



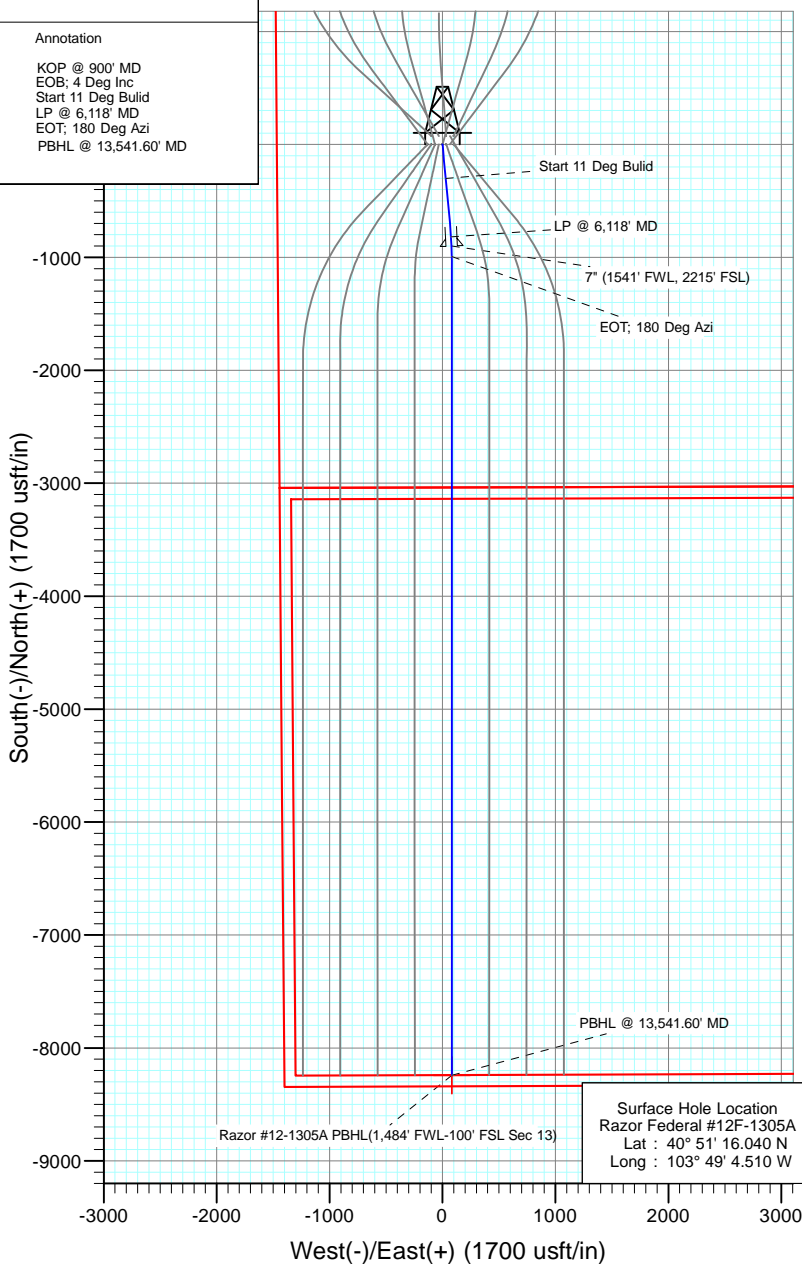
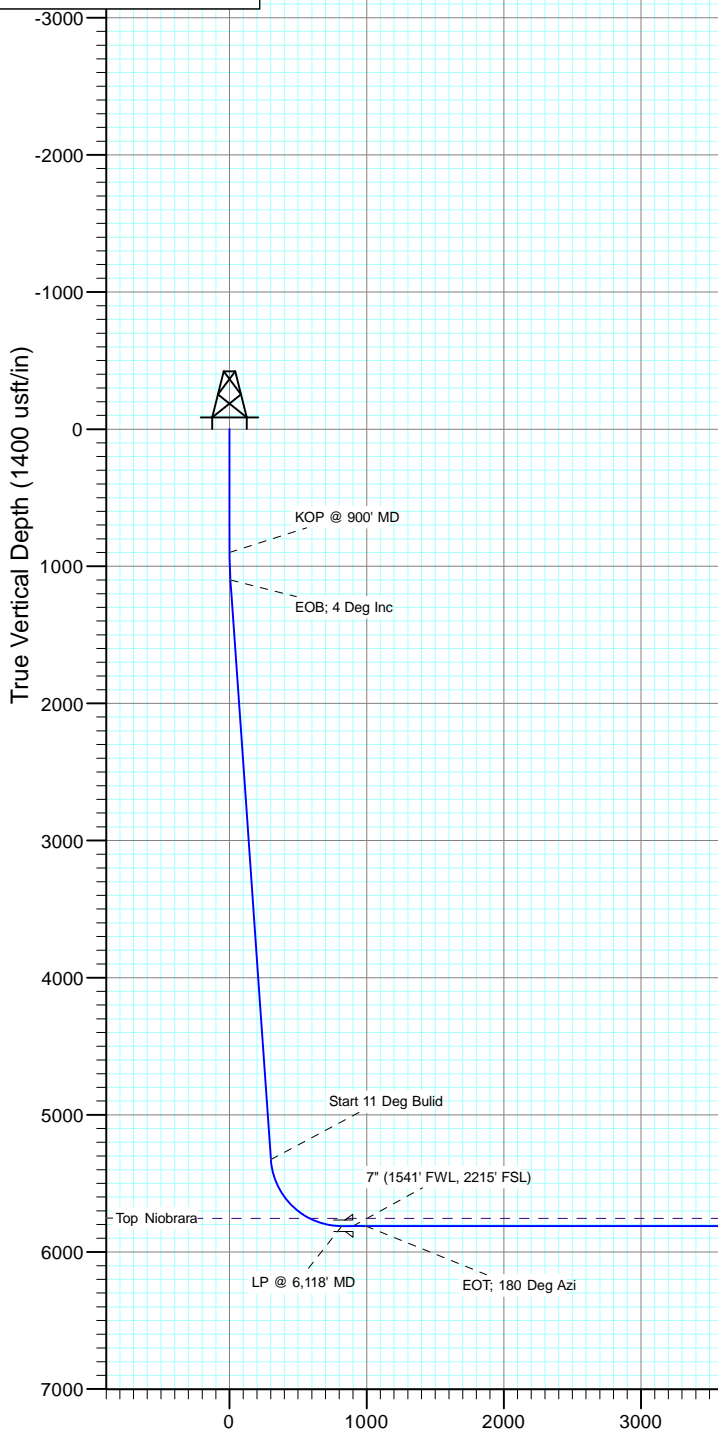
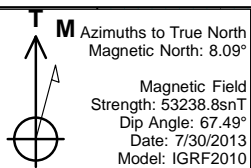
Project: Weld County, CO  
Site: S12-T10N-R58W  
Well: Razor Federal #12F-1305A  
Wellbore: HZ  
Design: Plan #3



#### SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00
3	1100.00	4.00	174.75	1099.84	-6.95	0.64	2.00	174.75	6.95
4	5337.00	4.00	174.75	5326.52	-301.27	27.68	0.00	0.00	301.27
5	6118.82	90.00	174.75	5811.05	-818.69	75.23	11.00	0.00	818.69
6	6293.67	90.00	180.00	5811.05	-993.30	83.24	3.00	89.99	993.30
7	13541.60	90.00	180.00	5810.99	-8241.23	83.79	0.00	0.00	8241.23

Annotation  
KOP @ 900' MD  
EOB; 4 Deg Inc  
Start 11 Deg Build  
LP @ 6,118' MD  
EOT; 180 Deg Azi  
PBHL @ 13,541.60' MD



#### FORMATION TOP DETAILS

TVDPath	MDPath	Formation Top Niobrara
5754.99	5874.93	

Plan #3  
Razor Federal #12F-1305A  
WELL @ 4953.59usft (Original Well Elev)  
Ground Elevation @ 4936.80  
North American Datum 1983  
Well Razor Federal #12F-1305A, True North

Vertical Section at 180.00° (1400 usft/in)

# Cathedral Energy Services

## Planning Report

<b>Database:</b>	USA EDM 5000 Multi Users DB	<b>Local Co-ordinate Reference:</b>	Well Razor Federal #12F-1305A
<b>Company:</b>	Whiting Petroleum Corporation	<b>TVD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Project:</b>	Weld County, CO	<b>MD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Site:</b>	S12-T10N-R58W	<b>North Reference:</b>	True
<b>Well:</b>	Razor Federal #12F-1305A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	HZ		
<b>Design:</b>	Plan #3		

<b>Project</b>	Weld County, CO		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Northern Zone		

Site		S12-T10N-R58W			
Site Position:		Northing:	1,558,537.97 usft	Latitude:	40° 51' 16.040 N
From:	Lat/Long	Easting:	3,465,176.15 usft	Longitude:	103° 49' 6.230 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	1.09 °

Well	Razor Federal #12F-1305A					
Well Position	+N/-S	0.00 usft	Northing:	1,558,540.47 usft	Latitude:	40° 51' 16.040 N
	+E/-W	0.00 usft	Easting:	3,465,308.30 usft	Longitude:	103° 49' 4.510 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	4,936.80 usft

<b>Wellbore</b>	HZ				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	7/30/2013	8.09	67.49	53,239

<b>Design</b>	Plan #3				
<b>Audit Notes:</b>					
<b>Version:</b>	<b>Phase:</b>	PLAN	<b>Tie On Depth:</b>	0.00	
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00	180.00	

<b>Plan Sections</b>										
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
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,100.00	4.00	174.75	1,099.84	-6.95	0.64	2.00	2.00	0.00	174.75	
5,337.00	4.00	174.75	5,326.52	-301.27	27.68	0.00	0.00	0.00	0.00	
6,118.82	90.00	174.75	5,811.05	-818.69	75.23	11.00	11.00	0.00	0.00	
6,293.67	90.00	180.00	5,811.05	-993.30	83.24	3.00	0.00	3.00	89.99	
13,541.60	90.00	180.00	5,810.99	-8,241.23	83.79	0.00	0.00	0.00	0.00	Razor #12-1305A PBI

# Cathedral Energy Services

## Planning Report

<b>Database:</b>	USA EDM 5000 Multi Users DB	<b>Local Co-ordinate Reference:</b>	Well Razor Federal #12F-1305A
<b>Company:</b>	Whiting Petroleum Corporation	<b>TVD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Project:</b>	Weld County, CO	<b>MD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Site:</b>	S12-T10N-R58W	<b>North Reference:</b>	True
<b>Well:</b>	Razor Federal #12F-1305A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	HZ		
<b>Design:</b>	Plan #3		

### 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
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	KOP @ 900' MD
1,000.00	2.00	174.75	999.98	-1.74	0.16	1.74	2.00	2.00	
1,100.00	4.00	174.75	1,099.84	-6.95	0.64	6.95	2.00	2.00	EOB; 4 Deg Inc
1,200.00	4.00	174.75	1,199.59	-13.90	1.28	13.90	0.00	0.00	
1,300.00	4.00	174.75	1,299.35	-20.84	1.92	20.84	0.00	0.00	
1,400.00	4.00	174.75	1,399.11	-27.79	2.55	27.79	0.00	0.00	
1,500.00	4.00	174.75	1,498.86	-34.73	3.19	34.73	0.00	0.00	
1,600.00	4.00	174.75	1,598.62	-41.68	3.83	41.68	0.00	0.00	
1,700.00	4.00	174.75	1,698.38	-48.63	4.47	48.63	0.00	0.00	
1,800.00	4.00	174.75	1,798.13	-55.57	5.11	55.57	0.00	0.00	
1,900.00	4.00	174.75	1,897.89	-62.52	5.74	62.52	0.00	0.00	
2,000.00	4.00	174.75	1,997.65	-69.47	6.38	69.47	0.00	0.00	
2,100.00	4.00	174.75	2,097.40	-76.41	7.02	76.41	0.00	0.00	
2,200.00	4.00	174.75	2,197.16	-83.36	7.66	83.36	0.00	0.00	
2,300.00	4.00	174.75	2,296.91	-90.31	8.30	90.31	0.00	0.00	
2,400.00	4.00	174.75	2,396.67	-97.25	8.94	97.25	0.00	0.00	
2,500.00	4.00	174.75	2,496.43	-104.20	9.57	104.20	0.00	0.00	
2,600.00	4.00	174.75	2,596.18	-111.14	10.21	111.14	0.00	0.00	
2,700.00	4.00	174.75	2,695.94	-118.09	10.85	118.09	0.00	0.00	
2,800.00	4.00	174.75	2,795.70	-125.04	11.49	125.04	0.00	0.00	
2,900.00	4.00	174.75	2,895.45	-131.98	12.13	131.98	0.00	0.00	
3,000.00	4.00	174.75	2,995.21	-138.93	12.77	138.93	0.00	0.00	
3,100.00	4.00	174.75	3,094.97	-145.88	13.40	145.88	0.00	0.00	
3,200.00	4.00	174.75	3,194.72	-152.82	14.04	152.82	0.00	0.00	
3,300.00	4.00	174.75	3,294.48	-159.77	14.68	159.77	0.00	0.00	
3,400.00	4.00	174.75	3,394.23	-166.72	15.32	166.72	0.00	0.00	
3,500.00	4.00	174.75	3,493.99	-173.66	15.96	173.66	0.00	0.00	
3,600.00	4.00	174.75	3,593.75	-180.61	16.60	180.61	0.00	0.00	
3,700.00	4.00	174.75	3,693.50	-187.56	17.23	187.56	0.00	0.00	
3,800.00	4.00	174.75	3,793.26	-194.50	17.87	194.50	0.00	0.00	
3,900.00	4.00	174.75	3,893.02	-201.45	18.51	201.45	0.00	0.00	
4,000.00	4.00	174.75	3,992.77	-208.39	19.15	208.39	0.00	0.00	
4,100.00	4.00	174.75	4,092.53	-215.34	19.79	215.34	0.00	0.00	
4,200.00	4.00	174.75	4,192.29	-222.29	20.43	222.29	0.00	0.00	
4,300.00	4.00	174.75	4,292.04	-229.23	21.06	229.23	0.00	0.00	
4,400.00	4.00	174.75	4,391.80	-236.18	21.70	236.18	0.00	0.00	
4,500.00	4.00	174.75	4,491.56	-243.13	22.34	243.13	0.00	0.00	
4,600.00	4.00	174.75	4,591.31	-250.07	22.98	250.07	0.00	0.00	
4,700.00	4.00	174.75	4,691.07	-257.02	23.62	257.02	0.00	0.00	
4,800.00	4.00	174.75	4,790.82	-263.97	24.26	263.97	0.00	0.00	
4,900.00	4.00	174.75	4,890.58	-270.91	24.89	270.91	0.00	0.00	
5,000.00	4.00	174.75	4,990.34	-277.86	25.53	277.86	0.00	0.00	
5,100.00	4.00	174.75	5,090.09	-284.80	26.17	284.80	0.00	0.00	

# Cathedral Energy Services

## Planning Report

<b>Database:</b>	USA EDM 5000 Multi Users DB	<b>Local Co-ordinate Reference:</b>	Well Razor Federal #12F-1305A
<b>Company:</b>	Whiting Petroleum Corporation	<b>TVD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Project:</b>	Weld County, CO	<b>MD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Site:</b>	S12-T10N-R58W	<b>North Reference:</b>	True
<b>Well:</b>	Razor Federal #12F-1305A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	HZ		
<b>Design:</b>	Plan #3		

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
5,200.00	4.00	174.75	5,189.85	-291.75	26.81	291.75	0.00	0.00	
5,300.00	4.00	174.75	5,289.61	-298.70	27.45	298.70	0.00	0.00	
5,337.00	4.00	174.75	5,326.52	-301.27	27.68	301.27	0.00	0.00	Start 11 Deg Build
5,400.00	10.93	174.75	5,388.94	-309.41	28.43	309.41	11.00	11.00	
5,500.00	21.93	174.75	5,484.71	-337.54	31.02	337.54	11.00	11.00	
5,600.00	32.93	174.75	5,573.33	-383.34	35.22	383.34	11.00	11.00	
5,700.00	43.93	174.75	5,651.55	-445.14	40.90	445.14	11.00	11.00	
5,800.00	54.93	174.75	5,716.49	-520.67	47.84	520.67	11.00	11.00	
5,874.93	63.17	174.75	5,754.99	-584.60	53.72	584.60	11.00	11.00	Top Niobrara
5,900.00	65.93	174.75	5,765.76	-607.14	55.79	607.14	11.00	11.00	
6,000.00	76.93	174.75	5,797.56	-701.39	64.45	701.39	11.00	11.00	
6,100.00	87.93	174.75	5,810.71	-799.96	73.51	799.96	11.00	11.00	
6,118.82	90.00	174.75	5,811.05	-818.69	75.23	818.69	11.00	11.00	LP @ 6,118' MD
6,199.99	90.00	177.19	5,811.05	-899.65	80.93	899.65	3.00	0.00	7" (1541' FWL, 2215' FSL)
6,200.00	90.00	177.19	5,811.05	-899.66	80.94	899.66	3.00	0.00	
6,293.67	90.00	180.00	5,811.05	-993.30	83.24	993.30	3.00	0.00	EOT; 180 Deg Azi
6,300.00	90.00	180.00	5,811.05	-999.63	83.24	999.63	0.00	0.00	
6,400.00	90.00	180.00	5,811.05	-1,099.63	83.25	1,099.63	0.00	0.00	
6,500.00	90.00	180.00	5,811.05	-1,199.63	83.25	1,199.63	0.00	0.00	
6,600.00	90.00	180.00	5,811.05	-1,299.63	83.26	1,299.63	0.00	0.00	
6,700.00	90.00	180.00	5,811.05	-1,399.63	83.27	1,399.63	0.00	0.00	
6,800.00	90.00	180.00	5,811.05	-1,499.63	83.28	1,499.63	0.00	0.00	
6,900.00	90.00	180.00	5,811.05	-1,599.63	83.28	1,599.63	0.00	0.00	
7,000.00	90.00	180.00	5,811.05	-1,699.63	83.29	1,699.63	0.00	0.00	
7,100.00	90.00	180.00	5,811.04	-1,799.63	83.30	1,799.63	0.00	0.00	
7,200.00	90.00	180.00	5,811.04	-1,899.63	83.31	1,899.63	0.00	0.00	
7,300.00	90.00	180.00	5,811.04	-1,999.63	83.32	1,999.63	0.00	0.00	
7,400.00	90.00	180.00	5,811.04	-2,099.63	83.32	2,099.63	0.00	0.00	
7,500.00	90.00	180.00	5,811.04	-2,199.63	83.33	2,199.63	0.00	0.00	
7,600.00	90.00	180.00	5,811.04	-2,299.63	83.34	2,299.63	0.00	0.00	
7,700.00	90.00	180.00	5,811.04	-2,399.63	83.35	2,399.63	0.00	0.00	
7,800.00	90.00	180.00	5,811.04	-2,499.63	83.35	2,499.63	0.00	0.00	
7,900.00	90.00	180.00	5,811.04	-2,599.63	83.36	2,599.63	0.00	0.00	
8,000.00	90.00	180.00	5,811.04	-2,699.63	83.37	2,699.63	0.00	0.00	
8,100.00	90.00	180.00	5,811.04	-2,799.63	83.38	2,799.63	0.00	0.00	
8,200.00	90.00	180.00	5,811.03	-2,899.63	83.38	2,899.63	0.00	0.00	
8,300.00	90.00	180.00	5,811.03	-2,999.63	83.39	2,999.63	0.00	0.00	
8,400.00	90.00	180.00	5,811.03	-3,099.63	83.40	3,099.63	0.00	0.00	
8,500.00	90.00	180.00	5,811.03	-3,199.63	83.41	3,199.63	0.00	0.00	
8,600.00	90.00	180.00	5,811.03	-3,299.63	83.41	3,299.63	0.00	0.00	
8,700.00	90.00	180.00	5,811.03	-3,399.63	83.42	3,399.63	0.00	0.00	
8,800.00	90.00	180.00	5,811.03	-3,499.63	83.43	3,499.63	0.00	0.00	
8,900.00	90.00	180.00	5,811.03	-3,599.63	83.44	3,599.63	0.00	0.00	
9,000.00	90.00	180.00	5,811.03	-3,699.63	83.44	3,699.63	0.00	0.00	
9,100.00	90.00	180.00	5,811.03	-3,799.63	83.45	3,799.63	0.00	0.00	
9,200.00	90.00	180.00	5,811.03	-3,899.63	83.46	3,899.63	0.00	0.00	
9,300.00	90.00	180.00	5,811.03	-3,999.63	83.47	3,999.63	0.00	0.00	
9,400.00	90.00	180.00	5,811.02	-4,099.63	83.47	4,099.63	0.00	0.00	
9,500.00	90.00	180.00	5,811.02	-4,199.63	83.48	4,199.63	0.00	0.00	
9,600.00	90.00	180.00	5,811.02	-4,299.63	83.49	4,299.63	0.00	0.00	
9,700.00	90.00	180.00	5,811.02	-4,399.63	83.50	4,399.63	0.00	0.00	
9,800.00	90.00	180.00	5,811.02	-4,499.63	83.51	4,499.63	0.00	0.00	

# Cathedral Energy Services

## Planning Report

<b>Database:</b>	USA EDM 5000 Multi Users DB	<b>Local Co-ordinate Reference:</b>	Well Razor Federal #12F-1305A
<b>Company:</b>	Whiting Petroleum Corporation	<b>TVD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Project:</b>	Weld County, CO	<b>MD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Site:</b>	S12-T10N-R58W	<b>North Reference:</b>	True
<b>Well:</b>	Razor Federal #12F-1305A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	HZ		
<b>Design:</b>	Plan #3		

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
9,900.00	90.00	180.00	5,811.02	-4,599.63	83.51	4,599.63	0.00	0.00	
10,000.00	90.00	180.00	5,811.02	-4,699.63	83.52	4,699.63	0.00	0.00	
10,100.00	90.00	180.00	5,811.02	-4,799.63	83.53	4,799.63	0.00	0.00	
10,200.00	90.00	180.00	5,811.02	-4,899.63	83.54	4,899.63	0.00	0.00	
10,300.00	90.00	180.00	5,811.02	-4,999.63	83.54	4,999.63	0.00	0.00	
10,400.00	90.00	180.00	5,811.02	-5,099.63	83.55	5,099.63	0.00	0.00	
10,500.00	90.00	180.00	5,811.01	-5,199.63	83.56	5,199.63	0.00	0.00	
10,600.00	90.00	180.00	5,811.01	-5,299.63	83.57	5,299.63	0.00	0.00	
10,700.00	90.00	180.00	5,811.01	-5,399.63	83.57	5,399.63	0.00	0.00	
10,800.00	90.00	180.00	5,811.01	-5,499.63	83.58	5,499.63	0.00	0.00	
10,900.00	90.00	180.00	5,811.01	-5,599.63	83.59	5,599.63	0.00	0.00	
11,000.00	90.00	180.00	5,811.01	-5,699.63	83.60	5,699.63	0.00	0.00	
11,100.00	90.00	180.00	5,811.01	-5,799.63	83.60	5,799.63	0.00	0.00	
11,200.00	90.00	180.00	5,811.01	-5,899.63	83.61	5,899.63	0.00	0.00	
11,300.00	90.00	180.00	5,811.01	-5,999.63	83.62	5,999.63	0.00	0.00	
11,400.00	90.00	180.00	5,811.01	-6,099.63	83.63	6,099.63	0.00	0.00	
11,500.00	90.00	180.00	5,811.01	-6,199.63	83.63	6,199.63	0.00	0.00	
11,600.00	90.00	180.00	5,811.01	-6,299.63	83.64	6,299.63	0.00	0.00	
11,700.00	90.00	180.00	5,811.00	-6,399.63	83.65	6,399.63	0.00	0.00	
11,800.00	90.00	180.00	5,811.00	-6,499.63	83.66	6,499.63	0.00	0.00	
11,900.00	90.00	180.00	5,811.00	-6,599.63	83.66	6,599.63	0.00	0.00	
12,000.00	90.00	180.00	5,811.00	-6,699.63	83.67	6,699.63	0.00	0.00	
12,100.00	90.00	180.00	5,811.00	-6,799.63	83.68	6,799.63	0.00	0.00	
12,200.00	90.00	180.00	5,811.00	-6,899.63	83.69	6,899.63	0.00	0.00	
12,300.00	90.00	180.00	5,811.00	-6,999.63	83.70	6,999.63	0.00	0.00	
12,400.00	90.00	180.00	5,811.00	-7,099.63	83.70	7,099.63	0.00	0.00	
12,500.00	90.00	180.00	5,811.00	-7,199.63	83.71	7,199.63	0.00	0.00	
12,600.00	90.00	180.00	5,811.00	-7,299.63	83.72	7,299.63	0.00	0.00	
12,700.00	90.00	180.00	5,811.00	-7,399.63	83.73	7,399.63	0.00	0.00	
12,800.00	90.00	180.00	5,810.99	-7,499.63	83.73	7,499.63	0.00	0.00	
12,900.00	90.00	180.00	5,810.99	-7,599.63	83.74	7,599.63	0.00	0.00	
13,000.00	90.00	180.00	5,810.99	-7,699.63	83.75	7,699.63	0.00	0.00	
13,100.00	90.00	180.00	5,810.99	-7,799.63	83.76	7,799.63	0.00	0.00	
13,200.00	90.00	180.00	5,810.99	-7,899.63	83.76	7,899.63	0.00	0.00	
13,300.00	90.00	180.00	5,810.99	-7,999.63	83.77	7,999.63	0.00	0.00	
13,400.00	90.00	180.00	5,810.99	-8,099.63	83.78	8,099.63	0.00	0.00	
13,500.00	90.00	180.00	5,810.99	-8,199.63	83.79	8,199.63	0.00	0.00	
13,541.60	90.00	180.00	5,810.99	-8,241.23	83.79	8,241.23	0.00	0.00	PBHL @ 13,541.60' MD

Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Razor #12-1305A PBHL	0.00	0.00	5,810.99	-8,241.23	83.79	1,550,302.31	3,465,548.39	40° 49' 54.610 N	103° 49' 3.420 W
- hit/miss target									
- Shape									
- plan hits target center									
- Point									

# Cathedral Energy Services

## Planning Report

<b>Database:</b>	USA EDM 5000 Multi Users DB	<b>Local Co-ordinate Reference:</b>	Well Razor Federal #12F-1305A
<b>Company:</b>	Whiting Petroleum Corporation	<b>TVD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Project:</b>	Weld County, CO	<b>MD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Site:</b>	S12-T10N-R58W	<b>North Reference:</b>	True
<b>Well:</b>	Razor Federal #12F-1305A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	HZ		
<b>Design:</b>	Plan #3		

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
6,199.99	5,811.05	7" (1541' FWL, 2215' FSL)	0	0	

Formations					
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
5,874.93	5,754.99	Top Niobrara		0.00	

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
900.00	900.00	0.00	0.00	KOP @ 900' MD	
1,100.00	1,099.84	-6.95	0.64	EOB; 4 Deg Inc	
5,337.00	5,326.52	-301.27	27.68	Start 11 Deg Bulid	
6,118.82	5,811.05	-818.69	75.23	LP @ 6,118' MD	
6,293.67	5,811.05	-993.30	83.24	EOT; 180 Deg Azi	
13,541.60	5,810.99	-8,241.23	83.79	PBHL @ 13,541.60' MD	

# **Whiting Petroleum Corporation**

**Weld County, CO**

**S12-T10N-R58W**

**Razor Federal #12F-1305A**

**HZ**

**Plan #3**

## **Anticollision Report**

**08 November, 2013**

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor Federal #12F-1305A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor Federal #12F-1305A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #3	<b>Offset TVD Reference:</b>	Offset Datum

Reference	Plan #3		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 100.00usft	Error Model:	Systematic Ellipse
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 687.19usft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma		

<b>Survey Tool Program</b>	<b>Date</b>	11/8/2013		
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
0.00	13,541.60	Plan #3 (HZ)	ISCWSA MWD	MWD - ISCWSA



# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor Federal #12F-1305A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor Federal #12F-1305A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #3	<b>Offset TVD Reference:</b>	Offset Datum

### Summary

Site Name Offset Well - Wellbore - Design	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance		Separation Factor	Warning
			Between Centres (usft)	Between Ellipses (usft)		
S12-T10N-R58W						
Razor #12F-0101A - HZ - Plan #2	466.66	466.67	151.91	150.08	82.772	CC
Razor #12F-0101A - HZ - Plan #2	500.00	500.00	151.91	149.93	76.524	ES
Razor #12F-0101A - HZ - Plan #2	5,000.00	4,954.87	677.35	655.01	30.315	SF
Razor #12F-0102B - HZ - Plan #2	466.66	466.67	132.17	130.34	72.017	CC
Razor #12F-0102B - HZ - Plan #2	500.00	500.00	132.17	130.19	66.582	ES
Razor #12F-0102B - HZ - Plan #2	3,500.00	3,470.98	429.34	413.97	27.926	SF
Razor #12F-0103A - HZ - Plan #2	900.00	900.01	81.85	78.07	21.635	CC, ES
Razor #12F-0103A - HZ - Plan #2	1,100.00	1,096.84	90.17	85.57	19.615	SF
Razor #12F-0104B - HZ - Plan #2	766.66	766.67	66.09	62.90	20.757	CC
Razor #12F-0104B - HZ - Plan #2	800.00	800.00	66.09	62.75	19.824	ES
Razor #12F-0104B - HZ - Plan #2	1,100.00	1,097.56	73.34	68.74	15.934	SF
Razor #12F-0105A - HZ - Plan #2	900.00	900.01	81.54	77.76	21.554	CC, ES
Razor #12F-0105A - HZ - Plan #2	1,100.00	1,099.85	87.74	83.13	19.058	SF
Razor #12F-0106B - HZ - Plan #2	705.01	705.01	0.01	-2.90	0.004	Level 1, CC, ES, SF
Razor #12F-0107A - HZ - Plan #2	900.00	900.01	123.63	119.85	32.677	CC, ES
Razor #12F-0107A - HZ - Plan #2	1,400.00	1,389.95	146.75	140.89	25.076	SF
Razor #12F-0108B - HZ - Plan #2	766.66	766.67	65.32	62.13	20.515	CC
Razor #12F-0108B - HZ - Plan #2	800.00	800.00	65.32	61.98	19.593	ES
Razor #12F-0108B - HZ - Plan #2	1,100.00	1,096.17	75.20	70.61	16.380	SF
Razor Federal #12F-1301A - HZ - Plan #3	900.00	900.00	132.17	128.39	34.936	CC
Razor Federal #12F-1301A - HZ - Plan #3	1,000.00	999.98	132.35	128.14	31.483	ES
Razor Federal #12F-1301A - HZ - Plan #3	5,300.00	5,286.55	373.66	348.52	14.863	SF
Razor Federal #12F-1302B - HZ - Plan #2	900.00	900.01	99.13	95.35	26.202	CC
Razor Federal #12F-1302B - HZ - Plan #2	1,000.00	999.99	99.31	95.10	23.623	ES
Razor Federal #12F-1302B - HZ - Plan #2	5,300.00	5,291.84	294.74	269.65	11.747	SF
Razor Federal #12F-1303A - HZ - Plan #3	500.00	500.00	66.09	64.10	33.291	CC, ES
Razor Federal #12F-1303A - HZ - Plan #3	13,541.60	13,607.35	659.55	342.85	2.083	SF
Razor Federal #12F-1304B - HZ - Plan #2	900.00	900.01	33.04	29.26	8.734	CC
Razor Federal #12F-1304B - HZ - Plan #2	1,000.00	999.99	33.25	29.04	7.909	ES
Razor Federal #12F-1304B - HZ - Plan #2	13,541.60	13,666.93	344.90	39.80	1.130	Level 2, SF
Razor Federal #12F-1306B - HZ - Plan #2	1,010.91	1,010.86	32.15	27.91	7.576	CC, ES
Razor Federal #12F-1306B - HZ - Plan #2	13,541.60	13,695.76	344.90	40.11	1.132	Level 2, SF
Razor Federal #12F-1307A - HZ - Plan #2	366.67	366.67	65.32	63.93	47.135	CC
Razor Federal #12F-1307A - HZ - Plan #2	400.00	400.00	65.32	63.78	42.536	ES
Razor Federal #12F-1307A - HZ - Plan #2	13,541.60	13,658.43	659.56	341.74	2.075	SF
Razor Federal #12G-1309A - HZ - Plan #1						Out of range
Razor Federal#12F-1308B - HZ - Plan #2	866.66	866.67	98.36	94.73	27.071	CC
Razor Federal#12F-1308B - HZ - Plan #2	900.00	900.00	98.36	94.58	25.999	ES
Razor Federal#12F-1308B - HZ - Plan #2	5,400.00	5,391.62	276.64	250.69	10.662	SF

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor Federal #12F-1305A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor Federal #12F-1305A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #3	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design S12-T10N-R58W - Razor #12F-0101A - HZ - Plan #2												Offset Site Error:	0.00 usft
Survey Program: O-ISCWSA MWD												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor	Warning
0.00	0.00	0.01	0.01	0.00	0.00	-60.47	74.88	-132.17	151.91				
100.00	100.00	100.01	100.01	0.09	0.09	-60.47	74.88	-132.17	151.91	151.72	0.19	812.192	
200.00	200.00	200.01	200.01	0.32	0.32	-60.47	74.88	-132.17	151.91	151.27	0.64	238.640	
300.00	300.00	300.01	300.01	0.54	0.54	-60.47	74.88	-132.17	151.91	150.83	1.09	139.868	
400.00	400.00	400.01	400.01	0.77	0.77	-60.47	74.88	-132.17	151.91	150.38	1.54	98.924	
466.66	466.66	466.67	466.67	0.92	0.92	-60.47	74.88	-132.17	151.91	150.08	1.84	82.772 CC	
500.00	500.00	500.00	500.00	0.99	0.99	-60.47	74.88	-132.17	151.91	149.93	1.99	76.524 ES	
600.00	600.00	595.06	595.04	1.22	1.20	-60.34	75.94	-133.34	153.53	151.11	2.42	63.424	
700.00	700.00	689.90	689.76	1.44	1.42	-59.96	79.12	-136.83	158.39	155.53	2.86	55.399	
800.00	800.00	789.11	788.73	1.67	1.65	-59.45	83.76	-141.93	165.19	161.88	3.31	49.941	
900.00	900.00	888.86	888.24	1.89	1.89	-58.98	88.44	-147.08	172.03	168.27	3.76	45.809	
1,000.00	999.98	988.51	987.64	2.09	2.13	127.03	93.12	-152.22	179.92	175.75	4.17	43.136	
1,100.00	1,099.84	1,087.85	1,086.75	2.27	2.37	128.51	97.79	-157.35	190.00	185.43	4.57	41.572	
1,200.00	1,199.59	1,187.01	1,185.66	2.46	2.62	130.36	102.44	-162.46	201.34	196.36	4.98	40.424	
1,300.00	1,299.35	1,286.16	1,284.57	2.66	2.87	132.02	107.10	-167.58	212.87	207.47	5.40	39.408	
1,400.00	1,399.11	1,385.32	1,383.49	2.87	3.12	133.51	111.75	-172.69	224.56	218.73	5.83	38.513	
1,500.00	1,498.86	1,484.47	1,482.40	3.10	3.37	134.84	116.41	-177.81	236.38	230.12	6.27	37.724	
1,600.00	1,598.62	1,583.63	1,581.31	3.33	3.62	136.06	121.06	-182.92	248.32	241.61	6.71	37.029	
1,700.00	1,698.38	1,682.78	1,680.22	3.56	3.88	137.16	125.72	-188.04	260.36	253.21	7.15	36.414	
1,800.00	1,798.13	1,781.94	1,779.14	3.80	4.13	138.16	130.37	-193.16	272.48	264.88	7.60	35.867	
1,900.00	1,897.89	1,881.09	1,878.05	4.04	4.38	139.07	135.03	-198.27	284.68	276.63	8.05	35.380	
2,000.00	1,997.65	1,980.24	1,976.96	4.28	4.64	139.92	139.68	-203.39	296.94	288.45	8.50	34.944	
2,100.00	2,097.40	2,079.40	2,075.88	4.53	4.89	140.69	144.34	-208.50	309.27	300.32	8.95	34.551	
2,200.00	2,197.16	2,178.55	2,174.79	4.78	5.15	141.41	148.99	-213.62	321.64	312.23	9.41	34.197	
2,300.00	2,296.91	2,277.71	2,273.70	5.03	5.40	142.07	153.65	-218.73	334.06	324.20	9.86	33.876	
2,400.00	2,396.67	2,376.86	2,372.61	5.28	5.66	142.68	158.30	-223.85	346.52	336.20	10.32	33.584	
2,500.00	2,496.43	2,476.02	2,471.53	5.53	5.91	143.26	162.96	-228.97	359.02	348.24	10.78	33.317	
2,600.00	2,596.18	2,575.17	2,570.44	5.78	6.17	143.79	167.61	-234.08	371.55	360.31	11.23	33.072	
2,700.00	2,695.94	2,674.32	2,669.35	6.04	6.42	144.29	172.27	-239.20	384.11	372.42	11.69	32.848	
2,800.00	2,795.70	2,773.48	2,768.27	6.29	6.68	144.75	176.92	-244.31	396.70	384.54	12.15	32.641	
2,900.00	2,895.45	2,872.63	2,867.18	6.55	6.93	145.19	181.58	-249.43	409.31	396.69	12.61	32.449	
3,000.00	2,995.21	2,971.79	2,966.09	6.81	7.19	145.61	186.23	-254.55	421.94	408.87	13.07	32.272	
3,100.00	3,094.97	3,070.94	3,065.00	7.06	7.44	145.99	190.89	-259.66	434.60	421.06	13.54	32.107	
3,200.00	3,194.72	3,170.10	3,163.92	7.32	7.70	146.36	195.54	-264.78	447.27	433.27	14.00	31.954	
3,300.00	3,294.48	3,269.25	3,262.83	7.58	7.95	146.71	200.20	-269.89	459.96	445.50	14.46	31.811	
3,400.00	3,394.23	3,368.40	3,361.74	7.84	8.21	147.03	204.85	-275.01	472.66	457.74	14.92	31.677	
3,500.00	3,493.99	3,467.56	3,460.66	8.10	8.46	147.34	209.51	-280.12	485.38	470.00	15.38	31.551	
3,600.00	3,593.75	3,566.71	3,559.57	8.36	8.72	147.64	214.16	-285.24	498.11	482.27	15.85	31.433	
3,700.00	3,693.50	3,665.87	3,658.48	8.62	8.98	147.92	218.82	-290.36	510.86	494.55	16.31	31.322	
3,800.00	3,793.26	3,765.02	3,757.39	8.88	9.23	148.18	223.47	-295.47	523.62	506.84	16.77	31.218	
3,900.00	3,893.02	3,864.18	3,856.31	9.14	9.49	148.44	228.13	-300.59	536.38	519.15	17.24	31.119	
4,000.00	3,992.77	3,963.33	3,955.22	9.40	9.74	148.68	232.78	-305.70	549.16	531.46	17.70	31.026	
4,100.00	4,092.53	4,062.49	4,054.13	9.66	10.00	148.91	237.44	-310.82	561.95	543.78	18.16	30.938	
4,200.00	4,192.29	4,161.64	4,153.04	9.92	10.26	149.13	242.09	-315.93	574.74	556.11	18.63	30.854	
4,300.00	4,292.04	4,260.79	4,251.96	10.18	10.51	149.34	246.75	-321.05	587.54	568.45	19.09	30.775	
4,400.00	4,391.80	4,359.95	4,350.87	10.45	10.77	149.54	251.40	-326.17	600.35	580.80	19.56	30.699	
4,500.00	4,491.56	4,459.10	4,449.78	10.71	11.02	149.74	256.06	-331.28	613.17	593.15	20.02	30.628	
4,600.00	4,591.31	4,558.26	4,548.70	10.97	11.28	149.92	260.71	-336.40	625.99	605.51	20.48	30.559	
4,700.00	4,691.07	4,657.41	4,647.61	11.23	11.54	150.10	265.37	-341.51	638.82	617.88	20.95	30.494	
4,800.00	4,790.82	4,756.57	4,746.52	11.49	11.79	150.27	270.02	-346.63	651.66	630.25	21.41	30.432	
4,900.00	4,890.58	4,855.72	4,845.43	11.76	12.05	150.44	274.68	-351.74	664.50	642.62	21.88	30.372	
5,000.00	4,990.34	4,954.87	4,944.35	12.02	12.31	150.60	279.33	-356.86	677.35	655.01	22.34	30.315 SF	

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

## Cathedral Energy Services

### Anticollision Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor Federal #12F-1305A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor Federal #12F-1305A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #3	<b>Offset TVD Reference:</b>	Offset Datum

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor Federal #12F-1305A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor Federal #12F-1305A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #3	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design S12-T10N-R58W - Razor #12F-0102B - HZ - Plan #2												Offset Site Error:	0.00 usft
Survey Program: O-ISCWSA MWD												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor	Warning
0.00	0.00	0.01	0.01	0.00	0.00	-90.00	0.00	-132.17	132.17				
100.00	100.00	100.01	100.01	0.09	0.09	-90.00	0.00	-132.17	132.17	131.99	0.19	706.665	
200.00	200.00	200.01	200.01	0.32	0.32	-90.00	0.00	-132.17	132.17	131.54	0.64	207.634	
300.00	300.00	300.01	300.01	0.54	0.54	-90.00	0.00	-132.17	132.17	131.09	1.09	121.696	
400.00	400.00	400.01	400.01	0.77	0.77	-90.00	0.00	-132.17	132.17	130.64	1.54	86.071	
466.66	466.66	466.67	466.67	0.92	0.92	-90.00	0.00	-132.17	132.17	130.34	1.84	72.017 CC	
500.00	500.00	500.00	500.00	0.99	0.99	-90.00	0.00	-132.17	132.17	130.19	1.99	66.582 ES	
600.00	600.00	597.29	597.27	1.22	1.21	-89.43	1.32	-133.16	133.20	130.77	2.43	54.895	
700.00	700.00	694.35	694.20	1.44	1.43	-87.78	5.28	-136.11	136.34	133.47	2.87	47.498	
800.00	800.00	793.93	793.54	1.67	1.66	-85.58	10.85	-140.26	140.83	137.50	3.32	42.361	
900.00	900.00	893.69	893.05	1.89	1.90	-83.51	16.43	-144.42	145.51	141.73	3.78	38.498	
1,000.00	999.98	993.32	992.44	2.09	2.14	104.21	22.00	-148.57	150.80	146.60	4.20	35.887	
1,100.00	1,099.84	1,092.62	1,091.51	2.27	2.39	107.69	27.56	-152.71	157.40	152.79	4.61	34.158	
1,200.00	1,199.59	1,191.72	1,190.36	2.46	2.64	111.55	33.10	-156.84	165.21	160.18	5.03	32.876	
1,300.00	1,299.35	1,290.82	1,289.22	2.66	2.89	115.05	38.64	-160.97	173.70	168.25	5.45	31.859	
1,400.00	1,399.11	1,389.92	1,388.08	2.87	3.14	118.21	44.19	-165.10	182.78	176.90	5.89	31.054	
1,500.00	1,498.86	1,489.02	1,486.93	3.10	3.39	121.07	49.73	-169.23	192.37	186.04	6.32	30.414	
1,600.00	1,598.62	1,588.12	1,585.79	3.33	3.64	123.66	55.27	-173.36	202.39	195.62	6.77	29.907	
1,700.00	1,698.38	1,687.21	1,684.65	3.56	3.89	126.00	60.82	-177.49	212.78	205.57	7.21	29.503	
1,800.00	1,798.13	1,786.31	1,783.50	3.80	4.14	128.12	66.36	-181.62	223.49	215.83	7.66	29.180	
1,900.00	1,897.89	1,885.41	1,882.36	4.04	4.40	130.05	71.90	-185.75	234.48	226.37	8.11	28.921	
2,000.00	1,997.65	1,984.51	1,981.22	4.28	4.65	131.80	77.45	-189.88	245.71	237.15	8.56	28.714	
2,100.00	2,097.40	2,083.61	2,080.07	4.53	4.90	133.40	82.99	-194.01	257.15	248.14	9.01	28.547	
2,200.00	2,197.16	2,182.71	2,178.93	4.78	5.16	134.86	88.53	-198.14	268.76	259.30	9.46	28.412	
2,300.00	2,296.91	2,281.80	2,277.79	5.03	5.41	136.20	94.08	-202.27	280.54	270.63	9.91	28.304	
2,400.00	2,396.67	2,380.90	2,376.64	5.28	5.66	137.43	99.62	-206.40	292.46	282.09	10.36	28.217	
2,500.00	2,496.43	2,480.00	2,475.50	5.53	5.92	138.57	105.16	-210.53	304.49	293.68	10.82	28.147	
2,600.00	2,596.18	2,579.10	2,574.36	5.78	6.17	139.61	110.71	-214.66	316.64	305.37	11.27	28.092	
2,700.00	2,695.94	2,678.20	2,673.22	6.04	6.43	140.59	116.25	-218.79	328.89	317.16	11.73	28.047	
2,800.00	2,795.70	2,777.29	2,772.07	6.29	6.68	141.49	121.79	-222.92	341.22	329.04	12.18	28.013	
2,900.00	2,895.45	2,876.39	2,870.93	6.55	6.94	142.33	127.34	-227.05	353.63	341.00	12.64	27.986	
3,000.00	2,995.21	2,975.49	2,969.79	6.81	7.19	143.11	132.88	-231.18	366.11	353.02	13.09	27.965	
3,100.00	3,094.97	3,074.59	3,068.64	7.06	7.44	143.84	138.42	-235.31	378.65	365.11	13.55	27.950	
3,200.00	3,194.72	3,173.69	3,167.50	7.32	7.70	144.52	143.97	-239.44	391.25	377.25	14.00	27.939	
3,300.00	3,294.48	3,272.79	3,266.36	7.58	7.95	145.16	149.51	-243.57	403.91	389.44	14.46	27.932	
3,400.00	3,394.23	3,371.88	3,365.21	7.84	8.21	145.76	155.05	-247.70	416.60	401.69	14.92	27.928	
3,500.00	3,493.99	3,470.98	3,464.07	8.10	8.46	146.33	160.60	-251.83	429.34	413.97	15.37	27.926 SF	
3,600.00	3,593.75	3,570.08	3,562.93	8.36	8.72	146.86	166.14	-255.96	442.12	426.29	15.83	27.927	
3,700.00	3,693.50	3,669.18	3,661.78	8.62	8.97	147.37	171.68	-260.09	454.94	438.65	16.29	27.929	
3,800.00	3,793.26	3,768.28	3,760.64	8.88	9.23	147.84	177.23	-264.22	467.79	451.04	16.75	27.933	
3,900.00	3,893.02	3,867.38	3,859.50	9.14	9.49	148.29	182.77	-268.35	480.66	463.46	17.20	27.938	
4,000.00	3,992.77	3,966.47	3,958.35	9.40	9.74	148.72	188.31	-272.48	493.57	475.91	17.66	27.944	
4,100.00	4,092.53	4,065.57	4,057.21	9.66	10.00	149.13	193.85	-276.61	506.50	488.38	18.12	27.951	
4,200.00	4,192.29	4,164.67	4,156.07	9.92	10.25	149.51	199.40	-280.74	519.46	500.88	18.58	27.959	
4,300.00	4,292.04	4,263.77	4,254.92	10.18	10.51	149.88	204.94	-284.87	532.43	513.39	19.04	27.967	
4,400.00	4,391.80	4,362.87	4,353.78	10.45	10.76	150.23	210.48	-289.01	545.43	525.93	19.50	27.976	
4,500.00	4,491.56	4,461.96	4,452.64	10.71	11.02	150.56	216.03	-293.14	558.45	538.49	19.96	27.985	
4,600.00	4,591.31	4,561.06	4,551.50	10.97	11.27	150.88	221.57	-297.27	571.48	551.07	20.41	27.994	
4,700.00	4,691.07	4,660.16	4,650.35	11.23	11.53	151.18	227.11	-301.40	584.53	563.66	20.87	28.004	
4,800.00	4,790.82	4,759.26	4,749.21	11.49	11.78	151.47	232.66	-305.53	597.60	576.26	21.33	28.013	
4,900.00	4,890.58	4,858.36	4,848.07	11.76	12.04	151.75	238.20	-309.66	610.68	588.89	21.79	28.023	
5,000.00	4,990.34	4,957.46	4,946.92	12.02	12.29	152.02	243.74	-313.79	623.77	601.52	22.25	28.033	

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

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor Federal #12F-1305A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor Federal #12F-1305A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #3	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b> S12-T10N-R58W - Razor #12F-0102B - HZ - Plan #2												<b>Offset Site Error:</b>	0.00 usft
Survey Program: 0-ISCWSA MWD												<b>Offset Well Error:</b>	0.00 usft
Reference		Offset		Semi Major Axis		Distance							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor	Warning
5,100.00	5,090.09	5,056.55	5,045.78	12.28	12.55	152.27	249.29	-317.92	636.88	614.17	22.71	28.043	
5,200.00	5,189.85	5,155.65	5,144.64	12.54	12.80	152.52	254.83	-322.05	650.00	626.83	23.17	28.053	
5,300.00	5,289.61	5,254.75	5,243.49	12.81	13.06	152.75	260.37	-326.18	663.13	639.50	23.63	28.062	
5,400.00	5,388.94	5,353.21	5,341.71	13.10	13.31	152.53	265.88	-330.28	679.61	655.79	23.82	28.529	

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor Federal #12F-1305A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor Federal #12F-1305A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #3	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design S12-T10N-R58W - Razor #12F-0103A - HZ - Plan #2												Offset Site Error:	0.00 usft
Survey Program: O-ISCWSA MWD												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor	Warning
0.00	0.00	0.01	0.01	0.00	0.00	-23.81	74.89	-33.04	81.85				
100.00	100.00	100.01	100.01	0.09	0.09	-23.81	74.89	-33.04	81.85	81.66	0.19	437.617	
200.00	200.00	200.01	200.01	0.32	0.32	-23.81	74.89	-33.04	81.85	81.21	0.64	128.582	
300.00	300.00	300.01	300.01	0.54	0.54	-23.81	74.89	-33.04	81.85	80.77	1.09	75.363	
400.00	400.00	400.01	400.01	0.77	0.77	-23.81	74.89	-33.04	81.85	80.32	1.54	53.301	
500.00	500.00	500.01	500.01	0.99	0.99	-23.81	74.89	-33.04	81.85	79.87	1.99	41.232	
600.00	600.00	600.01	600.01	1.22	1.22	-23.81	74.89	-33.04	81.85	79.42	2.43	33.619	
700.00	700.00	700.01	700.01	1.44	1.44	-23.81	74.89	-33.04	81.85	78.97	2.88	28.379	
800.00	800.00	800.01	800.01	1.67	1.67	-23.81	74.89	-33.04	81.85	78.52	3.33	24.552	
900.00	900.00	900.01	900.01	1.89	1.89	-23.81	74.89	-33.04	81.85	78.07	3.78	21.635 CC, ES	
1,000.00	999.98	999.99	999.99	2.09	2.12	161.81	74.89	-33.04	83.51	79.30	4.20	19.862	
1,100.00	1,099.84	1,096.84	1,096.82	2.27	2.33	162.66	76.30	-33.86	90.17	85.57	4.60	19.615 SF	
1,200.00	1,199.59	1,192.96	1,192.82	2.46	2.55	163.45	80.52	-36.28	101.84	96.83	5.00	20.362	
1,300.00	1,299.35	1,291.79	1,291.40	2.66	2.78	163.94	86.49	-39.70	115.39	109.98	5.42	21.303	
1,400.00	1,399.11	1,390.86	1,390.23	2.87	3.00	164.34	92.49	-43.14	128.97	123.13	5.84	22.102	
1,500.00	1,498.86	1,489.93	1,489.06	3.10	3.24	164.65	98.48	-46.58	142.55	136.29	6.26	22.775	
1,600.00	1,598.62	1,589.00	1,587.89	3.33	3.48	164.92	104.47	-50.02	156.13	149.44	6.69	23.345	
1,700.00	1,698.38	1,688.07	1,686.72	3.56	3.72	165.14	110.47	-53.46	169.72	162.59	7.12	23.834	
1,800.00	1,798.13	1,787.14	1,785.55	3.80	3.96	165.32	116.46	-56.90	183.30	175.75	7.56	24.256	
1,900.00	1,897.89	1,886.21	1,884.38	4.04	4.20	165.49	122.46	-60.34	196.89	188.90	8.00	24.625	
2,000.00	1,997.65	1,985.28	1,983.21	4.28	4.44	165.63	128.45	-63.78	210.48	202.04	8.44	24.949	
2,100.00	2,097.40	2,084.36	2,082.04	4.53	4.69	165.75	134.44	-67.22	224.07	215.19	8.88	25.235	
2,200.00	2,197.16	2,183.43	2,180.87	4.78	4.94	165.86	140.44	-70.66	237.67	228.34	9.32	25.489	
2,300.00	2,296.91	2,282.50	2,279.70	5.03	5.18	165.96	146.43	-74.10	251.26	241.49	9.77	25.716	
2,400.00	2,396.67	2,381.57	2,378.53	5.28	5.43	166.05	152.43	-77.54	264.85	254.63	10.22	25.920	
2,500.00	2,496.43	2,480.64	2,477.36	5.53	5.68	166.13	158.42	-80.98	278.45	267.78	10.67	26.105	
2,600.00	2,596.18	2,579.71	2,576.19	5.78	5.93	166.20	164.41	-84.42	292.04	280.93	11.12	26.273	
2,700.00	2,695.94	2,678.78	2,675.02	6.04	6.18	166.26	170.41	-87.86	305.64	294.07	11.57	26.425	
2,800.00	2,795.70	2,777.85	2,773.85	6.29	6.43	166.32	176.40	-91.30	319.23	307.21	12.02	26.565	
2,900.00	2,895.45	2,876.92	2,872.68	6.55	6.68	166.38	182.40	-94.74	332.83	320.36	12.47	26.693	
3,000.00	2,995.21	2,975.99	2,971.51	6.81	6.93	166.43	188.39	-98.18	346.42	333.50	12.92	26.810	
3,100.00	3,094.97	3,075.07	3,070.34	7.06	7.18	166.48	194.38	-101.62	360.02	346.65	13.37	26.919	
3,200.00	3,194.72	3,174.14	3,169.17	7.32	7.44	166.52	200.38	-105.06	373.62	359.79	13.83	27.020	
3,300.00	3,294.48	3,273.21	3,267.99	7.58	7.69	166.56	206.37	-108.50	387.21	372.93	14.28	27.113	
3,400.00	3,394.23	3,372.28	3,366.82	7.84	7.94	166.60	212.37	-111.94	400.81	386.07	14.74	27.201	
3,500.00	3,493.99	3,471.35	3,465.65	8.10	8.19	166.63	218.36	-115.38	414.41	399.22	15.19	27.282	
3,600.00	3,593.75	3,570.42	3,564.48	8.36	8.45	166.67	224.35	-118.82	428.00	412.36	15.64	27.358	
3,700.00	3,693.50	3,669.49	3,663.31	8.62	8.70	166.70	230.35	-122.26	441.60	425.50	16.10	27.429	
3,800.00	3,793.26	3,768.56	3,762.14	8.88	8.95	166.73	236.34	-125.70	455.20	438.64	16.56	27.496	
3,900.00	3,893.02	3,867.63	3,860.97	9.14	9.20	166.75	242.34	-129.14	468.80	451.79	17.01	27.558	
4,000.00	3,992.77	3,966.70	3,959.80	9.40	9.46	166.78	248.33	-132.58	482.39	464.93	17.47	27.618	
4,100.00	4,092.53	4,065.78	4,058.63	9.66	9.71	166.80	254.32	-136.02	495.99	478.07	17.92	27.673	
4,200.00	4,192.29	4,164.85	4,157.46	9.92	9.96	166.83	260.32	-139.46	509.59	491.21	18.38	27.726	
4,300.00	4,292.04	4,263.92	4,256.29	10.18	10.22	166.85	266.31	-142.90	523.19	504.35	18.84	27.776	
4,400.00	4,391.80	4,362.99	4,355.12	10.45	10.47	166.87	272.31	-146.34	536.79	517.49	19.29	27.823	
4,500.00	4,491.56	4,462.06	4,453.95	10.71	10.72	166.89	278.30	-149.78	550.38	530.63	19.75	27.868	
4,600.00	4,591.31	4,561.13	4,552.78	10.97	10.98	166.91	284.29	-153.21	563.98	543.78	20.21	27.911	
4,700.00	4,691.07	4,660.20	4,651.61	11.23	11.23	166.93	290.29	-156.65	577.58	556.92	20.66	27.952	
4,800.00	4,790.82	4,759.27	4,750.44	11.49	11.49	166.94	296.28	-160.09	591.18	570.06	21.12	27.990	
4,900.00	4,890.58	4,858.34	4,849.27	11.76	11.74	166.96	302.28	-163.53	604.78	583.20	21.58	28.027	
5,000.00	4,990.34	4,957.41	4,948.10	12.02	11.99	166.98	308.27	-166.97	618.38	596.34	22.04	28.063	
5,100.00	5,090.09	5,056.48	5,046.93	12.28	12.25	166.99	314.26	-170.41	631.97	609.48	22.49	28.096	

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

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor Federal #12F-1305A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor Federal #12F-1305A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #3	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design												S12-T10N-R58W - Razor #12F-0103A - HZ - Plan #2		Offset Site Error:		0.00 usft	
Survey Program:												0-ISCWSA MWD		Offset Well Error:		0.00 usft	
Reference		Offset		Semi Major Axis				Distance									
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore +N/-S (usft)	Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor	Warning				
5,200.00	5,189.85	5,155.56	5,145.76	12.54	12.50	167.00	320.26	-173.85	645.57	622.62	22.95	28.128					
5,300.00	5,289.61	5,254.63	5,244.59	12.81	12.76	167.02	326.25	-177.29	659.17	635.76	23.41	28.159					
5,400.00	5,388.94	5,344.06	5,333.80	13.10	12.99	166.77	331.70	-180.42	676.53	653.00	23.53	28.755					

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor Federal #12F-1305A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor Federal #12F-1305A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #3	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design S12-T10N-R58W - Razor #12F-0104B - HZ - Plan #2												Offset Site Error:	0.00 usft
Survey Program: O-ISCWSA MWD												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor	Warning
0.00	0.00	0.01	0.01	0.00	0.00	-90.01	-0.01	-66.09	66.09	65.90	0.19	353.332	
100.00	100.00	100.01	100.01	0.09	0.09	-90.01	-0.01	-66.09	66.09	65.45	0.64	103.817	
200.00	200.00	200.01	200.01	0.32	0.32	-90.01	-0.01	-66.09	66.09	65.00	1.09	60.848	
300.00	300.00	300.01	300.01	0.54	0.54	-90.01	-0.01	-66.09	66.09	64.55	1.54	43.036	
400.00	400.00	400.01	400.01	0.77	0.77	-90.01	-0.01	-66.09	66.09	64.10	1.99	33.290	
500.00	500.00	500.01	500.01	0.99	0.99	-90.01	-0.01	-66.09	66.09	63.65	2.43	27.144	
600.00	600.00	600.01	600.01	1.22	1.22	-90.01	-0.01	-66.09	66.09	63.20	2.88	22.913	
700.00	700.00	700.01	700.01	1.44	1.44	-90.01	-0.01	-66.09	66.09	62.75	3.33	19.824 ES	
766.66	766.66	766.67	766.67	1.59	1.59	-90.01	-0.01	-66.09	66.09	62.80	3.78	17.609	
800.00	800.00	800.00	800.00	1.67	1.67	-90.01	-0.01	-66.09	66.09	62.80	3.78	17.609	
900.00	900.00	899.35	899.33	1.89	1.89	-88.58	1.65	-66.55	66.58	62.80	3.78	17.609	
1,000.00	999.98	998.32	998.16	2.09	2.12	102.17	6.60	-67.94	68.63	64.43	4.20	16.347	
1,100.00	1,099.84	1,097.56	1,097.16	2.27	2.34	111.07	13.26	-69.81	73.34	68.74	4.60	15.934 SF	
1,200.00	1,199.59	1,196.59	1,195.95	2.46	2.57	119.90	19.92	-71.68	80.49	75.47	5.02	16.034	
1,300.00	1,299.35	1,295.63	1,294.74	2.66	2.81	127.16	26.57	-73.54	89.23	83.79	5.45	16.388	
1,400.00	1,399.11	1,394.66	1,393.54	2.87	3.05	133.06	33.22	-75.41	99.15	93.28	5.87	16.878	
1,500.00	1,498.86	1,493.70	1,492.33	3.10	3.29	137.86	39.87	-77.27	109.92	103.62	6.31	17.429	
1,600.00	1,598.62	1,592.73	1,591.12	3.33	3.54	141.78	46.52	-79.14	121.33	114.58	6.74	17.997	
1,700.00	1,698.38	1,691.77	1,689.92	3.56	3.78	145.02	53.17	-81.01	133.19	126.02	7.18	18.556	
1,800.00	1,798.13	1,790.80	1,788.71	3.80	4.03	147.73	59.82	-82.87	145.42	137.80	7.62	19.094	
1,900.00	1,897.89	1,889.83	1,887.50	4.04	4.27	150.01	66.48	-84.74	157.91	149.85	8.06	19.603	
2,000.00	1,997.65	1,988.87	1,986.30	4.28	4.52	151.96	73.13	-86.60	170.61	162.12	8.50	20.082	
2,100.00	2,097.40	2,087.90	2,085.09	4.53	4.77	153.63	79.78	-88.47	183.48	174.55	8.94	20.529	
2,200.00	2,197.16	2,186.94	2,183.89	4.78	5.02	155.09	86.43	-90.33	196.49	187.11	9.38	20.946	
2,300.00	2,296.91	2,285.97	2,282.68	5.03	5.27	156.37	93.08	-92.20	209.60	199.78	9.83	21.334	
2,400.00	2,396.67	2,385.01	2,381.47	5.28	5.52	157.49	99.73	-94.07	222.81	212.54	10.27	21.695	
2,500.00	2,496.43	2,484.04	2,480.27	5.53	5.77	158.49	106.39	-95.93	236.09	225.37	10.72	22.031	
2,600.00	2,596.18	2,583.08	2,579.06	5.78	6.02	159.38	113.04	-97.80	249.43	238.27	11.16	22.345	
2,700.00	2,695.94	2,682.11	2,677.85	6.04	6.27	160.18	119.69	-99.66	262.83	251.22	11.61	22.638	
2,800.00	2,795.70	2,781.15	2,776.65	6.29	6.52	160.91	126.34	-101.53	276.27	264.22	12.06	22.911	
2,900.00	2,895.45	2,880.18	2,875.44	6.55	6.78	161.56	132.99	-103.40	289.76	277.25	12.51	23.167	
3,000.00	2,995.21	2,979.22	2,974.23	6.81	7.03	162.16	139.64	-105.26	303.27	290.32	12.96	23.407	
3,100.00	3,094.97	3,078.25	3,073.03	7.06	7.28	162.71	146.29	-107.13	316.82	303.41	13.41	23.633	
3,200.00	3,194.72	3,177.29	3,171.82	7.32	7.53	163.21	152.95	-108.99	330.39	316.53	13.86	23.844	
3,300.00	3,294.48	3,276.32	3,270.61	7.58	7.78	163.67	159.60	-110.86	343.99	329.68	14.31	24.044	
3,400.00	3,394.23	3,375.36	3,369.41	7.84	8.04	164.10	166.25	-112.73	357.60	342.84	14.76	24.232	
3,500.00	3,493.99	3,474.39	3,468.20	8.10	8.29	164.50	172.90	-114.59	371.23	356.03	15.21	24.409	
3,600.00	3,593.75	3,573.43	3,567.00	8.36	8.54	164.87	179.55	-116.46	384.88	369.22	15.66	24.577	
3,700.00	3,693.50	3,672.46	3,665.79	8.62	8.79	165.21	186.20	-118.32	398.55	382.44	16.11	24.736	
3,800.00	3,793.26	3,771.50	3,764.58	8.88	9.05	165.53	192.86	-120.19	412.23	395.66	16.56	24.887	
3,900.00	3,893.02	3,870.53	3,863.38	9.14	9.30	165.83	199.51	-122.05	425.91	408.90	17.02	25.030	
4,000.00	3,992.77	3,969.57	3,962.17	9.40	9.55	166.11	206.16	-123.92	439.61	422.15	17.47	25.165	
4,100.00	4,092.53	4,068.60	4,060.96	9.66	9.81	166.37	212.81	-125.79	453.32	435.40	17.92	25.295	
4,200.00	4,192.29	4,167.64	4,159.76	9.92	10.06	166.62	219.46	-127.65	467.04	448.67	18.37	25.418	
4,300.00	4,292.04	4,266.67	4,258.55	10.18	10.31	166.86	226.11	-129.52	480.77	461.94	18.83	25.535	
4,400.00	4,391.80	4,365.71	4,357.34	10.45	10.57	167.08	232.77	-131.38	494.50	475.22	19.28	25.647	
4,500.00	4,491.56	4,464.74	4,456.14	10.71	10.82	167.29	239.42	-133.25	508.24	488.51	19.73	25.754	
4,600.00	4,591.31	4,563.78	4,554.93	10.97	11.07	167.49	246.07	-135.12	521.99	501.80	20.19	25.856	
4,700.00	4,691.07	4,662.81	4,653.73	11.23	11.33	167.67	252.72	-136.98	535.74	515.10	20.64	25.954	
4,800.00	4,790.82	4,761.84	4,752.52	11.49	11.58	167.85	259.37	-138.85	549.50	528.41	21.10	26.048	
4,900.00	4,890.58	4,860.88	4,851.31	11.76	11.83	168.02	266.02	-140.71	563.27	541.72	21.55	26.137	
5,000.00	4,990.34	4,959.91	4,950.11	12.02	12.09	168.18	272.67	-142.58	577.03	555.03	22.00	26.224	

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



# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor Federal #12F-1305A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor Federal #12F-1305A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #3	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design													S12-T10N-R58W - Razor #12F-0104B - HZ - Plan #2		Offset Site Error:		0.00 usft
Survey Program: 0-ISCSWA MWD															Offset Well Error:		0.00 usft
Reference		Offset		Semi Major Axis			Distance										
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Total Uncertainty Axis	Separation Factor	Warning				
(usft)	(usft)	(usft)	(usft)	(usft)	(usft)	(°)	+N/-S (usft)	+E/-W (usft)	(usft)	(usft)							
5,100.00	5,090.09	5,058.95	5,048.90	12.28	12.34	168.34	279.33	-144.45	590.81	568.35	22.46	26.307					
5,200.00	5,189.85	5,157.98	5,147.69	12.54	12.60	168.49	285.98	-146.31	604.58	581.67	22.91	26.386					
5,300.00	5,289.61	5,257.02	5,246.49	12.81	12.85	168.63	292.63	-148.18	618.36	594.99	23.37	26.463					
5,400.00	5,388.94	5,355.38	5,344.60	13.10	13.10	168.56	299.24	-150.03	635.82	612.33	23.50	27.062					
5,500.00	5,484.71	5,442.80	5,431.81	13.56	13.33	168.20	305.13	-151.68	670.22	647.42	22.80	29.395					

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor Federal #12F-1305A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor Federal #12F-1305A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #3	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design S12-T10N-R58W - Razor #12F-0105A - HZ - Plan #2													Offset Site Error: 0.00 usft	
Survey Program: 0-ISCWSA MWD													Offset Well Error: 0.00 usft	
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor		
0.00	0.00	0.01	0.01	0.00	0.00	23.32	74.89	32.27	81.54					
100.00	100.00	100.01	100.01	0.09	0.09	23.32	74.89	32.27	81.54	81.36	0.19	435.974		
200.00	200.00	200.01	200.01	0.32	0.32	23.32	74.89	32.27	81.54	80.91	0.64	128.099		
300.00	300.00	300.01	300.01	0.54	0.54	23.32	74.89	32.27	81.54	80.46	1.09	75.080		
400.00	400.00	400.01	400.01	0.77	0.77	23.32	74.89	32.27	81.54	80.01	1.54	53.101		
500.00	500.00	500.01	500.01	0.99	0.99	23.32	74.89	32.27	81.54	79.56	1.99	41.077		
600.00	600.00	600.01	600.01	1.22	1.22	23.32	74.89	32.27	81.54	79.11	2.43	33.493		
700.00	700.00	700.01	700.01	1.44	1.44	23.32	74.89	32.27	81.54	78.66	2.88	28.272		
800.00	800.00	800.01	800.01	1.67	1.67	23.32	74.89	32.27	81.54	78.21	3.33	24.460		
900.00	900.00	900.01	900.01	1.89	1.89	23.32	74.89	32.27	81.54	77.76	3.78	21.554	CC, ES	
1,000.00	999.98	999.99	999.99	2.09	2.12	-152.00	74.89	32.27	83.08	78.88	4.20	19.760		
1,100.00	1,099.84	1,099.85	1,099.85	2.27	2.34	-153.56	74.89	32.27	87.74	83.13	4.60	19.058	SF	
1,200.00	1,199.59	1,196.66	1,196.64	2.46	2.56	-155.79	76.51	32.15	95.58	90.57	5.01	19.083		
1,300.00	1,299.35	1,292.79	1,292.64	2.66	2.78	-158.31	81.35	31.80	106.69	101.26	5.42	19.672		
1,400.00	1,399.11	1,391.56	1,391.17	2.87	3.00	-160.70	88.21	31.29	119.77	113.93	5.85	20.486		
1,500.00	1,498.86	1,490.59	1,489.96	3.10	3.23	-162.63	95.10	30.78	133.04	126.76	6.27	21.211		
1,600.00	1,598.62	1,589.61	1,588.75	3.33	3.46	-164.21	101.99	30.27	146.42	139.72	6.70	21.851		
1,700.00	1,698.38	1,688.64	1,687.53	3.56	3.70	-165.52	108.88	29.77	159.90	152.76	7.13	22.417		
1,800.00	1,798.13	1,787.67	1,786.32	3.80	3.93	-166.63	115.77	29.26	173.44	165.87	7.57	22.919		
1,900.00	1,897.89	1,886.69	1,885.10	4.04	4.17	-167.58	122.66	28.75	187.04	179.04	8.00	23.366		
2,000.00	1,997.65	1,985.72	1,983.89	4.28	4.42	-168.40	129.55	28.24	200.68	192.24	8.44	23.767		
2,100.00	2,097.40	2,084.75	2,082.67	4.53	4.66	-169.11	136.44	27.73	214.36	205.48	8.88	24.128		
2,200.00	2,197.16	2,183.78	2,181.46	4.78	4.90	-169.74	143.33	27.22	228.07	218.74	9.33	24.455		
2,300.00	2,296.91	2,282.80	2,280.25	5.03	5.15	-170.30	150.22	26.72	241.80	232.03	9.77	24.751		
2,400.00	2,396.67	2,381.83	2,379.03	5.28	5.39	-170.80	157.10	26.21	255.55	245.34	10.21	25.020		
2,500.00	2,496.43	2,480.86	2,477.82	5.53	5.64	-171.25	163.99	25.70	269.32	258.66	10.66	25.267		
2,600.00	2,596.18	2,579.88	2,576.60	5.78	5.89	-171.65	170.88	25.19	283.10	272.00	11.11	25.493		
2,700.00	2,695.94	2,678.91	2,675.39	6.04	6.13	-172.02	177.77	24.68	296.90	285.35	11.55	25.701		
2,800.00	2,795.70	2,777.94	2,774.17	6.29	6.38	-172.35	184.66	24.17	310.71	298.71	12.00	25.893		
2,900.00	2,895.45	2,876.96	2,872.96	6.55	6.63	-172.65	191.55	23.67	324.52	312.07	12.45	26.070		
3,000.00	2,995.21	2,975.99	2,971.75	6.81	6.88	-172.93	198.44	23.16	338.34	325.45	12.90	26.235		
3,100.00	3,094.97	3,075.02	3,070.53	7.06	7.13	-173.19	205.33	22.65	352.18	338.83	13.35	26.389		
3,200.00	3,194.72	3,174.04	3,169.32	7.32	7.38	-173.43	212.22	22.14	366.01	352.22	13.80	26.532		
3,300.00	3,294.48	3,273.07	3,268.10	7.58	7.63	-173.65	219.11	21.63	379.86	365.61	14.25	26.665		
3,400.00	3,394.23	3,372.10	3,366.89	7.84	7.88	-173.86	226.00	21.12	393.71	379.01	14.70	26.791		
3,500.00	3,493.99	3,471.12	3,465.67	8.10	8.13	-174.05	232.88	20.62	407.56	392.41	15.15	26.908		
3,600.00	3,593.75	3,570.15	3,564.46	8.36	8.38	-174.23	239.77	20.11	421.42	405.82	15.60	27.019		
3,700.00	3,693.50	3,669.18	3,663.25	8.62	8.63	-174.40	246.66	19.60	435.28	419.23	16.05	27.123		
3,800.00	3,793.26	3,768.21	3,762.03	8.88	8.88	-174.55	253.55	19.09	449.14	432.64	16.50	27.221		
3,900.00	3,893.02	3,867.23	3,860.82	9.14	9.13	-174.70	260.44	18.58	463.01	446.06	16.95	27.313		
4,000.00	3,992.77	3,966.26	3,959.60	9.40	9.38	-174.84	267.33	18.07	476.88	459.48	17.40	27.401		
4,100.00	4,092.53	4,065.29	4,058.39	9.66	9.64	-174.97	274.22	17.57	490.75	472.90	17.86	27.484		
4,200.00	4,192.29	4,164.31	4,157.17	9.92	9.89	-175.10	281.11	17.06	504.63	486.32	18.31	27.563		
4,300.00	4,292.04	4,263.34	4,255.96	10.18	10.14	-175.22	288.00	16.55	518.51	499.75	18.76	27.638		
4,400.00	4,391.80	4,362.37	4,354.74	10.45	10.39	-175.33	294.89	16.04	532.39	513.17	19.21	27.709		
4,500.00	4,491.56	4,461.39	4,453.53	10.71	10.64	-175.43	301.77	15.53	546.27	526.60	19.67	27.777		
4,600.00	4,591.31	4,560.42	4,552.32	10.97	10.90	-175.53	308.66	15.02	560.15	540.03	20.12	27.841		
4,700.00	4,691.07	4,659.45	4,651.10	11.23	11.15	-175.63	315.55	14.52	574.04	553.47	20.57	27.903		
4,800.00	4,790.82	4,758.47	4,749.89	11.49	11.40	-175.72	322.44	14.01	587.92	566.90	21.03	27.962		
4,900.00	4,890.58	4,857.50	4,848.67	11.76	11.65	-175.81	329.33	13.50	601.81	580.33	21.48	28.018		
5,000.00	4,990.34	4,956.53	4,947.46	12.02	11.90	-175.89	336.22	12.99	615.70	593.77	21.93	28.072		
5,100.00	5,090.09	5,055.56	5,046.24	12.28	12.16	-175.97	343.11	12.48	629.59	607.21	22.39	28.124		

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

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor Federal #12F-1305A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor Federal #12F-1305A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #3	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design													S12-T10N-R58W - Razor #12F-0105A - HZ - Plan #2		Offset Site Error:		0.00 usft	
Survey Program:													0-ISCWSA MWD		Offset Well Error:		0.00 usft	
Reference		Offset		Semi Major Axis			Distance							Warning				
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft) +E/-W (usft)		Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor						
5,200.00	5,189.85	5,154.58	5,145.03	12.54	12.41	-176.05	350.00	11.98	643.48	620.64	22.84	28.174						
5,300.00	5,289.61	5,253.61	5,243.82	12.81	12.66	-176.12	356.89	11.47	657.38	634.08	23.29	28.221						
5,400.00	5,388.94	5,342.95	5,332.94	13.10	12.89	-176.10	363.15	11.00	675.12	651.72	23.39	28.858						

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor Federal #12F-1305A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor Federal #12F-1305A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #3	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design S12-T10N-R58W - Razor #12F-0106B - HZ - Plan #2												Offset Site Error:	0.00 usft
Survey Program: O-ISCWSA MWD												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor	Warning
0.00	0.00	0.01	0.01	0.00	0.00	180.00	-0.02	0.00	0.02				
100.00	100.00	100.01	100.01	0.09	0.09	180.00	-0.02	0.00	0.02	-0.17	0.19	0.084	Level 1
200.00	200.00	200.01	200.01	0.32	0.32	180.00	-0.02	0.00	0.02	-0.62	0.64	0.025	Level 1
300.00	300.00	300.01	300.01	0.54	0.54	180.00	-0.02	0.00	0.02	-1.07	1.09	0.014	Level 1
400.00	400.00	400.01	400.01	0.77	0.77	180.00	-0.02	0.00	0.02	-1.52	1.54	0.010	Level 1
500.00	500.00	500.01	500.01	0.99	0.99	180.00	-0.02	0.00	0.02	-1.97	1.99	0.008	Level 1
600.00	600.00	600.01	600.01	1.22	1.22	180.00	-0.02	0.00	0.02	-2.42	2.43	0.006	Level 1
700.00	700.00	700.01	700.01	1.44	1.44	180.00	-0.02	0.00	0.02	-2.87	2.88	0.005	Level 1
705.01	705.01	705.01	705.01	1.45	1.45	174.14	-0.01	0.00	0.01	-2.90	2.91	0.004	Level 1, CC, ES, SF
800.00	800.00	800.00	799.98	1.67	1.67	15.74	1.67	0.47	1.73	-1.60	3.33	0.519	Level 1
900.00	900.00	899.69	899.53	1.89	1.90	15.63	6.68	1.87	6.96	3.17	3.79	1.837	
1,000.00	999.98	999.31	998.90	2.09	2.12	-161.37	13.38	3.74	15.57	11.36	4.21	3.695	
1,100.00	1,099.84	1,098.58	1,097.94	2.27	2.35	-164.22	20.05	5.60	27.52	22.90	4.62	5.962	
1,200.00	1,199.59	1,197.64	1,196.75	2.46	2.59	-165.99	26.70	7.46	41.17	36.14	5.02	8.197	
1,300.00	1,299.35	1,296.70	1,295.57	2.66	2.83	-166.88	33.36	9.32	54.84	49.40	5.44	10.086	
1,400.00	1,399.11	1,395.76	1,394.39	2.87	3.07	-167.41	40.01	11.18	68.51	62.65	5.86	11.695	
1,500.00	1,498.86	1,494.82	1,493.21	3.10	3.32	-167.77	46.67	13.03	82.19	75.91	6.28	13.078	
1,600.00	1,598.62	1,593.88	1,592.02	3.33	3.56	-168.02	53.32	14.89	95.88	89.16	6.72	14.276	
1,700.00	1,698.38	1,692.93	1,690.84	3.56	3.81	-168.21	59.98	16.75	109.56	102.41	7.15	15.323	
1,800.00	1,798.13	1,791.99	1,789.66	3.80	4.06	-168.36	66.64	18.61	123.25	115.66	7.59	16.245	
1,900.00	1,897.89	1,891.05	1,888.47	4.04	4.31	-168.48	73.29	20.47	136.93	128.91	8.03	17.060	
2,000.00	1,997.65	1,990.11	1,987.29	4.28	4.56	-168.58	79.95	22.33	150.62	142.15	8.47	17.787	
2,100.00	2,097.40	2,089.17	2,086.11	4.53	4.81	-168.66	86.60	24.18	164.31	155.39	8.91	18.438	
2,200.00	2,197.16	2,188.23	2,184.93	4.78	5.06	-168.73	93.26	26.04	177.99	168.64	9.36	19.025	
2,300.00	2,296.91	2,287.29	2,283.74	5.03	5.31	-168.79	99.91	27.90	191.68	181.88	9.80	19.556	
2,400.00	2,396.67	2,386.34	2,382.56	5.28	5.56	-168.84	106.57	29.76	205.37	195.12	10.25	20.038	
2,500.00	2,496.43	2,485.40	2,481.38	5.53	5.81	-168.88	113.22	31.62	219.06	208.36	10.70	20.478	
2,600.00	2,596.18	2,584.46	2,580.20	5.78	6.06	-168.92	119.88	33.48	232.74	221.60	11.15	20.882	
2,700.00	2,695.94	2,683.52	2,679.01	6.04	6.31	-168.96	126.53	35.33	246.43	234.84	11.60	21.252	
2,800.00	2,795.70	2,782.58	2,777.83	6.29	6.56	-168.99	133.19	37.19	260.12	248.07	12.05	21.594	
2,900.00	2,895.45	2,881.64	2,876.65	6.55	6.81	-169.02	139.85	39.05	273.81	261.31	12.50	21.911	
3,000.00	2,995.21	2,980.70	2,975.47	6.81	7.07	-169.04	146.50	40.91	287.50	274.55	12.95	22.204	
3,100.00	3,094.97	3,079.76	3,074.28	7.06	7.32	-169.06	153.16	42.77	301.18	287.78	13.40	22.477	
3,200.00	3,194.72	3,178.81	3,173.10	7.32	7.57	-169.08	159.81	44.62	314.87	301.02	13.85	22.731	
3,300.00	3,294.48	3,277.87	3,271.92	7.58	7.82	-169.10	166.47	46.48	328.56	314.25	14.30	22.968	
3,400.00	3,394.23	3,376.93	3,370.74	7.84	8.08	-169.12	173.12	48.34	342.25	327.49	14.76	23.191	
3,500.00	3,493.99	3,475.99	3,469.55	8.10	8.33	-169.14	179.78	50.20	355.94	340.73	15.21	23.400	
3,600.00	3,593.75	3,575.05	3,568.37	8.36	8.58	-169.15	186.43	52.06	369.62	353.96	15.66	23.596	
3,700.00	3,693.50	3,674.11	3,667.19	8.62	8.83	-169.17	193.09	53.92	383.31	367.19	16.12	23.781	
3,800.00	3,793.26	3,773.17	3,766.00	8.88	9.09	-169.18	199.74	55.77	397.00	380.43	16.57	23.955	
3,900.00	3,893.02	3,872.22	3,864.82	9.14	9.34	-169.19	206.40	57.63	410.69	393.66	17.03	24.120	
4,000.00	3,992.77	3,971.28	3,963.64	9.40	9.59	-169.21	213.06	59.49	424.38	406.90	17.48	24.276	
4,100.00	4,092.53	4,070.34	4,062.46	9.66	9.84	-169.22	219.71	61.35	438.07	420.13	17.94	24.423	
4,200.00	4,192.29	4,169.40	4,161.27	9.92	10.10	-169.23	226.37	63.21	451.75	433.36	18.39	24.563	
4,300.00	4,292.04	4,268.46	4,260.09	10.18	10.35	-169.24	233.02	65.07	465.44	446.60	18.85	24.697	
4,400.00	4,391.80	4,367.52	4,358.91	10.45	10.60	-169.24	239.68	66.92	479.13	459.83	19.30	24.823	
4,500.00	4,491.56	4,466.58	4,457.73	10.71	10.86	-169.25	246.33	68.78	492.82	473.06	19.76	24.944	
4,600.00	4,591.31	4,565.64	4,556.54	10.97	11.11	-169.26	252.99	70.64	506.51	486.30	20.21	25.059	
4,700.00	4,691.07	4,664.69	4,655.36	11.23	11.36	-169.27	259.64	72.50	520.20	499.53	20.67	25.169	
4,800.00	4,790.82	4,763.75	4,754.18	11.49	11.62	-169.28	266.30	74.36	533.89	512.76	21.12	25.274	
4,900.00	4,890.58	4,862.81	4,853.00	11.76	11.87	-169.28	272.95	76.21	547.57	525.99	21.58	25.374	
5,000.00	4,990.34	4,961.87	4,951.81	12.02	12.12	-169.29	279.61	78.07	561.26	539.23	22.04	25.471	

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

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor Federal #12F-1305A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor Federal #12F-1305A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #3	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design													S12-T10N-R58W - Razor #12F-0106B - HZ - Plan #2		Offset Site Error:		0.00 usft
Survey Program: 0-ISCSWA MWD															Offset Well Error:		0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore +N/-S (usft)	Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor					
5,100.00	5,090.09	5,060.93	5,050.63	12.28	12.38	-169.30	286.27	79.93	574.95	552.46	22.49	25.563					
5,200.00	5,189.85	5,159.99	5,149.45	12.54	12.63	-169.30	292.92	81.79	588.64	565.69	22.95	25.651					
5,300.00	5,289.61	5,259.05	5,248.27	12.81	12.88	-169.31	299.58	83.65	602.33	578.92	23.40	25.736					
5,400.00	5,388.94	5,357.44	5,346.42	13.10	13.13	-169.12	306.19	85.49	619.70	596.17	23.53	26.339					
5,500.00	5,484.71	5,444.43	5,433.20	13.56	13.36	-168.68	312.06	87.13	654.05	631.23	22.82	28.666					

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor Federal #12F-1305A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor Federal #12F-1305A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #3	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design S12-T10N-R58W - Razor #12F-0107A - HZ - Plan #2												Offset Site Error:	0.00 usft
Survey Program: O-ISCWSA MWD												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor	Warning
0.00	0.00	0.01	0.01	0.00	0.00	52.71	74.89	98.36	123.63				
100.00	100.00	100.01	100.01	0.09	0.09	52.71	74.89	98.36	123.63	123.44	0.19	660.977	
200.00	200.00	200.01	200.01	0.32	0.32	52.71	74.89	98.36	123.63	122.99	0.64	194.210	
300.00	300.00	300.01	300.01	0.54	0.54	52.71	74.89	98.36	123.63	122.54	1.09	113.828	
400.00	400.00	400.01	400.01	0.77	0.77	52.71	74.89	98.36	123.63	122.09	1.54	80.506	
500.00	500.00	500.01	500.01	0.99	0.99	52.71	74.89	98.36	123.63	121.64	1.99	62.276	
600.00	600.00	600.01	600.01	1.22	1.22	52.71	74.89	98.36	123.63	121.19	2.43	50.778	
700.00	700.00	700.01	700.01	1.44	1.44	52.71	74.89	98.36	123.63	120.74	2.88	42.864	
800.00	800.00	800.01	800.01	1.67	1.67	52.71	74.89	98.36	123.63	120.29	3.33	37.084	
900.00	900.00	900.01	900.01	1.89	1.89	52.71	74.89	98.36	123.63	119.85	3.78	32.677 CC, ES	
1,000.00	999.98	999.99	999.99	2.09	2.12	-122.70	74.89	98.36	124.56	120.36	4.20	29.629	
1,100.00	1,099.84	1,099.85	1,099.85	2.27	2.34	-124.63	74.89	98.36	127.47	122.86	4.60	27.682	
1,200.00	1,199.59	1,199.60	1,199.60	2.46	2.57	-127.13	74.89	98.36	131.56	126.55	5.02	26.217	
1,300.00	1,299.35	1,295.08	1,295.06	2.66	2.78	-129.60	76.32	99.04	137.45	132.02	5.43	25.305	
1,400.00	1,399.11	1,389.95	1,389.81	2.87	2.99	-132.22	80.58	101.06	146.75	140.89	5.85	25.076 SF	
1,500.00	1,498.86	1,488.55	1,488.17	3.10	3.22	-134.81	86.78	104.00	158.25	151.97	6.28	25.183	
1,600.00	1,598.62	1,587.65	1,587.03	3.33	3.44	-137.05	93.02	106.97	170.05	163.33	6.72	25.312	
1,700.00	1,698.38	1,686.74	1,685.88	3.56	3.67	-139.01	99.27	109.93	182.08	174.92	7.16	25.446	
1,800.00	1,798.13	1,785.84	1,784.73	3.80	3.91	-140.72	105.51	112.90	194.29	186.69	7.60	25.579	
1,900.00	1,897.89	1,884.93	1,883.59	4.04	4.14	-142.22	111.75	115.86	206.65	198.61	8.04	25.710	
2,000.00	1,997.65	1,984.03	1,982.44	4.28	4.38	-143.56	118.00	118.83	219.13	210.65	8.48	25.836	
2,100.00	2,097.40	2,083.12	2,081.29	4.53	4.62	-144.75	124.24	121.79	231.72	222.80	8.93	25.958	
2,200.00	2,197.16	2,182.22	2,180.15	4.78	4.86	-145.82	130.49	124.76	244.40	235.03	9.37	26.074	
2,300.00	2,296.91	2,281.31	2,279.00	5.03	5.11	-146.79	136.73	127.72	257.16	247.34	9.82	26.184	
2,400.00	2,396.67	2,380.40	2,377.85	5.28	5.35	-147.66	142.98	130.69	269.98	259.71	10.27	26.288	
2,500.00	2,496.43	2,479.50	2,476.71	5.53	5.59	-148.45	149.22	133.65	282.85	272.13	10.72	26.386	
2,600.00	2,596.18	2,578.59	2,575.56	5.78	5.84	-149.18	155.46	136.62	295.78	284.61	11.17	26.480	
2,700.00	2,695.94	2,677.69	2,674.41	6.04	6.09	-149.84	161.71	139.58	308.75	297.13	11.62	26.568	
2,800.00	2,795.70	2,776.78	2,773.27	6.29	6.33	-150.45	167.95	142.55	321.75	309.68	12.07	26.651	
2,900.00	2,895.45	2,875.88	2,872.12	6.55	6.58	-151.02	174.20	145.51	334.79	322.26	12.53	26.730	
3,000.00	2,995.21	2,974.97	2,970.97	6.81	6.83	-151.54	180.44	148.48	347.86	334.88	12.98	26.804	
3,100.00	3,094.97	3,074.07	3,069.83	7.06	7.08	-152.02	186.69	151.44	360.95	347.52	13.43	26.874	
3,200.00	3,194.72	3,173.16	3,168.68	7.32	7.33	-152.47	192.93	154.41	374.07	360.18	13.88	26.941	
3,300.00	3,294.48	3,272.26	3,267.53	7.58	7.58	-152.89	199.17	157.37	387.21	372.87	14.34	27.004	
3,400.00	3,394.23	3,371.35	3,366.39	7.84	7.83	-153.28	205.42	160.34	400.36	385.57	14.79	27.064	
3,500.00	3,493.99	3,470.45	3,465.24	8.10	8.08	-153.64	211.66	163.30	413.54	398.29	15.25	27.121	
3,600.00	3,593.75	3,569.54	3,564.10	8.36	8.33	-153.99	217.91	166.27	426.73	411.03	15.70	27.175	
3,700.00	3,693.50	3,668.64	3,662.95	8.62	8.58	-154.31	224.15	169.23	439.93	423.77	16.16	27.226	
3,800.00	3,793.26	3,767.73	3,761.80	8.88	8.83	-154.62	230.40	172.20	453.15	436.54	16.61	27.275	
3,900.00	3,893.02	3,866.83	3,860.66	9.14	9.08	-154.90	236.64	175.16	466.38	449.31	17.07	27.322	
4,000.00	3,992.77	3,965.92	3,959.51	9.40	9.33	-155.17	242.89	178.13	479.62	462.09	17.53	27.366	
4,100.00	4,092.53	4,065.02	4,058.36	9.66	9.58	-155.43	249.13	181.09	492.87	474.89	17.98	27.408	
4,200.00	4,192.29	4,164.11	4,157.22	9.92	9.83	-155.67	255.37	184.06	506.13	487.69	18.44	27.449	
4,300.00	4,292.04	4,263.21	4,256.07	10.18	10.08	-155.90	261.62	187.02	519.40	500.50	18.90	27.487	
4,400.00	4,391.80	4,362.30	4,354.92	10.45	10.33	-156.12	267.86	189.99	532.67	513.32	19.35	27.524	
4,500.00	4,491.56	4,461.40	4,453.78	10.71	10.59	-156.33	274.11	192.95	545.96	526.15	19.81	27.560	
4,600.00	4,591.31	4,560.49	4,552.63	10.97	10.84	-156.53	280.35	195.92	559.25	538.98	20.27	27.594	
4,700.00	4,691.07	4,659.58	4,651.48	11.23	11.09	-156.72	286.60	198.88	572.54	551.82	20.72	27.626	
4,800.00	4,790.82	4,758.68	4,750.34	11.49	11.34	-156.90	292.84	201.85	585.84	564.66	21.18	27.658	
4,900.00	4,890.58	4,857.77	4,849.19	11.76	11.59	-157.07	299.08	204.81	599.15	577.51	21.64	27.688	
5,000.00	4,990.34	4,956.87	4,948.04	12.02	11.85	-157.24	305.33	207.78	612.46	590.37	22.10	27.717	
5,100.00	5,090.09	5,055.96	5,046.90	12.28	12.10	-157.40	311.57	210.74	625.78	603.22	22.56	27.744	

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

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor Federal #12F-1305A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor Federal #12F-1305A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #3	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b> S12-T10N-R58W - Razor #12F-0107A - HZ - Plan #2												<b>Offset Site Error:</b>	0.00 usft
Survey Program: 0-ISCWSA MWD												<b>Offset Well Error:</b>	0.00 usft
Reference		Offset		Semi Major Axis			Distance						
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor	Warning
5,200.00	5,189.85	5,155.06	5,145.75	12.54	12.35	-157.55	317.82	213.71	639.10	616.09	23.01	27.771	
5,300.00	5,289.61	5,254.15	5,244.60	12.81	12.60	-157.69	324.06	216.67	652.43	628.96	23.47	27.797	
5,400.00	5,388.94	5,343.31	5,333.54	13.10	12.83	-157.40	329.73	219.36	669.35	645.72	23.63	28.326	

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor Federal #12F-1305A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor Federal #12F-1305A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #3	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design S12-T10N-R58W - Razor #12F-0108B - HZ - Plan #2												Offset Site Error:	0.00 usft
Survey Program: O-ISCWSA MWD												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor	Warning
0.00	0.00	0.01	0.01	0.00	0.00	90.03	-0.03	65.32	65.32				
100.00	100.00	100.01	100.01	0.09	0.09	90.03	-0.03	65.32	65.32	65.13	0.19	349.224	
200.00	200.00	200.01	200.01	0.32	0.32	90.03	-0.03	65.32	65.32	64.68	0.64	102.610	
300.00	300.00	300.01	300.01	0.54	0.54	90.03	-0.03	65.32	65.32	64.23	1.09	60.140	
400.00	400.00	400.01	400.01	0.77	0.77	90.03	-0.03	65.32	65.32	63.78	1.54	42.535	
500.00	500.00	500.01	500.01	0.99	0.99	90.03	-0.03	65.32	65.32	63.33	1.99	32.903	
600.00	600.00	600.01	600.01	1.22	1.22	90.03	-0.03	65.32	65.32	62.88	2.43	26.828	
700.00	700.00	700.01	700.01	1.44	1.44	90.03	-0.03	65.32	65.32	62.43	2.88	22.647	
766.66	766.66	766.67	766.67	1.59	1.59	90.03	-0.03	65.32	65.32	62.13	3.18	20.515 CC	
800.00	800.00	800.00	800.00	1.67	1.67	90.03	-0.03	65.32	65.32	61.98	3.33	19.593 ES	
900.00	900.00	898.61	898.59	1.89	1.89	88.86	1.32	66.34	66.37	62.59	3.78	17.571	
1,000.00	999.98	996.88	996.72	2.09	2.11	-90.51	5.36	69.40	69.68	65.49	4.19	16.629	
1,100.00	1,099.84	1,096.17	1,095.77	2.27	2.33	-98.25	10.88	73.58	75.20	70.61	4.59	16.380 SF	
1,200.00	1,199.59	1,195.33	1,194.69	2.46	2.56	-106.09	16.40	77.76	82.41	77.40	5.01	16.463	
1,300.00	1,299.35	1,294.48	1,293.60	2.66	2.80	-112.58	21.91	81.93	90.90	85.47	5.43	16.741	
1,400.00	1,399.11	1,393.63	1,392.51	2.87	3.04	-117.92	27.42	86.11	100.36	94.50	5.86	17.123	
1,500.00	1,498.86	1,492.79	1,491.42	3.10	3.28	-122.31	32.94	90.28	110.54	104.25	6.30	17.554	
1,600.00	1,598.62	1,591.94	1,590.34	3.33	3.52	-125.95	38.45	94.46	121.26	114.52	6.74	17.999	
1,700.00	1,698.38	1,691.10	1,689.25	3.56	3.77	-128.99	43.97	98.63	132.38	125.20	7.18	18.439	
1,800.00	1,798.13	1,790.25	1,788.16	3.80	4.01	-131.55	49.48	102.81	143.81	136.19	7.62	18.864	
1,900.00	1,897.89	1,889.40	1,887.07	4.04	4.26	-133.73	55.00	106.98	155.49	147.42	8.07	19.267	
2,000.00	1,997.65	1,988.56	1,985.99	4.28	4.51	-135.61	60.51	111.16	167.35	158.84	8.52	19.646	
2,100.00	2,097.40	2,087.71	2,084.90	4.53	4.76	-137.24	66.03	115.33	179.38	170.41	8.97	20.001	
2,200.00	2,197.16	2,186.86	2,183.81	4.78	5.01	-138.66	71.54	119.51	191.52	182.11	9.42	20.333	
2,300.00	2,296.91	2,286.02	2,282.72	5.03	5.26	-139.92	77.05	123.68	203.77	193.90	9.87	20.643	
2,400.00	2,396.67	2,385.17	2,381.64	5.28	5.51	-141.03	82.57	127.86	216.11	205.79	10.32	20.931	
2,500.00	2,496.43	2,484.33	2,480.55	5.53	5.76	-142.02	88.08	132.03	228.52	217.74	10.78	21.200	
2,600.00	2,596.18	2,583.48	2,579.46	5.78	6.01	-142.91	93.60	136.21	240.98	229.75	11.23	21.451	
2,700.00	2,695.94	2,682.63	2,678.37	6.04	6.26	-143.71	99.11	140.38	253.50	241.81	11.69	21.686	
2,800.00	2,795.70	2,781.79	2,777.29	6.29	6.51	-144.43	104.63	144.56	266.07	253.92	12.15	21.905	
2,900.00	2,895.45	2,880.94	2,876.20	6.55	6.77	-145.09	110.14	148.73	278.67	266.06	12.60	22.111	
3,000.00	2,995.21	2,980.10	2,975.11	6.81	7.02	-145.70	115.65	152.91	291.30	278.24	13.06	22.303	
3,100.00	3,094.97	3,079.25	3,074.02	7.06	7.27	-146.25	121.17	157.08	303.97	290.45	13.52	22.484	
3,200.00	3,194.72	3,178.40	3,172.94	7.32	7.52	-146.76	126.68	161.26	316.66	302.68	13.98	22.654	
3,300.00	3,294.48	3,277.56	3,271.85	7.58	7.78	-147.23	132.20	165.43	329.37	314.93	14.44	22.815	
3,400.00	3,394.23	3,376.71	3,370.76	7.84	8.03	-147.66	137.71	169.61	342.10	327.20	14.90	22.966	
3,500.00	3,493.99	3,475.87	3,469.67	8.10	8.28	-148.07	143.23	173.78	354.85	339.50	15.36	23.109	
3,600.00	3,593.75	3,575.02	3,568.59	8.36	8.53	-148.44	148.74	177.96	367.62	351.80	15.82	23.244	
3,700.00	3,693.50	3,674.17	3,667.50	8.62	8.79	-148.79	154.26	182.13	380.40	364.12	16.28	23.371	
3,800.00	3,793.26	3,773.33	3,766.41	8.88	9.04	-149.12	159.77	186.31	393.19	376.46	16.74	23.493	
3,900.00	3,893.02	3,872.48	3,865.32	9.14	9.30	-149.43	165.28	190.48	406.00	388.80	17.20	23.608	
4,000.00	3,992.77	3,971.64	3,964.23	9.40	9.55	-149.71	170.80	194.66	418.81	401.16	17.66	23.717	
4,100.00	4,092.53	4,070.79	4,063.15	9.66	9.80	-149.99	176.31	198.83	431.64	413.52	18.12	23.821	
4,200.00	4,192.29	4,169.94	4,162.06	9.92	10.06	-150.24	181.83	203.01	444.48	425.89	18.58	23.920	
4,300.00	4,292.04	4,269.10	4,260.97	10.18	10.31	-150.48	187.34	207.18	457.32	438.28	19.04	24.015	
4,400.00	4,391.80	4,368.25	4,359.88	10.45	10.56	-150.71	192.86	211.36	470.17	450.67	19.51	24.105	
4,500.00	4,491.56	4,467.41	4,458.80	10.71	10.82	-150.93	198.37	215.53	483.03	463.06	19.97	24.191	
4,600.00	4,591.31	4,566.56	4,557.71	10.97	11.07	-151.13	203.89	219.71	495.89	475.46	20.43	24.274	
4,700.00	4,691.07	4,665.71	4,656.62	11.23	11.33	-151.32	209.40	223.88	508.76	487.87	20.89	24.352	
4,800.00	4,790.82	4,764.87	4,755.53	11.49	11.58	-151.51	214.91	228.06	521.64	500.28	21.35	24.428	
4,900.00	4,890.58	4,864.02	4,854.45	11.76	11.83	-151.68	220.43	232.23	534.52	512.70	21.82	24.500	
5,000.00	4,990.34	4,963.18	4,953.36	12.02	12.09	-151.85	225.94	236.41	547.41	525.13	22.28	24.570	

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



# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor Federal #12F-1305A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor Federal #12F-1305A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #3	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b> S12-T10N-R58W - Razor #12F-0108B - HZ - Plan #2													<b>Offset Site Error:</b> 0.00 usft
Survey Program: 0-ISCSWA MWD													<b>Offset Well Error:</b> 0.00 usft
Reference		Offset		Semi Major Axis			Distance						
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor	Warning
5,100.00	5,090.09	5,062.33	5,052.27	12.28	12.34	-152.01	231.46	240.58	560.30	537.55	22.74	24.637	
5,200.00	5,189.85	5,161.48	5,151.18	12.54	12.60	-152.16	236.97	244.76	573.19	549.98	23.21	24.701	
5,300.00	5,289.61	5,260.64	5,250.10	12.81	12.85	-152.31	242.49	248.93	586.09	562.42	23.67	24.763	
5,400.00	5,388.94	5,359.18	5,348.40	13.10	13.10	-152.02	247.97	253.08	602.32	578.45	23.87	25.237	
5,500.00	5,484.71	5,445.03	5,434.04	13.56	13.32	-151.21	252.78	256.72	634.02	610.59	23.44	27.052	
5,600.00	5,573.33	5,482.99	5,471.72	14.18	13.44	-148.63	256.39	259.46	685.47	662.87	22.60	30.333	

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor Federal #12F-1305A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor Federal #12F-1305A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #3	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design S12-T10N-R58W - Razor Federal #12F-1301A - HZ - Plan #3													Offset Site Error:	0.00 usft
Survey Program: O-ISCWSA MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance					Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis			
0.00	0.00	0.00	0.00	0.00	0.00	-90.00	0.00	-132.17	132.17					
100.00	100.00	100.00	100.00	0.09	0.09	-90.00	0.00	-132.17	132.17	131.99	0.19	706.708		
200.00	200.00	200.00	200.00	0.32	0.32	-90.00	0.00	-132.17	132.17	131.54	0.64	207.638		
300.00	300.00	300.00	300.00	0.54	0.54	-90.00	0.00	-132.17	132.17	131.09	1.09	121.697		
400.00	400.00	400.00	400.00	0.77	0.77	-90.00	0.00	-132.17	132.17	130.64	1.54	86.072		
500.00	500.00	500.00	500.00	0.99	0.99	-90.00	0.00	-132.17	132.17	130.19	1.99	66.581		
600.00	600.00	600.00	600.00	1.22	1.22	-90.00	0.00	-132.17	132.17	129.74	2.43	54.288		
700.00	700.00	700.00	700.00	1.44	1.44	-90.00	0.00	-132.17	132.17	129.29	2.88	45.827		
800.00	800.00	800.00	800.00	1.67	1.67	-90.00	0.00	-132.17	132.17	128.84	3.33	39.647		
900.00	900.00	900.00	900.00	1.89	1.89	-90.00	0.00	-132.17	132.17	128.39	3.78	34.936 CC		
1,000.00	999.98	999.98	999.98	2.09	2.12	96.00	0.00	-132.17	132.35	128.14	4.20	31.483 ES		
1,100.00	1,099.84	1,096.85	1,096.83	2.27	2.31	97.61	-1.18	-133.31	134.11	129.53	4.57	29.317		
1,200.00	1,199.59	1,193.69	1,193.54	2.46	2.49	98.87	-4.70	-136.73	138.44	133.50	4.94	27.996		
1,300.00	1,299.35	1,293.32	1,292.93	2.66	2.69	99.49	-9.69	-141.55	144.04	138.70	5.34	26.967		
1,400.00	1,399.11	1,393.15	1,392.52	2.87	2.90	100.08	-14.70	-146.40	149.67	143.91	5.76	26.002		
1,500.00	1,498.86	1,492.99	1,492.11	3.10	3.11	100.61	-19.70	-151.24	155.31	149.12	6.19	25.106		
1,600.00	1,598.62	1,592.82	1,591.70	3.33	3.33	101.11	-24.71	-156.08	160.96	154.33	6.63	24.282		
1,700.00	1,698.38	1,692.65	1,691.28	3.56	3.56	101.58	-29.71	-160.93	166.62	159.54	7.08	23.530		
1,800.00	1,798.13	1,792.48	1,790.87	3.80	3.80	102.02	-34.71	-165.77	172.30	164.75	7.54	22.843		
1,900.00	1,897.89	1,892.31	1,890.46	4.04	4.03	102.42	-39.72	-170.61	177.98	169.97	8.01	22.218		
2,000.00	1,997.65	1,992.14	1,990.05	4.28	4.27	102.81	-44.72	-175.45	183.67	175.18	8.48	21.647		
2,100.00	2,097.40	2,091.97	2,089.63	4.53	4.52	103.17	-49.73	-180.30	189.37	180.40	8.96	21.127		
2,200.00	2,197.16	2,191.80	2,189.22	4.78	4.76	103.51	-54.73	-185.14	195.07	185.63	9.45	20.650		
2,300.00	2,296.91	2,291.63	2,288.81	5.03	5.01	103.83	-59.74	-189.98	200.79	190.85	9.93	20.214		
2,400.00	2,396.67	2,391.46	2,388.40	5.28	5.26	104.13	-64.74	-194.82	206.50	196.08	10.42	19.812		
2,500.00	2,496.43	2,491.29	2,487.98	5.53	5.51	104.41	-69.74	-199.67	212.23	201.31	10.92	19.443		
2,600.00	2,596.18	2,591.12	2,587.57	5.78	5.76	104.68	-74.75	-204.51	217.96	206.55	11.41	19.102		
2,700.00	2,695.94	2,690.95	2,687.16	6.04	6.01	104.94	-79.75	-209.35	223.69	211.78	11.91	18.786		
2,800.00	2,795.70	2,790.78	2,786.75	6.29	6.27	105.18	-84.76	-214.20	229.43	217.02	12.41	18.494		
2,900.00	2,895.45	2,890.61	2,886.33	6.55	6.52	105.42	-89.76	-219.04	235.17	222.26	12.91	18.222		
3,000.00	2,995.21	2,990.44	2,985.92	6.81	6.78	105.64	-94.77	-223.88	240.91	227.50	13.41	17.968		
3,100.00	3,094.97	3,090.28	3,085.51	7.06	7.03	105.85	-99.77	-228.72	246.66	232.75	13.91	17.732		
3,200.00	3,194.72	3,190.11	3,185.10	7.32	7.29	106.05	-104.77	-233.57	252.41	238.00	14.41	17.511		
3,300.00	3,294.48	3,289.94	3,284.68	7.58	7.55	106.24	-109.78	-238.41	258.17	243.25	14.92	17.304		
3,400.00	3,394.23	3,389.77	3,384.27	7.84	7.80	106.42	-114.78	-243.25	263.92	248.50	15.43	17.109		
3,500.00	3,493.99	3,489.60	3,483.86	8.10	8.06	106.60	-119.79	-248.09	269.68	253.75	15.93	16.926		
3,600.00	3,593.75	3,589.43	3,583.45	8.36	8.32	106.77	-124.79	-252.94	275.44	259.00	16.44	16.754		
3,700.00	3,693.50	3,689.26	3,683.03	8.62	8.58	106.93	-129.79	-257.78	281.21	264.26	16.95	16.592		
3,800.00	3,793.26	3,789.09	3,782.62	8.88	8.84	107.08	-134.80	-262.62	286.98	269.52	17.46	16.439		
3,900.00	3,893.02	3,888.92	3,882.21	9.14	9.10	107.23	-139.80	-267.47	292.74	274.78	17.97	16.293		
4,000.00	3,992.77	3,988.75	3,981.80	9.40	9.36	107.38	-144.81	-272.31	298.51	280.04	18.48	16.156		
4,100.00	4,092.53	4,088.58	4,081.38	9.66	9.62	107.51	-149.81	-277.15	304.29	285.30	18.99	16.026		
4,200.00	4,192.29	4,188.41	4,180.97	9.92	9.88	107.65	-154.82	-281.99	310.06	290.56	19.50	15.902		
4,300.00	4,292.04	4,288.24	4,280.56	10.18	10.14	107.77	-159.82	-286.84	315.84	295.83	20.01	15.784		
4,400.00	4,391.80	4,388.07	4,380.15	10.45	10.40	107.90	-164.82	-291.68	321.61	301.09	20.52	15.672		
4,500.00	4,491.56	4,487.90	4,479.73	10.71	10.66	108.02	-169.83	-296.52	327.39	306.36	21.03	15.565		
4,600.00	4,591.31	4,587.74	4,579.32	10.97	10.92	108.13	-174.83	-301.36	333.17	311.63	21.55	15.463		
4,700.00	4,691.07	4,687.57	4,678.91	11.23	11.18	108.24	-179.84	-306.21	338.95	316.89	22.06	15.366		
4,800.00	4,790.82	4,787.40	4,778.50	11.49	11.44	108.35	-184.84	-311.05	344.74	322.16	22.57	15.273		
4,900.00	4,890.58	4,887.23	4,878.08	11.76	11.70	108.45	-189.85	-315.89	350.52	327.43	23.09	15.184		
5,000.00	4,990.34	4,987.06	4,977.67	12.02	11.96	108.55	-194.85	-320.74	356.30	332.70	23.60	15.098		
5,100.00	5,090.09	5,086.89	5,077.26	12.28	12.22	108.65	-199.85	-325.58	362.09	337.98	24.11	15.017		

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

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor Federal #12F-1305A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor Federal #12F-1305A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #3	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design												S12-T10N-R58W - Razor Federal #12F-1301A - HZ - Plan #3		Offset Site Error:		0.00 usft	
Survey Program:												0-ISCSWA MWD		Offset Well Error:		0.00 usft	
Reference				Offset		Semi Major Axis			Distance								
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Total Uncertainty	Separation	Warning				
(usft)	(usft)	(usft)	(usft)	(usft)	(usft)	(°)	+N/-S (usft)	+E/-W (usft)	(usft)	(usft)	Axis	Factor					
5,200.00	5,189.85	5,186.72	5,176.85	12.54	12.49	108.74	-204.86	-330.42	367.88	343.25	24.63	14.938					
5,300.00	5,289.61	5,286.55	5,276.43	12.81	12.75	108.84	-209.86	-335.26	373.66	348.52	25.14	14.863	SF				
5,400.00	5,388.94	5,373.01	5,362.56	13.10	12.99	108.55	-215.09	-340.32	381.54	355.92	25.62	14.893					
5,500.00	5,484.71	5,450.00	5,437.75	13.56	13.28	107.55	-226.76	-351.62	401.11	374.91	26.19	15.314					
5,600.00	5,573.33	5,512.69	5,496.67	14.18	13.61	105.49	-242.07	-366.43	432.62	405.70	26.92	16.069					
5,700.00	5,651.55	5,576.96	5,553.97	15.00	14.01	102.56	-262.93	-386.61	474.86	446.92	27.94	16.994					
5,800.00	5,716.49	5,636.65	5,603.61	16.02	14.45	98.58	-286.70	-409.62	526.07	496.76	29.31	17.946					
5,900.00	5,765.76	5,691.63	5,645.72	17.23	14.93	93.54	-312.07	-434.18	584.42	553.41	31.01	18.847					
6,000.00	5,797.56	5,742.01	5,680.84	18.59	15.42	87.53	-338.01	-459.28	648.04	615.25	32.79	19.762					

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor Federal #12F-1305A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor Federal #12F-1305A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #3	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design S12-T10N-R58W - Razor Federal #12F-1302B - HZ - Plan #2												Offset Site Error:	0.00 usft
Survey Program: 0-ISCSWA MWD												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor	Warning
0.00	0.00	0.01	0.01	0.00	0.00	-90.00	0.00	-99.13	99.13				
100.00	100.00	100.01	100.01	0.09	0.09	-90.00	0.00	-99.13	99.13	98.94	0.19	529.999	
200.00	200.00	200.01	200.01	0.32	0.32	-90.00	0.00	-99.13	99.13	98.49	0.64	155.726	
300.00	300.00	300.01	300.01	0.54	0.54	-90.00	0.00	-99.13	99.13	98.04	1.09	91.272	
400.00	400.00	400.01	400.01	0.77	0.77	-90.00	0.00	-99.13	99.13	97.59	1.54	64.553	
500.00	500.00	500.01	500.01	0.99	0.99	-90.00	0.00	-99.13	99.13	97.15	1.99	49.936	
600.00	600.00	600.01	600.01	1.22	1.22	-90.00	0.00	-99.13	99.13	96.70	2.43	40.716	
700.00	700.00	700.01	700.01	1.44	1.44	-90.00	0.00	-99.13	99.13	96.25	2.88	34.370	
800.00	800.00	800.01	800.01	1.67	1.67	-90.00	0.00	-99.13	99.13	95.80	3.33	29.735	
900.00	900.00	900.01	900.01	1.89	1.89	-90.00	0.00	-99.13	99.13	95.35	3.78	26.202 CC	
1,000.00	999.98	999.99	999.99	2.09	2.12	96.25	0.00	-99.13	99.31	95.10	4.20	23.623 ES	
1,100.00	1,099.84	1,099.85	1,099.85	2.27	2.34	99.21	0.00	-99.13	100.01	95.41	4.60	21.718	
1,200.00	1,199.59	1,199.60	1,199.60	2.46	2.57	103.10	0.00	-99.13	101.36	96.34	5.02	20.191	
1,300.00	1,299.35	1,297.93	1,297.91	2.66	2.76	105.96	-1.38	-100.09	103.86	98.44	5.42	19.168	
1,400.00	1,399.11	1,396.37	1,396.22	2.87	2.94	107.02	-5.52	-102.98	107.90	102.09	5.81	18.580	
1,500.00	1,498.86	1,496.20	1,495.81	3.10	3.13	107.15	-11.22	-106.97	112.69	106.47	6.22	18.127	
1,600.00	1,598.62	1,596.09	1,595.45	3.33	3.33	107.27	-16.94	-110.96	117.47	110.83	6.64	17.689	
1,700.00	1,698.38	1,695.97	1,695.09	3.56	3.54	107.38	-22.65	-114.96	122.26	115.18	7.08	17.273	
1,800.00	1,798.13	1,795.86	1,794.73	3.80	3.75	107.48	-28.36	-118.95	127.05	119.52	7.53	16.881	
1,900.00	1,897.89	1,895.74	1,894.37	4.04	3.98	107.58	-34.07	-122.94	131.84	123.86	7.98	16.514	
2,000.00	1,997.65	1,995.63	1,994.02	4.28	4.20	107.66	-39.78	-126.93	136.63	128.18	8.45	16.173	
2,100.00	2,097.40	2,095.51	2,093.66	4.53	4.43	107.74	-45.49	-130.92	141.42	132.50	8.92	15.856	
2,200.00	2,197.16	2,195.40	2,193.30	4.78	4.67	107.82	-51.20	-134.91	146.21	136.81	9.40	15.561	
2,300.00	2,296.91	2,295.28	2,292.94	5.03	4.91	107.89	-56.91	-138.90	151.00	141.12	9.88	15.288	
2,400.00	2,396.67	2,395.17	2,392.58	5.28	5.15	107.96	-62.62	-142.90	155.79	145.42	10.36	15.035	
2,500.00	2,496.43	2,495.05	2,492.23	5.53	5.39	108.02	-68.33	-146.89	160.58	149.73	10.85	14.799	
2,600.00	2,596.18	2,594.94	2,591.87	5.78	5.63	108.08	-74.05	-150.88	165.37	154.02	11.34	14.580	
2,700.00	2,695.94	2,694.83	2,691.51	6.04	5.88	108.13	-79.76	-154.87	170.16	158.32	11.84	14.376	
2,800.00	2,795.70	2,794.71	2,791.15	6.29	6.13	108.19	-85.47	-158.86	174.95	162.61	12.33	14.186	
2,900.00	2,895.45	2,894.60	2,890.79	6.55	6.38	108.24	-91.18	-162.85	179.74	166.91	12.83	14.008	
3,000.00	2,995.21	2,994.48	2,990.43	6.81	6.63	108.28	-96.89	-166.85	184.53	171.20	13.33	13.842	
3,100.00	3,094.97	3,094.37	3,090.08	7.06	6.88	108.33	-102.60	-170.84	189.32	175.49	13.83	13.686	
3,200.00	3,194.72	3,194.25	3,189.72	7.32	7.13	108.37	-108.31	-174.83	194.11	179.77	14.34	13.539	
3,300.00	3,294.48	3,294.14	3,289.36	7.58	7.38	108.41	-114.02	-178.82	198.90	184.06	14.84	13.402	
3,400.00	3,394.23	3,394.02	3,389.00	7.84	7.64	108.45	-119.73	-182.81	203.69	188.34	15.35	13.272	
3,500.00	3,493.99	3,493.91	3,488.64	8.10	7.89	108.49	-125.44	-186.80	208.48	192.63	15.85	13.150	
3,600.00	3,593.75	3,593.79	3,588.28	8.36	8.15	108.52	-131.16	-190.79	213.27	196.91	16.36	13.034	
3,700.00	3,693.50	3,693.68	3,687.93	8.62	8.40	108.56	-136.87	-194.79	218.07	201.19	16.87	12.925	
3,800.00	3,793.26	3,793.56	3,787.57	8.88	8.66	108.59	-142.58	-198.78	222.86	205.48	17.38	12.822	
3,900.00	3,893.02	3,893.45	3,887.21	9.14	8.92	108.62	-148.29	-202.77	227.65	209.76	17.89	12.724	
4,000.00	3,992.77	3,993.33	3,986.85	9.40	9.17	108.65	-154.00	-206.76	232.44	214.04	18.40	12.631	
4,100.00	4,092.53	4,093.22	4,086.49	9.66	9.43	108.68	-159.71	-210.75	237.23	218.32	18.91	12.542	
4,200.00	4,192.29	4,193.10	4,186.13	9.92	9.69	108.70	-165.42	-214.74	242.02	222.60	19.43	12.458	
4,300.00	4,292.04	4,292.99	4,285.78	10.18	9.95	108.73	-171.13	-218.73	246.82	226.88	19.94	12.378	
4,400.00	4,391.80	4,392.87	4,385.42	10.45	10.21	108.76	-176.84	-222.73	251.61	231.16	20.45	12.302	
4,500.00	4,491.56	4,492.76	4,485.06	10.71	10.47	108.78	-182.55	-226.72	256.40	235.43	20.97	12.229	
4,600.00	4,591.31	4,592.64	4,584.70	10.97	10.73	108.80	-188.27	-230.71	261.19	239.71	21.48	12.159	
4,700.00	4,691.07	4,692.53	4,684.34	11.23	10.98	108.83	-193.98	-234.70	265.98	243.99	22.00	12.093	
4,800.00	4,790.82	4,792.41	4,783.99	11.49	11.24	108.85	-199.69	-238.69	270.78	248.27	22.51	12.029	
4,900.00	4,890.58	4,892.30	4,883.63	11.76	11.50	108.87	-205.40	-242.68	275.57	252.54	23.03	11.968	
5,000.00	4,990.34	4,992.18	4,983.27	12.02	11.76	108.89	-211.11	-246.68	280.36	256.82	23.54	11.909	
5,100.00	5,090.09	5,092.07	5,082.91	12.28	12.03	108.91	-216.82	-250.67	285.15	261.10	24.06	11.853	

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

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor Federal #12F-1305A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor Federal #12F-1305A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #3	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design S12-T10N-R58W - Razor Federal #12F-1302B - HZ - Plan #2										Offset Site Error:		0.00 usft	
Survey Program: 0-ISCSWA MWD										Offset Well Error:		0.00 usft	
Reference		Offset		Semi Major Axis			Distance					Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis		Separation Factor
5,200.00	5,189.85	5,191.95	5,182.55	12.54	12.29	108.93	-222.53	-254.66	289.95	265.37	24.57	11.799	
5,300.00	5,289.61	5,291.84	5,282.19	12.81	12.55	108.95	-228.24	-258.65	294.74	269.65	25.09	11.747	SF
5,400.00	5,388.94	5,391.51	5,381.62	13.10	12.81	109.20	-233.94	-262.63	300.78	275.18	25.60	11.751	
5,500.00	5,484.71	5,480.98	5,470.70	13.56	13.06	110.85	-240.50	-267.22	313.94	287.83	26.11	12.025	
5,600.00	5,573.33	5,562.08	5,549.59	14.18	13.38	111.44	-255.65	-277.81	338.91	312.18	26.72	12.682	
5,700.00	5,651.55	5,641.61	5,623.24	15.00	13.80	110.73	-280.07	-294.88	375.23	347.65	27.58	13.604	
5,800.00	5,716.49	5,718.88	5,689.66	16.02	14.33	108.67	-312.33	-317.42	421.36	392.50	28.85	14.604	
5,900.00	5,765.76	5,793.72	5,747.76	17.23	14.94	105.29	-350.91	-344.39	475.52	444.84	30.68	15.501	
6,000.00	5,797.56	5,866.53	5,797.25	18.59	15.65	100.77	-394.62	-374.93	535.88	502.92	32.96	16.259	
6,100.00	5,810.71	5,938.29	5,838.29	20.07	16.45	95.36	-442.81	-408.61	600.63	565.13	35.50	16.921	
6,200.00	5,811.05	6,014.97	5,872.77	21.51	17.42	96.92	-498.88	-447.80	666.33	628.52	37.81	17.624	

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor Federal #12F-1305A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor Federal #12F-1305A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #3	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design S12-T10N-R58W - Razor Federal #12F-1303A - HZ - Plan #3												Offset Site Error:	0.00 usft
Survey Program: 0-ISCSWA MWD												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor	Warning
0.00	0.00	0.00	0.00	0.00	0.00	-90.00	0.00	-66.09	66.09				
100.00	100.00	100.00	100.00	0.09	0.09	-90.00	0.00	-66.09	66.09	65.90	0.19	353.354	
200.00	200.00	200.00	200.00	0.32	0.32	-90.00	0.00	-66.09	66.09	65.45	0.64	103.819	
300.00	300.00	300.00	300.00	0.54	0.54	-90.00	0.00	-66.09	66.09	65.00	1.09	60.848	
400.00	400.00	400.00	400.00	0.77	0.77	-90.00	0.00	-66.09	66.09	64.55	1.54	43.036	
500.00	500.00	500.00	500.00	0.99	0.99	-90.00	0.00	-66.09	66.09	64.10	1.99	33.291	CC, ES
600.00	600.00	599.03	599.01	1.22	1.19	-91.34	-1.56	-66.78	66.81	64.40	2.41	27.762	
700.00	700.00	697.83	697.68	1.44	1.38	-95.18	-6.24	-68.85	69.17	66.36	2.82	24.552	
800.00	800.00	797.56	797.16	1.67	1.58	-99.97	-12.60	-71.67	72.83	69.58	3.25	22.417	
900.00	900.00	897.32	896.68	1.89	1.81	-104.28	-18.96	-74.49	76.94	73.25	3.69	20.848	
1,000.00	999.98	997.16	996.28	2.09	2.04	78.23	-25.33	-77.31	81.07	76.97	4.10	19.753	
1,100.00	1,099.84	1,097.10	1,095.97	2.27	2.28	78.06	-31.70	-80.14	84.57	80.06	4.51	18.755	
1,200.00	1,199.59	1,197.03	1,195.66	2.46	2.53	79.08	-38.08	-82.96	87.73	82.79	4.94	17.772	
1,300.00	1,299.35	1,296.97	1,295.36	2.66	2.78	80.03	-44.45	-85.79	90.91	85.53	5.38	16.898	
1,400.00	1,399.11	1,396.91	1,395.05	2.87	3.03	80.92	-50.83	-88.61	94.12	88.28	5.84	16.126	
1,500.00	1,498.86	1,496.85	1,494.75	3.10	3.28	81.75	-57.20	-91.43	97.34	91.04	6.30	15.443	
1,600.00	1,598.62	1,596.79	1,594.44	3.33	3.54	82.52	-63.57	-94.26	100.59	93.81	6.78	14.839	
1,700.00	1,698.38	1,696.73	1,694.14	3.56	3.79	83.25	-69.95	-97.08	103.85	96.59	7.26	14.303	
1,800.00	1,798.13	1,796.66	1,793.83	3.80	4.05	83.93	-76.32	-99.91	107.13	99.38	7.75	13.825	
1,900.00	1,897.89	1,896.60	1,893.53	4.04	4.31	84.57	-82.69	-102.73	110.42	102.18	8.24	13.399	
2,000.00	1,997.65	1,996.54	1,993.22	4.28	4.57	85.17	-89.07	-105.56	113.73	104.99	8.74	13.015	
2,100.00	2,097.40	2,096.48	2,092.92	4.53	4.83	85.74	-95.44	-108.38	117.05	107.81	9.24	12.670	
2,200.00	2,197.16	2,196.42	2,192.61	4.78	5.09	86.28	-101.81	-111.21	120.37	110.63	9.74	12.358	
2,300.00	2,296.91	2,296.36	2,292.31	5.03	5.35	86.79	-108.19	-114.03	123.71	113.47	10.25	12.074	
2,400.00	2,396.67	2,396.30	2,392.00	5.28	5.61	87.27	-114.56	-116.85	127.06	116.31	10.75	11.816	
2,500.00	2,496.43	2,496.23	2,491.70	5.53	5.87	87.73	-120.93	-119.68	130.42	119.15	11.26	11.579	
2,600.00	2,596.18	2,596.17	2,591.39	5.78	6.13	88.17	-127.31	-122.50	133.78	122.01	11.77	11.363	
2,700.00	2,695.94	2,696.11	2,691.09	6.04	6.40	88.58	-133.68	-125.33	137.15	124.87	12.29	11.163	
2,800.00	2,795.70	2,796.05	2,790.78	6.29	6.66	88.97	-140.06	-128.15	140.53	127.73	12.80	10.980	
2,900.00	2,895.45	2,895.99	2,890.48	6.55	6.92	89.35	-146.43	-130.98	143.92	130.60	13.31	10.809	
3,000.00	2,995.21	2,995.93	2,990.17	6.81	7.18	89.71	-152.80	-133.80	147.31	133.48	13.83	10.652	
3,100.00	3,094.97	3,095.86	3,089.87	7.06	7.45	90.05	-159.18	-136.62	150.70	136.36	14.35	10.505	
3,200.00	3,194.72	3,195.80	3,189.56	7.32	7.71	90.38	-165.55	-139.45	154.10	139.24	14.86	10.368	
3,300.00	3,294.48	3,295.74	3,289.25	7.58	7.97	90.69	-171.92	-142.27	157.51	142.13	15.38	10.241	
3,400.00	3,394.23	3,395.68	3,388.95	7.84	8.24	90.99	-178.30	-145.10	160.92	145.02	15.90	10.121	
3,500.00	3,493.99	3,495.62	3,488.64	8.10	8.50	91.27	-184.67	-147.92	164.34	147.92	16.42	10.009	
3,600.00	3,593.75	3,595.56	3,588.34	8.36	8.76	91.55	-191.04	-150.75	167.75	150.82	16.94	9.904	
3,700.00	3,693.50	3,695.49	3,688.03	8.62	9.03	91.81	-197.42	-153.57	171.18	153.72	17.46	9.805	
3,800.00	3,793.26	3,795.43	3,787.73	8.88	9.29	92.07	-203.79	-156.40	174.60	156.62	17.98	9.712	
3,900.00	3,893.02	3,895.37	3,887.42	9.14	9.55	92.31	-210.16	-159.22	178.03	159.53	18.50	9.624	
4,000.00	3,992.77	3,995.31	3,987.12	9.40	9.82	92.55	-216.54	-162.04	181.46	162.44	19.02	9.541	
4,100.00	4,092.53	4,095.25	4,086.81	9.66	10.08	92.77	-222.91	-164.87	184.90	165.36	19.54	9.462	
4,200.00	4,192.29	4,195.19	4,186.51	9.92	10.34	92.99	-229.29	-167.69	188.34	168.27	20.06	9.387	
4,300.00	4,292.04	4,295.12	4,286.20	10.18	10.61	93.20	-235.66	-170.52	191.78	171.19	20.58	9.316	
4,400.00	4,391.80	4,395.06	4,385.90	10.45	10.87	93.40	-242.03	-173.34	195.22	174.11	21.11	9.249	
4,500.00	4,491.56	4,495.00	4,485.59	10.71	11.13	93.60	-248.41	-176.17	198.67	177.04	21.63	9.185	
4,600.00	4,591.31	4,594.94	4,585.29	10.97	11.40	93.79	-254.78	-178.99	202.11	179.96	22.15	9.124	
4,700.00	4,691.07	4,694.88	4,684.98	11.23	11.66	93.97	-261.15	-181.82	205.56	182.89	22.68	9.066	
4,800.00	4,790.82	4,794.82	4,784.68	11.49	11.93	94.15	-267.53	-184.64	209.02	185.82	23.20	9.010	
4,900.00	4,890.58	4,894.75	4,884.37	11.76	12.19	94.32	-273.90	-187.46	212.47	188.75	23.72	8.957	
5,000.00	4,990.34	4,994.69	4,984.07	12.02	12.45	94.48	-280.27	-190.29	215.92	191.68	24.24	8.906	
5,100.00	5,090.09	5,094.63	5,083.76	12.28	12.72	94.64	-286.65	-193.11	219.38	194.61	24.77	8.857	

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

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor Federal #12F-1305A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor Federal #12F-1305A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #3	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design S12-T10N-R58W - Razor Federal #12F-1303A - HZ - Plan #3													Offset Site Error: 0.00 usft	
Survey Program: 0-ISCWSA MWD													Offset Well Error: 0.00 usft	
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor		
5,200.00	5,189.85	5,194.57	5,183.46	12.54	12.98	94.80	-293.02	-195.94	222.84	197.55	25.29	8.811		
5,300.00	5,289.61	5,294.51	5,283.15	12.81	13.25	94.95	-299.40	-198.76	226.30	200.49	25.82	8.766		
5,400.00	5,388.94	5,385.80	5,374.01	13.10	13.51	94.99	-307.21	-202.23	231.15	204.79	26.36	8.768		
5,500.00	5,484.71	5,469.87	5,455.53	13.56	13.87	94.92	-325.62	-210.41	243.48	216.34	27.13	8.973		
5,600.00	5,573.33	5,550.00	5,529.26	14.18	14.32	94.56	-354.10	-223.08	263.66	235.51	28.15	9.366		
5,700.00	5,651.55	5,634.19	5,600.63	15.00	14.94	94.01	-394.76	-241.16	291.02	261.52	29.50	9.864		
5,800.00	5,716.49	5,714.15	5,660.93	16.02	15.65	92.94	-442.63	-262.46	324.75	293.55	31.20	10.409		
5,900.00	5,765.76	5,792.96	5,711.84	17.23	16.48	91.40	-497.49	-286.87	363.79	330.58	33.21	10.954		
6,000.00	5,797.56	5,871.24	5,752.88	18.59	17.42	89.45	-558.32	-313.93	406.99	371.49	35.50	11.464		
6,100.00	5,810.71	5,950.00	5,783.64	20.07	18.46	87.22	-624.49	-343.38	453.11	415.10	38.01	11.921		
6,200.00	5,811.05	6,032.71	5,803.81	21.51	19.66	89.07	-697.69	-375.95	499.59	458.75	40.84	12.233		
6,300.00	5,811.05	6,123.24	5,811.08	22.87	21.03	90.00	-780.04	-412.59	542.28	498.52	43.76	12.392		
6,400.00	5,811.05	6,254.62	5,811.08	24.50	22.87	90.00	-901.89	-461.62	579.64	532.39	47.24	12.269		
6,500.00	5,811.05	6,392.89	5,811.07	26.17	24.82	90.00	-1,033.46	-504.04	610.35	559.48	50.87	11.998		
6,600.00	5,811.05	6,537.05	5,811.07	27.87	26.93	90.00	-1,173.53	-538.02	633.95	579.22	54.73	11.583		
6,700.00	5,811.05	6,685.77	5,811.07	29.60	29.17	90.00	-1,320.28	-561.90	650.03	591.28	58.75	11.064		
6,800.00	5,811.05	6,837.38	5,811.07	31.35	31.48	90.00	-1,471.34	-574.42	658.30	595.42	62.88	10.469		
6,900.00	5,811.05	6,965.74	5,811.07	33.12	33.47	90.00	-1,599.67	-576.18	659.47	592.76	66.71	9.886		
7,000.00	5,811.05	7,065.74	5,811.07	34.90	35.08	90.00	-1,699.67	-576.17	659.47	589.29	70.18	9.397		
7,100.00	5,811.04	7,165.74	5,811.07	36.70	36.73	90.00	-1,799.67	-576.17	659.47	585.78	73.69	8.949		
7,200.00	5,811.04	7,265.74	5,811.07	38.51	38.41	90.00	-1,899.67	-576.16	659.47	582.23	77.24	8.538		
7,300.00	5,811.04	7,365.74	5,811.06	40.33	40.10	90.00	-1,999.67	-576.16	659.47	578.66	80.81	8.161		
7,400.00	5,811.04	7,465.74	5,811.06	42.16	41.82	90.00	-2,099.67	-576.15	659.47	575.07	84.41	7.813		
7,500.00	5,811.04	7,565.74	5,811.06	44.00	43.55	90.00	-2,199.67	-576.14	659.47	571.45	88.03	7.492		
7,600.00	5,811.04	7,665.74	5,811.06	45.85	45.30	90.00	-2,299.67	-576.14	659.47	567.81	91.66	7.195		
7,700.00	5,811.04	7,765.74	5,811.06	47.70	47.06	90.00	-2,399.67	-576.13	659.48	564.16	95.32	6.919		
7,800.00	5,811.04	7,865.74	5,811.06	49.55	48.84	90.00	-2,499.67	-576.12	659.48	560.49	98.99	6.662		
7,900.00	5,811.04	7,965.74	5,811.06	51.41	50.62	90.00	-2,599.67	-576.12	659.48	556.81	102.67	6.423		
8,000.00	5,811.04	8,065.74	5,811.06	53.28	52.42	90.00	-2,699.67	-576.11	659.48	553.12	106.36	6.200		
8,100.00	5,811.04	8,165.74	5,811.06	55.15	54.22	90.00	-2,799.67	-576.11	659.48	549.42	110.06	5.992		
8,200.00	5,811.03	8,265.74	5,811.05	57.02	56.03	90.00	-2,899.67	-576.10	659.48	545.71	113.78	5.796		
8,300.00	5,811.03	8,365.74	5,811.05	58.90	57.85	90.00	-2,999.67	-576.09	659.48	541.98	117.50	5.613		
8,400.00	5,811.03	8,465.74	5,811.05	60.78	59.67	90.00	-3,099.67	-576.09	659.49	538.26	121.23	5.440		
8,500.00	5,811.03	8,565.74	5,811.05	62.66	61.50	90.00	-3,199.67	-576.08	659.49	534.52	124.97	5.277		
8,600.00	5,811.03	8,665.74	5,811.05	64.54	63.34	90.00	-3,299.67	-576.07	659.49	530.78	128.71	5.124		
8,700.00	5,811.03	8,765.74	5,811.05	66.43	65.18	90.00	-3,399.67	-576.07	659.49	527.03	132.46	4.979		
8,800.00	5,811.03	8,865.74	5,811.05	68.32	67.03	90.00	-3,499.67	-576.06	659.49	523.28	136.21	4.842		
8,900.00	5,811.03	8,965.74	5,811.05	70.21	68.87	90.00	-3,599.67	-576.06	659.49	519.52	139.97	4.712		
9,000.00	5,811.03	9,065.74	5,811.04	72.10	70.73	90.00	-3,699.67	-576.05	659.49	515.76	143.73	4.588		
9,100.00	5,811.03	9,165.74	5,811.04	73.99	72.59	90.00	-3,799.67	-576.04	659.50	511.99	147.50	4.471		
9,200.00	5,811.03	9,265.74	5,811.04	75.88	74.45	90.00	-3,899.67	-576.04	659.50	508.22	151.27	4.360		
9,300.00	5,811.03	9,365.74	5,811.04	77.78	76.31	90.00	-3,999.67	-576.03	659.50	504.45	155.05	4.254		
9,400.00	5,811.02	9,465.74	5,811.04	79.68	78.18	90.00	-4,099.67	-576.02	659.50	500.67	158.83	4.152		
9,500.00	5,811.02	9,565.74	5,811.04	81.58	80.05	90.00	-4,199.67	-576.02	659.50	496.89	162.61	4.056		
9,600.00	5,811.02	9,665.74	5,811.04	83.47	81.92	90.00	-4,299.67	-576.01	659.50	493.11	166.39	3.964		
9,700.00	5,811.02	9,765.74	5,811.04	85.37	83.79	90.00	-4,399.67	-576.01	659.50	489.32	170.18	3.875		
9,800.00	5,811.02	9,865.74	5,811.03	87.28	85.67	90.00	-4,499.67	-576.00	659.50	485.54	173.97	3.791		
9,900.00	5,811.02	9,965.74	5,811.03	89.18	87.54	90.00	-4,599.67	-575.99	659.51	481.74	177.76	3.710		
10,000.00	5,811.02	10,065.74	5,811.03	91.08	89.42	90.00	-4,699.67	-575.99	659.51	477.95	181.56	3.633		
10,100.00	5,811.02	10,165.74	5,811.03	92.98	91.31	90.00	-4,799.67	-575.98	659.51	474.16	185.35	3.558		
10,200.00	5,811.02	10,265.74	5,811.03	94.89	93.19	90.00	-4,899.67	-575.97	659.51	470.36	189.15	3.487		
10,300.00	5,811.02	10,365.74	5,811.03	96.79	95.07	90.00	-4,999.67	-575.97	659.51	466.56	192.95	3.418		

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

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor Federal #12F-1305A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor Federal #12F-1305A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #3	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design S12-T10N-R58W - Razor Federal #12F-1303A - HZ - Plan #3													Offset Site Error: 0.00 usft	
Survey Program: 0-ISCWSA MWD													Offset Well Error: 0.00 usft	
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor		
10,400.00	5,811.02	10,465.74	5,811.03	98.70	96.96	90.00	-5,099.67	-575.96	659.51	462.76	196.75	3.352		
10,500.00	5,811.01	10,565.74	5,811.03	100.61	98.85	90.00	-5,199.67	-575.96	659.51	458.96	200.55	3.288		
10,600.00	5,811.01	10,665.74	5,811.02	102.51	100.74	90.00	-5,299.67	-575.95	659.52	455.16	204.36	3.227		
10,700.00	5,811.01	10,765.74	5,811.02	104.42	102.63	90.00	-5,399.67	-575.94	659.52	451.35	208.17	3.168		
10,800.00	5,811.01	10,865.74	5,811.02	106.33	104.52	90.00	-5,499.67	-575.94	659.52	447.55	211.97	3.111		
10,900.00	5,811.01	10,965.74	5,811.02	108.24	106.41	90.00	-5,599.67	-575.93	659.52	443.74	215.78	3.056		
11,000.00	5,811.01	11,065.74	5,811.02	110.15	108.30	90.00	-5,699.67	-575.92	659.52	439.93	219.59	3.003		
11,100.00	5,811.01	11,165.74	5,811.02	112.06	110.20	90.00	-5,799.67	-575.92	659.52	436.12	223.40	2.952		
11,200.00	5,811.01	11,265.74	5,811.02	113.96	112.09	90.00	-5,899.67	-575.91	659.52	432.31	227.21	2.903		
11,300.00	5,811.01	11,365.74	5,811.02	115.88	113.99	90.00	-5,999.67	-575.91	659.52	428.50	231.03	2.855		
11,400.00	5,811.01	11,465.74	5,811.01	117.79	115.89	90.00	-6,099.67	-575.90	659.53	424.68	234.84	2.808		
11,500.00	5,811.01	11,565.74	5,811.01	119.70	117.78	90.00	-6,199.67	-575.89	659.53	420.87	238.66	2.763		
11,600.00	5,811.01	11,665.74	5,811.01	121.61	119.68	90.00	-6,299.67	-575.89	659.53	417.05	242.47	2.720		
11,700.00	5,811.00	11,765.74	5,811.01	123.52	121.58	90.00	-6,399.67	-575.88	659.53	413.24	246.29	2.678		
11,800.00	5,811.00	11,865.74	5,811.01	125.43	123.48	90.00	-6,499.67	-575.87	659.53	409.42	250.11	2.637		
11,900.00	5,811.00	11,965.74	5,811.01	127.34	125.38	90.00	-6,599.67	-575.87	659.53	405.61	253.93	2.597		
12,000.00	5,811.00	12,065.74	5,811.01	129.26	127.28	90.00	-6,699.67	-575.86	659.53	401.79	257.75	2.559		
12,100.00	5,811.00	12,165.74	5,811.01	131.17	129.19	90.00	-6,799.67	-575.86	659.54	397.97	261.57	2.521		
12,200.00	5,811.00	12,265.74	5,811.00	133.08	131.09	90.00	-6,899.67	-575.85	659.54	394.15	265.39	2.485		
12,300.00	5,811.00	12,365.74	5,811.00	134.99	132.99	90.00	-6,999.67	-575.84	659.54	390.33	269.21	2.450		
12,400.00	5,811.00	12,465.74	5,811.00	136.91	134.90	90.00	-7,099.67	-575.84	659.54	386.51	273.03	2.416		
12,500.00	5,811.00	12,565.74	5,811.00	138.82	136.80	90.00	-7,199.67	-575.83	659.54	382.69	276.85	2.382		
12,600.00	5,811.00	12,665.74	5,811.00	140.74	138.70	90.00	-7,299.67	-575.82	659.54	378.87	280.68	2.350		
12,700.00	5,811.00	12,765.74	5,811.00	142.65	140.61	90.00	-7,399.67	-575.82	659.54	375.04	284.50	2.318		
12,800.00	5,810.99	12,865.74	5,811.00	144.56	142.52	90.00	-7,499.67	-575.81	659.54	371.22	288.32	2.288		
12,900.00	5,810.99	12,965.74	5,811.00	146.48	144.42	90.00	-7,599.67	-575.81	659.55	367.40	292.15	2.258		
13,000.00	5,810.99	13,065.74	5,811.00	148.39	146.33	90.00	-7,699.67	-575.80	659.55	363.57	295.97	2.228		
13,100.00	5,810.99	13,165.74	5,810.99	150.31	148.23	90.00	-7,799.67	-575.79	659.55	359.75	299.80	2.200		
13,200.00	5,810.99	13,265.74	5,810.99	152.22	150.14	90.00	-7,899.67	-575.79	659.55	355.92	303.63	2.172		
13,300.00	5,810.99	13,365.74	5,810.99	154.14	152.05	90.00	-7,999.67	-575.78	659.55	352.10	307.45	2.145		
13,400.00	5,810.99	13,465.74	5,810.99	156.05	153.96	90.00	-8,099.67	-575.77	659.55	348.27	311.28	2.119		
13,500.00	5,810.99	13,565.74	5,810.99	157.97	155.87	90.00	-8,199.67	-575.77	659.55	344.45	315.11	2.093		
13,541.60	5,810.99	13,607.35	5,810.99	158.77	156.66	90.00	-8,241.27	-575.77	659.55	342.85	316.70	2.083 SF		



# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor Federal #12F-1305A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor Federal #12F-1305A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #3	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design S12-T10N-R58W - Razor Federal #12F-1304B - HZ - Plan #2												Offset Site Error:	0.00 usft
Survey Program: 0-ISCSWA MWD												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor	Warning
0.00	0.00	0.01	0.01	0.00	0.00	-90.03	-0.02	-33.04	33.04				
100.00	100.00	100.01	100.01	0.09	0.09	-90.03	-0.02	-33.04	33.04	32.86	0.19	176.666	
200.00	200.00	200.01	200.01	0.32	0.32	-90.03	-0.02	-33.04	33.04	32.41	0.64	51.909	
300.00	300.00	300.01	300.01	0.54	0.54	-90.03	-0.02	-33.04	33.04	31.96	1.09	30.424	
400.00	400.00	400.01	400.01	0.77	0.77	-90.03	-0.02	-33.04	33.04	31.51	1.54	21.518	
500.00	500.00	500.01	500.01	0.99	0.99	-90.03	-0.02	-33.04	33.04	31.06	1.99	16.645	
600.00	600.00	600.01	600.01	1.22	1.22	-90.03	-0.02	-33.04	33.04	30.61	2.43	13.572	
700.00	700.00	700.01	700.01	1.44	1.44	-90.03	-0.02	-33.04	33.04	30.16	2.88	11.457	
800.00	800.00	800.01	800.01	1.67	1.67	-90.03	-0.02	-33.04	33.04	29.71	3.33	9.912	
900.00	900.00	900.01	900.01	1.89	1.89	-90.03	-0.02	-33.04	33.04	29.26	3.78	8.734 CC	
1,000.00	999.98	999.99	999.99	2.09	2.12	98.21	-0.02	-33.04	33.25	29.04	4.20	7.909 ES	
1,100.00	1,099.84	1,099.85	1,099.85	2.27	2.34	106.84	-0.02	-33.04	34.39	29.78	4.60	7.469	
1,200.00	1,199.59	1,199.79	1,199.77	2.46	2.54	114.56	-1.71	-33.41	36.76	31.77	4.99	7.367	
1,300.00	1,299.35	1,299.95	1,299.78	2.66	2.72	116.27	-6.84	-34.51	39.02	33.66	5.37	7.272	
1,400.00	1,399.11	1,399.92	1,399.52	2.87	2.90	115.38	-13.65	-35.97	41.03	35.27	5.77	7.118	
1,500.00	1,498.86	1,499.90	1,499.25	3.10	3.10	114.57	-20.47	-37.43	43.05	36.87	6.18	6.963	
1,600.00	1,598.62	1,599.88	1,598.99	3.33	3.31	113.84	-27.29	-38.89	45.08	38.46	6.62	6.814	
1,700.00	1,698.38	1,699.86	1,698.72	3.56	3.52	113.17	-34.11	-40.35	47.11	40.05	7.06	6.671	
1,800.00	1,798.13	1,799.84	1,798.46	3.80	3.74	112.56	-40.93	-41.82	49.15	41.64	7.52	6.537	
1,900.00	1,897.89	1,899.81	1,898.19	4.04	3.97	111.99	-47.75	-43.28	51.20	43.21	7.98	6.412	
2,000.00	1,997.65	1,999.79	1,997.92	4.28	4.20	111.47	-54.57	-44.74	53.25	44.79	8.46	6.296	
2,100.00	2,097.40	2,099.77	2,097.66	4.53	4.44	110.98	-61.39	-46.20	55.30	46.37	8.94	6.188	
2,200.00	2,197.16	2,199.75	2,197.39	4.78	4.68	110.54	-68.21	-47.66	57.36	47.94	9.42	6.088	
2,300.00	2,296.91	2,299.73	2,297.13	5.03	4.92	110.12	-75.03	-49.12	59.42	49.51	9.91	5.996	
2,400.00	2,396.67	2,399.70	2,396.86	5.28	5.16	109.73	-81.85	-50.59	61.48	51.08	10.40	5.910	
2,500.00	2,496.43	2,499.68	2,496.60	5.53	5.41	109.36	-88.67	-52.05	63.55	52.65	10.90	5.831	
2,600.00	2,596.18	2,599.66	2,596.33	5.78	5.65	109.02	-95.48	-53.51	65.62	54.22	11.40	5.757	
2,700.00	2,695.94	2,699.64	2,696.06	6.04	5.90	108.70	-102.30	-54.97	67.69	55.79	11.90	5.688	
2,800.00	2,795.70	2,799.61	2,795.80	6.29	6.15	108.40	-109.12	-56.43	69.76	57.36	12.40	5.624	
2,900.00	2,895.45	2,899.59	2,895.53	6.55	6.40	108.12	-115.94	-57.90	71.84	58.93	12.91	5.564	
3,000.00	2,995.21	2,999.57	2,995.27	6.81	6.66	107.85	-122.76	-59.36	73.91	60.50	13.42	5.508	
3,100.00	3,094.97	3,099.55	3,095.00	7.06	6.91	107.59	-129.58	-60.82	75.99	62.06	13.93	5.456	
3,200.00	3,194.72	3,199.53	3,194.74	7.32	7.16	107.35	-136.40	-62.28	78.07	63.63	14.44	5.407	
3,300.00	3,294.48	3,299.50	3,294.47	7.58	7.42	107.13	-143.22	-63.74	80.15	65.20	14.95	5.361	
3,400.00	3,394.23	3,399.48	3,394.20	7.84	7.67	106.91	-150.04	-65.21	82.23	66.77	15.46	5.318	
3,500.00	3,493.99	3,499.46	3,493.94	8.10	7.93	106.71	-156.86	-66.67	84.32	68.34	15.98	5.277	
3,600.00	3,593.75	3,599.44	3,593.67	8.36	8.19	106.51	-163.68	-68.13	86.40	69.91	16.49	5.239	
3,700.00	3,693.50	3,699.42	3,693.41	8.62	8.44	106.32	-170.50	-69.59	88.49	71.48	17.01	5.202	
3,800.00	3,793.26	3,799.39	3,793.14	8.88	8.70	106.15	-177.31	-71.05	90.57	73.05	17.53	5.168	
3,900.00	3,893.02	3,899.37	3,892.88	9.14	8.96	105.98	-184.13	-72.52	92.66	74.61	18.04	5.135	
4,000.00	3,992.77	3,999.35	3,992.61	9.40	9.22	105.81	-190.95	-73.98	94.75	76.18	18.56	5.104	
4,100.00	4,092.53	4,099.33	4,092.35	9.66	9.48	105.66	-197.77	-75.44	96.83	77.75	19.08	5.075	
4,200.00	4,192.29	4,199.30	4,192.08	9.92	9.74	105.51	-204.59	-76.90	98.92	79.32	19.60	5.047	
4,300.00	4,292.04	4,299.28	4,291.81	10.18	10.00	105.37	-211.41	-78.36	101.01	80.89	20.12	5.021	
4,400.00	4,391.80	4,399.26	4,391.55	10.45	10.26	105.23	-218.23	-79.82	103.10	82.46	20.64	4.995	
4,500.00	4,491.56	4,499.24	4,491.28	10.71	10.52	105.10	-225.05	-81.29	105.19	84.03	21.16	4.971	
4,600.00	4,591.31	4,599.22	4,591.02	10.97	10.78	104.97	-231.87	-82.75	107.28	85.60	21.68	4.948	
4,700.00	4,691.07	4,699.19	4,690.75	11.23	11.04	104.85	-238.69	-84.21	109.37	87.17	22.20	4.926	
4,800.00	4,790.82	4,799.17	4,790.49	11.49	11.30	104.74	-245.51	-85.67	111.47	88.74	22.72	4.905	
4,900.00	4,890.58	4,899.15	4,890.22	11.76	11.56	104.62	-252.33	-87.13	113.56	90.31	23.25	4.885	
5,000.00	4,990.34	4,999.13	4,989.95	12.02	11.82	104.51	-259.14	-88.60	115.65	91.88	23.77	4.866	
5,100.00	5,090.09	5,099.11	5,089.69	12.28	12.08	104.41	-265.96	-90.06	117.75	93.46	24.29	4.847	

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

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor Federal #12F-1305A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor Federal #12F-1305A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #3	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design S12-T10N-R58W - Razor Federal #12F-1304B - HZ - Plan #2													Offset Site Error: 0.00 usft	
Survey Program: 0-ISCWSA MWD													Offset Well Error: 0.00 usft	
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor		
5,200.00	5,189.85	5,199.08	5,189.42	12.54	12.34	104.31	-272.78	-91.52	119.84	95.03	24.81	4.830		
5,300.00	5,289.61	5,299.06	5,289.16	12.81	12.60	104.21	-279.60	-92.98	121.93	96.60	25.34	4.813		
5,400.00	5,388.94	5,398.87	5,388.73	13.10	12.86	105.56	-286.41	-94.44	125.01	99.15	25.86	4.834		
5,500.00	5,484.71	5,497.98	5,487.22	13.56	13.15	111.93	-296.53	-96.61	134.08	107.75	26.33	5.093		
5,600.00	5,573.33	5,599.86	5,584.89	14.18	13.60	116.68	-324.27	-102.56	150.35	123.54	26.81	5.608		
5,700.00	5,651.55	5,704.68	5,677.66	15.00	14.26	118.96	-371.63	-112.71	172.28	144.81	27.47	6.272		
5,800.00	5,716.49	5,812.31	5,760.85	16.02	15.14	119.11	-438.10	-126.96	198.34	169.74	28.61	6.934		
5,900.00	5,765.76	5,922.66	5,829.80	17.23	16.27	117.61	-522.08	-144.97	227.24	196.75	30.49	7.452		
6,000.00	5,797.56	6,035.68	5,880.08	18.59	17.65	114.93	-620.82	-166.13	257.82	224.63	33.19	7.768		
6,100.00	5,810.71	6,151.39	5,907.81	20.07	19.25	111.44	-730.42	-189.63	288.96	252.39	36.58	7.900		
6,200.00	5,811.05	6,267.90	5,912.29	21.51	20.93	109.16	-844.27	-213.42	316.17	275.96	40.20	7.864		
6,300.00	5,811.05	6,385.27	5,912.29	22.87	22.52	107.83	-960.21	-231.57	333.02	289.50	43.53	7.651		
6,400.00	5,811.05	6,505.04	5,912.29	24.50	24.20	107.25	-1,079.45	-242.71	341.91	295.04	46.87	7.295		
6,500.00	5,811.05	6,625.32	5,912.29	26.17	25.97	107.07	-1,199.65	-246.36	344.81	294.58	50.23	6.864		
6,600.00	5,811.05	6,725.32	5,912.28	27.87	27.57	107.07	-1,299.65	-246.36	344.81	291.39	53.42	6.454		
6,700.00	5,811.05	6,825.32	5,912.28	29.60	29.24	107.07	-1,399.65	-246.35	344.81	288.10	56.71	6.080		
6,800.00	5,811.05	6,925.32	5,912.27	31.35	30.94	107.07	-1,499.65	-246.35	344.82	284.76	60.05	5.742		
6,900.00	5,811.05	7,025.32	5,912.27	33.12	32.66	107.07	-1,599.65	-246.34	344.82	281.39	63.43	5.436		
7,000.00	5,811.05	7,125.32	5,912.27	34.90	34.41	107.07	-1,699.65	-246.34	344.82	277.98	66.84	5.159		
7,100.00	5,811.04	7,225.32	5,912.26	36.70	36.17	107.07	-1,799.65	-246.33	344.82	274.53	70.28	4.906		
7,200.00	5,811.04	7,325.32	5,912.26	38.51	37.95	107.07	-1,899.65	-246.33	344.82	271.07	73.75	4.675		
7,300.00	5,811.04	7,425.32	5,912.25	40.33	39.74	107.07	-1,999.65	-246.32	344.82	267.58	77.24	4.464		
7,400.00	5,811.04	7,525.32	5,912.25	42.16	41.54	107.07	-2,099.65	-246.32	344.82	264.07	80.75	4.270		
7,500.00	5,811.04	7,625.32	5,912.25	44.00	43.35	107.07	-2,199.65	-246.31	344.82	260.55	84.27	4.092		
7,600.00	5,811.04	7,725.32	5,912.24	45.85	45.18	107.07	-2,299.65	-246.31	344.83	257.01	87.81	3.927		
7,700.00	5,811.04	7,825.32	5,912.24	47.70	47.01	107.06	-2,399.65	-246.30	344.83	253.46	91.37	3.774		
7,800.00	5,811.04	7,925.32	5,912.23	49.55	48.84	107.06	-2,499.65	-246.29	344.83	249.90	94.93	3.632		
7,900.00	5,811.04	8,025.32	5,912.23	51.41	50.69	107.06	-2,599.65	-246.29	344.83	246.32	98.50	3.501		
8,000.00	5,811.04	8,125.32	5,912.23	53.28	52.54	107.06	-2,699.65	-246.28	344.83	242.74	102.09	3.378		
8,100.00	5,811.04	8,225.32	5,912.22	55.15	54.39	107.06	-2,799.65	-246.28	344.83	239.15	105.68	3.263		
8,200.00	5,811.03	8,325.32	5,912.22	57.02	56.25	107.06	-2,899.65	-246.27	344.83	235.56	109.28	3.156		
8,300.00	5,811.03	8,425.32	5,912.21	58.90	58.11	107.06	-2,999.65	-246.27	344.83	231.95	112.88	3.055		
8,400.00	5,811.03	8,525.32	5,912.21	60.78	59.98	107.06	-3,099.65	-246.26	344.83	228.34	116.49	2.960		
8,500.00	5,811.03	8,625.32	5,912.20	62.66	61.85	107.06	-3,199.65	-246.26	344.84	224.73	120.11	2.871		
8,600.00	5,811.03	8,725.32	5,912.20	64.54	63.72	107.06	-3,299.65	-246.25	344.84	221.11	123.73	2.787		
8,700.00	5,811.03	8,825.32	5,912.20	66.43	65.60	107.06	-3,399.65	-246.25	344.84	217.48	127.36	2.708		
8,800.00	5,811.03	8,925.32	5,912.19	68.32	67.48	107.06	-3,499.65	-246.24	344.84	213.85	130.99	2.633		
8,900.00	5,811.03	9,025.32	5,912.19	70.21	69.36	107.06	-3,599.65	-246.24	344.84	210.22	134.62	2.562		
9,000.00	5,811.03	9,125.32	5,912.18	72.10	71.24	107.06	-3,699.65	-246.23	344.84	206.58	138.26	2.494		
9,100.00	5,811.03	9,225.32	5,912.18	73.99	73.13	107.06	-3,799.65	-246.22	344.84	202.94	141.90	2.430		
9,200.00	5,811.03	9,325.32	5,912.18	75.88	75.01	107.06	-3,899.65	-246.22	344.84	199.30	145.55	2.369		
9,300.00	5,811.03	9,425.32	5,912.17	77.78	76.90	107.05	-3,999.65	-246.21	344.85	195.65	149.19	2.311		
9,400.00	5,811.02	9,525.32	5,912.17	79.68	78.79	107.05	-4,099.65	-246.21	344.85	192.01	152.84	2.256		
9,500.00	5,811.02	9,625.32	5,912.16	81.58	80.69	107.05	-4,199.65	-246.20	344.85	188.35	156.49	2.204		
9,600.00	5,811.02	9,725.32	5,912.16	83.47	82.58	107.05	-4,299.65	-246.20	344.85	184.70	160.15	2.153		
9,700.00	5,811.02	9,825.32	5,912.16	85.37	84.47	107.05	-4,399.65	-246.19	344.85	181.05	163.80	2.105		
9,800.00	5,811.02	9,925.32	5,912.15	87.28	86.37	107.05	-4,499.65	-246.19	344.85	177.39	167.46	2.059		
9,900.00	5,811.02	10,025.32	5,912.15	89.18	88.27	107.05	-4,599.65	-246.18	344.85	173.73	171.12	2.015		
10,000.00	5,811.02	10,125.32	5,912.14	91.08	90.16	107.05	-4,699.65	-246.18	344.85	170.07	174.79	1.973		
10,100.00	5,811.02	10,225.32	5,912.14	92.98	92.06	107.05	-4,799.65	-246.17	344.86	166.41	178.45	1.933		
10,200.00	5,811.02	10,325.32	5,912.14	94.89	93.96	107.05	-4,899.65	-246.17	344.86	162.74	182.11	1.894		
10,300.00	5,811.02	10,425.32	5,912.13	96.79	95.86	107.05	-4,999.65	-246.16	344.86	159.08	185.78	1.856		

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

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor Federal #12F-1305A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor Federal #12F-1305A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #3	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design S12-T10N-R58W - Razor Federal #12F-1304B - HZ - Plan #2												Offset Site Error:	0.00 usft
Survey Program: 0-ISCWSA MWD												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor	Warning
10,400.00	5,811.02	10,525.32	5,912.13	98.70	97.76	107.05	-5,099.65	-246.16	344.86	155.41	189.45	1.820	
10,500.00	5,811.01	10,625.32	5,912.12	100.61	99.67	107.05	-5,199.65	-246.15	344.86	151.74	193.12	1.786	
10,600.00	5,811.01	10,725.32	5,912.12	102.51	101.57	107.05	-5,299.65	-246.14	344.86	148.07	196.79	1.752	
10,700.00	5,811.01	10,825.32	5,912.12	104.42	103.47	107.05	-5,399.65	-246.14	344.86	144.40	200.46	1.720	
10,800.00	5,811.01	10,925.32	5,912.11	106.33	105.38	107.05	-5,499.65	-246.13	344.86	140.73	204.13	1.689	
10,900.00	5,811.01	11,025.32	5,912.11	108.24	107.28	107.04	-5,599.65	-246.13	344.87	137.06	207.81	1.660	
11,000.00	5,811.01	11,125.32	5,912.10	110.15	109.19	107.04	-5,699.65	-246.12	344.87	133.39	211.48	1.631	
11,100.00	5,811.01	11,225.32	5,912.10	112.06	111.09	107.04	-5,799.65	-246.12	344.87	129.71	215.16	1.603	
11,200.00	5,811.01	11,325.32	5,912.10	113.96	113.00	107.04	-5,899.65	-246.11	344.87	126.04	218.83	1.576	
11,300.00	5,811.01	11,425.32	5,912.09	115.88	114.91	107.04	-5,999.65	-246.11	344.87	122.36	222.51	1.550	
11,400.00	5,811.01	11,525.32	5,912.09	117.79	116.81	107.04	-6,099.65	-246.10	344.87	118.68	226.19	1.525	
11,500.00	5,811.01	11,625.32	5,912.08	119.70	118.72	107.04	-6,199.65	-246.10	344.87	115.01	229.87	1.500	
11,600.00	5,811.01	11,725.32	5,912.08	121.61	120.63	107.04	-6,299.65	-246.09	344.87	111.33	233.55	1.477 Level 3	
11,700.00	5,811.00	11,825.32	5,912.07	123.52	122.54	107.04	-6,399.65	-246.09	344.88	107.65	237.23	1.454 Level 3	
11,800.00	5,811.00	11,925.32	5,912.07	125.43	124.45	107.04	-6,499.65	-246.08	344.88	103.97	240.91	1.432 Level 3	
11,900.00	5,811.00	12,025.32	5,912.07	127.34	126.36	107.04	-6,599.65	-246.08	344.88	100.29	244.59	1.410 Level 3	
12,000.00	5,811.00	12,125.32	5,912.06	129.26	128.27	107.04	-6,699.65	-246.07	344.88	96.61	248.27	1.389 Level 3	
12,100.00	5,811.00	12,225.32	5,912.06	131.17	130.18	107.04	-6,799.65	-246.06	344.88	92.93	251.95	1.369 Level 3	
12,200.00	5,811.00	12,325.32	5,912.05	133.08	132.09	107.04	-6,899.65	-246.06	344.88	89.24	255.64	1.349 Level 3	
12,300.00	5,811.00	12,425.32	5,912.05	134.99	134.00	107.04	-6,999.65	-246.05	344.88	85.56	259.32	1.330 Level 3	
12,400.00	5,811.00	12,525.32	5,912.05	136.91	135.91	107.04	-7,099.65	-246.05	344.88	81.88	263.01	1.311 Level 3	
12,500.00	5,811.00	12,625.32	5,912.04	138.82	137.82	107.03	-7,199.65	-246.04	344.88	78.19	266.69	1.293 Level 3	
12,600.00	5,811.00	12,725.32	5,912.04	140.74	139.74	107.03	-7,299.65	-246.04	344.89	74.51	270.38	1.276 Level 3	
12,700.00	5,811.00	12,825.32	5,912.03	142.65	141.65	107.03	-7,399.65	-246.03	344.89	70.83	274.06	1.258 Level 3	
12,800.00	5,810.99	12,925.32	5,912.03	144.56	143.56	107.03	-7,499.65	-246.03	344.89	67.14	277.75	1.242 Level 2	
12,900.00	5,810.99	13,025.32	5,912.03	146.48	145.47	107.03	-7,599.65	-246.02	344.89	63.46	281.43	1.225 Level 2	
13,000.00	5,810.99	13,125.32	5,912.02	148.39	147.39	107.03	-7,699.65	-246.02	344.89	59.77	285.12	1.210 Level 2	
13,100.00	5,810.99	13,225.32	5,912.02	150.31	149.30	107.03	-7,799.65	-246.01	344.89	56.08	288.81	1.194 Level 2	
13,200.00	5,810.99	13,325.32	5,912.01	152.22	151.21	107.03	-7,899.65	-246.01	344.89	52.40	292.50	1.179 Level 2	
13,300.00	5,810.99	13,425.32	5,912.01	154.14	153.13	107.03	-7,999.65	-246.00	344.89	48.71	296.18	1.164 Level 2	
13,400.00	5,810.99	13,525.32	5,912.01	156.05	155.04	107.03	-8,099.65	-246.00	344.90	45.02	299.87	1.150 Level 2	
13,500.00	5,810.99	13,625.32	5,912.00	157.97	156.95	107.03	-8,199.65	-245.99	344.90	41.34	303.56	1.136 Level 2	
13,541.60	5,810.99	13,666.93	5,912.00	158.77	157.75	107.03	-8,241.25	-245.99	344.90	39.80	305.10	1.130 Level 2, SF	

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor Federal #12F-1305A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor Federal #12F-1305A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #3	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design S12-T10N-R58W - Razor Federal #12F-1306B - HZ - Plan #2													Offset Site Error:	0.00 usft
Survey Program: 0-ISCSWA MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor		
0.00	0.00	0.01	0.01	0.00	0.00	90.04	-0.02	32.28	32.28					
100.00	100.00	100.01	100.01	0.09	0.09	90.04	-0.02	32.28	32.28	32.09	0.19	172.558		
200.00	200.00	200.01	200.01	0.32	0.32	90.04	-0.02	32.28	32.28	31.64	0.64	50.701		
300.00	300.00	300.01	300.01	0.54	0.54	90.04	-0.02	32.28	32.28	31.19	1.09	29.716		
400.00	400.00	400.01	400.01	0.77	0.77	90.04	-0.02	32.28	32.28	30.74	1.54	21.017		
500.00	500.00	500.01	500.01	0.99	0.99	90.04	-0.02	32.28	32.28	30.29	1.99	16.258		
600.00	600.00	600.01	600.01	1.22	1.22	90.04	-0.02	32.28	32.28	29.84	2.43	13.256		
700.00	700.00	700.01	700.01	1.44	1.44	90.04	-0.02	32.28	32.28	29.39	2.88	11.190		
800.00	800.00	800.01	800.01	1.67	1.67	90.04	-0.02	32.28	32.28	28.94	3.33	9.681		
900.00	900.00	900.01	900.01	1.89	1.89	90.04	-0.02	32.28	32.28	28.49	3.78	8.531		
1,000.00	999.98	999.99	999.99	2.09	2.12	-87.81	-0.02	32.28	32.16	27.96	4.20	7.651		
1,010.91	1,010.88	1,010.86	1,010.86	2.11	2.14	-88.48	-0.04	32.28	32.15	27.91	4.24	7.576 CC, ES		
1,100.00	1,099.84	1,099.67	1,099.65	2.27	2.31	-94.04	-1.66	32.85	32.64	28.07	4.58	7.133		
1,200.00	1,199.59	1,199.48	1,199.31	2.46	2.49	-97.10	-6.57	34.58	34.10	29.16	4.95	6.895		
1,300.00	1,299.35	1,299.46	1,299.06	2.66	2.68	-97.10	-13.15	36.90	35.82	30.48	5.34	6.707		
1,400.00	1,399.11	1,399.45	1,398.80	2.87	2.88	-97.10	-19.73	39.21	37.54	31.78	5.76	6.520		
1,500.00	1,498.86	1,499.43	1,498.54	3.10	3.10	-97.10	-26.31	41.53	39.26	33.06	6.19	6.341		
1,600.00	1,598.62	1,599.42	1,598.28	3.33	3.32	-97.09	-32.89	43.85	40.97	34.34	6.64	6.172		
1,700.00	1,698.38	1,699.40	1,698.02	3.56	3.54	-97.09	-39.46	46.16	42.69	35.60	7.10	6.015		
1,800.00	1,798.13	1,799.39	1,797.76	3.80	3.77	-97.09	-46.04	48.48	44.41	36.85	7.57	5.870		
1,900.00	1,897.89	1,899.37	1,897.51	4.04	4.01	-97.09	-52.62	50.80	46.13	38.09	8.04	5.737		
2,000.00	1,997.65	1,999.36	1,997.25	4.28	4.25	-97.09	-59.20	53.11	47.85	39.33	8.52	5.614		
2,100.00	2,097.40	2,099.34	2,096.99	4.53	4.49	-97.09	-65.78	55.43	49.57	40.56	9.01	5.501		
2,200.00	2,197.16	2,199.33	2,196.73	4.78	4.73	-97.09	-72.36	57.75	51.28	41.78	9.50	5.398		
2,300.00	2,296.91	2,299.31	2,296.47	5.03	4.98	-97.09	-78.94	60.06	53.00	43.01	10.00	5.302		
2,400.00	2,396.67	2,399.30	2,396.21	5.28	5.23	-97.09	-85.51	62.38	54.72	44.23	10.49	5.214		
2,500.00	2,496.43	2,499.28	2,495.96	5.53	5.48	-97.08	-92.09	64.70	56.44	45.44	11.00	5.133		
2,600.00	2,596.18	2,599.27	2,595.70	5.78	5.73	-97.08	-98.67	67.01	58.16	46.66	11.50	5.057		
2,700.00	2,695.94	2,699.25	2,695.44	6.04	5.98	-97.08	-105.25	69.33	59.88	47.87	12.01	4.987		
2,800.00	2,795.70	2,799.24	2,795.18	6.29	6.23	-97.08	-111.83	71.65	61.59	49.08	12.51	4.922		
2,900.00	2,895.45	2,899.22	2,894.92	6.55	6.49	-97.08	-118.41	73.96	63.31	50.29	13.02	4.861		
3,000.00	2,995.21	2,999.21	2,994.66	6.81	6.74	-97.08	-124.99	76.28	65.03	51.50	13.53	4.805		
3,100.00	3,094.97	3,099.19	3,094.41	7.06	7.00	-97.08	-131.56	78.60	66.75	52.70	14.05	4.752		
3,200.00	3,194.72	3,199.18	3,194.15	7.32	7.25	-97.08	-138.14	80.91	68.47	53.91	14.56	4.702		
3,300.00	3,294.48	3,299.16	3,293.89	7.58	7.51	-97.08	-144.72	83.23	70.19	55.11	15.07	4.656		
3,400.00	3,394.23	3,399.15	3,393.63	7.84	7.77	-97.08	-151.30	85.55	71.90	56.31	15.59	4.612		
3,500.00	3,493.99	3,499.13	3,493.37	8.10	8.03	-97.08	-157.88	87.87	73.62	57.52	16.11	4.571		
3,600.00	3,593.75	3,599.12	3,593.11	8.36	8.29	-97.08	-164.46	90.18	75.34	58.72	16.62	4.532		
3,700.00	3,693.50	3,699.11	3,692.86	8.62	8.54	-97.08	-171.04	92.50	77.06	59.92	17.14	4.495		
3,800.00	3,793.26	3,799.09	3,792.60	8.88	8.80	-97.08	-177.62	94.82	78.78	61.12	17.66	4.461		
3,900.00	3,893.02	3,899.08	3,892.34	9.14	9.06	-97.08	-184.19	97.13	80.50	62.32	18.18	4.428		
4,000.00	3,992.77	3,999.06	3,992.08	9.40	9.32	-97.08	-190.77	99.45	82.21	63.51	18.70	4.397		
4,100.00	4,092.53	4,099.05	4,091.82	9.66	9.58	-97.08	-197.35	101.77	83.93	64.71	19.22	4.367		
4,200.00	4,192.29	4,199.03	4,191.56	9.92	9.84	-97.08	-203.93	104.08	85.65	65.91	19.74	4.339		
4,300.00	4,292.04	4,299.02	4,291.31	10.18	10.10	-97.08	-210.51	106.40	87.37	67.11	20.26	4.312		
4,400.00	4,391.80	4,399.00	4,391.05	10.45	10.36	-97.07	-217.09	108.72	89.09	68.30	20.78	4.287		
4,500.00	4,491.56	4,498.99	4,490.79	10.71	10.63	-97.07	-223.67	111.03	90.81	69.50	21.30	4.262		
4,600.00	4,591.31	4,598.97	4,590.53	10.97	10.89	-97.07	-230.24	113.35	92.52	70.70	21.83	4.239		
4,700.00	4,691.07	4,698.96	4,690.27	11.23	11.15	-97.07	-236.82	115.67	94.24	71.89	22.35	4.217		
4,800.00	4,790.82	4,798.94	4,790.01	11.49	11.41	-97.07	-243.40	117.98	95.96	73.09	22.87	4.196		
4,900.00	4,890.58	4,898.93	4,889.76	11.76	11.67	-97.07	-249.98	120.30	97.68	74.28	23.39	4.175		
5,000.00	4,990.34	4,998.91	4,989.50	12.02	11.93	-97.07	-256.56	122.62	99.40	75.48	23.92	4.156		

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

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor Federal #12F-1305A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor Federal #12F-1305A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #3	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design S12-T10N-R58W - Razor Federal #12F-1306B - HZ - Plan #2												Offset Site Error:	0.00 usft
Survey Program: O-ISCWSA MWD												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance		Total		Separation		Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Uncertainty Axis	Factor	
5,100.00	5,090.09	5,098.90	5,089.24	12.28	12.19	-97.07	-263.14	124.93	101.12	76.67	24.44	4.137	
5,200.00	5,189.85	5,198.88	5,188.98	12.54	12.46	-97.07	-269.72	127.25	102.83	77.87	24.96	4.119	
5,300.00	5,289.61	5,298.87	5,288.72	12.81	12.72	-97.07	-276.29	129.57	104.55	79.06	25.49	4.102	
5,400.00	5,388.94	5,398.69	5,388.30	13.10	12.98	-98.92	-282.86	131.88	106.80	80.77	26.03	4.103	
5,500.00	5,484.71	5,497.17	5,486.18	13.56	13.27	-107.15	-292.49	135.27	113.58	87.01	26.57	4.275	
5,600.00	5,573.33	5,598.16	5,583.08	14.18	13.72	-113.89	-318.81	144.54	127.31	100.24	27.07	4.703	
5,700.00	5,651.55	5,702.50	5,675.59	15.00	14.38	-117.92	-363.96	160.44	146.48	118.82	27.66	5.296	
5,800.00	5,716.49	5,810.22	5,759.13	16.02	15.28	-119.50	-427.81	182.92	169.37	140.75	28.62	5.919	
5,900.00	5,765.76	5,921.30	5,828.82	17.23	16.46	-119.16	-509.14	211.57	194.54	164.30	30.24	6.433	
6,000.00	5,797.56	6,035.67	5,879.84	18.59	17.93	-117.40	-605.45	245.48	220.78	188.08	32.70	6.752	
6,100.00	5,810.71	6,153.14	5,907.79	20.07	19.65	-114.63	-712.83	283.30	247.03	211.00	36.03	6.857	
6,200.00	5,811.05	6,268.81	5,912.05	21.51	21.42	-112.51	-821.97	321.06	271.84	232.45	39.39	6.901	
6,300.00	5,811.05	6,381.03	5,912.05	22.87	23.04	-110.56	-929.68	352.45	295.92	253.44	42.48	6.966	
6,400.00	5,811.05	6,495.95	5,912.05	24.50	24.73	-108.91	-1,041.72	377.99	316.90	270.77	46.13	6.869	
6,500.00	5,811.05	6,613.65	5,912.05	26.17	26.52	-107.84	-1,157.83	397.11	332.34	282.54	49.80	6.674	
6,600.00	5,811.05	6,733.31	5,912.05	27.87	28.37	-107.22	-1,276.86	409.18	341.96	288.51	53.45	6.398	
6,700.00	5,811.05	6,854.03	5,912.05	29.60	30.25	-106.99	-1,397.47	413.78	345.60	288.55	57.05	6.058	
6,800.00	5,811.05	6,956.20	5,912.05	31.35	31.92	-106.99	-1,499.64	413.82	345.62	285.23	60.39	5.723	
6,900.00	5,811.05	7,056.20	5,912.05	33.12	33.60	-106.99	-1,599.64	413.81	345.61	281.85	63.76	5.421	
7,000.00	5,811.05	7,156.20	5,912.05	34.90	35.31	-106.99	-1,699.64	413.81	345.60	278.44	67.16	5.146	
7,100.00	5,811.04	7,256.20	5,912.05	36.70	37.04	-106.99	-1,799.64	413.80	345.59	274.99	70.60	4.895	
7,200.00	5,811.04	7,356.20	5,912.04	38.51	38.79	-106.99	-1,899.64	413.80	345.58	271.52	74.06	4.667	
7,300.00	5,811.04	7,456.20	5,912.04	40.33	40.55	-106.99	-1,999.64	413.80	345.57	268.03	77.54	4.457	
7,400.00	5,811.04	7,556.20	5,912.04	42.16	42.33	-106.99	-2,099.64	413.79	345.56	264.52	81.04	4.264	
7,500.00	5,811.04	7,656.20	5,912.04	44.00	44.12	-106.99	-2,199.64	413.79	345.55	260.99	84.56	4.087	
7,600.00	5,811.04	7,756.20	5,912.04	45.85	45.92	-106.99	-2,299.64	413.79	345.54	257.45	88.09	3.923	
7,700.00	5,811.04	7,856.20	5,912.04	47.70	47.73	-106.99	-2,399.64	413.78	345.53	253.89	91.63	3.771	
7,800.00	5,811.04	7,956.20	5,912.04	49.55	49.55	-107.00	-2,499.64	413.78	345.51	250.32	95.19	3.630	
7,900.00	5,811.04	8,056.20	5,912.04	51.41	51.37	-107.00	-2,599.64	413.78	345.50	246.74	98.76	3.498	
8,000.00	5,811.04	8,156.20	5,912.04	53.28	53.21	-107.00	-2,699.64	413.77	345.49	243.15	102.34	3.376	
8,100.00	5,811.04	8,256.20	5,912.04	55.15	55.04	-107.00	-2,799.64	413.77	345.48	239.56	105.93	3.262	
8,200.00	5,811.03	8,356.20	5,912.04	57.02	56.89	-107.00	-2,899.64	413.76	345.47	235.95	109.52	3.154	
8,300.00	5,811.03	8,456.20	5,912.04	58.90	58.74	-107.00	-2,999.64	413.76	345.46	232.34	113.12	3.054	
8,400.00	5,811.03	8,556.20	5,912.04	60.78	60.59	-107.00	-3,099.64	413.76	345.45	228.72	116.73	2.959	
8,500.00	5,811.03	8,656.20	5,912.04	62.66	62.45	-107.00	-3,199.64	413.75	345.44	225.10	120.34	2.871	
8,600.00	5,811.03	8,756.20	5,912.03	64.54	64.31	-107.00	-3,299.64	413.75	345.43	221.47	123.96	2.787	
8,700.00	5,811.03	8,856.20	5,912.03	66.43	66.17	-107.00	-3,399.64	413.75	345.42	217.84	127.58	2.707	
8,800.00	5,811.03	8,956.20	5,912.03	68.32	68.04	-107.00	-3,499.64	413.74	345.41	214.20	131.21	2.633	
8,900.00	5,811.03	9,056.20	5,912.03	70.21	69.91	-107.00	-3,599.64	413.74	345.40	210.56	134.84	2.562	
9,000.00	5,811.03	9,156.20	5,912.03	72.10	71.79	-107.00	-3,699.64	413.73	345.39	206.92	138.47	2.494	
9,100.00	5,811.03	9,256.20	5,912.03	73.99	73.66	-107.00	-3,799.64	413.73	345.38	203.27	142.11	2.430	
9,200.00	5,811.03	9,356.20	5,912.03	75.88	75.54	-107.00	-3,899.64	413.73	345.36	199.62	145.75	2.370	
9,300.00	5,811.03	9,456.20	5,912.03	77.78	77.42	-107.00	-3,999.64	413.72	345.35	195.96	149.39	2.312	
9,400.00	5,811.02	9,556.20	5,912.03	79.68	79.30	-107.00	-4,099.64	413.72	345.34	192.30	153.04	2.257	
9,500.00	5,811.02	9,656.20	5,912.03	81.58	81.19	-107.01	-4,199.64	413.72	345.33	188.64	156.69	2.204	
9,600.00	5,811.02	9,756.20	5,912.03	83.47	83.07	-107.01	-4,299.64	413.71	345.32	184.98	160.34	2.154	
9,700.00	5,811.02	9,856.20	5,912.03	85.37	84.96	-107.01	-4,399.64	413.71	345.31	181.32	163.99	2.106	
9,800.00	5,811.02	9,956.20	5,912.03	87.28	86.85	-107.01	-4,499.64	413.71	345.30	177.65	167.65	2.060	
9,900.00	5,811.02	10,056.20	5,912.03	89.18	88.74	-107.01	-4,599.64	413.70	345.29	173.99	171.30	2.016	
10,000.00	5,811.02	10,156.20	5,912.03	91.08	90.63	-107.01	-4,699.64	413.70	345.28	170.32	174.96	1.973	
10,100.00	5,811.02	10,256.20	5,912.02	92.98	92.53	-107.01	-4,799.64	413.69	345.27	166.64	178.62	1.933	
10,200.00	5,811.02	10,356.20	5,912.02	94.89	94.42	-107.01	-4,899.64	413.69	345.26	162.97	182.29	1.894	

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

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor Federal #12F-1305A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor Federal #12F-1305A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #3	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design S12-T10N-R58W - Razor Federal #12F-1306B - HZ - Plan #2													Offset Site Error:	0.00 usft
Survey Program: 0-ISCWSA MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor		
10,300.00	5,811.02	10,456.20	5,912.02	96.79	96.32	-107.01	-4,999.64	413.69	345.25	159.30	185.95	1.857		
10,400.00	5,811.02	10,556.20	5,912.02	98.70	98.21	-107.01	-5,099.64	413.68	345.24	155.62	189.61	1.821		
10,500.00	5,811.01	10,656.20	5,912.02	100.61	100.11	-107.01	-5,199.64	413.68	345.22	151.95	193.28	1.786		
10,600.00	5,811.01	10,756.20	5,912.02	102.51	102.01	-107.01	-5,299.64	413.68	345.21	148.27	196.95	1.753		
10,700.00	5,811.01	10,856.20	5,912.02	104.42	103.91	-107.01	-5,399.64	413.67	345.20	144.59	200.62	1.721		
10,800.00	5,811.01	10,956.20	5,912.02	106.33	105.81	-107.01	-5,499.64	413.67	345.19	140.91	204.28	1.690		
10,900.00	5,811.01	11,056.20	5,912.02	108.24	107.71	-107.01	-5,599.64	413.66	345.18	137.23	207.96	1.660		
11,000.00	5,811.01	11,156.20	5,912.02	110.15	109.61	-107.01	-5,699.64	413.66	345.17	133.54	211.63	1.631		
11,100.00	5,811.01	11,256.20	5,912.02	112.06	111.51	-107.01	-5,799.64	413.66	345.16	129.86	215.30	1.603		
11,200.00	5,811.01	11,356.20	5,912.02	113.96	113.41	-107.01	-5,899.64	413.65	345.15	126.18	218.97	1.576		
11,300.00	5,811.01	11,456.20	5,912.02	115.88	115.32	-107.02	-5,999.64	413.65	345.14	122.49	222.65	1.550		
11,400.00	5,811.01	11,556.20	5,912.02	117.79	117.22	-107.02	-6,099.64	413.65	345.13	118.81	226.32	1.525		
11,500.00	5,811.01	11,656.20	5,912.01	119.70	119.13	-107.02	-6,199.64	413.64	345.12	115.12	230.00	1.501		
11,600.00	5,811.01	11,756.20	5,912.01	121.61	121.03	-107.02	-6,299.64	413.64	345.11	111.43	233.67	1.477 Level 3		
11,700.00	5,811.00	11,856.20	5,912.01	123.52	122.94	-107.02	-6,399.64	413.63	345.10	107.74	237.35	1.454 Level 3		
11,800.00	5,811.00	11,956.20	5,912.01	125.43	124.84	-107.02	-6,499.64	413.63	345.08	104.06	241.03	1.432 Level 3		
11,900.00	5,811.00	12,056.20	5,912.01	127.34	126.75	-107.02	-6,599.64	413.63	345.07	100.37	244.71	1.410 Level 3		
12,000.00	5,811.00	12,156.20	5,912.01	129.26	128.66	-107.02	-6,699.64	413.62	345.06	96.68	248.39	1.389 Level 3		
12,100.00	5,811.00	12,256.20	5,912.01	131.17	130.56	-107.02	-6,799.64	413.62	345.05	92.99	252.07	1.369 Level 3		
12,200.00	5,811.00	12,356.20	5,912.01	133.08	132.47	-107.02	-6,899.64	413.62	345.04	89.30	255.75	1.349 Level 3		
12,300.00	5,811.00	12,456.20	5,912.01	134.99	134.38	-107.02	-6,999.64	413.61	345.03	85.60	259.43	1.330 Level 3		
12,400.00	5,811.00	12,556.20	5,912.01	136.91	136.29	-107.02	-7,099.64	413.61	345.02	81.91	263.11	1.311 Level 3		
12,500.00	5,811.00	12,656.20	5,912.01	138.82	138.20	-107.02	-7,199.64	413.61	345.01	78.22	266.79	1.293 Level 3		
12,600.00	5,811.00	12,756.20	5,912.01	140.74	140.11	-107.02	-7,299.64	413.60	345.00	74.53	270.47	1.276 Level 3		
12,700.00	5,811.00	12,856.20	5,912.01	142.65	142.02	-107.02	-7,399.64	413.60	344.99	70.84	274.15	1.258 Level 3		
12,800.00	5,810.99	12,956.20	5,912.01	144.56	143.93	-107.02	-7,499.64	413.59	344.98	67.14	277.84	1.242 Level 2		
12,900.00	5,810.99	13,056.20	5,912.00	146.48	145.84	-107.02	-7,599.64	413.59	344.97	63.45	281.52	1.225 Level 2		
13,000.00	5,810.99	13,156.20	5,912.00	148.39	147.75	-107.03	-7,699.64	413.59	344.96	59.75	285.20	1.210 Level 2		
13,100.00	5,810.99	13,256.20	5,912.00	150.31	149.66	-107.03	-7,799.64	413.58	344.95	56.06	288.89	1.194 Level 2		
13,200.00	5,810.99	13,356.20	5,912.00	152.22	151.57	-107.03	-7,899.64	413.58	344.93	52.36	292.57	1.179 Level 2		
13,300.00	5,810.99	13,456.20	5,912.00	154.14	153.48	-107.03	-7,999.64	413.58	344.92	48.67	296.26	1.164 Level 2		
13,400.00	5,810.99	13,556.20	5,912.00	156.05	155.39	-107.03	-8,099.64	413.57	344.91	44.97	299.94	1.150 Level 2		
13,500.00	5,810.99	13,656.20	5,912.00	157.97	157.11	-107.03	-8,199.64	413.57	344.90	41.47	303.43	1.137 Level 2		
13,532.43	5,810.99	13,688.62	5,912.00	158.59	157.61	-107.03	-8,232.07	413.57	344.90	40.39	304.51	1.133 Level 2		
13,541.60	5,810.99	13,695.76	5,912.00	158.77	157.73	-107.03	-8,239.21	413.57	344.90	40.11	304.79	1.132 Level 2, SF		

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor Federal #12F-1305A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor Federal #12F-1305A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #3	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design S12-T10N-R58W - Razor Federal #12F-1307A - HZ - Plan #2												Offset Site Error:	0.00 usft
Survey Program: 0-ISCSWA MWD												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor	Warning
0.00	0.00	0.00	0.00	0.00	0.00	90.00	0.00	65.32	65.32				
100.00	100.00	100.00	100.00	0.09	0.09	90.00	0.00	65.32	65.32	65.13	0.19	349.245	
200.00	200.00	200.00	200.00	0.32	0.32	90.00	0.00	65.32	65.32	64.68	0.64	102.612	
300.00	300.00	300.00	300.00	0.54	0.54	90.00	0.00	65.32	65.32	64.23	1.09	60.141	
366.67	366.67	366.67	366.67	0.69	0.69	90.00	0.00	65.32	65.32	63.93	1.39	47.135 CC	
400.00	400.00	400.00	400.00	0.77	0.77	90.00	0.00	65.32	65.32	63.78	1.54	42.536 ES	
500.00	500.00	498.84	498.82	0.99	0.97	91.28	-1.48	66.17	66.19	64.23	1.96	33.802	
600.00	600.00	597.45	597.29	1.22	1.16	94.91	-5.90	68.70	69.01	66.63	2.38	29.052	
700.00	700.00	697.17	696.77	1.44	1.38	99.39	-11.94	72.16	73.21	70.40	2.81	26.048	
800.00	800.00	796.92	796.28	1.67	1.61	103.37	-17.98	75.61	77.81	74.56	3.25	23.925	
900.00	900.00	896.68	895.79	1.89	1.85	106.89	-24.01	79.07	82.74	79.05	3.70	22.374	
1,000.00	999.98	996.53	995.40	2.09	2.09	-65.69	-30.06	82.53	87.23	83.10	4.13	21.139	
1,100.00	1,099.84	1,096.47	1,095.10	2.27	2.34	-65.75	-36.11	86.00	90.33	85.79	4.54	19.915	
1,200.00	1,199.59	1,196.43	1,194.81	2.46	2.60	-66.84	-42.16	89.46	92.73	87.76	4.97	18.673	
1,300.00	1,299.35	1,296.39	1,294.53	2.66	2.85	-67.87	-48.21	92.93	95.16	89.75	5.41	17.586	
1,400.00	1,399.11	1,396.34	1,394.24	2.87	3.11	-68.86	-54.26	96.39	97.62	91.76	5.87	16.635	
1,500.00	1,498.86	1,496.30	1,493.95	3.10	3.37	-69.79	-60.31	99.86	100.11	93.78	6.34	15.802	
1,600.00	1,598.62	1,596.25	1,593.66	3.33	3.62	-70.68	-66.36	103.32	102.63	95.82	6.81	15.069	
1,700.00	1,698.38	1,696.21	1,693.38	3.56	3.88	-71.53	-72.41	106.79	105.17	97.88	7.29	14.421	
1,800.00	1,798.13	1,796.17	1,793.09	3.80	4.14	-72.33	-78.46	110.25	107.73	99.95	7.78	13.846	
1,900.00	1,897.89	1,896.12	1,892.80	4.04	4.41	-73.10	-84.51	113.72	110.31	102.04	8.27	13.334	
2,000.00	1,997.65	1,996.08	1,992.51	4.28	4.67	-73.83	-90.56	117.18	112.91	104.14	8.77	12.876	
2,100.00	2,097.40	2,096.03	2,092.23	4.53	4.93	-74.53	-96.61	120.65	115.53	106.26	9.27	12.464	
2,200.00	2,197.16	2,195.99	2,191.94	4.78	5.19	-75.20	-102.66	124.12	118.16	108.39	9.77	12.092	
2,300.00	2,296.91	2,295.95	2,291.65	5.03	5.45	-75.84	-108.71	127.58	120.81	110.53	10.28	11.755	
2,400.00	2,396.67	2,395.90	2,391.36	5.28	5.71	-76.45	-114.77	131.05	123.47	112.69	10.78	11.449	
2,500.00	2,496.43	2,495.86	2,491.08	5.53	5.98	-77.04	-120.82	134.51	126.15	114.86	11.29	11.170	
2,600.00	2,596.18	2,595.81	2,590.79	5.78	6.24	-77.60	-126.87	137.98	128.84	117.03	11.81	10.914	
2,700.00	2,695.94	2,695.77	2,690.50	6.04	6.50	-78.14	-132.92	141.44	131.54	119.22	12.32	10.679	
2,800.00	2,795.70	2,795.73	2,790.21	6.29	6.77	-78.66	-138.97	144.91	134.25	121.42	12.83	10.462	
2,900.00	2,895.45	2,895.68	2,889.93	6.55	7.03	-79.15	-145.02	148.37	136.98	123.63	13.35	10.262	
3,000.00	2,995.21	2,995.64	2,989.64	6.81	7.29	-79.63	-151.07	151.84	139.71	125.85	13.86	10.077	
3,100.00	3,094.97	3,095.59	3,089.35	7.06	7.56	-80.09	-157.12	155.30	142.45	128.07	14.38	9.905	
3,200.00	3,194.72	3,195.55	3,189.06	7.32	7.82	-80.53	-163.17	158.77	145.20	130.30	14.90	9.745	
3,300.00	3,294.48	3,295.51	3,288.78	7.58	8.08	-80.95	-169.22	162.23	147.96	132.54	15.42	9.596	
3,400.00	3,394.23	3,395.46	3,388.49	7.84	8.35	-81.36	-175.27	165.70	150.73	134.79	15.94	9.457	
3,500.00	3,493.99	3,495.42	3,488.20	8.10	8.61	-81.76	-181.32	169.16	153.51	137.05	16.46	9.326	
3,600.00	3,593.75	3,595.37	3,587.91	8.36	8.87	-82.14	-187.37	172.63	156.29	139.31	16.98	9.204	
3,700.00	3,693.50	3,695.33	3,687.63	8.62	9.14	-82.51	-193.42	176.09	159.08	141.57	17.50	9.089	
3,800.00	3,793.26	3,795.29	3,787.34	8.88	9.40	-82.86	-199.47	179.56	161.87	143.85	18.02	8.981	
3,900.00	3,893.02	3,895.24	3,887.05	9.14	9.66	-83.20	-205.52	183.02	164.67	146.13	18.55	8.879	
4,000.00	3,992.77	3,995.20	3,986.76	9.40	9.93	-83.53	-211.57	186.49	167.48	148.41	19.07	8.783	
4,100.00	4,092.53	4,095.15	4,086.48	9.66	10.19	-83.85	-217.62	189.95	170.29	150.70	19.59	8.692	
4,200.00	4,192.29	4,195.11	4,186.19	9.92	10.46	-84.16	-223.68	193.42	173.11	152.99	20.12	8.606	
4,300.00	4,292.04	4,295.07	4,285.90	10.18	10.72	-84.46	-229.73	196.88	175.93	155.29	20.64	8.524	
4,400.00	4,391.80	4,395.02	4,385.62	10.45	10.98	-84.75	-235.78	200.35	178.76	157.59	21.16	8.447	
4,500.00	4,491.56	4,494.98	4,485.33	10.71	11.25	-85.04	-241.83	203.82	181.59	159.90	21.69	8.373	
4,600.00	4,591.31	4,594.93	4,585.04	10.97	11.51	-85.31	-247.88	207.28	184.42	162.21	22.21	8.303	
4,700.00	4,691.07	4,694.89	4,684.75	11.23	11.78	-85.57	-253.93	210.75	187.26	164.52	22.74	8.236	
4,800.00	4,790.82	4,794.85	4,784.47	11.49	12.04	-85.83	-259.98	214.21	190.10	166.84	23.26	8.173	
4,900.00	4,890.58	4,894.80	4,884.18	11.76	12.30	-86.08	-266.03	217.68	192.95	169.16	23.79	8.112	
5,000.00	4,990.34	4,994.76	4,983.89	12.02	12.57	-86.32	-272.08	221.14	195.80	171.49	24.31	8.054	

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



# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor Federal #12F-1305A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor Federal #12F-1305A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #3	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design S12-T10N-R58W - Razor Federal #12F-1307A - HZ - Plan #2													Offset Site Error: 0.00 usft	
Survey Program: O-ISCWSA MWD													Offset Well Error: 0.00 usft	
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor		
5,100.00	5,090.09	5,094.71	5,083.60	12.28	12.83	-86.55	-278.13	224.61	198.65	173.82	24.84	7.998		
5,200.00	5,189.85	5,194.67	5,183.32	12.54	13.10	-86.78	-284.18	228.07	201.51	176.15	25.36	7.945		
5,300.00	5,289.61	5,294.63	5,283.03	12.81	13.36	-87.00	-290.23	231.54	204.37	178.48	25.89	7.894		
5,400.00	5,388.94	5,385.84	5,373.80	13.10	13.63	-87.24	-297.65	235.79	208.24	181.79	26.45	7.873		
5,500.00	5,484.71	5,470.04	5,455.44	13.56	13.99	-87.74	-315.18	245.82	217.94	190.69	27.25	7.997		
5,600.00	5,573.33	5,550.00	5,529.02	14.18	14.45	-88.24	-342.18	261.29	234.01	205.69	28.32	8.264		
5,700.00	5,651.55	5,636.39	5,602.14	15.00	15.10	-88.85	-381.94	284.06	256.05	226.30	29.74	8.608		
5,800.00	5,716.49	5,718.51	5,663.73	16.02	15.87	-89.04	-428.96	310.99	283.62	252.17	31.45	9.018		
5,900.00	5,765.76	5,800.00	5,715.69	17.23	16.76	-88.82	-483.34	342.13	315.95	282.50	33.45	9.446		
6,000.00	5,797.56	5,882.37	5,757.63	18.59	17.82	-88.23	-544.77	377.31	352.15	316.40	35.75	9.851		
6,100.00	5,810.71	5,965.60	5,788.16	20.07	19.02	-87.30	-611.88	415.75	391.17	352.82	38.34	10.202		
6,200.00	5,811.05	6,051.60	5,806.36	21.51	20.37	-89.30	-684.73	457.47	433.59	392.72	40.87	10.609		
6,300.00	5,811.05	6,145.56	5,810.82	22.87	21.91	-89.97	-766.18	503.92	481.11	437.78	43.33	11.104		
6,400.00	5,811.05	6,266.39	5,810.82	24.50	23.78	-89.97	-873.62	559.17	526.86	480.10	46.76	11.268		
6,500.00	5,811.05	6,394.94	5,810.82	26.17	25.80	-89.98	-991.50	610.36	566.71	516.29	50.42	11.241		
6,600.00	5,811.05	6,530.68	5,810.82	27.87	28.00	-89.98	-1,119.43	655.69	600.12	545.77	54.35	11.041		
6,700.00	5,811.05	6,672.78	5,810.82	29.60	30.32	-89.98	-1,256.43	693.28	626.59	568.09	58.50	10.711		
6,800.00	5,811.05	6,820.00	5,810.83	31.35	32.72	-89.98	-1,400.91	721.37	645.68	582.89	62.80	10.282		
6,900.00	5,811.05	6,970.82	5,810.83	33.12	35.13	-89.98	-1,550.71	738.52	657.06	589.89	67.17	9.782		
7,000.00	5,811.05	7,119.92	5,810.83	34.90	37.48	-89.98	-1,699.68	743.82	660.53	589.03	71.50	9.238		
7,100.00	5,811.04	7,219.92	5,810.84	36.70	39.07	-89.98	-1,799.68	743.81	660.51	585.52	75.00	8.807		
7,200.00	5,811.04	7,319.92	5,810.84	38.51	40.70	-89.98	-1,899.68	743.81	660.50	581.96	78.54	8.410		
7,300.00	5,811.04	7,419.92	5,810.84	40.33	42.36	-89.98	-1,999.68	743.80	660.48	578.37	82.11	8.044		
7,400.00	5,811.04	7,519.92	5,810.84	42.16	44.04	-89.98	-2,099.68	743.79	660.47	574.76	85.70	7.706		
7,500.00	5,811.04	7,619.92	5,810.85	44.00	45.74	-89.98	-2,199.68	743.78	660.45	571.13	89.32	7.394		
7,600.00	5,811.04	7,719.92	5,810.85	45.85	47.46	-89.98	-2,299.68	743.78	660.44	567.48	92.95	7.105		
7,700.00	5,811.04	7,819.92	5,810.85	47.70	49.19	-89.98	-2,399.68	743.77	660.42	563.82	96.61	6.836		
7,800.00	5,811.04	7,919.92	5,810.85	49.55	50.93	-89.98	-2,499.68	743.76	660.41	560.14	100.27	6.586		
7,900.00	5,811.04	8,019.92	5,810.85	51.41	52.69	-89.98	-2,599.68	743.75	660.39	556.44	103.95	6.353		
8,000.00	5,811.04	8,119.92	5,810.86	53.28	54.45	-89.98	-2,699.68	743.75	660.38	552.74	107.64	6.135		
8,100.00	5,811.04	8,219.92	5,810.86	55.15	56.23	-89.98	-2,799.68	743.74	660.36	549.02	111.34	5.931		
8,200.00	5,811.03	8,319.92	5,810.86	57.02	58.02	-89.98	-2,899.68	743.73	660.35	545.30	115.05	5.740		
8,300.00	5,811.03	8,419.92	5,810.86	58.90	59.81	-89.99	-2,999.68	743.73	660.33	541.57	118.77	5.560		
8,400.00	5,811.03	8,519.92	5,810.87	60.78	61.61	-89.99	-3,099.68	743.72	660.32	537.82	122.50	5.391		
8,500.00	5,811.03	8,619.92	5,810.87	62.66	63.42	-89.99	-3,199.68	743.71	660.30	534.08	126.23	5.231		
8,600.00	5,811.03	8,719.92	5,810.87	64.54	65.24	-89.99	-3,299.68	743.70	660.29	530.32	129.97	5.080		
8,700.00	5,811.03	8,819.92	5,810.87	66.43	67.06	-89.99	-3,399.68	743.70	660.27	526.56	133.72	4.938		
8,800.00	5,811.03	8,919.92	5,810.88	68.32	68.89	-89.99	-3,499.68	743.69	660.26	522.79	137.47	4.803		
8,900.00	5,811.03	9,019.92	5,810.88	70.21	70.72	-89.99	-3,599.68	743.68	660.24	519.02	141.22	4.675		
9,000.00	5,811.03	9,119.92	5,810.88	72.10	72.55	-89.99	-3,699.68	743.67	660.23	515.25	144.98	4.554		
9,100.00	5,811.03	9,219.92	5,810.88	73.99	74.40	-89.99	-3,799.68	743.67	660.22	511.47	148.75	4.438		
9,200.00	5,811.03	9,319.92	5,810.89	75.88	76.24	-89.99	-3,899.68	743.66	660.20	507.68	152.52	4.329		
9,300.00	5,811.03	9,419.92	5,810.89	77.78	78.09	-89.99	-3,999.68	743.65	660.19	503.89	156.29	4.224		
9,400.00	5,811.02	9,519.92	5,810.89	79.68	79.94	-89.99	-4,099.68	743.65	660.17	500.10	160.07	4.124		
9,500.00	5,811.02	9,619.92	5,810.89	81.58	81.80	-89.99	-4,199.68	743.64	660.16	496.31	163.85	4.029		
9,600.00	5,811.02	9,719.92	5,810.89	83.47	83.66	-89.99	-4,299.68	743.63	660.14	492.51	167.63	3.938		
9,700.00	5,811.02	9,819.92	5,810.90	85.37	85.52	-89.99	-4,399.68	743.62	660.13	488.71	171.41	3.851		
9,800.00	5,811.02	9,919.92	5,810.90	87.28	87.38	-89.99	-4,499.68	743.62	660.11	484.91	175.20	3.768		
9,900.00	5,811.02	10,019.92	5,810.90	89.18	89.25	-89.99	-4,599.68	743.61	660.10	481.10	178.99	3.688		
10,000.00	5,811.02	10,119.92	5,810.90	91.08	91.12	-89.99	-4,699.68	743.60	660.08	477.30	182.78	3.611		
10,100.00	5,811.02	10,219.92	5,810.91	92.98	92.99	-89.99	-4,799.68	743.59	660.07	473.49	186.58	3.538		
10,200.00	5,811.02	10,319.92	5,810.91	94.89	94.86	-89.99	-4,899.68	743.59	660.05	469.68	190.38	3.467		

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



# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor Federal #12F-1305A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor Federal #12F-1305A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #3	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design S12-T10N-R58W - Razor Federal #12F-1307A - HZ - Plan #2												Offset Site Error:	0.00 usft
Survey Program: 0-ISCWSA MWD												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor	
10,300.00	5,811.02	10,419.92	5,810.91	96.79	96.73	-89.99	-4,999.68	743.58	660.04	465.86	194.17	3.399	
10,400.00	5,811.02	10,519.92	5,810.91	98.70	98.61	-89.99	-5,099.68	743.57	660.02	462.05	197.97	3.334	
10,500.00	5,811.01	10,619.92	5,810.92	100.61	100.49	-89.99	-5,199.68	743.57	660.01	458.23	201.78	3.271	
10,600.00	5,811.01	10,719.92	5,810.92	102.51	102.37	-89.99	-5,299.68	743.56	659.99	454.41	205.58	3.210	
10,700.00	5,811.01	10,819.92	5,810.92	104.42	104.25	-89.99	-5,399.68	743.55	659.98	450.59	209.38	3.152	
10,800.00	5,811.01	10,919.92	5,810.92	106.33	106.13	-89.99	-5,499.68	743.54	659.96	446.77	213.19	3.096	
10,900.00	5,811.01	11,019.92	5,810.93	108.24	108.02	-89.99	-5,599.68	743.54	659.95	442.95	217.00	3.041	
11,000.00	5,811.01	11,119.92	5,810.93	110.15	109.90	-89.99	-5,699.68	743.53	659.93	439.13	220.81	2.989	
11,100.00	5,811.01	11,219.92	5,810.93	112.06	111.79	-89.99	-5,799.68	743.52	659.92	435.30	224.62	2.938	
11,200.00	5,811.01	11,319.92	5,810.93	113.96	113.68	-89.99	-5,899.68	743.51	659.90	431.48	228.43	2.889	
11,300.00	5,811.01	11,419.92	5,810.94	115.88	115.57	-89.99	-5,999.68	743.51	659.89	427.65	232.24	2.841	
11,400.00	5,811.01	11,519.92	5,810.94	117.79	117.46	-89.99	-6,099.68	743.50	659.87	423.82	236.05	2.795	
11,500.00	5,811.01	11,619.92	5,810.94	119.70	119.35	-89.99	-6,199.68	743.49	659.86	419.99	239.87	2.751	
11,600.00	5,811.01	11,719.92	5,810.94	121.61	121.24	-89.99	-6,299.68	743.49	659.84	416.16	243.68	2.708	
11,700.00	5,811.00	11,819.92	5,810.94	123.52	123.13	-89.99	-6,399.68	743.48	659.83	412.33	247.50	2.666	
11,800.00	5,811.00	11,919.92	5,810.95	125.43	125.03	-90.00	-6,499.68	743.47	659.81	408.50	251.31	2.625	
11,900.00	5,811.00	12,019.92	5,810.95	127.34	126.92	-90.00	-6,599.68	743.46	659.80	404.67	255.13	2.586	
12,000.00	5,811.00	12,119.92	5,810.95	129.26	128.82	-90.00	-6,699.68	743.46	659.78	400.84	258.95	2.548	
12,100.00	5,811.00	12,219.92	5,810.95	131.17	130.71	-90.00	-6,799.68	743.45	659.77	397.00	262.77	2.511	
12,200.00	5,811.00	12,319.92	5,810.96	133.08	132.61	-90.00	-6,899.68	743.44	659.75	393.17	266.59	2.475	
12,300.00	5,811.00	12,419.92	5,810.96	134.99	134.51	-90.00	-6,999.68	743.43	659.74	389.33	270.41	2.440	
12,400.00	5,811.00	12,519.92	5,810.96	136.91	136.41	-90.00	-7,099.68	743.43	659.72	385.50	274.23	2.406	
12,500.00	5,811.00	12,619.92	5,810.96	138.82	138.31	-90.00	-7,199.68	743.42	659.71	381.66	278.05	2.373	
12,600.00	5,811.00	12,719.92	5,810.97	140.74	140.21	-90.00	-7,299.68	743.41	659.69	377.82	281.87	2.340	
12,700.00	5,811.00	12,819.92	5,810.97	142.65	142.11	-90.00	-7,399.68	743.41	659.68	373.98	285.70	2.309	
12,800.00	5,810.99	12,919.92	5,810.97	144.56	144.01	-90.00	-7,499.68	743.40	659.66	370.15	289.52	2.278	
12,900.00	5,810.99	13,019.92	5,810.97	146.48	145.91	-90.00	-7,599.68	743.39	659.65	366.31	293.34	2.249	
13,000.00	5,810.99	13,119.92	5,810.98	148.39	147.81	-90.00	-7,699.68	743.38	659.63	362.47	297.17	2.220	
13,100.00	5,810.99	13,219.92	5,810.98	150.31	149.71	-90.00	-7,799.68	743.38	659.62	358.63	300.99	2.191	
13,200.00	5,810.99	13,319.92	5,810.98	152.22	151.62	-90.00	-7,899.68	743.37	659.61	354.79	304.82	2.164	
13,300.00	5,810.99	13,419.92	5,810.98	154.14	153.52	-90.00	-7,999.68	743.36	659.59	350.95	308.64	2.137	
13,400.00	5,810.99	13,519.92	5,810.99	156.05	155.42	-90.00	-8,099.68	743.35	659.58	347.11	312.47	2.111	
13,500.00	5,810.99	13,619.92	5,810.99	157.97	157.33	-90.00	-8,199.68	743.35	659.56	343.26	316.30	2.085	
13,532.35	5,810.99	13,652.26	5,810.99	158.59	157.94	-90.00	-8,232.02	743.34	659.56	342.03	317.53	2.077	
13,541.60	5,810.99	13,658.43	5,810.99	158.77	158.06	-90.00	-8,238.19	743.34	659.56	341.74	317.83	2.075 SF	

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor Federal #12F-1305A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor Federal #12F-1305A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #3	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design S12-T10N-R58W - Razor Federal#12F-1308B - HZ - Plan #2												Offset Site Error:	0.00 usft
Survey Program: 0-ISCSWA MWD												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor	Warning
0.00	0.00	0.01	0.01	0.00	0.00	90.02	-0.03	98.36	98.36				
100.00	100.00	100.01	100.01	0.09	0.09	90.02	-0.03	98.36	98.36	98.18	0.19	525.890	
200.00	200.00	200.01	200.01	0.32	0.32	90.02	-0.03	98.36	98.36	97.73	0.64	154.519	
300.00	300.00	300.01	300.01	0.54	0.54	90.02	-0.03	98.36	98.36	97.28	1.09	90.564	
400.00	400.00	400.01	400.01	0.77	0.77	90.02	-0.03	98.36	98.36	96.83	1.54	64.053	
500.00	500.00	500.01	500.01	0.99	0.99	90.02	-0.03	98.36	98.36	96.38	1.99	49.548	
600.00	600.00	600.01	600.01	1.22	1.22	90.02	-0.03	98.36	98.36	95.93	2.43	40.400	
700.00	700.00	700.01	700.01	1.44	1.44	90.02	-0.03	98.36	98.36	95.48	2.88	34.103	
800.00	800.00	800.01	800.01	1.67	1.67	90.02	-0.03	98.36	98.36	95.03	3.33	29.505	
866.66	866.66	866.67	866.67	1.82	1.82	90.02	-0.03	98.36	98.36	94.73	3.63	27.071 CC	
900.00	900.00	900.00	900.00	1.89	1.89	90.02	-0.03	98.36	98.36	94.58	3.78	25.999 ES	
1,000.00	999.98	997.84	997.83	2.09	2.09	-84.95	-1.31	99.43	99.30	95.12	4.17	23.788	
1,100.00	1,099.84	1,095.62	1,095.47	2.27	2.27	-85.60	-5.15	102.64	102.11	97.58	4.53	22.537	
1,200.00	1,199.59	1,195.44	1,195.04	2.46	2.47	-86.43	-10.50	107.11	105.98	101.06	4.92	21.553	
1,300.00	1,299.35	1,295.35	1,294.71	2.66	2.68	-87.20	-15.84	111.57	109.87	104.55	5.33	20.630	
1,400.00	1,399.11	1,395.26	1,394.38	2.87	2.90	-87.91	-21.19	116.04	113.78	108.03	5.75	19.780	
1,500.00	1,498.86	1,495.18	1,494.05	3.10	3.12	-88.58	-26.54	120.51	117.70	111.51	6.19	19.005	
1,600.00	1,598.62	1,595.09	1,593.72	3.33	3.35	-89.21	-31.89	124.98	121.64	115.00	6.65	18.303	
1,700.00	1,698.38	1,695.01	1,693.39	3.56	3.59	-89.80	-37.24	129.45	125.60	118.49	7.11	17.668	
1,800.00	1,798.13	1,794.92	1,793.06	3.80	3.83	-90.35	-42.59	133.92	129.56	121.99	7.58	17.095	
1,900.00	1,897.89	1,894.83	1,892.73	4.04	4.07	-90.87	-47.93	138.39	133.54	125.49	8.06	16.576	
2,000.00	1,997.65	1,994.75	1,992.40	4.28	4.32	-91.36	-53.28	142.86	137.53	128.99	8.54	16.107	
2,100.00	2,097.40	2,094.66	2,092.08	4.53	4.56	-91.82	-58.63	147.32	141.53	132.50	9.03	15.680	
2,200.00	2,197.16	2,194.57	2,191.75	4.78	4.81	-92.25	-63.98	151.79	145.53	136.02	9.52	15.292	
2,300.00	2,296.91	2,294.49	2,291.42	5.03	5.06	-92.67	-69.33	156.26	149.55	139.53	10.01	14.938	
2,400.00	2,396.67	2,394.40	2,391.09	5.28	5.32	-93.06	-74.68	160.73	153.57	143.06	10.51	14.614	
2,500.00	2,496.43	2,494.32	2,490.76	5.53	5.57	-93.43	-80.02	165.20	157.59	146.59	11.01	14.316	
2,600.00	2,596.18	2,594.23	2,590.43	5.78	5.82	-93.78	-85.37	169.67	161.63	150.12	11.51	14.042	
2,700.00	2,695.94	2,694.14	2,690.10	6.04	6.08	-94.11	-90.72	174.14	165.67	153.65	12.01	13.790	
2,800.00	2,795.70	2,794.06	2,789.77	6.29	6.33	-94.43	-96.07	178.61	169.71	157.19	12.52	13.556	
2,900.00	2,895.45	2,893.97	2,889.44	6.55	6.59	-94.74	-101.42	183.08	173.76	160.74	13.03	13.339	
3,000.00	2,995.21	2,993.88	2,989.11	6.81	6.85	-95.03	-106.77	187.54	177.82	164.28	13.53	13.138	
3,100.00	3,094.97	3,093.80	3,088.78	7.06	7.10	-95.31	-112.11	192.01	181.88	167.83	14.04	12.950	
3,200.00	3,194.72	3,193.71	3,188.45	7.32	7.36	-95.57	-117.46	196.48	185.94	171.39	14.56	12.775	
3,300.00	3,294.48	3,293.63	3,288.12	7.58	7.62	-95.82	-122.81	200.95	190.01	174.94	15.07	12.611	
3,400.00	3,394.23	3,393.54	3,387.79	7.84	7.88	-96.07	-128.16	205.42	194.08	178.50	15.58	12.458	
3,500.00	3,493.99	3,493.45	3,487.46	8.10	8.14	-96.30	-133.51	209.89	198.15	182.06	16.09	12.313	
3,600.00	3,593.75	3,593.37	3,587.13	8.36	8.40	-96.53	-138.86	214.36	202.23	185.62	16.61	12.178	
3,700.00	3,693.50	3,693.28	3,686.80	8.62	8.66	-96.74	-144.21	218.83	206.31	189.19	17.12	12.050	
3,800.00	3,793.26	3,793.19	3,786.47	8.88	8.92	-96.95	-149.55	223.29	210.39	192.76	17.64	11.930	
3,900.00	3,893.02	3,893.11	3,886.14	9.14	9.18	-97.15	-154.90	227.76	214.48	196.33	18.15	11.816	
4,000.00	3,992.77	3,993.02	3,985.81	9.40	9.44	-97.34	-160.25	232.23	218.57	199.90	18.67	11.708	
4,100.00	4,092.53	4,092.94	4,085.48	9.66	9.70	-97.52	-165.60	236.70	222.66	203.47	19.18	11.606	
4,200.00	4,192.29	4,192.85	4,185.15	9.92	9.96	-97.70	-170.95	241.17	226.75	207.05	19.70	11.509	
4,300.00	4,292.04	4,292.76	4,284.82	10.18	10.22	-97.87	-176.30	245.64	230.84	210.62	20.22	11.417	
4,400.00	4,391.80	4,392.68	4,384.49	10.45	10.48	-98.04	-181.64	250.11	234.94	214.20	20.74	11.330	
4,500.00	4,491.56	4,492.59	4,484.16	10.71	10.74	-98.20	-186.99	254.58	239.04	217.78	21.25	11.247	
4,600.00	4,591.31	4,592.51	4,583.84	10.97	11.00	-98.35	-192.34	259.05	243.14	221.37	21.77	11.167	
4,700.00	4,691.07	4,692.42	4,683.51	11.23	11.26	-98.50	-197.69	263.51	247.24	224.95	22.29	11.091	
4,800.00	4,790.82	4,792.33	4,783.18	11.49	11.53	-98.64	-203.04	267.98	251.34	228.53	22.81	11.019	
4,900.00	4,890.58	4,892.25	4,882.85	11.76	11.79	-98.78	-208.39	272.45	255.45	232.12	23.33	10.950	
5,000.00	4,990.34	4,992.16	4,982.52	12.02	12.05	-98.92	-213.73	276.92	259.56	235.71	23.85	10.884	

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

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor Federal #12F-1305A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.59usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor Federal #12F-1305A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #3	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design S12-T10N-R58W - Razor Federal#12F-1308B - HZ - Plan #2													Offset Site Error: 0.00 usft	
Survey Program: 0-ISCSA MWD													Offset Well Error: 0.00 usft	
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor		
5,100.00	5,090.09	5,092.07	5,082.19	12.28	12.31	-99.05	-219.08	281.39	263.66	239.30	24.37	10.820		
5,200.00	5,189.85	5,191.99	5,181.86	12.54	12.57	-99.18	-224.43	285.86	267.77	242.89	24.89	10.759		
5,300.00	5,289.61	5,291.90	5,281.53	12.81	12.83	-99.30	-229.78	290.33	271.88	246.48	25.41	10.701		
5,400.00	5,388.94	5,391.62	5,381.00	13.10	13.10	-99.84	-235.12	294.79	276.64	250.69	25.95	10.662 SF		
5,500.00	5,484.71	5,480.67	5,469.66	13.56	13.35	-102.34	-241.22	299.89	286.00	259.42	26.58	10.759		
5,600.00	5,573.33	5,561.50	5,548.31	14.18	13.68	-104.12	-255.31	311.66	305.67	278.31	27.36	11.173		
5,700.00	5,651.55	5,641.86	5,622.73	15.00	14.12	-104.82	-278.39	330.94	335.80	307.44	28.35	11.843		
5,800.00	5,716.49	5,721.35	5,690.95	16.02	14.68	-104.33	-309.59	357.01	375.22	345.56	29.66	12.649		
5,900.00	5,765.76	5,799.99	5,751.57	17.23	15.36	-102.66	-347.94	389.05	422.44	391.08	31.36	13.473		
6,000.00	5,797.56	5,878.35	5,803.82	18.59	16.19	-99.94	-392.67	426.43	475.79	442.34	33.45	14.224		
6,100.00	5,810.71	5,957.53	5,847.14	20.07	17.17	-96.41	-443.46	468.87	533.60	497.75	35.85	14.884		
6,200.00	5,811.05	6,041.20	5,881.47	21.51	18.35	-98.78	-501.95	517.73	594.92	557.21	37.71	15.776		
6,300.00	5,811.05	6,131.64	5,904.35	22.87	19.78	-100.77	-569.00	573.76	659.36	619.90	39.46	16.711		

# Cathedral Energy Services

## Anticollision Report

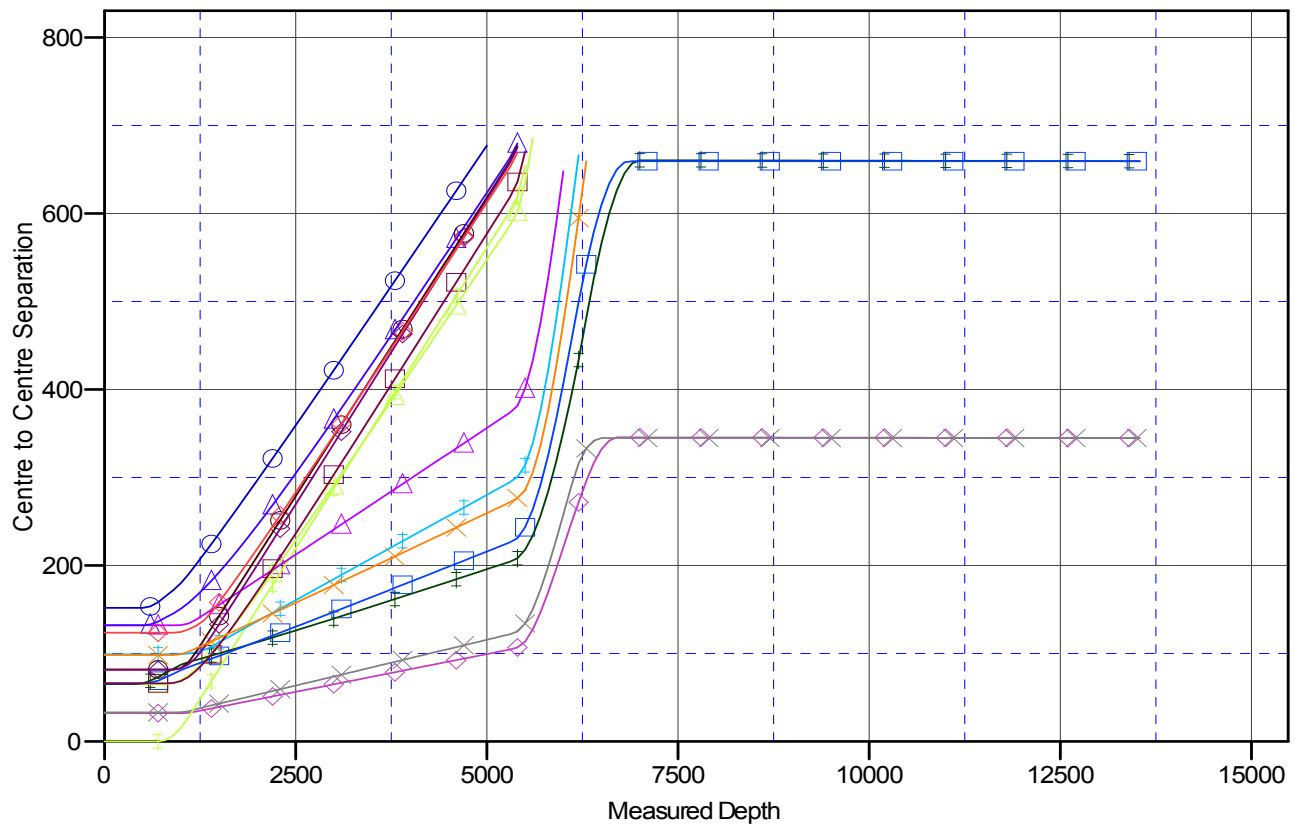
**Company:** Whiting Petroleum Corporation  
**Project:** Weld County, CO  
**Reference Site:** S12-T10N-R58W  
**Site Error:** 0.00usft  
**Reference Well:** Razor Federal #12F-1305A  
**Well Error:** 0.00usft  
**Reference Wellbore:** HZ  
**Reference Design:** Plan #3

**Local Co-ordinate Reference:** Well Razor Federal #12F-1305A  
**TVD Reference:** WELL @ 4953.59usft (Original Well Elev)  
**MD Reference:** WELL @ 4953.59usft (Original Well Elev)  
**North Reference:** True  
**Survey Calculation Method:** Minimum Curvature  
**Output errors are at** 2.00 sigma  
**Database:** USA EDM 5000 Multi Users DB  
**Offset TVD Reference:** Offset Datum

Reference Depths are relative to WELL @ 4953.59usft (Original Well E  
 Offset Depths are relative to Offset Datum  
 Central Meridian is 105° 30' 0.000 W °

Coordinates are relative to: Razor Federal #12F-1305A  
 Coordinate System is US State Plane 1983, Colorado Northern Zone  
 Grid Convergence at Surface is: 1.09°

### Ladder Plot



### LEGEND

- Razor Federal #12F-1306B, HZ, Plan #2 V0
- Razor Federal #12F-1303A, HZ, Plan #3 V0
- Razor #12F-0103A, HZ, Plan #2 V0
- Razor Federal #12F-1304B, HZ, Plan #2 V0
- Razor Federal #12F-1301A, HZ, Plan #3 V0
- Razor #12F-0101A, HZ, Plan #2 V0
- Razor #12F-0108B, HZ, Plan #2 V0
- Razor Federal #12F-1302B, HZ, Plan #2 V0
- Razor #12F-0105A, HZ, Plan #2 V0
- Razor #12F-0106B, HZ, Plan #2 V0
- Razor #12F-0102B, HZ, Plan #2 V0
- Razor #12F-0107A, HZ, Plan #2 V0
- Razor Federal #12F-1307A, HZ, Plan #2 V0
- Razor #12F-0104B, HZ, Plan #2 V0
- Razor Federal #12F-1308B, HZ, Plan #2 V0