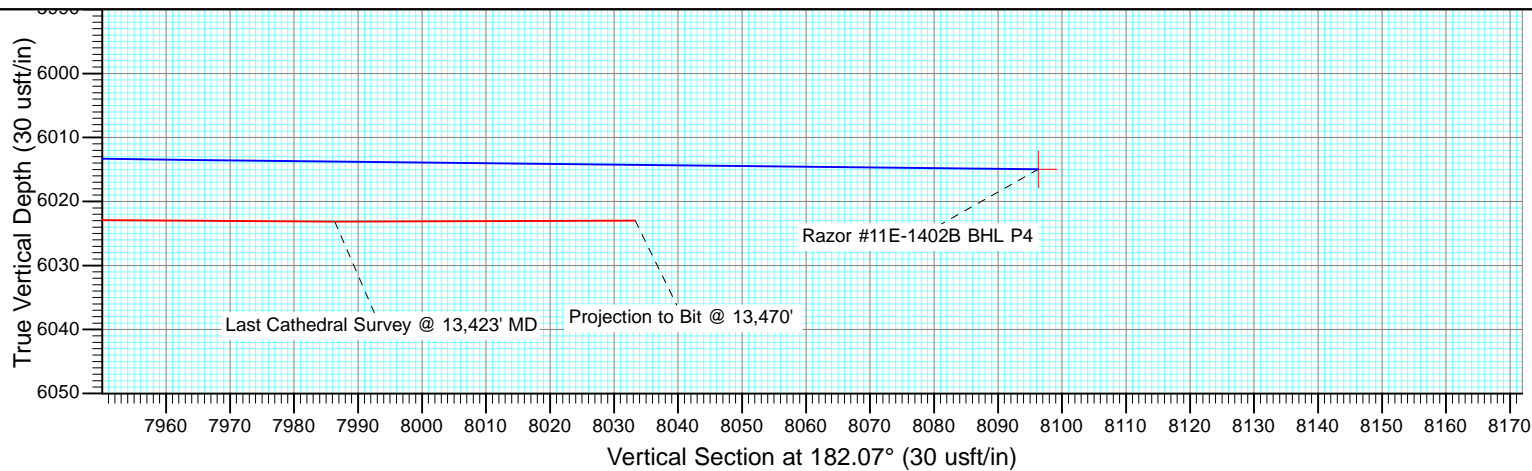
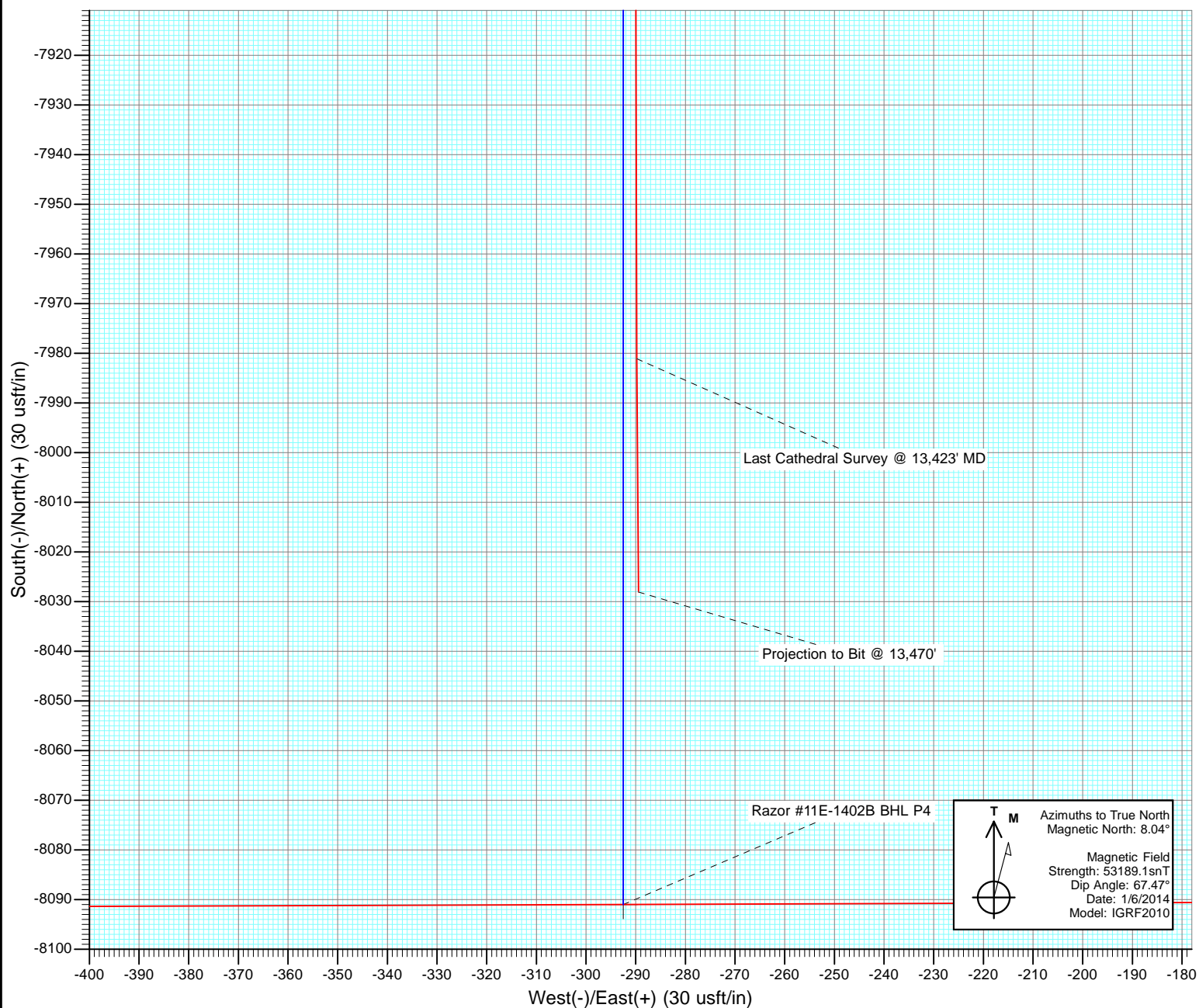




Project: Weld County, CO
Site: S11-T10N-R58W
Well: Razor #11E-1402B
Wellbore: HZ
Design: FINAL



Cathedral Energy Services

Survey Report

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well Razor #11E-1402B
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-1402B	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° 51' 17.19 N
From:	Lat/Long	Easting:	3,463,389.92 usft	Longitude:	103° 49' 29.45 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	1.08 °

Well	Razor #11E-1402B					
Well Position	+N/-S	0.0 usft	Northing:	1,558,256.50 usft	Latitude:	40° 51' 14.34 N
	+E/-W	0.0 usft	Easting:	3,459,373.20 usft	Longitude:	103° 50' 21.80 W
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	1/6/2014	8.04	67.47	53,189

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	182.07	

Survey Program	Date	1/26/2014			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
440.0	13,470.0	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		
440.0	0.97	313.70	440.0	2.6	-2.7	-2.5	0.22	0.22		
532.0	1.10	256.46	532.0	2.9	-4.1	-2.8	1.08	0.14		
623.0	2.20	212.02	622.9	1.2	-5.9	-1.0	1.77	1.21		
715.0	4.04	200.46	714.8	-3.3	-8.0	3.6	2.10	2.00		
989.0	5.32	206.40	987.9	-23.7	-17.0	24.3	0.50	0.47		
1,080.0	5.32	197.21	1,078.5	-31.5	-20.1	32.3	0.94	0.00		
1,171.0	5.05	187.93	1,169.1	-39.5	-21.9	40.3	0.97	-0.30		
1,263.0	4.57	170.74	1,260.8	-47.2	-21.9	47.9	1.64	-0.52		
1,355.0	4.35	177.70	1,352.5	-54.3	-21.1	55.0	0.63	-0.24		
1,537.0	5.76	183.13	1,533.8	-70.3	-21.4	71.0	0.82	0.77		
1,629.0	5.27	192.85	1,625.4	-79.0	-22.6	79.8	1.14	-0.53		
1,721.0	3.69	208.41	1,717.1	-85.7	-24.9	86.6	2.15	-1.72		

Cathedral Energy Services

Survey Report

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well Razor #11E-1402B
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-1402B	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
1,826.0	2.37	222.27	1,822.0	-90.3	-28.0	91.3	1.43	-1.26	
1,941.0	2.33	213.54	1,936.9	-94.0	-30.9	95.1	0.31	-0.03	
2,032.0	3.96	192.33	2,027.7	-98.6	-32.6	99.8	2.17	1.79	
2,124.0	3.52	182.09	2,119.5	-104.6	-33.3	105.7	0.87	-0.48	
2,216.0	4.48	184.09	2,211.3	-111.0	-33.7	112.1	1.05	1.04	
2,307.0	4.35	182.68	2,302.0	-118.0	-34.1	119.1	0.19	-0.14	
2,398.0	4.31	182.59	2,392.8	-124.8	-34.4	126.0	0.04	-0.04	
2,490.0	4.18	178.21	2,484.5	-131.6	-34.5	132.8	0.38	-0.14	
2,581.0	3.78	173.28	2,575.3	-137.9	-34.0	139.1	0.58	-0.44	
2,673.0	4.44	188.18	2,667.1	-144.5	-34.2	145.6	1.36	0.72	
2,765.0	4.00	182.59	2,758.8	-151.2	-34.8	152.4	0.65	-0.48	
2,857.0	4.35	208.84	2,850.6	-157.5	-36.7	158.7	2.09	0.38	
2,948.0	3.96	208.88	2,941.3	-163.2	-39.8	164.6	0.43	-0.43	
3,040.0	3.78	211.89	3,033.1	-168.6	-43.0	170.0	0.29	-0.20	
3,131.0	3.43	209.32	3,123.9	-173.5	-45.9	175.1	0.42	-0.38	
3,222.0	3.12	207.50	3,214.8	-178.1	-48.4	179.7	0.36	-0.34	
3,314.0	2.68	193.91	3,306.7	-182.4	-50.0	184.1	0.88	-0.48	
3,405.0	2.81	187.72	3,397.6	-186.7	-50.9	188.4	0.36	0.14	
3,496.0	2.68	182.97	3,488.5	-191.0	-51.3	192.7	0.29	-0.14	
3,587.0	4.35	187.40	3,579.3	-196.5	-51.8	198.3	1.86	1.84	
3,679.0	4.35	180.36	3,671.0	-203.5	-52.3	205.3	0.58	0.00	
3,771.0	4.44	208.15	3,762.8	-210.1	-54.0	211.9	2.29	0.10	
3,862.0	4.04	204.32	3,853.5	-216.2	-57.0	218.1	0.54	-0.44	
3,953.0	4.40	198.50	3,944.3	-222.4	-59.4	224.4	0.61	0.40	
4,044.0	5.01	185.87	4,035.0	-229.6	-60.9	231.7	1.32	0.67	
4,136.0	3.74	195.22	4,126.7	-236.5	-62.1	238.6	1.58	-1.38	
4,227.0	4.35	168.85	4,217.5	-242.8	-62.2	244.9	2.13	0.67	
4,319.0	3.91	189.87	4,309.3	-249.3	-62.1	251.4	1.70	-0.48	
4,411.0	3.60	168.10	4,401.1	-255.2	-62.0	257.3	1.58	-0.34	
4,503.0	3.65	185.69	4,492.9	-261.0	-61.7	263.0	1.21	0.05	
4,685.0	2.99	198.95	4,674.6	-271.2	-63.8	273.3	0.55	-0.36	
4,775.0	3.43	159.07	4,764.4	-276.0	-63.6	278.1	2.47	0.49	
4,867.0	4.97	187.59	4,856.2	-282.5	-63.2	284.6	2.77	1.67	
4,958.0	1.01	222.00	4,947.1	-287.0	-64.2	289.1	4.59	-4.35	
5,050.0	4.13	231.56	5,039.0	-289.6	-67.4	291.9	3.41	3.39	
5,141.0	2.86	218.18	5,129.8	-293.5	-71.4	295.8	1.65	-1.40	
5,232.0	3.78	203.49	5,220.6	-298.0	-74.0	300.5	1.37	1.01	
5,324.0	2.59	191.67	5,312.5	-302.8	-75.6	305.3	1.47	-1.29	
5,415.0	6.64	189.71	5,403.2	-310.0	-76.9	312.6	4.45	4.45	
5,507.0	14.90	194.37	5,493.5	-326.7	-80.7	329.5	9.02	8.98	
5,599.0	21.05	194.94	5,581.0	-354.2	-87.9	357.1	6.69	6.68	
5,629.0	22.95	194.14	5,608.8	-365.1	-90.7	368.1	6.41	6.33	
5,660.0	24.97	192.23	5,637.1	-377.3	-93.6	380.5	6.98	6.52	
5,690.0	26.90	193.13	5,664.1	-390.1	-96.5	393.4	6.57	6.43	
5,781.0	35.43	193.75	5,741.9	-435.9	-107.5	439.5	9.38	9.37	
5,872.0	46.33	194.58	5,810.6	-493.5	-122.1	497.6	11.99	11.98	
5,964.0	58.73	195.92	5,866.4	-563.8	-141.3	568.6	13.53	13.48	
5,995.0	63.87	195.78	5,881.3	-590.0	-148.7	595.0	16.59	16.58	
6,027.0	65.49	195.59	5,895.0	-617.8	-156.5	623.1	5.09	5.06	
6,059.0	65.58	194.84	5,908.2	-645.9	-164.2	651.4	2.15	0.28	
6,090.0	65.54	194.87	5,921.1	-673.2	-171.4	679.0	0.16	-0.13	
6,122.0	66.73	194.77	5,934.0	-701.5	-178.9	707.5	3.73	3.72	
6,154.0	68.18	195.23	5,946.3	-730.0	-186.5	736.3	4.72	4.53	

Cathedral Energy Services

Survey Report

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well Razor #11E-1402B
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-1402B	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
6,185.0	70.33	194.97	5,957.3	-758.0	-194.1	764.5	6.98	6.94	
6,217.0	72.66	195.53	5,967.4	-787.3	-202.1	794.1	7.47	7.28	
6,248.0	73.23	195.46	5,976.5	-815.9	-210.0	822.9	1.85	1.84	
6,280.0	74.46	194.51	5,985.4	-845.5	-217.9	852.9	4.79	3.84	
6,311.0	78.37	193.06	5,992.7	-874.8	-225.1	882.4	13.41	12.61	
6,343.0	81.67	190.69	5,998.2	-905.6	-231.6	913.4	12.63	10.31	
6,374.0	85.27	187.64	6,001.8	-936.0	-236.5	944.0	15.18	11.61	
6,395.0	87.78	186.07	6,003.0	-956.9	-239.0	964.9	14.09	11.95	
6,492.0	91.38	184.41	6,003.8	-1,053.4	-247.9	1,061.7	4.09	3.71	
6,586.0	89.89	184.35	6,002.7	-1,147.1	-255.0	1,155.6	1.59	-1.59	
6,681.0	89.76	184.21	6,003.0	-1,241.9	-262.1	1,250.5	0.20	-0.14	
6,776.0	89.71	184.31	6,003.4	-1,336.6	-269.2	1,345.4	0.12	-0.05	
6,870.0	91.12	184.88	6,002.8	-1,430.3	-276.7	1,439.4	1.62	1.50	
6,965.0	91.34	185.22	6,000.7	-1,524.9	-285.1	1,534.2	0.43	0.23	
7,059.0	92.18	183.74	5,997.8	-1,618.6	-292.4	1,628.1	1.81	0.89	
7,154.0	92.75	182.08	5,993.8	-1,713.3	-297.2	1,723.0	1.85	0.60	
7,248.0	92.04	180.28	5,989.8	-1,807.2	-299.2	1,816.9	2.06	-0.76	
7,343.0	90.15	179.91	5,988.0	-1,902.2	-299.3	1,911.8	2.03	-1.99	
7,438.0	89.89	179.80	5,988.0	-1,997.2	-299.1	2,006.7	0.30	-0.27	
7,532.0	90.20	180.14	5,987.9	-2,091.2	-299.0	2,100.7	0.49	0.33	
7,627.0	90.46	180.20	5,987.4	-2,186.2	-299.3	2,195.6	0.28	0.27	
7,722.0	90.46	180.36	5,986.6	-2,281.2	-299.8	2,290.6	0.17	0.00	
7,817.0	90.46	180.35	5,985.8	-2,376.2	-300.4	2,385.5	0.01	0.00	
7,912.0	90.20	180.20	5,985.3	-2,471.2	-300.8	2,480.5	0.32	-0.27	
8,006.0	90.20	179.66	5,985.0	-2,565.2	-300.7	2,574.4	0.57	0.00	
8,098.0	90.42	179.56	5,984.5	-2,657.2	-300.1	2,666.3	0.26	0.24	
8,190.0	90.55	179.61	5,983.7	-2,749.2	-299.4	2,758.2	0.15	0.14	
8,282.0	91.03	179.68	5,982.4	-2,841.2	-298.8	2,850.1	0.53	0.52	
8,372.0	89.85	179.60	5,981.7	-2,931.2	-298.3	2,940.0	1.31	-1.31	
8,464.0	90.33	179.89	5,981.6	-3,023.2	-297.9	3,032.0	0.61	0.52	
8,556.0	90.81	179.64	5,980.7	-3,115.2	-297.5	3,123.9	0.59	0.52	
8,648.0	89.32	179.82	5,980.6	-3,207.2	-297.1	3,215.8	1.63	-1.62	
8,738.0	89.71	179.89	5,981.3	-3,297.2	-296.8	3,305.7	0.44	0.43	
8,830.0	89.71	179.46	5,981.8	-3,389.2	-296.3	3,397.7	0.47	0.00	
8,921.0	90.81	180.80	5,981.4	-3,480.2	-296.5	3,488.6	1.91	1.21	
9,012.0	90.86	180.94	5,980.0	-3,571.1	-297.9	3,579.6	0.16	0.05	
9,104.0	89.76	179.36	5,979.5	-3,663.1	-298.1	3,671.5	2.09	-1.20	
9,196.0	89.67	179.87	5,980.0	-3,755.1	-297.5	3,763.4	0.56	-0.10	
9,287.0	88.70	180.07	5,981.3	-3,846.1	-297.5	3,854.3	1.09	-1.07	
9,379.0	89.14	180.00	5,983.0	-3,938.1	-297.5	3,946.3	0.48	0.48	
9,470.0	89.27	180.00	5,984.3	-4,029.1	-297.5	4,037.2	0.14	0.14	
9,562.0	89.85	180.28	5,985.0	-4,121.1	-297.8	4,129.2	0.70	0.63	
9,654.0	88.92	180.15	5,986.0	-4,213.1	-298.1	4,221.1	1.02	-1.01	
9,746.0	89.19	180.40	5,987.5	-4,305.1	-298.5	4,313.0	0.40	0.29	
9,837.0	89.49	180.58	5,988.6	-4,396.1	-299.3	4,404.0	0.38	0.33	
9,928.0	90.20	180.54	5,988.8	-4,487.0	-300.2	4,495.0	0.78	0.78	
10,019.0	90.20	179.86	5,988.5	-4,578.0	-300.5	4,585.9	0.75	0.00	
10,111.0	90.07	180.35	5,988.3	-4,670.0	-300.7	4,677.9	0.55	-0.14	
10,202.0	89.89	180.27	5,988.3	-4,761.0	-301.2	4,768.8	0.22	-0.20	
10,294.0	90.42	180.67	5,988.0	-4,853.0	-301.9	4,860.8	0.72	0.58	
10,385.0	90.02	179.66	5,987.7	-4,944.0	-302.2	4,951.7	1.19	-0.44	
10,476.0	90.59	179.51	5,987.2	-5,035.0	-301.5	5,042.6	0.65	0.63	
10,568.0	89.76	179.46	5,986.9	-5,127.0	-300.7	5,134.5	0.90	-0.90	

Cathedral Energy Services

Survey Report

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well Razor #11E-1402B
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-1402B	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
10,660.0	90.64	179.88	5,986.6	-5,219.0	-300.2	5,226.5	1.06	0.96	
10,754.0	90.46	180.15	5,985.7	-5,313.0	-300.2	5,320.4	0.35	-0.19	
10,844.0	89.98	180.17	5,985.4	-5,403.0	-300.5	5,410.3	0.53	-0.53	
10,935.0	88.97	179.49	5,986.2	-5,494.0	-300.2	5,501.3	1.34	-1.11	
11,027.0	90.02	179.11	5,987.0	-5,586.0	-299.1	5,593.2	1.21	1.14	
11,118.0	91.65	178.75	5,985.7	-5,677.0	-297.4	5,684.0	1.83	1.79	
11,210.0	90.24	179.53	5,984.2	-5,768.9	-296.0	5,775.9	1.75	-1.53	
11,302.0	88.35	178.71	5,985.3	-5,860.9	-294.6	5,867.8	2.24	-2.05	
11,394.0	89.49	177.93	5,987.0	-5,952.9	-291.9	5,959.5	1.50	1.24	
11,485.0	89.80	178.78	5,987.6	-6,043.8	-289.3	6,050.4	0.99	0.34	
11,576.0	89.01	178.85	5,988.5	-6,134.8	-287.4	6,141.2	0.87	-0.87	
11,667.0	88.04	177.85	5,990.9	-6,225.8	-284.8	6,232.0	1.53	-1.07	
11,758.0	88.75	178.91	5,993.4	-6,316.7	-282.2	6,322.7	1.40	0.78	
11,849.0	88.44	180.33	5,995.7	-6,407.6	-281.6	6,413.6	1.60	-0.34	
11,941.0	88.66	180.61	5,998.0	-6,499.6	-282.3	6,505.6	0.39	0.24	
12,032.0	89.05	179.91	5,999.8	-6,590.6	-282.8	6,596.5	0.88	0.43	
12,123.0	88.57	181.39	6,001.7	-6,681.6	-283.8	6,687.5	1.71	-0.53	
12,215.0	88.84	181.40	6,003.8	-6,773.5	-286.0	6,779.4	0.29	0.29	
12,306.0	89.58	180.33	6,005.0	-6,864.5	-287.4	6,870.4	1.43	0.81	
12,398.0	90.33	179.41	6,005.1	-6,956.5	-287.2	6,962.3	1.29	0.82	
12,490.0	90.86	179.60	6,004.1	-7,048.5	-286.4	7,054.2	0.61	0.58	
12,581.0	90.42	181.15	6,003.1	-7,139.5	-287.0	7,145.2	1.77	-0.48	
12,672.0	89.98	180.69	6,002.8	-7,230.4	-288.5	7,236.1	0.70	-0.48	
12,764.0	88.53	180.31	6,004.0	-7,322.4	-289.3	7,328.1	1.63	-1.58	
12,855.0	88.92	179.61	6,006.0	-7,413.4	-289.2	7,419.0	0.88	0.43	
12,950.0	88.22	179.46	6,008.4	-7,508.4	-288.4	7,513.9	0.75	-0.74	
13,044.0	87.38	180.68	6,012.0	-7,602.3	-288.5	7,607.8	1.57	-0.89	
13,139.0	87.65	180.15	6,016.1	-7,697.2	-289.2	7,702.6	0.63	0.28	
13,234.0	87.65	180.32	6,020.0	-7,792.1	-289.6	7,797.5	0.18	0.00	
13,329.0	89.23	180.12	6,022.6	-7,887.1	-290.0	7,892.4	1.68	1.66	
13,423.0	90.15	179.60	6,023.1	-7,981.1	-289.8	7,986.4	1.12	0.98	Last Cathedral Survey @ 13,423' MD
13,470.0	90.15	179.60	6,023.0	-8,028.1	-289.4	8,033.3	0.00	0.00	Projection to Bit @ 13,470' - TD - 163' FSL, 499'

Cathedral Energy Services

Survey Report

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well Razor #11E-1402B
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-1402B	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-1402B PBH	0.00	0.00	6,013.0	-8,092.4	-293.6	1,550,159.97	3,459,231.14	40° 49' 54.38 N	103° 50' 25.62 W
- survey misses target center by 65.3usft at 13470.0usft MD (6023.0 TVD, -8028.1 N, -289.4 E)									
- Point									
Razor #11E-1402B BHL	0.00	0.00	6,015.0	-8,091.0	-292.5	1,550,161.46	3,459,232.26	40° 49' 54.39 N	103° 50' 25.61 W
- survey misses target center by 63.5usft at 13470.0usft MD (6023.0 TVD, -8028.1 N, -289.4 E)									
- Point									
Razor #11E-1402B 720C	0.00	0.00	6,005.0	-7,194.1	-292.5	1,551,058.20	3,459,215.47	40° 50' 3.26 N	103° 50' 25.61 W
- survey misses target center by 5.0usft at 12635.7usft MD (6002.9 TVD, -7194.2 N, -288.0 E)									
- Point									
Razor #11E-1402B 500C	0.00	0.00	5,985.0	-4,992.7	-292.4	1,553,259.21	3,459,174.34	40° 50' 25.01 N	103° 50' 25.60 W
- survey misses target center by 9.8usft at 10433.7usft MD (5987.5 TVD, -4992.8 N, -301.9 E)									
- Point									
Razor #11E-1402B BHL	0.00	0.00	5,992.0	-8,091.0	-292.5	1,550,161.46	3,459,232.26	40° 49' 54.39 N	103° 50' 25.61 W
- survey misses target center by 70.2usft at 13470.0usft MD (6023.0 TVD, -8028.1 N, -289.4 E)									
- Point									
Razor #11E-1402B 360C	0.00	0.00	5,980.0	-3,591.8	-292.4	1,554,659.86	3,459,148.11	40° 50' 38.85 N	103° 50' 25.60 W
- survey misses target center by 5.8usft at 9032.6usft MD (5979.8 TVD, -3591.8 N, -298.2 E)									
- Point									
Razor #11E-1402B BHL	0.00	0.00	6,013.0	-8,091.0	-292.5	1,550,161.46	3,459,232.26	40° 49' 54.39 N	103° 50' 25.61 W
- survey misses target center by 63.8usft at 13470.0usft MD (6023.0 TVD, -8028.1 N, -289.4 E)									
- Point									
Razor #11E-1402B 200C	0.00	0.00	5,990.0	-1,990.7	-292.4	1,556,260.68	3,459,118.13	40° 50' 54.67 N	103° 50' 25.60 W
- survey misses target center by 7.0usft at 7431.5usft MD (5988.0 TVD, -1990.7 N, -299.1 E)									
- Point									
Razor #11E-1402B 620C	0.00	0.00	5,990.0	-6,193.5	-292.5	1,552,058.62	3,459,196.73	40° 50' 13.14 N	103° 50' 25.61 W
- survey misses target center by 6.6usft at 11634.5usft MD (5989.9 TVD, -6193.3 N, -285.9 E)									
- Point									

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
6,427.0	6,004.0	7" - 1,915' FSL, 578' FWL	0	0	

Survey Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
13,423.0	6,023.1	-7,981.1	-289.8	Last Cathedral Survey @ 13,423' MD	
13,470.0	6,023.0	-8,028.1	-289.4	Projection to Bit @ 13,470'	
13,470.0	6,023.0	-8,028.1	-289.4	TD - 163' FSL, 499' FWL	

Checked By: _____ Approved By: _____ Date: _____

Whiting Petroleum Corporation

Weld County, CO

S11-T10N-R58W

Razor #11E-1402B

HZ

Survey: Survey #1

Survey Report - Geographic

26 January, 2014

Cathedral Energy Services

Survey Report - Geographic

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well Razor #11E-1402B
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-1402B	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° 51' 17.19 N
From:	Lat/Long	Easting:	3,463,389.92 usft	Longitude:	103° 49' 29.45 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	1.08 °

Well		Razor #11E-1402B				
Well Position	+N/-S	0.0 usft	Northing:	1,558,256.50 usft	Latitude:	40° 51' 14.34 N
	+E/-W	0.0 usft	Easting:	3,459,373.20 usft	Longitude:	103° 50' 21.80 W
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	1/6/2014	8.04	67.47	53,189

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	182.07	

Survey Program	Date	1/26/2014			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
440.0	13,470.0	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	1,558,256.50	3,459,373.20	40° 51' 14.34 N	103° 50' 21.80 W
440.0	0.97	313.70	440.0	2.6	-2.7	1,558,259.03	3,459,370.46	40° 51' 14.37 N	103° 50' 21.84 W
532.0	1.10	256.46	532.0	2.9	-4.1	1,558,259.33	3,459,369.03	40° 51' 14.37 N	103° 50' 21.85 W
623.0	2.20	212.02	622.9	1.2	-5.9	1,558,257.61	3,459,367.29	40° 51' 14.35 N	103° 50' 21.88 W
715.0	4.04	200.46	714.8	-3.3	-8.0	1,558,253.04	3,459,365.30	40° 51' 14.31 N	103° 50' 21.90 W
989.0	5.32	206.40	987.9	-23.7	-17.0	1,558,232.45	3,459,356.66	40° 51' 14.11 N	103° 50' 22.02 W
1,080.0	5.32	197.21	1,078.5	-31.5	-20.1	1,558,224.59	3,459,353.69	40° 51' 14.03 N	103° 50' 22.06 W
1,171.0	5.05	187.93	1,169.1	-39.5	-21.9	1,558,216.56	3,459,352.04	40° 51' 13.95 N	103° 50' 22.09 W
1,263.0	4.57	170.74	1,260.8	-47.2	-21.9	1,558,208.93	3,459,352.21	40° 51' 13.87 N	103° 50' 22.08 W
1,355.0	4.35	177.70	1,352.5	-54.3	-21.1	1,558,201.84	3,459,353.07	40° 51' 13.80 N	103° 50' 22.08 W
1,537.0	5.76	183.13	1,533.8	-70.3	-21.4	1,558,185.82	3,459,353.15	40° 51' 13.65 N	103° 50' 22.08 W
1,629.0	5.27	192.85	1,625.4	-79.0	-22.6	1,558,177.07	3,459,352.12	40° 51' 13.56 N	103° 50' 22.09 W

Cathedral Energy Services

Survey Report - Geographic

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well Razor #11E-1402B
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-1402B	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	
1,721.0	3.69	208.41	1,717.1	-85.7	-24.9	1,558,170.31	3,459,349.90	40° 51' 13.49 N	103° 50' 22.12 W	
1,826.0	2.37	222.27	1,822.0	-90.3	-28.0	1,558,165.67	3,459,346.92	40° 51' 13.45 N	103° 50' 22.16 W	
1,941.0	2.33	213.54	1,936.9	-94.0	-30.9	1,558,161.91	3,459,344.10	40° 51' 13.41 N	103° 50' 22.20 W	
2,032.0	3.96	192.33	2,027.7	-98.6	-32.6	1,558,157.27	3,459,342.49	40° 51' 13.37 N	103° 50' 22.22 W	
2,124.0	3.52	182.09	2,119.5	-104.6	-33.3	1,558,151.33	3,459,341.82	40° 51' 13.31 N	103° 50' 22.23 W	
2,216.0	4.48	184.09	2,211.3	-111.0	-33.7	1,558,144.92	3,459,341.58	40° 51' 13.24 N	103° 50' 22.24 W	
2,307.0	4.35	182.68	2,302.0	-118.0	-34.1	1,558,137.92	3,459,341.30	40° 51' 13.17 N	103° 50' 22.24 W	
2,398.0	4.31	182.59	2,392.8	-124.8	-34.4	1,558,131.05	3,459,341.11	40° 51' 13.11 N	103° 50' 22.25 W	
2,490.0	4.18	178.21	2,484.5	-131.6	-34.5	1,558,124.24	3,459,341.19	40° 51' 13.04 N	103° 50' 22.25 W	
2,581.0	3.78	173.28	2,575.3	-137.9	-34.0	1,558,117.96	3,459,341.76	40° 51' 12.98 N	103° 50' 22.24 W	
2,673.0	4.44	188.18	2,667.1	-144.5	-34.2	1,558,111.42	3,459,341.73	40° 51' 12.91 N	103° 50' 22.24 W	
2,765.0	4.00	182.59	2,758.8	-151.2	-34.8	1,558,104.68	3,459,341.20	40° 51' 12.85 N	103° 50' 22.25 W	
2,857.0	4.35	208.84	2,850.6	-157.5	-36.7	1,558,098.39	3,459,339.49	40° 51' 12.78 N	103° 50' 22.28 W	
2,948.0	3.96	208.88	2,941.3	-163.2	-39.8	1,558,092.55	3,459,336.42	40° 51' 12.73 N	103° 50' 22.32 W	
3,040.0	3.78	211.89	3,033.1	-168.6	-43.0	1,558,087.14	3,459,333.38	40° 51' 12.67 N	103° 50' 22.36 W	
3,131.0	3.43	209.32	3,123.9	-173.5	-45.9	1,558,082.16	3,459,330.56	40° 51' 12.63 N	103° 50' 22.40 W	
3,222.0	3.12	207.50	3,214.8	-178.1	-48.4	1,558,077.55	3,459,328.17	40° 51' 12.58 N	103° 50' 22.43 W	
3,314.0	2.68	193.91	3,306.7	-182.4	-50.0	1,558,073.21	3,459,326.58	40° 51' 12.54 N	103° 50' 22.45 W	
3,405.0	2.81	187.72	3,397.6	-186.7	-50.9	1,558,068.92	3,459,325.85	40° 51' 12.50 N	103° 50' 22.46 W	
3,496.0	2.68	182.97	3,488.5	-191.0	-51.3	1,558,064.58	3,459,325.52	40° 51' 12.45 N	103° 50' 22.47 W	
3,587.0	4.35	187.40	3,579.3	-196.5	-51.8	1,558,059.02	3,459,325.07	40° 51' 12.40 N	103° 50' 22.47 W	
3,679.0	4.35	180.36	3,671.0	-203.5	-52.3	1,558,052.06	3,459,324.72	40° 51' 12.33 N	103° 50' 22.48 W	
3,771.0	4.44	208.15	3,762.8	-210.1	-54.0	1,558,045.40	3,459,323.15	40° 51' 12.26 N	103° 50' 22.50 W	
3,862.0	4.04	204.32	3,853.5	-216.2	-57.0	1,558,039.32	3,459,320.28	40° 51' 12.20 N	103° 50' 22.54 W	
3,953.0	4.40	198.50	3,944.3	-222.4	-59.4	1,558,033.05	3,459,317.97	40° 51' 12.14 N	103° 50' 22.57 W	
4,044.0	5.01	185.87	4,035.0	-229.6	-60.9	1,558,025.76	3,459,316.59	40° 51' 12.07 N	103° 50' 22.59 W	
4,136.0	3.74	195.22	4,126.7	-236.5	-62.1	1,558,018.84	3,459,315.52	40° 51' 12.00 N	103° 50' 22.61 W	
4,227.0	4.35	168.85	4,217.5	-242.8	-62.2	1,558,012.59	3,459,315.53	40° 51' 11.94 N	103° 50' 22.61 W	
4,319.0	3.91	189.87	4,309.3	-249.3	-62.1	1,558,006.08	3,459,315.78	40° 51' 11.88 N	103° 50' 22.61 W	
4,411.0	3.60	168.10	4,401.1	-255.2	-62.0	1,558,000.17	3,459,315.95	40° 51' 11.82 N	103° 50' 22.61 W	
4,503.0	3.65	185.69	4,492.9	-261.0	-61.7	1,557,994.43	3,459,316.37	40° 51' 11.76 N	103° 50' 22.60 W	
4,685.0	2.99	198.95	4,674.6	-271.2	-63.8	1,557,984.14	3,459,314.44	40° 51' 11.66 N	103° 50' 22.63 W	
4,775.0	3.43	159.07	4,764.4	-276.0	-63.6	1,557,979.41	3,459,314.73	40° 51' 11.61 N	103° 50' 22.63 W	
4,867.0	4.97	187.59	4,856.2	-282.5	-63.2	1,557,972.90	3,459,315.31	40° 51' 11.55 N	103° 50' 22.62 W	
4,958.0	1.01	222.00	4,947.1	-287.0	-64.2	1,557,968.37	3,459,314.34	40° 51' 11.50 N	103° 50' 22.64 W	
5,050.0	4.13	231.56	5,039.0	-289.6	-67.4	1,557,965.65	3,459,311.25	40° 51' 11.48 N	103° 50' 22.68 W	
5,141.0	2.86	218.18	5,129.8	-293.5	-71.4	1,557,961.76	3,459,307.35	40° 51' 11.44 N	103° 50' 22.73 W	
5,232.0	3.78	203.49	5,220.6	-298.0	-74.0	1,557,957.17	3,459,304.84	40° 51' 11.40 N	103° 50' 22.76 W	
5,324.0	2.59	191.67	5,312.5	-302.8	-75.6	1,557,952.33	3,459,303.30	40° 51' 11.35 N	103° 50' 22.78 W	
5,415.0	6.64	189.71	5,403.2	-310.0	-76.9	1,557,945.10	3,459,302.13	40° 51' 11.28 N	103° 50' 22.80 W	
5,507.0	14.90	194.37	5,493.5	-326.7	-80.7	1,557,928.30	3,459,298.60	40° 51' 11.11 N	103° 50' 22.85 W	
5,599.0	21.05	194.94	5,581.0	-354.2	-87.9	1,557,900.72	3,459,291.92	40° 51' 10.84 N	103° 50' 22.94 W	
5,629.0	22.95	194.14	5,608.8	-365.1	-90.7	1,557,889.79	3,459,289.30	40° 51' 10.73 N	103° 50' 22.98 W	
5,660.0	24.97	192.23	5,637.1	-377.3	-93.6	1,557,877.48	3,459,286.67	40° 51' 10.61 N	103° 50' 23.02 W	
5,690.0	26.90	193.13	5,664.1	-390.1	-96.5	1,557,864.63	3,459,284.03	40° 51' 10.48 N	103° 50' 23.06 W	
5,781.0	35.43	193.75	5,741.9	-435.9	-107.5	1,557,818.68	3,459,273.92	40° 51' 10.03 N	103° 50' 23.20 W	
5,872.0	46.33	194.58	5,810.6	-493.5	-122.1	1,557,760.77	3,459,260.40	40° 51' 9.46 N	103° 50' 23.39 W	
5,964.0	58.73	195.92	5,866.4	-563.8	-141.3	1,557,690.14	3,459,242.49	40° 51' 8.77 N	103° 50' 23.64 W	
5,995.0	63.87	195.78	5,881.3	-590.0	-148.7	1,557,663.85	3,459,235.56	40° 51' 8.51 N	103° 50' 23.74 W	
6,027.0	65.49	195.59	5,895.0	-617.8	-156.5	1,557,635.86	3,459,228.26	40° 51' 8.24 N	103° 50' 23.84 W	
6,059.0	65.58	194.84	5,908.2	-645.9	-164.2	1,557,607.62	3,459,221.14	40° 51' 7.96 N	103° 50' 23.94 W	
6,090.0	65.54	194.87	5,921.1	-673.2	-171.4	1,557,580.21	3,459,214.42	40° 51' 7.69 N	103° 50' 24.03 W	
6,122.0	66.73	194.77	5,934.0	-701.5	-178.9	1,557,551.79	3,459,207.46	40° 51' 7.41 N	103° 50' 24.13 W	
6,154.0	68.18	195.23	5,946.3	-730.0	-186.5	1,557,523.10	3,459,200.35	40° 51' 7.13 N	103° 50' 24.23 W	
6,185.0	70.33	194.97	5,957.3	-758.0	-194.1	1,557,494.98	3,459,193.33	40° 51' 6.85 N	103° 50' 24.33 W	

Cathedral Energy Services

Survey Report - Geographic

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well Razor #11E-1402B
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-1402B	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
6,217.0	72.66	195.53	5,967.4	-787.3	-202.1	1,557,465.56	3,459,185.89	40° 51' 6.56 N	103° 50' 24.43 W
6,248.0	73.23	195.46	5,976.5	-815.9	-210.0	1,557,436.86	3,459,178.51	40° 51' 6.28 N	103° 50' 24.53 W
6,280.0	74.46	194.51	5,985.4	-845.5	-217.9	1,557,407.02	3,459,171.12	40° 51' 5.99 N	103° 50' 24.64 W
6,311.0	78.37	193.06	5,992.7	-874.8	-225.1	1,557,377.63	3,459,164.50	40° 51' 5.70 N	103° 50' 24.73 W
6,343.0	81.67	190.69	5,998.2	-905.6	-231.6	1,557,346.68	3,459,158.59	40° 51' 5.39 N	103° 50' 24.81 W
6,374.0	85.27	187.64	6,001.8	-936.0	-236.5	1,557,316.20	3,459,154.26	40° 51' 5.09 N	103° 50' 24.88 W
6,395.0	87.78	186.07	6,003.0	-956.9	-239.0	1,557,295.35	3,459,152.15	40° 51' 4.89 N	103° 50' 24.91 W
6,492.0	91.38	184.41	6,003.8	-1,053.4	-247.9	1,557,198.64	3,459,145.11	40° 51' 3.93 N	103° 50' 25.03 W
6,586.0	89.89	184.35	6,002.7	-1,147.1	-255.0	1,557,104.80	3,459,139.68	40° 51' 3.01 N	103° 50' 25.12 W
6,681.0	89.76	184.21	6,003.0	-1,241.9	-262.1	1,557,009.95	3,459,134.37	40° 51' 2.07 N	103° 50' 25.21 W
6,776.0	89.71	184.31	6,003.4	-1,336.6	-269.2	1,556,915.10	3,459,129.09	40° 51' 1.13 N	103° 50' 25.30 W
6,870.0	91.12	184.88	6,002.8	-1,430.3	-276.7	1,556,821.28	3,459,123.31	40° 51' 0.21 N	103° 50' 25.40 W
6,965.0	91.34	185.22	6,000.7	-1,524.9	-285.1	1,556,726.53	3,459,116.73	40° 50' 59.27 N	103° 50' 25.51 W
7,059.0	92.18	183.74	5,997.8	-1,618.6	-292.4	1,556,632.75	3,459,111.14	40° 50' 58.35 N	103° 50' 25.60 W
7,154.0	92.75	182.08	5,993.8	-1,713.3	-297.2	1,556,537.89	3,459,108.10	40° 50' 57.41 N	103° 50' 25.67 W
7,248.0	92.04	180.28	5,989.8	-1,807.2	-299.2	1,556,443.98	3,459,107.93	40° 50' 56.48 N	103° 50' 25.69 W
7,343.0	90.15	179.91	5,988.0	-1,902.2	-299.3	1,556,349.01	3,459,109.55	40° 50' 55.54 N	103° 50' 25.69 W
7,438.0	89.89	179.80	5,988.0	-1,997.2	-299.1	1,556,254.03	3,459,111.57	40° 50' 49.92 N	103° 50' 25.69 W
7,532.0	90.20	180.14	5,987.9	-2,091.2	-299.0	1,556,160.05	3,459,113.38	40° 50' 53.68 N	103° 50' 25.69 W
7,627.0	90.46	180.20	5,987.4	-2,186.2	-299.3	1,556,065.06	3,459,114.87	40° 50' 52.74 N	103° 50' 25.69 W
7,722.0	90.46	180.36	5,986.6	-2,281.2	-299.8	1,555,970.08	3,459,116.19	40° 50' 51.80 N	103° 50' 25.70 W
7,817.0	90.46	180.35	5,985.8	-2,376.2	-300.4	1,555,875.09	3,459,117.38	40° 50' 50.86 N	103° 50' 25.71 W
7,912.0	90.20	180.20	5,985.3	-2,471.2	-300.8	1,555,780.10	3,459,118.70	40° 50' 49.92 N	103° 50' 25.71 W
8,006.0	90.20	179.66	5,985.0	-2,565.2	-300.7	1,555,686.12	3,459,120.58	40° 50' 48.99 N	103° 50' 25.71 W
8,098.0	90.42	179.56	5,984.5	-2,657.2	-300.1	1,555,594.15	3,459,122.92	40° 50' 48.08 N	103° 50' 25.70 W
8,190.0	90.55	179.61	5,983.7	-2,749.2	-299.4	1,555,502.18	3,459,125.31	40° 50' 47.18 N	103° 50' 25.70 W
8,282.0	91.03	179.68	5,982.4	-2,841.2	-298.8	1,555,410.22	3,459,127.61	40° 50' 46.27 N	103° 50' 25.69 W
8,372.0	89.85	179.60	5,981.7	-2,931.2	-298.3	1,555,320.25	3,459,129.86	40° 50' 45.38 N	103° 50' 25.68 W
8,464.0	90.33	179.89	5,981.6	-3,023.2	-297.9	1,555,228.28	3,459,131.99	40° 50' 44.47 N	103° 50' 25.68 W
8,556.0	90.81	179.64	5,980.7	-3,115.2	-297.5	1,555,136.31	3,459,134.09	40° 50' 43.56 N	103° 50' 25.67 W
8,648.0	89.32	179.82	5,980.6	-3,207.2	-297.1	1,555,044.34	3,459,136.24	40° 50' 42.65 N	103° 50' 25.67 W
8,738.0	89.71	179.89	5,981.3	-3,297.2	-296.8	1,554,954.36	3,459,138.16	40° 50' 41.76 N	103° 50' 25.66 W
8,830.0	89.71	179.46	5,981.8	-3,389.2	-296.3	1,554,862.39	3,459,140.40	40° 50' 40.85 N	103° 50' 25.66 W
8,921.0	90.81	180.80	5,981.4	-3,480.2	-296.5	1,554,771.41	3,459,141.90	40° 50' 39.95 N	103° 50' 25.66 W
9,012.0	90.86	180.94	5,980.0	-3,571.1	-297.9	1,554,680.42	3,459,142.22	40° 50' 39.05 N	103° 50' 25.68 W
9,104.0	89.76	179.36	5,979.5	-3,663.1	-298.1	1,554,588.44	3,459,143.70	40° 50' 38.15 N	103° 50' 25.68 W
9,196.0	89.67	179.87	5,980.0	-3,755.1	-297.5	1,554,496.47	3,459,146.04	40° 50' 37.24 N	103° 50' 25.67 W
9,287.0	88.70	180.07	5,981.3	-3,846.1	-297.5	1,554,405.49	3,459,147.80	40° 50' 36.34 N	103° 50' 25.67 W
9,379.0	89.14	180.00	5,983.0	-3,938.1	-297.5	1,554,313.53	3,459,149.46	40° 50' 35.43 N	103° 50' 25.67 W
9,470.0	89.27	180.00	5,984.3	-4,029.1	-297.5	1,554,222.55	3,459,151.17	40° 50' 34.53 N	103° 50' 25.67 W
9,562.0	89.85	180.28	5,985.0	-4,121.1	-297.8	1,554,130.57	3,459,152.66	40° 50' 33.62 N	103° 50' 25.67 W
9,654.0	88.92	180.15	5,986.0	-4,213.1	-298.1	1,554,038.58	3,459,154.04	40° 50' 32.71 N	103° 50' 25.68 W
9,746.0	89.19	180.40	5,987.5	-4,305.1	-298.5	1,553,946.60	3,459,155.32	40° 50' 31.80 N	103° 50' 25.68 W
9,837.0	89.49	180.58	5,988.6	-4,396.1	-299.3	1,553,855.62	3,459,156.25	40° 50' 30.90 N	103° 50' 25.69 W
9,928.0	90.20	180.54	5,988.8	-4,487.0	-300.2	1,553,764.62	3,459,157.06	40° 50' 30.00 N	103° 50' 25.71 W
10,019.0	90.20	179.86	5,988.5	-4,578.0	-300.5	1,553,673.63	3,459,158.45	40° 50' 29.11 N	103° 50' 25.71 W
10,111.0	90.07	180.35	5,988.3	-4,670.0	-300.7	1,553,581.65	3,459,160.00	40° 50' 28.20 N	103° 50' 25.71 W
10,202.0	89.89	180.27	5,988.3	-4,761.0	-301.2	1,553,490.65	3,459,161.22	40° 50' 27.30 N	103° 50' 25.72 W
10,294.0	90.42	180.67	5,988.0	-4,853.0	-301.9	1,553,398.66	3,459,162.18	40° 50' 26.39 N	103° 50' 25.73 W
10,385.0	90.02	179.66	5,987.7	-4,944.0	-302.2	1,553,307.67	3,459,163.63	40° 50' 25.49 N	103° 50' 25.73 W
10,476.0	90.59	179.51	5,987.2	-5,035.0	-301.5	1,553,216.71	3,459,165.99	40° 50' 24.59 N	103° 50' 25.72 W
10,568.0	89.76	179.46	5,986.9	-5,127.0	-300.7	1,553,124.74	3,459,168.54	40° 50' 23.68 N	103° 50' 25.71 W
10,660.0	90.64	179.88	5,986.6	-5,219.0	-300.2	1,553,032.77	3,459,170.79	40° 50' 22.77 N	103° 50' 25.71 W
10,754.0	90.46	180.15	5,985.7	-5,313.0	-300.2	1,552,938.79	3,459,172.53	40° 50' 21.84 N	103° 50' 25.71 W
10,844.0	89.98	180.17	5,985.4	-5,403.0	-300.5	1,552,848.81	3,459,173.96	40° 50' 20.95 N	103° 50' 25.71 W

Cathedral Energy Services

Survey Report - Geographic

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well Razor #11E-1402B
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-1402B	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
10,935.0	88.97	179.49	5,986.2	-5,494.0	-300.2	1,552,757.83	3,459,175.93	40° 50' 20.05 N	103° 50' 25.71 W
11,027.0	90.02	179.11	5,987.0	-5,586.0	-299.1	1,552,665.88	3,459,178.78	40° 50' 19.15 N	103° 50' 25.69 W
11,118.0	91.65	178.75	5,985.7	-5,677.0	-297.4	1,552,574.96	3,459,182.18	40° 50' 18.25 N	103° 50' 25.67 W
11,210.0	90.24	179.53	5,984.2	-5,768.9	-296.0	1,552,483.03	3,459,185.29	40° 50' 17.34 N	103° 50' 25.65 W
11,302.0	88.35	178.71	5,985.3	-5,860.9	-294.6	1,552,391.07	3,459,188.42	40° 50' 16.43 N	103° 50' 25.63 W
11,394.0	89.49	177.93	5,987.0	-5,952.9	-291.9	1,552,299.20	3,459,192.84	40° 50' 15.52 N	103° 50' 25.60 W
11,485.0	89.80	178.78	5,987.6	-6,043.8	-289.3	1,552,208.30	3,459,197.15	40° 50' 14.62 N	103° 50' 25.56 W
11,576.0	89.01	178.85	5,988.5	-6,134.8	-287.4	1,552,117.38	3,459,200.74	40° 50' 13.72 N	103° 50' 25.54 W
11,667.0	88.04	177.85	5,990.9	-6,225.8	-284.8	1,552,026.51	3,459,205.06	40° 50' 12.82 N	103° 50' 25.50 W
11,758.0	88.75	178.91	5,993.4	-6,316.7	-282.2	1,551,935.65	3,459,209.33	40° 50' 11.93 N	103° 50' 25.47 W
11,849.0	88.44	180.33	5,995.7	-6,407.6	-281.6	1,551,844.71	3,459,211.64	40° 50' 11.03 N	103° 50' 25.46 W
11,941.0	88.66	180.61	5,998.0	-6,499.6	-282.3	1,551,752.74	3,459,212.61	40° 50' 10.12 N	103° 50' 25.47 W
12,032.0	89.05	179.91	5,999.8	-6,590.6	-282.8	1,551,661.77	3,459,213.90	40° 50' 9.22 N	103° 50' 25.48 W
12,123.0	88.57	181.39	6,001.7	-6,681.6	-283.8	1,551,570.80	3,459,214.57	40° 50' 8.32 N	103° 50' 25.49 W
12,215.0	88.84	181.40	6,003.8	-6,773.5	-286.0	1,551,478.82	3,459,214.05	40° 50' 7.41 N	103° 50' 25.52 W
12,306.0	89.58	180.33	6,005.0	-6,864.5	-287.4	1,551,387.83	3,459,214.38	40° 50' 6.51 N	103° 50' 25.54 W
12,398.0	90.33	179.41	6,005.1	-6,956.5	-287.2	1,551,295.85	3,459,216.32	40° 50' 5.60 N	103° 50' 25.54 W
12,490.0	90.86	179.60	6,004.1	-7,048.5	-286.4	1,551,203.89	3,459,218.83	40° 50' 4.70 N	103° 50' 25.53 W
12,581.0	90.42	181.15	6,003.1	-7,139.5	-287.0	1,551,112.91	3,459,219.94	40° 50' 3.80 N	103° 50' 25.53 W
12,672.0	89.98	180.69	6,002.8	-7,230.4	-288.5	1,551,021.94	3,459,220.18	40° 50' 2.90 N	103° 50' 25.55 W
12,764.0	88.53	180.31	6,004.0	-7,322.4	-289.3	1,550,929.95	3,459,221.10	40° 50' 1.99 N	103° 50' 25.56 W
12,855.0	88.92	179.61	6,006.0	-7,413.4	-289.2	1,550,838.99	3,459,222.87	40° 50' 1.09 N	103° 50' 25.56 W
12,950.0	88.22	179.46	6,008.4	-7,508.4	-288.4	1,550,744.06	3,459,225.42	40° 50' 0.15 N	103° 50' 25.55 W
13,044.0	87.38	180.68	6,012.0	-7,602.3	-288.5	1,550,650.14	3,459,227.06	40° 49' 59.22 N	103° 50' 25.55 W
13,139.0	87.65	180.15	6,016.1	-7,697.2	-289.2	1,550,555.24	3,459,228.15	40° 49' 58.29 N	103° 50' 25.56 W
13,234.0	87.65	180.32	6,020.0	-7,792.1	-289.6	1,550,460.33	3,459,229.54	40° 49' 57.35 N	103° 50' 25.57 W
13,329.0	89.23	180.12	6,022.6	-7,887.1	-290.0	1,550,365.38	3,459,230.96	40° 49' 56.41 N	103° 50' 25.57 W
13,423.0	90.15	179.60	6,023.1	-7,981.1	-289.8	1,550,271.38	3,459,232.95	40° 49' 55.48 N	103° 50' 25.57 W
Last Cathedral Survey @ 13,423' MD									
13,470.0	90.15	179.60	6,023.0	-8,028.1	-289.4	1,550,224.42	3,459,234.15	40° 49' 55.02 N	103° 50' 25.57 W
Projection to Bit @ 13,470' - TD - 163' FSL, 499' FWL									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Razor #11E-1402B BHL	0.00	0.00	6,015.0	-8,091.0	-292.5	1,550,161.46	3,459,232.26	40° 49' 54.39 N	103° 50' 25.61 W
- hit/miss target									
- Shape									
- survey misses target center by 63.5usft at 13470.0usft MD (6023.0 TVD, -8028.1 N, -289.4 E)									
- Point									

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
6,427.0	6,004.0	7" - 1,915' FSL, 578' FWL	0	0	

Cathedral Energy Services

Survey Report - Geographic

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well Razor #11E-1402B
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-1402B	North Reference:	True
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Survey Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
13,423.0	6,023.1	-7,981.1	-289.8	Last Cathedral Survey @ 13,423' MD
13,470.0	6,023.0	-8,028.1	-289.4	Projection to Bit @ 13,470'
13,470.0	6,023.0	-8,028.1	-289.4	TD - 163' FSL, 499' FWL

Checked By: _____	Approved By: _____	Date: _____
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