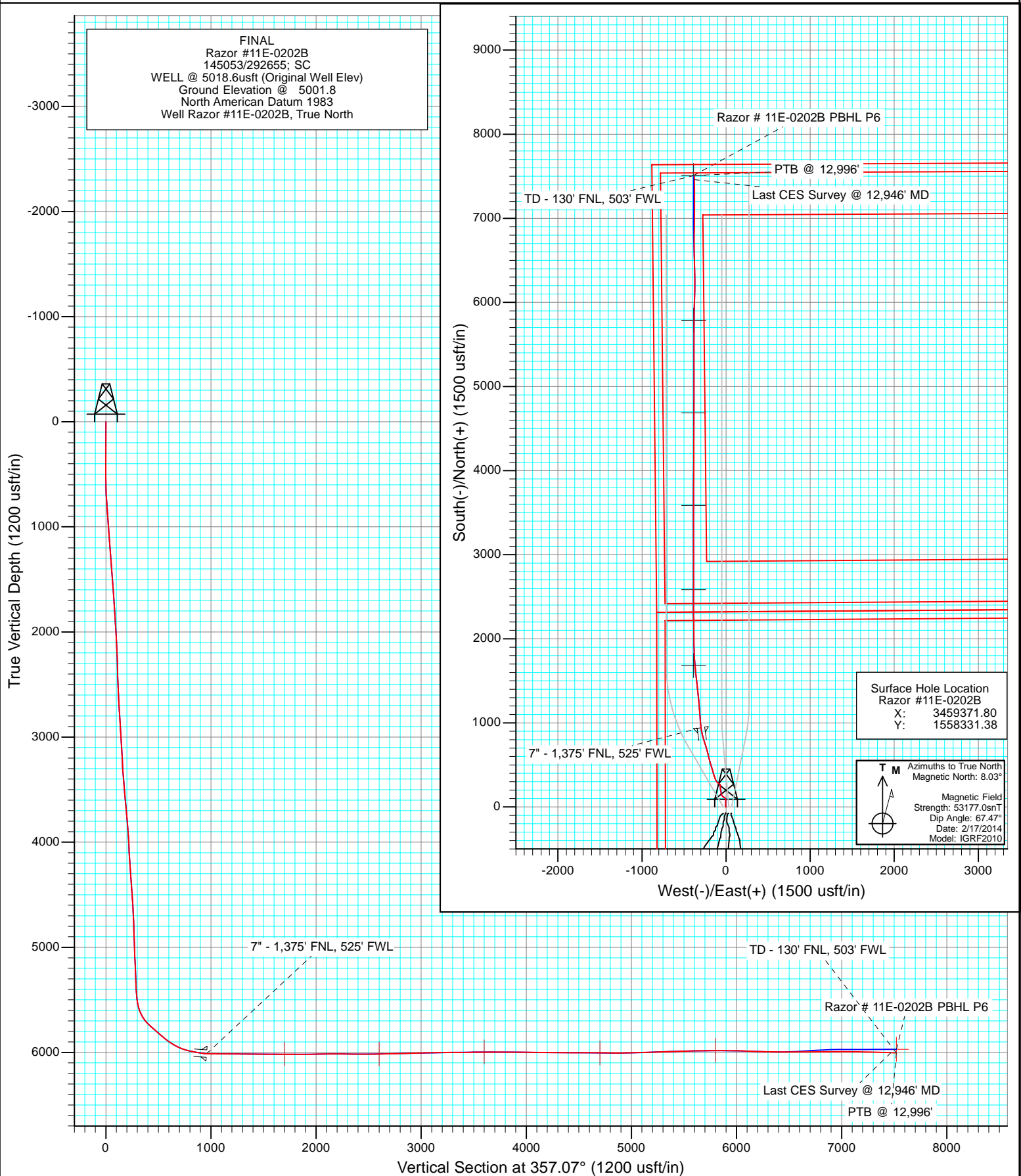


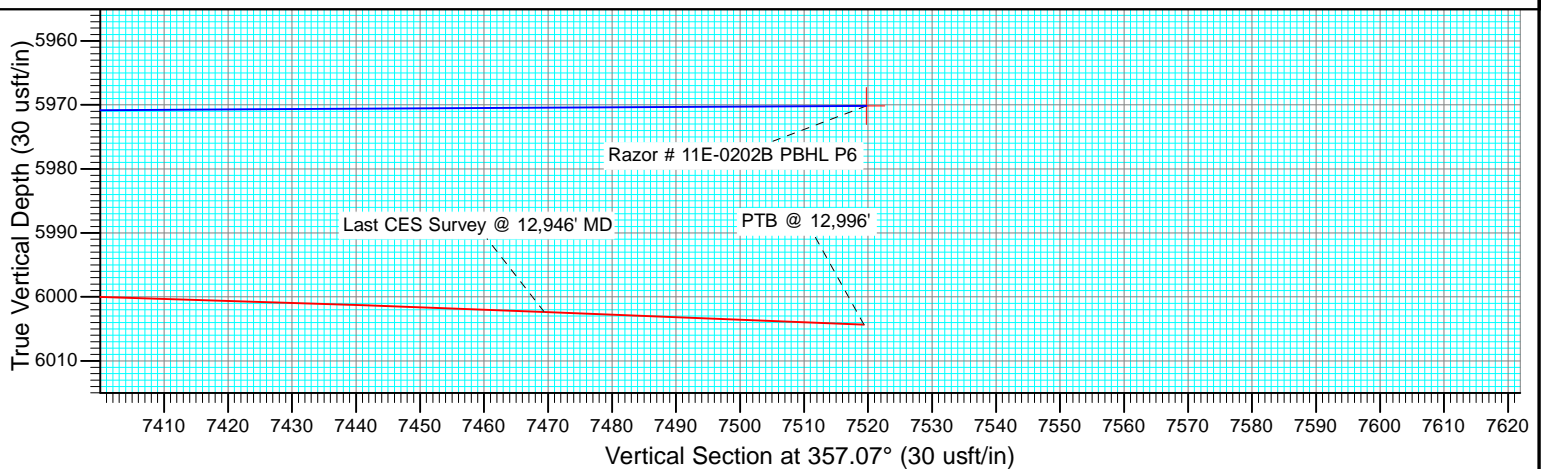
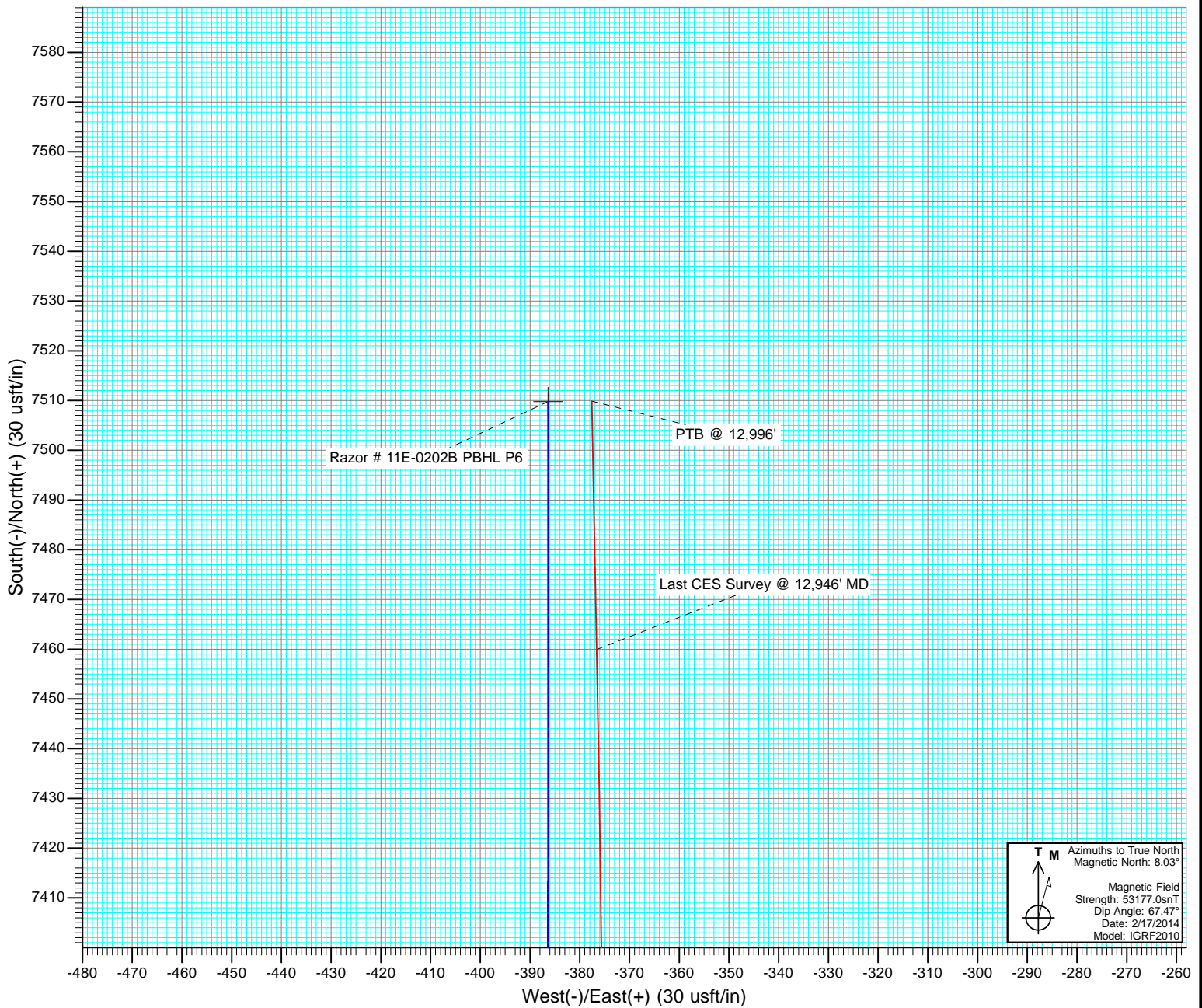


Project: Weld County, CO
Site: S11-T10N-R58W
Well: Razor #11E-0202B
Wellbore: HZ
Design: FINAL





Project: Weld County, CO
Site: S11-T10N-R58W
Well: Razor #11E-0202B
Wellbore: HZ
Design: FINAL



Cathedral Energy Services

Survey Report

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well Razor #11E-0202B
Project:	Weld County, CO	TVD Reference:	WELL @ 5018.6usft (Original Well Elev)
Site:	S11-T10N-R58W	MD Reference:	WELL @ 5018.6usft (Original Well Elev)
Well:	Razor #11E-0202B	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		S11-T10N-R58W			
Site Position:		Northing:	1,558,620.57 usft	Latitude:	40.854775
From:	Lat/Long	Easting:	3,463,389.92 usft	Longitude:	-103.824847
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	1.08 °

Well	Razor #11E-0202B					
Well Position	+N/-S	0.0 usft	Northing:	1,558,331.38 usft	Latitude:	40.854189
	+E/-W	0.0 usft	Easting:	3,459,371.80 usft	Longitude:	-103.839389
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	5,001.8 usft

Wellbore	HZ				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2/17/2014	8.03	67.47	53,177

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	357.07	

Survey Program	Date	3/4/2014			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
505.0	12,996.0	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		
505.0	0.79	264.37	505.0	-0.3	-3.5	-0.2	0.16	0.16		
597.0	0.79	351.91	597.0	0.2	-4.2	0.4	1.19	0.00		
690.0	2.86	356.57	689.9	3.2	-4.4	3.4	2.23	2.23		
782.0	4.22	355.25	781.7	8.8	-4.8	9.1	1.48	1.48		
1,332.0	4.22	2.99	1,330.3	49.2	-5.5	49.4	0.10	0.00		
1,422.0	4.84	2.20	1,420.0	56.3	-5.1	56.5	0.69	0.69		
1,514.0	4.18	1.05	1,511.7	63.5	-4.9	63.7	0.72	-0.72		
1,788.0	3.60	7.73	1,785.1	82.1	-3.6	82.1	0.27	-0.21		
1,855.0	3.78	4.26	1,851.9	86.3	-3.1	86.4	0.43	0.27		
1,947.0	4.26	344.76	1,943.7	92.7	-3.8	92.7	1.57	0.52		
2,038.0	3.87	335.16	2,034.5	98.7	-6.0	98.9	0.86	-0.43		
2,129.0	3.16	322.11	2,125.3	103.5	-8.8	103.8	1.17	-0.78		

Cathedral Energy Services

Survey Report

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well Razor #11E-0202B
Project:	Weld County, CO	TVD Reference:	WELL @ 5018.6usft (Original Well Elev)
Site:	S11-T10N-R58W	MD Reference:	WELL @ 5018.6usft (Original Well Elev)
Well:	Razor #11E-0202B	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)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
2,221.0	2.81	294.83	2,217.2	106.4	-12.4	106.9	1.57	-0.38	
2,313.0	4.09	308.86	2,309.0	109.4	-17.0	110.2	1.66	1.39	
2,405.0	3.21	306.32	2,400.8	113.0	-21.7	114.0	0.97	-0.96	
2,495.0	2.77	287.10	2,490.7	115.1	-25.8	116.3	1.21	-0.49	
2,587.0	3.74	299.28	2,582.6	117.3	-30.5	118.7	1.29	1.05	
2,678.0	5.32	313.59	2,673.3	121.6	-36.1	123.3	2.12	1.74	
2,769.0	4.62	320.24	2,763.9	127.4	-41.5	129.3	1.00	-0.77	
2,861.0	4.66	324.60	2,855.6	133.3	-46.1	135.4	0.39	0.04	
2,952.0	3.96	330.35	2,946.4	139.0	-49.8	141.4	0.90	-0.77	
3,044.0	3.25	321.12	3,038.2	143.8	-53.0	146.3	0.99	-0.77	
3,135.0	3.82	340.93	3,129.0	148.7	-55.6	151.3	1.47	0.63	
3,227.0	2.51	335.27	3,220.9	153.4	-57.4	156.1	1.46	-1.42	
3,318.0	4.70	359.54	3,311.7	158.9	-58.3	161.7	2.88	2.41	
3,410.0	3.69	1.32	3,403.5	165.7	-58.3	168.4	1.11	-1.10	
3,502.0	5.54	351.05	3,495.2	173.0	-58.9	175.8	2.19	2.01	
3,594.0	5.05	350.95	3,586.8	181.4	-60.2	184.2	0.53	-0.53	
3,685.0	5.10	346.82	3,677.4	189.3	-61.8	192.2	0.41	0.05	
3,776.0	5.05	349.80	3,768.0	197.2	-63.4	200.1	0.29	-0.05	
3,868.0	5.14	345.32	3,859.7	205.1	-65.2	208.2	0.44	0.10	
3,959.0	3.74	348.93	3,950.4	212.0	-66.8	215.1	1.57	-1.54	
4,050.0	2.07	342.00	4,041.3	216.5	-67.8	219.6	1.87	-1.84	
4,142.0	3.12	354.55	4,133.2	220.5	-68.6	223.8	1.29	1.14	
4,233.0	3.21	2.99	4,224.1	225.5	-68.7	228.8	0.52	0.10	
4,325.0	6.07	7.21	4,315.7	232.9	-68.0	236.1	3.13	3.11	
4,416.0	4.70	352.89	4,406.3	241.4	-67.8	244.6	2.10	-1.51	
4,508.0	3.56	9.68	4,498.1	248.0	-67.8	251.1	1.79	-1.24	
4,598.0	2.95	8.07	4,588.0	253.0	-67.0	256.1	0.69	-0.68	
4,690.0	2.11	352.11	4,679.9	257.0	-66.9	260.1	1.18	-0.91	
4,781.0	2.37	319.18	4,770.8	260.1	-68.4	263.3	1.42	0.29	
4,873.0	3.30	321.51	4,862.7	263.6	-71.3	266.9	1.02	1.01	
4,964.0	2.20	315.39	4,953.6	266.9	-74.1	270.4	1.25	-1.21	
5,056.0	3.03	319.13	5,045.5	270.0	-76.9	273.6	0.92	0.90	
5,148.0	4.75	304.14	5,137.3	274.0	-81.7	277.8	2.16	1.87	
5,239.0	3.52	296.60	5,228.0	277.4	-87.3	281.5	1.47	-1.35	
5,330.0	3.74	313.03	5,318.9	280.6	-92.0	285.0	1.16	0.24	
5,421.0	4.35	314.47	5,409.6	285.1	-96.6	289.7	0.68	0.67	
5,512.0	8.09	317.45	5,500.1	292.2	-103.4	297.1	4.12	4.11	
5,603.0	20.97	325.81	5,588.0	310.5	-116.9	316.1	14.30	14.15	
5,695.0	33.23	341.42	5,669.8	348.2	-134.3	354.6	15.30	13.33	
5,786.0	47.74	343.00	5,738.9	404.3	-152.2	411.6	15.98	15.95	
5,817.0	50.42	344.08	5,759.2	426.8	-158.8	434.4	9.04	8.65	
5,847.0	50.29	344.05	5,778.3	449.0	-165.2	456.9	0.44	-0.43	
5,877.0	49.98	343.28	5,797.5	471.1	-171.6	479.3	2.22	-1.03	
5,909.0	49.63	343.14	5,818.2	494.5	-178.7	503.0	1.14	-1.09	
5,941.0	49.67	342.62	5,838.9	517.8	-185.9	526.6	1.24	0.12	
5,972.0	50.59	344.28	5,858.8	540.6	-192.7	549.8	5.07	2.97	
6,004.0	52.57	345.32	5,878.7	564.8	-199.2	574.3	6.69	6.19	
6,036.0	56.00	346.12	5,897.3	590.0	-205.6	599.7	10.91	10.72	
6,067.0	58.46	346.64	5,914.1	615.3	-211.8	625.3	8.06	7.94	
6,099.0	59.87	345.85	5,930.5	642.0	-218.3	652.3	4.89	4.41	
6,130.0	63.34	344.30	5,945.3	668.4	-225.3	679.0	12.03	11.19	
6,162.0	67.74	342.85	5,958.5	696.3	-233.6	707.3	14.35	13.75	
6,194.0	72.44	342.66	5,969.4	725.0	-242.5	736.5	14.70	14.69	

Cathedral Energy Services

Survey Report

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well Razor #11E-0202B
Project:	Weld County, CO	TVD Reference:	WELL @ 5018.6usft (Original Well Elev)
Site:	S11-T10N-R58W	MD Reference:	WELL @ 5018.6usft (Original Well Elev)
Well:	Razor #11E-0202B	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)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
6,225.0	75.96	343.10	5,977.8	753.5	-251.3	765.4	11.44	11.35	
6,257.0	76.84	343.00	5,985.4	783.3	-260.3	795.5	2.77	2.75	
6,288.0	78.55	342.88	5,992.0	812.2	-269.2	824.9	5.53	5.52	
6,320.0	80.53	344.83	5,997.8	842.4	-278.0	855.5	8.61	6.19	
6,351.0	80.79	347.10	6,002.8	872.1	-285.4	885.6	7.27	0.84	
6,388.0	81.98	350.29	6,008.4	908.0	-292.6	921.8	9.11	3.22	
6,454.0	89.10	353.66	6,013.5	973.1	-301.7	987.2	11.93	10.79	
6,548.0	89.71	356.40	6,014.5	1,066.7	-309.9	1,081.2	2.99	0.65	
6,643.0	89.71	356.16	6,015.0	1,161.5	-316.0	1,176.2	0.25	0.00	
6,738.0	90.20	353.95	6,015.0	1,256.2	-324.2	1,271.1	2.38	0.52	
6,832.0	89.76	354.05	6,015.1	1,349.6	-334.0	1,365.0	0.48	-0.47	
6,927.0	89.76	353.96	6,015.5	1,444.1	-344.0	1,459.8	0.09	0.00	
7,021.0	89.54	353.89	6,016.0	1,537.6	-353.9	1,553.7	0.25	-0.23	
7,115.0	89.01	353.66	6,017.2	1,631.0	-364.1	1,647.5	0.61	-0.56	
7,210.0	89.36	355.63	6,018.6	1,725.6	-373.0	1,742.4	2.11	0.37	
7,304.0	90.15	357.15	6,019.0	1,819.4	-378.9	1,836.4	1.82	0.84	
7,399.0	91.12	359.64	6,017.9	1,914.4	-381.5	1,931.4	2.81	1.02	
7,494.0	91.21	359.21	6,016.0	2,009.3	-382.5	2,026.3	0.46	0.09	
7,589.0	90.29	359.30	6,014.7	2,104.3	-383.7	2,121.2	0.97	-0.97	
7,681.0	89.71	359.26	6,014.7	2,196.3	-384.9	2,213.1	0.63	-0.63	
7,773.0	89.10	358.57	6,015.7	2,288.3	-386.6	2,305.1	1.00	-0.66	
7,866.0	90.11	0.09	6,016.3	2,381.3	-387.7	2,398.0	1.96	1.09	
7,958.0	89.58	359.47	6,016.6	2,473.3	-388.1	2,489.9	0.89	-0.58	
8,049.0	91.21	0.75	6,016.0	2,564.3	-387.9	2,580.7	2.28	1.79	
8,142.0	91.25	0.62	6,014.0	2,657.2	-386.8	2,673.5	0.15	0.04	
8,235.0	91.52	0.34	6,011.7	2,750.2	-386.0	2,766.3	0.42	0.29	
8,326.0	91.65	0.17	6,009.2	2,841.2	-385.6	2,857.2	0.24	0.14	
8,418.0	91.65	0.00	6,006.6	2,933.1	-385.5	2,949.0	0.18	0.00	
8,510.0	92.00	359.81	6,003.6	3,025.1	-385.6	3,040.8	0.43	0.38	
8,601.0	90.77	359.78	6,001.4	3,116.1	-385.9	3,131.7	1.35	-1.35	
8,693.0	90.90	359.67	6,000.1	3,208.0	-386.4	3,223.6	0.19	0.14	
8,784.0	89.89	359.73	5,999.5	3,299.0	-386.9	3,314.5	1.11	-1.11	
8,877.0	90.33	359.96	5,999.3	3,392.0	-387.1	3,407.4	0.53	0.47	
8,967.0	90.46	359.86	5,998.7	3,482.0	-387.3	3,497.3	0.18	0.14	
9,058.0	90.33	359.73	5,998.0	3,573.0	-387.6	3,588.2	0.20	-0.14	
9,150.0	90.55	359.47	5,997.3	3,665.0	-388.2	3,680.1	0.37	0.24	
9,241.0	89.98	1.34	5,996.9	3,756.0	-387.6	3,770.9	2.15	-0.63	
9,333.0	89.93	1.00	5,997.0	3,848.0	-385.7	3,862.7	0.37	-0.05	
9,424.0	89.49	0.72	5,997.4	3,939.0	-384.3	3,953.5	0.57	-0.48	
9,515.0	89.23	0.14	5,998.5	4,030.0	-383.7	4,044.3	0.70	-0.29	
9,607.0	89.10	359.97	5,999.8	4,122.0	-383.6	4,136.2	0.23	-0.14	
9,699.0	88.62	359.81	6,001.6	4,214.0	-383.7	4,228.1	0.55	-0.52	
9,790.0	90.07	0.44	6,002.7	4,304.9	-383.5	4,318.9	1.74	1.59	
9,882.0	89.93	0.33	6,002.7	4,396.9	-382.9	4,410.8	0.19	-0.15	
9,974.0	89.85	359.91	6,002.8	4,488.9	-382.7	4,502.6	0.46	-0.09	
10,066.0	90.20	359.93	6,002.8	4,580.9	-382.9	4,594.5	0.38	0.38	
10,157.0	89.23	0.39	6,003.3	4,671.9	-382.6	4,685.4	1.18	-1.07	
10,248.0	89.32	359.73	6,004.4	4,762.9	-382.5	4,776.3	0.73	0.10	
10,339.0	89.67	359.25	6,005.2	4,853.9	-383.3	4,867.2	0.65	0.38	
10,431.0	91.52	0.65	6,004.2	4,945.9	-383.4	4,959.0	2.52	2.01	
10,522.0	91.52	0.55	6,001.8	5,036.9	-382.5	5,049.8	0.11	0.00	
10,613.0	91.47	0.21	5,999.5	5,127.8	-381.8	5,140.7	0.38	-0.05	
10,705.0	91.87	359.89	5,996.8	5,219.8	-381.8	5,232.5	0.56	0.43	

Cathedral Energy Services

Survey Report

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well Razor #11E-0202B
Project:	Weld County, CO	TVD Reference:	WELL @ 5018.6usft (Original Well Elev)
Site:	S11-T10N-R58W	MD Reference:	WELL @ 5018.6usft (Original Well Elev)
Well:	Razor #11E-0202B	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)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
10,797.0	92.22	0.08	5,993.5	5,311.7	-381.8	5,324.3	0.43	0.38	
10,888.0	92.66	359.91	5,989.6	5,402.7	-381.8	5,415.1	0.52	0.48	
10,980.0	91.21	359.96	5,986.5	5,494.6	-381.9	5,506.9	1.58	-1.58	
11,070.0	91.30	359.51	5,984.5	5,584.6	-382.3	5,596.8	0.51	0.10	
11,162.0	90.02	0.12	5,983.5	5,676.6	-382.6	5,688.7	1.54	-1.39	
11,253.0	89.71	1.29	5,983.7	5,767.6	-381.5	5,779.5	1.33	-0.34	
11,345.0	89.80	0.94	5,984.1	5,859.5	-379.7	5,871.3	0.39	0.10	
11,436.0	90.46	1.70	5,983.9	5,950.5	-377.6	5,962.0	1.11	0.73	
11,528.0	87.74	1.57	5,985.3	6,042.5	-375.0	6,053.7	2.96	-2.96	
11,620.0	87.25	1.30	5,989.4	6,134.3	-372.7	6,145.4	0.61	-0.53	
11,711.0	88.22	0.68	5,993.0	6,225.3	-371.1	6,236.1	1.26	1.07	
11,802.0	88.60	358.94	5,995.5	6,316.2	-371.4	6,327.0	1.96	0.42	
11,893.0	90.90	357.40	5,995.9	6,407.2	-374.3	6,417.9	3.04	2.53	
11,984.0	90.64	358.99	5,994.6	6,498.1	-377.2	6,508.9	1.77	-0.29	
12,075.0	90.20	359.56	5,994.0	6,589.1	-378.3	6,599.8	0.79	-0.48	
12,167.0	90.29	358.85	5,993.6	6,681.1	-379.6	6,691.8	0.78	0.10	
12,258.0	90.15	1.26	5,993.2	6,772.1	-379.5	6,782.6	2.65	-0.15	
12,349.0	89.58	1.31	5,993.5	6,863.1	-377.5	6,873.4	0.63	-0.63	
12,444.0	90.68	359.94	5,993.2	6,958.1	-376.4	6,968.2	1.85	1.16	
12,539.0	89.50	0.48	5,993.1	7,053.0	-376.1	7,063.1	1.37	-1.24	
12,634.0	89.05	0.39	5,994.3	7,148.0	-375.4	7,157.9	0.48	-0.47	
12,728.0	88.79	0.32	5,996.1	7,242.0	-374.8	7,251.7	0.29	-0.28	
12,823.0	88.44	359.63	5,998.4	7,337.0	-374.8	7,346.6	0.81	-0.37	
12,918.0	88.00	358.88	6,001.3	7,431.9	-376.1	7,441.4	0.91	-0.46	
12,946.0	87.74	358.92	6,002.4	7,459.9	-376.6	7,469.4	0.94	-0.93	Last CES Survey @ 12,946' MD
12,996.0	87.74	358.92	6,004.3	7,509.9	-377.6	7,519.3	0.00	0.00	PTB @ 12,996' - TD - 130' FNL, 503' FWL

Cathedral Energy Services

Survey Report

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well Razor #11E-0202B
Project:	Weld County, CO	TVD Reference:	WELL @ 5018.6usft (Original Well Elev)
Site:	S11-T10N-R58W	MD Reference:	WELL @ 5018.6usft (Original Well Elev)
Well:	Razor #11E-0202B	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)		
Razor # 11E-0202B WP	0.00	0.00	6,015.0	2,583.6	-386.4	1,560,907.29	3,458,937.10	40.861280	-103.840786
- actual wellpath misses target center by 1.4usft at 8068.4usft MD (6015.6 TVD, 2583.6 N, -387.7 E)									
- Point									
Razor # 11E-0202B PBI-	0.00	0.00	6,016.0	7,539.8	-386.4	1,565,862.66	3,458,844.29	40.874883	-103.840786
- actual wellpath misses target center by 33.4usft at 12996.0usft MD (6004.3 TVD, 7509.9 N, -377.6 E)									
- Point									
Razor # 11E-0202B WP	0.00	0.00	5,995.0	3,584.9	-386.4	1,561,908.42	3,458,918.35	40.864028	-103.840786
- actual wellpath misses target center by 3.2usft at 9069.9usft MD (5998.0 TVD, 3584.9 N, -387.6 E)									
- Point									
Razor # 11E-0202B WP	0.00	0.00	5,980.0	5,787.8	-386.4	1,564,110.93	3,458,877.10	40.870074	-103.840786
- actual wellpath misses target center by 6.5usft at 11273.1usft MD (5983.8 TVD, 5787.7 N, -381.1 E)									
- Point									
Razor # 11E-0202B PBI-	0.00	0.00	5,970.2	7,509.8	-386.4	1,565,832.62	3,458,844.85	40.874801	-103.840786
- actual wellpath misses target center by 35.3usft at 12994.7usft MD (6004.3 TVD, 7508.6 N, -377.5 E)									
- Point									
Razor # 11E-0202B WP	0.00	0.00	6,005.0	4,686.4	-386.4	1,563,009.73	3,458,897.72	40.867051	-103.840786
- actual wellpath misses target center by 4.2usft at 10171.5usft MD (6003.4 TVD, 4686.4 N, -382.5 E)									
- Point									
Razor # 11E-0202B WP	0.00	0.00	6,015.0	1,682.4	-386.4	1,560,006.25	3,458,953.98	40.858806	-103.840786
- actual wellpath misses target center by 17.3usft at 7168.2usft MD (6018.0 TVD, 1683.9 N, -369.5 E)									
- Point									
Razor # 11E-0202B PBI-	0.00	0.00	6,013.0	7,040.0	-381.0	1,565,363.00	3,458,858.99	40.873511	-103.840767
- actual wellpath misses target center by 20.6usft at 12525.9usft MD (5993.0 TVD, 7039.9 N, -376.2 E)									
- Point									

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
6,425.0	6,012.2	7" - 1,375' FNL, 525' FWL	0	0	

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
12,946.0	6,002.4	7,459.9	-376.6	Last CES Survey @ 12,946' MD	
12,996.0	6,004.3	7,509.9	-377.6	PTB @ 12,996'	
12,996.0	6,004.3	7,509.9	-377.6	TD - 130' FNL, 503' FWL	

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

Weld County, CO

S11-T10N-R58W

Razor #11E-0202B

HZ

Design: FINAL

Survey Report - Geographic

04 March, 2014

Cathedral Energy Services

Survey Report - Geographic

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well Razor #11E-0202B
Project:	Weld County, CO	TVD Reference:	WELL @ 5018.6usft (Original Well Elev)
Site:	S11-T10N-R58W	MD Reference:	WELL @ 5018.6usft (Original Well Elev)
Well:	Razor #11E-0202B	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	S11-T10N-R58W				
Site Position:		Northing:	1,558,620.57 usft	Latitude:	40.854775
From:	Lat/Long	Easting:	3,463,389.92 usft	Longitude:	-103.824847
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	1.08 °

Well		Razor #11E-0202B				
Well Position	+N/-S	0.0 usft	Northing:	1,558,331.39 usft	Latitude:	40.854189
	+E/-W	0.0 usft	Easting:	3,459,371.79 usft	Longitude:	-103.839389
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	5,001.8 usft

Wellbore	HZ				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2/17/2014	8.03	67.47	53,177

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	357.07	

Survey Program	Date	3/4/2014			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
505.0	12,996.0	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	1,558,331.39	3,459,371.79	40.854189	-103.839389
505.0	0.79	264.37	505.0	-0.3	-3.5	1,558,330.98	3,459,368.34	40.854188	-103.839402
597.0	0.79	351.91	597.0	0.2	-4.2	1,558,331.53	3,459,367.61	40.854190	-103.839404
690.0	2.86	356.57	689.9	3.2	-4.4	1,558,334.48	3,459,367.32	40.854198	-103.839405
782.0	4.22	355.25	781.7	8.8	-4.8	1,558,340.14	3,459,366.80	40.854213	-103.839407
1,332.0	4.22	2.99	1,330.3	49.2	-5.5	1,558,380.49	3,459,365.42	40.854324	-103.839409
1,422.0	4.84	2.20	1,420.0	56.3	-5.1	1,558,387.60	3,459,365.61	40.854344	-103.839408
1,514.0	4.18	1.05	1,511.7	63.5	-4.9	1,558,394.83	3,459,365.68	40.854363	-103.839407
1,788.0	3.60	7.73	1,785.1	82.1	-3.6	1,558,413.36	3,459,366.68	40.854414	-103.839402
1,855.0	3.78	4.26	1,851.9	86.3	-3.1	1,558,417.66	3,459,367.04	40.854426	-103.839400
1,947.0	4.26	344.76	1,943.7	92.7	-3.8	1,558,423.96	3,459,366.25	40.854443	-103.839403
2,038.0	3.87	335.16	2,034.5	98.7	-6.0	1,558,429.97	3,459,363.96	40.854460	-103.839411

Cathedral Energy Services

Survey Report - Geographic

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well Razor #11E-0202B
Project:	Weld County, CO	TVD Reference:	WELL @ 5018.6usft (Original Well Elev)
Site:	S11-T10N-R58W	MD Reference:	WELL @ 5018.6usft (Original Well Elev)
Well:	Razor #11E-0202B	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
2,129.0	3.16	322.11	2,125.3	103.5	-8.8	1,558,434.68	3,459,361.04	40.854473	-103.839421
2,221.0	2.81	294.83	2,217.2	106.4	-12.4	1,558,437.56	3,459,357.38	40.854481	-103.839434
2,313.0	4.09	308.86	2,309.0	109.4	-17.0	1,558,440.48	3,459,352.72	40.854489	-103.839451
2,405.0	3.21	306.32	2,400.8	113.0	-21.7	1,558,443.98	3,459,348.03	40.854499	-103.839467
2,495.0	2.77	287.10	2,490.7	115.1	-25.8	1,558,446.03	3,459,343.88	40.854505	-103.839482
2,587.0	3.74	299.28	2,582.6	117.3	-30.5	1,558,448.07	3,459,339.10	40.854511	-103.839499
2,678.0	5.32	313.59	2,673.3	121.6	-36.1	1,558,452.32	3,459,333.37	40.854523	-103.839520
2,769.0	4.62	320.24	2,763.9	127.4	-41.5	1,558,457.94	3,459,327.87	40.854538	-103.839539
2,861.0	4.66	324.60	2,855.6	133.3	-46.1	1,558,463.75	3,459,323.22	40.854555	-103.839556
2,952.0	3.96	330.35	2,946.4	139.0	-49.8	1,558,469.43	3,459,319.42	40.854570	-103.839569
3,044.0	3.25	321.12	3,038.2	143.8	-53.0	1,558,474.16	3,459,316.12	40.854584	-103.839581
3,135.0	3.82	340.93	3,129.0	148.7	-55.6	1,558,478.98	3,459,313.42	40.854597	-103.839590
3,227.0	2.51	335.27	3,220.9	153.4	-57.4	1,558,483.67	3,459,311.49	40.854610	-103.839597
3,318.0	4.70	359.54	3,311.7	158.9	-58.3	1,558,489.19	3,459,310.52	40.854625	-103.839600
3,410.0	3.69	1.32	3,403.5	165.7	-58.3	1,558,495.92	3,459,310.43	40.854644	-103.839600
3,502.0	5.54	351.05	3,495.2	173.0	-58.9	1,558,503.26	3,459,309.67	40.854664	-103.839602
3,594.0	5.05	350.95	3,586.8	181.4	-60.2	1,558,511.61	3,459,308.19	40.854687	-103.839607
3,685.0	5.10	346.82	3,677.4	189.3	-61.8	1,558,519.48	3,459,306.49	40.854708	-103.839612
3,776.0	5.05	349.80	3,768.0	197.2	-63.4	1,558,527.33	3,459,304.71	40.854730	-103.839618
3,868.0	5.14	345.32	3,859.7	205.1	-65.2	1,558,535.26	3,459,302.80	40.854752	-103.839625
3,959.0	3.74	348.93	3,950.4	212.0	-66.8	1,558,542.09	3,459,301.07	40.854771	-103.839630
4,050.0	2.07	342.00	4,041.3	216.5	-67.8	1,558,546.54	3,459,299.91	40.854783	-103.839634
4,142.0	3.12	354.55	4,133.2	220.5	-68.6	1,558,550.60	3,459,299.08	40.854794	-103.839637
4,233.0	3.21	2.99	4,224.1	225.5	-68.7	1,558,555.61	3,459,298.89	40.854808	-103.839637
4,325.0	6.07	7.21	4,315.7	232.9	-68.0	1,558,563.02	3,459,299.49	40.854828	-103.839635
4,416.0	4.70	352.89	4,406.3	241.4	-67.8	1,558,571.50	3,459,299.48	40.854852	-103.839634
4,508.0	3.56	9.68	4,498.1	248.0	-67.8	1,558,578.05	3,459,299.37	40.854870	-103.839634
4,598.0	2.95	8.07	4,588.0	253.0	-67.0	1,558,583.11	3,459,300.07	40.854883	-103.839631
4,690.0	2.11	352.11	4,679.9	257.0	-66.9	1,558,587.13	3,459,300.09	40.854894	-103.839631
4,781.0	2.37	319.18	4,770.8	260.1	-68.4	1,558,590.19	3,459,298.57	40.854903	-103.839636
4,873.0	3.30	321.51	4,862.7	263.6	-71.3	1,558,593.65	3,459,295.62	40.854913	-103.839647
4,964.0	2.20	315.39	4,953.6	266.9	-74.1	1,558,596.89	3,459,292.70	40.854922	-103.839657
5,056.0	3.03	319.13	5,045.5	270.0	-76.9	1,558,599.93	3,459,289.81	40.854930	-103.839667
5,148.0	4.75	304.14	5,137.3	274.0	-81.7	1,558,603.82	3,459,284.99	40.854941	-103.839684
5,239.0	3.52	296.60	5,228.0	277.4	-87.3	1,558,607.08	3,459,279.31	40.854950	-103.839705
5,330.0	3.74	313.03	5,318.9	280.6	-92.0	1,558,610.26	3,459,274.59	40.854959	-103.839722
5,421.0	4.35	314.47	5,409.6	285.1	-96.6	1,558,614.62	3,459,269.87	40.854971	-103.839738
5,512.0	8.09	317.45	5,500.1	292.2	-103.4	1,558,621.63	3,459,262.94	40.854991	-103.839763
5,603.0	20.97	325.81	5,588.0	310.5	-116.9	1,558,639.64	3,459,249.06	40.855041	-103.839812
5,695.0	33.23	341.42	5,669.8	348.2	-134.3	1,558,677.01	3,459,230.99	40.855145	-103.839875
5,786.0	47.74	343.00	5,738.9	404.3	-152.2	1,558,732.80	3,459,212.06	40.855299	-103.839939
5,817.0	50.42	344.08	5,759.2	426.8	-158.8	1,558,755.14	3,459,205.01	40.855360	-103.839963
5,847.0	50.29	344.05	5,778.3	449.0	-165.2	1,558,777.23	3,459,198.25	40.855421	-103.839986
5,877.0	49.98	343.28	5,797.5	471.1	-171.6	1,558,799.20	3,459,191.36	40.855482	-103.840010
5,909.0	49.63	343.14	5,818.2	494.5	-178.7	1,558,822.46	3,459,183.86	40.855546	-103.840035
5,941.0	49.67	342.62	5,838.9	517.8	-185.9	1,558,845.63	3,459,176.25	40.855610	-103.840061
5,972.0	50.59	344.28	5,858.8	540.6	-192.7	1,558,868.31	3,459,169.05	40.855673	-103.840086
6,004.0	52.57	345.32	5,878.7	564.8	-199.2	1,558,892.37	3,459,162.03	40.855739	-103.840109
6,036.0	56.00	346.12	5,897.3	590.0	-205.6	1,558,917.42	3,459,155.15	40.855808	-103.840132
6,067.0	58.46	346.64	5,914.1	615.3	-211.8	1,558,942.64	3,459,148.54	40.855878	-103.840155
6,099.0	59.87	345.85	5,930.5	642.0	-218.3	1,558,969.20	3,459,141.51	40.855951	-103.840178
6,130.0	63.34	344.30	5,945.3	668.4	-225.3	1,558,995.40	3,459,133.99	40.856023	-103.840204
6,162.0	67.74	342.85	5,958.5	696.3	-233.6	1,559,023.17	3,459,125.23	40.856100	-103.840233
6,194.0	72.44	342.66	5,969.4	725.0	-242.5	1,559,051.73	3,459,115.77	40.856179	-103.840266
6,225.0	75.96	343.10	5,977.8	753.5	-251.3	1,559,080.06	3,459,106.46	40.856257	-103.840297

Cathedral Energy Services

Survey Report - Geographic

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well Razor #11E-0202B
Project:	Weld County, CO	TVD Reference:	WELL @ 5018.6usft (Original Well Elev)
Site:	S11-T10N-R58W	MD Reference:	WELL @ 5018.6usft (Original Well Elev)
Well:	Razor #11E-0202B	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
6,257.0	76.84	343.00	5,985.4	783.3	-260.3	1,559,109.64	3,459,096.84	40.856339	-103.840330
6,288.0	78.55	342.88	5,992.0	812.2	-269.2	1,559,138.42	3,459,087.41	40.856418	-103.840362
6,320.0	80.53	344.83	5,997.8	842.4	-278.0	1,559,168.48	3,459,078.10	40.856501	-103.840394
6,351.0	80.79	347.10	6,002.8	872.1	-285.4	1,559,198.01	3,459,070.13	40.856583	-103.840421
6,388.0	81.98	350.29	6,008.4	908.0	-292.6	1,559,233.73	3,459,062.29	40.856681	-103.840447
6,454.0	89.10	353.66	6,013.5	973.1	-301.7	1,559,298.66	3,459,051.90	40.856860	-103.840480
6,548.0	89.71	356.40	6,014.5	1,066.7	-309.9	1,559,392.12	3,459,042.01	40.857117	-103.840509
6,643.0	89.71	356.16	6,015.0	1,161.5	-316.0	1,559,486.79	3,459,034.07	40.857377	-103.840532
6,738.0	90.20	353.95	6,015.0	1,256.2	-324.2	1,559,581.26	3,459,024.11	40.857637	-103.840561
6,832.0	89.76	354.05	6,015.1	1,349.6	-334.0	1,559,674.54	3,459,012.54	40.857893	-103.840597
6,927.0	89.76	353.96	6,015.5	1,444.1	-344.0	1,559,768.82	3,459,000.85	40.858153	-103.840633
7,021.0	89.54	353.89	6,016.0	1,537.6	-353.9	1,559,862.09	3,458,989.15	40.858409	-103.840669
7,115.0	89.01	353.66	6,017.2	1,631.0	-364.1	1,559,955.32	3,458,977.21	40.858666	-103.840705
7,210.0	89.36	355.63	6,018.6	1,725.6	-373.0	1,560,049.70	3,458,966.58	40.858925	-103.840737
7,304.0	90.15	357.15	6,019.0	1,819.4	-378.9	1,560,143.39	3,458,958.90	40.859183	-103.840759
7,399.0	91.12	359.64	6,017.9	1,914.4	-381.5	1,560,238.27	3,458,954.47	40.859443	-103.840768
7,494.0	91.21	359.21	6,016.0	2,009.3	-382.5	1,560,333.21	3,458,951.73	40.859704	-103.840772
7,589.0	90.29	359.30	6,014.7	2,104.3	-383.7	1,560,428.15	3,458,948.72	40.859965	-103.840776
7,681.0	89.71	359.26	6,014.7	2,196.3	-384.9	1,560,520.11	3,458,945.84	40.860217	-103.840781
7,773.0	89.10	358.57	6,015.7	2,288.3	-386.6	1,560,612.04	3,458,942.38	40.860469	-103.840787
7,866.0	90.11	0.09	6,016.3	2,381.3	-387.7	1,560,704.99	3,458,939.55	40.860725	-103.840791
7,958.0	89.58	359.47	6,016.6	2,473.3	-388.1	1,560,796.96	3,458,937.47	40.860977	-103.840792
8,049.0	91.21	0.75	6,016.0	2,564.3	-387.9	1,560,887.94	3,458,935.94	40.861227	-103.840791
8,142.0	91.25	0.62	6,014.0	2,657.2	-386.8	1,560,980.92	3,458,935.32	40.861482	-103.840787
8,235.0	91.52	0.34	6,011.7	2,750.2	-386.0	1,561,073.89	3,458,934.35	40.861737	-103.840785
8,326.0	91.65	0.17	6,009.2	2,841.2	-385.6	1,561,164.84	3,458,933.05	40.861987	-103.840783
8,418.0	91.65	0.00	6,006.6	2,933.1	-385.5	1,561,256.79	3,458,931.47	40.862239	-103.840783
8,510.0	92.00	359.81	6,003.6	3,025.1	-385.6	1,561,348.72	3,458,929.59	40.862492	-103.840783
8,601.0	90.77	359.78	6,001.4	3,116.1	-385.9	1,561,439.67	3,458,927.57	40.862741	-103.840784
8,693.0	90.90	359.67	6,000.1	3,208.0	-386.4	1,561,531.64	3,458,925.40	40.862994	-103.840786
8,784.0	89.89	359.73	5,999.5	3,299.0	-386.9	1,561,622.61	3,458,923.22	40.863244	-103.840788
8,877.0	90.33	359.96	5,999.3	3,392.0	-387.1	1,561,715.59	3,458,921.23	40.863499	-103.840789
8,967.0	90.46	359.86	5,998.7	3,482.0	-387.3	1,561,805.57	3,458,919.40	40.863746	-103.840789
9,058.0	90.33	359.73	5,998.0	3,573.0	-387.6	1,561,896.54	3,458,917.37	40.863996	-103.840790
9,150.0	90.55	359.47	5,997.3	3,665.0	-388.2	1,561,988.51	3,458,915.01	40.864248	-103.840793
9,241.0	89.98	1.34	5,996.9	3,756.0	-387.6	1,562,079.50	3,458,913.95	40.864498	-103.840790
9,333.0	89.93	1.00	5,997.0	3,848.0	-385.7	1,562,171.50	3,458,914.10	40.864750	-103.840784
9,424.0	89.49	0.72	5,997.4	3,939.0	-384.3	1,562,262.49	3,458,913.76	40.865000	-103.840779
9,515.0	89.23	0.14	5,998.5	4,030.0	-383.7	1,562,353.48	3,458,912.74	40.865250	-103.840776
9,607.0	89.10	359.97	5,999.8	4,122.0	-383.6	1,562,445.46	3,458,911.11	40.865502	-103.840776
9,699.0	88.62	359.81	6,001.6	4,214.0	-383.7	1,562,537.42	3,458,909.21	40.865755	-103.840777
9,790.0	90.07	0.44	6,002.7	4,304.9	-383.5	1,562,628.40	3,458,907.70	40.866004	-103.840776
9,882.0	89.93	0.33	6,002.7	4,396.9	-382.9	1,562,720.39	3,458,906.60	40.866257	-103.840774
9,974.0	89.85	359.91	6,002.8	4,488.9	-382.7	1,562,812.38	3,458,905.07	40.866510	-103.840773
10,066.0	90.20	359.93	6,002.8	4,580.9	-382.9	1,562,904.36	3,458,903.22	40.866762	-103.840773
10,157.0	89.23	0.39	6,003.3	4,671.9	-382.6	1,562,995.35	3,458,901.77	40.867012	-103.840772
10,248.0	89.32	359.73	6,004.4	4,762.9	-382.5	1,563,086.32	3,458,900.16	40.867262	-103.840772
10,339.0	89.67	359.25	6,005.2	4,853.9	-383.3	1,563,177.28	3,458,897.65	40.867511	-103.840775
10,431.0	91.52	0.65	6,004.2	4,945.9	-383.4	1,563,269.26	3,458,895.84	40.867764	-103.840775
10,522.0	91.52	0.55	6,001.8	5,036.9	-382.5	1,563,360.22	3,458,895.09	40.868013	-103.840772
10,613.0	91.47	0.21	5,999.5	5,127.8	-381.8	1,563,451.18	3,458,893.99	40.868263	-103.840770
10,705.0	91.87	359.89	5,996.8	5,219.8	-381.8	1,563,543.13	3,458,892.35	40.868515	-103.840769
10,797.0	92.22	0.08	5,993.5	5,311.7	-381.8	1,563,635.05	3,458,890.60	40.868768	-103.840770
10,888.0	92.66	359.91	5,989.6	5,402.7	-381.8	1,563,725.95	3,458,888.89	40.869017	-103.840770
10,980.0	91.21	359.96	5,986.5	5,494.6	-381.9	1,563,817.88	3,458,887.07	40.869270	-103.840770

Cathedral Energy Services

Survey Report - Geographic

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well Razor #11E-0202B
Project:	Weld County, CO	TVD Reference:	WELL @ 5018.6usft (Original Well Elev)
Site:	S11-T10N-R58W	MD Reference:	WELL @ 5018.6usft (Original Well Elev)
Well:	Razor #11E-0202B	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
11,070.0	91.30	359.51	5,984.5	5,584.6	-382.3	1,563,907.84	3,458,884.97	40.869517	-103.840771
11,162.0	90.02	0.12	5,983.5	5,676.6	-382.6	1,563,999.80	3,458,882.95	40.869769	-103.840773
11,253.0	89.71	1.29	5,983.7	5,767.6	-381.5	1,564,090.80	3,458,882.36	40.870019	-103.840768
11,345.0	89.80	0.94	5,984.1	5,859.5	-379.7	1,564,182.80	3,458,882.43	40.870271	-103.840762
11,436.0	90.46	1.70	5,983.9	5,950.5	-377.6	1,564,273.80	3,458,882.82	40.870521	-103.840754
11,528.0	87.74	1.57	5,985.3	6,042.5	-375.0	1,564,365.77	3,458,883.72	40.870773	-103.840745
11,620.0	87.25	1.30	5,989.4	6,134.3	-372.7	1,564,457.68	3,458,884.31	40.871026	-103.840737
11,711.0	88.22	0.68	5,992.9	6,225.3	-371.1	1,564,548.61	3,458,884.17	40.871275	-103.840731
11,802.0	88.60	358.94	5,995.5	6,316.2	-371.4	1,564,639.55	3,458,882.17	40.871525	-103.840732
11,893.0	90.90	357.40	5,995.9	6,407.2	-374.3	1,564,730.42	3,458,877.56	40.871774	-103.840743
11,984.0	90.64	358.99	5,994.6	6,498.1	-377.2	1,564,821.30	3,458,872.99	40.872024	-103.840753
12,075.0	90.20	359.56	5,994.0	6,589.1	-378.3	1,564,912.25	3,458,870.14	40.872274	-103.840757
12,167.0	90.29	358.85	5,993.6	6,681.1	-379.6	1,565,004.20	3,458,867.14	40.872526	-103.840762
12,258.0	90.15	1.26	5,993.2	6,772.1	-379.5	1,565,095.18	3,458,865.52	40.872776	-103.840761
12,349.0	89.58	1.31	5,993.5	6,863.1	-377.5	1,565,186.18	3,458,865.86	40.873026	-103.840754
12,444.0	90.68	359.94	5,993.2	6,958.1	-376.4	1,565,281.17	3,458,865.12	40.873286	-103.840750
12,539.0	89.50	0.48	5,993.1	7,053.0	-376.1	1,565,376.16	3,458,863.68	40.873547	-103.840749
12,634.0	89.05	0.39	5,994.3	7,148.0	-375.4	1,565,471.14	3,458,862.63	40.873808	-103.840746
12,728.0	88.79	0.32	5,996.1	7,242.0	-374.8	1,565,565.12	3,458,861.45	40.874066	-103.840744
12,823.0	88.44	359.63	5,998.4	7,337.0	-374.8	1,565,660.07	3,458,859.63	40.874326	-103.840745
12,918.0	88.00	358.88	6,001.3	7,431.9	-376.1	1,565,754.98	3,458,856.62	40.874587	-103.840749
12,946.0	87.74	358.92	6,002.4	7,459.9	-376.6	1,565,782.94	3,458,855.56	40.874664	-103.840751
Last CES Survey @ 12,946' MD									
12,996.0	87.74	358.92	6,004.3	7,509.9	-377.6	1,565,832.86	3,458,853.68	40.874801	-103.840754
PTB @ 12,996' - TD - 130' FNL, 503' FWL									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
Razor # 11E-0202B PBI	0.00	0.00	5,970.2	7,509.8	-386.4	1,565,832.63	3,458,844.85	40.874801	-103.840786
- actual wellpath misses target center by 35.3usft at 12994.7usft MD (6004.3 TVD, 7508.6 N, -377.5 E)									
- Point									
Razor # 11E-0202B WP	0.00	0.00	5,980.0	5,787.8	-386.4	1,564,110.94	3,458,877.10	40.870074	-103.840786
- actual wellpath misses target center by 6.5usft at 11273.1usft MD (5983.8 TVD, 5787.7 N, -381.1 E)									
- Point									
Razor # 11E-0202B WP	0.00	0.00	5,995.0	3,584.9	-386.4	1,561,908.42	3,458,918.35	40.864028	-103.840786
- actual wellpath misses target center by 3.2usft at 9069.9usft MD (5998.0 TVD, 3584.9 N, -387.6 E)									
- Point									
Razor # 11E-0202B WP	0.00	0.00	6,005.0	4,686.4	-386.4	1,563,009.73	3,458,897.72	40.867051	-103.840786
- actual wellpath misses target center by 4.2usft at 10171.5usft MD (6003.4 TVD, 4686.4 N, -382.5 E)									
- Point									
Razor # 11E-0202B WP	0.00	0.00	6,015.0	2,583.6	-386.4	1,560,907.30	3,458,937.10	40.861280	-103.840786
- actual wellpath misses target center by 1.4usft at 8068.4usft MD (6015.6 TVD, 2583.6 N, -387.7 E)									
- Point									
Razor # 11E-0202B WP	0.00	0.00	6,015.0	1,682.4	-386.4	1,560,006.26	3,458,953.97	40.858807	-103.840786
- actual wellpath misses target center by 17.3usft at 7168.2usft MD (6018.0 TVD, 1683.9 N, -369.5 E)									
- Point									

Cathedral Energy Services

Survey Report - Geographic

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well Razor #11E-0202B
Project:	Weld County, CO	TVD Reference:	WELL @ 5018.6usft (Original Well Elev)
Site:	S11-T10N-R58W	MD Reference:	WELL @ 5018.6usft (Original Well Elev)
Well:	Razor #11E-0202B	North Reference:	True
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name		Casing Diameter (")	Hole Diameter (")
6,425.0	6,012.2	7" - 1,375' FNL, 525' FWL		0	0

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
12,946.0	6,002.4	7,459.9	-376.6	Last CES Survey @ 12,946' MD	
12,996.0	6,004.3	7,509.9	-377.6	PTB @ 12,996'	
12,996.0	6,004.3	7,509.9	-377.6	TD - 130' FNL, 503' FWL	

Checked By: _____ Approved By: _____ Date: _____