



Project: Weld County, CO  
Site: S12-T10N-R58W  
Well: Razor #12F-0101A  
Wellbore: HZ  
Design: Plan #3



#### SECTION DETAILS

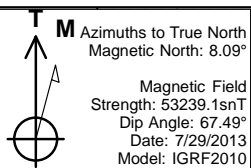
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00
3	700.00	4.00	313.26	699.84	4.78	-5.08	2.00	313.26	4.78
4	5337.90	4.00	313.26	5326.44	226.50	-240.69	0.00	0.00	226.50
5	6119.72	90.00	313.26	5810.98	582.58	-619.09	11.00	0.00	582.58
6	7677.77	90.00	0.00	5810.98	1973.50	-1220.10	3.00	90.00	1973.50
7	12596.54	90.00	0.00	5811.00	6892.26	-1219.96	0.00	0.00	6892.26

#### Annotation

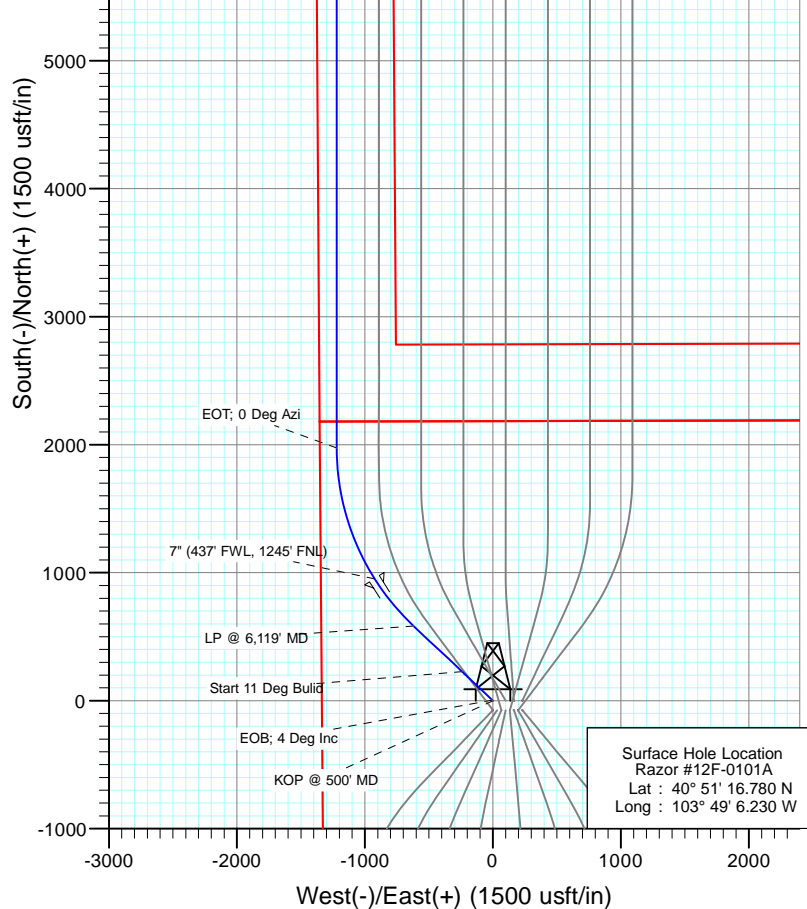
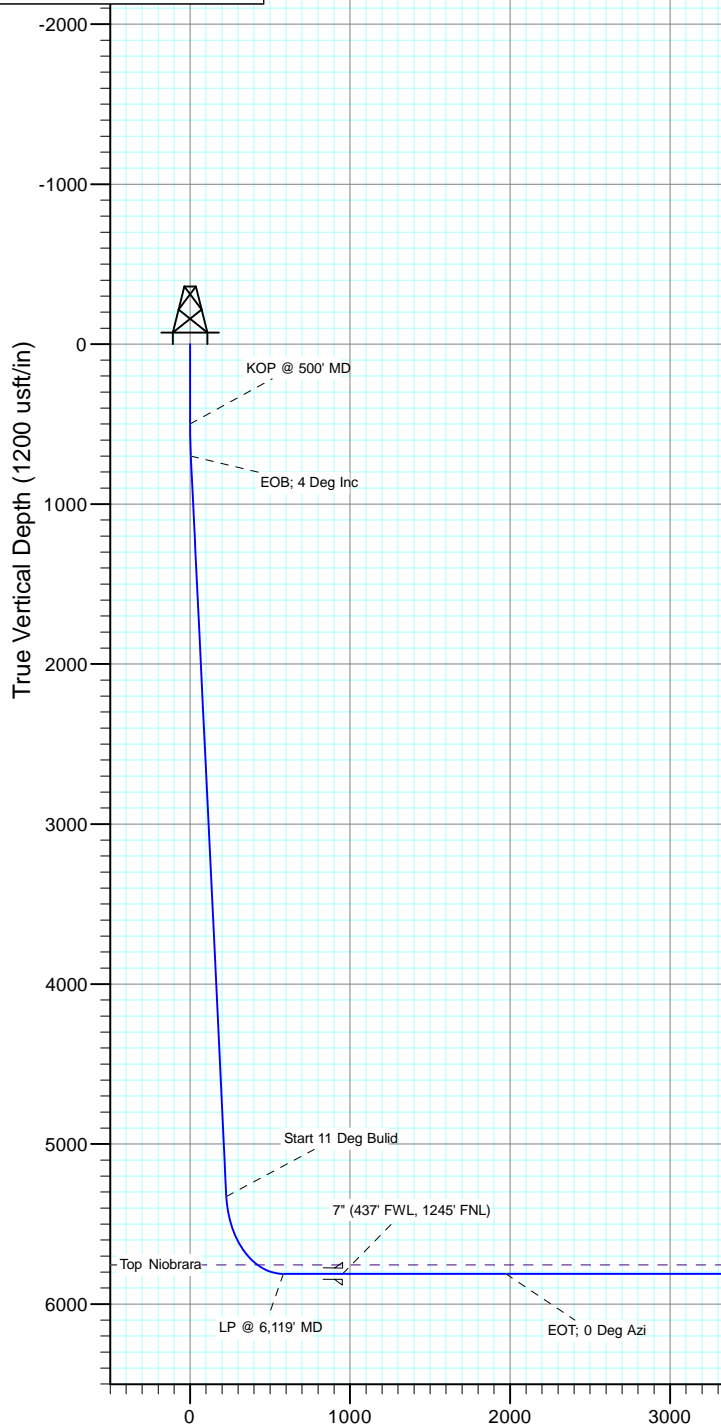
KOP @ 500' MD  
EOB; 4 Deg Inc  
Start 11 Deg Build  
LP @ 6,119' MD  
EOT; 0 Deg Azi  
PBHL @ 12,596.54' MD

Razor #12F-0101A PBHL(165' FWL-600' FNL Sec 1)

PBHL @ 12,596.54' MD



Magnetic Field  
Strength: 53239.1snT  
Dip Angle: 67.49°  
Date: 7/29/2013  
Model: IGRF2010



Surface Hole Location  
Razor #12F-0101A  
Lat : 40° 51' 16.780 N  
Long : 103° 49' 6.230 W

#### FORMATION TOP DETAILS

TVDPath	MDPath	Formation
5755.00	5876.02	Top Niobrara

Plan #3  
Razor #12F-0101A  
WELL @ 4953.60usft (Original Well Elev)  
Ground Elevation @ 4936.80  
North American Datum 1983  
Well Razor #12F-0101A, True North

Vertical Section at 0.00° (1200 usft/in)

# Cathedral Energy Services

## Survey Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor #12F-0101A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Well:</b>	Razor #12F-0101A	<b>North Reference:</b>	True
<b>Wellbore:</b>	HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Plan #3	<b>Database:</b>	USA EDM 5000 Multi Users DB

<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 #12F-0101A					
Well Position	+N/-S	0.00 usft	Northing:	1,558,612.83 usft	Latitude:	40° 51' 16.780 N
	+E/-W	0.00 usft	Easting:	3,465,174.73 usft	Longitude:	103° 49' 6.230 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	7/29/2013	8.09	67.49	53,239

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

<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	12,596.54	Plan #3 (HZ)	ISCWSA MWD	MWD - ISCWSA	

<b>Planned Survey</b>										
<b>Measured Depth (usft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Vertical Section (usft)</b>	<b>Dogleg Rate (°/100usf)</b>	<b>Build Rate (°/100u)</b>	<b>Formations / Comments</b>	
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		KOP @ 500' MD
600.00	2.00	313.26	599.98	1.20	-1.27	1.20	2.00	2.00		
700.00	4.00	313.26	699.84	4.78	-5.08	4.78	2.00	2.00		EOB; 4 Deg Inc
800.00	4.00	313.26	799.59	9.56	-10.16	9.56	0.00	0.00		
900.00	4.00	313.26	899.35	14.34	-15.24	14.34	0.00	0.00		
1,000.00	4.00	313.26	999.11	19.12	-20.32	19.12	0.00	0.00		
1,100.00	4.00	313.26	1,098.86	23.90	-25.40	23.90	0.00	0.00		
1,200.00	4.00	313.26	1,198.62	28.68	-30.48	28.68	0.00	0.00		

# Cathedral Energy Services

## Survey Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor #12F-0101A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Well:</b>	Razor #12F-0101A	<b>North Reference:</b>	True
<b>Wellbore:</b>	HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Plan #3	<b>Database:</b>	USA EDM 5000 Multi Users DB

### Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
1,300.00	4.00	313.26	1,298.38	33.47	-35.56	33.47	0.00	0.00	
1,400.00	4.00	313.26	1,398.13	38.25	-40.64	38.25	0.00	0.00	
1,500.00	4.00	313.26	1,497.89	43.03	-45.72	43.03	0.00	0.00	
1,600.00	4.00	313.26	1,597.65	47.81	-50.80	47.81	0.00	0.00	
1,700.00	4.00	313.26	1,697.40	52.59	-55.88	52.59	0.00	0.00	
1,800.00	4.00	313.26	1,797.16	57.37	-60.96	57.37	0.00	0.00	
1,900.00	4.00	313.26	1,896.91	62.15	-66.04	62.15	0.00	0.00	
2,000.00	4.00	313.26	1,996.67	66.93	-71.12	66.93	0.00	0.00	
2,100.00	4.00	313.26	2,096.43	71.71	-76.20	71.71	0.00	0.00	
2,200.00	4.00	313.26	2,196.18	76.49	-81.28	76.49	0.00	0.00	
2,300.00	4.00	313.26	2,295.94	81.27	-86.36	81.27	0.00	0.00	
2,400.00	4.00	313.26	2,395.70	86.05	-91.44	86.05	0.00	0.00	
2,500.00	4.00	313.26	2,495.45	90.83	-96.52	90.83	0.00	0.00	
2,600.00	4.00	313.26	2,595.21	95.61	-101.60	95.61	0.00	0.00	
2,700.00	4.00	313.26	2,694.97	100.39	-106.68	100.39	0.00	0.00	
2,800.00	4.00	313.26	2,794.72	105.17	-111.76	105.17	0.00	0.00	
2,900.00	4.00	313.26	2,894.48	109.95	-116.84	109.95	0.00	0.00	
3,000.00	4.00	313.26	2,994.23	114.73	-121.92	114.73	0.00	0.00	
3,100.00	4.00	313.26	3,093.99	119.51	-127.00	119.51	0.00	0.00	
3,200.00	4.00	313.26	3,193.75	124.29	-132.08	124.29	0.00	0.00	
3,300.00	4.00	313.26	3,293.50	129.07	-137.16	129.07	0.00	0.00	
3,400.00	4.00	313.26	3,393.26	133.86	-142.24	133.86	0.00	0.00	
3,500.00	4.00	313.26	3,493.02	138.64	-147.32	138.64	0.00	0.00	
3,600.00	4.00	313.26	3,592.77	143.42	-152.40	143.42	0.00	0.00	
3,700.00	4.00	313.26	3,692.53	148.20	-157.48	148.20	0.00	0.00	
3,800.00	4.00	313.26	3,792.29	152.98	-162.56	152.98	0.00	0.00	
3,900.00	4.00	313.26	3,892.04	157.76	-167.64	157.76	0.00	0.00	
4,000.00	4.00	313.26	3,991.80	162.54	-172.72	162.54	0.00	0.00	
4,100.00	4.00	313.26	4,091.56	167.32	-177.80	167.32	0.00	0.00	
4,200.00	4.00	313.26	4,191.31	172.10	-182.88	172.10	0.00	0.00	
4,300.00	4.00	313.26	4,291.07	176.88	-187.96	176.88	0.00	0.00	
4,400.00	4.00	313.26	4,390.82	181.66	-193.04	181.66	0.00	0.00	
4,500.00	4.00	313.26	4,490.58	186.44	-198.12	186.44	0.00	0.00	
4,600.00	4.00	313.26	4,590.34	191.22	-203.20	191.22	0.00	0.00	
4,700.00	4.00	313.26	4,690.09	196.00	-208.28	196.00	0.00	0.00	
4,800.00	4.00	313.26	4,789.85	200.78	-213.36	200.78	0.00	0.00	
4,900.00	4.00	313.26	4,889.61	205.56	-218.44	205.56	0.00	0.00	
5,000.00	4.00	313.26	4,989.36	210.34	-223.52	210.34	0.00	0.00	
5,100.00	4.00	313.26	5,089.12	215.12	-228.60	215.12	0.00	0.00	
5,200.00	4.00	313.26	5,188.88	219.90	-233.68	219.90	0.00	0.00	
5,300.00	4.00	313.26	5,288.63	224.68	-238.76	224.68	0.00	0.00	
5,337.90	4.00	313.26	5,326.44	226.50	-240.69	226.50	0.00	0.00	Start 11 Deg Build
5,400.00	10.83	313.26	5,387.98	231.99	-246.52	231.99	11.00	11.00	
5,500.00	21.83	313.26	5,483.80	251.23	-266.97	251.23	11.00	11.00	
5,600.00	32.83	313.26	5,572.50	282.64	-300.35	282.64	11.00	11.00	
5,700.00	43.83	313.26	5,650.83	325.08	-345.45	325.08	11.00	11.00	
5,800.00	54.83	313.26	5,715.90	376.98	-400.60	376.98	11.00	11.00	
5,876.02	63.19	313.26	5,755.00	421.60	-448.02	421.60	11.00	11.00	Top Niobrara
5,900.00	65.83	313.26	5,765.32	436.44	-463.78	436.44	11.00	11.00	
6,000.00	76.83	313.26	5,797.28	501.26	-532.67	501.26	11.00	11.00	
6,100.00	87.83	313.26	5,810.60	569.07	-604.73	569.07	11.00	11.00	
6,119.72	90.00	313.26	5,810.98	582.58	-619.09	582.58	11.00	11.00	LP @ 6,119' MD
6,200.00	90.00	315.67	5,810.98	638.82	-676.38	638.82	3.00	0.00	

# Cathedral Energy Services

## Survey Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor #12F-0101A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Well:</b>	Razor #12F-0101A	<b>North Reference:</b>	True
<b>Wellbore:</b>	HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Plan #3	<b>Database:</b>	USA EDM 5000 Multi Users DB

### Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
6,300.00	90.00	318.67	5,810.98	712.14	-744.36	712.14	3.00	0.00	
6,400.00	90.00	321.67	5,810.98	788.93	-808.40	788.93	3.00	0.00	
6,500.00	90.00	324.67	5,810.98	868.96	-868.34	868.96	3.00	0.00	
6,600.00	90.00	327.67	5,810.98	952.02	-924.01	952.02	3.00	0.00	7" (437' FWL, 1245' FNL)
6,700.00	90.00	330.67	5,810.98	1,037.87	-975.26	1,037.87	3.00	0.00	
6,800.00	90.00	333.67	5,810.98	1,126.30	-1,021.94	1,126.30	3.00	0.00	
6,900.00	90.00	336.67	5,810.98	1,217.04	-1,063.93	1,217.04	3.00	0.00	
7,000.00	90.00	339.67	5,810.98	1,309.86	-1,101.11	1,309.86	3.00	0.00	
7,100.00	90.00	342.67	5,810.98	1,404.49	-1,133.39	1,404.49	3.00	0.00	
7,200.00	90.00	345.67	5,810.98	1,500.69	-1,160.67	1,500.69	3.00	0.00	
7,300.00	90.00	348.67	5,810.98	1,598.18	-1,182.87	1,598.18	3.00	0.00	
7,400.00	90.00	351.67	5,810.98	1,696.70	-1,199.95	1,696.70	3.00	0.00	
7,500.00	90.00	354.67	5,810.98	1,795.98	-1,211.84	1,795.98	3.00	0.00	
7,600.00	90.00	357.67	5,810.98	1,895.75	-1,218.52	1,895.75	3.00	0.00	
7,677.77	90.00	0.00	5,810.98	1,973.49	-1,220.10	1,973.49	3.00	0.00	EOT; 0 Deg Azi
7,700.00	90.00	0.00	5,810.98	1,995.72	-1,220.10	1,995.72	0.00	0.00	
7,800.00	90.00	0.00	5,810.98	2,095.72	-1,220.10	2,095.72	0.00	0.00	
7,900.00	90.00	0.00	5,810.98	2,195.72	-1,220.10	2,195.72	0.00	0.00	
8,000.00	90.00	0.00	5,810.98	2,295.72	-1,220.09	2,295.72	0.00	0.00	
8,100.00	90.00	0.00	5,810.98	2,395.72	-1,220.09	2,395.72	0.00	0.00	
8,200.00	90.00	0.00	5,810.98	2,495.72	-1,220.09	2,495.72	0.00	0.00	
8,300.00	90.00	0.00	5,810.98	2,595.72	-1,220.08	2,595.72	0.00	0.00	
8,400.00	90.00	0.00	5,810.98	2,695.72	-1,220.08	2,695.72	0.00	0.00	
8,500.00	90.00	0.00	5,810.98	2,795.72	-1,220.08	2,795.72	0.00	0.00	
8,600.00	90.00	0.00	5,810.98	2,895.72	-1,220.08	2,895.72	0.00	0.00	
8,700.00	90.00	0.00	5,810.98	2,995.72	-1,220.07	2,995.72	0.00	0.00	
8,800.00	90.00	0.00	5,810.98	3,095.72	-1,220.07	3,095.72	0.00	0.00	
8,900.00	90.00	0.00	5,810.98	3,195.72	-1,220.07	3,195.72	0.00	0.00	
9,000.00	90.00	0.00	5,810.99	3,295.72	-1,220.06	3,295.72	0.00	0.00	
9,100.00	90.00	0.00	5,810.99	3,395.72	-1,220.06	3,395.72	0.00	0.00	
9,200.00	90.00	0.00	5,810.99	3,495.72	-1,220.06	3,495.72	0.00	0.00	
9,300.00	90.00	0.00	5,810.99	3,595.72	-1,220.05	3,595.72	0.00	0.00	
9,400.00	90.00	0.00	5,810.99	3,695.72	-1,220.05	3,695.72	0.00	0.00	
9,500.00	90.00	0.00	5,810.99	3,795.72	-1,220.05	3,795.72	0.00	0.00	
9,600.00	90.00	0.00	5,810.99	3,895.72	-1,220.05	3,895.72	0.00	0.00	
9,700.00	90.00	0.00	5,810.99	3,995.72	-1,220.04	3,995.72	0.00	0.00	
9,800.00	90.00	0.00	5,810.99	4,095.72	-1,220.04	4,095.72	0.00	0.00	
9,900.00	90.00	0.00	5,810.99	4,195.72	-1,220.04	4,195.72	0.00	0.00	
10,000.00	90.00	0.00	5,810.99	4,295.72	-1,220.03	4,295.72	0.00	0.00	
10,100.00	90.00	0.00	5,810.99	4,395.72	-1,220.03	4,395.72	0.00	0.00	
10,200.00	90.00	0.00	5,810.99	4,495.72	-1,220.03	4,495.72	0.00	0.00	
10,300.00	90.00	0.00	5,810.99	4,595.72	-1,220.03	4,595.72	0.00	0.00	
10,400.00	90.00	0.00	5,810.99	4,695.72	-1,220.02	4,695.72	0.00	0.00	
10,500.00	90.00	0.00	5,810.99	4,795.72	-1,220.02	4,795.72	0.00	0.00	
10,600.00	90.00	0.00	5,810.99	4,895.72	-1,220.02	4,895.72	0.00	0.00	
10,700.00	90.00	0.00	5,810.99	4,995.72	-1,220.01	4,995.72	0.00	0.00	
10,800.00	90.00	0.00	5,810.99	5,095.72	-1,220.01	5,095.72	0.00	0.00	
10,900.00	90.00	0.00	5,810.99	5,195.72	-1,220.01	5,195.72	0.00	0.00	
11,000.00	90.00	0.00	5,810.99	5,295.72	-1,220.00	5,295.72	0.00	0.00	
11,100.00	90.00	0.00	5,810.99	5,395.72	-1,220.00	5,395.72	0.00	0.00	
11,200.00	90.00	0.00	5,810.99	5,495.72	-1,220.00	5,495.72	0.00	0.00	
11,300.00	90.00	0.00	5,810.99	5,595.72	-1,220.00	5,595.72	0.00	0.00	
11,400.00	90.00	0.00	5,811.00	5,695.72	-1,219.99	5,695.72	0.00	0.00	

# Cathedral Energy Services

## Survey Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor #12F-0101A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Well:</b>	Razor #12F-0101A	<b>North Reference:</b>	True
<b>Wellbore:</b>	HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Plan #3	<b>Database:</b>	USA EDM 5000 Multi Users DB

### Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
11,500.00	90.00	0.00	5,811.00	5,795.72	-1,219.99	5,795.72	0.00	0.00	
11,600.00	90.00	0.00	5,811.00	5,895.72	-1,219.99	5,895.72	0.00	0.00	
11,700.00	90.00	0.00	5,811.00	5,995.72	-1,219.98	5,995.72	0.00	0.00	
11,800.00	90.00	0.00	5,811.00	6,095.72	-1,219.98	6,095.72	0.00	0.00	
11,900.00	90.00	0.00	5,811.00	6,195.72	-1,219.98	6,195.72	0.00	0.00	
12,000.00	90.00	0.00	5,811.00	6,295.72	-1,219.98	6,295.72	0.00	0.00	
12,100.00	90.00	0.00	5,811.00	6,395.72	-1,219.97	6,395.72	0.00	0.00	
12,200.00	90.00	0.00	5,811.00	6,495.72	-1,219.97	6,495.72	0.00	0.00	
12,300.00	90.00	0.00	5,811.00	6,595.72	-1,219.97	6,595.72	0.00	0.00	
12,400.00	90.00	0.00	5,811.00	6,695.72	-1,219.96	6,695.72	0.00	0.00	
12,500.00	90.00	0.00	5,811.00	6,795.72	-1,219.96	6,795.72	0.00	0.00	
12,596.54	90.00	0.00	5,811.00	6,892.26	-1,219.96	6,892.26	0.00	0.00	PBHL @ 12,596.54' MD

### Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Razor #12F-0101A PBH - plan hits target center - Point	0.00	0.00	5,811.00	6,892.26	-1,219.96	1,565,480.72	3,463,824.30	40° 52' 24.880 N	103° 49' 22.110 W

### Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
6,600.00	5,810.98	7" (437' FWL, 1245' FNL)	0	0

### Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
5,876.02	5,755.00	Top Niobrara		0.00	

### Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
500.00	500.00	0.00	0.00	KOP @ 500' MD
700.00	699.84	4.78	-5.08	EOB; 4 Deg Inc
5,337.90	5,326.44	226.50	-240.69	Start 11 Deg Bulid
6,119.72	5,810.98	582.58	-619.09	LP @ 6,119' MD
7,677.77	5,810.98	1,973.49	-1,220.10	EOT; 0 Deg Azi
12,596.54	5,811.00	6,892.26	-1,219.96	PBHL @ 12,596.54' MD

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_

# **Whiting Petroleum Corporation**

**Weld County, CO**

**S12-T10N-R58W**

**Razor #12F-0101A**

**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 #12F-0101A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor #12F-0101A	<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		

Survey Tool Program		Date	11/8/2013		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.00	12,596.54	Plan #3 (HZ)	ISCWSA MWD	MWD - ISCWSA	

Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
S12-T10N-R58W						
Razor #12F-0102B - HZ - Plan #2	4,675.59	4,679.48	55.76	34.65	2.641	CC
Razor #12F-0102B - HZ - Plan #2	5,300.00	5,303.84	56.28	32.30	2.347	ES
Razor #12F-0102B - HZ - Plan #2	12,596.54	12,582.50	344.70	89.65	1.352	Level 3, SF
Razor #12F-0103A - HZ - Plan #2	500.00	500.00	99.13	97.15	49.936	CC, ES
Razor #12F-0103A - HZ - Plan #2	12,596.54	12,348.47	659.91	397.06	2.511	SF
Razor #12F-0104B - HZ - Plan #2	500.00	500.00	99.88	97.89	50.314	CC, ES
Razor #12F-0104B - HZ - Plan #2	5,300.00	5,303.72	221.96	196.66	8.774	SF
Razor #12F-0105A - HZ - Plan #2	500.00	500.00	164.45	162.46	82.840	CC, ES
Razor #12F-0105A - HZ - Plan #2	5,300.00	5,296.29	386.92	361.50	15.226	SF
Razor #12F-0106B - HZ - Plan #2	500.00	500.00	151.92	149.93	76.528	CC, ES
Razor #12F-0106B - HZ - Plan #2	5,300.00	5,290.79	455.27	429.94	17.976	SF
Razor #12F-0107A - HZ - Plan #2	500.00	500.00	230.54	228.55	116.131	CC, ES
Razor #12F-0107A - HZ - Plan #2	5,300.00	5,278.95	589.24	564.29	23.614	SF
Razor #12F-0108B - HZ - Plan #2	500.00	500.00	211.22	209.24	106.402	CC, ES
Razor #12F-0108B - HZ - Plan #2	5,300.00	5,276.15	623.49	598.61	25.063	SF
Razor Federal #12F-1301A - HZ - Plan #3	500.00	499.99	74.88	72.90	37.721	CC, ES
Razor Federal #12F-1301A - HZ - Plan #3	5,300.00	5,274.90	510.69	485.94	20.635	SF
Razor Federal #12F-1302B - HZ - Plan #2	500.00	500.00	81.85	79.87	41.232	CC, ES
Razor Federal #12F-1302B - HZ - Plan #2	5,300.00	5,272.57	539.32	514.93	22.112	SF
Razor Federal #12F-1303A - HZ - Plan #3	500.00	499.99	99.87	97.89	50.311	CC, ES
Razor Federal #12F-1303A - HZ - Plan #3	5,300.00	5,266.63	622.62	598.01	25.298	SF
Razor Federal #12F-1304B - HZ - Plan #2	500.00	500.00	124.24	122.26	62.587	CC, ES
Razor Federal #12F-1304B - HZ - Plan #2	5,300.00	5,263.10	641.41	617.47	26.799	SF
Razor Federal #12F-1305A - HZ - Plan #3	500.00	499.99	151.91	149.93	76.525	CC, ES
Razor Federal #12F-1305A - HZ - Plan #3	5,000.00	4,957.47	678.67	656.33	30.378	SF
Razor Federal #12F-1306B - HZ - Plan #2	500.00	500.00	180.70	178.72	91.029	CC, ES
Razor Federal #12F-1306B - HZ - Plan #2	4,700.00	4,654.81	681.08	660.34	32.850	SF
Razor Federal #12F-1307A - HZ - Plan #3	400.00	399.99	211.21	209.68	137.544	CC, ES
Razor Federal #12F-1307A - HZ - Plan #3	4,100.00	4,055.04	678.08	659.85	37.199	SF
Razor Federal #12F-1308B - HZ - Plan #2	500.00	500.00	242.40	240.42	122.109	CC, ES
Razor Federal #12F-1308B - HZ - Plan #2	4,100.00	4,052.71	680.86	662.92	37.954	SF

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor #12F-0101A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor #12F-0101A	<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		Highside Toolface (°)	Distance		Total Uncertainty Axis	Separation Factor	Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Between Centres (usft)	Between Ellipses (usft)						
0.00	0.00	0.00	0.00	0.00	0.00	-180.00	-74.88	0.00	74.88					
100.00	100.00	100.00	100.00	0.09	0.09	-180.00	-74.88	0.00	74.88	74.69	0.19	400.422		
200.00	200.00	200.00	200.00	0.32	0.32	-180.00	-74.88	0.00	74.88	74.24	0.64	117.638		
300.00	300.00	300.00	300.00	0.54	0.54	-180.00	-74.88	0.00	74.88	73.80	1.09	68.947		
400.00	400.00	400.00	400.00	0.77	0.77	-180.00	-74.88	0.00	74.88	73.35	1.54	48.763		
500.00	500.00	500.00	500.00	0.99	0.99	-180.00	-74.88	0.00	74.88	72.90	1.99	37.721		
600.00	599.98	602.14	602.12	1.21	1.22	-133.42	-73.42	-1.09	74.65	72.21	2.43	30.658		
700.00	699.84	704.18	704.01	1.44	1.45	-133.93	-69.05	-4.34	73.96	71.07	2.89	25.612		
800.00	799.59	804.17	803.76	1.67	1.69	-134.65	-63.46	-8.51	73.16	69.81	3.35	21.854		
900.00	899.35	904.17	903.51	1.91	1.93	-135.38	-57.87	-12.68	72.37	68.56	3.81	18.977		
1,000.00	999.11	1,004.16	1,003.26	2.16	2.17	-136.14	-52.27	-16.85	71.60	67.32	4.28	16.714		
1,100.00	1,098.86	1,104.15	1,103.00	2.41	2.42	-136.91	-46.68	-21.01	70.84	66.08	4.76	14.895		
1,200.00	1,198.62	1,204.14	1,202.75	2.66	2.67	-137.69	-41.09	-25.18	70.09	64.86	5.23	13.403		
1,300.00	1,298.38	1,304.14	1,302.50	2.91	2.92	-138.50	-35.49	-29.35	69.36	63.66	5.70	12.161		
1,400.00	1,398.13	1,404.13	1,402.25	3.16	3.17	-139.32	-29.90	-33.52	68.64	62.46	6.18	11.112		
1,500.00	1,497.89	1,504.12	1,502.00	3.41	3.42	-140.15	-24.31	-37.68	67.93	61.28	6.65	10.215		
1,600.00	1,597.65	1,604.11	1,601.75	3.67	3.68	-141.01	-18.71	-41.85	67.24	60.12	7.12	9.440		
1,700.00	1,697.40	1,704.11	1,701.50	3.92	3.93	-141.88	-13.12	-46.02	66.57	58.97	7.60	8.765		
1,800.00	1,797.16	1,804.10	1,801.25	4.18	4.19	-142.77	-7.53	-50.19	65.91	57.84	8.07	8.171		
1,900.00	1,896.91	1,904.09	1,901.00	4.43	4.44	-143.68	-1.93	-54.35	65.27	56.73	8.54	7.647		
2,000.00	1,996.67	2,004.08	2,000.74	4.69	4.70	-144.60	3.66	-58.52	64.64	55.64	9.00	7.180		
2,100.00	2,096.43	2,104.08	2,100.49	4.94	4.95	-145.55	9.25	-62.69	64.03	54.56	9.47	6.761		
2,200.00	2,196.18	2,204.07	2,200.24	5.20	5.21	-146.51	14.85	-66.86	63.44	53.50	9.94	6.385		
2,300.00	2,295.94	2,304.06	2,299.99	5.46	5.47	-147.49	20.44	-71.02	62.86	52.47	10.40	6.045		
2,400.00	2,395.70	2,404.05	2,399.74	5.71	5.72	-148.48	26.03	-75.19	62.31	51.45	10.86	5.737		
2,500.00	2,495.45	2,504.05	2,499.49	5.97	5.98	-149.50	31.63	-79.36	61.77	50.45	11.32	5.456		
2,600.00	2,595.21	2,604.04	2,599.24	6.23	6.24	-150.53	37.22	-83.53	61.26	49.48	11.78	5.200		
2,700.00	2,694.97	2,704.03	2,698.99	6.49	6.49	-151.58	42.81	-87.69	60.76	48.52	12.24	4.965		
2,800.00	2,794.72	2,804.02	2,798.74	6.74	6.75	-152.64	48.41	-91.86	60.29	47.59	12.69	4.749		
2,900.00	2,894.48	2,904.02	2,898.49	7.00	7.01	-153.73	54.00	-96.03	59.83	46.69	13.15	4.551		
3,000.00	2,994.23	3,004.01	2,998.23	7.26	7.26	-154.83	59.59	-100.20	59.40	45.80	13.60	4.367		
3,100.00	3,093.99	3,104.00	3,097.98	7.52	7.52	-155.94	65.19	-104.36	58.99	44.94	14.05	4.198		
3,200.00	3,193.75	3,203.99	3,197.73	7.77	7.78	-157.07	70.78	-108.53	58.60	44.10	14.50	4.041		
3,300.00	3,293.50	3,303.99	3,297.48	8.03	8.03	-158.21	76.37	-112.70	58.24	43.29	14.95	3.895		
3,400.00	3,393.26	3,403.98	3,397.23	8.29	8.29	-159.37	81.97	-116.87	57.90	42.50	15.40	3.759		
3,500.00	3,493.02	3,503.97	3,496.98	8.55	8.55	-160.54	87.56	-121.03	57.58	41.73	15.85	3.633		
3,600.00	3,592.77	3,603.96	3,596.73	8.81	8.81	-161.73	93.15	-125.20	57.29	40.99	16.30	3.515		
3,700.00	3,692.53	3,703.96	3,696.48	9.06	9.06	-162.92	98.74	-129.37	57.02	40.28	16.74	3.406		
3,800.00	3,792.29	3,803.95	3,796.23	9.32	9.32	-164.13	104.34	-133.54	56.78	39.59	17.19	3.303		
3,900.00	3,892.04	3,903.94	3,895.98	9.58	9.58	-165.34	109.93	-137.70	56.56	38.92	17.64	3.207		
4,000.00	3,991.80	4,003.93	3,995.72	9.84	9.84	-166.57	115.52	-141.87	56.37	38.29	18.08	3.117		
4,100.00	4,091.56	4,103.93	4,095.47	10.10	10.09	-167.80	121.12	-146.04	56.20	37.67	18.53	3.033		
4,200.00	4,191.31	4,203.92	4,195.22	10.35	10.35	-169.04	126.71	-150.21	56.06	37.09	18.98	2.954		
4,300.00	4,291.07	4,303.91	4,294.97	10.61	10.61	-170.28	132.30	-154.38	55.95	36.53	19.42	2.880		
4,400.00	4,390.82	4,403.90	4,394.72	10.87	10.87	-171.53	137.90	-158.54	55.86	35.99	19.87	2.811		
4,500.00	4,490.58	4,503.90	4,494.47	11.13	11.12	-172.78	143.49	-162.71	55.80	35.48	20.32	2.746		
4,600.00	4,590.34	4,603.89	4,594.22	11.39	11.38	-174.04	149.08	-166.88	55.77	35.00	20.77	2.685		
4,675.59	4,665.74	4,679.48	4,669.62	11.58	11.58	-174.99	153.31	-170.03	55.76	34.65	21.11	2.641 CC		
4,700.00	4,690.09	4,703.88	4,693.97	11.65	11.64	-175.29	154.68	-171.05	55.76	34.54	21.23	2.627		
4,800.00	4,789.85	4,803.87	4,793.72	11.90	11.90	-176.55	160.27	-175.21	55.78	34.10	21.68	2.573		
4,900.00	4,889.61	4,903.87	4,893.46	12.16	12.16	-177.80	165.86	-179.38	55.83	33.69	22.14	2.522		

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 #12F-0101A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor #12F-0101A	<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								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		
5,000.00	4,989.36	5,003.86	4,993.21	12.42	12.41	-179.05	171.46	-183.55	55.90	33.31	22.59	2.474		
5,100.00	5,089.12	5,103.85	5,092.96	12.68	12.67	179.70	177.05	-187.72	56.00	32.95	23.05	2.429		
5,200.00	5,188.88	5,203.85	5,192.71	12.94	12.93	178.46	182.64	-191.88	56.13	32.61	23.52	2.387		
5,300.00	5,288.63	5,303.84	5,292.46	13.20	13.19	177.22	188.24	-196.05	56.28	32.30	23.98	2.347 ES		
5,400.00	5,387.98	5,403.68	5,392.06	13.49	13.44	176.21	193.82	-200.21	60.15	35.88	24.26	2.479		
5,500.00	5,483.80	5,511.88	5,499.41	13.93	13.77	175.37	203.93	-207.75	77.38	53.57	23.81	3.250		
5,600.00	5,572.50	5,629.05	5,610.31	14.55	14.33	172.19	233.62	-229.87	93.81	71.14	22.67	4.138		
5,700.00	5,650.83	5,750.06	5,713.19	15.38	15.16	167.23	284.30	-267.63	107.75	86.56	21.18	5.087		
5,800.00	5,715.90	5,873.78	5,800.43	16.45	16.34	160.85	354.31	-319.79	119.13	98.97	20.16	5.909		
5,900.00	5,765.32	5,998.74	5,865.20	17.76	17.88	153.28	439.72	-383.44	128.23	107.30	20.93	6.126		
6,000.00	5,797.28	6,123.39	5,902.75	19.31	19.74	144.72	534.79	-454.27	135.63	111.12	24.51	5.534		
6,100.00	5,810.60	6,240.33	5,911.83	21.02	21.68	135.94	628.16	-523.72	142.48	112.31	30.17	4.723		
6,200.00	5,810.98	6,333.13	5,911.83	22.78	23.21	130.70	704.44	-576.56	156.34	121.10	35.24	4.437		
6,300.00	5,810.98	6,425.12	5,911.83	24.56	24.74	126.58	782.49	-625.22	171.22	131.22	40.00	4.281		
6,400.00	5,810.98	6,516.35	5,911.83	26.39	26.30	123.19	862.12	-669.71	186.45	141.96	44.49	4.191		
6,500.00	5,810.98	6,606.86	5,911.83	28.25	27.86	120.38	943.14	-710.04	201.83	153.09	48.73	4.141		
6,600.00	5,810.98	6,699.99	5,911.83	30.11	29.48	117.96	1,028.40	-747.49	217.18	164.36	52.82	4.112		
6,700.00	5,810.98	6,785.86	5,911.83	31.98	30.97	116.05	1,108.54	-778.30	232.29	175.79	56.51	4.111		
6,800.00	5,810.98	6,874.42	5,911.84	33.83	32.50	114.37	1,192.57	-806.27	247.14	187.10	60.04	4.116		
6,900.00	5,810.98	6,962.41	5,911.84	35.65	34.00	112.92	1,277.24	-830.17	261.61	198.28	63.34	4.130		
7,000.00	5,810.98	7,049.86	5,911.84	37.44	35.48	111.68	1,362.40	-850.03	275.64	209.24	66.40	4.151		
7,100.00	5,810.98	7,136.80	5,911.84	39.19	36.92	110.61	1,447.87	-865.90	289.15	219.93	69.22	4.177		
7,200.00	5,810.98	7,223.26	5,911.84	40.90	38.33	109.67	1,533.50	-877.80	302.10	230.31	71.79	4.208		
7,300.00	5,810.98	7,309.28	5,911.85	42.56	39.71	108.85	1,619.14	-885.78	314.45	240.32	74.12	4.242		
7,400.00	5,810.98	7,399.99	5,911.85	44.17	41.13	108.10	1,709.74	-890.02	326.19	249.89	76.30	4.275		
7,500.00	5,810.98	7,486.22	5,911.85	45.73	42.45	107.50	1,795.97	-890.52	336.78	258.65	78.13	4.311		
7,600.00	5,810.98	7,585.98	5,911.85	47.25	43.98	107.11	1,895.73	-890.52	343.17	263.28	79.89	4.296		
7,700.00	5,810.98	7,685.96	5,911.86	48.70	45.54	107.02	1,995.71	-890.51	344.68	262.91	81.77	4.215		
7,800.00	5,810.98	7,785.96	5,911.86	50.13	47.12	107.02	2,095.71	-890.51	344.68	259.70	84.98	4.056		
7,900.00	5,810.98	7,885.96	5,911.86	51.58	48.73	107.02	2,195.71	-890.51	344.68	256.45	88.23	3.907		
8,000.00	5,810.98	7,985.96	5,911.86	53.05	50.35	107.02	2,295.71	-890.51	344.68	253.17	91.52	3.766		
8,100.00	5,810.98	8,085.96	5,911.87	54.56	52.00	107.02	2,395.71	-890.50	344.68	249.85	94.83	3.635		
8,200.00	5,810.98	8,185.96	5,911.87	56.08	53.67	107.02	2,495.71	-890.50	344.68	246.51	98.17	3.511		
8,300.00	5,810.98	8,285.96	5,911.87	57.63	55.35	107.02	2,595.71	-890.50	344.68	243.14	101.54	3.395		
8,400.00	5,810.98	8,385.96	5,911.88	59.20	57.04	107.02	2,695.71	-890.49	344.68	239.75	104.93	3.285		
8,500.00	5,810.98	8,485.96	5,911.88	60.79	58.75	107.02	2,795.71	-890.49	344.68	236.34	108.34	3.181		
8,600.00	5,810.98	8,585.96	5,911.88	62.40	60.47	107.02	2,895.71	-890.49	344.68	232.91	111.77	3.084		
8,700.00	5,810.98	8,685.96	5,911.89	64.02	62.21	107.02	2,995.71	-890.49	344.68	229.47	115.22	2.992		
8,800.00	5,810.98	8,785.96	5,911.89	65.66	63.95	107.02	3,095.71	-890.48	344.69	226.01	118.68	2.904		
8,900.00	5,810.98	8,885.96	5,911.89	67.31	65.70	107.02	3,195.71	-890.48	344.69	222.54	122.15	2.822		
9,000.00	5,810.99	8,985.96	5,911.89	68.98	67.47	107.02	3,295.71	-890.48	344.69	219.05	125.64	2.744		
9,100.00	5,810.99	9,085.96	5,911.90	70.66	69.24	107.02	3,395.71	-890.48	344.69	215.55	129.14	2.669		
9,200.00	5,810.99	9,185.96	5,911.90	72.35	71.02	107.02	3,495.71	-890.47	344.69	212.04	132.65	2.599		
9,300.00	5,810.99	9,285.96	5,911.90	74.06	72.80	107.02	3,595.71	-890.47	344.69	208.52	136.17	2.531		
9,400.00	5,810.99	9,385.96	5,911.91	75.77	74.60	107.02	3,695.71	-890.47	344.69	204.99	139.70	2.467		
9,500.00	5,810.99	9,485.96	5,911.91	77.50	76.40	107.03	3,795.71	-890.47	344.69	201.46	143.23	2.406		
9,600.00	5,810.99	9,585.96	5,911.91	79.23	78.20	107.03	3,895.71	-890.46	344.69	197.91	146.78	2.348		
9,700.00	5,810.99	9,685.96	5,911.91	80.97	80.01	107.03	3,995.71	-890.46	344.69	194.36	150.33	2.293		
9,800.00	5,810.99	9,785.96	5,911.92	82.72	81.83	107.03	4,095.71	-890.46	344.69	190.80	153.89	2.240		
9,900.00	5,810.99	9,885.96	5,911.92	84.48	83.65	107.03	4,195.71	-890.46	344.69	187.23	157.46	2.189		
10,000.00	5,810.99	9,985.96	5,911.92	86.24	85.47	107.03	4,295.71	-890.45	344.69	183.66	161.03	2.141		
10,100.00	5,810.99	10,085.96	5,911.93	88.01	87.30	107.03	4,395.71	-890.45	344.69	180.08	164.61	2.094		

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 #12F-0101A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor #12F-0101A	<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: 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
10,200.00	5,810.99	10,185.96	5,911.93	89.79	89.14	107.03	4,495.71	-890.45	344.69	176.50	168.19	2.049	
10,300.00	5,810.99	10,285.96	5,911.93	91.58	90.97	107.03	4,595.71	-890.44	344.69	172.91	171.78	2.007	
10,400.00	5,810.99	10,385.96	5,911.94	93.37	92.81	107.03	4,695.71	-890.44	344.69	169.32	175.37	1.965	
10,500.00	5,810.99	10,485.96	5,911.94	95.16	94.66	107.03	4,795.71	-890.44	344.69	165.72	178.97	1.926	
10,600.00	5,810.99	10,585.96	5,911.94	96.96	96.50	107.03	4,895.71	-890.44	344.69	162.12	182.57	1.888	
10,700.00	5,810.99	10,685.96	5,911.94	98.76	98.35	107.03	4,995.71	-890.43	344.69	158.52	186.17	1.851	
10,800.00	5,810.99	10,785.96	5,911.95	100.57	100.21	107.03	5,095.71	-890.43	344.69	154.91	189.78	1.816	
10,900.00	5,810.99	10,885.96	5,911.95	102.38	102.06	107.03	5,195.71	-890.43	344.69	151.30	193.40	1.782	
11,000.00	5,810.99	10,985.96	5,911.95	104.20	103.92	107.03	5,295.71	-890.43	344.69	147.68	197.01	1.750	
11,100.00	5,810.99	11,085.96	5,911.96	106.02	105.78	107.03	5,395.71	-890.42	344.70	144.07	200.63	1.718	
11,200.00	5,810.99	11,185.96	5,911.96	107.85	107.64	107.03	5,495.71	-890.42	344.70	140.45	204.25	1.688	
11,300.00	5,810.99	11,285.96	5,911.96	109.67	109.50	107.03	5,595.71	-890.42	344.70	136.82	207.87	1.658	
11,400.00	5,811.00	11,385.96	5,911.96	111.51	111.37	107.03	5,695.71	-890.42	344.70	133.20	211.50	1.630	
11,500.00	5,811.00	11,485.96	5,911.97	113.34	113.24	107.03	5,795.71	-890.41	344.70	129.57	215.13	1.602	
11,600.00	5,811.00	11,585.96	5,911.97	115.18	115.11	107.03	5,895.71	-890.41	344.70	125.94	218.76	1.576	
11,700.00	5,811.00	11,685.96	5,911.97	117.02	116.98	107.03	5,995.71	-890.41	344.70	122.31	222.39	1.550	
11,800.00	5,811.00	11,785.96	5,911.98	118.86	118.85	107.03	6,095.71	-890.41	344.70	118.67	226.03	1.525	
11,900.00	5,811.00	11,885.96	5,911.98	120.70	120.73	107.04	6,195.71	-890.40	344.70	115.03	229.66	1.501	
12,000.00	5,811.00	11,985.96	5,911.98	122.55	122.60	107.04	6,295.71	-890.40	344.70	111.39	233.30	1.477 Level 3	
12,100.00	5,811.00	12,085.96	5,911.99	124.40	124.48	107.04	6,395.71	-890.40	344.70	107.75	236.95	1.455 Level 3	
12,200.00	5,811.00	12,185.96	5,911.99	126.25	126.36	107.04	6,495.71	-890.39	344.70	104.11	240.59	1.433 Level 3	
12,300.00	5,811.00	12,285.96	5,911.99	128.11	128.24	107.04	6,595.71	-890.39	344.70	100.47	244.23	1.411 Level 3	
12,400.00	5,811.00	12,385.96	5,911.99	129.96	130.12	107.04	6,695.71	-890.39	344.70	96.82	247.88	1.391 Level 3	
12,500.00	5,811.00	12,485.96	5,912.00	131.82	132.00	107.04	6,795.71	-890.39	344.70	93.17	251.53	1.370 Level 3	
12,596.54	5,811.00	12,582.50	5,912.00	133.62	133.82	107.04	6,892.25	-890.38	344.70	89.65	255.05	1.352 Level 3, SF	

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor #12F-0101A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor #12F-0101A	<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 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	99.13	99.13				
100.00	100.00	100.00	100.00	0.09	0.09	90.00	0.00	99.13	99.13	98.94	0.19	530.092	
200.00	200.00	200.00	200.00	0.32	0.32	90.00	0.00	99.13	99.13	98.49	0.64	155.733	
300.00	300.00	300.00	300.00	0.54	0.54	90.00	0.00	99.13	99.13	98.04	1.09	91.274	
400.00	400.00	400.00	400.00	0.77	0.77	90.00	0.00	99.13	99.13	97.59	1.54	64.555	
500.00	500.00	500.00	500.00	0.99	0.99	90.00	0.00	99.13	99.13	97.15	1.99	49.936	CC, ES
600.00	599.98	599.98	599.98	1.21	1.22	137.40	0.00	99.13	100.41	97.98	2.43	41.295	
700.00	699.84	699.84	699.84	1.44	1.44	139.30	0.00	99.13	104.32	101.44	2.88	36.259	
800.00	799.59	799.59	799.59	1.67	1.67	141.67	0.00	99.13	109.71	106.39	3.32	33.001	
900.00	899.35	899.35	899.35	1.91	1.89	143.82	0.00	99.13	115.27	111.49	3.77	30.538	
1,000.00	999.11	999.11	999.11	2.16	2.11	145.77	0.00	99.13	120.97	116.75	4.23	28.624	
1,100.00	1,098.86	1,101.76	1,101.74	2.41	2.34	146.97	1.57	98.23	125.67	120.98	4.68	26.840	
1,200.00	1,198.62	1,204.53	1,204.36	2.66	2.58	146.84	6.33	95.50	128.08	122.94	5.14	24.920	
1,300.00	1,298.38	1,304.51	1,304.10	2.91	2.80	146.16	12.38	92.03	129.45	123.85	5.60	23.127	
1,400.00	1,398.13	1,404.49	1,403.83	3.16	3.04	145.49	18.43	88.56	130.83	124.77	6.06	21.589	
1,500.00	1,497.89	1,504.47	1,503.57	3.41	3.27	144.84	24.48	85.09	132.24	125.71	6.53	20.260	
1,600.00	1,597.65	1,604.45	1,603.30	3.67	3.51	144.21	30.53	81.61	133.66	126.66	7.00	19.102	
1,700.00	1,697.40	1,704.43	1,703.04	3.92	3.76	143.59	36.58	78.14	135.10	127.63	7.47	18.084	
1,800.00	1,797.16	1,804.41	1,802.77	4.18	4.00	142.98	42.62	74.67	136.55	128.60	7.95	17.184	
1,900.00	1,896.91	1,904.39	1,902.51	4.43	4.24	142.38	48.67	71.20	138.02	129.59	8.42	16.383	
2,000.00	1,996.67	2,004.37	2,002.24	4.69	4.49	141.79	54.72	67.73	139.50	130.59	8.90	15.665	
2,100.00	2,096.43	2,104.34	2,101.98	4.94	4.74	141.22	60.77	64.26	140.99	131.61	9.39	15.020	
2,200.00	2,196.18	2,204.32	2,201.71	5.20	4.99	140.66	66.82	60.79	142.50	132.63	9.87	14.436	
2,300.00	2,295.94	2,304.30	2,301.45	5.46	5.24	140.12	72.87	57.32	144.03	133.67	10.36	13.906	
2,400.00	2,395.70	2,404.28	2,401.19	5.71	5.49	139.58	78.92	53.84	145.56	134.72	10.84	13.423	
2,500.00	2,495.45	2,504.26	2,500.92	5.97	5.74	139.05	84.97	50.37	147.11	135.78	11.33	12.981	
2,600.00	2,595.21	2,604.24	2,600.66	6.23	5.99	138.54	91.02	46.90	148.67	136.85	11.82	12.575	
2,700.00	2,694.97	2,704.22	2,700.39	6.49	6.25	138.04	97.06	43.43	150.25	137.93	12.31	12.201	
2,800.00	2,794.72	2,804.20	2,800.13	6.74	6.50	137.54	103.11	39.96	151.83	139.02	12.81	11.856	
2,900.00	2,894.48	2,904.18	2,899.86	7.00	6.75	137.06	109.16	36.49	153.43	140.13	13.30	11.536	
3,000.00	2,994.23	3,004.16	2,999.60	7.26	7.01	136.59	115.21	33.02	155.03	141.24	13.79	11.239	
3,100.00	3,093.99	3,104.13	3,099.33	7.52	7.26	136.13	121.26	29.54	156.65	142.36	14.29	10.962	
3,200.00	3,193.75	3,204.11	3,199.07	7.77	7.51	135.67	127.31	26.07	158.27	143.49	14.79	10.704	
3,300.00	3,293.50	3,304.09	3,298.80	8.03	7.77	135.23	133.36	22.60	159.91	144.63	15.28	10.463	
3,400.00	3,393.26	3,404.07	3,398.54	8.29	8.02	134.79	139.41	19.13	161.56	145.77	15.78	10.237	
3,500.00	3,493.02	3,504.05	3,498.28	8.55	8.28	134.37	145.46	15.66	163.21	146.93	16.28	10.025	
3,600.00	3,592.77	3,604.03	3,598.01	8.81	8.53	133.95	151.51	12.19	164.87	148.09	16.78	9.825	
3,700.00	3,692.53	3,704.01	3,697.75	9.06	8.79	133.54	157.55	8.72	166.54	149.26	17.28	9.637	
3,800.00	3,792.29	3,803.99	3,797.48	9.32	9.04	133.14	163.60	5.25	168.22	150.44	17.78	9.460	
3,900.00	3,892.04	3,903.97	3,897.22	9.58	9.30	132.74	169.65	1.77	169.91	151.63	18.28	9.293	
4,000.00	3,991.80	4,003.95	3,996.95	9.84	9.55	132.36	175.70	-1.70	171.61	152.82	18.79	9.135	
4,100.00	4,091.56	4,103.92	4,096.69	10.10	9.81	131.98	181.75	-5.17	173.31	154.02	19.29	8.985	
4,200.00	4,191.31	4,203.90	4,196.42	10.35	10.06	131.61	187.80	-8.64	175.02	155.23	19.79	8.843	
4,300.00	4,291.07	4,303.88	4,296.16	10.61	10.32	131.25	193.85	-12.11	176.74	156.45	20.30	8.708	
4,400.00	4,390.82	4,403.86	4,395.90	10.87	10.57	130.89	199.90	-15.58	178.47	157.67	20.80	8.580	
4,500.00	4,490.58	4,503.84	4,495.63	11.13	10.83	130.54	205.95	-19.05	180.20	158.89	21.31	8.458	
4,600.00	4,590.34	4,603.82	4,595.37	11.39	11.09	130.20	211.99	-22.52	181.94	160.13	21.81	8.341	
4,700.00	4,690.09	4,703.80	4,695.10	11.65	11.34	129.86	218.04	-26.00	183.68	161.37	22.32	8.230	
4,800.00	4,789.85	4,803.78	4,794.84	11.90	11.60	129.53	224.09	-29.47	185.43	162.61	22.82	8.125	
4,900.00	4,889.61	4,903.76	4,894.57	12.16	11.86	129.21	230.14	-32.94	187.19	163.86	23.33	8.023	
5,000.00	4,989.36	5,003.74	4,994.31	12.42	12.11	128.89	236.19	-36.41	188.95	165.12	23.84	7.927	
5,100.00	5,089.12	5,103.72	5,094.04	12.68	12.37	128.58	242.24	-39.88	190.72	166.38	24.35	7.834	

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 #12F-0101A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor #12F-0101A	<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
5,200.00	5,188.88	5,203.69	5,193.78	12.94	12.62	128.27	248.29	-43.35	192.50	167.65	24.85	7.746	
5,300.00	5,288.63	5,303.67	5,293.51	13.20	12.88	127.97	254.34	-46.82	194.28	168.92	25.36	7.660	
5,400.00	5,387.98	5,413.81	5,402.71	13.49	13.21	126.94	265.87	-53.44	196.58	170.68	25.91	7.589	
5,500.00	5,483.80	5,527.74	5,510.40	13.93	13.73	123.87	297.52	-71.60	202.53	175.93	26.59	7.616	
5,600.00	5,572.50	5,639.11	5,605.58	14.55	14.45	119.24	347.33	-100.19	212.94	185.27	27.68	7.694	
5,700.00	5,650.83	5,747.21	5,684.27	15.38	15.39	113.64	411.37	-136.94	228.12	198.72	29.41	7.758	
5,800.00	5,715.90	5,851.80	5,744.34	16.45	16.54	107.62	485.44	-179.45	247.96	216.11	31.85	7.785	
5,900.00	5,765.32	5,953.05	5,785.14	17.76	17.88	101.61	565.66	-225.48	271.81	236.96	34.84	7.801	
6,000.00	5,797.28	6,051.43	5,806.94	19.31	19.36	95.89	648.74	-273.16	298.65	260.52	38.12	7.834	
6,100.00	5,810.60	6,143.36	5,811.30	21.02	20.83	90.82	728.38	-318.68	327.42	286.05	41.38	7.913	
6,200.00	5,810.98	6,224.05	5,811.30	22.78	22.11	90.05	799.68	-356.44	358.11	313.65	44.46	8.055	
6,300.00	5,810.98	6,299.99	5,811.30	24.56	23.30	90.05	868.19	-389.20	387.93	340.46	47.47	8.172	
6,400.00	5,810.98	6,383.01	5,811.29	26.39	24.64	90.05	944.51	-421.86	416.68	366.05	50.63	8.229	
6,500.00	5,810.98	6,461.42	5,811.29	28.25	25.93	90.04	1,017.83	-449.63	444.39	390.67	53.72	8.272	
6,600.00	5,810.98	6,539.17	5,811.29	30.11	27.22	90.04	1,091.60	-474.18	470.99	414.24	56.75	8.299	
6,700.00	5,810.98	6,616.33	5,811.29	31.98	28.50	90.04	1,165.74	-495.56	496.45	436.75	59.70	8.316	
6,800.00	5,810.98	6,699.99	5,811.29	33.83	29.89	90.04	1,247.01	-515.33	520.80	458.15	62.65	8.313	
6,900.00	5,810.98	6,769.02	5,811.29	35.65	31.03	90.03	1,314.69	-528.95	543.82	478.59	65.23	8.337	
7,000.00	5,810.98	6,844.64	5,811.28	37.44	32.27	90.03	1,389.32	-541.05	565.68	497.90	67.78	8.346	
7,100.00	5,810.98	6,919.82	5,811.28	39.19	33.50	90.03	1,463.95	-550.14	586.27	516.11	70.16	8.356	
7,200.00	5,810.98	6,999.99	5,811.28	40.90	34.80	90.03	1,543.85	-556.59	605.61	533.16	72.45	8.359	
7,300.00	5,810.98	7,069.01	5,811.27	42.56	35.89	90.03	1,612.81	-559.46	623.58	549.22	74.36	8.386	
7,400.00	5,810.98	7,152.91	5,811.27	44.17	37.22	90.03	1,696.71	-559.99	639.96	563.62	76.34	8.383	
7,500.00	5,810.98	7,252.19	5,811.26	45.73	38.79	90.03	1,795.99	-559.99	651.85	573.48	78.37	8.317	
7,600.00	5,810.98	7,351.96	5,811.26	47.25	40.40	90.02	1,895.75	-559.99	658.53	578.30	80.23	8.208	
7,700.00	5,810.98	7,451.94	5,811.25	48.70	42.03	90.02	1,995.73	-559.99	660.11	577.82	82.29	8.022	
7,800.00	5,810.98	7,551.94	5,811.25	50.13	43.69	90.02	2,095.73	-559.99	660.11	574.46	85.65	7.707	
7,900.00	5,810.98	7,651.94	5,811.24	51.58	45.37	90.02	2,195.73	-559.99	660.10	571.05	89.05	7.413	
8,000.00	5,810.98	7,751.94	5,811.24	53.05	47.07	90.02	2,295.73	-559.99	660.10	567.61	92.49	7.137	
8,100.00	5,810.98	7,851.94	5,811.23	54.56	48.78	90.02	2,395.73	-559.99	660.10	564.14	95.95	6.879	
8,200.00	5,810.98	7,951.94	5,811.23	56.08	50.51	90.02	2,495.73	-560.00	660.09	560.65	99.45	6.638	
8,300.00	5,810.98	8,051.94	5,811.22	57.63	52.25	90.02	2,595.73	-560.00	660.09	557.12	102.96	6.411	
8,400.00	5,810.98	8,151.94	5,811.22	59.20	54.00	90.02	2,695.73	-560.00	660.08	553.58	106.50	6.198	
8,500.00	5,810.98	8,251.94	5,811.21	60.79	55.77	90.02	2,795.73	-560.00	660.08	550.01	110.06	5.997	
8,600.00	5,810.98	8,351.94	5,811.21	62.40	57.54	90.02	2,895.73	-560.00	660.08	546.43	113.64	5.808	
8,700.00	5,810.98	8,451.94	5,811.20	64.02	59.33	90.02	2,995.73	-560.00	660.07	542.83	117.24	5.630	
8,800.00	5,810.98	8,551.94	5,811.20	65.66	61.12	90.02	3,095.73	-560.00	660.07	539.22	120.85	5.462	
8,900.00	5,810.98	8,651.94	5,811.19	67.31	62.92	90.02	3,195.73	-560.00	660.06	535.59	124.48	5.303	
9,000.00	5,810.99	8,751.94	5,811.19	68.98	64.72	90.02	3,295.73	-560.00	660.06	531.95	128.11	5.152	
9,100.00	5,810.99	8,851.94	5,811.18	70.66	66.54	90.02	3,395.73	-560.01	660.06	528.29	131.76	5.009	
9,200.00	5,810.99	8,951.94	5,811.18	72.35	68.35	90.02	3,495.73	-560.01	660.05	524.63	135.42	4.874	
9,300.00	5,810.99	9,051.94	5,811.17	74.06	70.18	90.02	3,595.73	-560.01	660.05	520.96	139.09	4.745	
9,400.00	5,810.99	9,151.94	5,811.17	75.77	72.01	90.02	3,695.73	-560.01	660.04	517.27	142.77	4.623	
9,500.00	5,810.99	9,251.94	5,811.16	77.50	73.84	90.01	3,795.73	-560.01	660.04	513.58	146.46	4.507	
9,600.00	5,810.99	9,351.94	5,811.15	79.23	75.68	90.01	3,895.73	-560.01	660.04	509.88	150.15	4.396	
9,700.00	5,810.99	9,451.94	5,811.15	80.97	77.52	90.01	3,995.73	-560.01	660.03	506.18	153.86	4.290	
9,800.00	5,810.99	9,551.94	5,811.14	82.72	79.37	90.01	4,095.73	-560.01	660.03	502.46	157.56	4.189	
9,900.00	5,810.99	9,651.94	5,811.14	84.48	81.22	90.01	4,195.73	-560.01	660.02	498.74	161.28	4.092	
10,000.00	5,810.99	9,751.94	5,811.13	86.24	83.07	90.01	4,295.73	-560.02	660.02	495.02	165.00	4.000	
10,100.00	5,810.99	9,851.94	5,811.13	88.01	84.93	90.01	4,395.73	-560.02	660.01	491.29	168.73	3.912	
10,200.00	5,810.99	9,951.94	5,811.12	89.79	86.79	90.01	4,495.73	-560.02	660.01	487.55	172.46	3.827	
10,300.00	5,810.99	10,051.94	5,811.12	91.58	88.65	90.01	4,595.73	-560.02	660.01	483.81	176.20	3.746	

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 #12F-0101A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor #12F-0101A	<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-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
10,400.00	5,810.99	10,151.94	5,811.11	93.37	90.51	90.01	4,695.73	-560.02	660.00	480.06	179.94	3.668	
10,500.00	5,810.99	10,251.94	5,811.11	95.16	92.38	90.01	4,795.73	-560.02	660.00	476.32	183.68	3.593	
10,600.00	5,810.99	10,351.94	5,811.10	96.96	94.25	90.01	4,895.73	-560.02	659.99	472.56	187.43	3.521	
10,700.00	5,810.99	10,451.94	5,811.10	98.76	96.12	90.01	4,995.73	-560.02	659.99	468.81	191.19	3.452	
10,800.00	5,810.99	10,551.94	5,811.09	100.57	97.99	90.01	5,095.73	-560.02	659.99	465.04	194.94	3.386	
10,900.00	5,810.99	10,651.94	5,811.09	102.38	99.87	90.01	5,195.73	-560.02	659.98	461.28	198.70	3.321	
11,000.00	5,810.99	10,751.94	5,811.08	104.20	101.74	90.01	5,295.73	-560.03	659.98	457.51	202.46	3.260	
11,100.00	5,810.99	10,851.94	5,811.08	106.02	103.62	90.01	5,395.73	-560.03	659.97	453.74	206.23	3.200	
11,200.00	5,810.99	10,951.94	5,811.07	107.85	105.50	90.01	5,495.73	-560.03	659.97	449.97	210.00	3.143	
11,300.00	5,810.99	11,051.94	5,811.07	109.67	107.38	90.01	5,595.73	-560.03	659.97	446.20	213.77	3.087	
11,400.00	5,811.00	11,151.94	5,811.06	111.51	109.26	90.01	5,695.73	-560.03	659.96	442.42	217.54	3.034	
11,500.00	5,811.00	11,251.94	5,811.06	113.34	111.15	90.01	5,795.73	-560.03	659.96	438.64	221.32	2.982	
11,600.00	5,811.00	11,351.94	5,811.05	115.18	113.03	90.00	5,895.73	-560.03	659.95	434.85	225.10	2.932	
11,700.00	5,811.00	11,451.94	5,811.05	117.02	114.92	90.00	5,995.73	-560.03	659.95	431.07	228.88	2.883	
11,800.00	5,811.00	11,551.94	5,811.04	118.86	116.81	90.00	6,095.73	-560.03	659.95	427.28	232.66	2.836	
11,900.00	5,811.00	11,651.94	5,811.04	120.70	118.70	90.00	6,195.73	-560.04	659.94	423.49	236.45	2.791	
12,000.00	5,811.00	11,751.94	5,811.03	122.55	120.59	90.00	6,295.73	-560.04	659.94	419.70	240.23	2.747	
12,100.00	5,811.00	11,851.94	5,811.03	124.40	122.48	90.00	6,395.73	-560.04	659.93	415.91	244.02	2.704	
12,200.00	5,811.00	11,951.94	5,811.02	126.25	124.37	90.00	6,495.73	-560.04	659.93	412.12	247.81	2.663	
12,300.00	5,811.00	12,051.94	5,811.02	128.11	126.26	90.00	6,595.73	-560.04	659.93	408.32	251.60	2.623	
12,400.00	5,811.00	12,151.94	5,811.01	129.96	128.15	90.00	6,695.73	-560.04	659.92	404.52	255.40	2.584	
12,500.00	5,811.00	12,251.94	5,811.01	131.82	130.05	90.00	6,795.73	-560.04	659.92	400.73	259.19	2.546	
12,596.54	5,811.00	12,348.47	5,811.00	133.62	131.88	90.00	6,892.27	-560.04	659.91	397.06	262.86	2.511 SF	

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor #12F-0101A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor #12F-0101A	<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	0.00	0.00	0.00	0.00	138.57	-74.89	66.09	99.88				
100.00	100.00	100.00	100.00	0.09	0.09	138.57	-74.89	66.09	99.88	99.69	0.19	534.097	
200.00	200.00	200.00	200.00	0.32	0.32	138.57	-74.89	66.09	99.88	99.24	0.64	156.910	
300.00	300.00	300.00	300.00	0.54	0.54	138.57	-74.89	66.09	99.88	98.79	1.09	91.964	
400.00	400.00	400.00	400.00	0.77	0.77	138.57	-74.89	66.09	99.88	98.34	1.54	65.042	
500.00	500.00	500.00	500.00	0.99	0.99	138.57	-74.89	66.09	99.88	97.89	1.99	50.314	CC, ES
600.00	599.98	599.98	599.98	1.21	1.22	-174.78	-74.89	66.09	101.62	99.18	2.43	41.764	
700.00	699.84	699.84	699.84	1.44	1.44	-175.02	-74.89	66.09	106.83	103.95	2.88	37.090	
800.00	799.59	799.59	799.59	1.67	1.67	-175.33	-74.89	66.09	113.78	110.46	3.32	34.224	
900.00	899.35	903.19	903.17	1.91	1.90	-176.01	-73.10	65.59	119.14	115.36	3.78	31.547	
1,000.00	999.11	1,006.73	1,006.55	2.16	2.14	-177.45	-67.72	64.08	121.33	117.10	4.23	28.681	
1,100.00	1,098.86	1,106.66	1,106.23	2.41	2.36	-179.15	-61.01	62.19	122.22	117.54	4.68	26.113	
1,200.00	1,198.62	1,206.59	1,205.92	2.66	2.60	179.17	-54.29	60.31	123.22	118.08	5.13	24.002	
1,300.00	1,298.38	1,306.52	1,305.61	2.91	2.84	177.52	-47.58	58.43	124.32	118.73	5.59	22.241	
1,400.00	1,398.13	1,406.45	1,405.29	3.16	3.08	175.89	-40.87	56.54	125.52	119.48	6.05	20.754	
1,500.00	1,497.89	1,506.38	1,504.98	3.41	3.32	174.31	-34.16	54.66	126.83	120.32	6.51	19.485	
1,600.00	1,597.65	1,606.31	1,604.67	3.67	3.57	172.75	-27.45	52.78	128.22	121.25	6.97	18.391	
1,700.00	1,697.40	1,706.24	1,704.36	3.92	3.82	171.23	-20.74	50.90	129.72	122.28	7.44	17.439	
1,800.00	1,797.16	1,806.17	1,804.04	4.18	4.07	169.74	-14.02	49.01	131.30	123.39	7.91	16.607	
1,900.00	1,896.91	1,906.10	1,903.73	4.43	4.31	168.29	-7.31	47.13	132.96	124.59	8.38	15.873	
2,000.00	1,996.67	2,006.03	2,003.42	4.69	4.56	166.88	-0.60	45.25	134.71	125.86	8.85	15.222	
2,100.00	2,096.43	2,105.96	2,103.10	4.94	4.82	165.51	6.11	43.36	136.54	127.22	9.32	14.643	
2,200.00	2,196.18	2,205.89	2,202.79	5.20	5.07	164.17	12.82	41.48	138.45	128.65	9.80	14.124	
2,300.00	2,295.94	2,305.82	2,302.48	5.46	5.32	162.87	19.53	39.60	140.43	130.15	10.28	13.658	
2,400.00	2,395.70	2,405.75	2,402.16	5.71	5.57	161.60	26.25	37.72	142.48	131.72	10.76	13.237	
2,500.00	2,495.45	2,505.68	2,501.85	5.97	5.83	160.37	32.96	35.83	144.60	133.35	11.25	12.856	
2,600.00	2,595.21	2,605.61	2,601.54	6.23	6.08	159.18	39.67	33.95	146.78	135.05	11.73	12.510	
2,700.00	2,694.97	2,705.54	2,701.22	6.49	6.33	158.02	46.38	32.07	149.02	136.80	12.22	12.195	
2,800.00	2,794.72	2,805.47	2,800.91	6.74	6.59	156.90	53.09	30.18	151.33	138.62	12.71	11.906	
2,900.00	2,894.48	2,905.40	2,900.60	7.00	6.84	155.81	59.80	28.30	153.69	140.49	13.20	11.642	
3,000.00	2,994.23	3,005.33	3,000.28	7.26	7.09	154.76	66.52	26.42	156.10	142.41	13.69	11.400	
3,100.00	3,093.99	3,105.26	3,099.97	7.52	7.35	153.74	73.23	24.54	158.56	144.38	14.19	11.176	
3,200.00	3,193.75	3,205.19	3,199.66	7.77	7.60	152.75	79.94	22.65	161.08	146.39	14.68	10.970	
3,300.00	3,293.50	3,305.12	3,299.34	8.03	7.86	151.79	86.65	20.77	163.64	148.46	15.18	10.780	
3,400.00	3,393.26	3,405.05	3,399.03	8.29	8.11	150.85	93.36	18.89	166.24	150.56	15.68	10.603	
3,500.00	3,493.02	3,504.98	3,498.72	8.55	8.37	149.95	100.07	17.01	168.89	152.71	16.18	10.440	
3,600.00	3,592.77	3,604.91	3,598.40	8.81	8.62	149.08	106.79	15.12	171.58	154.90	16.68	10.288	
3,700.00	3,692.53	3,704.84	3,698.09	9.06	8.88	148.23	113.50	13.24	174.30	157.12	17.18	10.146	
3,800.00	3,792.29	3,804.77	3,797.78	9.32	9.13	147.41	120.21	11.36	177.07	159.38	17.68	10.014	
3,900.00	3,892.04	3,904.70	3,897.46	9.58	9.39	146.62	126.92	9.47	179.86	161.68	18.19	9.891	
4,000.00	3,991.80	4,004.63	3,997.15	9.84	9.64	145.85	133.63	7.59	182.69	164.01	18.69	9.775	
4,100.00	4,091.56	4,104.56	4,096.84	10.10	9.90	145.10	140.34	5.71	185.56	166.36	19.19	9.667	
4,200.00	4,191.31	4,204.49	4,196.52	10.35	10.15	144.38	147.06	3.83	188.45	168.75	19.70	9.566	
4,300.00	4,291.07	4,304.42	4,296.21	10.61	10.41	143.68	153.77	1.94	191.38	171.17	20.21	9.471	
4,400.00	4,390.82	4,404.35	4,395.90	10.87	10.67	143.00	160.48	0.06	194.33	173.61	20.71	9.382	
4,500.00	4,490.58	4,504.28	4,495.58	11.13	10.92	142.34	167.19	-1.82	197.31	176.08	21.22	9.298	
4,600.00	4,590.34	4,604.21	4,595.27	11.39	11.18	141.69	173.90	-3.71	200.31	178.58	21.73	9.218	
4,700.00	4,690.09	4,704.14	4,694.96	11.65	11.43	141.07	180.61	-5.59	203.34	181.10	22.24	9.144	
4,800.00	4,789.85	4,804.07	4,794.64	11.90	11.69	140.47	187.33	-7.47	206.39	183.64	22.75	9.073	
4,900.00	4,889.61	4,904.00	4,894.33	12.16	11.94	139.88	194.04	-9.35	209.46	186.20	23.26	9.007	
5,000.00	4,989.36	5,003.93	4,994.02	12.42	12.20	139.32	200.75	-11.24	212.55	188.79	23.77	8.944	
5,100.00	5,089.12	5,103.86	5,093.71	12.68	12.46	138.76	207.46	-13.12	215.67	191.39	24.28	8.884	

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 #12F-0101A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor #12F-0101A	<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-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		
5,200.00	5,188.88	5,203.79	5,193.39	12.94	12.71	138.23	214.17	-15.00	218.80	194.02	24.79	8.828	
5,300.00	5,288.63	5,303.72	5,293.08	13.20	12.97	137.71	220.88	-16.89	221.96	196.66	25.30	8.774 SF	
5,400.00	5,387.98	5,403.47	5,392.58	13.49	13.22	137.48	227.58	-18.76	227.85	202.16	25.69	8.870	
5,500.00	5,483.80	5,512.16	5,500.39	13.93	13.55	138.27	239.93	-22.23	245.56	219.84	25.72	9.546	
5,600.00	5,572.50	5,627.36	5,609.42	14.55	14.08	136.60	275.04	-32.08	270.91	245.11	25.80	10.500	
5,700.00	5,650.83	5,741.89	5,707.26	15.38	14.82	132.59	331.93	-48.04	302.80	276.43	26.37	11.485	
5,800.00	5,715.90	5,854.16	5,788.40	16.45	15.79	126.91	406.34	-68.91	340.79	312.90	27.89	12.220	
5,900.00	5,765.32	5,963.62	5,849.81	17.76	16.98	120.16	493.34	-93.32	384.22	353.68	30.54	12.580	
6,000.00	5,797.28	6,070.69	5,890.36	19.31	18.36	112.78	588.56	-120.03	431.93	397.84	34.09	12.670	
6,100.00	5,810.60	6,176.57	5,909.77	21.02	19.89	105.19	688.60	-148.09	482.33	444.27	38.06	12.673	
6,200.00	5,810.98	6,260.30	5,911.56	22.78	21.13	102.51	769.28	-170.28	532.24	490.86	41.38	12.863	
6,300.00	5,810.98	6,328.02	5,911.56	24.56	22.12	101.36	835.15	-186.02	580.51	536.16	44.35	13.089	
6,400.00	5,810.98	6,399.99	5,911.57	26.39	23.15	100.37	905.70	-200.17	627.45	580.07	47.38	13.243	
6,500.00	5,810.98	6,461.49	5,911.57	28.25	24.06	99.62	966.38	-210.16	672.92	622.65	50.27	13.387	

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor #12F-0101A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor #12F-0101A	<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: 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	0.00	0.00	0.00	0.00	90.00	0.00	164.45	164.45				
100.00	100.00	100.00	100.00	0.09	0.09	90.00	0.00	164.45	164.45	164.26	0.19	879.377	
200.00	200.00	200.00	200.00	0.32	0.32	90.00	0.00	164.45	164.45	163.81	0.64	258.348	
300.00	300.00	300.00	300.00	0.54	0.54	90.00	0.00	164.45	164.45	163.36	1.09	151.416	
400.00	400.00	400.00	400.00	0.77	0.77	90.00	0.00	164.45	164.45	162.91	1.54	107.091	
500.00	500.00	500.00	500.00	0.99	0.99	90.00	0.00	164.45	164.45	162.46	1.99	82.840	CC, ES
600.00	599.98	599.98	599.98	1.21	1.22	137.13	0.00	164.45	165.72	163.29	2.43	68.158	
700.00	699.84	699.84	699.84	1.44	1.44	138.28	0.00	164.45	169.60	166.72	2.88	58.947	
800.00	799.59	799.59	799.59	1.67	1.67	139.80	0.00	164.45	174.87	171.55	3.32	52.596	
900.00	899.35	899.35	899.35	1.91	1.89	141.23	0.00	164.45	180.26	176.49	3.78	47.741	
1,000.00	999.11	999.11	999.11	2.16	2.11	142.58	0.00	164.45	185.76	181.53	4.23	43.927	
1,100.00	1,098.86	1,098.86	1,098.86	2.41	2.34	143.85	0.00	164.45	191.35	186.67	4.68	40.862	
1,200.00	1,198.62	1,200.08	1,200.06	2.66	2.57	144.56	1.75	164.32	196.66	191.52	5.14	38.261	
1,300.00	1,298.38	1,301.41	1,301.24	2.91	2.80	144.25	7.06	163.93	201.25	195.65	5.60	35.940	
1,400.00	1,398.13	1,401.28	1,400.87	3.16	3.02	143.48	14.01	163.42	205.51	199.45	6.06	33.898	
1,500.00	1,497.89	1,501.15	1,500.50	3.41	3.25	142.74	20.96	162.90	209.80	203.27	6.53	32.124	
1,600.00	1,597.65	1,601.03	1,600.13	3.67	3.49	142.03	27.91	162.39	214.13	207.13	7.00	30.572	
1,700.00	1,697.40	1,700.90	1,699.76	3.92	3.73	141.35	34.85	161.88	218.49	211.01	7.48	29.207	
1,800.00	1,797.16	1,800.77	1,799.39	4.18	3.97	140.70	41.80	161.36	222.88	214.92	7.96	27.997	
1,900.00	1,896.91	1,900.64	1,899.02	4.43	4.21	140.07	48.75	160.85	227.30	218.86	8.44	26.920	
2,000.00	1,996.67	2,000.51	1,998.65	4.69	4.45	139.47	55.70	160.34	231.74	222.81	8.93	25.956	
2,100.00	2,096.43	2,100.39	2,098.27	4.94	4.70	138.89	62.64	159.83	236.21	226.79	9.42	25.088	
2,200.00	2,196.18	2,200.26	2,197.90	5.20	4.94	138.33	69.59	159.31	240.70	230.80	9.90	24.303	
2,300.00	2,295.94	2,300.13	2,297.53	5.46	5.19	137.79	76.54	158.80	245.21	234.82	10.39	23.591	
2,400.00	2,395.70	2,400.00	2,397.16	5.71	5.44	137.27	83.49	158.29	249.75	238.86	10.89	22.942	
2,500.00	2,495.45	2,499.87	2,496.79	5.97	5.69	136.77	90.44	157.78	254.30	242.92	11.38	22.348	
2,600.00	2,595.21	2,599.75	2,596.42	6.23	5.94	136.29	97.38	157.26	258.87	247.00	11.87	21.804	
2,700.00	2,694.97	2,699.62	2,696.05	6.49	6.19	135.82	104.33	156.75	263.46	251.10	12.37	21.302	
2,800.00	2,794.72	2,799.49	2,795.68	6.74	6.44	135.37	111.28	156.24	268.07	255.21	12.86	20.839	
2,900.00	2,894.48	2,899.36	2,895.30	7.00	6.69	134.94	118.23	155.72	272.69	259.33	13.36	20.410	
3,000.00	2,994.23	2,999.23	2,994.93	7.26	6.94	134.52	125.18	155.21	277.33	263.47	13.86	20.012	
3,100.00	3,093.99	3,099.11	3,094.56	7.52	7.19	134.11	132.12	154.70	281.98	267.63	14.36	19.642	
3,200.00	3,193.75	3,198.98	3,194.19	7.77	7.44	133.72	139.07	154.19	286.65	271.80	14.86	19.296	
3,300.00	3,293.50	3,298.85	3,293.82	8.03	7.69	133.34	146.02	153.67	291.33	275.98	15.35	18.973	
3,400.00	3,393.26	3,398.72	3,393.45	8.29	7.95	132.97	152.97	153.16	296.02	280.17	15.85	18.671	
3,500.00	3,493.02	3,498.59	3,493.08	8.55	8.20	132.61	159.91	152.65	300.72	284.37	16.35	18.387	
3,600.00	3,592.77	3,598.47	3,592.71	8.81	8.45	132.27	166.86	152.14	305.44	288.58	16.86	18.121	
3,700.00	3,692.53	3,698.34	3,692.33	9.06	8.71	131.93	173.81	151.62	310.17	292.81	17.36	17.870	
3,800.00	3,792.29	3,798.21	3,791.96	9.32	8.96	131.61	180.76	151.11	314.90	297.04	17.86	17.633	
3,900.00	3,892.04	3,898.08	3,891.59	9.58	9.21	131.29	187.71	150.60	319.65	301.29	18.36	17.410	
4,000.00	3,991.80	3,997.96	3,991.22	9.84	9.47	130.98	194.65	150.08	324.40	305.54	18.86	17.198	
4,100.00	4,091.56	4,097.83	4,090.85	10.10	9.72	130.69	201.60	149.57	329.17	309.80	19.37	16.998	
4,200.00	4,191.31	4,197.70	4,190.48	10.35	9.97	130.40	208.55	149.06	333.94	314.07	19.87	16.808	
4,300.00	4,291.07	4,297.57	4,290.11	10.61	10.23	130.12	215.50	148.55	338.72	318.35	20.37	16.628	
4,400.00	4,390.82	4,397.44	4,389.74	10.87	10.48	129.84	222.44	148.03	343.51	322.63	20.87	16.456	
4,500.00	4,490.58	4,497.32	4,489.36	11.13	10.74	129.58	229.39	147.52	348.30	326.93	21.38	16.293	
4,600.00	4,590.34	4,597.19	4,588.99	11.39	10.99	129.32	236.34	147.01	353.11	331.23	21.88	16.137	
4,700.00	4,690.09	4,697.06	4,688.62	11.65	11.24	129.07	243.29	146.50	357.92	335.53	22.39	15.989	
4,800.00	4,789.85	4,796.93	4,788.25	11.90	11.50	128.82	250.24	145.98	362.74	339.85	22.89	15.847	
4,900.00	4,889.61	4,896.80	4,887.88	12.16	11.75	128.58	257.18	145.47	367.56	344.17	23.39	15.712	
5,000.00	4,989.36	4,996.68	4,987.51	12.42	12.01	128.35	264.13	144.96	372.39	348.49	23.90	15.583	
5,100.00	5,089.12	5,096.55	5,087.14	12.68	12.26	128.12	271.08	144.45	377.23	352.82	24.40	15.459	

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 #12F-0101A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor #12F-0101A	<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-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	5,188.88	5,196.42	5,186.77	12.94	12.52	127.90	278.03	143.93	382.07	357.16	24.91	15.340				
5,300.00	5,288.63	5,296.29	5,286.39	13.20	12.77	127.69	284.98	143.42	386.92	361.50	25.41	15.226 SF				
5,400.00	5,387.98	5,392.34	5,381.89	13.49	13.04	126.96	294.68	142.70	394.29	368.43	25.86	15.246				
5,500.00	5,483.80	5,483.85	5,470.07	13.93	13.41	124.73	318.62	140.94	413.66	387.38	26.29	15.737				
5,600.00	5,572.50	5,571.37	5,549.25	14.55	13.88	121.15	355.57	138.21	445.19	418.30	26.89	16.554				
5,700.00	5,650.83	5,653.95	5,617.28	15.38	14.43	116.37	402.09	134.78	487.52	459.59	27.93	17.458				
5,800.00	5,715.90	5,731.44	5,673.69	16.45	15.07	110.53	454.98	130.87	538.83	509.26	29.57	18.223				
5,900.00	5,765.32	5,804.38	5,719.05	17.76	15.77	103.78	511.87	126.68	597.05	565.28	31.77	18.790				
6,000.00	5,797.28	5,873.77	5,754.41	19.31	16.54	96.39	571.35	122.29	660.09	625.81	34.29	19.253				

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor #12F-0101A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor #12F-0101A	<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	0.00	0.00	0.00	0.00	119.54	-74.90	132.17	151.92				
100.00	100.00	100.00	100.00	0.09	0.09	119.54	-74.90	132.17	151.92	151.73	0.19	812.378	
200.00	200.00	200.00	200.00	0.32	0.32	119.54	-74.90	132.17	151.92	151.28	0.64	238.665	
300.00	300.00	300.00	300.00	0.54	0.54	119.54	-74.90	132.17	151.92	150.83	1.09	139.880	
400.00	400.00	400.00	400.00	0.77	0.77	119.54	-74.90	132.17	151.92	150.38	1.54	98.931	
500.00	500.00	500.00	500.00	0.99	0.99	119.54	-74.90	132.17	151.92	149.93	1.99	76.528	CC, ES
600.00	599.98	599.98	599.98	1.21	1.22	166.42	-74.90	132.17	153.62	151.18	2.43	63.148	
700.00	699.84	699.84	699.84	1.44	1.44	166.84	-74.90	132.17	158.71	155.83	2.88	55.130	
800.00	799.59	801.07	801.05	1.67	1.67	166.80	-73.18	132.65	165.06	161.74	3.32	49.663	
900.00	899.35	902.26	902.09	1.91	1.90	165.60	-68.02	134.09	170.57	166.79	3.77	45.215	
1,000.00	999.11	1,002.00	1,001.59	2.16	2.13	163.96	-61.32	135.96	175.79	171.57	4.23	41.588	
1,100.00	1,098.86	1,101.74	1,101.08	2.41	2.36	162.40	-54.62	137.83	181.16	176.47	4.69	38.633	
1,200.00	1,198.62	1,201.48	1,200.58	2.66	2.60	160.94	-47.92	139.71	186.64	181.49	5.16	36.196	
1,300.00	1,298.38	1,301.21	1,300.08	2.91	2.84	159.57	-41.22	141.58	192.25	186.62	5.63	34.158	
1,400.00	1,398.13	1,400.95	1,399.57	3.16	3.09	158.27	-34.52	143.45	197.95	191.85	6.10	32.435	
1,500.00	1,497.89	1,500.69	1,499.07	3.41	3.33	157.04	-27.82	145.32	203.76	197.18	6.58	30.961	
1,600.00	1,597.65	1,600.43	1,598.56	3.67	3.58	155.89	-21.12	147.19	209.65	202.59	7.06	29.690	
1,700.00	1,697.40	1,700.17	1,698.06	3.92	3.83	154.80	-14.41	149.06	215.62	208.07	7.54	28.583	
1,800.00	1,797.16	1,799.91	1,797.56	4.18	4.08	153.76	-7.71	150.93	221.66	213.64	8.03	27.613	
1,900.00	1,896.91	1,899.65	1,897.05	4.43	4.33	152.78	-1.01	152.80	227.78	219.26	8.51	26.756	
2,000.00	1,996.67	1,999.39	1,996.55	4.69	4.58	151.86	5.69	154.67	233.95	224.95	9.00	25.995	
2,100.00	2,096.43	2,099.13	2,096.05	4.94	4.83	150.98	12.39	156.54	240.19	230.70	9.49	25.315	
2,200.00	2,196.18	2,198.87	2,195.54	5.20	5.08	150.14	19.09	158.42	246.48	236.50	9.98	24.705	
2,300.00	2,295.94	2,298.61	2,295.04	5.46	5.34	149.35	25.79	160.29	252.81	242.35	10.47	24.154	
2,400.00	2,395.70	2,398.35	2,394.53	5.71	5.59	148.59	32.49	162.16	259.20	248.24	10.96	23.655	
2,500.00	2,495.45	2,498.09	2,494.03	5.97	5.84	147.88	39.20	164.03	265.62	254.17	11.45	23.201	
2,600.00	2,595.21	2,597.83	2,593.53	6.23	6.09	147.19	45.90	165.90	272.09	260.15	11.94	22.787	
2,700.00	2,694.97	2,697.56	2,693.02	6.49	6.35	146.54	52.60	167.77	278.59	266.16	12.43	22.407	
2,800.00	2,794.72	2,797.30	2,792.52	6.74	6.60	145.92	59.30	169.64	285.13	272.20	12.93	22.058	
2,900.00	2,894.48	2,897.04	2,892.02	7.00	6.85	145.32	66.00	171.51	291.70	278.28	13.42	21.737	
3,000.00	2,994.23	2,996.78	2,991.51	7.26	7.11	144.75	72.70	173.38	298.29	284.38	13.91	21.439	
3,100.00	3,093.99	3,096.52	3,091.01	7.52	7.36	144.21	79.40	175.25	304.92	290.51	14.41	21.164	
3,200.00	3,193.75	3,196.26	3,190.51	7.77	7.61	143.69	86.10	177.13	311.57	296.67	14.90	20.908	
3,300.00	3,293.50	3,296.00	3,290.00	8.03	7.87	143.19	92.80	179.00	318.25	302.85	15.40	20.670	
3,400.00	3,393.26	3,395.74	3,389.50	8.29	8.12	142.71	99.51	180.87	324.95	309.06	15.89	20.448	
3,500.00	3,493.02	3,495.48	3,488.99	8.55	8.38	142.25	106.21	182.74	331.67	315.29	16.39	20.240	
3,600.00	3,592.77	3,595.22	3,588.49	8.81	8.63	141.81	112.91	184.61	338.42	321.53	16.88	20.045	
3,700.00	3,692.53	3,694.96	3,687.99	9.06	8.89	141.39	119.61	186.48	345.18	327.80	17.38	19.863	
3,800.00	3,792.29	3,794.70	3,787.48	9.32	9.14	140.98	126.31	188.35	351.96	334.08	17.87	19.691	
3,900.00	3,892.04	3,894.44	3,886.98	9.58	9.40	140.59	133.01	190.22	358.76	340.38	18.37	19.529	
4,000.00	3,991.80	3,994.18	3,986.48	9.84	9.65	140.21	139.71	192.09	365.57	346.70	18.87	19.377	
4,100.00	4,091.56	4,093.92	4,085.97	10.10	9.90	139.85	146.41	193.96	372.40	353.03	19.36	19.233	
4,200.00	4,191.31	4,193.65	4,185.47	10.35	10.16	139.50	153.12	195.83	379.24	359.38	19.86	19.096	
4,300.00	4,291.07	4,293.39	4,284.97	10.61	10.41	139.16	159.82	197.71	386.09	365.74	20.36	18.967	
4,400.00	4,390.82	4,393.13	4,384.46	10.87	10.67	138.84	166.52	199.58	392.96	372.11	20.85	18.845	
4,500.00	4,490.58	4,492.87	4,483.96	11.13	10.92	138.52	173.22	201.45	399.84	378.49	21.35	18.729	
4,600.00	4,590.34	4,592.61	4,583.45	11.39	11.18	138.22	179.92	203.32	406.74	384.89	21.85	18.618	
4,700.00	4,690.09	4,692.35	4,682.95	11.65	11.43	137.92	186.62	205.19	413.64	391.30	22.34	18.513	
4,800.00	4,789.85	4,792.09	4,782.45	11.90	11.69	137.64	193.32	207.06	420.55	397.71	22.84	18.413	
4,900.00	4,889.61	4,891.83	4,881.94	12.16	11.94	137.36	200.02	208.93	427.48	404.14	23.34	18.318	
5,000.00	4,989.36	4,991.57	4,981.44	12.42	12.20	137.10	206.72	210.80	434.41	410.58	23.83	18.226	
5,100.00	5,089.12	5,091.31	5,080.94	12.68	12.45	136.84	213.43	212.67	441.36	417.02	24.33	18.139	

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 #12F-0101A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor #12F-0101A	<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											
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	5,188.88	5,191.05	5,180.43	12.94	12.71	136.59	220.13	214.54	448.31	423.48	24.83	18.056						
5,300.00	5,288.63	5,290.79	5,279.93	13.20	12.96	136.35	226.83	216.42	455.27	429.94	25.33	17.976 SF						
5,400.00	5,387.98	5,390.24	5,379.14	13.49	13.22	135.89	233.51	218.28	464.89	439.21	25.68	18.101						
5,500.00	5,483.80	5,477.70	5,466.25	13.93	13.46	135.28	240.76	220.31	487.70	462.03	25.67	18.998						
5,600.00	5,572.50	5,549.99	5,536.84	14.55	13.72	133.04	255.51	224.42	526.68	501.14	25.55	20.617						
5,700.00	5,650.83	5,619.55	5,602.15	15.38	14.06	128.98	278.44	230.83	580.21	554.45	25.75	22.532						
5,800.00	5,715.90	5,679.73	5,655.65	16.45	14.41	122.68	304.89	238.21	645.68	618.89	26.80	24.094						

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor #12F-0101A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor #12F-0101A	<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								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	0.00	0.00	0.00	0.00	90.00	0.01	230.54	230.54					
100.00	100.00	100.00	100.00	0.09	0.09	90.00	0.01	230.54	230.54	230.35	0.19	1,232.771		
200.00	200.00	200.00	200.00	0.32	0.32	90.00	0.01	230.54	230.54	229.90	0.64	362.171		
300.00	300.00	300.00	300.00	0.54	0.54	90.00	0.01	230.54	230.54	229.45	1.09	212.266		
400.00	400.00	400.00	400.00	0.77	0.77	90.00	0.01	230.54	230.54	229.00	1.54	150.127		
500.00	500.00	500.00	500.00	0.99	0.99	90.00	0.01	230.54	230.54	228.55	1.99	116.131	CC, ES	
600.00	599.98	599.98	599.98	1.21	1.22	137.02	0.01	230.54	231.81	229.38	2.43	95.338		
700.00	699.84	699.84	699.84	1.44	1.44	137.83	0.01	230.54	235.67	232.79	2.88	81.910		
800.00	799.59	799.59	799.59	1.67	1.67	138.94	0.01	230.54	240.89	237.56	3.32	72.448		
900.00	899.35	899.35	899.35	1.91	1.89	140.01	0.01	230.54	246.19	242.42	3.78	65.192		
1,000.00	999.11	999.11	999.11	2.16	2.11	141.03	0.01	230.54	251.58	247.35	4.23	59.475		
1,100.00	1,098.86	1,098.86	1,098.86	2.41	2.34	142.01	0.01	230.54	257.05	252.37	4.68	54.867		
1,200.00	1,198.62	1,198.62	1,198.62	2.66	2.56	142.94	0.01	230.54	262.59	257.45	5.14	51.081		
1,300.00	1,298.38	1,295.54	1,295.52	2.91	2.78	143.49	1.45	231.22	268.71	263.12	5.59	48.076		
1,400.00	1,398.13	1,392.34	1,392.20	3.16	3.00	143.37	5.84	233.30	275.92	269.88	6.04	45.689		
1,500.00	1,497.89	1,491.77	1,491.38	3.41	3.22	142.88	12.10	236.27	283.76	277.26	6.50	43.662		
1,600.00	1,597.65	1,591.43	1,590.80	3.67	3.45	142.41	18.38	239.26	291.63	284.66	6.96	41.880		
1,700.00	1,697.40	1,691.10	1,690.22	3.92	3.68	141.96	24.66	242.24	299.51	292.08	7.43	40.303		
1,800.00	1,797.16	1,790.76	1,789.64	4.18	3.92	141.54	30.94	245.22	307.41	299.51	7.90	38.899		
1,900.00	1,896.91	1,890.42	1,889.06	4.43	4.16	141.14	37.22	248.20	315.33	306.95	8.38	37.643		
2,000.00	1,996.67	1,990.08	1,988.48	4.69	4.40	140.76	43.50	251.18	323.26	314.41	8.85	36.514		
2,100.00	2,096.43	2,089.75	2,087.90	4.94	4.64	140.40	49.78	254.17	331.21	321.87	9.33	35.494		
2,200.00	2,196.18	2,189.41	2,187.32	5.20	4.88	140.06	56.06	257.15	339.16	329.35	9.81	34.570		
2,300.00	2,295.94	2,289.07	2,286.74	5.46	5.12	139.73	62.34	260.13	347.13	336.84	10.29	33.729		
2,400.00	2,395.70	2,388.73	2,386.16	5.71	5.37	139.42	68.62	263.11	355.11	344.34	10.77	32.960		
2,500.00	2,495.45	2,488.40	2,485.58	5.97	5.62	139.12	74.90	266.09	363.10	351.84	11.26	32.255		
2,600.00	2,595.21	2,588.06	2,585.00	6.23	5.86	138.83	81.18	269.08	371.10	359.36	11.74	31.606		
2,700.00	2,694.97	2,687.72	2,684.42	6.49	6.11	138.55	87.46	272.06	379.11	366.88	12.23	31.008		
2,800.00	2,794.72	2,787.38	2,783.84	6.74	6.36	138.29	93.74	275.04	387.12	374.41	12.71	30.454		
2,900.00	2,894.48	2,887.05	2,883.26	7.00	6.61	138.04	100.02	278.02	395.15	381.95	13.20	29.940		
3,000.00	2,994.23	2,986.71	2,982.68	7.26	6.86	137.79	106.30	281.00	403.18	389.50	13.68	29.462		
3,100.00	3,093.99	3,086.37	3,082.10	7.52	7.11	137.56	112.58	283.99	411.22	397.05	14.17	29.017		
3,200.00	3,193.75	3,186.04	3,181.52	7.77	7.36	137.33	118.86	286.97	419.26	404.60	14.66	28.600		
3,300.00	3,293.50	3,285.70	3,280.94	8.03	7.61	137.12	125.14	289.95	427.31	412.17	15.15	28.210		
3,400.00	3,393.26	3,385.36	3,380.36	8.29	7.86	136.91	131.42	292.93	435.37	419.74	15.64	27.845		
3,500.00	3,493.02	3,485.02	3,479.78	8.55	8.11	136.71	137.70	295.91	443.43	427.31	16.12	27.501		
3,600.00	3,592.77	3,584.69	3,579.20	8.81	8.36	136.52	143.98	298.90	451.50	434.89	16.61	27.177		
3,700.00	3,692.53	3,684.35	3,678.62	9.06	8.62	136.33	150.26	301.88	459.58	442.47	17.10	26.871		
3,800.00	3,792.29	3,784.01	3,778.04	9.32	8.87	136.15	156.54	304.86	467.65	450.06	17.59	26.583		
3,900.00	3,892.04	3,883.67	3,877.46	9.58	9.12	135.97	162.82	307.84	475.73	457.65	18.08	26.310		
4,000.00	3,991.80	3,983.34	3,976.88	9.84	9.37	135.81	169.10	310.82	483.82	465.25	18.57	26.051		
4,100.00	4,091.56	4,083.00	4,076.30	10.10	9.63	135.64	175.38	313.81	491.91	472.85	19.06	25.806		
4,200.00	4,191.31	4,182.66	4,175.72	10.35	9.88	135.49	181.66	316.79	500.00	480.45	19.55	25.573		
4,300.00	4,291.07	4,282.32	4,275.14	10.61	10.13	135.33	187.94	319.77	508.10	488.06	20.04	25.351		
4,400.00	4,390.82	4,381.99	4,374.56	10.87	10.38	135.19	194.22	322.75	516.20	495.67	20.53	25.140		
4,500.00	4,490.58	4,481.65	4,473.98	11.13	10.64	135.04	200.50	325.73	524.31	503.28	21.02	24.939		
4,600.00	4,590.34	4,581.31	4,573.40	11.39	10.89	134.90	206.78	328.71	532.41	510.90	21.51	24.747		
4,700.00	4,690.09	4,680.97	4,672.82	11.65	11.14	134.77	213.06	331.70	540.53	518.52	22.01	24.563		
4,800.00	4,789.85	4,780.64	4,772.24	11.90	11.40	134.64	219.34	334.68	548.64	526.14	22.50	24.388		
4,900.00	4,889.61	4,880.30	4,871.66	12.16	11.65	134.51	225.62	337.66	556.75	533.77	22.99	24.220		
5,000.00	4,989.36	4,979.96	4,971.08	12.42	11.91	134.39	231.90	340.64	564.87	541.39	23.48	24.059		
5,100.00	5,089.12	5,079.63	5,070.50	12.68	12.16	134.27	238.18	343.62	572.99	549.02	23.97	23.905		

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 #12F-0101A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor #12F-0101A	<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-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	
5,200.00	5,188.88	5,179.29	5,169.92	12.94	12.41	134.15	244.46	346.61	581.12	556.66	24.46	23.757		
5,300.00	5,288.63	5,278.95	5,269.34	13.20	12.67	134.04	250.74	349.59	589.24	564.29	24.95	23.614	SF	
5,400.00	5,387.98	5,363.47	5,353.59	13.49	12.89	133.41	256.72	352.43	600.45	575.16	25.29	23.746		
5,500.00	5,483.80	5,425.36	5,414.42	13.93	13.10	131.33	266.83	357.23	628.23	602.89	25.34	24.788		
5,600.00	5,572.50	5,482.07	5,468.64	14.55	13.34	127.65	281.76	364.32	672.73	647.29	25.44	26.445		

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor #12F-0101A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor #12F-0101A	<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	0.00	0.00	0.00	0.00	110.77	-74.91	197.49	211.22					
100.00	100.00	100.00	100.00	0.09	0.09	110.77	-74.91	197.49	211.22	211.04	0.19	1,129.499		
200.00	200.00	200.00	200.00	0.32	0.32	110.77	-74.91	197.49	211.22	210.59	0.64	331.831		
300.00	300.00	300.00	300.00	0.54	0.54	110.77	-74.91	197.49	211.22	210.14	1.09	194.484		
400.00	400.00	400.00	400.00	0.77	0.77	110.77	-74.91	197.49	211.22	209.69	1.54	137.551		
500.00	500.00	500.00	500.00	0.99	0.99	110.77	-74.91	197.49	211.22	209.24	1.99	106.402	CC, ES	
600.00	599.98	599.98	599.98	1.21	1.22	157.68	-74.91	197.49	212.84	210.40	2.43	87.505		
700.00	699.84	699.84	699.84	1.44	1.44	158.17	-74.91	197.49	217.69	214.81	2.88	75.635		
800.00	799.59	799.59	799.59	1.67	1.67	158.83	-74.91	197.49	224.18	220.86	3.32	67.476		
900.00	899.35	897.37	897.35	1.91	1.88	159.04	-73.59	198.49	231.12	227.36	3.76	61.428		
1,000.00	999.11	994.95	994.80	2.16	2.10	158.47	-69.63	201.50	238.95	234.75	4.20	56.828		
1,100.00	1,098.86	1,094.41	1,094.02	2.41	2.33	157.51	-64.10	205.68	247.32	242.66	4.66	53.097		
1,200.00	1,198.62	1,193.97	1,193.34	2.66	2.56	156.61	-58.56	209.87	255.75	250.64	5.12	49.984		
1,300.00	1,298.38	1,293.54	1,292.66	2.91	2.80	155.76	-53.02	214.06	264.25	258.67	5.58	47.352		
1,400.00	1,398.13	1,393.10	1,391.98	3.16	3.04	154.97	-47.49	218.26	272.79	266.75	6.05	45.106		
1,500.00	1,497.89	1,492.67	1,491.31	3.41	3.28	154.23	-41.95	222.45	281.39	274.87	6.52	43.170		
1,600.00	1,597.65	1,592.23	1,590.63	3.67	3.52	153.53	-36.41	226.64	290.03	283.04	6.99	41.487		
1,700.00	1,697.40	1,691.80	1,689.95	3.92	3.77	152.87	-30.87	230.83	298.71	291.24	7.47	40.012		
1,800.00	1,797.16	1,791.37	1,789.28	4.18	4.02	152.25	-25.34	235.03	307.43	299.49	7.94	38.711		
1,900.00	1,896.91	1,890.93	1,888.60	4.43	4.27	151.66	-19.80	239.22	316.18	307.76	8.42	37.556		
2,000.00	1,996.67	1,990.50	1,987.92	4.69	4.51	151.10	-14.26	243.41	324.96	316.06	8.90	36.523		
2,100.00	2,096.43	2,090.06	2,087.24	4.94	4.76	150.58	-8.72	247.60	333.77	324.40	9.38	35.596		
2,200.00	2,196.18	2,189.63	2,186.57	5.20	5.01	150.08	-3.19	251.80	342.61	332.75	9.86	34.758		
2,300.00	2,295.94	2,289.19	2,285.89	5.46	5.27	149.60	2.35	255.99	351.47	341.14	10.34	33.999		
2,400.00	2,395.70	2,388.76	2,385.21	5.71	5.52	149.15	7.89	260.18	360.36	349.54	10.82	33.307		
2,500.00	2,495.45	2,488.32	2,484.54	5.97	5.77	148.72	13.42	264.37	369.26	357.96	11.30	32.675		
2,600.00	2,595.21	2,587.89	2,583.86	6.23	6.02	148.31	18.96	268.57	378.19	366.41	11.78	32.095		
2,700.00	2,694.97	2,687.45	2,683.18	6.49	6.27	147.92	24.50	272.76	387.13	374.87	12.27	31.561		
2,800.00	2,794.72	2,787.02	2,782.50	6.74	6.53	147.55	30.04	276.95	396.10	383.35	12.75	31.068		
2,900.00	2,894.48	2,886.58	2,881.83	7.00	6.78	147.19	35.57	281.14	405.07	391.84	13.23	30.612		
3,000.00	2,994.23	2,986.15	2,981.15	7.26	7.03	146.85	41.11	285.33	414.06	400.35	13.72	30.188		
3,100.00	3,093.99	3,085.72	3,080.47	7.52	7.29	146.53	46.65	289.53	423.07	408.87	14.20	29.794		
3,200.00	3,193.75	3,185.28	3,179.80	7.77	7.54	146.22	52.19	293.72	432.09	417.41	14.68	29.426		
3,300.00	3,293.50	3,284.85	3,279.12	8.03	7.79	145.92	57.72	297.91	441.12	425.95	15.17	29.082		
3,400.00	3,393.26	3,384.41	3,378.44	8.29	8.05	145.63	63.26	302.10	450.16	434.51	15.65	28.759		
3,500.00	3,493.02	3,483.98	3,477.76	8.55	8.30	145.35	68.80	306.30	459.22	443.08	16.14	28.457		
3,600.00	3,592.77	3,583.54	3,577.09	8.81	8.56	145.09	74.34	310.49	468.28	451.66	16.62	28.172		
3,700.00	3,692.53	3,683.11	3,676.41	9.06	8.81	144.83	79.87	314.68	477.35	460.25	17.11	27.904		
3,800.00	3,792.29	3,782.67	3,775.73	9.32	9.07	144.58	85.41	318.87	486.44	468.84	17.59	27.651		
3,900.00	3,892.04	3,882.24	3,875.05	9.58	9.32	144.35	90.95	323.07	495.53	477.45	18.08	27.412		
4,000.00	3,991.80	3,981.80	3,974.38	9.84	9.57	144.12	96.48	327.26	504.63	486.06	18.56	27.185		
4,100.00	4,091.56	4,081.37	4,073.70	10.10	9.83	143.90	102.02	331.45	513.73	494.68	19.05	26.971		
4,200.00	4,191.31	4,180.93	4,173.02	10.35	10.08	143.69	107.56	335.64	522.85	503.31	19.53	26.767		
4,300.00	4,291.07	4,280.50	4,272.35	10.61	10.34	143.48	113.10	339.83	531.97	511.95	20.02	26.574		
4,400.00	4,390.82	4,380.07	4,371.67	10.87	10.59	143.28	118.63	344.03	541.09	520.59	20.50	26.389		
4,500.00	4,490.58	4,479.63	4,470.99	11.13	10.85	143.09	124.17	348.22	550.23	529.24	20.99	26.214		
4,600.00	4,590.34	4,579.20	4,570.31	11.39	11.10	142.90	129.71	352.41	559.37	537.89	21.48	26.047		
4,700.00	4,690.09	4,678.76	4,669.64	11.65	11.36	142.72	135.25	356.60	568.51	546.55	21.96	25.887		
4,800.00	4,789.85	4,778.33	4,768.96	11.90	11.61	142.55	140.78	360.80	577.66	555.22	22.45	25.735		
4,900.00	4,889.61	4,877.89	4,868.28	12.16	11.87	142.38	146.32	364.99	586.82	563.89	22.93	25.589		
5,000.00	4,989.36	4,977.46	4,967.61	12.42	12.12	142.22	151.86	369.18	595.98	572.56	23.42	25.449		
5,100.00	5,089.12	5,077.02	5,066.93	12.68	12.38	142.06	157.40	373.37	605.15	581.24	23.90	25.315		

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 #12F-0101A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor #12F-0101A	<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: 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			
5,200.00	5,188.88	5,176.59	5,166.25	12.94	12.63	141.91	162.93	377.57	614.31	589.92	24.39	25.187				
5,300.00	5,288.63	5,276.15	5,265.57	13.20	12.89	141.76	168.47	381.76	623.49	598.61	24.88	25.063 SF				
5,400.00	5,387.98	5,375.34	5,364.52	13.49	13.14	141.23	173.99	385.93	635.54	610.37	25.18	25.242				
5,500.00	5,483.80	5,449.99	5,438.98	13.93	13.34	140.05	178.25	389.16	661.69	636.71	24.98	26.486				

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor #12F-0101A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor #12F-0101A	<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							
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	-180.00	-74.88	0.00	74.88				
100.00	100.00	99.99	99.99	0.09	0.09	-180.00	-74.88	0.00	74.88	74.69	0.19	400.419	
200.00	200.00	199.99	199.99	0.32	0.32	-180.00	-74.88	0.00	74.88	74.24	0.64	117.640	
300.00	300.00	299.99	299.99	0.54	0.54	-180.00	-74.88	0.00	74.88	73.80	1.09	68.948	
400.00	400.00	399.99	399.99	0.77	0.77	-180.00	-74.88	0.00	74.88	73.35	1.54	48.764	
500.00	500.00	499.99	499.99	0.99	0.99	-180.00	-74.88	0.00	74.88	72.90	1.99	37.721	CC, ES
600.00	599.98	599.97	599.97	1.21	1.22	-134.20	-74.88	0.00	76.09	73.66	2.43	31.279	
700.00	699.84	699.83	699.83	1.44	1.44	-136.84	-74.88	0.00	79.83	76.94	2.88	27.696	
800.00	799.59	799.58	799.58	1.67	1.67	-140.05	-74.88	0.00	85.05	81.72	3.33	25.507	
900.00	899.35	899.34	899.34	1.91	1.89	-142.89	-74.88	0.00	90.52	86.73	3.79	23.891	
1,000.00	999.11	999.10	999.10	2.16	2.11	-145.39	-74.88	0.00	96.18	91.93	4.24	22.664	
1,100.00	1,098.86	1,097.01	1,096.99	2.41	2.31	-146.80	-76.06	-1.14	102.88	98.21	4.67	22.011	
1,200.00	1,198.62	1,194.69	1,194.54	2.66	2.49	-146.55	-79.63	-4.60	111.44	106.35	5.09	21.876	
1,300.00	1,298.38	1,294.10	1,293.70	2.91	2.69	-145.59	-84.61	-9.42	121.03	115.50	5.53	21.892	
1,400.00	1,398.13	1,393.62	1,392.98	3.16	2.90	-144.77	-89.60	-14.25	130.65	124.67	5.97	21.880	
1,500.00	1,497.89	1,493.14	1,492.26	3.41	3.11	-144.06	-94.59	-19.07	140.29	133.86	6.42	21.848	
1,600.00	1,597.65	1,592.66	1,591.54	3.67	3.33	-143.44	-99.58	-23.90	149.94	143.07	6.88	21.804	
1,700.00	1,697.40	1,692.18	1,690.82	3.92	3.56	-142.90	-104.57	-28.73	159.62	152.28	7.34	21.753	
1,800.00	1,797.16	1,791.70	1,790.09	4.18	3.79	-142.41	-109.56	-33.56	169.31	161.50	7.80	21.698	
1,900.00	1,896.91	1,891.22	1,889.37	4.43	4.03	-141.99	-114.55	-38.38	179.00	170.73	8.27	21.642	
2,000.00	1,996.67	1,990.74	1,988.65	4.69	4.27	-141.60	-119.53	-43.21	188.71	179.97	8.74	21.587	
2,100.00	2,096.43	2,090.26	2,087.93	4.94	4.51	-141.25	-124.52	-48.04	198.42	189.21	9.22	21.533	
2,200.00	2,196.18	2,189.78	2,187.20	5.20	4.76	-140.94	-129.51	-52.87	208.15	198.45	9.69	21.480	
2,300.00	2,295.94	2,289.30	2,286.48	5.46	5.00	-140.65	-134.50	-57.69	217.87	207.70	10.17	21.429	
2,400.00	2,395.70	2,388.82	2,385.76	5.71	5.25	-140.39	-139.49	-62.52	227.60	216.96	10.65	21.381	
2,500.00	2,495.45	2,488.34	2,485.04	5.97	5.50	-140.15	-144.48	-67.35	237.34	226.21	11.12	21.334	
2,600.00	2,595.21	2,587.86	2,584.32	6.23	5.75	-139.92	-149.47	-72.18	247.08	235.47	11.61	21.290	
2,700.00	2,694.97	2,687.38	2,683.59	6.49	6.00	-139.72	-154.46	-77.00	256.82	244.73	12.09	21.248	
2,800.00	2,794.72	2,786.90	2,782.87	6.74	6.26	-139.53	-159.44	-81.83	266.57	254.00	12.57	21.208	
2,900.00	2,894.48	2,886.42	2,882.15	7.00	6.51	-139.35	-164.43	-86.66	276.32	263.26	13.05	21.170	
3,000.00	2,994.23	2,985.94	2,981.43	7.26	6.76	-139.19	-169.42	-91.49	286.07	272.53	13.54	21.134	
3,100.00	3,093.99	3,085.46	3,080.70	7.52	7.02	-139.03	-174.41	-96.32	295.82	281.80	14.02	21.100	
3,200.00	3,193.75	3,184.98	3,179.98	7.77	7.28	-138.89	-179.40	-101.14	305.58	291.07	14.50	21.067	
3,300.00	3,293.50	3,284.50	3,279.26	8.03	7.53	-138.75	-184.39	-105.97	315.33	300.34	14.99	21.036	
3,400.00	3,393.26	3,384.02	3,378.54	8.29	7.79	-138.63	-189.38	-110.80	325.09	309.61	15.48	21.007	
3,500.00	3,493.02	3,483.54	3,477.81	8.55	8.05	-138.51	-194.37	-115.63	334.85	318.89	15.96	20.978	
3,600.00	3,592.77	3,583.06	3,577.09	8.81	8.30	-138.39	-199.35	-120.45	344.61	328.16	16.45	20.951	
3,700.00	3,692.53	3,682.58	3,676.37	9.06	8.56	-138.29	-204.34	-125.28	354.38	337.44	16.93	20.926	
3,800.00	3,792.29	3,782.10	3,775.65	9.32	8.82	-138.19	-209.33	-130.11	364.14	346.72	17.42	20.901	
3,900.00	3,892.04	3,881.62	3,874.93	9.58	9.08	-138.09	-214.32	-134.94	373.90	355.99	17.91	20.878	
4,000.00	3,991.80	3,981.14	3,974.20	9.84	9.34	-138.00	-219.31	-139.76	383.67	365.27	18.40	20.856	
4,100.00	4,091.56	4,080.66	4,073.48	10.10	9.60	-137.91	-224.30	-144.59	393.44	374.55	18.88	20.834	
4,200.00	4,191.31	4,180.18	4,172.76	10.35	9.85	-137.83	-229.29	-149.42	403.20	383.83	19.37	20.814	
4,300.00	4,291.07	4,279.70	4,272.04	10.61	10.11	-137.75	-234.27	-154.25	412.97	393.11	19.86	20.794	
4,400.00	4,390.82	4,379.22	4,371.31	10.87	10.37	-137.68	-239.26	-159.08	422.74	402.39	20.35	20.775	
4,500.00	4,490.58	4,478.74	4,470.59	11.13	10.63	-137.61	-244.25	-163.90	432.51	411.68	20.84	20.757	
4,600.00	4,590.34	4,578.26	4,569.87	11.39	10.89	-137.54	-249.24	-168.73	442.28	420.96	21.33	20.740	
4,700.00	4,690.09	4,677.78	4,669.15	11.65	11.15	-137.48	-254.23	-173.56	452.05	430.24	21.81	20.723	
4,800.00	4,789.85	4,777.30	4,768.43	11.90	11.41	-137.41	-259.22	-178.39	461.83	439.52	22.30	20.707	
4,900.00	4,889.61	4,876.82	4,867.70	12.16	11.67	-137.35	-264.21	-183.21	471.60	448.81	22.79	20.691	
5,000.00	4,989.36	4,976.34	4,966.98	12.42	11.94	-137.30	-269.20	-188.04	481.37	458.09	23.28	20.676	
5,100.00	5,089.12	5,075.86	5,066.26	12.68	12.20	-137.24	-274.18	-192.87	491.14	467.37	23.77	20.662	

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 #12F-0101A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor #12F-0101A	<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							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	5,188.88	5,175.38	5,165.54	12.94	12.46	-137.19	-279.17	-197.70	500.92	476.66	24.26	20.648					
5,300.00	5,288.63	5,274.90	5,264.81	13.20	12.72	-137.14	-284.16	-202.52	510.69	485.94	24.75	20.635 SF					
5,400.00	5,387.98	5,350.00	5,339.72	13.49	12.92	-136.48	-288.04	-206.28	523.81	498.79	25.02	20.935					
5,500.00	5,483.80	5,415.34	5,404.20	13.93	13.14	-134.44	-295.40	-213.40	554.98	530.00	24.98	22.218					
5,600.00	5,572.50	5,465.14	5,452.21	14.55	13.36	-130.57	-304.88	-222.57	604.73	579.84	24.89	24.294					
5,700.00	5,650.83	5,500.00	5,484.96	15.38	13.53	-124.03	-313.45	-230.86	669.59	644.28	25.31	26.455					

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor #12F-0101A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor #12F-0101A	<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: 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	0.00	0.00	0.00	0.00	156.19	-74.89	33.04	81.85				
100.00	100.00	100.00	100.00	0.09	0.09	156.19	-74.89	33.04	81.85	81.66	0.19	437.695	
200.00	200.00	200.00	200.00	0.32	0.32	156.19	-74.89	33.04	81.85	81.21	0.64	128.589	
300.00	300.00	300.00	300.00	0.54	0.54	156.19	-74.89	33.04	81.85	80.77	1.09	75.365	
400.00	400.00	400.00	400.00	0.77	0.77	156.19	-74.89	33.04	81.85	80.32	1.54	53.303	
500.00	500.00	500.00	500.00	0.99	0.99	156.19	-74.89	33.04	81.85	79.87	1.99	41.232 CC, ES	
600.00	599.98	599.98	599.98	1.21	1.22	-157.52	-74.89	33.04	83.46	81.03	2.43	34.302	
700.00	699.84	699.84	699.84	1.44	1.44	-158.79	-74.89	33.04	88.32	85.44	2.88	30.652	
800.00	799.59	799.59	799.59	1.67	1.67	-160.31	-74.89	33.04	94.86	91.53	3.33	28.501	
900.00	899.35	899.35	899.35	1.91	1.89	-161.64	-74.89	33.04	101.46	97.68	3.78	26.859	
1,000.00	999.11	999.11	999.11	2.16	2.11	-162.80	-74.89	33.04	108.10	103.87	4.23	25.569	
1,100.00	1,098.86	1,098.86	1,098.86	2.41	2.34	-163.83	-74.89	33.04	114.78	110.10	4.68	24.532	
1,200.00	1,198.62	1,198.62	1,198.62	2.66	2.56	-164.75	-74.89	33.04	121.50	116.37	5.13	23.681	
1,300.00	1,298.38	1,296.67	1,296.65	2.91	2.76	-164.88	-76.22	32.11	128.89	123.34	5.56	23.199	
1,400.00	1,398.13	1,394.40	1,394.25	3.16	2.94	-163.72	-80.29	29.27	137.67	131.70	5.97	23.072	
1,500.00	1,497.89	1,493.73	1,493.34	3.41	3.13	-162.02	-85.96	25.30	147.32	140.93	6.39	23.049	
1,600.00	1,597.65	1,593.17	1,592.54	3.67	3.32	-160.52	-91.65	21.33	157.09	150.26	6.83	23.017	
1,700.00	1,697.40	1,692.62	1,691.74	3.92	3.53	-159.20	-97.34	17.35	166.95	159.68	7.27	22.976	
1,800.00	1,797.16	1,792.06	1,790.94	4.18	3.75	-158.03	-103.02	13.38	176.89	169.18	7.71	22.932	
1,900.00	1,896.91	1,891.50	1,890.14	4.43	3.97	-156.98	-108.71	9.40	186.90	178.73	8.17	22.887	
2,000.00	1,996.67	1,990.95	1,989.34	4.69	4.19	-156.04	-114.39	5.43	196.96	188.33	8.62	22.841	
2,100.00	2,096.43	2,090.39	2,088.55	4.94	4.42	-155.19	-120.08	1.46	207.06	197.98	9.08	22.796	
2,200.00	2,196.18	2,189.83	2,187.75	5.20	4.66	-154.42	-125.76	-2.52	217.21	207.67	9.55	22.753	
2,300.00	2,295.94	2,289.28	2,286.95	5.46	4.89	-153.71	-131.45	-6.49	227.40	217.39	10.01	22.711	
2,400.00	2,395.70	2,388.72	2,386.15	5.71	5.13	-153.07	-137.14	-10.46	237.62	227.13	10.48	22.672	
2,500.00	2,495.45	2,488.16	2,485.35	5.97	5.37	-152.48	-142.82	-14.44	247.86	236.91	10.95	22.635	
2,600.00	2,595.21	2,587.61	2,584.55	6.23	5.62	-151.94	-148.51	-18.41	258.13	246.70	11.42	22.599	
2,700.00	2,694.97	2,687.05	2,683.75	6.49	5.86	-151.44	-154.19	-22.39	268.41	256.52	11.89	22.566	
2,800.00	2,794.72	2,786.49	2,782.95	6.74	6.11	-150.98	-159.88	-26.36	278.72	266.35	12.37	22.534	
2,900.00	2,894.48	2,885.93	2,882.15	7.00	6.35	-150.55	-165.57	-30.33	289.04	276.20	12.84	22.505	
3,000.00	2,994.23	2,985.38	2,981.35	7.26	6.60	-150.15	-171.25	-34.31	299.38	286.06	13.32	22.477	
3,100.00	3,093.99	3,084.82	3,080.55	7.52	6.85	-149.77	-176.94	-38.28	309.73	295.94	13.80	22.450	
3,200.00	3,193.75	3,184.26	3,179.75	7.77	7.11	-149.42	-182.62	-42.25	320.10	305.82	14.27	22.425	
3,300.00	3,293.50	3,283.71	3,278.96	8.03	7.36	-149.10	-188.31	-46.23	330.47	315.72	14.75	22.401	
3,400.00	3,393.26	3,383.15	3,378.16	8.29	7.61	-148.79	-193.99	-50.20	340.86	325.63	15.23	22.379	
3,500.00	3,493.02	3,482.59	3,477.36	8.55	7.86	-148.50	-199.68	-54.18	351.25	335.54	15.71	22.358	
3,600.00	3,592.77	3,582.04	3,576.56	8.81	8.12	-148.23	-205.37	-58.15	361.66	345.47	16.19	22.338	
3,700.00	3,692.53	3,681.48	3,675.76	9.06	8.37	-147.97	-211.05	-62.12	372.07	355.40	16.67	22.319	
3,800.00	3,792.29	3,780.92	3,774.96	9.32	8.63	-147.72	-216.74	-66.10	382.48	365.33	17.15	22.301	
3,900.00	3,892.04	3,880.37	3,874.16	9.58	8.88	-147.49	-222.42	-70.07	392.91	375.28	17.63	22.284	
4,000.00	3,991.80	3,979.81	3,973.36	9.84	9.14	-147.27	-228.11	-74.05	403.34	385.23	18.11	22.268	
4,100.00	4,091.56	4,079.25	4,072.56	10.10	9.40	-147.07	-233.79	-78.02	413.77	395.18	18.59	22.252	
4,200.00	4,191.31	4,178.69	4,171.76	10.35	9.65	-146.87	-239.48	-81.99	424.22	405.14	19.08	22.237	
4,300.00	4,291.07	4,278.14	4,270.96	10.61	9.91	-146.68	-245.17	-85.97	434.66	415.10	19.56	22.223	
4,400.00	4,390.82	4,377.58	4,370.16	10.87	10.17	-146.50	-250.85	-89.94	445.11	425.07	20.04	22.210	
4,500.00	4,490.58	4,477.02	4,469.37	11.13	10.43	-146.33	-256.54	-93.91	455.56	435.04	20.52	22.197	
4,600.00	4,590.34	4,576.47	4,568.57	11.39	10.68	-146.17	-262.22	-97.89	466.02	445.02	21.01	22.185	
4,700.00	4,690.09	4,675.91	4,667.77	11.65	10.94	-146.01	-267.91	-101.86	476.48	454.99	21.49	22.173	
4,800.00	4,789.85	4,775.35	4,766.97	11.90	11.20	-145.86	-273.59	-105.84	486.95	464.98	21.97	22.162	
4,900.00	4,889.61	4,874.80	4,866.17	12.16	11.46	-145.72	-279.28	-109.81	497.42	474.96	22.46	22.151	
5,000.00	4,989.36	4,974.24	4,965.37	12.42	11.72	-145.58	-284.97	-113.78	507.89	484.95	22.94	22.140	
5,100.00	5,089.12	5,073.68	5,064.57	12.68	11.98	-145.45	-290.65	-117.76	518.36	494.94	23.42	22.130	

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 #12F-0101A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor #12F-0101A	<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-ISWWSA 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	5,188.88	5,173.13	5,163.77	12.94	12.24	-145.32	-296.34	-121.73	528.84	504.93	23.91	22.121					
5,300.00	5,288.63	5,272.57	5,262.97	13.20	12.50	-145.20	-302.02	-125.70	539.32	514.93	24.39	22.112 SF					
5,400.00	5,387.98	5,371.57	5,361.73	13.49	12.75	-144.70	-307.68	-129.66	552.80	528.13	24.67	22.405					
5,500.00	5,483.80	5,449.99	5,439.95	13.93	12.96	-143.65	-312.28	-132.87	580.90	556.48	24.42	23.789					
5,600.00	5,572.50	5,499.99	5,489.44	14.55	13.12	-140.93	-318.03	-136.89	628.03	604.15	23.88	26.295					

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor #12F-0101A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor #12F-0101A	<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: 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	0.00	0.00	0.00	0.00	138.57	-74.88	66.09	99.87				
100.00	100.00	99.99	99.99	0.09	0.09	138.57	-74.88	66.09	99.87	99.69	0.19	534.061	
200.00	200.00	199.99	199.99	0.32	0.32	138.57	-74.88	66.09	99.87	99.24	0.64	156.904	
300.00	300.00	299.99	299.99	0.54	0.54	138.57	-74.88	66.09	99.87	98.79	1.09	91.959	
400.00	400.00	399.99	399.99	0.77	0.77	138.57	-74.88	66.09	99.87	98.34	1.54	65.039	
500.00	500.00	499.99	499.99	0.99	0.99	138.57	-74.88	66.09	99.87	97.89	1.99	50.311	CC, ES
600.00	599.98	598.48	598.46	1.21	1.19	-173.91	-76.43	65.40	102.34	99.93	2.41	42.543	
700.00	699.84	696.50	696.34	1.44	1.38	-171.79	-81.04	63.36	109.83	107.01	2.82	38.945	
800.00	799.59	795.79	795.39	1.67	1.58	-169.32	-87.37	60.55	120.06	116.81	3.25	36.962	
900.00	899.35	895.14	894.50	1.91	1.80	-167.24	-93.71	57.74	130.48	126.79	3.69	35.376	
1,000.00	999.11	994.49	993.61	2.16	2.04	-165.46	-100.04	54.94	141.05	136.91	4.14	34.085	
1,100.00	1,098.86	1,093.84	1,092.72	2.41	2.27	-163.94	-106.38	52.13	151.73	147.14	4.59	33.026	
1,200.00	1,198.62	1,193.19	1,191.83	2.66	2.52	-162.61	-112.71	49.32	162.51	157.45	5.06	32.146	
1,300.00	1,298.38	1,292.55	1,290.94	2.91	2.77	-161.45	-119.05	46.51	173.36	167.84	5.52	31.407	
1,400.00	1,398.13	1,391.90	1,390.05	3.16	3.02	-160.43	-125.39	43.71	184.27	178.28	5.99	30.779	
1,500.00	1,497.89	1,491.25	1,489.16	3.41	3.27	-159.52	-131.72	40.90	195.23	188.78	6.46	30.241	
1,600.00	1,597.65	1,590.60	1,588.27	3.67	3.52	-158.71	-138.06	38.09	206.24	199.32	6.93	29.775	
1,700.00	1,697.40	1,689.96	1,687.38	3.92	3.78	-157.98	-144.40	35.28	217.29	209.89	7.40	29.369	
1,800.00	1,797.16	1,789.31	1,786.49	4.18	4.03	-157.32	-150.73	32.47	228.36	220.49	7.87	29.011	
1,900.00	1,896.91	1,888.66	1,885.60	4.43	4.29	-156.72	-157.07	29.67	239.47	231.12	8.35	28.694	
2,000.00	1,996.67	1,988.01	1,984.71	4.69	4.55	-156.18	-163.40	26.86	250.59	241.77	8.82	28.412	
2,100.00	2,096.43	2,087.36	2,083.82	4.94	4.81	-155.68	-169.74	24.05	261.74	252.44	9.30	28.159	
2,200.00	2,196.18	2,186.72	2,182.93	5.20	5.06	-155.22	-176.08	21.24	272.90	263.13	9.77	27.930	
2,300.00	2,295.94	2,286.07	2,282.04	5.46	5.32	-154.80	-182.41	18.44	284.09	273.84	10.25	27.724	
2,400.00	2,395.70	2,385.42	2,381.15	5.71	5.58	-154.41	-188.75	15.63	295.28	284.56	10.72	27.535	
2,500.00	2,495.45	2,484.77	2,480.26	5.97	5.84	-154.05	-195.09	12.82	306.49	295.29	11.20	27.364	
2,600.00	2,595.21	2,584.12	2,579.37	6.23	6.10	-153.71	-201.42	10.01	317.71	306.03	11.68	27.206	
2,700.00	2,694.97	2,683.48	2,678.48	6.49	6.36	-153.40	-207.76	7.20	328.93	316.78	12.16	27.061	
2,800.00	2,794.72	2,782.83	2,777.59	6.74	6.62	-153.11	-214.09	4.40	340.17	327.54	12.63	26.928	
2,900.00	2,894.48	2,882.18	2,876.70	7.00	6.89	-152.83	-220.43	1.59	351.42	338.31	13.11	26.804	
3,000.00	2,994.23	2,981.53	2,975.81	7.26	7.15	-152.58	-226.77	-1.22	362.67	349.08	13.59	26.689	
3,100.00	3,093.99	3,080.88	3,074.92	7.52	7.41	-152.33	-233.10	-4.03	373.93	359.86	14.07	26.582	
3,200.00	3,193.75	3,180.24	3,174.03	7.77	7.67	-152.11	-239.44	-6.83	385.20	370.65	14.55	26.482	
3,300.00	3,293.50	3,279.59	3,273.14	8.03	7.93	-151.89	-245.78	-9.64	396.47	381.45	15.02	26.389	
3,400.00	3,393.26	3,378.94	3,372.25	8.29	8.19	-151.69	-252.11	-12.45	407.75	392.24	15.50	26.302	
3,500.00	3,493.02	3,478.29	3,471.36	8.55	8.45	-151.50	-258.45	-15.26	419.03	403.05	15.98	26.220	
3,600.00	3,592.77	3,577.64	3,570.47	8.81	8.72	-151.32	-264.78	-18.07	430.31	413.85	16.46	26.142	
3,700.00	3,692.53	3,677.00	3,669.58	9.06	8.98	-151.15	-271.12	-20.87	441.60	424.67	16.94	26.070	
3,800.00	3,792.29	3,776.35	3,768.69	9.32	9.24	-150.98	-277.46	-23.68	452.90	435.48	17.42	26.001	
3,900.00	3,892.04	3,875.70	3,867.80	9.58	9.50	-150.83	-283.79	-26.49	464.20	446.30	17.90	25.936	
4,000.00	3,991.80	3,975.05	3,966.91	9.84	9.76	-150.68	-290.13	-29.30	475.50	457.12	18.38	25.875	
4,100.00	4,091.56	4,074.41	4,066.02	10.10	10.02	-150.54	-296.46	-32.10	486.80	467.94	18.86	25.817	
4,200.00	4,191.31	4,173.76	4,165.13	10.35	10.29	-150.40	-302.80	-34.91	498.11	478.77	19.34	25.761	
4,300.00	4,291.07	4,273.11	4,264.24	10.61	10.55	-150.27	-309.14	-37.72	509.42	489.60	19.81	25.709	
4,400.00	4,390.82	4,372.46	4,363.35	10.87	10.81	-150.15	-315.47	-40.53	520.73	500.43	20.29	25.659	
4,500.00	4,490.58	4,471.81	4,462.46	11.13	11.07	-150.03	-321.81	-43.34	532.04	511.27	20.77	25.611	
4,600.00	4,590.34	4,571.17	4,561.57	11.39	11.34	-149.92	-328.15	-46.14	543.36	522.10	21.25	25.566	
4,700.00	4,690.09	4,670.52	4,660.68	11.65	11.60	-149.81	-334.48	-48.95	554.67	532.94	21.73	25.522	
4,800.00	4,789.85	4,769.87	4,759.79	11.90	11.86	-149.71	-340.82	-51.76	565.99	543.78	22.21	25.481	
4,900.00	4,889.61	4,869.22	4,858.90	12.16	12.12	-149.61	-347.15	-54.57	577.32	554.62	22.69	25.441	
5,000.00	4,989.36	4,968.57	4,958.01	12.42	12.39	-149.51	-353.49	-57.37	588.64	565.47	23.17	25.403	
5,100.00	5,089.12	5,067.93	5,057.12	12.68	12.65	-149.42	-359.83	-60.18	599.96	576.31	23.65	25.366	

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 #12F-0101A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor #12F-0101A	<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 Federal #12F-1303A - HZ - Plan #3													<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	5,188.88	5,167.28	5,156.23	12.94	12.91	-149.33	-366.16	-62.99	611.29	587.16	24.13	25.331		
5,300.00	5,288.63	5,266.63	5,255.34	13.20	13.17	-149.24	-372.50	-65.80	622.62	598.01	24.61	25.298	SF	
5,400.00	5,387.98	5,350.00	5,338.50	13.49	13.40	-148.66	-377.94	-68.21	637.38	612.57	24.81	25.690		
5,500.00	5,483.80	5,400.00	5,387.99	13.93	13.56	-146.75	-384.35	-71.06	671.95	647.56	24.40	27.545		

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor #12F-0101A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor #12F-0101A	<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		
0.00	0.00	0.00	0.00	0.00	0.00	127.07	-74.90	99.13	124.24					
100.00	100.00	100.00	100.00	0.09	0.09	127.07	-74.90	99.13	124.24	124.06	0.19	664.382		
200.00	200.00	200.00	200.00	0.32	0.32	127.07	-74.90	99.13	124.24	123.61	0.64	195.186		
300.00	300.00	300.00	300.00	0.54	0.54	127.07	-74.90	99.13	124.24	123.16	1.09	114.397		
400.00	400.00	400.00	400.00	0.77	0.77	127.07	-74.90	99.13	124.24	122.71	1.54	80.909		
500.00	500.00	500.00	500.00	0.99	0.99	127.07	-74.90	99.13	124.24	122.26	1.99	62.587	CC, ES	
600.00	599.98	599.98	599.98	1.21	1.22	173.89	-74.90	99.13	125.98	123.55	2.43	51.782		
700.00	699.84	699.84	699.84	1.44	1.44	174.13	-74.90	99.13	131.18	128.30	2.88	45.559		
800.00	799.59	799.59	799.59	1.67	1.67	174.42	-74.90	99.13	138.12	134.80	3.32	41.567		
900.00	899.35	899.35	899.35	1.91	1.89	174.69	-74.90	99.13	145.07	141.30	3.77	38.490		
1,000.00	999.11	999.11	999.11	2.16	2.11	174.93	-74.90	99.13	152.02	147.80	4.22	36.051		
1,100.00	1,098.86	1,098.86	1,098.86	2.41	2.34	175.16	-74.90	99.13	158.97	154.30	4.67	34.072		
1,200.00	1,198.62	1,196.10	1,196.08	2.66	2.53	175.85	-76.47	98.79	166.66	161.58	5.08	32.786		
1,300.00	1,298.38	1,292.84	1,292.70	2.91	2.70	177.43	-81.24	97.77	175.98	170.49	5.48	32.094		
1,400.00	1,398.13	1,391.90	1,391.51	3.16	2.89	179.40	-87.99	96.32	186.38	180.49	5.90	31.611		
1,500.00	1,497.89	1,491.16	1,490.53	3.41	3.08	-178.83	-94.76	94.87	196.99	190.67	6.32	31.178		
1,600.00	1,597.65	1,590.42	1,589.55	3.67	3.29	-177.25	-101.53	93.42	207.77	201.02	6.75	30.787		
1,700.00	1,697.40	1,689.68	1,688.57	3.92	3.50	-175.82	-108.30	91.97	218.68	211.50	7.19	30.436		
1,800.00	1,797.16	1,788.94	1,787.59	4.18	3.72	-174.53	-115.07	90.52	229.72	222.10	7.63	30.120		
1,900.00	1,896.91	1,888.20	1,886.61	4.43	3.94	-173.36	-121.84	89.07	240.87	232.79	8.07	29.836		
2,000.00	1,996.67	1,987.46	1,985.63	4.69	4.17	-172.29	-128.61	87.62	252.10	243.58	8.52	29.579		
2,100.00	2,096.43	2,086.73	2,084.65	4.94	4.41	-171.31	-135.38	86.16	263.42	254.44	8.98	29.348		
2,200.00	2,196.18	2,185.99	2,183.67	5.20	4.64	-170.41	-142.15	84.71	274.80	265.37	9.43	29.139		
2,300.00	2,295.94	2,285.25	2,282.69	5.46	4.88	-169.59	-148.92	83.26	286.24	276.36	9.89	28.949		
2,400.00	2,395.70	2,384.51	2,381.71	5.71	5.12	-168.83	-155.69	81.81	297.74	287.40	10.35	28.776		
2,500.00	2,495.45	2,483.77	2,480.73	5.97	5.37	-168.12	-162.46	80.36	309.29	298.48	10.81	28.619		
2,600.00	2,595.21	2,583.03	2,579.75	6.23	5.61	-167.47	-169.23	78.91	320.88	309.61	11.27	28.475		
2,700.00	2,694.97	2,682.30	2,678.77	6.49	5.86	-166.86	-176.00	77.46	332.51	320.78	11.73	28.343		
2,800.00	2,794.72	2,781.56	2,777.79	6.74	6.11	-166.29	-182.77	76.00	344.17	331.98	12.20	28.221		
2,900.00	2,894.48	2,880.82	2,876.81	7.00	6.36	-165.76	-189.54	74.55	355.87	343.21	12.66	28.109		
3,000.00	2,994.23	2,980.08	2,975.83	7.26	6.61	-165.26	-196.31	73.10	367.59	354.47	13.13	28.005		
3,100.00	3,093.99	3,079.34	3,074.85	7.52	6.86	-164.80	-203.08	71.65	379.34	365.75	13.59	27.909		
3,200.00	3,193.75	3,178.60	3,173.87	7.77	7.11	-164.36	-209.85	70.20	391.11	377.05	14.06	27.820		
3,300.00	3,293.50	3,277.87	3,272.89	8.03	7.36	-163.95	-216.62	68.75	402.90	388.38	14.53	27.737		
3,400.00	3,393.26	3,377.13	3,371.91	8.29	7.62	-163.56	-223.39	67.30	414.72	399.72	14.99	27.659		
3,500.00	3,493.02	3,476.39	3,470.93	8.55	7.87	-163.19	-230.16	65.84	426.55	411.08	15.46	27.587		
3,600.00	3,592.77	3,575.65	3,569.95	8.81	8.13	-162.84	-236.94	64.39	438.39	422.46	15.93	27.519		
3,700.00	3,692.53	3,674.91	3,668.96	9.06	8.38	-162.51	-243.71	62.94	450.26	433.86	16.40	27.455		
3,800.00	3,792.29	3,774.17	3,767.98	9.32	8.64	-162.20	-250.48	61.49	462.13	445.26	16.87	27.395		
3,900.00	3,892.04	3,873.44	3,867.00	9.58	8.89	-161.90	-257.25	60.04	474.02	456.68	17.34	27.339		
4,000.00	3,991.80	3,972.70	3,966.02	9.84	9.15	-161.62	-264.02	58.59	485.92	468.11	17.81	27.286		
4,100.00	4,091.56	4,071.96	4,065.04	10.10	9.41	-161.35	-270.79	57.14	497.83	479.55	18.28	27.236		
4,200.00	4,191.31	4,171.22	4,164.06	10.35	9.66	-161.10	-277.56	55.68	509.75	491.00	18.75	27.189		
4,300.00	4,291.07	4,270.48	4,263.08	10.61	9.92	-160.85	-284.33	54.23	521.68	502.46	19.22	27.144		
4,400.00	4,390.82	4,369.74	4,362.10	10.87	10.18	-160.62	-291.10	52.78	533.62	513.93	19.69	27.101		
4,500.00	4,490.58	4,469.01	4,461.12	11.13	10.44	-160.40	-297.87	51.33	545.57	525.41	20.16	27.061		
4,600.00	4,590.34	4,568.27	4,560.14	11.39	10.70	-160.18	-304.64	49.88	557.53	536.90	20.63	27.022		
4,700.00	4,690.09	4,667.53	4,659.16	11.65	10.95	-159.98	-311.41	48.43	569.49	548.39	21.10	26.986		
4,800.00	4,789.85	4,766.79	4,758.18	11.90	11.21	-159.78	-318.18	46.98	581.46	559.89	21.57	26.951		
4,900.00	4,889.61	4,866.05	4,857.20	12.16	11.47	-159.59	-324.95	45.52	593.44	571.39	22.05	26.918		
5,000.00	4,989.36	4,965.31	4,956.22	12.42	11.73	-159.41	-331.72	44.07	605.42	582.91	22.52	26.886		
5,100.00	5,089.12	5,064.58	5,055.24	12.68	11.99	-159.24	-338.49	42.62	617.41	594.42	22.99	26.856		

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 #12F-0101A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor #12F-0101A	<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 Federal #12F-1304B - 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	5,188.88	5,163.84	5,154.26	12.94	12.25	-159.07	-345.26	41.17	629.41	605.95	23.46	26.827		
5,300.00	5,288.63	5,263.10	5,253.28	13.20	12.51	-158.91	-352.03	39.72	641.41	617.47	23.93	26.799 SF		
5,400.00	5,387.98	5,361.82	5,351.77	13.49	12.77	-158.43	-358.76	38.28	656.82	632.68	24.13	27.215		

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor #12F-0101A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor #12F-0101A	<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-1305A - 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							
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	119.53	-74.88	132.17	151.91				
100.00	100.00	99.99	99.99	0.09	0.09	119.53	-74.88	132.17	151.91	151.72	0.19	812.329	
200.00	200.00	199.99	199.99	0.32	0.32	119.53	-74.88	132.17	151.91	151.28	0.64	238.657	
300.00	300.00	299.99	299.99	0.54	0.54	119.53	-74.88	132.17	151.91	150.83	1.09	139.874	
400.00	400.00	399.99	399.99	0.77	0.77	119.53	-74.88	132.17	151.91	150.38	1.54	98.927	
500.00	500.00	499.99	499.99	0.99	0.99	119.53	-74.88	132.17	151.91	149.93	1.99	76.525 CC, ES	
600.00	599.98	599.97	599.97	1.21	1.22	166.42	-74.88	132.17	153.61	151.17	2.43	63.145	
700.00	699.84	699.83	699.83	1.44	1.44	166.84	-74.88	132.17	158.70	155.82	2.88	55.127	
800.00	799.59	799.58	799.58	1.67	1.67	167.39	-74.88	132.17	165.50	162.18	3.32	49.814	
900.00	899.35	899.34	899.34	1.91	1.89	167.90	-74.88	132.17	172.32	168.55	3.77	45.724	
1,000.00	999.11	995.48	995.46	2.16	2.08	168.75	-76.47	132.32	180.14	175.96	4.18	43.068	
1,100.00	1,098.86	1,091.04	1,090.90	2.41	2.25	170.30	-81.22	132.76	190.08	185.50	4.58	41.492	
1,200.00	1,198.62	1,189.81	1,189.43	2.66	2.44	172.17	-88.07	133.39	201.42	196.42	4.99	40.332	
1,300.00	1,298.38	1,288.96	1,288.34	2.91	2.64	173.84	-94.96	134.02	212.96	207.54	5.42	39.327	
1,400.00	1,398.13	1,388.11	1,387.25	3.16	2.85	175.34	-101.84	134.65	224.66	218.81	5.84	38.444	
1,500.00	1,497.89	1,487.26	1,486.15	3.41	3.07	176.70	-108.73	135.28	236.50	230.22	6.28	37.667	
1,600.00	1,597.65	1,586.41	1,585.06	3.67	3.29	177.92	-115.62	135.92	248.46	241.74	6.72	36.981	
1,700.00	1,697.40	1,685.56	1,683.97	3.92	3.53	179.03	-122.51	136.55	260.51	253.35	7.16	36.375	
1,800.00	1,797.16	1,784.71	1,782.88	4.18	3.76	-179.95	-129.39	137.18	272.66	265.05	7.61	35.836	
1,900.00	1,896.91	1,883.85	1,881.78	4.43	4.00	-179.03	-136.28	137.82	284.89	276.83	8.06	35.356	
2,000.00	1,996.67	1,983.00	1,980.69	4.69	4.24	-178.18	-143.17	138.45	297.18	288.67	8.51	34.927	
2,100.00	2,096.43	2,082.15	2,079.60	4.94	4.48	-177.39	-150.05	139.08	309.53	300.57	8.96	34.541	
2,200.00	2,196.18	2,181.30	2,178.51	5.20	4.73	-176.67	-156.94	139.71	321.93	312.52	9.42	34.192	
2,300.00	2,295.94	2,280.45	2,277.41	5.46	4.98	-176.00	-163.83	140.35	334.39	324.51	9.87	33.876	
2,400.00	2,395.70	2,379.60	2,376.32	5.71	5.23	-175.38	-170.72	140.98	346.88	336.55	10.33	33.588	
2,500.00	2,495.45	2,478.75	2,475.23	5.97	5.48	-174.80	-177.60	141.61	359.41	348.62	10.78	33.326	
2,600.00	2,595.21	2,577.90	2,574.13	6.23	5.73	-174.27	-184.49	142.25	371.97	360.73	11.24	33.086	
2,700.00	2,694.97	2,677.05	2,673.04	6.49	5.98	-173.76	-191.38	142.88	384.57	372.86	11.70	32.865	
2,800.00	2,794.72	2,776.19	2,771.95	6.74	6.23	-173.29	-198.27	143.51	397.19	385.03	12.16	32.661	
2,900.00	2,894.48	2,875.34	2,870.86	7.00	6.49	-172.85	-205.15	144.14	409.83	397.21	12.62	32.473	
3,000.00	2,994.23	2,974.49	2,969.76	7.26	6.74	-172.43	-212.04	144.78	422.50	409.42	13.08	32.299	
3,100.00	3,093.99	3,073.64	3,068.67	7.52	7.00	-172.04	-218.93	145.41	435.19	421.65	13.54	32.137	
3,200.00	3,193.75	3,172.79	3,167.58	7.77	7.25	-171.67	-225.81	146.04	447.90	433.90	14.00	31.986	
3,300.00	3,293.50	3,271.94	3,266.49	8.03	7.51	-171.32	-232.70	146.68	460.63	446.16	14.46	31.845	
3,400.00	3,393.26	3,371.09	3,365.39	8.29	7.76	-170.99	-239.59	147.31	473.37	458.44	14.93	31.714	
3,500.00	3,493.02	3,470.24	3,464.30	8.55	8.02	-170.68	-246.48	147.94	486.12	470.74	15.39	31.591	
3,600.00	3,592.77	3,569.39	3,563.21	8.81	8.28	-170.38	-253.36	148.58	498.89	483.04	15.85	31.475	
3,700.00	3,692.53	3,668.54	3,662.12	9.06	8.54	-170.10	-260.25	149.21	511.68	495.36	16.31	31.366	
3,800.00	3,792.29	3,767.68	3,761.02	9.32	8.79	-169.83	-267.14	149.84	524.47	507.69	16.78	31.263	
3,900.00	3,892.04	3,866.83	3,859.93	9.58	9.05	-169.57	-274.02	150.47	537.28	520.04	17.24	31.167	
4,000.00	3,991.80	3,965.98	3,958.84	9.84	9.31	-169.33	-280.91	151.11	550.09	532.39	17.70	31.075	
4,100.00	4,091.56	4,065.13	4,057.75	10.10	9.57	-169.10	-287.80	151.74	562.91	544.75	18.17	30.989	
4,200.00	4,191.31	4,164.28	4,156.65	10.35	9.83	-168.87	-294.69	152.37	575.75	557.12	18.63	30.906	
4,300.00	4,291.07	4,263.43	4,255.56	10.61	10.09	-168.66	-301.57	153.01	588.59	569.50	19.09	30.829	
4,400.00	4,390.82	4,362.58	4,354.47	10.87	10.35	-168.46	-308.46	153.64	601.44	581.88	19.56	30.755	
4,500.00	4,490.58	4,461.73	4,453.37	11.13	10.61	-168.26	-315.35	154.27	614.29	594.27	20.02	30.684	
4,600.00	4,590.34	4,560.88	4,552.28	11.39	10.87	-168.08	-322.24	154.90	627.16	606.67	20.48	30.617	
4,700.00	4,690.09	4,660.02	4,651.19	11.65	11.13	-167.90	-329.12	155.54	640.03	619.08	20.95	30.553	
4,800.00	4,789.85	4,759.17	4,750.10	11.90	11.39	-167.72	-336.01	156.17	652.90	631.49	21.41	30.492	
4,900.00	4,889.61	4,858.32	4,849.00	12.16	11.65	-167.56	-342.90	156.80	665.78	643.91	21.88	30.434	
5,000.00	4,989.36	4,957.47	4,947.91	12.42	11.91	-167.40	-349.78	157.44	678.67	656.33	22.34	30.378 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 #12F-0101A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor #12F-0101A	<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							
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	114.49	-74.90	164.45	180.70	180.52	0.19	966.305	
100.00	100.00	100.00	100.00	0.09	0.09	114.49	-74.90	164.45	180.70	180.07	0.64	283.887	
200.00	200.00	200.00	200.00	0.32	0.32	114.49	-74.90	164.45	180.70	179.62	1.09	166.384	
300.00	300.00	300.00	300.00	0.54	0.54	114.49	-74.90	164.45	180.70	179.17	1.54	117.677	
400.00	400.00	400.00	400.00	0.77	0.77	114.49	-74.90	164.45	180.70	178.72	1.99	91.029 CC, ES	
500.00	500.00	500.00	500.00	0.99	0.99	114.49	-74.90	164.45	180.70	178.72	1.99	91.029 CC, ES	
600.00	599.98	599.98	599.98	1.21	1.22	161.39	-74.90	164.45	182.36	179.93	2.43	74.969	
700.00	699.84	699.84	699.84	1.44	1.44	161.87	-74.90	164.45	187.33	184.45	2.88	65.080	
800.00	799.59	799.59	799.59	1.67	1.67	162.52	-74.90	164.45	193.97	190.65	3.32	58.384	
900.00	899.35	899.35	899.35	1.91	1.89	163.11	-74.90	164.45	200.63	196.87	3.77	53.235	
1,000.00	999.11	999.11	999.11	2.16	2.11	163.67	-74.90	164.45	207.32	203.10	4.22	49.161	
1,100.00	1,098.86	1,093.72	1,093.70	2.41	2.30	164.45	-76.35	164.96	215.21	210.58	4.63	46.475	
1,200.00	1,198.62	1,187.69	1,187.56	2.66	2.47	165.70	-80.70	166.49	225.58	220.55	5.03	44.865	
1,300.00	1,298.38	1,286.05	1,285.67	2.91	2.66	167.22	-87.15	168.76	237.61	232.17	5.44	43.688	
1,400.00	1,398.13	1,385.13	1,384.51	3.16	2.86	168.60	-93.67	171.06	249.81	243.95	5.86	42.657	
1,500.00	1,497.89	1,484.21	1,483.35	3.41	3.06	169.85	-100.19	173.35	262.14	255.85	6.28	41.740	
1,600.00	1,597.65	1,583.29	1,582.19	3.67	3.28	170.99	-106.71	175.65	274.58	267.87	6.71	40.922	
1,700.00	1,697.40	1,682.37	1,681.03	3.92	3.50	172.03	-113.22	177.94	287.12	279.97	7.14	40.191	
1,800.00	1,797.16	1,781.45	1,779.87	4.18	3.73	172.98	-119.74	180.24	299.74	292.16	7.58	39.536	
1,900.00	1,896.91	1,880.53	1,878.71	4.43	3.96	173.86	-126.26	182.54	312.44	304.42	8.02	38.947	
2,000.00	1,996.67	1,979.62	1,977.55	4.69	4.20	174.67	-132.78	184.83	325.21	316.75	8.46	38.418	
2,100.00	2,096.43	2,078.70	2,076.39	4.94	4.44	175.42	-139.30	187.13	338.04	329.13	8.91	37.940	
2,200.00	2,196.18	2,177.78	2,175.23	5.20	4.68	176.11	-145.82	189.42	350.92	341.56	9.36	37.505	
2,300.00	2,295.94	2,276.86	2,274.07	5.46	4.92	176.75	-152.34	191.72	363.84	354.04	9.80	37.110	
2,400.00	2,395.70	2,375.94	2,372.91	5.71	5.17	177.35	-158.86	194.01	376.81	366.56	10.25	36.748	
2,500.00	2,495.45	2,475.02	2,471.75	5.97	5.42	177.91	-165.38	196.31	389.81	379.11	10.70	36.417	
2,600.00	2,595.21	2,574.10	2,570.59	6.23	5.66	178.43	-171.90	198.61	402.85	391.70	11.16	36.113	
2,700.00	2,694.97	2,673.18	2,669.43	6.49	5.91	178.92	-178.42	200.90	415.93	404.32	11.61	35.833	
2,800.00	2,794.72	2,772.26	2,768.27	6.74	6.17	179.38	-184.93	203.20	429.02	416.96	12.06	35.574	
2,900.00	2,894.48	2,871.35	2,867.11	7.00	6.42	179.82	-191.45	205.49	442.15	429.64	12.51	35.334	
3,000.00	2,994.23	2,970.43	2,965.95	7.26	6.67	-179.77	-197.97	207.79	455.30	442.33	12.97	35.111	
3,100.00	3,093.99	3,069.51	3,064.79	7.52	6.92	-179.39	-204.49	210.09	468.47	455.04	13.42	34.903	
3,200.00	3,193.75	3,168.59	3,163.63	7.77	7.18	-179.03	-211.01	212.38	481.66	467.78	13.88	34.710	
3,300.00	3,293.50	3,267.67	3,262.47	8.03	7.43	-178.68	-217.53	214.68	494.86	480.53	14.33	34.529	
3,400.00	3,393.26	3,366.75	3,361.31	8.29	7.69	-178.35	-224.05	216.97	508.09	493.30	14.79	34.359	
3,500.00	3,493.02	3,465.83	3,460.15	8.55	7.94	-178.04	-230.57	219.27	521.33	506.08	15.24	34.200	
3,600.00	3,592.77	3,564.91	3,558.99	8.81	8.20	-177.75	-237.09	221.56	534.58	518.88	15.70	34.050	
3,700.00	3,692.53	3,663.99	3,657.83	9.06	8.45	-177.47	-243.61	223.86	547.85	531.69	16.16	33.909	
3,800.00	3,792.29	3,763.08	3,756.67	9.32	8.71	-177.20	-250.13	226.16	561.13	544.51	16.61	33.776	
3,900.00	3,892.04	3,862.16	3,855.51	9.58	8.97	-176.94	-256.65	228.45	574.42	557.35	17.07	33.650	
4,000.00	3,991.80	3,961.24	3,954.35	9.84	9.22	-176.70	-263.16	230.75	587.72	570.19	17.53	33.531	
4,100.00	4,091.56	4,060.32	4,053.19	10.10	9.48	-176.47	-269.68	233.04	601.03	583.05	17.98	33.419	
4,200.00	4,191.31	4,159.40	4,152.03	10.35	9.74	-176.25	-276.20	235.34	614.35	595.91	18.44	33.312	
4,300.00	4,291.07	4,258.48	4,250.87	10.61	10.00	-176.03	-282.72	237.63	627.68	608.78	18.90	33.210	
4,400.00	4,390.82	4,357.56	4,349.71	10.87	10.26	-175.83	-289.24	239.93	641.02	621.66	19.36	33.114	
4,500.00	4,490.58	4,456.64	4,448.55	11.13	10.51	-175.63	-295.76	242.23	654.36	634.55	19.82	33.021	
4,600.00	4,590.34	4,555.73	4,547.39	11.39	10.77	-175.44	-302.28	244.52	667.72	647.44	20.27	32.934	
4,700.00	4,690.09	4,654.81	4,646.23	11.65	11.03	-175.26	-308.80	246.82	681.08	660.34	20.73	32.850 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 #12F-0101A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor #12F-0101A	<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 #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		
0.00	0.00	0.00	0.00	0.00	0.00	110.76	-74.88	197.49	211.21					
100.00	100.00	99.99	99.99	0.09	0.09	110.76	-74.88	197.49	211.21	211.02	0.19	1,129.430		
200.00	200.00	199.99	199.99	0.32	0.32	110.76	-74.88	197.49	211.21	210.58	0.64	331.819		
300.00	300.00	299.99	299.99	0.54	0.54	110.76	-74.88	197.49	211.21	210.13	1.09	194.475		
400.00	400.00	399.99	399.99	0.77	0.77	110.76	-74.88	197.49	211.21	209.68	1.54	137.544	CC, ES	
500.00	500.00	494.57	494.55	0.99	0.96	111.03	-76.23	198.27	212.49	210.54	1.95	108.908		
600.00	599.98	588.82	588.68	1.21	1.14	158.67	-80.28	200.58	217.97	215.61	2.36	92.275		
700.00	699.84	687.41	687.04	1.44	1.35	160.14	-86.23	203.99	228.38	225.58	2.80	81.667		
800.00	799.59	786.46	785.85	1.67	1.58	161.70	-92.22	207.42	240.61	237.38	3.23	74.571		
900.00	899.35	885.51	884.65	1.91	1.82	163.10	-98.22	210.86	253.00	249.33	3.67	69.030		
1,000.00	999.11	984.56	983.46	2.16	2.06	164.37	-104.21	214.29	265.52	261.41	4.11	64.618		
1,100.00	1,098.86	1,083.61	1,082.27	2.41	2.31	165.53	-110.21	217.73	278.16	273.60	4.56	61.045		
1,200.00	1,198.62	1,182.65	1,181.07	2.66	2.56	166.58	-116.21	221.16	290.90	285.90	5.01	58.105		
1,300.00	1,298.38	1,281.70	1,279.88	2.91	2.81	167.55	-122.20	224.59	303.73	298.28	5.46	55.649		
1,400.00	1,398.13	1,380.75	1,378.69	3.16	3.07	168.44	-128.20	228.03	316.65	310.73	5.91	53.570		
1,500.00	1,497.89	1,479.80	1,477.49	3.41	3.32	169.26	-134.19	231.46	329.63	323.26	6.36	51.792		
1,600.00	1,597.65	1,578.85	1,576.30	3.67	3.58	170.02	-140.19	234.90	342.67	335.85	6.82	50.255		
1,700.00	1,697.40	1,677.89	1,675.11	3.92	3.84	170.72	-146.18	238.33	355.76	348.49	7.27	48.915		
1,800.00	1,797.16	1,776.94	1,773.91	4.18	4.09	171.37	-152.18	241.76	368.91	361.18	7.73	47.736		
1,900.00	1,896.91	1,875.99	1,872.72	4.43	4.35	171.98	-158.17	245.20	382.09	373.91	8.18	46.692		
2,000.00	1,996.67	1,975.04	1,971.53	4.69	4.61	172.55	-164.17	248.63	395.32	386.68	8.64	45.761		
2,100.00	2,096.43	2,074.09	2,070.33	4.94	4.87	173.08	-170.17	252.06	408.59	399.49	9.09	44.927		
2,200.00	2,196.18	2,173.13	2,169.14	5.20	5.13	173.57	-176.16	255.50	421.88	412.33	9.55	44.174		
2,300.00	2,295.94	2,272.18	2,267.95	5.46	5.39	174.04	-182.16	258.93	435.21	425.20	10.01	43.493		
2,400.00	2,395.70	2,371.23	2,366.75	5.71	5.65	174.48	-188.15	262.37	448.56	438.10	10.46	42.873		
2,500.00	2,495.45	2,470.28	2,465.56	5.97	5.91	174.89	-194.15	265.80	461.93	451.01	10.92	42.306		
2,600.00	2,595.21	2,569.33	2,564.37	6.23	6.17	175.28	-200.14	269.23	475.33	463.96	11.38	41.787		
2,700.00	2,694.97	2,668.37	2,663.17	6.49	6.43	175.65	-206.14	272.67	488.75	476.92	11.83	41.309		
2,800.00	2,794.72	2,767.42	2,761.98	6.74	6.69	176.00	-212.13	276.10	502.19	489.90	12.29	40.868		
2,900.00	2,894.48	2,866.47	2,860.79	7.00	6.95	176.33	-218.13	279.53	515.64	502.90	12.74	40.459		
3,000.00	2,994.23	2,965.52	2,959.59	7.26	7.21	176.64	-224.13	282.97	529.11	515.91	13.20	40.080		
3,100.00	3,093.99	3,064.56	3,058.40	7.52	7.47	176.94	-230.12	286.40	542.60	528.94	13.66	39.727		
3,200.00	3,193.75	3,163.61	3,157.21	7.77	7.73	177.23	-236.12	289.84	556.10	541.98	14.11	39.398		
3,300.00	3,293.50	3,262.66	3,256.01	8.03	8.00	177.50	-242.11	293.27	569.61	555.04	14.57	39.090		
3,400.00	3,393.26	3,361.71	3,354.82	8.29	8.26	177.75	-248.11	296.70	583.13	568.11	15.03	38.801		
3,500.00	3,493.02	3,460.76	3,453.63	8.55	8.52	178.00	-254.10	300.14	596.67	581.18	15.49	38.530		
3,600.00	3,592.77	3,559.80	3,552.43	8.81	8.78	178.23	-260.10	303.57	610.22	594.27	15.94	38.276		
3,700.00	3,692.53	3,658.85	3,651.24	9.06	9.04	178.46	-266.09	307.00	623.77	607.37	16.40	38.035		
3,800.00	3,792.29	3,757.90	3,750.05	9.32	9.30	178.68	-272.09	310.44	637.33	620.48	16.86	37.808		
3,900.00	3,892.04	3,856.95	3,848.85	9.58	9.56	178.88	-278.09	313.87	650.91	633.59	17.31	37.594		
4,000.00	3,991.80	3,956.00	3,947.66	9.84	9.82	179.08	-284.08	317.31	664.49	646.72	17.77	37.391		
4,100.00	4,091.56	4,055.04	4,046.47	10.10	10.09	179.27	-290.08	320.74	678.08	659.85	18.23	37.199	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 #12F-0101A
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Reference Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	WELL @ 4953.60usft (Original Well Elev)
<b>Site Error:</b>	0.00usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Razor #12F-0101A	<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-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	0.00	0.00	0.00	0.00	108.00	-74.91	230.54	242.40					
100.00	100.00	100.00	100.00	0.09	0.09	108.00	-74.91	230.54	242.40	242.21	0.19	1,296.226		
200.00	200.00	200.00	200.00	0.32	0.32	108.00	-74.91	230.54	242.40	241.77	0.64	380.813		
300.00	300.00	300.00	300.00	0.54	0.54	108.00	-74.91	230.54	242.40	241.32	1.09	223.192		
400.00	400.00	400.00	400.00	0.77	0.77	108.00	-74.91	230.54	242.40	240.87	1.54	157.855		
500.00	500.00	500.00	500.00	0.99	0.99	108.00	-74.91	230.54	242.40	240.42	1.99	122.109	CC, ES	
600.00	599.98	599.98	599.98	1.21	1.22	154.90	-74.91	230.54	243.98	241.55	2.43	100.314		
700.00	699.84	699.84	699.84	1.44	1.44	155.37	-74.91	230.54	248.73	245.85	2.88	86.427		
800.00	799.59	799.59	799.59	1.67	1.67	156.03	-74.91	230.54	255.09	251.77	3.32	76.777		
900.00	899.35	899.35	899.35	1.91	1.89	156.65	-74.91	230.54	261.48	257.71	3.77	69.359		
1,000.00	999.11	991.62	991.61	2.16	2.08	157.35	-76.04	231.48	269.28	265.10	4.18	64.393		
1,100.00	1,098.86	1,083.24	1,083.12	2.41	2.25	158.30	-79.41	234.29	279.93	275.35	4.58	61.095		
1,200.00	1,198.62	1,180.83	1,180.48	2.66	2.44	159.44	-84.59	238.63	292.54	287.54	5.00	58.542		
1,300.00	1,298.38	1,279.86	1,279.26	2.91	2.65	160.49	-89.90	243.06	305.30	299.89	5.42	56.354		
1,400.00	1,398.13	1,378.90	1,378.05	3.16	2.86	161.47	-95.20	247.48	318.16	312.32	5.84	54.445		
1,500.00	1,497.89	1,477.93	1,476.84	3.41	3.08	162.37	-100.50	251.91	331.10	324.83	6.27	52.768		
1,600.00	1,597.65	1,576.96	1,575.63	3.67	3.31	163.20	-105.80	256.34	344.12	337.41	6.71	51.288		
1,700.00	1,697.40	1,675.99	1,674.42	3.92	3.55	163.97	-111.10	260.77	357.20	350.05	7.15	49.978		
1,800.00	1,797.16	1,775.02	1,773.21	4.18	3.78	164.68	-116.40	265.20	370.34	362.75	7.59	48.808		
1,900.00	1,896.91	1,874.05	1,872.00	4.43	4.02	165.35	-121.70	269.63	383.53	375.50	8.03	47.764		
2,000.00	1,996.67	1,973.08	1,970.79	4.69	4.26	165.97	-127.00	274.06	396.78	388.30	8.47	46.825		
2,100.00	2,096.43	2,072.11	2,069.58	4.94	4.51	166.55	-132.30	278.49	410.06	401.14	8.92	45.978		
2,200.00	2,196.18	2,171.14	2,168.37	5.20	4.76	167.10	-137.60	282.92	423.38	414.02	9.36	45.210		
2,300.00	2,295.94	2,270.17	2,267.15	5.46	5.00	167.61	-142.91	287.35	436.74	426.93	9.81	44.511		
2,400.00	2,395.70	2,369.20	2,365.94	5.71	5.25	168.09	-148.21	291.78	450.13	439.87	10.26	43.873		
2,500.00	2,495.45	2,468.23	2,464.73	5.97	5.50	168.55	-153.51	296.21	463.55	452.85	10.71	43.287		
2,600.00	2,595.21	2,567.26	2,563.52	6.23	5.75	168.98	-158.81	300.64	477.00	465.84	11.16	42.749		
2,700.00	2,694.97	2,666.29	2,662.31	6.49	6.01	169.38	-164.11	305.07	490.47	478.87	11.61	42.253		
2,800.00	2,794.72	2,765.32	2,761.10	6.74	6.26	169.77	-169.41	309.50	503.97	491.91	12.06	41.794		
2,900.00	2,894.48	2,864.35	2,859.89	7.00	6.51	170.13	-174.71	313.92	517.49	504.98	12.51	41.369		
3,000.00	2,994.23	2,963.38	2,958.68	7.26	6.77	170.47	-180.01	318.35	531.02	518.06	12.96	40.973		
3,100.00	3,093.99	3,062.41	3,057.47	7.52	7.02	170.80	-185.31	322.78	544.58	531.16	13.41	40.605		
3,200.00	3,193.75	3,161.44	3,156.26	7.77	7.28	171.11	-190.62	327.21	558.15	544.28	13.86	40.260		
3,300.00	3,293.50	3,260.47	3,255.05	8.03	7.53	171.41	-195.92	331.64	571.73	557.42	14.32	39.938		
3,400.00	3,393.26	3,359.50	3,353.83	8.29	7.79	171.69	-201.22	336.07	585.33	570.56	14.77	39.636		
3,500.00	3,493.02	3,458.53	3,452.62	8.55	8.05	171.96	-206.52	340.50	598.95	583.72	15.22	39.352		
3,600.00	3,592.77	3,557.56	3,551.41	8.81	8.30	172.22	-211.82	344.93	612.57	596.90	15.67	39.084		
3,700.00	3,692.53	3,656.59	3,650.20	9.06	8.56	172.47	-217.12	349.36	626.21	610.08	16.13	38.832		
3,800.00	3,792.29	3,755.62	3,748.99	9.32	8.82	172.71	-222.42	353.79	639.86	623.28	16.58	38.594		
3,900.00	3,892.04	3,854.65	3,847.78	9.58	9.08	172.93	-227.72	358.22	653.52	636.48	17.03	38.369		
4,000.00	3,991.80	3,953.68	3,946.57	9.84	9.33	173.15	-233.02	362.65	667.19	649.70	17.49	38.156		
4,100.00	4,091.56	4,052.71	4,045.36	10.10	9.59	173.36	-238.33	367.08	680.86	662.92	17.94	37.954	SF	

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

# Cathedral Energy Services

## Anticollision Report

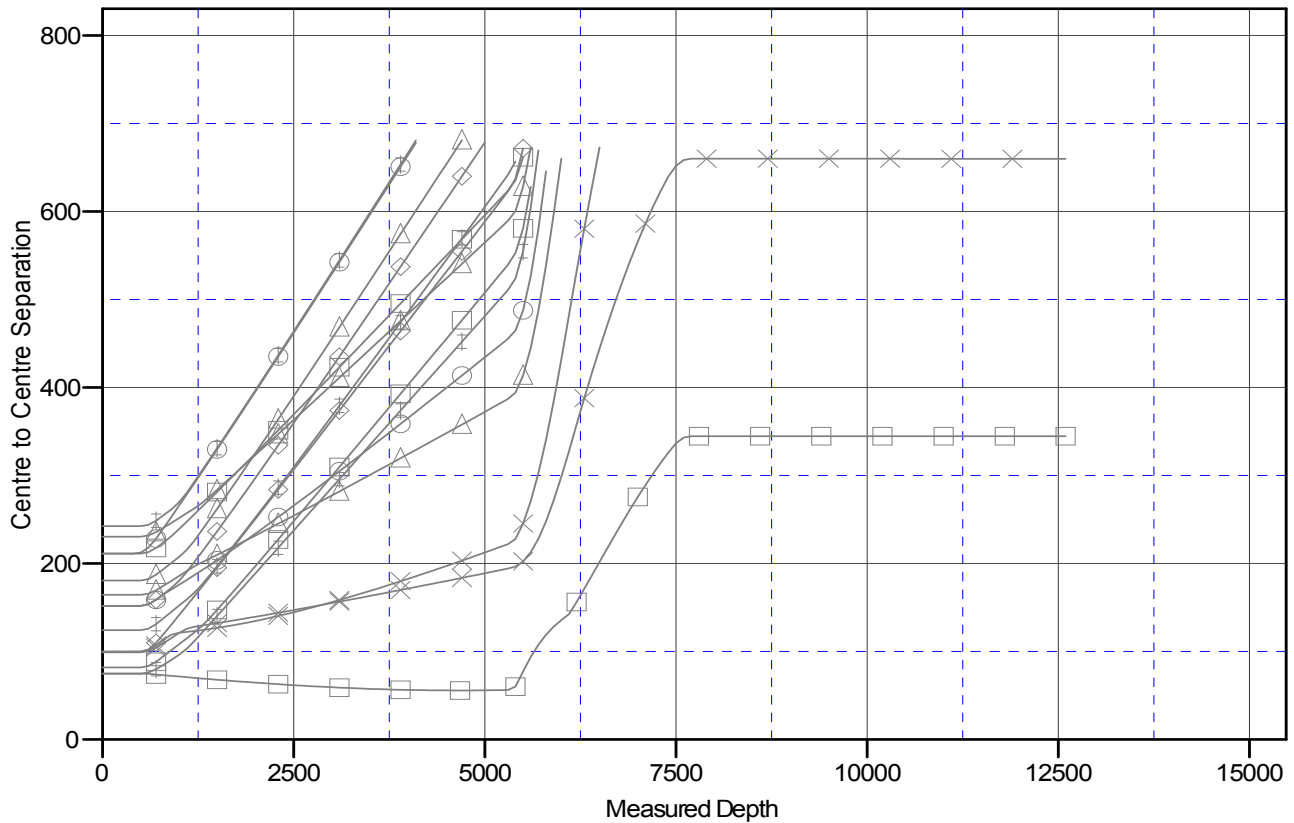
**Company:** Whiting Petroleum Corporation  
**Project:** Weld County, CO  
**Reference Site:** S12-T10N-R58W  
**Site Error:** 0.00usft  
**Reference Well:** Razor #12F-0101A  
**Well Error:** 0.00usft  
**Reference Wellbore:** HZ  
**Reference Design:** Plan #3

**Local Co-ordinate Reference:** Well Razor #12F-0101A  
**TVD Reference:** WELL @ 4953.60usft (Original Well Elev)  
**MD Reference:** WELL @ 4953.60usft (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 @ 4953.60usft (Original Well E  
 Offset Depths are relative to Offset Datum  
 Central Meridian is 105° 30' 0.000 W °

Coordinates are relative to: Razor #12F-0101A  
 Coordinate System is US State Plane 1983, Colorado Northern Zone  
 Grid Convergence at Surface is: 1.09°

### Ladder Plot



### LEGEND

- Razor#12F-0102B, HZ, Plan #2 V0
- Razor#12F-0103A, HZ, Plan #2 V0
- Razor#12F-0104B, HZ, Plan #2 V0
- Razor#12F-0105A, HZ, Plan #2 V0
- Razor#12F-0106B, HZ, Plan #2 V0
- Razor#12F-0107A, HZ, Plan #2 V0
- Razor#12F-0108B, HZ, Plan #2 V0
- Razor Federal#12F-1301A, HZ, Plan #3 V0
- Razor Federal#12F-1302B, HZ, Plan #2 V0
- Razor Federal#12F-1303A, HZ, Plan #3 V0
- Razor Federal#12F-1304B, HZ, Plan #2 V0
- Razor Federal#12F-1305A, HZ, Plan #3 V0
- Razor Federal#12F-1306B, HZ, Plan #2 V0
- Razor Federal#12F-1307A, HZ, Plan #3 V0
- Razor Federal#12F-1308B, HZ, Plan #2 V0