

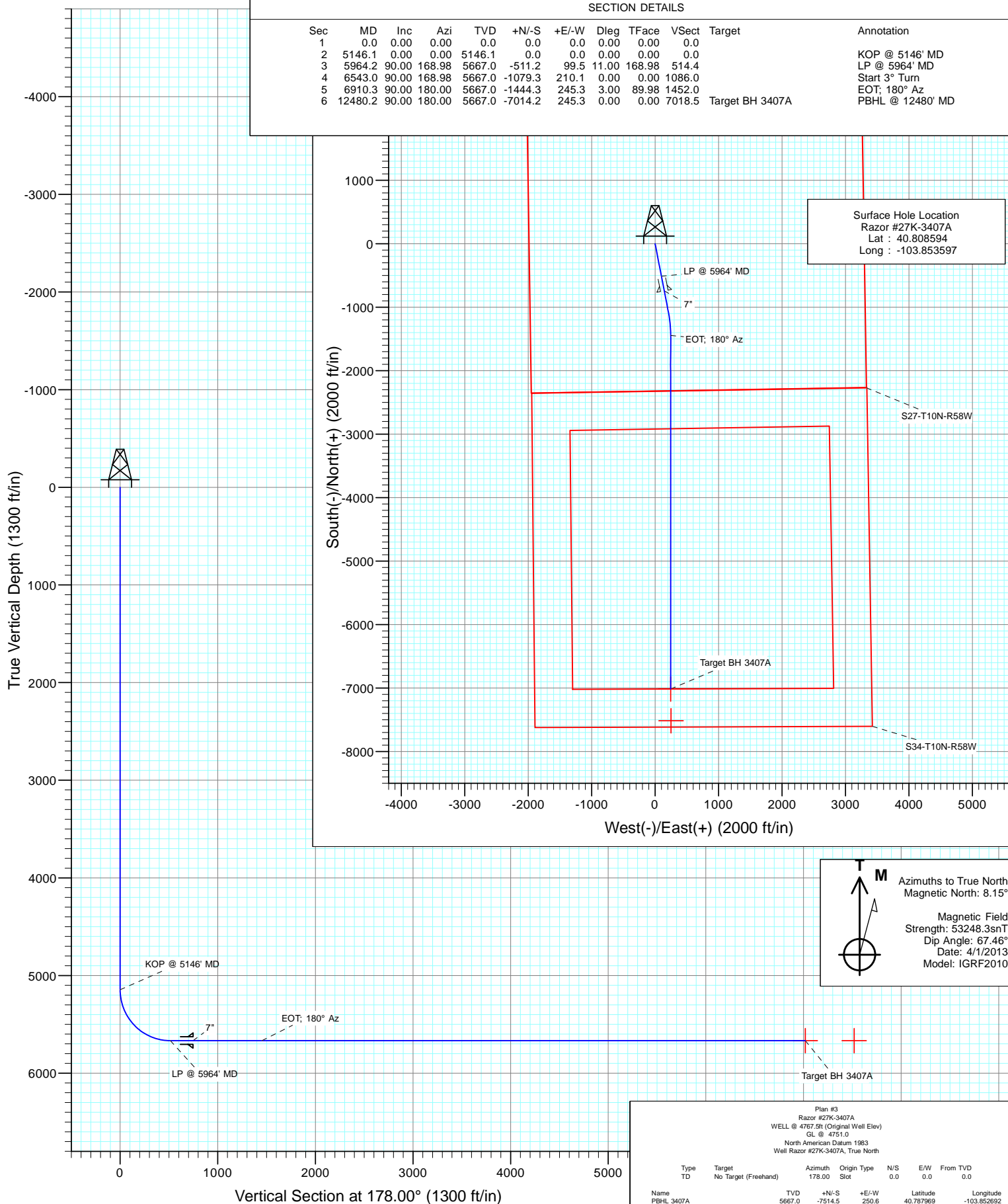


Project: Weld County, CO
Site: S27-T10N-R58W
Well: Razor #27K-3407A
Wellbore: HZ
Design: Plan #3



SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Target	Annotation
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0		KOP @ 5146' MD
2	5146.1	0.00	0.00	5146.1	0.0	0.0	0.00	0.00	0.0		LP @ 5964' MD
3	5964.2	90.00	168.98	5667.0	-511.2	99.5	11.00	168.98	514.4		Start 3° Turn
4	6543.0	90.00	168.98	5667.0	-1079.3	210.1	0.00	0.00	1086.0		EOT: 180° Az
5	6910.3	90.00	180.00	5667.0	-1444.3	245.3	3.00	89.98	1452.0		PBHL @ 12480' MD
6	12480.2	90.00	180.00	5667.0	-7014.2	245.3	0.00	0.00	7018.5	Target BH 3407A	PBHL @ 12480' MD



Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Razor #27K-3407A
Company:	Whiting Petroleum Corporation	TVD Reference:	WELL @ 4767.5ft (Original Well Elev)
Project:	Weld County, CO	MD Reference:	WELL @ 4767.5ft (Original Well Elev)
Site:	S27-T10N-R58W	North Reference:	True
Well:	Razor #27K-3407A	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #3		

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

Site		S27-T10N-R58W			
Site Position:		Northing:	1,541,650.73 ft	Latitude:	40.808594
From:	Lat/Long	Easting:	3,455,691.89 ft	Longitude:	-103.853833
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	1.06 °

Well	Razor #27K-3407A					
Well Position	+N/-S	0.0 ft	Northing:	1,541,651.93 ft	Latitude:	40.808594
	+E/-W	0.0 ft	Easting:	3,455,757.21 ft	Longitude:	-103.853597
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,751.0 ft

Wellbore	HZ				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	4/1/2013	8.15	67.46	53,248

Design	Plan #3				
Audit Notes:					
Version:	Phase:	PLAN	Tie On Depth:	0.0	
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.0	0.0	0.0	178.00	

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
5,146.1	0.00	0.00	5,146.1	0.0	0.0	0.00	0.00	0.00	0.00	
5,964.2	90.00	168.98	5,667.0	-511.2	99.5	11.00	11.00	0.00	168.98	
6,543.0	90.00	168.98	5,667.0	-1,079.3	210.1	0.00	0.00	0.00	0.00	
6,910.3	90.00	180.00	5,667.0	-1,444.3	245.3	3.00	0.00	3.00	89.98	
12,480.2	90.00	180.00	5,667.0	-7,014.2	245.3	0.00	0.00	0.00	0.00	Target BH 3407A

Cathedral Energy Services

Planning Report

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Company:	Whiting Petroleum Corporation	TVD Reference:	WELL @ 4767.5ft (Original Well Elev)
Project:	Weld County, CO	MD Reference:	WELL @ 4767.5ft (Original Well Elev)
Site:	S27-T10N-R58W	North Reference:	True
Well:	Razor #27K-3407A	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #3		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	
2,300.0	0.00	0.00	2,300.0	0.0	0.0	0.0	0.00	0.00	
2,400.0	0.00	0.00	2,400.0	0.0	0.0	0.0	0.00	0.00	
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.0	0.00	0.00	
2,600.0	0.00	0.00	2,600.0	0.0	0.0	0.0	0.00	0.00	
2,700.0	0.00	0.00	2,700.0	0.0	0.0	0.0	0.00	0.00	
2,800.0	0.00	0.00	2,800.0	0.0	0.0	0.0	0.00	0.00	
2,900.0	0.00	0.00	2,900.0	0.0	0.0	0.0	0.00	0.00	
3,000.0	0.00	0.00	3,000.0	0.0	0.0	0.0	0.00	0.00	
3,100.0	0.00	0.00	3,100.0	0.0	0.0	0.0	0.00	0.00	
3,200.0	0.00	0.00	3,200.0	0.0	0.0	0.0	0.00	0.00	
3,300.0	0.00	0.00	3,300.0	0.0	0.0	0.0	0.00	0.00	
3,400.0	0.00	0.00	3,400.0	0.0	0.0	0.0	0.00	0.00	
3,500.0	0.00	0.00	3,500.0	0.0	0.0	0.0	0.00	0.00	
3,600.0	0.00	0.00	3,600.0	0.0	0.0	0.0	0.00	0.00	
3,700.0	0.00	0.00	3,700.0	0.0	0.0	0.0	0.00	0.00	
3,800.0	0.00	0.00	3,800.0	0.0	0.0	0.0	0.00	0.00	
3,900.0	0.00	0.00	3,900.0	0.0	0.0	0.0	0.00	0.00	
4,000.0	0.00	0.00	4,000.0	0.0	0.0	0.0	0.00	0.00	
4,100.0	0.00	0.00	4,100.0	0.0	0.0	0.0	0.00	0.00	
4,200.0	0.00	0.00	4,200.0	0.0	0.0	0.0	0.00	0.00	
4,300.0	0.00	0.00	4,300.0	0.0	0.0	0.0	0.00	0.00	
4,400.0	0.00	0.00	4,400.0	0.0	0.0	0.0	0.00	0.00	
4,500.0	0.00	0.00	4,500.0	0.0	0.0	0.0	0.00	0.00	
4,600.0	0.00	0.00	4,600.0	0.0	0.0	0.0	0.00	0.00	
4,700.0	0.00	0.00	4,700.0	0.0	0.0	0.0	0.00	0.00	
4,800.0	0.00	0.00	4,800.0	0.0	0.0	0.0	0.00	0.00	
4,900.0	0.00	0.00	4,900.0	0.0	0.0	0.0	0.00	0.00	
5,000.0	0.00	0.00	5,000.0	0.0	0.0	0.0	0.00	0.00	
5,100.0	0.00	0.00	5,100.0	0.0	0.0	0.0	0.00	0.00	

Cathedral Energy Services

Planning Report

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Project:	Weld County, CO	MD Reference:	WELL @ 4767.5ft (Original Well Elev)
Site:	S27-T10N-R58W	North Reference:	True
Well:	Razor #27K-3407A	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #3		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
5,146.1	0.00	0.00	5,146.1	0.0	0.0	0.0	0.00	0.00	KOP @ 5146' MD
5,200.0	5.93	168.98	5,199.9	-2.7	0.5	2.8	11.00	11.00	
5,300.0	16.93	168.98	5,297.8	-22.2	4.3	22.3	11.00	11.00	
5,400.0	27.93	168.98	5,390.1	-59.6	11.6	59.9	11.00	11.00	
5,500.0	38.93	168.98	5,473.4	-113.5	22.1	114.3	11.00	11.00	
5,600.0	49.93	168.98	5,544.7	-182.2	35.5	183.3	11.00	11.00	
5,700.0	60.93	168.98	5,601.4	-262.9	51.2	264.5	11.00	11.00	
5,800.0	71.93	168.98	5,641.3	-352.7	68.7	354.9	11.00	11.00	
5,900.0	82.93	168.98	5,663.0	-448.3	87.3	451.1	11.00	11.00	
5,964.2	90.00	168.98	5,667.0	-511.2	99.5	514.4	11.00	11.00	LP @ 5964' MD
6,000.0	90.00	168.98	5,667.0	-546.3	106.4	549.7	0.00	0.00	
6,100.0	90.00	168.98	5,667.0	-644.5	125.5	648.5	0.00	0.00	
6,200.0	90.00	168.98	5,667.0	-742.6	144.6	747.2	0.00	0.00	7"
6,300.0	90.00	168.98	5,667.0	-840.8	163.7	846.0	0.00	0.00	
6,400.0	90.00	168.98	5,667.0	-939.0	182.8	944.8	0.00	0.00	
6,500.0	90.00	168.98	5,667.0	-1,037.1	201.9	1,043.6	0.00	0.00	
6,543.0	90.00	168.98	5,667.0	-1,079.3	210.1	1,086.0	0.00	0.00	Start 3° Turn
6,600.0	90.00	170.69	5,667.0	-1,135.4	220.2	1,142.4	3.00	0.00	
6,700.0	90.00	173.69	5,667.0	-1,234.5	233.8	1,241.9	3.00	0.00	
6,800.0	90.00	176.69	5,667.0	-1,334.1	242.2	1,341.8	3.00	0.00	
6,900.0	90.00	179.69	5,667.0	-1,434.1	245.3	1,441.8	3.00	0.00	
6,910.3	90.00	180.00	5,667.0	-1,444.4	245.3	1,452.1	2.99	0.00	EOT; 180° Az
7,000.0	90.00	180.00	5,667.0	-1,534.1	245.3	1,541.7	0.00	0.00	
7,100.0	90.00	180.00	5,667.0	-1,634.1	245.3	1,641.7	0.00	0.00	
7,200.0	90.00	180.00	5,667.0	-1,734.1	245.3	1,741.6	0.00	0.00	
7,300.0	90.00	180.00	5,667.0	-1,834.1	245.3	1,841.5	0.00	0.00	
7,400.0	90.00	180.00	5,667.0	-1,934.1	245.3	1,941.5	0.00	0.00	
7,500.0	90.00	180.00	5,667.0	-2,034.1	245.3	2,041.4	0.00	0.00	
7,600.0	90.00	180.00	5,667.0	-2,134.1	245.3	2,141.4	0.00	0.00	
7,700.0	90.00	180.00	5,667.0	-2,234.1	245.3	2,241.3	0.00	0.00	
7,800.0	90.00	180.00	5,667.0	-2,334.1	245.3	2,341.2	0.00	0.00	
7,900.0	90.00	180.00	5,667.0	-2,434.1	245.3	2,441.2	0.00	0.00	
8,000.0	90.00	180.00	5,667.0	-2,534.1	245.3	2,541.1	0.00	0.00	
8,100.0	90.00	180.00	5,667.0	-2,634.1	245.3	2,641.0	0.00	0.00	
8,200.0	90.00	180.00	5,667.0	-2,734.1	245.3	2,741.0	0.00	0.00	
8,300.0	90.00	180.00	5,667.0	-2,834.1	245.3	2,840.9	0.00	0.00	
8,400.0	90.00	180.00	5,667.0	-2,934.1	245.3	2,940.9	0.00	0.00	
8,500.0	90.00	180.00	5,667.0	-3,034.1	245.3	3,040.8	0.00	0.00	
8,600.0	90.00	180.00	5,667.0	-3,134.1	245.3	3,140.7	0.00	0.00	
8,700.0	90.00	180.00	5,667.0	-3,234.1	245.3	3,240.7	0.00	0.00	
8,800.0	90.00	180.00	5,667.0	-3,334.1	245.3	3,340.6	0.00	0.00	
8,900.0	90.00	180.00	5,667.0	-3,434.1	245.3	3,440.6	0.00	0.00	
9,000.0	90.00	180.00	5,667.0	-3,534.1	245.3	3,540.5	0.00	0.00	
9,100.0	90.00	180.00	5,667.0	-3,634.1	245.3	3,640.4	0.00	0.00	
9,200.0	90.00	180.00	5,667.0	-3,734.1	245.3	3,740.4	0.00	0.00	
9,300.0	90.00	180.00	5,667.0	-3,834.1	245.3	3,840.3	0.00	0.00	
9,400.0	90.00	180.00	5,667.0	-3,934.1	245.3	3,940.3	0.00	0.00	
9,500.0	90.00	180.00	5,667.0	-4,034.1	245.3	4,040.2	0.00	0.00	
9,600.0	90.00	180.00	5,667.0	-4,134.1	245.3	4,140.1	0.00	0.00	
9,700.0	90.00	180.00	5,667.0	-4,234.1	245.3	4,240.1	0.00	0.00	
9,800.0	90.00	180.00	5,667.0	-4,334.1	245.3	4,340.0	0.00	0.00	
9,900.0	90.00	180.00	5,667.0	-4,434.1	245.3	4,439.9	0.00	0.00	

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Well:	Razor #27K-3407A	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #3		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
10,000.0	90.00	180.00	5,667.0	-4,534.1	245.3	4,539.9	0.00	0.00	
10,100.0	90.00	180.00	5,667.0	-4,634.1	245.3	4,639.8	0.00	0.00	
10,200.0	90.00	180.00	5,667.0	-4,734.1	245.3	4,739.8	0.00	0.00	
10,300.0	90.00	180.00	5,667.0	-4,834.1	245.3	4,839.7	0.00	0.00	
10,400.0	90.00	180.00	5,667.0	-4,934.1	245.3	4,939.6	0.00	0.00	
10,500.0	90.00	180.00	5,667.0	-5,034.1	245.3	5,039.6	0.00	0.00	
10,600.0	90.00	180.00	5,667.0	-5,134.1	245.3	5,139.5	0.00	0.00	
10,700.0	90.00	180.00	5,667.0	-5,234.1	245.3	5,239.5	0.00	0.00	
10,800.0	90.00	180.00	5,667.0	-5,334.1	245.3	5,339.4	0.00	0.00	
10,900.0	90.00	180.00	5,667.0	-5,434.1	245.3	5,439.3	0.00	0.00	
11,000.0	90.00	180.00	5,667.0	-5,534.1	245.3	5,539.3	0.00	0.00	
11,100.0	90.00	180.00	5,667.0	-5,634.1	245.3	5,639.2	0.00	0.00	
11,200.0	90.00	180.00	5,667.0	-5,734.1	245.3	5,739.2	0.00	0.00	
11,300.0	90.00	180.00	5,667.0	-5,834.1	245.3	5,839.1	0.00	0.00	
11,400.0	90.00	180.00	5,667.0	-5,934.1	245.3	5,939.0	0.00	0.00	
11,500.0	90.00	180.00	5,667.0	-6,034.1	245.3	6,039.0	0.00	0.00	
11,600.0	90.00	180.00	5,667.0	-6,134.1	245.3	6,138.9	0.00	0.00	
11,700.0	90.00	180.00	5,667.0	-6,234.1	245.3	6,238.9	0.00	0.00	
11,800.0	90.00	180.00	5,667.0	-6,334.1	245.3	6,338.8	0.00	0.00	
11,900.0	90.00	180.00	5,667.0	-6,434.1	245.3	6,438.7	0.00	0.00	
12,000.0	90.00	180.00	5,667.0	-6,534.1	245.3	6,538.7	0.00	0.00	
12,100.0	90.00	180.00	5,667.0	-6,634.1	245.3	6,638.6	0.00	0.00	
12,200.0	90.00	180.00	5,667.0	-6,734.1	245.3	6,738.5	0.00	0.00	
12,300.0	90.00	180.00	5,667.0	-6,834.1	245.3	6,838.5	0.00	0.00	
12,400.0	90.00	180.00	5,667.0	-6,934.1	245.3	6,938.4	0.00	0.00	
12,480.2	90.00	180.00	5,667.0	-7,014.2	245.3	7,018.5	0.00	0.00	PBHL @ 12480' MD

Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- hit/miss target									
- Shape									
Target BH 3407A	0.00	1.06	5,667.0	-7,014.2	245.3	1,534,643.46	3,456,132.74	40.789342	-103.852711
- plan hits target center									
- Point									
PBHL 3407A	0.00	1.06	5,667.0	-7,514.5	250.6	1,534,143.41	3,456,147.29	40.787969	-103.852692
- plan misses target center by 500.3ft at 12480.2ft MD (5667.0 TVD, -7014.2 N, 245.3 E)									
- Point									

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
6,200.0	5,667.0	7"	0.000	0.000

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Razor #27K-3407A
Company:	Whiting Petroleum Corporation	TVD Reference:	WELL @ 4767.5ft (Original Well Elev)
Project:	Weld County, CO	MD Reference:	WELL @ 4767.5ft (Original Well Elev)
Site:	S27-T10N-R58W	North Reference:	True
Well:	Razor #27K-3407A	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #3		

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
5,146.1	5,146.1	0.0	0.0	KOP @ 5146' MD
5,964.2	5,667.0	-511.2	99.5	LP @ 5964' MD
6,543.0	5,667.0	-1,079.3	210.1	Start 3° Turn
6,910.3	5,667.0	-1,444.4	245.3	EOT; 180° Az
12,480.2	5,667.0	-7,014.2	245.3	PBHL @ 12480' MD

Whiting Petroleum Corporation

Weld County, CO

S27-T10N-R58W

Razor #27K-3407A

HZ

Plan #3

Anticollision Report

11 June, 2013

Cathedral Energy Services

Anticollision Report

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well Razor #27K-3407A
Project:	Weld County, CO	TVD Reference:	WELL @ 4767.5ft (Original Well Elev)
Reference Site:	S27-T10N-R58W	MD Reference:	WELL @ 4767.5ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Razor #27K-3407A	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #3	Offset TVD Reference:	Offset Datum

Reference	Plan #3		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	Error Model:	Systematic Ellipse
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 500.0ft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma		

Survey Tool Program		Date	6/11/2013		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
0.0	12,479.3	Plan #3 (HZ)	ISCWSA MWD	MWD - ISCWSA	

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
S27-T10N-R58W						
Razor #27K-3405A - HZ - Plan #3	5,146.1	5,145.1	65.3	42.5	2.857	CC
Razor #27K-3405A - HZ - Plan #3	5,150.0	5,148.9	65.3	42.5	2.855	ES, SF
Razor #27K-3406B - HZ - Plan #4	5,443.4	5,417.9	57.1	33.5	2.419	CC
Razor #27K-3406B - HZ - Plan #4	5,450.0	5,423.9	57.1	33.4	2.414	ES
Razor #27K-3406B - HZ - Plan #4	12,480.2	12,470.1	341.9	81.1	1.311	Level 3, SF
Razor #27K-3408B - HZ - Plan #3	1,000.0	998.0	81.6	77.4	19.303	CC, ES
Razor #27K-3408B - HZ - Plan #3	12,480.2	12,441.1	341.6	82.2	1.317	Level 3, SF

Cathedral Energy Services

Anticollision Report

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well Razor #27K-3407A
Project:	Weld County, CO	TVD Reference:	WELL @ 4767.5ft (Original Well Elev)
Reference Site:	S27-T10N-R58W	MD Reference:	WELL @ 4767.5ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Razor #27K-3407A	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design S27-T10N-R58W - Razor #27K-3405A - HZ - Plan #3													Offset Site Error:	0.0 ft
Survey Program: 0-ISCSWA MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Total Uncertainty Axis	Separation Factor	Warning			
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)						
0.0	0.0	0.0	0.0	0.0	0.0	-90.00	0.0	-65.3	65.3					
100.0	100.0	99.0	99.0	0.1	0.1	-90.00	0.0	-65.3	65.3	65.1	0.19	349.855		
200.0	200.0	199.0	199.0	0.3	0.3	-90.00	0.0	-65.3	65.3	64.7	0.63	102.891		
300.0	300.0	299.0	299.0	0.5	0.5	-90.00	0.0	-65.3	65.3	64.2	1.08	60.242		
400.0	400.0	399.0	399.0	0.8	0.8	-90.00	0.0	-65.3	65.3	63.8	1.53	42.589		
500.0	500.0	499.0	499.0	1.0	1.0	-90.00	0.0	-65.3	65.3	63.3	1.98	32.937		
600.0	600.0	599.0	599.0	1.2	1.2	-90.00	0.0	-65.3	65.3	62.9	2.43	26.852		
700.0	700.0	699.0	699.0	1.4	1.4	-90.00	0.0	-65.3	65.3	62.4	2.88	22.664		
800.0	800.0	799.0	799.0	1.7	1.7	-90.00	0.0	-65.3	65.3	62.0	3.33	19.607		
900.0	900.0	899.0	899.0	1.9	1.9	-90.00	0.0	-65.3	65.3	61.6	3.78	17.276		
1,000.0	1,000.0	999.0	999.0	2.1	2.1	-90.00	0.0	-65.3	65.3	61.1	4.23	15.441		
1,100.0	1,100.0	1,099.0	1,099.0	2.3	2.3	-90.00	0.0	-65.3	65.3	60.7	4.68	13.958		
1,200.0	1,200.0	1,199.0	1,199.0	2.6	2.6	-90.00	0.0	-65.3	65.3	60.2	5.13	12.735		
1,300.0	1,300.0	1,299.0	1,299.0	2.8	2.8	-90.00	0.0	-65.3	65.3	59.8	5.58	11.709		
1,400.0	1,400.0	1,399.0	1,399.0	3.0	3.0	-90.00	0.0	-65.3	65.3	59.3	6.03	10.836		
1,500.0	1,500.0	1,499.0	1,499.0	3.2	3.2	-90.00	0.0	-65.3	65.3	58.9	6.48	10.084		
1,600.0	1,600.0	1,599.0	1,599.0	3.5	3.5	-90.00	0.0	-65.3	65.3	58.4	6.93	9.430		
1,700.0	1,700.0	1,699.0	1,699.0	3.7	3.7	-90.00	0.0	-65.3	65.3	58.0	7.38	8.855		
1,800.0	1,800.0	1,799.0	1,799.0	3.9	3.9	-90.00	0.0	-65.3	65.3	57.5	7.83	8.347		
1,900.0	1,900.0	1,899.0	1,899.0	4.1	4.1	-90.00	0.0	-65.3	65.3	57.1	8.28	7.893		
2,000.0	2,000.0	1,999.0	1,999.0	4.4	4.4	-90.00	0.0	-65.3	65.3	56.6	8.73	7.487		
2,100.0	2,100.0	2,099.0	2,099.0	4.6	4.6	-90.00	0.0	-65.3	65.3	56.2	9.18	7.120		
2,200.0	2,200.0	2,199.0	2,199.0	4.8	4.8	-90.00	0.0	-65.3	65.3	55.7	9.63	6.787		
2,300.0	2,300.0	2,299.0	2,299.0	5.0	5.0	-90.00	0.0	-65.3	65.3	55.3	10.08	6.485		
2,400.0	2,400.0	2,399.0	2,399.0	5.3	5.3	-90.00	0.0	-65.3	65.3	54.8	10.52	6.208		
2,500.0	2,500.0	2,499.0	2,499.0	5.5	5.5	-90.00	0.0	-65.3	65.3	54.4	10.97	5.953		
2,600.0	2,600.0	2,599.0	2,599.0	5.7	5.7	-90.00	0.0	-65.3	65.3	53.9	11.42	5.719		
2,700.0	2,700.0	2,699.0	2,699.0	5.9	5.9	-90.00	0.0	-65.3	65.3	53.5	11.87	5.502		
2,800.0	2,800.0	2,799.0	2,799.0	6.2	6.2	-90.00	0.0	-65.3	65.3	53.0	12.32	5.302		
2,900.0	2,900.0	2,899.0	2,899.0	6.4	6.4	-90.00	0.0	-65.3	65.3	52.6	12.77	5.115		
3,000.0	3,000.0	2,999.0	2,999.0	6.6	6.6	-90.00	0.0	-65.3	65.3	52.1	13.22	4.941		
3,100.0	3,100.0	3,099.0	3,099.0	6.8	6.8	-90.00	0.0	-65.3	65.3	51.7	13.67	4.779		
3,200.0	3,200.0	3,199.0	3,199.0	7.1	7.1	-90.00	0.0	-65.3	65.3	51.2	14.12	4.627		
3,300.0	3,300.0	3,299.0	3,299.0	7.3	7.3	-90.00	0.0	-65.3	65.3	50.8	14.57	4.484		
3,400.0	3,400.0	3,399.0	3,399.0	7.5	7.5	-90.00	0.0	-65.3	65.3	50.3	15.02	4.350		
3,500.0	3,500.0	3,499.0	3,499.0	7.7	7.7	-90.00	0.0	-65.3	65.3	49.9	15.47	4.223		
3,600.0	3,600.0	3,599.0	3,599.0	8.0	8.0	-90.00	0.0	-65.3	65.3	49.4	15.92	4.104		
3,700.0	3,700.0	3,699.0	3,699.0	8.2	8.2	-90.00	0.0	-65.3	65.3	49.0	16.37	3.991		
3,800.0	3,800.0	3,799.0	3,799.0	8.4	8.4	-90.00	0.0	-65.3	65.3	48.5	16.82	3.885		
3,900.0	3,900.0	3,899.0	3,899.0	8.6	8.6	-90.00	0.0	-65.3	65.3	48.1	17.27	3.784		
4,000.0	4,000.0	3,999.0	3,999.0	8.9	8.9	-90.00	0.0	-65.3	65.3	47.6	17.72	3.688		
4,100.0	4,100.0	4,099.0	4,099.0	9.1	9.1	-90.00	0.0	-65.3	65.3	47.2	18.17	3.596		
4,200.0	4,200.0	4,199.0	4,199.0	9.3	9.3	-90.00	0.0	-65.3	65.3	46.7	18.62	3.509		
4,300.0	4,300.0	4,299.0	4,299.0	9.5	9.5	-90.00	0.0	-65.3	65.3	46.3	19.07	3.427		
4,400.0	4,400.0	4,399.0	4,399.0	9.8	9.8	-90.00	0.0	-65.3	65.3	45.8	19.52	3.348		
4,500.0	4,500.0	4,499.0	4,499.0	10.0	10.0	-90.00	0.0	-65.3	65.3	45.4	19.96	3.272		
4,600.0	4,600.0	4,599.0	4,599.0	10.2	10.2	-90.00	0.0	-65.3	65.3	44.9	20.41	3.200		
4,700.0	4,700.0	4,699.0	4,699.0	10.4	10.4	-90.00	0.0	-65.3	65.3	44.5	20.86	3.131		
4,800.0	4,800.0	4,799.0	4,799.0	10.7	10.7	-90.00	0.0	-65.3	65.3	44.0	21.31	3.065		
4,900.0	4,900.0	4,899.0	4,899.0	10.9	10.9	-90.00	0.0	-65.3	65.3	43.6	21.76	3.002		
5,000.0	5,000.0	4,999.0	4,999.0	11.1	11.1	-90.00	0.0	-65.3	65.3	43.1	22.21	2.941		
5,100.0	5,100.0	5,099.0	5,099.0	11.3	11.3	-90.00	0.0	-65.3	65.3	42.7	22.66	2.883		

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	Local Co-ordinate Reference:	Well Razor #27K-3407A
Project:	Weld County, CO	TVD Reference:	WELL @ 4767.5ft (Original Well Elev)
Reference Site:	S27-T10N-R58W	MD Reference:	WELL @ 4767.5ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Razor #27K-3407A	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design S27-T10N-R58W - Razor #27K-3405A - HZ - Plan #3													Offset Site Error:	0.0 ft
Survey Program: 0-ISCSWA MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance				Total Uncertainty Axis	Separation Factor	Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)				
5,146.1	5,146.1	5,145.1	5,145.1	11.4	11.4	-90.00	0.0	-65.3	65.3	42.5	22.87	2.857 CC		
5,150.0	5,150.0	5,148.9	5,148.9	11.4	11.4	101.02	0.0	-65.3	65.3	42.5	22.88	2.855 ES, SF		
5,200.0	5,199.9	5,197.3	5,197.2	11.5	11.5	101.08	-2.4	-66.0	66.6	43.5	23.04	2.889		
5,250.0	5,249.3	5,245.5	5,244.9	11.6	11.6	101.09	-9.1	-67.9	69.9	46.7	23.19	3.016		
5,300.0	5,297.8	5,293.5	5,291.5	11.7	11.7	101.01	-20.0	-70.9	75.4	52.1	23.33	3.232		
5,350.0	5,344.8	5,341.2	5,336.6	11.8	11.8	100.84	-34.8	-75.0	82.9	59.5	23.47	3.533		
5,400.0	5,390.1	5,388.4	5,379.8	11.9	11.9	100.53	-53.3	-80.1	92.4	68.8	23.65	3.908		
5,450.0	5,433.0	5,435.2	5,420.5	12.0	12.0	100.09	-75.3	-86.2	103.8	79.9	23.86	4.350		
5,500.0	5,473.4	5,481.4	5,458.7	12.1	12.1	99.51	-100.4	-93.2	116.9	92.8	24.13	4.844		
5,550.0	5,510.7	5,527.1	5,494.0	12.3	12.2	98.80	-128.4	-101.0	131.6	107.1	24.47	5.378		
5,600.0	5,544.7	5,572.3	5,526.3	12.5	12.4	97.95	-158.8	-109.4	147.8	122.9	24.90	5.935		
5,650.0	5,575.0	5,617.0	5,555.4	12.8	12.6	96.99	-191.5	-118.5	165.3	139.9	25.43	6.502		
5,700.0	5,601.4	5,661.2	5,581.3	13.1	12.9	95.92	-226.1	-128.1	184.0	158.0	26.05	7.063		
5,750.0	5,623.5	5,705.2	5,603.8	13.5	13.1	94.75	-262.4	-138.2	203.7	176.9	26.78	7.607		
5,800.0	5,641.3	5,748.8	5,623.0	14.0	13.5	93.52	-300.2	-148.7	224.3	196.7	27.61	8.124		
5,850.0	5,654.5	5,792.4	5,638.9	14.5	13.8	92.22	-339.3	-159.5	245.5	217.0	28.52	8.607		
5,900.0	5,663.0	5,836.0	5,651.2	15.0	14.2	90.88	-379.5	-170.7	267.3	237.7	29.52	9.053		
5,950.0	5,666.8	5,879.7	5,660.1	15.6	14.7	89.53	-420.7	-182.2	289.4	258.8	30.59	9.460		
5,964.2	5,667.0	5,892.2	5,662.0	15.8	14.8	89.14	-432.7	-185.5	295.7	264.8	30.90	9.570		
6,000.0	5,667.0	5,923.9	5,665.4	16.2	15.2	89.89	-463.0	-193.9	311.6	279.9	31.72	9.826		
6,100.0	5,667.0	6,013.3	5,667.0	17.6	16.2	90.18	-549.1	-217.8	356.3	322.1	34.17	10.429		
6,200.0	5,667.0	6,102.8	5,667.0	19.1	17.4	90.16	-635.3	-241.8	401.0	364.2	36.82	10.891		
6,300.0	5,667.0	6,192.3	5,667.0	20.6	18.6	90.14	-721.5	-265.7	445.7	406.0	39.65	11.241		
6,400.0	5,667.0	6,281.7	5,667.0	22.2	19.9	90.13	-807.7	-289.7	490.4	447.7	42.61	11.507		

Cathedral Energy Services

Anticollision Report

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well Razor #27K-3407A
Project:	Weld County, CO	TVD Reference:	WELL @ 4767.5ft (Original Well Elev)
Reference Site:	S27-T10N-R58W	MD Reference:	WELL @ 4767.5ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Razor #27K-3407A	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design S27-T10N-R58W - Razor #27K-3406B - HZ - Plan #4												Offset Site Error:	0.0 ft
Survey Program: 0-ISCSA MWD												Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Distance		Total		Separation		Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Uncertainty Axis		
0.0	0.0	0.0	0.0	0.0	0.0	-156.56	-74.7	-32.4	81.5				
100.0	100.0	97.0	97.0	0.1	0.1	-156.56	-74.7	-32.4	81.4	81.2	0.18	440.475	
200.0	200.0	197.0	197.0	0.3	0.3	-156.56	-74.7	-32.4	81.4	80.8	0.63	129.155	
300.0	300.0	297.0	297.0	0.5	0.5	-156.56	-74.7	-32.4	81.4	80.3	1.08	75.396	
400.0	400.0	397.0	397.0	0.8	0.8	-156.56	-74.7	-32.4	81.4	79.9	1.53	53.237	
500.0	500.0	497.0	497.0	1.0	1.0	-156.56	-74.7	-32.4	81.4	79.4	1.98	41.145	
600.0	600.0	597.0	597.0	1.2	1.2	-156.56	-74.7	-32.4	81.4	79.0	2.43	33.529	
700.0	700.0	697.0	697.0	1.4	1.4	-156.56	-74.7	-32.4	81.4	78.6	2.88	28.292	
800.0	800.0	797.0	797.0	1.7	1.7	-156.56	-74.7	-32.4	81.4	78.1	3.33	24.470	
900.0	900.0	897.0	897.0	1.9	1.9	-156.56	-74.7	-32.4	81.4	77.7	3.78	21.558	
1,000.0	1,000.0	997.0	997.0	2.1	2.1	-156.56	-74.7	-32.4	81.4	77.2	4.23	19.265	
1,100.0	1,100.0	1,097.0	1,097.0	2.3	2.3	-156.56	-74.7	-32.4	81.4	76.8	4.68	17.413	
1,200.0	1,200.0	1,197.0	1,197.0	2.6	2.6	-156.56	-74.7	-32.4	81.4	76.3	5.13	15.886	
1,300.0	1,300.0	1,297.0	1,297.0	2.8	2.8	-156.56	-74.7	-32.4	81.4	75.9	5.58	14.605	
1,400.0	1,400.0	1,397.0	1,397.0	3.0	3.0	-156.56	-74.7	-32.4	81.4	75.4	6.02	13.515	
1,500.0	1,500.0	1,497.0	1,497.0	3.2	3.2	-156.56	-74.7	-32.4	81.4	75.0	6.47	12.577	
1,600.0	1,600.0	1,597.0	1,597.0	3.5	3.5	-156.56	-74.7	-32.4	81.4	74.5	6.92	11.760	
1,700.0	1,700.0	1,697.0	1,697.0	3.7	3.7	-156.56	-74.7	-32.4	81.4	74.1	7.37	11.043	
1,800.0	1,800.0	1,797.0	1,797.0	3.9	3.9	-156.56	-74.7	-32.4	81.4	73.6	7.82	10.409	
1,900.0	1,900.0	1,897.0	1,897.0	4.1	4.1	-156.56	-74.7	-32.4	81.4	73.2	8.27	9.843	
2,000.0	2,000.0	1,997.0	1,997.0	4.4	4.4	-156.56	-74.7	-32.4	81.4	72.7	8.72	9.336	
2,100.0	2,100.0	2,097.0	2,097.0	4.6	4.6	-156.56	-74.7	-32.4	81.4	72.3	9.17	8.878	
2,200.0	2,200.0	2,197.0	2,197.0	4.8	4.8	-156.56	-74.7	-32.4	81.4	71.8	9.62	8.463	
2,300.0	2,300.0	2,297.0	2,297.0	5.0	5.0	-156.56	-74.7	-32.4	81.4	71.4	10.07	8.086	
2,400.0	2,400.0	2,397.0	2,397.0	5.3	5.3	-156.56	-74.7	-32.4	81.4	70.9	10.52	7.740	
2,500.0	2,500.0	2,497.0	2,497.0	5.5	5.5	-156.56	-74.7	-32.4	81.4	70.5	10.97	7.423	
2,600.0	2,600.0	2,597.0	2,597.0	5.7	5.7	-156.56	-74.7	-32.4	81.4	70.0	11.42	7.131	
2,700.0	2,700.0	2,697.0	2,697.0	5.9	5.9	-156.56	-74.7	-32.4	81.4	69.6	11.87	6.861	
2,800.0	2,800.0	2,797.0	2,797.0	6.2	6.2	-156.56	-74.7	-32.4	81.4	69.1	12.32	6.610	
2,900.0	2,900.0	2,897.0	2,897.0	6.4	6.4	-156.56	-74.7	-32.4	81.4	68.7	12.77	6.378	
3,000.0	3,000.0	2,997.0	2,997.0	6.6	6.6	-156.56	-74.7	-32.4	81.4	68.2	13.22	6.161	
3,100.0	3,100.0	3,097.0	3,097.0	6.8	6.8	-156.56	-74.7	-32.4	81.4	67.8	13.67	5.958	
3,200.0	3,200.0	3,197.0	3,197.0	7.1	7.1	-156.56	-74.7	-32.4	81.4	67.3	14.12	5.768	
3,300.0	3,300.0	3,297.0	3,297.0	7.3	7.3	-156.56	-74.7	-32.4	81.4	66.9	14.57	5.590	
3,400.0	3,400.0	3,397.0	3,397.0	7.5	7.5	-156.56	-74.7	-32.4	81.4	66.4	15.02	5.423	
3,500.0	3,500.0	3,497.0	3,497.0	7.7	7.7	-156.56	-74.7	-32.4	81.4	66.0	15.47	5.265	
3,600.0	3,600.0	3,597.0	3,597.0	8.0	8.0	-156.56	-74.7	-32.4	81.4	65.5	15.91	5.117	
3,700.0	3,700.0	3,697.0	3,697.0	8.2	8.2	-156.56	-74.7	-32.4	81.4	65.1	16.36	4.976	
3,800.0	3,800.0	3,797.0	3,797.0	8.4	8.4	-156.56	-74.7	-32.4	81.4	64.6	16.81	4.843	
3,900.0	3,900.0	3,897.0	3,897.0	8.6	8.6	-156.56	-74.7	-32.4	81.4	64.2	17.26	4.717	
4,000.0	4,000.0	3,997.0	3,997.0	8.9	8.9	-156.56	-74.7	-32.4	81.4	63.7	17.71	4.597	
4,100.0	4,100.0	4,097.0	4,097.0	9.1	9.1	-156.56	-74.7	-32.4	81.4	63.3	18.16	4.483	
4,200.0	4,200.0	4,197.0	4,197.0	9.3	9.3	-156.56	-74.7	-32.4	81.4	62.8	18.61	4.375	
4,300.0	4,300.0	4,297.0	4,297.0	9.5	9.5	-156.56	-74.7	-32.4	81.4	62.4	19.06	4.272	
4,400.0	4,400.0	4,397.0	4,397.0	9.8	9.8	-156.56	-74.7	-32.4	81.4	61.9	19.51	4.173	
4,500.0	4,500.0	4,497.0	4,497.0	10.0	10.0	-156.56	-74.7	-32.4	81.4	61.5	19.96	4.080	
4,600.0	4,600.0	4,597.0	4,597.0	10.2	10.2	-156.56	-74.7	-32.4	81.4	61.0	20.41	3.990	
4,700.0	4,700.0	4,697.0	4,697.0	10.4	10.4	-156.56	-74.7	-32.4	81.4	60.6	20.86	3.904	
4,800.0	4,800.0	4,797.0	4,797.0	10.7	10.7	-156.56	-74.7	-32.4	81.4	60.1	21.31	3.821	
4,900.0	4,900.0	4,897.0	4,897.0	10.9	10.9	-156.56	-74.7	-32.4	81.4	59.7	21.76	3.742	
5,000.0	5,000.0	4,997.0	4,997.0	11.1	11.1	-156.56	-74.7	-32.4	81.4	59.2	22.21	3.667	
5,100.0	5,100.0	5,097.0	5,097.0	11.3	11.3	-156.56	-74.7	-32.4	81.4	58.8	22.66	3.594	

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	Local Co-ordinate Reference:	Well Razor #27K-3407A
Project:	Weld County, CO	TVD Reference:	WELL @ 4767.5ft (Original Well Elev)
Reference Site:	S27-T10N-R58W	MD Reference:	WELL @ 4767.5ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Razor #27K-3407A	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design S27-T10N-R58W - Razor #27K-3406B - HZ - Plan #4													Offset Site Error: 0.0 ft	
Survey Program: 0-ISCWSA MWD													Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor		
5,146.1	5,146.1	5,143.1	5,143.1	11.4	11.4	-156.56	-74.7	-32.4	81.4	58.6	22.86	3.561		
5,150.0	5,150.0	5,147.0	5,147.0	11.4	11.4	34.46	-74.7	-32.4	81.4	58.5	22.88	3.558		
5,200.0	5,199.9	5,196.9	5,196.9	11.5	11.5	35.74	-74.7	-32.4	79.1	56.1	23.00	3.440		
5,250.0	5,249.3	5,244.7	5,244.7	11.6	11.7	39.39	-74.9	-32.4	73.3	50.3	23.02	3.184		
5,300.0	5,297.8	5,288.7	5,288.6	11.7	11.7	44.68	-77.8	-32.5	67.0	44.0	22.97	2.916		
5,350.0	5,344.8	5,333.2	5,332.5	11.8	11.8	51.84	-84.5	-32.8	61.7	38.7	22.99	2.684		
5,400.0	5,390.1	5,378.2	5,376.3	11.9	11.9	60.91	-95.0	-33.2	58.1	34.9	23.21	2.505		
5,443.4	5,427.5	5,417.9	5,414.0	12.0	12.0	69.98	-107.4	-33.7	57.1	33.5	23.59	2.419 CC		
5,450.0	5,433.0	5,423.9	5,419.6	12.0	12.0	71.41	-109.6	-33.8	57.1	33.4	23.65	2.414 ES		
5,500.0	5,473.4	5,470.3	5,462.1	12.1	12.1	82.25	-128.1	-34.5	59.1	34.9	24.16	2.445		
5,550.0	5,510.7	5,517.4	5,503.3	12.3	12.1	92.17	-150.8	-35.4	64.2	39.7	24.53	2.618		
5,600.0	5,544.7	5,565.2	5,543.0	12.5	12.3	100.38	-177.5	-36.5	72.1	47.5	24.68	2.924		
5,650.0	5,575.0	5,613.9	5,580.6	12.8	12.4	106.68	-208.3	-37.8	82.3	57.6	24.67	3.335		
5,700.0	5,601.4	5,663.5	5,615.8	13.1	12.6	111.29	-243.1	-39.2	94.1	69.5	24.64	3.819		
5,750.0	5,623.5	5,714.0	5,648.2	13.5	12.8	114.52	-281.9	-40.7	107.1	82.4	24.69	4.339		
5,800.0	5,641.3	5,765.6	5,677.1	14.0	13.1	116.67	-324.5	-42.4	121.0	96.1	24.90	4.860		
5,850.0	5,654.5	5,818.3	5,702.2	14.5	13.5	118.01	-370.8	-44.3	135.5	110.1	25.31	5.352		
5,900.0	5,663.0	5,872.2	5,722.9	15.0	13.9	118.71	-420.6	-46.3	150.2	124.3	25.95	5.789		
5,950.0	5,666.8	5,927.4	5,738.6	15.6	14.4	118.91	-473.4	-48.4	165.1	138.3	26.81	6.158		
5,964.2	5,667.0	5,943.3	5,742.1	15.8	14.6	118.90	-489.0	-49.0	169.3	142.2	27.09	6.250		
6,000.0	5,667.0	5,984.1	5,748.9	16.2	15.0	119.37	-529.2	-50.7	179.3	151.6	27.76	6.459		
6,100.0	5,667.0	6,092.5	5,753.1	17.6	16.2	116.88	-637.2	-55.0	201.4	170.6	30.77	6.546		
6,200.0	5,667.0	6,189.8	5,753.0	19.1	17.5	114.20	-734.5	-58.9	222.3	188.3	33.99	6.540		
6,300.0	5,667.0	6,287.1	5,753.0	20.6	18.8	111.98	-831.7	-62.8	243.6	206.3	37.29	6.531		
6,400.0	5,667.0	6,384.4	5,753.0	22.2	20.3	110.12	-928.9	-66.7	265.1	224.5	40.68	6.517		
6,500.0	5,667.0	6,481.7	5,753.0	23.9	21.8	108.54	-1,026.2	-70.6	286.9	242.8	44.14	6.501		
6,543.0	5,667.0	6,523.6	5,753.0	24.7	22.4	107.93	-1,068.0	-72.3	296.4	250.7	45.65	6.493		
6,600.0	5,667.0	6,579.2	5,753.0	25.6	23.3	107.12	-1,123.6	-74.5	308.1	260.4	47.71	6.458		
6,700.0	5,667.0	6,677.7	5,753.0	27.1	24.9	106.07	-1,221.9	-78.5	325.0	273.8	51.16	6.352		
6,800.0	5,667.0	6,776.9	5,753.0	28.7	26.6	105.39	-1,321.1	-82.5	336.9	282.4	54.50	6.181		
6,900.0	5,667.0	6,889.9	5,753.0	30.3	28.3	105.09	-1,434.1	-84.7	341.8	284.1	57.75	5.919		
6,910.3	5,667.0	6,900.2	5,753.0	30.4	28.5	105.09	-1,444.3	-84.7	341.9	283.8	58.06	5.889		
7,000.0	5,667.0	6,989.9	5,753.0	31.9	30.1	105.09	-1,534.1	-84.7	341.9	280.8	61.02	5.602		
7,100.0	5,667.0	7,089.9	5,753.0	33.7	31.8	105.09	-1,634.1	-84.7	341.9	277.4	64.42	5.307		
7,200.0	5,667.0	7,189.9	5,753.0	35.4	33.6	105.09	-1,734.1	-84.7	341.9	274.0	67.85	5.038		
7,300.0	5,667.0	7,289.9	5,753.0	37.2	35.4	105.09	-1,834.1	-84.7	341.9	270.5	71.31	4.794		
7,400.0	5,667.0	7,389.9	5,753.0	38.9	37.2	105.09	-1,934.1	-84.7	341.9	267.1	74.80	4.570		
7,500.0	5,667.0	7,489.9	5,753.0	40.7	39.0	105.09	-2,034.1	-84.7	341.9	263.5	78.31	4.365		
7,600.0	5,667.0	7,589.9	5,753.0	42.5	40.8	105.09	-2,134.1	-84.7	341.9	260.0	81.84	4.177		
7,700.0	5,667.0	7,689.9	5,753.0	44.3	42.6	105.09	-2,234.1	-84.7	341.9	256.5	85.39	4.004		
7,800.0	5,667.0	7,789.9	5,753.0	46.2	44.5	105.09	-2,334.1	-84.7	341.9	252.9	88.95	3.843		
7,900.0	5,667.0	7,889.9	5,753.0	48.0	46.3	105.09	-2,434.1	-84.7	341.9	249.3	92.53	3.695		
8,000.0	5,667.0	7,989.9	5,753.0	49.8	48.2	105.09	-2,534.1	-84.7	341.9	245.7	96.12	3.557		
8,100.0	5,667.0	8,089.9	5,753.0	51.7	50.0	105.09	-2,634.1	-84.7	341.9	242.1	99.72	3.428		
8,200.0	5,667.0	8,189.9	5,753.0	53.5	51.9	105.09	-2,734.1	-84.7	341.9	238.5	103.32	3.309		
8,300.0	5,667.0	8,289.9	5,753.0	55.4	53.7	105.09	-2,834.1	-84.7	341.9	234.9	106.94	3.197		
8,400.0	5,667.0	8,389.9	5,753.0	57.2	55.6	105.09	-2,934.1	-84.7	341.9	231.3	110.56	3.092		
8,500.0	5,667.0	8,489.9	5,753.0	59.1	57.5	105.09	-3,034.1	-84.7	341.9	227.7	114.20	2.994		
8,600.0	5,667.0	8,589.9	5,753.0	61.0	59.4	105.09	-3,134.1	-84.7	341.9	224.0	117.83	2.901		
8,700.0	5,667.0	8,689.9	5,753.0	62.8	61.2	105.09	-3,234.1	-84.7	341.9	220.4	121.48	2.814		
8,800.0	5,667.0	8,789.9	5,753.0	64.7	63.1	105.09	-3,334.1	-84.7	341.9	216.7	125.12	2.732		
8,900.0	5,667.0	8,889.9	5,753.0	66.6	65.0	105.09	-3,434.1	-84.7	341.9	213.1	128.78	2.655		

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	Local Co-ordinate Reference:	Well Razor #27K-3407A
Project:	Weld County, CO	TVD Reference:	WELL @ 4767.5ft (Original Well Elev)
Reference Site:	S27-T10N-R58W	MD Reference:	WELL @ 4767.5ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Razor #27K-3407A	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design S27-T10N-R58W - Razor #27K-3406B - HZ - Plan #4													Offset Site Error: 0.0 ft	
Survey Program: 0-ISCWSA MWD													Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor		
9,000.0	5,667.0	8,989.9	5,753.0	68.5	66.9	105.09	-3,534.1	-84.7	341.9	209.4	132.43	2.581		
9,100.0	5,667.0	9,089.9	5,753.0	70.3	68.8	105.09	-3,634.1	-84.7	341.9	205.8	136.09	2.512		
9,200.0	5,667.0	9,189.9	5,753.0	72.2	70.7	105.09	-3,734.1	-84.7	341.9	202.1	139.76	2.446		
9,300.0	5,667.0	9,289.9	5,753.0	74.1	72.5	105.09	-3,834.1	-84.7	341.9	198.4	143.43	2.384		
9,400.0	5,667.0	9,389.9	5,753.0	76.0	74.4	105.09	-3,934.1	-84.7	341.9	194.8	147.10	2.324		
9,500.0	5,667.0	9,489.9	5,753.0	77.9	76.3	105.09	-4,034.1	-84.7	341.9	191.1	150.77	2.267		
9,600.0	5,667.0	9,589.9	5,753.0	79.8	78.2	105.09	-4,134.1	-84.7	341.9	187.4	154.45	2.213		
9,700.0	5,667.0	9,689.9	5,753.0	81.6	80.1	105.09	-4,234.1	-84.7	341.9	183.7	158.13	2.162		
9,800.0	5,667.0	9,789.9	5,753.0	83.5	82.0	105.09	-4,334.1	-84.7	341.9	180.1	161.81	2.113		
9,900.0	5,667.0	9,889.9	5,753.0	85.4	83.9	105.09	-4,434.1	-84.7	341.9	176.4	165.49	2.066		
10,000.0	5,667.0	9,989.9	5,753.0	87.3	85.8	105.09	-4,534.1	-84.7	341.9	172.7	169.18	2.021		
10,100.0	5,667.0	10,089.9	5,753.0	89.2	87.7	105.09	-4,634.1	-84.7	341.9	169.0	172.87	1.978		
10,200.0	5,667.0	10,189.9	5,753.0	91.1	89.6	105.09	-4,734.1	-84.7	341.9	165.3	176.56	1.936		
10,300.0	5,667.0	10,289.9	5,753.0	93.0	91.5	105.09	-4,834.1	-84.7	341.9	161.6	180.25	1.897		
10,400.0	5,667.0	10,389.9	5,753.0	94.9	93.4	105.09	-4,934.1	-84.7	341.9	157.9	183.94	1.859		
10,500.0	5,667.0	10,489.9	5,753.0	96.8	95.3	105.09	-5,034.1	-84.7	341.9	154.2	187.63	1.822		
10,600.0	5,667.0	10,589.9	5,753.0	98.7	97.2	105.09	-5,134.1	-84.7	341.9	150.5	191.33	1.787		
10,700.0	5,667.0	10,689.9	5,753.0	100.6	99.1	105.09	-5,234.1	-84.7	341.9	146.8	195.03	1.753		
10,800.0	5,667.0	10,789.9	5,753.0	102.5	101.0	105.09	-5,334.1	-84.7	341.9	143.1	198.73	1.720		
10,900.0	5,667.0	10,889.9	5,753.0	104.4	103.0	105.09	-5,434.1	-84.7	341.9	139.4	202.42	1.689		
11,000.0	5,667.0	10,989.9	5,753.0	106.3	104.9	105.09	-5,534.1	-84.7	341.9	135.7	206.13	1.659		
11,100.0	5,667.0	11,089.9	5,753.0	108.2	106.8	105.09	-5,634.1	-84.7	341.9	132.0	209.83	1.629		
11,200.0	5,667.0	11,189.9	5,753.0	110.1	108.7	105.09	-5,734.1	-84.7	341.9	128.3	213.53	1.601		
11,300.0	5,667.0	11,289.9	5,753.0	112.0	110.6	105.09	-5,834.1	-84.7	341.9	124.6	217.23	1.574		
11,400.0	5,667.0	11,389.9	5,753.0	113.9	112.5	105.09	-5,934.1	-84.7	341.9	120.9	220.94	1.547		
11,500.0	5,667.0	11,489.9	5,753.0	115.8	114.4	105.09	-6,034.1	-84.7	341.9	117.2	224.64	1.522		
11,600.0	5,667.0	11,589.9	5,753.0	117.7	116.3	105.09	-6,134.1	-84.7	341.9	113.5	228.35	1.497 Level 3		
11,700.0	5,667.0	11,689.9	5,753.0	119.7	118.2	105.09	-6,234.1	-84.7	341.9	109.8	232.05	1.473 Level 3		
11,800.0	5,667.0	11,789.9	5,753.0	121.6	120.1	105.09	-6,334.1	-84.7	341.9	106.1	235.76	1.450 Level 3		
11,900.0	5,667.0	11,889.9	5,753.0	123.5	122.0	105.09	-6,434.1	-84.7	341.9	102.4	239.47	1.428 Level 3		
12,000.0	5,667.0	11,989.9	5,753.0	125.4	123.9	105.09	-6,534.1	-84.7	341.9	98.7	243.18	1.406 Level 3		
12,100.0	5,667.0	12,089.9	5,753.0	127.3	125.9	105.09	-6,634.1	-84.7	341.9	95.0	246.89	1.385 Level 3		
12,200.0	5,667.0	12,189.9	5,753.0	129.2	127.8	105.09	-6,734.1	-84.7	341.9	91.3	250.60	1.364 Level 3		
12,300.0	5,667.0	12,289.9	5,753.0	131.1	129.7	105.09	-6,834.1	-84.7	341.9	87.6	254.31	1.344 Level 3		
12,400.0	5,667.0	12,389.9	5,753.0	133.0	131.6	105.09	-6,934.1	-84.7	341.9	83.8	258.02	1.325 Level 3		
12,480.2	5,667.0	12,470.1	5,753.0	134.3	133.1	105.09	-7,014.2	-84.7	341.9	81.1	260.72	1.311 Level 3, SF		

Cathedral Energy Services

Anticollision Report

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well Razor #27K-3407A
Project:	Weld County, CO	TVD Reference:	WELL @ 4767.5ft (Original Well Elev)
Reference Site:	S27-T10N-R58W	MD Reference:	WELL @ 4767.5ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Razor #27K-3407A	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design S27-T10N-R58W - Razor #27K-3408B - HZ - Plan #3												Offset Site Error:	0.0 ft
Survey Program: 0-ISCSWA MWD												Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Distance		Total		Separation		Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Uncertainty Axis	Factor	
0.0	0.0	0.0	0.0	0.0	0.0	156.20	-74.7	32.9	81.7				
100.0	100.0	98.0	98.0	0.1	0.1	156.20	-74.7	32.9	81.6	81.4	0.19	439.347	
200.0	200.0	198.0	198.0	0.3	0.3	156.20	-74.7	32.9	81.6	81.0	0.63	129.018	
300.0	300.0	298.0	298.0	0.5	0.5	156.20	-74.7	32.9	81.6	80.5	1.08	75.428	
400.0	400.0	398.0	398.0	0.8	0.8	156.20	-74.7	32.9	81.6	80.1	1.53	53.292	
500.0	500.0	498.0	498.0	1.0	1.0	156.20	-74.7	32.9	81.6	79.7	1.98	41.201	
600.0	600.0	598.0	598.0	1.2	1.2	156.20	-74.7	32.9	81.6	79.2	2.43	33.582	
700.0	700.0	698.0	698.0	1.4	1.4	156.20	-74.7	32.9	81.6	78.8	2.88	28.341	
800.0	800.0	798.0	798.0	1.7	1.7	156.20	-74.7	32.9	81.6	78.3	3.33	24.515	
900.0	900.0	898.0	898.0	1.9	1.9	156.20	-74.7	32.9	81.6	77.9	3.78	21.599	
1,000.0	1,000.0	998.0	998.0	2.1	2.1	156.20	-74.7	32.9	81.6	77.4	4.23	19.303 CC, ES	
1,100.0	1,100.0	1,095.3	1,095.2	2.3	2.3	156.12	-76.1	33.7	83.3	78.6	4.65	17.911	
1,200.0	1,200.0	1,195.1	1,195.0	2.6	2.5	155.94	-79.2	35.3	86.7	81.7	5.05	17.161	
1,300.0	1,300.0	1,295.0	1,294.9	2.8	2.7	155.78	-82.2	37.0	90.2	84.7	5.47	16.507	
1,400.0	1,400.0	1,394.9	1,394.7	3.0	2.9	155.63	-85.3	38.6	93.7	87.8	5.88	15.929	
1,500.0	1,500.0	1,494.9	1,494.6	3.2	3.1	155.49	-88.4	40.3	97.2	90.9	6.30	15.415	
1,600.0	1,600.0	1,594.8	1,594.5	3.5	3.3	155.36	-91.4	41.9	100.7	93.9	6.73	14.957	
1,700.0	1,700.0	1,694.8	1,694.4	3.7	3.5	155.24	-94.5	43.6	104.1	97.0	7.16	14.547	
1,800.0	1,800.0	1,794.7	1,794.3	3.9	3.7	155.13	-97.6	45.2	107.6	100.0	7.59	14.178	
1,900.0	1,900.0	1,894.6	1,894.1	4.1	3.9	155.02	-100.7	46.9	111.1	103.1	8.03	13.844	
2,000.0	2,000.0	1,994.6	1,994.0	4.4	4.1	154.93	-103.7	48.5	114.6	106.1	8.46	13.542	
2,100.0	2,100.0	2,094.5	2,093.9	4.6	4.3	154.83	-106.8	50.2	118.1	109.2	8.90	13.267	
2,200.0	2,200.0	2,194.5	2,193.8	4.8	4.6	154.74	-109.9	51.8	121.6	112.2	9.34	13.015	
2,300.0	2,300.0	2,294.4	2,293.6	5.0	4.8	154.66	-113.0	53.5	125.1	115.3	9.78	12.785	
2,400.0	2,400.0	2,394.3	2,393.5	5.3	5.0	154.58	-116.0	55.1	128.5	118.3	10.22	12.573	
2,500.0	2,500.0	2,494.3	2,493.4	5.5	5.2	154.51	-119.1	56.8	132.0	121.4	10.67	12.377	
2,600.0	2,600.0	2,594.2	2,593.3	5.7	5.5	154.44	-122.2	58.4	135.5	124.4	11.11	12.196	
2,700.0	2,700.0	2,694.1	2,693.2	5.9	5.7	154.37	-125.2	60.1	139.0	127.4	11.56	12.029	
2,800.0	2,800.0	2,794.1	2,793.0	6.2	5.9	154.31	-128.3	61.7	142.5	130.5	12.00	11.872	
2,900.0	2,900.0	2,894.0	2,892.9	6.4	6.1	154.25	-131.4	63.4	146.0	133.5	12.45	11.727	
3,000.0	3,000.0	2,894.0	2,892.8	6.6	6.4	154.19	-134.5	65.0	149.5	136.6	12.89	11.591	
3,100.0	3,100.0	3,093.9	3,092.7	6.8	6.6	154.13	-137.5	66.7	152.9	139.6	13.34	11.463	
3,200.0	3,200.0	3,193.8	3,192.5	7.1	6.8	154.08	-140.6	68.3	156.4	142.6	13.79	11.344	
3,300.0	3,300.0	3,293.8	3,292.4	7.3	7.1	154.03	-143.7	70.0	159.9	145.7	14.24	11.232	
3,400.0	3,400.0	3,393.7	3,392.3	7.5	7.3	153.98	-146.8	71.6	163.4	148.7	14.69	11.126	
3,500.0	3,500.0	3,493.7	3,492.2	7.7	7.5	153.94	-149.8	73.3	166.9	151.8	15.14	11.026	
3,600.0	3,600.0	3,593.6	3,592.1	8.0	7.8	153.89	-152.9	74.9	170.4	154.8	15.59	10.932	
3,700.0	3,700.0	3,693.5	3,691.9	8.2	8.0	153.85	-156.0	76.6	173.9	157.8	16.04	10.842	
3,800.0	3,800.0	3,793.5	3,791.8	8.4	8.2	153.81	-159.0	78.2	177.4	160.9	16.49	10.758	
3,900.0	3,900.0	3,893.4	3,891.7	8.6	8.5	153.77	-162.1	79.9	180.8	163.9	16.94	10.678	
4,000.0	4,000.0	3,993.4	3,991.6	8.9	8.7	153.73	-165.2	81.5	184.3	166.9	17.39	10.601	
4,100.0	4,100.0	4,093.3	4,091.4	9.1	8.9	153.69	-168.3	83.2	187.8	170.0	17.84	10.529	
4,200.0	4,200.0	4,193.2	4,191.3	9.3	9.1	153.66	-171.3	84.8	191.3	173.0	18.29	10.460	
4,300.0	4,300.0	4,293.2	4,291.2	9.5	9.4	153.63	-174.4	86.5	194.8	176.1	18.74	10.394	
4,400.0	4,400.0	4,393.1	4,391.1	9.8	9.6	153.59	-177.5	88.1	198.3	179.1	19.19	10.331	
4,500.0	4,500.0	4,493.0	4,491.0	10.0	9.8	153.56	-180.6	89.8	201.8	182.1	19.65	10.270	
4,600.0	4,600.0	4,593.0	4,590.8	10.2	10.1	153.53	-183.6	91.4	205.3	185.2	20.10	10.213	
4,700.0	4,700.0	4,692.9	4,690.7	10.4	10.3	153.50	-186.7	93.1	208.7	188.2	20.55	10.158	
4,800.0	4,800.0	4,792.9	4,790.6	10.7	10.5	153.47	-189.8	94.7	212.2	191.2	21.00	10.105	
4,900.0	4,900.0	4,892.8	4,890.5	10.9	10.8	153.45	-192.8	96.4	215.7	194.3	21.46	10.054	
5,000.0	5,000.0	4,992.7	4,990.4	11.1	11.0	153.42	-195.9	98.0	219.2	197.3	21.91	10.005	
5,100.0	5,100.0	5,092.7	5,090.2	11.3	11.2	153.39	-199.0	99.7	222.7	200.3	22.36	9.958	

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	Local Co-ordinate Reference:	Well Razor #27K-3407A
Project:	Weld County, CO	TVD Reference:	WELL @ 4767.5ft (Original Well Elev)
Reference Site:	S27-T10N-R58W	MD Reference:	WELL @ 4767.5ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Razor #27K-3407A	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design S27-T10N-R58W - Razor #27K-3408B - HZ - Plan #3													Offset Site Error:	0.0 ft
Survey Program: 0-ISCSWA MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance				Total Uncertainty Axis	Separation Factor	Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)				
5,146.1	5,146.1	5,138.8	5,136.3	11.4	11.4	153.38	-200.4	100.4	224.3	201.7	22.57	9.937		
5,150.0	5,150.0	5,142.7	5,140.2	11.4	11.4	-15.60	-200.5	100.5	224.4	202.0	22.46	9.992		
5,200.0	5,199.9	5,192.6	5,190.1	11.5	11.5	-15.83	-202.1	101.3	223.5	200.9	22.58	9.899		
5,250.0	5,249.3	5,242.2	5,239.7	11.6	11.6	-16.56	-203.6	102.1	218.0	195.5	22.52	9.679		
5,300.0	5,297.8	5,280.1	5,277.5	11.7	11.7	-17.59	-205.4	103.1	209.0	186.7	22.26	9.386		
5,350.0	5,344.8	5,315.0	5,312.2	11.8	11.8	-19.00	-209.1	105.1	198.8	176.9	21.85	9.098		
5,400.0	5,390.1	5,350.0	5,346.5	11.9	11.9	-20.91	-214.9	108.2	187.6	166.3	21.31	8.802		
5,450.0	5,433.0	5,385.7	5,381.0	12.0	12.0	-23.48	-222.9	112.5	175.6	154.9	20.73	8.474		
5,500.0	5,473.4	5,421.4	5,414.9	12.1	12.2	-26.81	-232.9	117.9	163.1	143.0	20.18	8.086		
5,550.0	5,510.7	5,457.5	5,448.2	12.3	12.3	-31.10	-245.1	124.4	150.5	130.7	19.82	7.594		
5,600.0	5,544.7	5,493.9	5,480.8	12.5	12.5	-36.54	-259.4	132.1	138.4	118.5	19.88	6.962		
5,650.0	5,575.0	5,530.8	5,512.5	12.8	12.7	-43.28	-276.0	141.0	127.5	106.9	20.56	6.202		
5,700.0	5,601.4	5,568.1	5,543.2	13.1	12.9	-51.36	-294.7	151.0	118.9	97.0	21.95	5.417		
5,750.0	5,623.5	5,606.1	5,572.8	13.5	13.2	-60.52	-315.6	162.3	113.9	90.0	23.89	4.768		
5,777.8	5,633.9	5,627.5	5,588.7	13.8	13.3	-65.89	-328.2	169.1	113.1	88.0	25.06	4.513		
5,800.0	5,641.3	5,644.8	5,601.1	14.0	13.5	-70.22	-338.9	174.8	113.6	87.7	25.96	4.377		
5,850.0	5,654.5	5,684.3	5,627.9	14.5	13.8	-79.66	-364.5	188.5	118.8	91.0	27.75	4.281		
5,900.0	5,663.0	5,724.9	5,653.0	15.0	14.2	-88.19	-392.5	203.6	129.2	100.2	29.04	4.450		
5,950.0	5,666.8	5,766.7	5,676.2	15.6	14.6	-95.41	-423.2	220.0	144.2	114.3	29.90	4.824		
5,964.2	5,667.0	5,778.9	5,682.4	15.8	14.7	-97.21	-432.4	225.0	149.2	119.1	30.09	4.959		
6,000.0	5,667.0	5,810.7	5,697.5	16.2	15.1	-102.54	-457.0	238.2	162.5	132.2	30.37	5.351		
6,100.0	5,667.0	5,910.2	5,733.4	17.6	16.3	-111.47	-538.7	282.0	201.0	169.6	31.37	6.407		
6,200.0	5,667.0	6,021.4	5,751.8	19.1	18.0	-112.82	-635.2	333.8	234.3	200.5	33.84	6.924		
6,300.0	5,667.0	6,132.5	5,752.7	20.6	19.6	-110.27	-733.7	384.9	260.9	223.6	37.33	6.988		
6,400.0	5,667.0	6,245.0	5,752.7	22.2	21.3	-108.44	-836.4	430.9	282.4	241.6	40.85	6.914		
6,500.0	5,667.0	6,360.3	5,752.7	23.9	23.0	-107.24	-944.2	471.7	298.5	254.0	44.51	6.707		
6,543.0	5,667.0	6,410.6	5,752.7	24.7	23.8	-106.89	-992.0	487.4	303.7	257.6	46.09	6.588		
6,600.0	5,667.0	6,477.5	5,752.7	25.6	24.9	-106.54	-1,056.1	506.4	309.7	261.7	47.96	6.457		
6,700.0	5,667.0	6,595.7	5,752.7	27.1	26.8	-106.00	-1,170.9	534.4	319.6	268.4	51.11	6.253		
6,800.0	5,667.0	6,714.7	5,752.7	28.7	28.8	-105.54	-1,288.1	555.4	328.5	274.4	54.17	6.065		
6,900.0	5,667.0	6,834.5	5,752.7	30.3	30.7	-105.15	-1,407.0	569.1	336.5	279.4	57.11	5.893		
6,910.3	5,667.0	6,846.8	5,752.7	30.4	30.9	-105.11	-1,419.3	570.1	337.3	279.9	57.40	5.876		
7,000.0	5,667.0	6,955.0	5,752.7	31.9	32.6	-104.88	-1,527.4	575.3	341.5	280.8	60.69	5.627		
7,100.0	5,667.0	7,061.7	5,752.7	33.7	34.3	-104.87	-1,634.1	575.7	341.8	277.7	64.13	5.330		
7,200.0	5,667.0	7,161.7	5,752.7	35.4	35.9	-104.87	-1,734.1	575.7	341.8	274.3	67.49	5.064		
7,300.0	5,667.0	7,261.7	5,752.7	37.2	37.5	-104.87	-1,834.1	575.7	341.8	270.9	70.89	4.822		
7,400.0	5,667.0	7,361.7	5,752.7	38.9	39.2	-104.87	-1,934.1	575.7	341.8	267.5	74.32	4.599		
7,500.0	5,667.0	7,461.7	5,752.7	40.7	40.9	-104.87	-2,034.1	575.7	341.8	264.0	77.77	4.395		
7,600.0	5,667.0	7,561.7	5,752.7	42.5	42.6	-104.87	-2,134.1	575.7	341.8	260.5	81.25	4.206		
7,700.0	5,667.0	7,661.7	5,752.8	44.3	44.3	-104.88	-2,234.1	575.7	341.8	257.0	84.76	4.033		
7,800.0	5,667.0	7,761.7	5,752.8	46.2	46.1	-104.88	-2,334.1	575.7	341.8	253.5	88.28	3.872		
7,900.0	5,667.0	7,861.7	5,752.8	48.0	47.8	-104.88	-2,434.1	575.7	341.8	250.0	91.82	3.722		
8,000.0	5,667.0	7,961.7	5,752.8	49.8	49.6	-104.88	-2,534.1	575.7	341.8	246.4	95.37	3.584		
8,100.0	5,667.0	8,061.7	5,752.8	51.7	51.4	-104.88	-2,634.1	575.7	341.8	242.8	98.94	3.454		
8,200.0	5,667.0	8,161.7	5,752.8	53.5	53.1	-104.88	-2,734.1	575.7	341.8	239.3	102.51	3.334		
8,300.0	5,667.0	8,261.7	5,752.8	55.4	54.9	-104.88	-2,834.1	575.6	341.8	235.7	106.10	3.221		
8,400.0	5,667.0	8,361.7	5,752.8	57.2	56.8	-104.88	-2,934.1	575.6	341.8	232.1	109.70	3.115		
8,500.0	5,667.0	8,461.7	5,752.8	59.1	58.6	-104.88	-3,034.1	575.6	341.8	228.5	113.31	3.016		
8,600.0	5,667.0	8,561.7	5,752.8	61.0	60.4	-104.89	-3,134.1	575.6	341.8	224.8	116.92	2.923		
8,700.0	5,667.0	8,661.7	5,752.8	62.8	62.2	-104.89	-3,234.1	575.6	341.8	221.2	120.54	2.835		
8,800.0	5,667.0	8,761.7	5,752.8	64.7	64.0	-104.89	-3,334.1	575.6	341.7	217.6	124.17	2.752		
8,900.0	5,667.0	8,861.7	5,752.8	66.6	65.9	-104.89	-3,434.1	575.6	341.7	213.9	127.81	2.674		

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	Local Co-ordinate Reference:	Well Razor #27K-3407A
Project:	Weld County, CO	TVD Reference:	WELL @ 4767.5ft (Original Well Elev)
Reference Site:	S27-T10N-R58W	MD Reference:	WELL @ 4767.5ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Razor #27K-3407A	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design S27-T10N-R58W - Razor #27K-3408B - HZ - Plan #3												Offset Site Error:	0.0 ft
Survey Program: 0-ISCWSA MWD												Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Distance		Total		Separation		Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Uncertainty Axis	Factor	
9,000.0	5,667.0	8,961.7	5,752.8	68.5	67.7	-104.89	-3,534.1	575.6	341.7	210.3	131.45	2.600	
9,100.0	5,667.0	9,061.7	5,752.8	70.3	69.6	-104.89	-3,634.1	575.6	341.7	206.6	135.09	2.530	
9,200.0	5,667.0	9,161.7	5,752.8	72.2	71.4	-104.89	-3,734.1	575.6	341.7	203.0	138.74	2.463	
9,300.0	5,667.0	9,261.7	5,752.8	74.1	73.3	-104.89	-3,834.1	575.6	341.7	199.3	142.39	2.400	
9,400.0	5,667.0	9,361.7	5,752.8	76.0	75.1	-104.89	-3,934.1	575.6	341.7	195.7	146.05	2.340	
9,500.0	5,667.0	9,461.7	5,752.9	77.9	77.0	-104.90	-4,034.1	575.6	341.7	192.0	149.71	2.283	
9,600.0	5,667.0	9,561.7	5,752.9	79.8	78.8	-104.90	-4,134.1	575.6	341.7	188.3	153.37	2.228	
9,700.0	5,667.0	9,661.7	5,752.9	81.6	80.7	-104.90	-4,234.1	575.6	341.7	184.7	157.04	2.176	
9,800.0	5,667.0	9,761.7	5,752.9	83.5	82.6	-104.90	-4,334.1	575.6	341.7	181.0	160.71	2.126	
9,900.0	5,667.0	9,861.7	5,752.9	85.4	84.4	-104.90	-4,434.1	575.6	341.7	177.3	164.38	2.079	
10,000.0	5,667.0	9,961.7	5,752.9	87.3	86.3	-104.90	-4,534.1	575.6	341.7	173.6	168.06	2.033	
10,100.0	5,667.0	10,061.7	5,752.9	89.2	88.2	-104.90	-4,634.1	575.5	341.7	170.0	171.74	1.990	
10,200.0	5,667.0	10,161.7	5,752.9	91.1	90.1	-104.90	-4,734.1	575.5	341.7	166.3	175.42	1.948	
10,300.0	5,667.0	10,261.7	5,752.9	93.0	91.9	-104.90	-4,834.1	575.5	341.7	162.6	179.10	1.908	
10,400.0	5,667.0	10,361.7	5,752.9	94.9	93.8	-104.91	-4,934.1	575.5	341.7	158.9	182.78	1.869	
10,500.0	5,667.0	10,461.7	5,752.9	96.8	95.7	-104.91	-5,034.1	575.5	341.7	155.2	186.47	1.832	
10,600.0	5,667.0	10,561.7	5,752.9	98.7	97.6	-104.91	-5,134.1	575.5	341.7	151.5	190.16	1.797	
10,700.0	5,667.0	10,661.7	5,752.9	100.6	99.5	-104.91	-5,234.1	575.5	341.7	147.8	193.85	1.763	
10,800.0	5,667.0	10,761.7	5,752.9	102.5	101.4	-104.91	-5,334.1	575.5	341.7	144.1	197.54	1.730	
10,900.0	5,667.0	10,861.7	5,752.9	104.4	103.3	-104.91	-5,434.1	575.5	341.7	140.4	201.23	1.698	
11,000.0	5,667.0	10,961.7	5,752.9	106.3	105.1	-104.91	-5,534.1	575.5	341.7	136.7	204.92	1.667	
11,100.0	5,667.0	11,061.7	5,752.9	108.2	107.0	-104.91	-5,634.1	575.5	341.7	133.0	208.62	1.638	
11,200.0	5,667.0	11,161.7	5,752.9	110.1	108.9	-104.91	-5,734.1	575.5	341.7	129.3	212.31	1.609	
11,300.0	5,667.0	11,261.7	5,752.9	112.0	110.8	-104.92	-5,834.1	575.5	341.7	125.6	216.01	1.582	
11,400.0	5,667.0	11,361.7	5,753.0	113.9	112.7	-104.92	-5,934.1	575.5	341.6	121.9	219.71	1.555	
11,500.0	5,667.0	11,461.7	5,753.0	115.8	114.6	-104.92	-6,034.1	575.5	341.6	118.2	223.41	1.529	
11,600.0	5,667.0	11,561.7	5,753.0	117.7	116.5	-104.92	-6,134.1	575.5	341.6	114.5	227.11	1.504	
11,700.0	5,667.0	11,661.7	5,753.0	119.7	118.4	-104.92	-6,234.1	575.5	341.6	110.8	230.81	1.480 Level 3	
11,800.0	5,667.0	11,761.7	5,753.0	121.6	120.3	-104.92	-6,334.1	575.5	341.6	107.1	234.51	1.457 Level 3	
11,900.0	5,667.0	11,861.7	5,753.0	123.5	122.2	-104.92	-6,434.1	575.5	341.6	103.4	238.21	1.434 Level 3	
12,000.0	5,667.0	11,961.7	5,753.0	125.4	124.1	-104.92	-6,534.1	575.4	341.6	99.7	241.92	1.412 Level 3	
12,100.0	5,667.0	12,061.7	5,753.0	127.3	126.0	-104.92	-6,634.1	575.4	341.6	96.0	245.62	1.391 Level 3	
12,200.0	5,667.0	12,161.7	5,753.0	129.2	127.9	-104.92	-6,734.1	575.4	341.6	92.3	249.33	1.370 Level 3	
12,300.0	5,667.0	12,261.7	5,753.0	131.1	129.8	-104.93	-6,834.1	575.4	341.6	88.6	253.03	1.350 Level 3	
12,400.0	5,667.0	12,361.7	5,753.0	133.0	131.7	-104.93	-6,934.1	575.4	341.6	84.9	256.74	1.331 Level 3	
12,458.9	5,667.0	12,420.6	5,753.0	133.9	132.8	-104.93	-6,993.0	575.4	341.6	82.9	258.70	1.320 Level 3	
12,480.2	5,667.0	12,441.1	5,753.0	134.3	133.2	-104.93	-7,013.5	575.4	341.6	82.2	259.42	1.317 Level 3, SF	

Cathedral Energy Services

Anticollision Report

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Reference Site:	S27-T10N-R58W	MD Reference:	WELL @ 4767.5ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Razor #27K-3407A	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #3	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4767.5ft (Original Well Elev)
 Offset Depths are relative to Offset Datum
 Central Meridian is -105.500000 °

Coordinates are relative to: Razor #27K-3407A
 Coordinate System is US State Plane 1983, Colorado Northern Zone
 Grid Convergence at Surface is: 1.06°

