445.0	215.20	3.068	
11,200.0	5,962.0	11,218.7	5,962.0	110.1	109.2	90.00	5,760.7	402.0	660.2	441.2	219.00	3.015	
11,300.0	5,962.0	11,318.7	5,962.0	112.0	111.1	90.00	5,860.7	402.0	660.2	437.4	222.81	2.963	
11,400.0	5,962.0	11,418.7	5,962.0	113.9	113.0	90.00	5,960.7	402.0	660.2	433.6	226.61	2.914	
11,500.0	5,962.0	11,518.7	5,962.0	115.8	114.9	90.00	6,060.7	402.0	660.2	429.8	230.42	2.865	
11,600.0	5,962.0	11,618.7	5,962.0	117.7	116.8	90.00	6,160.7	402.1	660.2	426.0	234.23	2.819	
11,700.0	5,962.0	11,718.7	5,962.0	119.6	118.7	90.00	6,260.7	402.1	660.2	422.2	238.04	2.774	
11,800.0	5,962.0	11,818.7	5,962.0	121.5	120.6	90.00	6,360.7	402.1	660.2	418.4	241.85	2.730	
11,900.0	5,962.0	11,918.7	5,962.0	123.4	122.5	90.00	6,460.7	402.1	660.3	414.6	245.66	2.688	
12,000.0	5,962.0	12,018.7	5,962.0	125.3	124.4	90.00	6,560.7	402.1	660.3	410.8	249.48	2.647	
12,100.0	5,962.0	12,118.7	5,962.0	127.2	126.3	90.00	6,660.7	402.1	660.3	407.0	253.29	2.607	
12,200.0	5,962.0	12,218.7	5,962.0	129.1	128.2	90.00	6,760.7	402.1	660.3	403.2	257.11	2.568	
12,300.0	5,962.0	12,318.7	5,962.0	131.0	130.1	90.00	6,860.7	402.1	660.3	399.3	260.92	2.531	
12,400.0	5,962.0	12,418.7	5,962.0	133.0	132.0	90.00	6,960.7	402.1	660.3	395.5	264.74	2.494	
12,500.0	5,962.0	12,518.7	5,962.0	134.9	133.9	90.00	7,060.7	402.1	660.3	391.7	268.56	2.459	
12,600.0	5,962.0	12,618.7	5,962.0	136.8	135.8	90.00	7,160.7	402.1	660.3	387.9	272.37	2.424	
12,700.0	5,962.0	12,718.7	5,962.0	138.7	137.7	90.00	7,260.7	402.1	660.3	384.1	276.19	2.391	
12,800.0	5,962.0	12,818.7	5,962.0	140.6	139.6	90.00	7,360.7	402.1	660.3	380.3	280.01	2.358	
12,900.0	5,962.0	12,918.7	5,962.0	142.5	141.5	90.00	7,460.7	402.1	660.3	376.5	283.83	2.326	
13,000.0	5,962.0	13,018.7	5,962.0	144.4	143.4	90.00	7,560.7	402.1	660.3	372.6	287.65	2.295	
13,100.0	5,962.0	13,118.7	5,962.0	146.3	145.4	90.00	7,660.7	402.1	660.3	368.8	291.47	2.265	
13,200.0	5,962.0	13,218.7	5,962.0	148.2	147.3	90.00	7,760.7	402.1	660.3	365.0	295.29	2.236	
13,300.0	5,962.0	13,318.7	5,962.0	150.1	149.2	90.00	7,860.7	402.1	660.3	361.2	299.11	2.207	
13,400.0	5,962.0	13,418.7	5,962.0	152.0	151.1	90.00	7,960.7	402.1	660.3	357.4	302.94	2.180	
13,500.0	5,962.0	13,518.7	5,962.0	154.0	153.0	90.00	8,060.7	402.1	660.3	353.5	306.76	2.153	
13,534.8	5,962.0	13,553.6	5,962.0	154.5	153.7	90.00	8,095.5	402.1	660.3	352.3	307.97	2.144	
13,563.0	5,962.0	13,577.7	5,962.0	154.9	154.1	90.00	8,119.7	402.1	660.3	351.4	308.87	2.138	SF

Company:	Whiting Petroleum Corporation	**Local Co-ordinate Reference:**	Well Razor Federal 30J-1910
Project:	Weld County, CO	**TVD Reference:**	KB=17' @ 4855.0usft (Cade #23)
Reference Site:	S30-T10N-R58W	**MD Reference:**	KB=17' @ 4855.0usft (Cade #23)
Site Error:	0.0usft	**North Reference:**	True
Reference Well:	Razor Federal 30J-1910	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0usft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design S30-T10N-R58W - Razor Federal 30L-1904 - HZ - Plan #2

Offset Site Error: 0.0 usft

Survey Program: 0-ISCWSA MWD

Offset Well Error: 0.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor	Warning
6,600.0	5,962.0	6,923.0	5,968.0	25.7	30.2	-89.58	1,392.3	-1,767.3	1,531.1	1,474.5	56.57	27.067	
6,700.0	5,962.0	6,977.8	5,968.0	27.2	31.0	-89.58	1,446.6	-1,759.8	1,513.4	1,453.9	59.45	25.456	
6,800.0	5,962.0	7,033.3	5,968.0	28.8	31.9	-89.58	1,501.8	-1,753.8	1,502.3	1,440.2	62.09	24.194	
6,900.0	5,962.0	7,100.0	5,968.0	30.4	32.9	-89.58	1,568.2	-1,748.7	1,494.5	1,429.6	64.90	23.027	
7,000.0	5,962.0	7,145.3	5,968.0	32.1	33.6	-89.58	1,613.5	-1,746.6	1,489.4	1,422.0	67.39	22.100	
7,100.0	5,962.0	7,200.0	5,968.0	33.8	34.5	-89.58	1,668.2	-1,745.4	1,487.3	1,417.3	70.06	21.230	
7,145.7	5,962.0	7,238.4	5,968.0	34.6	35.0	-89.58	1,706.5	-1,745.4	1,487.2	1,415.7	71.53	20.791	
7,200.0	5,962.0	7,292.7	5,968.0	35.6	35.9	-89.58	1,760.8	-1,745.4	1,487.2	1,413.9	73.32	20.284	
7,300.0	5,962.0	7,392.7	5,968.0	37.3	37.5	-89.58	1,860.8	-1,745.4	1,487.2	1,410.5	76.72	19.384	
7,400.0	5,962.0	7,492.7	5,968.0	39.1	39.0	-89.58	1,960.8	-1,745.4	1,487.2	1,407.1	80.16	18.552	
7,500.0	5,962.0	7,592.7	5,968.0	40.9	40.7	-89.58	2,060.8	-1,745.4	1,487.2	1,403.6	83.64	17.781	
7,600.0	5,962.0	7,692.7	5,968.0	42.7	42.3	-89.58	2,160.8	-1,745.3	1,487.2	1,400.1	87.15	17.065	
7,700.0	5,962.0	7,792.7	5,968.0	44.5	44.0	-89.58	2,260.8	-1,745.3	1,487.2	1,396.5	90.69	16.399	
7,800.0	5,962.0	7,892.7	5,968.0	46.3	45.7	-89.58	2,360.8	-1,745.3	1,487.2	1,392.9	94.25	15.779	
7,900.0	5,962.0	7,992.7	5,968.0	48.1	47.4	-89.58	2,460.8	-1,745.3	1,487.2	1,389.3	97.84	15.201	
8,000.0	5,962.0	8,092.7	5,968.0	49.9	49.1	-89.58	2,560.8	-1,745.3	1,487.2	1,385.7	101.44	14.661	
8,100.0	5,962.0	8,192.7	5,968.0	51.8	50.8	-89.58	2,660.8	-1,745.3	1,487.2	1,382.1	105.06	14.155	
8,200.0	5,962.0	8,292.7	5,968.0	53.6	52.6	-89.58	2,760.8	-1,745.3	1,487.2	1,378.5	108.70	13.682	
8,300.0	5,962.0	8,392.7	5,968.0	55.4	54.3	-89.58	2,860.8	-1,745.3	1,487.1	1,374.8	112.35	13.237	
8,400.0	5,962.0	8,492.7	5,968.0	57.3	56.1	-89.58	2,960.8	-1,745.3	1,487.1	1,371.1	116.01	12.819	
8,500.0	5,962.0	8,592.7	5,968.0	59.1	57.9	-89.58	3,060.8	-1,745.3	1,487.1	1,367.4	119.69	12.425	
8,600.0	5,962.0	8,692.7	5,968.0	61.0	59.7	-89.58	3,160.8	-1,745.3	1,487.1	1,363.7	123.37	12.054	
8,700.0	5,962.0	8,792.7	5,968.0	62.9	61.5	-89.58	3,260.8	-1,745.3	1,487.1	1,360.0	127.07	11.703	
8,800.0	5,962.0	8,892.7	5,968.0	64.7	63.3	-89.58	3,360.8	-1,745.2	1,487.1	1,356.3	130.77	11.372	
8,900.0	5,962.0	8,992.7	5,968.0	66.6	65.1	-89.58	3,460.8	-1,745.2	1,487.1	1,352.6	134.49	11.058	
9,000.0	5,962.0	9,092.7	5,968.0	68.5	66.9	-89.58	3,560.8	-1,745.2	1,487.1	1,348.9	138.20	10.760	
9,100.0	5,962.0	9,192.7	5,968.0	70.3	68.7	-89.58	3,660.8	-1,745.2	1,487.1	1,345.1	141.93	10.477	
9,200.0	5,962.0	9,292.7	5,968.0	72.2	70.5	-89.58	3,760.8	-1,745.2	1,487.1	1,341.4	145.66	10.209	
9,300.0	5,962.0	9,392.7	5,968.0	74.1	72.4	-89.58	3,860.8	-1,745.2	1,487.1	1,337.7	149.40	9.954	
9,400.0	5,962.0	9,492.7	5,968.0	76.0	74.2	-89.58	3,960.8	-1,745.2	1,487.1	1,333.9	153.14	9.710	
9,500.0	5,962.0	9,592.7	5,968.0	77.9	76.1	-89.58	4,060.8	-1,745.2	1,487.0	1,330.2	156.89	9.478	
9,600.0	5,962.0	9,692.7	5,968.0	79.8	77.9	-89.58	4,160.8	-1,745.2	1,487.0	1,326.4	160.64	9.257	
9,700.0	5,962.0	9,792.7	5,968.0	81.6	79.8	-89.58	4,260.8	-1,745.2	1,487.0	1,322.6	164.40	9.045	
9,800.0	5,962.0	9,892.7	5,968.0	83.5	81.6	-89.58	4,360.8	-1,745.2	1,487.0	1,318.9	168.16	8.843	
9,900.0	5,962.0	9,992.7	5,968.0	85.4	83.5	-89.58	4,460.8	-1,745.2	1,487.0	1,315.1	171.92	8.649	
10,000.0	5,962.0	10,092.7	5,968.0	87.3	85.3	-89.58	4,560.8	-1,745.1	1,487.0	1,311.3	175.69	8.464	
10,100.0	5,962.0	10,192.7	5,968.0	89.2	87.2	-89.58	4,660.8	-1,745.1	1,487.0	1,307.5	179.46	8.286	
10,200.0	5,962.0	10,292.7	5,968.0	91.1	89.0	-89.58	4,760.8	-1,745.1	1,487.0	1,303.7	183.24	8.115	
10,300.0	5,962.0	10,392.7	5,968.0	93.0	90.9	-89.58	4,860.8	-1,745.1	1,487.0	1,300.0	187.01	7.951	
10,400.0	5,962.0	10,492.7	5,968.0	94.9	92.8	-89.58	4,960.8	-1,745.1	1,487.0	1,296.2	190.79	7.794	
10,500.0	5,962.0	10,592.7	5,968.0	96.8	94.6	-89.58	5,060.8	-1,745.1	1,487.0	1,292.4	194.57	7.642	
10,600.0	5,962.0	10,692.7	5,968.0	98.7	96.5	-89.58	5,160.8	-1,745.1	1,486.9	1,288.6	198.36	7.496	
10,700.0	5,962.0	10,792.7	5,968.0	100.6	98.4	-89.58	5,260.8	-1,745.1	1,486.9	1,284.8	202.14	7.356	
10,800.0	5,962.0	10,892.7	5,968.0	102.5	100.3	-89.58	5,360.8	-1,745.1	1,486.9	1,281.0	205.93	7.221	
10,900.0	5,962.0	10,992.7	5,968.0	104.4	102.1	-89.58	5,460.8	-1,745.1	1,486.9	1,277.2	209.72	7.090	
11,000.0	5,962.0	11,092.7	5,968.0	106.3	104.0	-89.58	5,560.8	-1,745.1	1,486.9	1,273.4	213.51	6.964	
11,100.0	5,962.0	11,192.7	5,968.0	108.2	105.9	-89.58	5,660.8	-1,745.1	1,486.9	1,269.6	217.31	6.842	
11,200.0	5,962.0	11,292.7	5,968.0	110.1	107.8	-89.58	5,760.8	-1,745.0	1,486.9	1,265.8	221.10	6.725	
11,300.0	5,962.0	11,392.7	5,968.0	112.0	109.7	-89.58	5,860.8	-1,745.0	1,486.9	1,262.0	224.90	6.611	
11,400.0	5,962.0	11,492.7	5,968.0	113.9	111.5	-89.58	5,960.8	-1,745.0	1,486.9	1,258.2	228.70	6.502	
11,500.0	5,962.0	11,592.7	5,968.0	115.8	113.4	-89.58	6,060.8	-1,745.0	1,486.9	1,254.4	232.50	6.395	
11,600.0	5,962.0	11,692.7	5,968.0	117.7	115.3	-89.58	6,160.8	-1,745.0	1,486.9	1,250.6	236.30	6.292	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	Whiting Petroleum Corporation	**Local Co-ordinate Reference:**	Well Razor Federal 30J-1910
Project:	Weld County, CO	**TVD Reference:**	KB=17' @ 4855.0usft (Cade #23)
Reference Site:	S30-T10N-R58W	**MD Reference:**	KB=17' @ 4855.0usft (Cade #23)
Site Error:	0.0usft	**North Reference:**	True
Reference Well:	Razor Federal 30J-1910	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0usft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design S30-T10N-R58W - Razor Federal 30L-1904 - HZ - Plan #2

Offset Site Error: 0.0 usft

Survey Program: 0-ISCWSA MWD

Offset Well Error: 0.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor	Warning
11,700.0	5,962.0	11,792.7	5,968.0	119.6	117.2	-89.58	6,260.8	-1,745.0	1,486.9	1,246.8	240.10	6.193	
11,800.0	5,962.0	11,892.7	5,968.0	121.5	119.1	-89.58	6,360.8	-1,745.0	1,486.8	1,242.9	243.90	6.096	
11,900.0	5,962.0	11,992.7	5,968.0	123.4	121.0	-89.58	6,460.8	-1,745.0	1,486.8	1,239.1	247.71	6.002	
12,000.0	5,962.0	12,092.7	5,968.0	125.3	122.9	-89.58	6,560.8	-1,745.0	1,486.8	1,235.3	251.51	5.911	
12,100.0	5,962.0	12,192.7	5,968.0	127.2	124.8	-89.58	6,660.8	-1,745.0	1,486.8	1,231.5	255.32	5.823	
12,200.0	5,962.0	12,292.7	5,968.0	129.1	126.7	-89.58	6,760.8	-1,745.0	1,486.8	1,227.7	259.13	5.738	
12,300.0	5,962.0	12,392.7	5,968.0	131.0	128.6	-89.58	6,860.8	-1,745.0	1,486.8	1,223.9	262.94	5.655	
12,400.0	5,962.0	12,492.7	5,968.0	133.0	130.5	-89.58	6,960.8	-1,744.9	1,486.8	1,220.0	266.75	5.574	
12,500.0	5,962.0	12,592.7	5,968.0	134.9	132.3	-89.58	7,060.8	-1,744.9	1,486.8	1,216.2	270.56	5.495	
12,600.0	5,962.0	12,692.7	5,968.0	136.8	134.2	-89.58	7,160.8	-1,744.9	1,486.8	1,212.4	274.37	5.419	
12,700.0	5,962.0	12,792.7	5,968.0	138.7	136.1	-89.58	7,260.8	-1,744.9	1,486.8	1,208.6	278.18	5.345	
12,800.0	5,962.0	12,892.7	5,968.0	140.6	138.0	-89.58	7,360.8	-1,744.9	1,486.8	1,204.8	282.00	5.272	
12,900.0	5,962.0	12,992.7	5,968.0	142.5	139.9	-89.58	7,460.8	-1,744.9	1,486.7	1,200.9	285.81	5.202	
13,000.0	5,962.0	13,092.7	5,968.0	144.4	141.8	-89.58	7,560.8	-1,744.9	1,486.7	1,197.1	289.62	5.133	
13,100.0	5,962.0	13,192.7	5,968.0	146.3	143.7	-89.58	7,660.8	-1,744.9	1,486.7	1,193.3	293.44	5.067	
13,200.0	5,962.0	13,292.7	5,968.0	148.2	145.6	-89.58	7,760.8	-1,744.9	1,486.7	1,189.5	297.26	5.001	
13,300.0	5,962.0	13,392.7	5,968.0	150.1	147.5	-89.58	7,860.8	-1,744.9	1,486.7	1,185.6	301.07	4.938	
13,400.0	5,962.0	13,492.7	5,968.0	152.0	149.4	-89.58	7,960.8	-1,744.9	1,486.7	1,181.8	304.89	4.876	
13,500.0	5,962.0	13,592.7	5,968.0	154.0	151.3	-89.58	8,060.8	-1,744.9	1,486.7	1,178.0	308.71	4.816	
13,563.0	5,962.0	13,655.6	5,968.0	154.9	152.5	-89.58	8,123.8	-1,744.8	1,486.7	1,175.8	310.89	4.782	CC, ES, SF

Company:	Whiting Petroleum Corporation	**Local Co-ordinate Reference:**	Well Razor Federal 30J-1910
Project:	Weld County, CO	**TVD Reference:**	KB=17' @ 4855.0usft (Cade #23)
Reference Site:	S30-T10N-R58W	**MD Reference:**	KB=17' @ 4855.0usft (Cade #23)
Site Error:	0.0usft	**North Reference:**	True
Reference Well:	Razor Federal 30J-1910	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0usft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Reference Depths are relative to KB=17' @ 4855.0usft (Cade #23)
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000 °
Coordinates are relative to: Razor Federal 30J-1910
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 1.03°