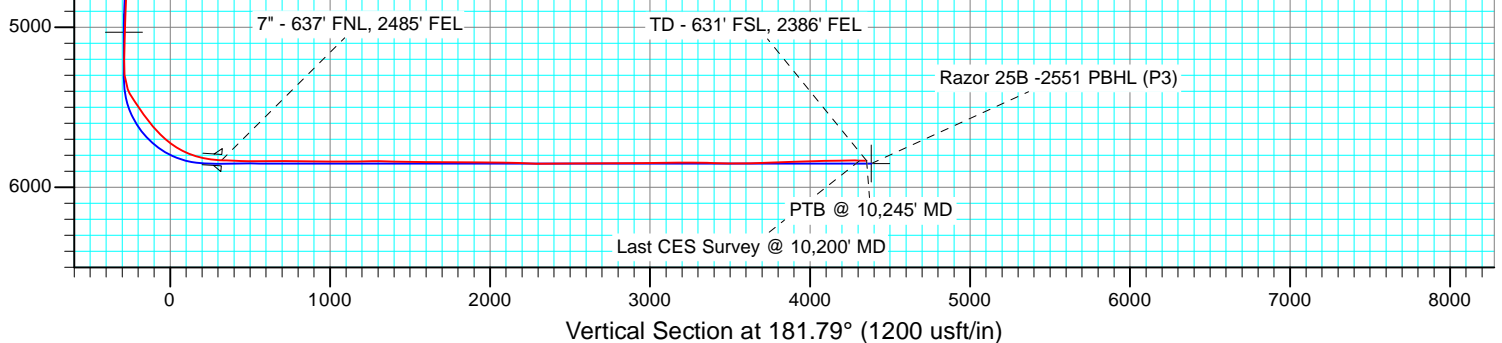


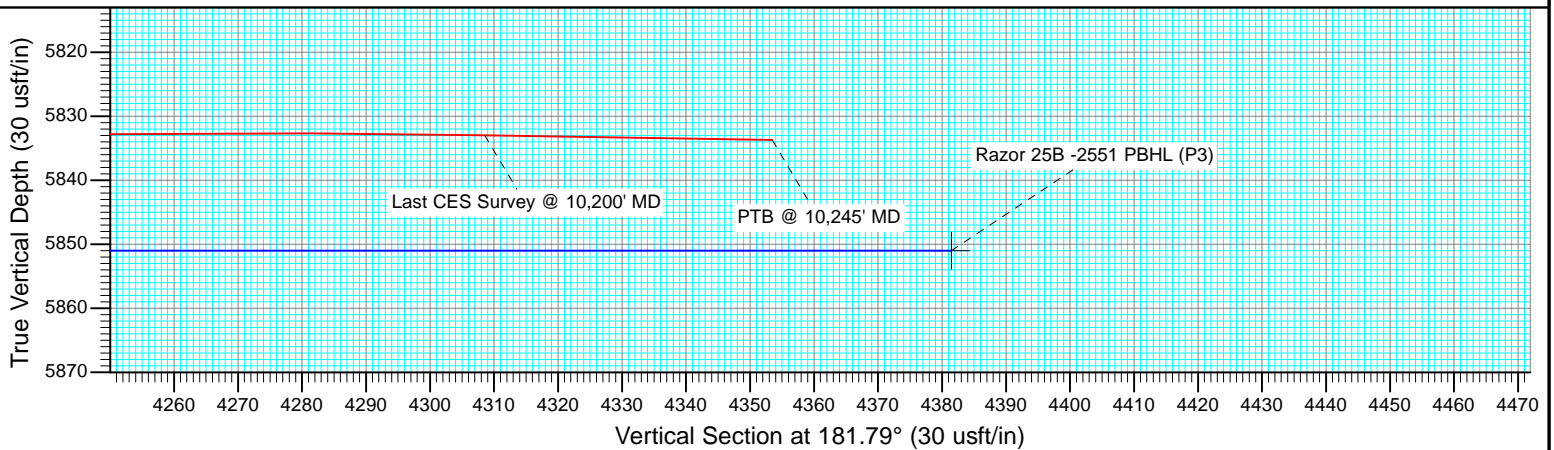
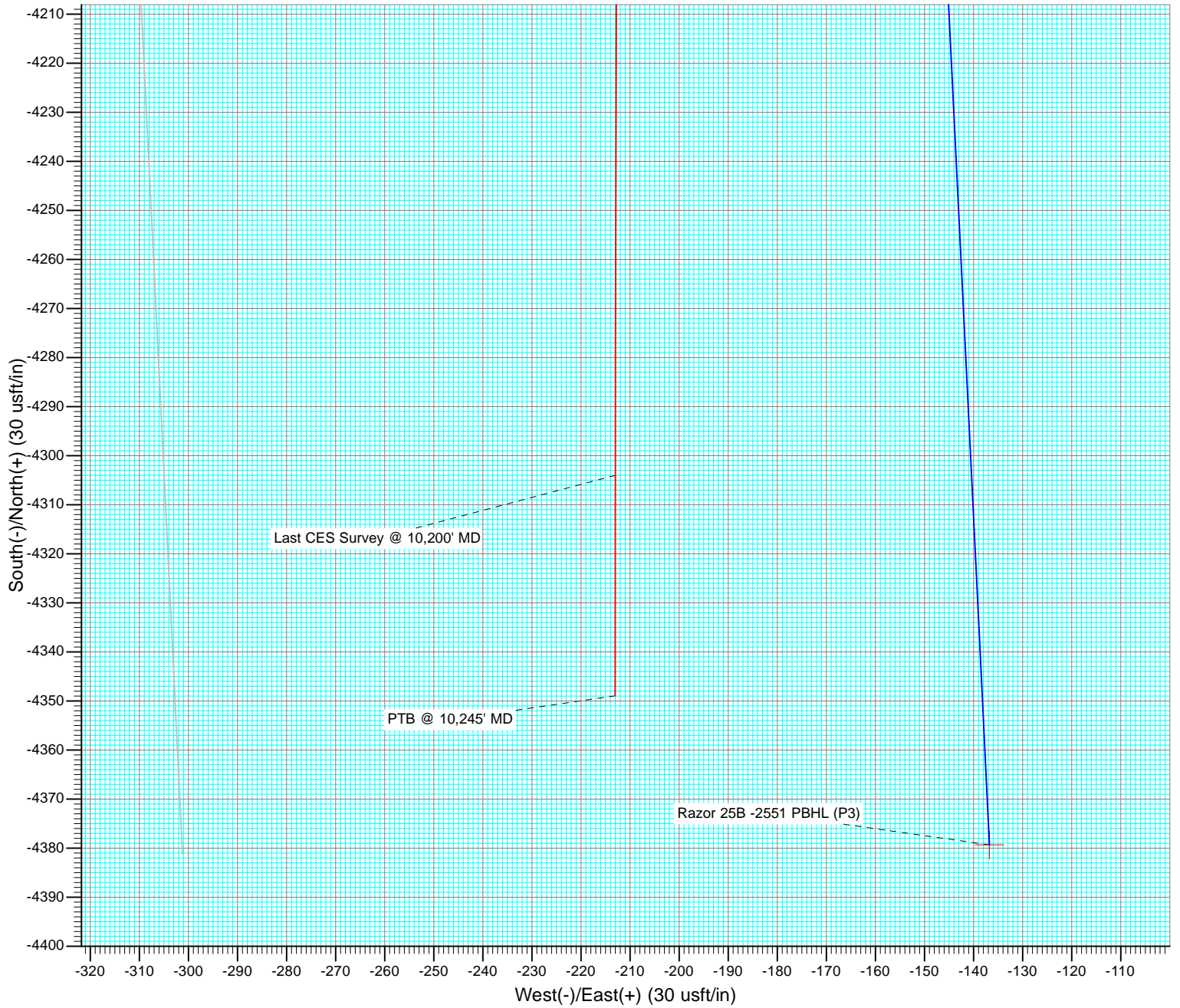
DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting
Razor 25B -2551 VP (P3)	5030.1	300.0	-364.2	1544911.88	3467109.60
Razor 25B -2551 PBHL (P3)	5851.0	-4379.3	-136.8	1540237.73	3467426.15





Project: Weld County, CO
Site: S25-T10N-R58W
Well: Razor 25B -2551
Wellbore: HZ
Design: FINAL



Cathedral Energy Services

Survey Report

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well Razor 25B -2551
Project:	Weld County, CO	TVD Reference:	KB=17' @ 4773.4usft (Cade #23)
Site:	S25-T10N-R58W	MD Reference:	KB=17' @ 4773.4usft (Cade #23)
Well:	Razor 25B -2551	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		S25-T10N-R58W			
Site Position:		Northing:	1,544,670.15 usft	Latitude:	40.816275
From:	Lat/Long	Easting:	3,467,568.48 usft	Longitude:	-103.810706
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16"	Grid Convergence:	1.09 °

Well	Razor 25B -2551					
Well Position	+N/-S	0.0 usft	Northing:	1,544,618.85 usft	Latitude:	40.816139
	+E/-W	0.0 usft	Easting:	3,467,479.48 usft	Longitude:	-103.811031
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	4,756.4 usft

Wellbore	HZ				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	7/2/2014	7.96	67.43	53,123

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	181.79	

Survey Program	Date	7/21/2014			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
413.0	10,245.0	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		
413.0	0.52	143.54	413.0	-1.5	1.1	1.5	0.13	0.13		
504.0	0.79	148.99	504.0	-2.4	1.7	2.3	0.30	0.30		
596.0	1.35	332.62	596.0	-2.0	1.5	1.9	2.33	0.61		
688.0	3.65	312.92	687.9	1.0	-1.1	-1.0	2.63	2.50		
780.0	5.58	307.98	779.6	5.7	-6.8	-5.5	2.14	2.10		
871.0	7.52	306.11	870.0	12.0	-15.1	-11.5	2.14	2.13		
1,053.0	6.81	310.09	1,050.6	25.9	-33.0	-24.9	0.48	-0.39		
1,145.0	6.78	310.14	1,141.9	33.0	-41.3	-31.7	0.03	-0.03		
1,328.0	6.34	310.93	1,323.7	46.5	-57.2	-44.7	0.25	-0.24		
1,479.0	6.22	310.36	1,473.8	57.3	-69.7	-55.1	0.09	-0.08		
1,580.0	5.90	308.77	1,574.2	64.1	-77.9	-61.6	0.36	-0.32		
1,671.0	8.00	299.69	1,664.6	70.2	-87.1	-67.4	2.60	2.31		

Cathedral Energy Services

Survey Report

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well Razor 25B -2551
Project:	Weld County, CO	TVD Reference:	KB=17' @ 4773.4usft (Cade #23)
Site:	S25-T10N-R58W	MD Reference:	KB=17' @ 4773.4usft (Cade #23)
Well:	Razor 25B -2551	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
1,763.0	7.33	293.70	1,755.8	75.7	-98.0	-72.6	1.13	-0.73	
1,855.0	6.96	294.50	1,847.0	80.4	-108.5	-76.9	0.42	-0.40	
1,946.0	8.09	301.38	1,937.3	86.0	-119.0	-82.2	1.59	1.24	
2,038.0	7.46	298.95	2,028.4	92.2	-129.7	-88.2	0.77	-0.68	
2,129.0	7.47	291.05	2,118.6	97.2	-140.4	-92.8	1.13	0.01	
2,220.0	8.08	288.17	2,208.8	101.3	-152.0	-96.6	0.80	0.67	
2,312.0	7.64	285.33	2,299.9	105.0	-164.0	-99.8	0.64	-0.48	
2,403.0	7.70	294.76	2,390.1	109.1	-175.4	-103.6	1.38	0.07	
2,495.0	6.81	294.46	2,481.4	114.0	-186.0	-108.1	0.97	-0.97	
2,586.0	8.17	303.06	2,571.6	119.7	-196.3	-113.6	1.93	1.49	
2,678.0	8.05	305.58	2,662.7	127.1	-207.0	-120.5	0.41	-0.13	
2,769.0	7.62	306.48	2,752.8	134.3	-217.1	-127.5	0.49	-0.47	
2,860.0	7.52	305.05	2,843.1	141.4	-226.8	-134.2	0.23	-0.11	
2,952.0	6.48	305.01	2,934.4	147.8	-236.0	-140.4	1.13	-1.13	
3,043.0	4.46	304.95	3,024.9	152.8	-243.1	-145.1	2.22	-2.22	
3,135.0	4.50	317.94	3,116.7	157.5	-248.4	-149.7	1.10	0.04	
3,226.0	5.84	314.31	3,207.3	163.4	-254.1	-155.4	1.52	1.47	
3,317.0	6.66	307.56	3,297.8	169.8	-261.6	-161.6	1.21	0.90	
3,409.0	6.99	304.90	3,389.1	176.3	-270.4	-167.8	0.50	0.36	
3,500.0	8.07	309.19	3,479.3	183.5	-279.9	-174.7	1.34	1.19	
3,591.0	8.66	312.02	3,569.4	192.1	-290.0	-183.0	0.79	0.65	
3,683.0	8.41	311.99	3,660.3	201.2	-300.1	-191.8	0.27	-0.27	
3,774.0	7.11	317.83	3,750.5	209.9	-308.8	-200.1	1.67	-1.43	
3,866.0	5.96	315.26	3,841.9	217.5	-316.0	-207.5	1.29	-1.25	
3,958.0	6.90	313.78	3,933.3	224.7	-323.4	-214.5	1.04	1.02	
4,049.0	8.40	318.92	4,023.5	233.5	-331.7	-223.0	1.81	1.65	
4,140.0	7.60	318.87	4,113.6	243.0	-340.0	-232.3	0.88	-0.88	
4,232.0	7.09	317.87	4,204.9	251.8	-347.8	-240.8	0.57	-0.55	
4,323.0	7.15	305.62	4,295.2	259.3	-356.2	-248.0	1.67	0.07	
4,415.0	6.57	306.15	4,386.5	265.7	-365.1	-254.2	0.63	-0.63	
4,506.0	6.36	300.27	4,476.9	271.3	-373.7	-259.5	0.76	-0.23	
4,597.0	5.38	299.32	4,567.5	276.0	-381.7	-263.9	1.08	-1.08	
4,689.0	5.26	303.62	4,659.1	280.4	-389.0	-268.1	0.45	-0.13	
4,781.0	4.64	307.82	4,750.7	285.0	-395.5	-272.6	0.78	-0.67	
4,873.0	4.41	305.39	4,842.4	289.4	-401.3	-276.7	0.33	-0.25	
4,964.0	3.21	300.20	4,933.2	292.7	-406.3	-279.9	1.37	-1.32	
5,056.0	2.75	313.18	5,025.1	295.5	-410.2	-282.5	0.88	-0.50	
5,146.0	1.68	332.29	5,115.0	298.1	-412.4	-285.1	1.43	-1.19	
5,238.0	1.37	314.62	5,207.0	300.1	-413.8	-287.0	0.61	-0.34	
5,329.0	4.11	183.15	5,297.9	297.6	-414.7	-284.5	5.63	3.01	
5,420.0	20.64	177.56	5,386.5	278.2	-414.2	-265.1	18.19	18.16	
5,450.0	28.04	175.65	5,413.8	265.9	-413.5	-252.8	24.80	24.67	
5,481.0	34.33	177.10	5,440.3	249.8	-412.5	-236.8	20.43	20.29	
5,512.0	35.55	178.70	5,465.7	232.1	-411.8	-219.1	4.92	3.94	
5,543.0	34.49	178.32	5,491.1	214.3	-411.4	-201.4	3.49	-3.42	
5,573.0	34.17	178.71	5,515.9	197.4	-410.9	-184.5	1.29	-1.07	
5,604.0	34.92	179.64	5,541.4	179.8	-410.7	-166.9	2.96	2.42	
5,634.0	35.15	179.64	5,566.0	162.6	-410.6	-149.7	0.77	0.77	
5,665.0	36.50	179.27	5,591.1	144.5	-410.4	-131.6	4.41	4.35	
5,696.0	40.39	179.72	5,615.4	125.2	-410.2	-112.3	12.58	12.55	
5,726.0	42.90	179.51	5,637.8	105.3	-410.1	-92.4	8.38	8.37	
5,756.0	44.40	179.16	5,659.5	84.6	-409.8	-71.7	5.06	5.00	
5,786.0	46.45	177.62	5,680.6	63.2	-409.2	-50.4	7.75	6.83	

Cathedral Energy Services

Survey Report

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well Razor 25B -2551
Project:	Weld County, CO	TVD Reference:	KB=17' @ 4773.4usft (Cade #23)
Site:	S25-T10N-R58W	MD Reference:	KB=17' @ 4773.4usft (Cade #23)
Well:	Razor 25B -2551	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
5,816.0	48.81	177.14	5,700.8	41.1	-408.2	-28.3	7.95	7.87	
5,847.0	52.63	175.05	5,720.4	17.1	-406.6	-4.4	13.38	12.32	
5,877.0	56.31	174.81	5,737.9	-7.2	-404.4	19.8	12.28	12.27	
5,909.0	60.43	176.15	5,754.6	-34.3	-402.3	46.9	13.36	12.88	
5,940.0	63.83	177.55	5,769.1	-61.7	-400.8	74.2	11.67	10.97	
5,972.0	65.14	178.01	5,782.9	-90.6	-399.7	103.0	4.29	4.09	
6,003.0	67.90	177.31	5,795.3	-119.0	-398.5	131.3	9.14	8.90	
6,035.0	72.66	177.58	5,806.1	-149.1	-397.2	161.4	14.90	14.88	
6,067.0	78.51	178.69	5,814.0	-180.0	-396.1	192.3	18.59	18.28	
6,098.0	81.00	178.58	5,819.5	-210.5	-395.4	222.7	8.04	8.03	
6,130.0	81.74	177.96	5,824.3	-242.1	-394.5	254.3	3.00	2.31	
6,162.0	84.35	177.67	5,828.2	-273.9	-393.3	286.0	8.21	8.16	
6,228.0	87.97	178.99	5,832.6	-339.7	-391.3	351.7	5.84	5.48	
6,319.0	88.27	177.92	5,835.6	-430.6	-388.9	442.5	1.22	0.33	
6,412.0	89.66	177.65	5,837.3	-523.5	-385.3	535.3	1.52	1.49	
6,503.0	90.00	177.51	5,837.6	-614.4	-381.5	626.0	0.40	0.37	
6,594.0	90.00	178.49	5,837.6	-705.4	-378.3	716.8	1.08	0.00	
6,685.0	89.72	177.80	5,837.8	-796.3	-375.3	807.7	0.82	-0.31	
6,777.0	90.15	178.90	5,837.9	-888.3	-372.7	899.5	1.28	0.47	
6,868.0	88.74	177.10	5,838.8	-979.2	-369.5	990.3	2.51	-1.55	
6,960.0	89.54	176.05	5,840.2	-1,071.0	-364.0	1,081.9	1.43	0.87	
7,051.0	91.66	175.86	5,839.2	-1,161.8	-357.6	1,172.4	2.34	2.33	
7,142.0	91.20	176.00	5,836.9	-1,252.5	-351.1	1,262.9	0.53	-0.51	
7,234.0	87.75	174.86	5,837.8	-1,344.2	-343.8	1,354.3	3.95	-3.75	
7,325.0	88.71	174.83	5,840.6	-1,434.8	-335.6	1,444.6	1.06	1.05	
7,416.0	89.29	178.41	5,842.2	-1,525.6	-330.3	1,535.2	3.98	0.64	
7,507.0	89.57	178.25	5,843.1	-1,616.6	-327.6	1,626.0	0.35	0.31	
7,599.0	89.85	178.96	5,843.5	-1,708.6	-325.4	1,717.9	0.83	0.30	
7,691.0	90.00	178.86	5,843.7	-1,800.5	-323.6	1,809.8	0.20	0.16	
7,782.0	89.14	177.49	5,844.3	-1,891.5	-320.7	1,900.6	1.78	-0.95	
7,874.0	89.75	177.95	5,845.2	-1,983.4	-317.1	1,992.3	0.83	0.66	
7,965.0	89.35	178.05	5,846.0	-2,074.4	-313.9	2,083.1	0.45	-0.44	
8,057.0	87.78	178.18	5,848.3	-2,166.3	-310.9	2,174.9	1.71	-1.71	
8,148.0	87.60	177.12	5,851.9	-2,257.1	-307.1	2,265.6	1.18	-0.20	
8,239.0	91.11	177.81	5,852.9	-2,348.0	-303.1	2,356.3	3.93	3.86	
8,331.0	91.36	177.76	5,851.0	-2,439.9	-299.6	2,448.1	0.28	0.27	
8,422.0	89.82	173.99	5,850.0	-2,530.7	-293.0	2,538.6	4.47	-1.69	
8,514.0	89.29	172.95	5,850.7	-2,622.1	-282.6	2,629.6	1.27	-0.58	
8,606.0	90.55	173.73	5,850.9	-2,713.4	-271.9	2,720.6	1.61	1.37	
8,697.0	90.12	170.35	5,850.3	-2,803.5	-259.3	2,810.3	3.74	-0.47	
8,789.0	91.33	173.61	5,849.2	-2,894.6	-246.5	2,900.9	3.78	1.32	
8,880.0	90.80	177.86	5,847.5	-2,985.3	-239.7	2,991.4	4.71	-0.58	
8,972.0	89.88	173.07	5,846.9	-3,077.0	-232.4	3,082.8	5.30	-1.00	
9,062.0	91.79	175.55	5,845.6	-3,166.6	-223.5	3,172.0	3.48	2.12	
9,154.0	89.01	179.15	5,845.0	-3,258.4	-219.2	3,263.7	4.94	-3.02	
9,245.0	88.64	179.68	5,846.8	-3,349.4	-218.3	3,354.6	0.71	-0.41	
9,336.0	87.66	178.99	5,849.8	-3,440.3	-217.3	3,445.5	1.32	-1.08	
9,429.0	90.15	179.20	5,851.6	-3,533.3	-215.8	3,538.3	2.69	2.68	
9,520.0	92.93	179.94	5,849.1	-3,624.3	-215.1	3,629.2	3.16	3.05	
9,612.0	91.63	179.29	5,845.5	-3,716.2	-214.5	3,721.1	1.58	-1.41	
9,703.0	90.03	178.63	5,844.1	-3,807.2	-212.8	3,811.9	1.90	-1.76	
9,794.0	92.50	180.27	5,842.1	-3,898.1	-212.0	3,902.8	3.26	2.71	
9,889.0	92.47	180.04	5,838.0	-3,993.0	-212.2	3,997.7	0.24	-0.03	

Cathedral Energy Services

Survey Report

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well Razor 25B -2551
Project:	Weld County, CO	TVD Reference:	KB=17' @ 4773.4usft (Cade #23)
Site:	S25-T10N-R58W	MD Reference:	KB=17' @ 4773.4usft (Cade #23)
Well:	Razor 25B -2551	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
9,983.0	91.39	180.22	5,834.8	-4,087.0	-212.4	4,091.6	1.16	-1.15	
10,078.0	90.80	180.12	5,833.0	-4,182.0	-212.7	4,186.6	0.63	-0.62	
10,173.0	89.63	180.17	5,832.7	-4,277.0	-213.0	4,281.5	1.23	-1.23	
10,200.0	89.11	180.05	5,833.0	-4,304.0	-213.0	4,308.5	1.98	-1.92	Last CES Survey @ 10,200' MD
10,245.0	89.11	180.05	5,833.7	-4,348.9	-213.0	4,353.5	0.00	0.00	PTB @ 10,245' MD - TD - 631' FSL, 2386' FEL

Targets									
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Razor 25B -2551 VP (P2) - actual wellpath misses target center by 46.3usft at 5060.0usft MD (5029.1 TVD, 295.6 N, -410.3 E) - Point	0.00	0.00	5,030.1	300.0	-364.2	1,544,911.88	3,467,109.60	40.816962	-103.812347
Razor 25B -2551 VP - actual wellpath misses target center by 72.4usft at 5078.4usft MD (5047.5 TVD, 296.2 N, -410.9 E) - Point	0.00	0.00	5,049.1	300.0	-338.6	1,544,912.37	3,467,135.19	40.816962	-103.812254
Razor 25B -2551 PBHL - actual wellpath misses target center by 83.9usft at 10245.0usft MD (5833.7 TVD, -4348.9 N, -213.0 E) - Point	0.00	0.00	5,851.0	-4,379.3	-136.8	1,540,237.73	3,467,426.15	40.804119	-103.811525
Razor 25B -2551 VP (2) - actual wellpath misses target center by 46.8usft at 5079.0usft MD (5048.1 TVD, 296.2 N, -410.9 E) - Point	0.00	0.00	5,049.1	300.0	-364.2	1,544,911.88	3,467,109.60	40.816962	-103.812347
Razor 25B -2551 PBHL - actual wellpath misses target center by 89.8usft at 10245.0usft MD (5833.7 TVD, -4348.9 N, -213.0 E) - Point	0.00	0.00	5,870.0	-4,379.3	-136.8	1,540,237.73	3,467,426.15	40.804119	-103.811525

Casing Points				
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
6,198.6	5,831.2	7" - 637' FNL, 2485' FEL	0	0

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	+E/-W (usft)	Comment
10,200.0	5,833.0	-4,304.0	-213.0	Last CES Survey @ 10,200' MD
10,245.0	5,833.7	-4,348.9	-213.0	PTB @ 10,245' MD
10,245.0	5,833.7	-4,348.9	-213.0	TD - 631' FSL, 2386' FEL

Checked By: _____ Approved By: _____ Date: _____

Whiting Petroleum Corporation

Weld County, CO

S25-T10N-R58W

Razor 25B -2551

HZ

Design: FINAL

Survey Report - Geographic

21 July, 2014

Cathedral Energy Services

Survey Report - Geographic

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well Razor 25B -2551
Project:	Weld County, CO	TVD Reference:	KB=17' @ 4773.4usft (Cade #23)
Site:	S25-T10N-R58W	MD Reference:	KB=17' @ 4773.4usft (Cade #23)
Well:	Razor 25B -2551	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	S25-T10N-R58W				
Site Position:		Northing:	1,544,670.15 usft	Latitude:	40.816275
From:	Lat/Long	Easting:	3,467,568.48 usft	Longitude:	-103.810706
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	1.09 °

Well	Razor 25B -2551					
Well Position	+N-S	0.0 usft	Northing:	1,544,618.86 usft	Latitude:	40.816139
	+E-W	0.0 usft	Easting:	3,467,479.48 usft	Longitude:	-103.811031
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	4,756.4 usft

Wellbore	HZ				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	7/2/2014	7.96	67.43	53,123

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	181.79	

Survey Program	Date	7/21/2014			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
413.0	10,245.0	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	1,544,618.86	3,467,479.48	40.816139	-103.811031	
413.0	0.52	143.54	413.0	-1.5	1.1	1,544,617.37	3,467,480.62	40.816135	-103.811027	
504.0	0.79	148.99	504.0	-2.4	1.7	1,544,616.51	3,467,481.21	40.816132	-103.811025	
596.0	1.35	332.62	596.0	-2.0	1.5	1,544,616.93	3,467,481.03	40.816134	-103.811026	
688.0	3.65	312.92	687.9	1.0	-1.1	1,544,619.83	3,467,478.33	40.816142	-103.811035	
780.0	5.58	307.98	779.6	5.7	-6.8	1,544,624.47	3,467,472.57	40.816155	-103.811056	
871.0	7.52	306.11	870.0	12.0	-15.1	1,544,630.54	3,467,464.15	40.816172	-103.811086	
1,053.0	6.81	310.09	1,050.6	25.9	-33.0	1,544,644.17	3,467,446.01	40.816210	-103.811150	
1,145.0	6.78	310.14	1,141.9	33.0	-41.3	1,544,651.02	3,467,437.55	40.816229	-103.811180	
1,328.0	6.34	310.93	1,323.7	46.5	-57.2	1,544,664.30	3,467,421.41	40.816267	-103.811238	
1,479.0	6.22	310.36	1,473.8	57.3	-69.7	1,544,674.82	3,467,408.67	40.816296	-103.811283	
1,580.0	5.90	308.77	1,574.2	64.1	-77.9	1,544,681.46	3,467,400.33	40.816315	-103.811313	

Cathedral Energy Services

Survey Report - Geographic

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well Razor 25B -2551
Project:	Weld County, CO	TVD Reference:	KB=17' @ 4773.4usft (Cade #23)
Site:	S25-T10N-R58W	MD Reference:	KB=17' @ 4773.4usft (Cade #23)
Well:	Razor 25B -2551	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
1,671.0	8.00	299.69	1,664.6	70.2	-87.1	1,544,687.35	3,467,391.06	40.816332	-103.811346
1,763.0	7.33	293.70	1,755.8	75.7	-98.0	1,544,692.67	3,467,380.03	40.816347	-103.811385
1,855.0	6.96	294.50	1,847.0	80.4	-108.5	1,544,697.14	3,467,369.49	40.816360	-103.811423
1,946.0	8.09	301.38	1,937.3	86.0	-119.0	1,544,702.56	3,467,358.90	40.816375	-103.811461
2,038.0	7.46	298.95	2,028.4	92.2	-129.7	1,544,708.61	3,467,348.03	40.816392	-103.811500
2,129.0	7.47	291.05	2,118.6	97.2	-140.4	1,544,713.39	3,467,337.25	40.816406	-103.811538
2,220.0	8.08	288.17	2,208.8	101.3	-152.0	1,544,717.29	3,467,325.58	40.816417	-103.811580
2,312.0	7.64	285.33	2,299.9	105.0	-164.0	1,544,720.69	3,467,313.47	40.816427	-103.811624
2,403.0	7.70	294.76	2,390.1	109.1	-175.4	1,544,724.63	3,467,302.02	40.816439	-103.811665
2,495.0	6.81	294.46	2,481.4	114.0	-186.0	1,544,729.27	3,467,291.37	40.816452	-103.811703
2,586.0	8.17	303.06	2,571.6	119.7	-196.3	1,544,734.83	3,467,280.93	40.816468	-103.811740
2,678.0	8.05	305.58	2,662.7	127.1	-207.0	1,544,741.94	3,467,270.07	40.816488	-103.811779
2,769.0	7.62	306.48	2,752.8	134.3	-217.1	1,544,749.04	3,467,259.90	40.816508	-103.811815
2,860.0	7.52	305.05	2,843.1	141.4	-226.8	1,544,755.86	3,467,250.05	40.816527	-103.811851
2,952.0	6.48	305.01	2,934.4	147.8	-236.0	1,544,762.12	3,467,240.75	40.816545	-103.811884
3,043.0	4.46	304.95	3,024.9	152.8	-243.1	1,544,766.96	3,467,233.54	40.816558	-103.811909
3,135.0	4.50	317.94	3,116.7	157.5	-248.4	1,544,771.59	3,467,228.11	40.816571	-103.811929
3,226.0	5.84	314.31	3,207.3	163.4	-254.1	1,544,777.36	3,467,222.29	40.816587	-103.811949
3,317.0	6.66	307.56	3,297.8	169.8	-261.6	1,544,783.67	3,467,214.67	40.816605	-103.811976
3,409.0	6.99	304.90	3,389.1	176.3	-270.4	1,544,789.95	3,467,205.73	40.816623	-103.812008
3,500.0	8.07	309.19	3,479.3	183.5	-279.9	1,544,796.98	3,467,196.10	40.816643	-103.812043
3,591.0	8.66	312.02	3,569.4	192.1	-290.0	1,544,805.41	3,467,185.90	40.816666	-103.812079
3,683.0	8.41	311.99	3,660.3	201.2	-300.1	1,544,814.35	3,467,175.58	40.816691	-103.812116
3,774.0	7.11	317.83	3,750.5	209.9	-308.8	1,544,822.81	3,467,166.69	40.816715	-103.812147
3,866.0	5.96	315.26	3,841.9	217.5	-316.0	1,544,830.28	3,467,159.36	40.816736	-103.812173
3,958.0	6.90	313.78	3,933.3	224.7	-323.4	1,544,837.36	3,467,151.88	40.816756	-103.812200
4,049.0	8.40	318.92	4,023.5	233.5	-331.7	1,544,845.99	3,467,143.39	40.816780	-103.812230
4,140.0	7.60	318.87	4,113.6	243.0	-340.0	1,544,855.37	3,467,134.89	40.816806	-103.812260
4,232.0	7.09	317.87	4,204.9	251.8	-347.8	1,544,864.02	3,467,126.91	40.816830	-103.812288
4,323.0	7.15	305.62	4,295.2	259.3	-356.2	1,544,871.32	3,467,118.40	40.816851	-103.812318
4,415.0	6.57	306.15	4,386.5	265.7	-365.1	1,544,877.59	3,467,109.37	40.816868	-103.812350
4,506.0	6.36	300.27	4,476.9	271.3	-373.7	1,544,883.03	3,467,100.71	40.816884	-103.812381
4,597.0	5.38	299.32	4,567.5	276.0	-381.7	1,544,887.51	3,467,092.55	40.816896	-103.812410
4,689.0	5.26	303.62	4,659.1	280.4	-389.0	1,544,891.82	3,467,085.20	40.816909	-103.812437
4,781.0	4.64	307.82	4,750.7	285.0	-395.5	1,544,896.31	3,467,078.66	40.816921	-103.812460
4,873.0	4.41	305.39	4,842.4	289.4	-401.3	1,544,900.53	3,467,072.75	40.816933	-103.812481
4,964.0	3.21	300.20	4,933.2	292.7	-406.3	1,544,903.74	3,467,067.64	40.816942	-103.812499
5,056.0	2.75	313.18	5,025.1	295.5	-410.2	1,544,906.47	3,467,063.75	40.816950	-103.812513
5,146.0	1.68	332.29	5,115.0	298.1	-412.4	1,544,909.08	3,467,061.51	40.816957	-103.812521
5,238.0	1.37	314.62	5,207.0	300.1	-413.8	1,544,911.01	3,467,060.06	40.816963	-103.812526
5,329.0	4.11	183.15	5,297.9	297.6	-414.7	1,544,908.50	3,467,059.16	40.816956	-103.812530
5,420.0	20.64	177.56	5,386.5	278.2	-414.2	1,544,889.10	3,467,060.04	40.816902	-103.812528
5,450.0	28.04	175.65	5,413.8	265.9	-413.5	1,544,876.79	3,467,061.03	40.816869	-103.812525
5,481.0	34.33	177.10	5,440.3	249.8	-412.5	1,544,860.80	3,467,062.33	40.816825	-103.812521
5,512.0	35.55	178.70	5,465.7	232.1	-411.8	1,544,843.07	3,467,063.32	40.816776	-103.812519
5,543.0	34.49	178.32	5,491.1	214.3	-411.4	1,544,825.30	3,467,064.12	40.816727	-103.812517
5,573.0	34.17	178.71	5,515.9	197.4	-410.9	1,544,808.40	3,467,064.88	40.816681	-103.812516
5,604.0	34.92	179.64	5,541.4	179.8	-410.7	1,544,790.83	3,467,065.46	40.816633	-103.812515
5,634.0	35.15	179.64	5,566.0	162.6	-410.6	1,544,773.61	3,467,065.90	40.816585	-103.812514
5,665.0	36.50	179.27	5,591.1	144.5	-410.4	1,544,755.48	3,467,066.42	40.816535	-103.812514
5,696.0	40.39	179.72	5,615.4	125.2	-410.2	1,544,736.21	3,467,066.95	40.816483	-103.812513
5,726.0	42.90	179.51	5,637.8	105.3	-410.1	1,544,716.29	3,467,067.47	40.816428	-103.812513
5,756.0	44.40	179.16	5,659.5	84.6	-409.8	1,544,695.59	3,467,068.10	40.816371	-103.812512
5,786.0	46.45	177.62	5,680.6	63.2	-409.2	1,544,674.25	3,467,069.11	40.816312	-103.812510
5,816.0	48.81	177.14	5,700.8	41.1	-408.2	1,544,652.13	3,467,070.55	40.816252	-103.812506

Cathedral Energy Services

Survey Report - Geographic

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well Razor 25B -2551
Project:	Weld County, CO	TVD Reference:	KB=17' @ 4773.4usft (Cade #23)
Site:	S25-T10N-R58W	MD Reference:	KB=17' @ 4773.4usft (Cade #23)
Well:	Razor 25B -2551	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
5,847.0	52.63	175.05	5,720.4	17.1	-406.6	1,544,628.23	3,467,072.65	40.816186	-103.812500
5,877.0	56.31	174.81	5,737.9	-7.2	-404.4	1,544,603.96	3,467,075.27	40.816119	-103.812492
5,909.0	60.43	176.15	5,754.6	-34.3	-402.3	1,544,576.85	3,467,077.93	40.816045	-103.812485
5,940.0	63.83	177.55	5,769.1	-61.7	-400.8	1,544,549.53	3,467,079.95	40.815970	-103.812479
5,972.0	65.14	178.01	5,782.9	-90.6	-399.7	1,544,520.70	3,467,081.62	40.815890	-103.812475
6,003.0	67.90	177.31	5,795.3	-119.0	-398.5	1,544,492.32	3,467,083.32	40.815812	-103.812471
6,035.0	72.66	177.58	5,806.1	-149.1	-397.2	1,544,462.27	3,467,085.24	40.815730	-103.812466
6,067.0	78.51	178.69	5,814.0	-180.0	-396.1	1,544,431.33	3,467,086.83	40.815645	-103.812462
6,098.0	81.00	178.58	5,819.5	-210.5	-395.4	1,544,400.85	3,467,088.14	40.815561	-103.812460
6,130.0	81.74	177.96	5,824.3	-242.1	-394.5	1,544,369.26	3,467,089.69	40.815474	-103.812456
6,162.0	84.35	177.67	5,828.2	-273.9	-393.3	1,544,337.55	3,467,091.51	40.815387	-103.812452
6,228.0	87.97	178.99	5,832.6	-339.7	-391.3	1,544,271.78	3,467,094.68	40.815207	-103.812445
6,319.0	88.27	177.92	5,835.6	-430.6	-388.9	1,544,180.93	3,467,098.86	40.814957	-103.812436
6,412.0	89.66	177.65	5,837.3	-523.5	-385.3	1,544,088.10	3,467,104.23	40.814702	-103.812423
6,503.0	90.00	177.51	5,837.6	-614.4	-381.5	1,543,997.27	3,467,109.80	40.814453	-103.812409
6,594.0	90.00	178.49	5,837.6	-705.4	-378.3	1,543,906.41	3,467,114.71	40.814203	-103.812398
6,685.0	89.72	177.80	5,837.8	-796.3	-375.3	1,543,815.53	3,467,119.38	40.813953	-103.812387
6,777.0	90.15	178.90	5,837.9	-888.3	-372.7	1,543,723.64	3,467,123.78	40.813701	-103.812378
6,868.0	88.74	177.10	5,838.8	-979.2	-369.5	1,543,632.78	3,467,128.69	40.813451	-103.812366
6,960.0	89.54	176.05	5,840.2	-1,071.0	-364.0	1,543,541.08	3,467,135.93	40.813199	-103.812346
7,051.0	91.66	175.86	5,839.2	-1,161.8	-357.6	1,543,450.45	3,467,144.08	40.812950	-103.812323
7,142.0	91.20	176.00	5,836.9	-1,252.5	-351.1	1,543,359.85	3,467,152.26	40.812701	-103.812300
7,234.0	87.75	174.86	5,837.8	-1,344.2	-343.8	1,543,268.32	3,467,161.34	40.812449	-103.812273
7,325.0	88.71	174.83	5,840.6	-1,434.8	-335.6	1,543,177.90	3,467,171.23	40.812201	-103.812244
7,416.0	89.29	178.41	5,842.2	-1,525.6	-330.3	1,543,087.21	3,467,178.32	40.811952	-103.812224
7,507.0	89.57	178.25	5,843.1	-1,616.6	-327.6	1,542,996.32	3,467,182.71	40.811702	-103.812215
7,599.0	89.85	178.96	5,843.5	-1,708.6	-325.4	1,542,904.41	3,467,186.70	40.811449	-103.812207
7,691.0	90.00	178.86	5,843.7	-1,800.5	-323.6	1,542,812.48	3,467,190.20	40.811197	-103.812200
7,782.0	89.14	177.49	5,844.3	-1,891.5	-320.7	1,542,721.60	3,467,194.83	40.810947	-103.812190
7,874.0	89.75	177.95	5,845.2	-1,983.4	-317.1	1,542,629.76	3,467,200.24	40.810695	-103.812177
7,965.0	89.35	178.05	5,846.0	-2,074.4	-313.9	1,542,538.90	3,467,205.15	40.810445	-103.812165
8,057.0	87.78	178.18	5,848.3	-2,166.3	-310.9	1,542,447.06	3,467,209.92	40.810193	-103.812154
8,148.0	87.60	177.12	5,851.9	-2,257.1	-307.1	1,542,356.29	3,467,215.38	40.809944	-103.812141
8,239.0	91.11	177.81	5,852.9	-2,348.0	-303.1	1,542,265.50	3,467,221.13	40.809694	-103.812126
8,331.0	91.36	177.76	5,851.0	-2,439.9	-299.6	1,542,173.67	3,467,226.44	40.809442	-103.812113
8,422.0	89.82	173.99	5,850.0	-2,530.7	-293.0	1,542,083.07	3,467,234.71	40.809193	-103.812090
8,514.0	89.29	172.95	5,850.7	-2,622.1	-282.6	1,541,991.89	3,467,246.91	40.808942	-103.812052
8,606.0	90.55	173.73	5,850.9	-2,713.4	-271.9	1,541,900.73	3,467,259.32	40.808691	-103.812013
8,697.0	90.12	170.35	5,850.3	-2,803.5	-259.3	1,541,810.88	3,467,273.63	40.808444	-103.811968
8,789.0	91.33	173.61	5,849.2	-2,894.6	-246.5	1,541,720.06	3,467,288.20	40.808194	-103.811922
8,880.0	90.80	177.86	5,847.5	-2,985.3	-239.7	1,541,629.50	3,467,296.69	40.807945	-103.811897
8,972.0	89.88	173.07	5,846.9	-3,077.0	-232.4	1,541,537.97	3,467,305.71	40.807693	-103.811871
9,062.0	91.79	175.55	5,845.6	-3,166.6	-223.5	1,541,448.62	3,467,316.33	40.807448	-103.811839
9,154.0	89.01	179.15	5,845.0	-3,258.4	-219.2	1,541,356.84	3,467,322.33	40.807196	-103.811823
9,245.0	88.64	179.68	5,846.8	-3,349.4	-218.3	1,541,265.90	3,467,324.99	40.806946	-103.811820
9,336.0	87.66	178.99	5,849.8	-3,440.3	-217.3	1,541,174.99	3,467,327.78	40.806696	-103.811816
9,429.0	90.15	179.20	5,851.6	-3,533.3	-215.8	1,541,082.08	3,467,331.02	40.806441	-103.811811
9,520.0	92.93	179.94	5,849.1	-3,624.3	-215.1	1,540,991.15	3,467,333.44	40.806191	-103.811808
9,612.0	91.63	179.29	5,845.5	-3,716.2	-214.5	1,540,899.26	3,467,335.80	40.805939	-103.811806
9,703.0	90.03	178.63	5,844.1	-3,807.2	-212.8	1,540,808.33	3,467,339.19	40.805689	-103.811800
9,794.0	92.50	180.27	5,842.1	-3,898.1	-212.0	1,540,717.40	3,467,341.79	40.805440	-103.811797
9,889.0	92.47	180.04	5,838.0	-3,993.0	-212.2	1,540,622.50	3,467,343.35	40.805179	-103.811798
9,983.0	91.39	180.22	5,834.8	-4,087.0	-212.4	1,540,528.57	3,467,344.92	40.804921	-103.811799
10,078.0	90.80	180.12	5,833.0	-4,182.0	-212.7	1,540,433.60	3,467,346.45	40.804661	-103.811800
10,173.0	89.63	180.17	5,832.7	-4,277.0	-213.0	1,540,338.62	3,467,348.02	40.804400	-103.811800

Cathedral Energy Services

Survey Report - Geographic

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well Razor 25B -2551
Project:	Weld County, CO	TVD Reference:	KB=17' @ 4773.4usft (Cade #23)
Site:	S25-T10N-R58W	MD Reference:	KB=17' @ 4773.4usft (Cade #23)
Well:	Razor 25B -2551	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
10,200.0	89.11	180.05	5,833.0	-4,304.0	-213.0	1,540,311.60	3,467,348.48	40.804326	-103.811801
Last CES Survey @ 10,200' MD									
10,245.0	89.11	180.05	5,833.7	-4,348.9	-213.0	1,540,266.64	3,467,349.30	40.804202	-103.811801
PTB @ 10,245' MD - TD - 631' FSL, 2386' FEL									

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 25B -2551 VP (P)	0.00	0.00	5,030.1	300.0	-364.2	1,544,911.88	3,467,109.60	40.816962	-103.812347
- actual wellpath misses target center by 46.3usft at 5060.0usft MD (5029.1 TVD, 295.6 N, -410.3 E)									
- Point									
Razor 25B -2551 PBHL	0.00	0.00	5,851.0	-4,379.3	-136.8	1,540,237.73	3,467,426.15	40.804119	-103.811525
- actual wellpath misses target center by 83.9usft at 10245.0usft MD (5833.7 TVD, -4348.9 N, -213.0 E)									
- Point									

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
6,198.6	5,831.2	7" - 637' FNL, 2485' FEL	0	0	

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
10,200.0	5,833.0	-4,304.0	-213.0	Last CES Survey @ 10,200' MD	
10,245.0	5,833.7	-4,348.9	-213.0	PTB @ 10,245' MD	
10,245.0	5,833.7	-4,348.9	-213.0	TD - 631' FSL, 2386' FEL	

Checked By: _____ Approved By: _____ Date: _____