



Cathedral Energy Services

Survey Report

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well Razor #33O-2811A
Project:	Weld County, CO	TVD Reference:	KB=21 @ 4735.7usft (Frontier #9)
Site:	S33-T10N-R58W	MD Reference:	KB=21 @ 4735.7usft (Frontier #9)
Well:	Razor #33O-2811A	North Reference:	True
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

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		S33-T10N-R58W			
Site Position:		Northing:	1,534,460.86 usft	Latitude:	40.789186
From:	Lat/Long	Easting:	3,449,473.56 usft	Longitude:	-103.876742
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16"	Grid Convergence:	1.05 °

Well		Razor #33O-2811A				
Well Position	+N/-S	0.0 usft	Northing:	1,534,282.33 usft	Latitude:	40.788564
	+E/-W	0.0 usft	Easting:	3,452,098.81 usft	Longitude:	-103.867275
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	4,714.7 usft

Wellbore	HZ				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	12/10/2014	7.93	67.38	53,056

Design	FINAL				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	359.92	

Survey Program	Date	1/8/2015			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
166.0	13,152.0	Survey #1 (HZ)	ISCWSA MWD	MWD - ISCWSA	

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	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00		
166.0	0.58	152.21	166.0	-0.7	0.4	-0.7	0.35	0.35		
258.0	0.47	144.14	258.0	-1.5	0.8	-1.5	0.14	-0.12		
350.0	0.18	113.11	350.0	-1.8	1.2	-1.8	0.36	-0.32		
442.0	0.60	103.76	442.0	-2.0	1.8	-2.0	0.46	0.46		
535.0	0.26	146.02	535.0	-2.3	2.4	-2.3	0.48	-0.37		
628.0	0.17	116.75	628.0	-2.5	2.6	-2.5	0.15	-0.10		
720.0	0.09	75.80	720.0	-2.6	2.8	-2.6	0.13	-0.09		
812.0	0.33	82.47	812.0	-2.5	3.1	-2.5	0.26	0.26		
905.0	0.04	134.58	905.0	-2.5	3.4	-2.5	0.33	-0.31		
997.0	1.74	222.43	997.0	-3.6	2.5	-3.6	1.89	1.85		
1,088.0	2.62	195.57	1,087.9	-6.6	1.0	-6.6	1.46	0.97		
1,181.0	3.25	196.21	1,180.8	-11.2	-0.3	-11.2	0.68	0.68		

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Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

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1,273.0	3.93	194.74	1,272.6	-16.7	-1.8	-16.7	0.75	0.74	
1,366.0	4.27	197.27	1,365.4	-23.1	-3.7	-23.1	0.41	0.37	
1,458.0	4.22	200.07	1,457.1	-29.5	-5.8	-29.5	0.23	-0.05	
1,510.0	4.09	195.36	1,509.0	-33.1	-7.0	-33.1	0.70	-0.25	
1,577.0	3.86	199.03	1,575.8	-37.6	-8.3	-37.6	0.51	-0.34	
1,670.0	3.73	195.79	1,668.6	-43.4	-10.2	-43.4	0.27	-0.14	
1,762.0	3.80	181.53	1,760.4	-49.4	-11.1	-49.4	1.02	0.08	
1,854.0	3.51	176.24	1,852.2	-55.2	-11.0	-55.2	0.48	-0.32	
1,945.0	3.48	169.43	1,943.1	-60.7	-10.3	-60.7	0.46	-0.03	
2,037.0	4.17	195.33	2,034.9	-66.7	-10.7	-66.7	2.00	0.75	
2,128.0	3.41	196.88	2,125.7	-72.5	-12.3	-72.5	0.84	-0.84	
2,221.0	3.03	195.16	2,218.5	-77.5	-13.8	-77.5	0.42	-0.41	
2,313.0	4.47	209.85	2,310.3	-82.9	-16.2	-82.9	1.87	1.57	
2,406.0	5.05	216.99	2,403.0	-89.4	-20.5	-89.3	0.89	0.62	
2,498.0	6.80	205.65	2,494.5	-97.5	-25.3	-97.5	2.28	1.90	
2,590.0	7.13	209.29	2,585.8	-107.4	-30.4	-107.4	0.60	0.36	
2,683.0	7.51	192.62	2,678.1	-118.4	-34.6	-118.3	2.31	0.41	
2,776.0	5.47	182.74	2,770.5	-128.7	-36.1	-128.7	2.49	-2.19	
2,868.0	5.32	178.43	2,862.1	-137.4	-36.2	-137.3	0.47	-0.16	
2,960.0	4.54	172.95	2,953.7	-145.2	-35.6	-145.2	0.99	-0.85	
3,052.0	4.60	174.53	3,045.4	-152.5	-34.8	-152.5	0.15	0.07	
3,144.0	4.47	169.21	3,137.1	-159.7	-33.8	-159.7	0.48	-0.14	
3,236.0	4.40	164.92	3,228.9	-166.7	-32.2	-166.6	0.37	-0.08	
3,329.0	4.11	158.72	3,321.6	-173.2	-30.1	-173.2	0.58	-0.31	
3,421.0	4.37	157.70	3,413.4	-179.5	-27.6	-179.5	0.29	0.28	
3,513.0	4.98	183.12	3,505.1	-186.7	-26.4	-186.7	2.33	0.66	
3,606.0	4.66	175.78	3,597.7	-194.5	-26.4	-194.5	0.75	-0.34	
3,699.0	4.45	173.69	3,690.4	-201.9	-25.7	-201.9	0.29	-0.23	
3,791.0	3.45	175.65	3,782.2	-208.2	-25.1	-208.2	1.10	-1.09	
3,883.0	3.35	174.10	3,874.1	-213.6	-24.6	-213.6	0.15	-0.11	
3,975.0	3.83	170.73	3,965.9	-219.3	-23.8	-219.3	0.57	0.52	
4,068.0	3.96	170.03	4,058.7	-225.6	-22.8	-225.5	0.15	0.14	
4,160.0	3.80	168.36	4,150.5	-231.7	-21.6	-231.7	0.21	-0.17	
4,252.0	4.02	177.48	4,242.2	-237.9	-20.9	-237.9	0.72	0.24	
4,344.0	4.11	172.46	4,334.0	-244.4	-20.3	-244.4	0.40	0.10	
4,435.0	3.66	164.93	4,424.8	-250.4	-19.1	-250.4	0.75	-0.49	
4,527.0	3.07	177.42	4,516.6	-255.7	-18.2	-255.7	1.02	-0.64	
4,619.0	1.45	172.44	4,608.6	-259.3	-18.0	-259.3	1.77	-1.76	
4,711.0	1.05	153.03	4,700.5	-261.2	-17.4	-261.2	0.63	-0.43	
4,804.0	1.12	148.46	4,793.5	-262.8	-16.6	-262.8	0.12	0.08	
4,896.0	1.22	168.90	4,885.5	-264.5	-15.9	-264.5	0.46	0.11	
4,988.0	0.83	178.97	4,977.5	-266.1	-15.7	-266.1	0.47	-0.42	
5,080.0	6.95	6.34	5,069.3	-261.3	-15.1	-261.2	8.45	6.65	
5,172.0	13.58	13.55	5,159.8	-245.2	-11.9	-245.2	7.33	7.21	
5,264.0	19.96	356.12	5,247.9	-219.0	-10.5	-219.0	8.76	6.93	
5,356.0	25.58	353.69	5,332.7	-183.6	-13.7	-183.5	6.19	6.11	
5,449.0	40.47	359.65	5,410.5	-133.1	-16.1	-133.1	16.37	16.01	
5,541.0	54.52	356.90	5,472.5	-65.5	-18.3	-65.5	15.43	15.27	
5,571.0	55.37	356.93	5,489.7	-41.0	-19.7	-41.0	2.83	2.83	
5,602.0	55.01	357.40	5,507.4	-15.6	-20.9	-15.5	1.70	-1.16	
5,633.0	54.90	357.33	5,525.2	9.8	-22.1	9.8	0.40	-0.35	
5,663.0	56.08	359.11	5,542.2	34.5	-22.9	34.5	6.27	3.93	
5,693.0	58.76	0.77	5,558.3	59.8	-22.9	59.8	10.08	8.93	

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Survey									
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5,724.0	61.26	2.43	5,573.8	86.6	-22.1	86.6	9.30	8.06	
5,754.0	62.23	3.14	5,588.0	113.0	-20.8	113.0	3.85	3.23	
5,785.0	65.50	2.28	5,601.7	140.8	-19.5	140.8	10.84	10.55	
5,816.0	68.65	2.85	5,613.8	169.3	-18.2	169.3	10.30	10.16	
5,847.0	71.41	0.88	5,624.4	198.4	-17.3	198.4	10.72	8.90	
5,878.0	73.49	1.91	5,633.7	228.0	-16.6	228.0	7.42	6.71	
5,909.0	76.86	2.32	5,641.6	257.9	-15.5	257.9	10.95	10.87	
5,943.0	81.75	1.24	5,647.9	291.3	-14.4	291.3	14.72	14.38	
6,072.0	87.82	358.21	5,659.7	419.7	-15.1	419.7	5.25	4.71	
6,166.0	90.65	359.45	5,660.9	513.6	-17.0	513.7	3.29	3.01	
6,261.0	91.24	0.77	5,659.3	608.6	-16.8	608.6	1.52	0.62	
6,355.0	90.30	359.96	5,658.1	702.6	-16.2	702.6	1.32	-1.00	
6,449.0	91.81	359.01	5,656.4	796.6	-17.1	796.6	1.90	1.61	
6,544.0	91.41	358.28	5,653.7	891.5	-19.3	891.5	0.88	-0.42	
6,638.0	93.71	359.73	5,649.5	985.4	-20.9	985.4	2.89	2.45	
6,733.0	92.79	1.42	5,644.1	1,080.2	-20.0	1,080.3	2.02	-0.97	
6,828.0	92.69	0.90	5,639.6	1,175.1	-18.1	1,175.1	0.56	-0.11	
6,922.0	92.55	0.28	5,635.3	1,269.0	-17.1	1,269.0	0.68	-0.15	
7,017.0	91.72	2.35	5,631.7	1,363.9	-14.9	1,363.9	2.35	-0.87	
7,112.0	89.40	2.28	5,630.8	1,458.8	-11.1	1,458.8	2.44	-2.44	
7,206.0	89.67	1.97	5,631.6	1,552.8	-7.6	1,552.8	0.44	0.29	
7,300.0	89.71	1.94	5,632.1	1,646.7	-4.4	1,646.7	0.05	0.04	
7,395.0	88.94	0.26	5,633.2	1,741.7	-2.6	1,741.7	1.95	-0.81	
7,489.0	89.05	359.91	5,634.8	1,835.7	-2.4	1,835.7	0.39	0.12	
7,584.0	90.09	3.00	5,635.5	1,930.6	0.0	1,930.6	3.43	1.09	
7,679.0	91.53	5.56	5,634.2	2,025.3	7.1	2,025.3	3.09	1.52	
7,773.0	89.92	6.39	5,633.0	2,118.8	16.9	2,118.8	1.93	-1.71	
7,869.0	88.00	2.82	5,634.8	2,214.5	24.6	2,214.4	4.22	-2.00	
7,964.0	86.79	359.33	5,639.1	2,309.3	26.4	2,309.3	3.88	-1.27	
8,059.0	89.35	0.99	5,642.3	2,404.3	26.6	2,404.2	3.21	2.69	
8,154.0	94.60	0.66	5,639.0	2,499.2	28.0	2,499.1	5.54	5.53	
8,246.0	95.04	359.86	5,631.3	2,590.8	28.4	2,590.8	0.99	0.48	
8,338.0	92.85	358.67	5,624.9	2,682.6	27.2	2,682.6	2.71	-2.38	
8,430.0	91.01	358.01	5,621.8	2,774.5	24.6	2,774.5	2.12	-2.00	
8,523.0	90.28	357.97	5,620.8	2,867.4	21.3	2,867.4	0.79	-0.78	
8,616.0	89.76	357.05	5,620.8	2,960.3	17.3	2,960.3	1.14	-0.56	
8,708.0	89.39	357.80	5,621.4	3,052.2	13.1	3,052.2	0.91	-0.40	
8,800.0	89.96	0.68	5,622.0	3,144.2	11.9	3,144.2	3.19	0.62	
8,892.0	88.93	0.73	5,622.9	3,236.2	13.0	3,236.2	1.12	-1.12	
8,984.0	89.73	1.29	5,623.9	3,328.2	14.7	3,328.2	1.06	0.87	
9,075.0	91.22	2.05	5,623.2	3,419.1	17.3	3,419.1	1.84	1.64	
9,167.0	90.91	1.66	5,621.5	3,511.1	20.3	3,511.1	0.54	-0.34	
9,259.0	90.54	0.31	5,620.3	3,603.1	21.9	3,603.0	1.52	-0.40	
9,352.0	90.39	0.68	5,619.6	3,696.1	22.7	3,696.0	0.43	-0.16	
9,444.0	90.36	1.91	5,618.9	3,788.0	24.7	3,788.0	1.34	-0.03	
9,536.0	90.07	359.60	5,618.6	3,880.0	26.0	3,880.0	2.53	-0.32	
9,629.0	93.01	1.15	5,616.1	3,973.0	26.6	3,972.9	3.57	3.16	
9,722.0	91.43	359.08	5,612.5	4,065.9	26.8	4,065.8	2.80	-1.70	
9,814.0	91.66	358.50	5,610.0	4,157.8	24.8	4,157.8	0.68	0.25	
9,906.0	91.05	359.89	5,607.8	4,249.8	23.5	4,249.8	1.65	-0.66	
9,999.0	87.69	358.91	5,608.9	4,342.8	22.5	4,342.7	3.76	-3.61	
10,091.0	90.72	0.47	5,610.1	4,434.7	22.0	4,434.7	3.70	3.29	
10,182.0	90.51	359.78	5,609.2	4,525.7	22.2	4,525.7	0.79	-0.23	

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10,275.0	90.33	3.00	5,608.5	4,618.7	24.5	4,618.7	3.47	-0.19	
10,367.0	90.66	4.76	5,607.7	4,710.5	30.7	4,710.4	1.95	0.36	
10,459.0	88.93	3.04	5,608.0	4,802.3	37.0	4,802.2	2.65	-1.88	
10,551.0	87.85	0.24	5,610.6	4,894.2	39.6	4,894.1	3.26	-1.17	
10,644.0	87.95	0.55	5,614.0	4,987.1	40.3	4,987.0	0.35	0.11	
10,737.0	88.95	358.21	5,616.5	5,080.1	39.3	5,080.0	2.74	1.08	
10,829.0	88.33	357.78	5,618.7	5,172.0	36.0	5,171.9	0.82	-0.67	
10,921.0	90.86	357.58	5,619.4	5,263.9	32.3	5,263.8	2.76	2.75	
11,013.0	90.30	356.82	5,618.4	5,355.8	27.8	5,355.7	1.03	-0.61	
11,106.0	90.42	357.56	5,617.8	5,448.7	23.3	5,448.6	0.81	0.13	
11,198.0	89.99	357.88	5,617.5	5,540.6	19.6	5,540.6	0.58	-0.47	
11,291.0	92.15	358.80	5,615.8	5,633.5	16.9	5,633.5	2.52	2.32	
11,383.0	92.83	358.47	5,611.8	5,725.4	14.7	5,725.4	0.82	0.74	
11,474.0	92.89	357.58	5,607.2	5,816.2	11.6	5,816.2	0.98	0.07	
11,566.0	90.85	357.72	5,604.2	5,908.1	7.8	5,908.1	2.22	-2.22	
11,657.0	89.27	1.16	5,604.1	5,999.1	6.9	5,999.1	4.16	-1.74	
11,750.0	88.72	1.02	5,605.8	6,092.1	8.7	6,092.0	0.61	-0.59	
11,842.0	88.80	0.89	5,607.8	6,184.0	10.2	6,184.0	0.17	0.09	
11,934.0	88.26	359.71	5,610.1	6,276.0	10.7	6,276.0	1.41	-0.59	
12,026.0	87.81	359.38	5,613.3	6,367.9	10.0	6,367.9	0.61	-0.49	
12,118.0	87.55	358.80	5,617.0	6,459.8	8.5	6,459.8	0.69	-0.28	
12,210.0	89.03	359.39	5,619.8	6,551.8	7.1	6,551.8	1.73	1.61	
12,301.0	87.74	357.93	5,622.3	6,642.7	4.9	6,642.7	2.14	-1.42	
12,394.0	89.42	359.32	5,624.6	6,735.7	2.7	6,735.7	2.34	1.81	
12,486.0	88.69	358.56	5,626.1	6,827.6	1.0	6,827.6	1.15	-0.79	
12,579.0	88.09	357.92	5,628.8	6,920.6	-1.8	6,920.5	0.94	-0.65	
12,670.0	89.32	358.74	5,630.8	7,011.5	-4.5	7,011.5	1.62	1.35	
12,762.0	88.24	357.25	5,632.8	7,103.4	-7.7	7,103.4	2.00	-1.17	
12,854.0	89.44	358.95	5,634.6	7,195.4	-10.8	7,195.4	2.26	1.30	
12,947.0	89.42	359.90	5,635.6	7,288.3	-11.7	7,288.4	1.02	-0.02	
13,039.0	88.66	359.99	5,637.1	7,380.3	-11.8	7,380.3	0.83	-0.83	
13,097.0	88.44	0.15	5,638.6	7,438.3	-11.7	7,438.3	0.47	-0.38	Last CES Survey @ 13,097' MD
13,152.0	88.44	0.15	5,640.1	7,493.3	-11.6	7,493.3	0.00	0.00	PTB @ 13,152' - TD - 2547' FSL, 1823' FEL

Cathedral Energy Services

Survey Report

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well Razor #33O-2811A
Project:	Weld County, CO	TVD Reference:	KB=21 @ 4735.7usft (Frontier #9)
Site:	S33-T10N-R58W	MD Reference:	KB=21 @ 4735.7usft (Frontier #9)
Well:	Razor #33O-2811A	North Reference:	True
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Targets									
Target Name									
- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- Shape	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
33O-2811A PBHL (P5)	0.00	1.05	5,630.0	7,493.2	-10.8	1,541,774.10	3,451,950.08	40.809131	-103.867314
- actual wellpath misses target center by 10.1usft at 13151.7usft MD (5640.1 TVD, 7493.0 N, -11.6 E)									
- Point									
33O-2811A PBHL (P3)	0.00	1.05	5,643.0	7,493.2	-10.8	1,541,774.10	3,451,950.08	40.809131	-103.867314
- actual wellpath misses target center by 3.0usft at 13152.0usft MD (5640.1 TVD, 7493.3 N, -11.6 E)									
- Point									
33O-2811A PBHL	0.00	1.05	5,623.0	7,493.2	-10.8	1,541,774.10	3,451,950.08	40.809131	-103.867314
- actual wellpath misses target center by 17.1usft at 13151.5usft MD (5640.0 TVD, 7492.8 N, -11.6 E)									
- Point									
33O-2811A VP (P3)	0.00	1.05	4,822.1	-250.8	-10.8	1,534,031.38	3,452,092.66	40.787875	-103.867314
- actual wellpath misses target center by 13.6usft at 4832.4usft MD (4821.9 TVD, -263.3 N, -16.3 E)									
- Point									
33O-2811A VP	0.00	1.05	4,802.1	-250.8	-10.8	1,534,031.38	3,452,092.66	40.787875	-103.867314
- actual wellpath misses target center by 13.4usft at 4812.4usft MD (4801.9 TVD, -262.9 N, -16.5 E)									
- Point									
33O-2811A VP (P5)	0.00	1.05	4,809.1	-250.8	-10.8	1,534,031.38	3,452,092.66	40.787875	-103.867314
- actual wellpath misses target center by 13.5usft at 4819.4usft MD (4808.9 TVD, -263.0 N, -16.4 E)									
- Point									

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
5,993.0	5,654.1	7" - 671' FSL, 1902' FEL	0	0	

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
13,097.0	5,638.6	7,438.3	-11.7	Last CES Survey @ 13,097' MD	
13,152.0	5,640.1	7,493.3	-11.6	PTB @ 13,152'	
13,152.0	5,640.1	7,493.3	-11.6	TD - 2547' FSL, 1823' FEL	

Checked By: _____	Approved By: _____	Date: _____
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Whiting Petroleum Corporation

Weld County, CO

S33-T10N-R58W

Razor #33O-2811A

HZ

Design: FINAL

Survey Report - Geographic

08 January, 2015

Cathedral Energy Services

Survey Report - Geographic

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well Razor #33O-2811A
Project:	Weld County, CO	TVD Reference:	KB=21 @ 4735.7usft (Frontier #9)
Site:	S33-T10N-R58W	MD Reference:	KB=21 @ 4735.7usft (Frontier #9)
Well:	Razor #33O-2811A	North Reference:	True
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

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		S33-T10N-R58W							
Site Position:		Northing:	1,534,460.86	usft	Latitude:	40.789186			
From:	Lat/Long	Easting:	3,449,473.55	usft	Longitude:	-103.876742			
Position Uncertainty:		0.0	usft	Slot Radius:	13-3/16	"	Grid Convergence:	1.05	°

Well		Razor #33O-2811A				
Well Position	+N/-S	0.0 usft	Northing:	1,534,282.34 usft	Latitude:	40.788564
	+E/-W	0.0 usft	Easting:	3,452,098.81 usft	Longitude:	-103.867275
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	4,714.7 usft

Wellbore	HZ				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	12/10/2014	7.93	67.38	53,056

Design	FINAL				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	359.92	

Survey Program	Date	1/8/2015			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
166.0	13,152.0	Survey #1 (HZ)	ISCWSA MWD	MWD - ISCWSA	

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
0.0	0.00	0.00	0.0	0.0	0.0	1,534,282.34	3,452,098.81	40.788564	-103.867275	
166.0	0.58	152.21	166.0	-0.7	0.4	1,534,281.60	3,452,099.21	40.788562	-103.867274	
258.0	0.47	144.14	258.0	-1.5	0.8	1,534,280.89	3,452,099.66	40.788560	-103.867272	
350.0	0.18	113.11	350.0	-1.8	1.2	1,534,280.54	3,452,100.02	40.788559	-103.867271	
442.0	0.60	103.76	442.0	-2.0	1.8	1,534,280.38	3,452,100.63	40.788558	-103.867269	
535.0	0.26	146.02	535.0	-2.3	2.4	1,534,280.10	3,452,101.22	40.788558	-103.867267	
628.0	0.17	116.75	628.0	-2.5	2.6	1,534,279.86	3,452,101.47	40.788557	-103.867266	
720.0	0.09	75.80	720.0	-2.6	2.8	1,534,279.82	3,452,101.66	40.788557	-103.867265	
812.0	0.33	82.47	812.0	-2.5	3.1	1,534,279.88	3,452,101.99	40.788557	-103.867264	
905.0	0.04	134.58	905.0	-2.5	3.4	1,534,279.90	3,452,102.28	40.788557	-103.867263	
997.0	1.74	222.43	997.0	-3.6	2.5	1,534,278.83	3,452,101.38	40.788554	-103.867266	
1,088.0	2.62	195.57	1,087.9	-6.6	1.0	1,534,275.78	3,452,099.95	40.788546	-103.867272	

Cathedral Energy Services

Survey Report - Geographic

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well Razor #330-2811A
Project:	Weld County, CO	TVD Reference:	KB=21 @ 4735.7usft (Frontier #9)
Site:	S33-T10N-R58W	MD Reference:	KB=21 @ 4735.7usft (Frontier #9)
Well:	Razor #330-2811A	North Reference:	True
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
1,181.0	3.25	196.21	1,180.8	-11.2	-0.3	1,534,271.18	3,452,098.72	40.788533	-103.867276
1,273.0	3.93	194.74	1,272.6	-16.7	-1.8	1,534,265.60	3,452,097.30	40.788518	-103.867282
1,366.0	4.27	197.27	1,365.4	-23.1	-3.7	1,534,259.17	3,452,095.58	40.788500	-103.867288
1,458.0	4.22	200.07	1,457.1	-29.5	-5.8	1,534,252.69	3,452,093.52	40.788483	-103.867296
1,510.0	4.09	195.36	1,509.0	-33.1	-7.0	1,534,249.08	3,452,092.44	40.788473	-103.867300
1,577.0	3.86	199.03	1,575.8	-37.6	-8.3	1,534,244.62	3,452,091.15	40.788461	-103.867305
1,670.0	3.73	195.79	1,668.6	-43.4	-10.2	1,534,238.72	3,452,089.41	40.788445	-103.867312
1,762.0	3.80	181.53	1,760.4	-49.4	-11.1	1,534,232.77	3,452,088.63	40.788428	-103.867315
1,854.0	3.51	176.24	1,852.2	-55.2	-11.0	1,534,226.92	3,452,088.84	40.788412	-103.867315
1,945.0	3.48	169.43	1,943.1	-60.7	-10.3	1,534,221.44	3,452,089.63	40.788397	-103.867312
2,037.0	4.17	195.33	2,034.9	-66.7	-10.7	1,534,215.46	3,452,089.37	40.788381	-103.867314
2,128.0	3.41	196.88	2,125.7	-72.5	-12.3	1,534,209.65	3,452,087.81	40.788365	-103.867320
2,221.0	3.03	195.16	2,218.5	-77.5	-13.8	1,534,204.61	3,452,086.46	40.788351	-103.867325
2,313.0	4.47	209.85	2,310.3	-82.9	-16.2	1,534,199.10	3,452,084.14	40.788336	-103.867334
2,406.0	5.05	216.99	2,403.0	-89.4	-20.5	1,534,192.61	3,452,079.99	40.788319	-103.867349
2,498.0	6.80	205.65	2,494.5	-97.5	-25.3	1,534,184.38	3,452,075.35	40.788296	-103.867366
2,590.0	7.13	209.29	2,585.8	-107.4	-30.4	1,534,174.40	3,452,070.38	40.788269	-103.867385
2,683.0	7.51	192.62	2,678.1	-118.4	-34.6	1,534,163.36	3,452,066.43	40.788239	-103.867400
2,776.0	5.47	182.74	2,770.5	-128.7	-36.1	1,534,152.97	3,452,065.08	40.788211	-103.867406
2,868.0	5.32	178.43	2,862.1	-137.4	-36.2	1,534,144.33	3,452,065.15	40.788187	-103.867406
2,960.0	4.54	172.95	2,953.7	-145.2	-35.6	1,534,136.46	3,452,065.86	40.788165	-103.867404
3,052.0	4.60	174.53	3,045.4	-152.5	-34.8	1,534,129.19	3,452,066.79	40.788145	-103.867401
3,144.0	4.47	169.21	3,137.1	-159.7	-33.8	1,534,122.02	3,452,067.94	40.788126	-103.867397
3,236.0	4.40	164.92	3,228.9	-166.7	-32.2	1,534,115.12	3,452,069.66	40.788106	-103.867392
3,329.0	4.11	158.72	3,321.6	-173.2	-30.1	1,534,108.61	3,452,071.92	40.788089	-103.867384
3,421.0	4.37	157.70	3,413.4	-179.5	-27.6	1,534,102.34	3,452,074.56	40.788071	-103.867375
3,513.0	4.98	183.12	3,505.1	-186.7	-26.4	1,534,095.14	3,452,075.81	40.788051	-103.867371
3,606.0	4.66	175.78	3,597.7	-194.5	-26.4	1,534,087.34	3,452,076.01	40.788030	-103.867371
3,699.0	4.45	173.69	3,690.4	-201.9	-25.7	1,534,080.00	3,452,076.82	40.788010	-103.867368
3,791.0	3.45	175.65	3,782.2	-208.2	-25.1	1,534,073.70	3,452,077.54	40.787992	-103.867366
3,883.0	3.35	174.10	3,874.1	-213.6	-24.6	1,534,068.28	3,452,078.12	40.787978	-103.867364
3,975.0	3.83	170.73	3,965.9	-219.3	-23.8	1,534,062.59	3,452,079.00	40.787962	-103.867361
4,068.0	3.96	170.03	4,058.7	-225.6	-22.8	1,534,056.38	3,452,080.17	40.787945	-103.867358
4,160.0	3.80	168.36	4,150.5	-231.7	-21.6	1,534,050.29	3,452,081.45	40.787928	-103.867353
4,252.0	4.02	177.48	4,242.2	-237.9	-20.9	1,534,044.10	3,452,082.32	40.787911	-103.867351
4,344.0	4.11	172.46	4,334.0	-244.4	-20.3	1,534,037.62	3,452,083.01	40.787893	-103.867349
4,435.0	3.66	164.93	4,424.8	-250.4	-19.1	1,534,031.60	3,452,084.31	40.787877	-103.867344
4,527.0	3.07	177.42	4,516.6	-255.7	-18.2	1,534,026.32	3,452,085.28	40.787862	-103.867341
4,619.0	1.45	172.44	4,608.6	-259.3	-18.0	1,534,022.71	3,452,085.61	40.787852	-103.867340
4,711.0	1.05	153.03	4,700.5	-261.2	-17.4	1,534,020.82	3,452,086.18	40.787847	-103.867338
4,804.0	1.12	148.46	4,793.5	-262.8	-16.6	1,534,019.30	3,452,087.07	40.787843	-103.867335
4,896.0	1.22	168.90	4,885.5	-264.5	-15.9	1,534,017.59	3,452,087.76	40.787838	-103.867333
4,988.0	0.83	178.97	4,977.5	-266.1	-15.7	1,534,015.96	3,452,087.99	40.787833	-103.867332
5,080.0	6.95	6.34	5,069.3	-261.3	-15.1	1,534,020.85	3,452,088.53	40.787847	-103.867330
5,172.0	13.58	13.55	5,159.8	-245.2	-11.9	1,534,036.95	3,452,091.38	40.787891	-103.867318
5,264.0	19.96	356.12	5,247.9	-219.0	-10.5	1,534,063.19	3,452,092.37	40.787963	-103.867313
5,356.0	25.58	353.69	5,332.7	-183.6	-13.7	1,534,098.56	3,452,088.47	40.788060	-103.867325
5,449.0	40.47	359.65	5,410.5	-133.1	-16.1	1,534,148.94	3,452,085.13	40.788199	-103.867333
5,541.0	54.52	356.90	5,472.5	-65.5	-18.3	1,534,216.50	3,452,081.67	40.788384	-103.867342
5,571.0	55.37	356.93	5,489.7	-41.0	-19.7	1,534,240.99	3,452,079.90	40.788451	-103.867346
5,602.0	55.01	357.40	5,507.4	-15.6	-20.9	1,534,266.38	3,452,078.17	40.788521	-103.867351
5,633.0	54.90	357.33	5,525.2	9.8	-22.1	1,534,291.71	3,452,076.54	40.788591	-103.867355
5,663.0	56.08	359.11	5,542.2	34.5	-22.9	1,534,316.40	3,452,075.32	40.788659	-103.867358
5,693.0	58.76	0.77	5,558.3	59.8	-22.9	1,534,341.67	3,452,074.83	40.788728	-103.867358
5,724.0	61.26	2.43	5,573.8	86.6	-22.1	1,534,368.51	3,452,075.09	40.788802	-103.867355

Cathedral Energy Services

Survey Report - Geographic

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well Razor #33O-2811A
Project:	Weld County, CO	TVD Reference:	KB=21 @ 4735.7usft (Frontier #9)
Site:	S33-T10N-R58W	MD Reference:	KB=21 @ 4735.7usft (Frontier #9)
Well:	Razor #33O-2811A	North Reference:	True
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
5,754.0	62.23	3.14	5,588.0	113.0	-20.8	1,534,394.93	3,452,075.89	40.788874	-103.867351
5,785.0	65.50	2.28	5,601.7	140.8	-19.5	1,534,422.74	3,452,076.69	40.788950	-103.867346
5,816.0	68.65	2.85	5,613.8	169.3	-18.2	1,534,451.28	3,452,077.45	40.789029	-103.867341
5,847.0	71.41	0.88	5,624.4	198.4	-17.3	1,534,480.41	3,452,077.85	40.789109	-103.867338
5,878.0	73.49	1.91	5,633.7	228.0	-16.6	1,534,509.96	3,452,078.03	40.789190	-103.867335
5,909.0	76.86	2.32	5,641.6	257.9	-15.5	1,534,539.92	3,452,078.58	40.789272	-103.867331
5,943.0	81.75	1.24	5,647.9	291.3	-14.4	1,534,573.32	3,452,079.00	40.789363	-103.867327
6,072.0	87.82	358.21	5,659.7	419.7	-15.1	1,534,701.66	3,452,076.01	40.789716	-103.867330
6,166.0	90.65	359.45	5,660.9	513.6	-17.0	1,534,795.57	3,452,072.36	40.789974	-103.867337
6,261.0	91.24	0.77	5,659.3	608.6	-16.8	1,534,890.54	3,452,070.79	40.790234	-103.867336
6,355.0	90.30	359.96	5,658.1	702.6	-16.2	1,534,984.52	3,452,069.66	40.790492	-103.867334
6,449.0	91.81	359.01	5,656.4	796.6	-17.1	1,535,078.47	3,452,067.09	40.790750	-103.867337
6,544.0	91.41	358.28	5,653.7	891.5	-19.3	1,535,173.35	3,452,063.09	40.791011	-103.867345
6,638.0	93.71	359.73	5,649.5	985.4	-20.9	1,535,267.18	3,452,059.73	40.791269	-103.867351
6,733.0	92.79	1.42	5,644.1	1,080.2	-20.0	1,535,362.02	3,452,058.94	40.791529	-103.867347
6,828.0	92.69	0.90	5,639.6	1,175.1	-18.1	1,535,456.91	3,452,059.11	40.791789	-103.867340
6,922.0	92.55	0.28	5,635.3	1,269.0	-17.1	1,535,550.81	3,452,058.35	40.792047	-103.867337
7,017.0	91.72	2.35	5,631.7	1,363.9	-14.9	1,535,645.74	3,452,058.78	40.792307	-103.867329
7,112.0	89.40	2.28	5,630.8	1,458.8	-11.1	1,535,740.70	3,452,060.87	40.792568	-103.867315
7,206.0	89.67	1.97	5,631.6	1,552.8	-7.6	1,535,834.68	3,452,062.63	40.792826	-103.867303
7,300.0	89.71	1.94	5,632.1	1,646.7	-4.4	1,535,928.67	3,452,064.10	40.793084	-103.867291
7,395.0	88.94	0.26	5,633.2	1,741.7	-2.6	1,536,023.66	3,452,064.18	40.793344	-103.867285
7,489.0	89.05	359.91	5,634.8	1,835.7	-2.4	1,536,117.63	3,452,062.59	40.793602	-103.867284
7,584.0	90.09	3.00	5,635.5	1,930.6	0.0	1,536,212.61	3,452,063.25	40.793863	-103.867275
7,679.0	91.53	5.56	5,634.2	2,025.3	7.1	1,536,307.44	3,452,068.59	40.794123	-103.867250
7,773.0	89.92	6.39	5,633.0	2,118.8	16.9	1,536,401.09	3,452,076.66	40.794379	-103.867214
7,869.0	88.00	2.82	5,634.8	2,214.5	24.6	1,536,496.87	3,452,082.60	40.794642	-103.867187
7,964.0	86.79	359.33	5,639.1	2,309.3	26.4	1,536,591.75	3,452,082.63	40.794902	-103.867180
8,059.0	89.35	0.99	5,642.3	2,404.3	26.6	1,536,686.67	3,452,081.15	40.795163	-103.867179
8,154.0	94.60	0.66	5,639.0	2,499.2	28.0	1,536,781.58	3,452,080.77	40.795423	-103.867174
8,246.0	95.04	359.86	5,631.3	2,590.8	28.4	1,536,873.25	3,452,079.50	40.795675	-103.867173
8,338.0	92.85	358.67	5,624.9	2,682.6	27.2	1,536,964.98	3,452,076.63	40.795927	-103.867177
8,430.0	91.01	358.01	5,621.8	2,774.5	24.6	1,537,056.82	3,452,072.28	40.796179	-103.867187
8,523.0	90.28	357.97	5,620.8	2,867.4	21.3	1,537,149.68	3,452,067.30	40.796434	-103.867198
8,616.0	89.76	357.05	5,620.8	2,960.3	17.3	1,537,242.50	3,452,061.55	40.796689	-103.867213
8,708.0	89.39	357.80	5,621.4	3,052.2	13.1	1,537,334.31	3,452,055.73	40.796941	-103.867228
8,800.0	89.96	0.68	5,622.0	3,144.2	11.9	1,537,426.25	3,452,052.82	40.797194	-103.867232
8,892.0	88.93	0.73	5,622.9	3,236.2	13.0	1,537,518.25	3,452,052.25	40.797446	-103.867228
8,984.0	89.73	1.29	5,623.9	3,328.2	14.7	1,537,610.24	3,452,052.18	40.797699	-103.867222
9,075.0	91.22	2.05	5,623.2	3,419.1	17.3	1,537,701.23	3,452,053.16	40.797948	-103.867213
9,167.0	90.91	1.66	5,621.5	3,511.1	20.3	1,537,793.20	3,452,054.44	40.798201	-103.867202
9,259.0	90.54	0.31	5,620.3	3,603.1	21.9	1,537,885.19	3,452,054.33	40.798453	-103.867196
9,352.0	90.39	0.68	5,619.6	3,696.1	22.7	1,537,978.18	3,452,053.42	40.798709	-103.867193
9,444.0	90.36	1.91	5,618.9	3,788.0	24.7	1,538,070.18	3,452,053.81	40.798961	-103.867186
9,536.0	90.07	359.60	5,618.6	3,880.0	26.0	1,538,162.17	3,452,053.33	40.799213	-103.867181
9,629.0	93.01	1.15	5,616.1	3,973.0	26.6	1,538,255.12	3,452,052.22	40.799469	-103.867179
9,722.0	91.43	359.08	5,612.5	4,065.9	26.8	1,538,348.03	3,452,050.70	40.799724	-103.867179
9,814.0	91.66	358.50	5,610.0	4,157.8	24.8	1,538,439.92	3,452,047.06	40.799976	-103.867186
9,906.0	91.05	359.89	5,607.8	4,249.8	23.5	1,538,531.84	3,452,044.08	40.800228	-103.867190
9,999.0	87.69	358.91	5,608.9	4,342.8	22.5	1,538,624.78	3,452,041.39	40.800484	-103.867194
10,091.0	90.72	0.47	5,610.1	4,434.7	22.0	1,538,716.73	3,452,039.20	40.800736	-103.867196
10,182.0	90.51	359.78	5,609.2	4,525.7	22.2	1,538,807.72	3,452,037.72	40.800986	-103.867195
10,275.0	90.33	3.00	5,608.5	4,618.7	24.5	1,538,900.70	3,452,038.27	40.801241	-103.867187
10,367.0	90.66	4.76	5,607.7	4,710.5	30.7	1,538,992.58	3,452,042.80	40.801493	-103.867164
10,459.0	88.93	3.04	5,608.0	4,802.3	37.0	1,539,084.46	3,452,047.37	40.801745	-103.867142

Cathedral Energy Services

Survey Report - Geographic

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well Razor #330-2811A
Project:	Weld County, CO	TVD Reference:	KB=21 @ 4735.7usft (Frontier #9)
Site:	S33-T10N-R58W	MD Reference:	KB=21 @ 4735.7usft (Frontier #9)
Well:	Razor #330-2811A	North Reference:	True
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
10,551.0	87.85	0.24	5,610.6	4,894.2	39.6	1,539,176.41	3,452,048.31	40.801997	-103.867132
10,644.0	87.95	0.55	5,614.0	4,987.1	40.3	1,539,269.34	3,452,047.24	40.802252	-103.867130
10,737.0	88.95	358.21	5,616.5	5,080.1	39.3	1,539,362.26	3,452,044.52	40.802507	-103.867133
10,829.0	88.33	357.78	5,618.7	5,172.0	36.0	1,539,454.10	3,452,039.61	40.802759	-103.867145
10,921.0	90.86	357.58	5,619.4	5,263.9	32.3	1,539,545.93	3,452,034.19	40.803012	-103.867159
11,013.0	90.30	356.82	5,618.4	5,355.8	27.8	1,539,637.72	3,452,028.01	40.803264	-103.867175
11,106.0	90.42	357.56	5,617.8	5,448.7	23.3	1,539,730.50	3,452,021.74	40.803519	-103.867191
11,198.0	89.99	357.88	5,617.5	5,540.6	19.6	1,539,822.35	3,452,016.39	40.803771	-103.867204
11,291.0	92.15	358.80	5,615.8	5,633.5	16.9	1,539,915.22	3,452,011.98	40.804026	-103.867214
11,383.0	92.83	358.47	5,611.8	5,725.4	14.7	1,540,007.05	3,452,008.10	40.804278	-103.867222
11,474.0	92.89	357.58	5,607.2	5,816.2	11.6	1,540,097.81	3,452,003.30	40.804528	-103.867233
11,566.0	90.85	357.72	5,604.2	5,908.1	7.8	1,540,189.59	3,451,997.84	40.804780	-103.867247
11,657.0	89.27	1.16	5,604.1	5,999.1	6.9	1,540,280.54	3,451,995.27	40.805030	-103.867250
11,750.0	88.72	1.02	5,605.8	6,092.1	8.7	1,540,373.52	3,451,995.33	40.805285	-103.867244
11,842.0	88.80	0.89	5,607.8	6,184.0	10.2	1,540,465.50	3,451,995.17	40.805537	-103.867238
11,934.0	88.26	359.71	5,610.1	6,276.0	10.7	1,540,557.46	3,451,993.96	40.805790	-103.867237
12,026.0	87.81	359.38	5,613.3	6,367.9	10.0	1,540,649.37	3,451,991.54	40.806042	-103.867239
12,118.0	87.55	358.80	5,617.0	6,459.8	8.5	1,540,741.24	3,451,988.39	40.806294	-103.867245
12,210.0	89.03	359.39	5,619.8	6,551.8	7.1	1,540,833.15	3,451,985.24	40.806547	-103.867250
12,301.0	87.74	357.93	5,622.3	6,642.7	4.9	1,540,924.03	3,451,981.44	40.806796	-103.867257
12,394.0	89.42	359.32	5,624.6	6,735.7	2.7	1,541,016.91	3,451,977.50	40.807051	-103.867265
12,486.0	88.69	358.56	5,626.1	6,827.6	1.0	1,541,108.83	3,451,974.10	40.807304	-103.867272
12,579.0	88.09	357.92	5,628.8	6,920.6	-1.8	1,541,201.68	3,451,969.54	40.807559	-103.867282
12,670.0	89.32	358.74	5,630.8	7,011.5	-4.5	1,541,292.58	3,451,965.21	40.807808	-103.867292
12,762.0	88.24	357.25	5,632.8	7,103.4	-7.7	1,541,384.42	3,451,960.30	40.808061	-103.867303
12,854.0	89.44	358.95	5,634.6	7,195.4	-10.8	1,541,476.28	3,451,955.56	40.808313	-103.867314
12,947.0	89.42	359.90	5,635.6	7,288.3	-11.7	1,541,569.23	3,451,952.92	40.808568	-103.867318
13,039.0	88.66	359.99	5,637.1	7,380.3	-11.8	1,541,661.20	3,451,951.13	40.808821	-103.867318
13,097.0	88.44	0.15	5,638.6	7,438.3	-11.7	1,541,719.17	3,451,950.14	40.808980	-103.867318
Last CES Survey @ 13,097' MD									
13,152.0	88.44	0.15	5,640.1	7,493.3	-11.6	1,541,774.15	3,451,949.27	40.809131	-103.867317
PTB @ 13,152' - TD - 2547' FSL, 1823' FEL									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
330-2811A VP (P5)	0.00	1.05	4,809.1	-250.8	-10.8	1,534,031.38	3,452,092.66	40.787876	-103.867314
- hit/miss target									
- Shape									
- actual wellpath misses target center by 13.5usft at 4819.4usft MD (4808.9 TVD, -263.0 N, -16.4 E)									
- Point									
330-2811A PBHL (P5)	0.00	1.05	5,630.0	7,493.2	-10.8	1,541,774.11	3,451,950.08	40.809131	-103.867314
- actual wellpath misses target center by 10.1usft at 13151.7usft MD (5640.1 TVD, 7493.0 N, -11.6 E)									
- Point									

Casing Points				
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
5,993.0	5,654.1	7" - 671' FSL, 1902' FEL	0	0

Cathedral Energy Services

Survey Report - Geographic

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well Razor #33O-2811A
Project:	Weld County, CO	TVD Reference:	KB=21 @ 4735.7usft (Frontier #9)
Site:	S33-T10N-R58W	MD Reference:	KB=21 @ 4735.7usft (Frontier #9)
Well:	Razor #33O-2811A	North Reference:	True
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
13,097.0	5,638.6	7,438.3	-11.7	Last CES Survey @ 13,097' MD
13,152.0	5,640.1	7,493.3	-11.6	PTB @ 13,152'
13,152.0	5,640.1	7,493.3	-11.6	TD - 2547' FSL, 1823' FEL

Checked By: _____ Approved By: _____ Date: _____