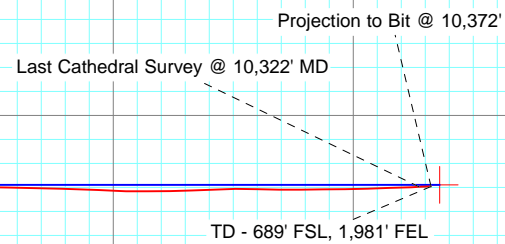
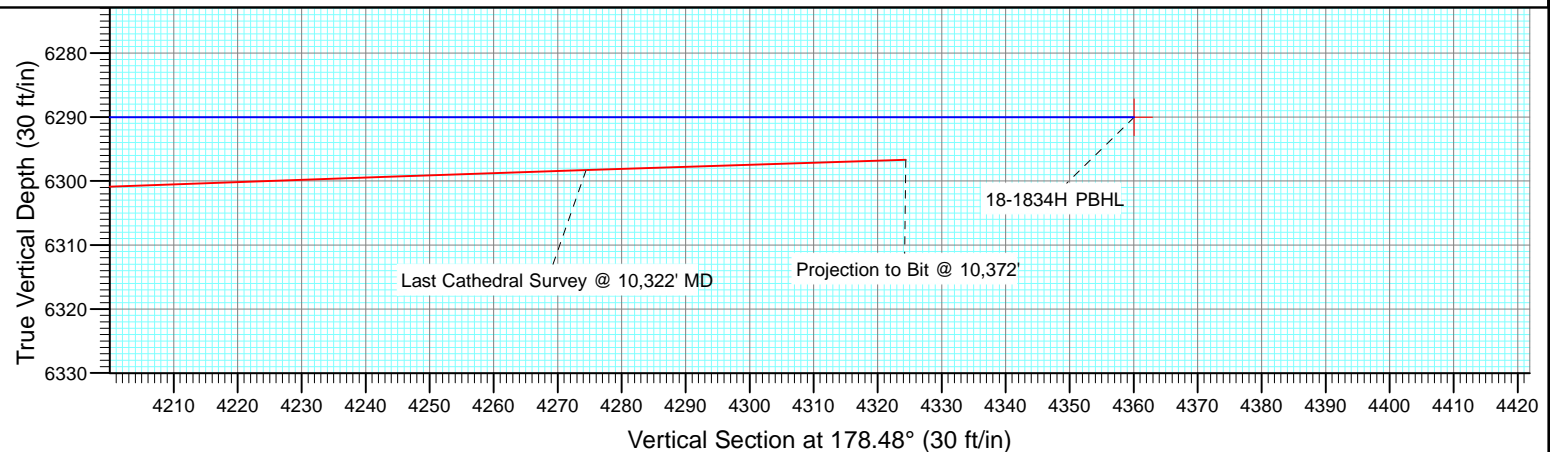
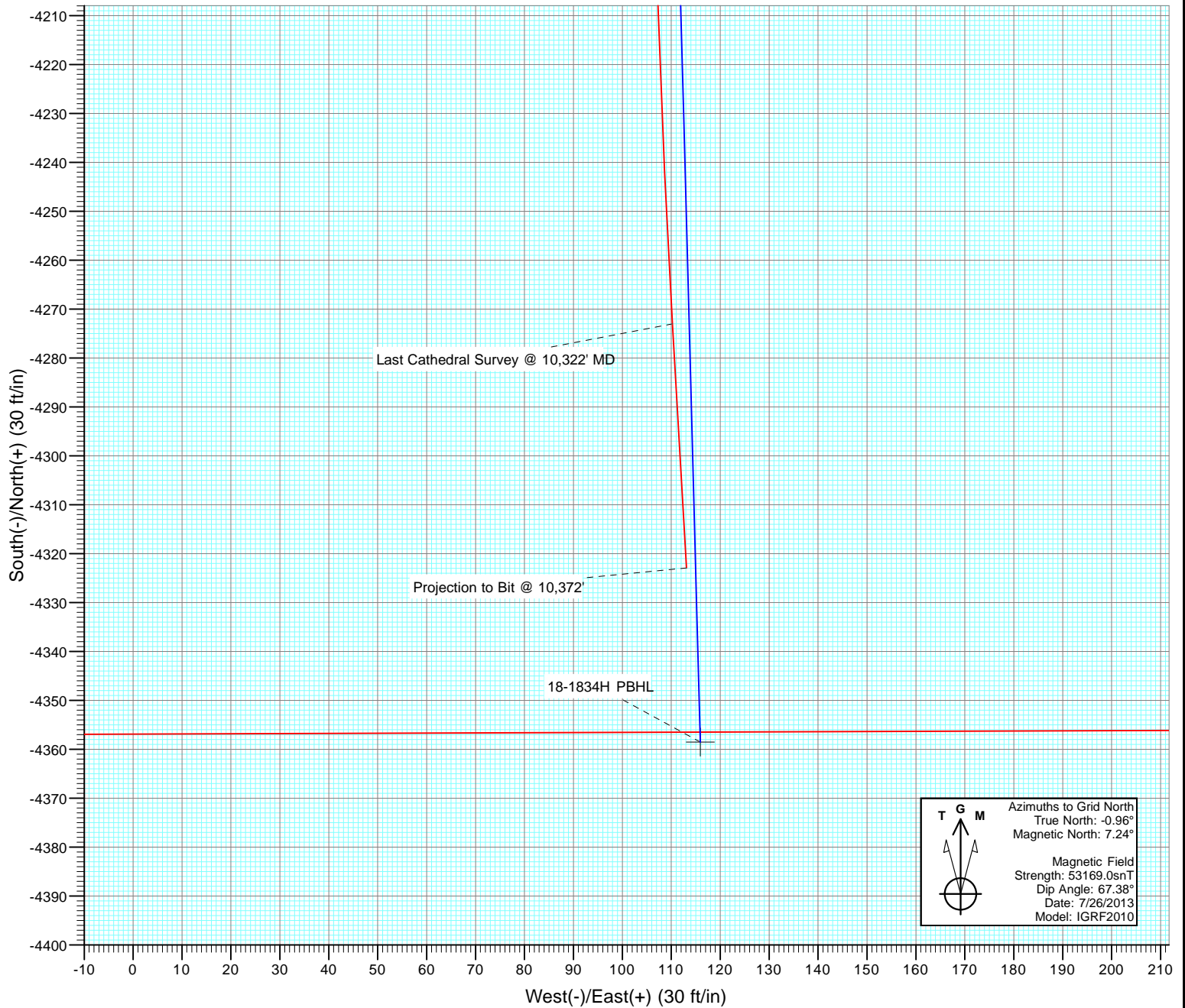


FINAL
 WILDHORSE #18-1834H
 WELL @ 5056.2ft (Original Well Elev)
 Ground Elevation @ 5041.2
 North American Datum 1983
 Well WILDHORSE #18-1834H, Grid North





Cathedral Energy Services

Survey Report

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well WILDHORSE #18-1834H
Project:	Weld County, CO	TVD Reference:	WELL @ 5056.2ft (Original Well Elev)
Site:	S18-T9N-R59W	MD Reference:	WELL @ 5056.2ft (Original Well Elev)
Well:	WILDHORSE #18-1834H	North Reference:	Grid
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		S18-T9N-R59W			
Site Position:		Northing:	1,522,038.33 ft	Latitude:	40.756967
From:	Map	Easting:	3,410,342.69 ft	Longitude:	-104.018808
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	0.96 °

Well	WILDHORSE #18-1834H					
Well Position	+N/-S	0.0 ft	Northing:	1,522,038.33 ft	Latitude:	40.756967
	+E/-W	0.0 ft	Easting:	3,410,342.69 ft	Longitude:	-104.018808
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	5,041.2 ft

Wellbore	HZ				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	7/26/2013	8.20	67.38	53,169

Design	FINAL			
Audit Notes:				
Version:	1.0	Phase:	ACTUAL	Tie On Depth: 0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	178.48

Survey Program	Date	8/10/2013			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
377.0	10,372.0	Survey #1 (HZ)	ISCWSA MWD	MWD - ISCWSA	

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Formations / Comments	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00		
377.0	0.60	123.50	377.0	-1.1	1.6	1.1	0.16	0.16		
744.0	1.10	109.20	744.0	-3.3	6.6	3.5	0.15	0.14		
1,204.0	0.50	195.60	1,203.9	-6.7	10.2	7.0	0.26	-0.13		
1,583.0	1.00	222.50	1,582.9	-10.7	7.5	10.9	0.16	0.13		
1,811.0	1.30	242.70	1,810.8	-13.4	3.9	13.5	0.22	0.13		
1,876.0	1.20	242.80	1,875.8	-14.0	2.6	14.1	0.15	-0.15		
1,937.0	0.50	338.20	1,936.8	-14.1	2.0	14.1	2.20	-1.15		
2,029.0	0.40	288.70	2,028.8	-13.6	1.5	13.6	0.42	-0.11		
2,121.0	0.70	281.50	2,120.8	-13.4	0.6	13.4	0.33	0.33		
2,315.0	1.10	318.90	2,314.8	-11.7	-1.7	11.7	0.36	0.21		
2,409.0	1.00	298.90	2,408.8	-10.7	-3.0	10.6	0.40	-0.11		
2,504.0	2.00	39.20	2,503.8	-9.0	-2.7	8.9	2.52	1.05		

Cathedral Energy Services

Survey Report

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well WILDHORSE #18-1834H
Project:	Weld County, CO	TVD Reference:	WELL @ 5056.2ft (Original Well Elev)
Site:	S18-T9N-R59W	MD Reference:	WELL @ 5056.2ft (Original Well Elev)
Well:	WILDHORSE #18-1834H	North Reference:	Grid
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Formations / Comments
2,599.0	1.80	65.70	2,598.7	-7.1	-0.3	7.1	0.94	-0.21	
2,694.0	1.70	68.40	2,693.7	-5.9	2.4	6.0	0.14	-0.11	
2,789.0	1.70	67.30	2,788.6	-4.9	5.0	5.0	0.03	0.00	
2,883.0	2.00	65.90	2,882.6	-3.7	7.7	3.9	0.32	0.32	
2,978.0	2.00	62.80	2,977.5	-2.2	10.7	2.5	0.11	0.00	
3,073.0	1.10	354.90	3,072.5	-0.6	12.1	0.9	1.98	-0.95	
3,168.0	0.60	19.60	3,167.5	0.8	12.2	-0.5	0.64	-0.53	
3,263.0	1.00	358.30	3,262.5	2.1	12.4	-1.8	0.52	0.42	
3,358.0	0.30	286.50	3,357.5	3.0	12.1	-2.7	1.00	-0.74	
3,452.0	0.50	333.10	3,451.5	3.4	11.7	-3.1	0.39	0.21	
3,547.0	0.40	357.10	3,546.4	4.1	11.5	-3.8	0.22	-0.11	
3,642.0	0.80	339.80	3,641.4	5.1	11.2	-4.8	0.46	0.42	
3,737.0	0.90	351.90	3,736.4	6.4	10.9	-6.2	0.22	0.11	
3,832.0	1.10	329.20	3,831.4	8.0	10.3	-7.7	0.46	0.21	
3,926.0	0.50	346.10	3,925.4	9.1	9.8	-8.9	0.68	-0.64	
4,021.0	0.70	355.50	4,020.4	10.1	9.6	-9.9	0.23	0.21	
4,116.0	0.40	278.60	4,115.4	10.8	9.2	-10.5	0.76	-0.32	
4,211.0	0.40	100.50	4,210.4	10.7	9.2	-10.5	0.84	0.00	
4,306.0	0.40	79.40	4,305.4	10.7	9.9	-10.5	0.15	0.00	
4,401.0	0.60	141.10	4,400.4	10.4	10.5	-10.1	0.57	0.21	
4,496.0	0.50	131.30	4,495.4	9.8	11.1	-9.5	0.14	-0.11	
4,590.0	1.50	157.20	4,589.4	8.3	11.9	-8.0	1.14	1.06	
4,685.0	2.00	134.80	4,684.3	6.0	13.6	-5.7	0.88	0.53	
4,780.0	2.20	161.20	4,779.3	3.1	15.4	-2.7	1.03	0.21	
4,875.0	1.60	193.60	4,874.2	0.1	15.6	0.3	1.27	-0.63	
4,970.0	0.60	81.10	4,969.2	-1.1	15.8	1.5	2.01	-1.05	
5,064.0	0.70	249.60	5,063.2	-1.2	15.8	1.6	1.38	0.11	
5,159.0	0.60	200.00	5,158.2	-1.9	15.0	2.3	0.58	-0.11	
5,254.0	0.70	223.60	5,253.2	-2.8	14.5	3.2	0.30	0.11	
5,348.0	0.10	131.30	5,347.2	-3.2	14.1	3.6	0.76	-0.64	
5,443.0	0.60	182.70	5,442.2	-3.8	14.2	4.2	0.57	0.53	
5,538.0	1.10	181.20	5,537.2	-5.2	14.1	5.6	0.53	0.53	
5,633.0	1.10	176.90	5,632.2	-7.0	14.2	7.4	0.09	0.00	
5,696.0	0.60	169.50	5,695.2	-7.9	14.3	8.3	0.81	-0.79	
5,728.0	2.10	186.30	5,727.1	-8.7	14.2	9.1	4.80	4.69	
5,760.0	6.20	194.00	5,759.1	-11.0	13.7	11.3	12.90	12.81	
5,791.0	9.80	189.80	5,789.7	-15.2	12.9	15.5	11.76	11.61	
5,823.0	13.20	190.80	5,821.1	-21.5	11.7	21.8	10.64	10.62	
5,854.0	16.40	189.50	5,851.1	-29.3	10.4	29.5	10.38	10.32	
5,886.0	18.90	187.80	5,881.6	-38.8	8.9	39.1	7.98	7.81	
5,918.0	22.10	186.80	5,911.5	-50.0	7.5	50.1	10.06	10.00	
5,949.0	25.10	183.80	5,939.9	-62.3	6.4	62.5	10.42	9.68	
5,981.0	27.30	182.90	5,968.6	-76.4	5.5	76.5	6.99	6.87	
6,013.0	28.80	180.30	5,996.9	-91.5	5.1	91.6	6.05	4.69	
6,044.0	30.20	180.40	6,023.9	-106.7	5.0	106.8	4.52	4.52	
6,076.0	32.20	179.70	6,051.2	-123.3	5.0	123.4	6.35	6.25	
6,108.0	34.10	177.80	6,078.0	-140.8	5.4	140.9	6.77	5.94	
6,139.0	36.60	177.60	6,103.3	-158.7	6.1	158.8	8.07	8.06	
6,171.0	39.80	177.60	6,128.5	-178.5	7.0	178.6	10.00	10.00	
6,202.0	44.10	179.20	6,151.5	-199.2	7.5	199.3	14.29	13.87	
6,234.0	49.30	181.10	6,173.4	-222.5	7.4	222.6	16.81	16.25	
6,265.0	52.30	181.20	6,193.0	-246.5	7.0	246.6	9.68	9.68	
6,297.0	54.50	181.30	6,212.1	-272.2	6.4	272.2	6.88	6.87	

Cathedral Energy Services

Survey Report

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well WILDHORSE #18-1834H
Project:	Weld County, CO	TVD Reference:	WELL @ 5056.2ft (Original Well Elev)
Site:	S18-T9N-R59W	MD Reference:	WELL @ 5056.2ft (Original Well Elev)
Well:	WILDHORSE #18-1834H	North Reference:	Grid
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Formations / Comments
6,329.0	56.70	180.20	6,230.2	-298.6	6.1	298.6	7.44	6.87	
6,360.0	60.30	179.40	6,246.4	-325.0	6.2	325.0	11.82	11.61	
6,392.0	64.50	178.90	6,261.2	-353.3	6.6	353.4	13.20	13.12	
6,423.0	69.00	178.40	6,273.4	-381.8	7.3	381.9	14.59	14.52	
6,455.0	74.60	177.20	6,283.4	-412.2	8.4	412.2	17.86	17.50	
6,487.0	79.60	178.00	6,290.6	-443.3	9.7	443.4	15.81	15.62	
6,518.0	83.80	178.30	6,295.1	-474.0	10.7	474.1	13.58	13.55	
6,592.0	88.10	177.30	6,300.3	-547.7	13.6	547.9	5.97	5.81	
6,715.0	89.60	176.80	6,302.7	-670.5	19.9	670.8	1.29	1.22	
6,758.0	88.80	176.50	6,303.3	-713.4	22.4	713.8	1.99	-1.86	
6,899.0	88.60	176.00	6,306.5	-854.1	31.6	854.6	0.38	-0.14	
6,990.0	89.60	176.80	6,308.0	-944.9	37.3	945.6	1.41	1.10	
7,082.0	89.70	177.60	6,308.5	-1,036.8	41.8	1,037.5	0.88	0.11	
7,173.0	89.40	178.60	6,309.2	-1,127.7	44.8	1,128.5	1.15	-0.33	
7,264.0	88.80	179.20	6,310.7	-1,218.7	46.6	1,219.5	0.93	-0.66	
7,355.0	90.70	178.80	6,311.1	-1,309.7	48.2	1,310.5	2.13	2.09	
7,447.0	91.10	180.70	6,309.6	-1,401.7	48.6	1,402.5	2.11	0.43	
7,538.0	90.40	179.50	6,308.4	-1,492.7	48.4	1,493.4	1.53	-0.77	
7,630.0	89.30	177.80	6,308.7	-1,584.6	50.6	1,585.4	2.20	-1.20	
7,722.0	90.60	177.00	6,308.8	-1,676.5	54.8	1,677.4	1.66	1.41	
7,813.0	91.30	177.60	6,307.3	-1,767.4	59.0	1,768.4	1.01	0.77	
7,905.0	92.00	179.60	6,304.6	-1,859.4	61.3	1,860.3	2.30	0.76	
7,997.0	92.70	179.90	6,300.8	-1,951.3	61.7	1,952.2	0.83	0.76	
8,088.0	91.30	182.20	6,297.7	-2,042.2	60.0	2,043.1	2.96	-1.54	
8,180.0	88.80	181.50	6,297.6	-2,134.1	57.1	2,134.9	2.82	-2.72	
8,272.0	89.40	181.40	6,299.0	-2,226.1	54.7	2,226.8	0.66	0.65	
8,368.0	90.70	182.50	6,298.9	-2,322.0	51.5	2,322.6	1.77	1.35	
8,460.0	89.10	181.50	6,299.1	-2,414.0	48.3	2,414.4	2.05	-1.74	
8,552.0	89.40	180.30	6,300.3	-2,506.0	46.8	2,506.3	1.34	0.33	
8,643.0	88.70	179.70	6,301.8	-2,597.0	46.8	2,597.3	1.01	-0.77	
8,735.0	89.40	177.60	6,303.3	-2,688.9	49.0	2,689.3	2.41	0.76	
8,826.0	87.50	175.90	6,305.8	-2,779.7	54.1	2,780.2	2.80	-2.09	
8,918.0	87.80	176.30	6,309.6	-2,871.4	60.4	2,872.0	0.54	0.33	
9,009.0	87.60	175.60	6,313.2	-2,962.1	66.8	2,962.9	0.80	-0.22	
9,100.0	88.70	174.80	6,316.2	-3,052.8	74.4	3,053.7	1.49	1.21	
9,191.0	90.90	174.90	6,316.5	-3,143.4	82.6	3,144.5	2.42	2.42	
9,283.0	90.60	174.80	6,315.3	-3,235.0	90.8	3,236.3	0.34	-0.33	
9,375.0	91.80	175.50	6,313.3	-3,326.7	98.6	3,328.1	1.51	1.30	
9,466.0	92.20	178.70	6,310.2	-3,417.5	103.2	3,419.0	3.54	0.44	
9,557.0	91.60	179.70	6,307.2	-3,508.4	104.5	3,509.9	1.28	-0.66	
9,648.0	88.30	179.90	6,307.2	-3,599.4	104.8	3,600.9	3.63	-3.63	
9,739.0	88.70	180.60	6,309.6	-3,690.4	104.4	3,691.8	0.89	0.44	
9,831.0	91.10	180.20	6,309.8	-3,782.4	103.8	3,783.8	2.64	2.61	
9,922.0	90.70	180.30	6,308.3	-3,873.3	103.4	3,874.7	0.45	-0.44	
10,014.0	89.90	180.60	6,307.9	-3,965.3	102.6	3,966.7	0.93	-0.87	
10,106.0	92.30	179.20	6,306.1	-4,057.3	102.8	4,058.6	3.02	2.61	
10,197.0	92.00	178.10	6,302.7	-4,148.2	104.9	4,149.5	1.25	-0.33	
10,291.0	92.10	177.40	6,299.3	-4,242.1	108.6	4,243.5	0.75	0.11	
10,322.0	91.80	176.70	6,298.3	-4,273.0	110.2	4,274.5	2.46	-0.97	Last Cathedral Survey @ 10,322' MD
10,372.0	91.80	176.70	6,296.7	-4,322.9	113.1	4,324.4	0.00	0.00	Projection to Bit @ 10,372'

Cathedral Energy Services

Survey Report

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well WILDHORSE #18-1834H
Project:	Weld County, CO	TVD Reference:	WELL @ 5056.2ft (Original Well Elev)
Site:	S18-T9N-R59W	MD Reference:	WELL @ 5056.2ft (Original Well Elev)
Well:	WILDHORSE #18-1834H	North Reference:	Grid
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	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)		
18-1834H PBHL	0.00	0.00	6,290.0	-4,358.5	115.9	1,517,679.82	3,410,458.61	40.745000	-104.018653
- actual wellpath misses target center by 36.3ft at 10372.0ft MD (6296.7 TVD, -4322.9 N, 113.1 E)									
- Point									

Design Annotations					
Measured Depth	Vertical Depth	Local Coordinates			
(ft)	(ft)	+N/-S (ft)	+E/-W (ft)	Comment	
10,322.0	6,298.3	-4,273.0	110.2	Last Cathedral Survey @ 10,322' MD	
10,372.0	6,296.7	-4,322.9	113.1	Projection to Bit @ 10,372'	

Checked By: _____ Approved By: _____ Date: _____