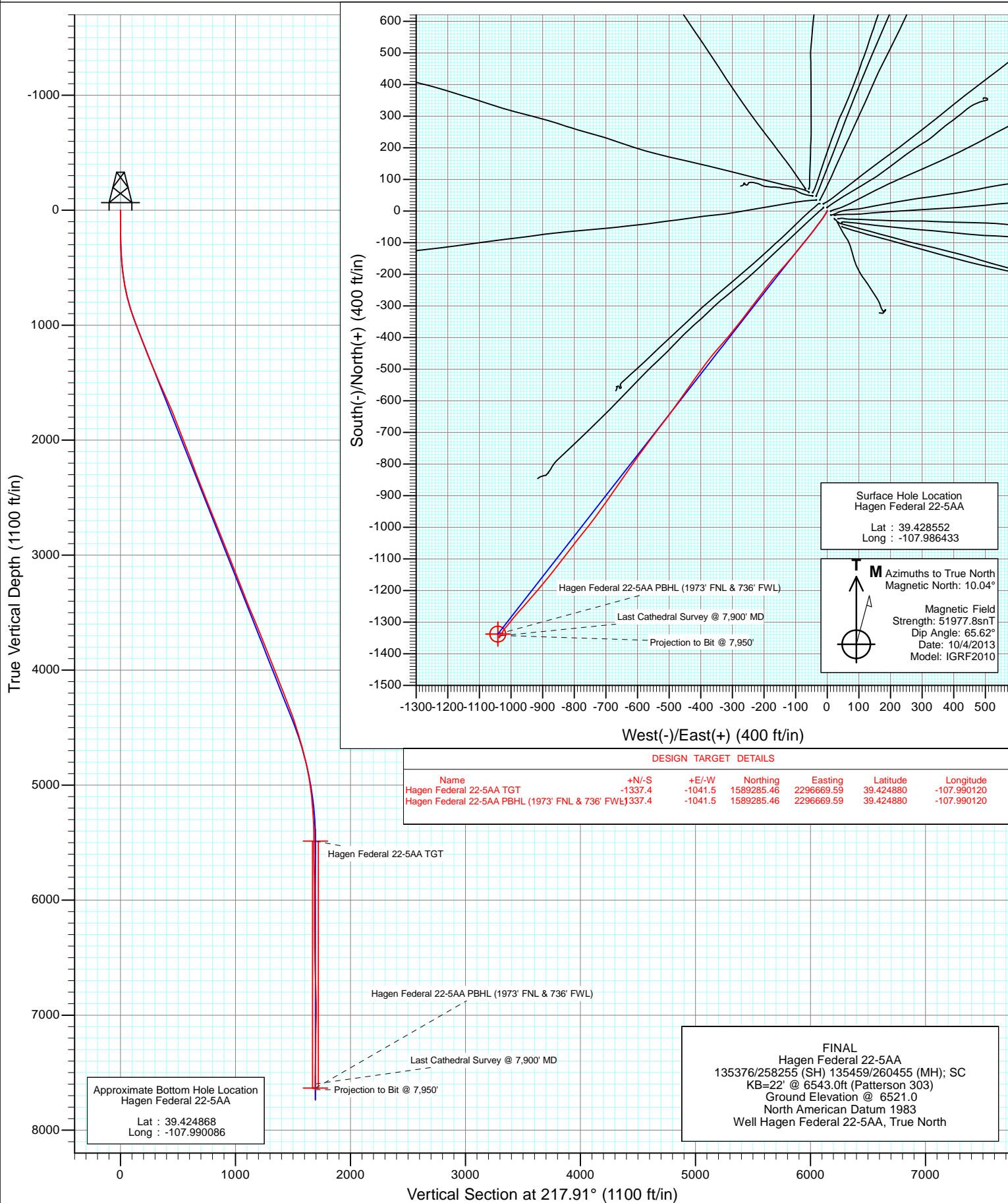


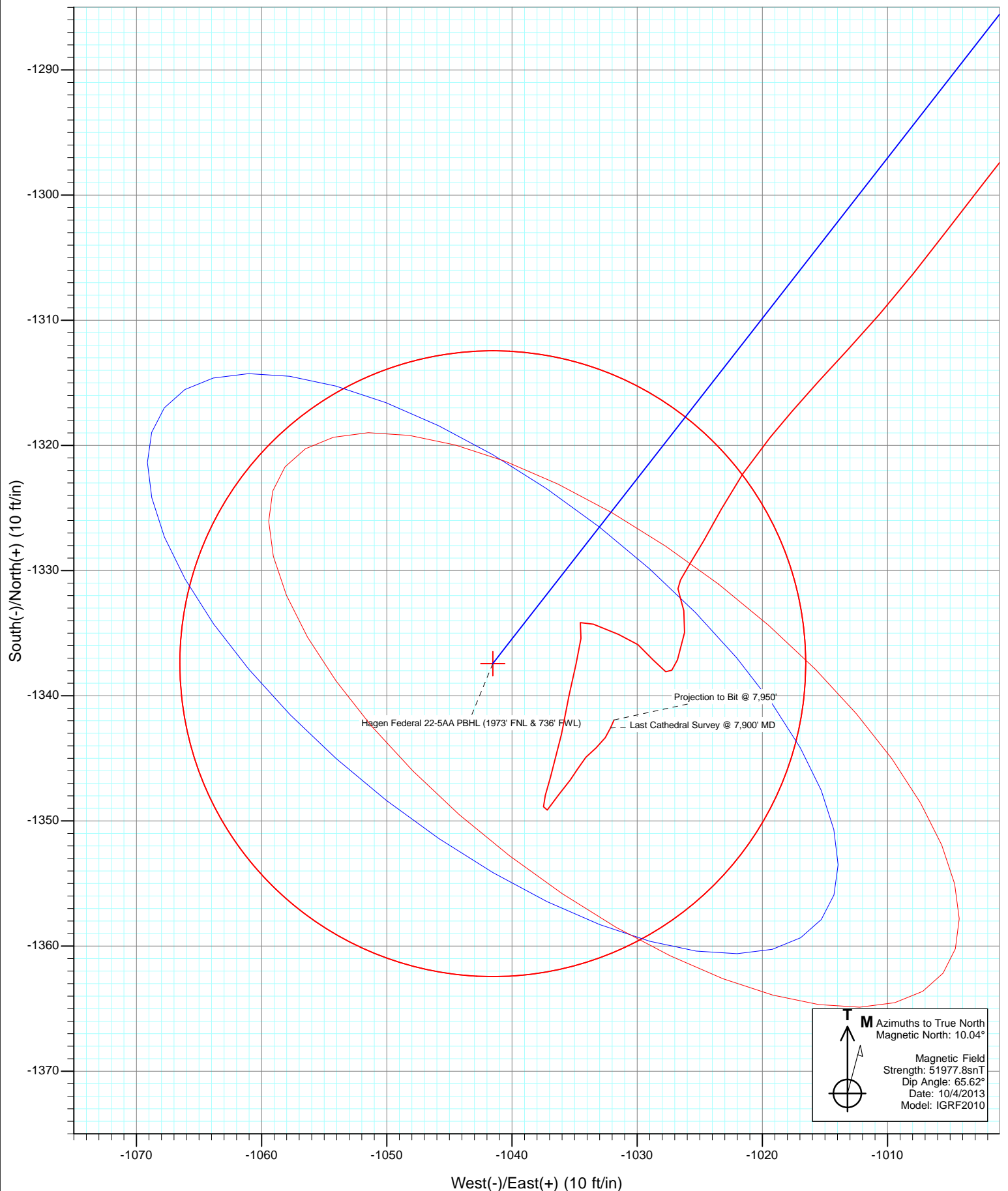


Project: S. Piceance (Parachute)
Site: PC-22 Pad NENW 2 7S 95W
Well: Hagen Federal 22-5AA
Wellbore: OH
Design: FINAL



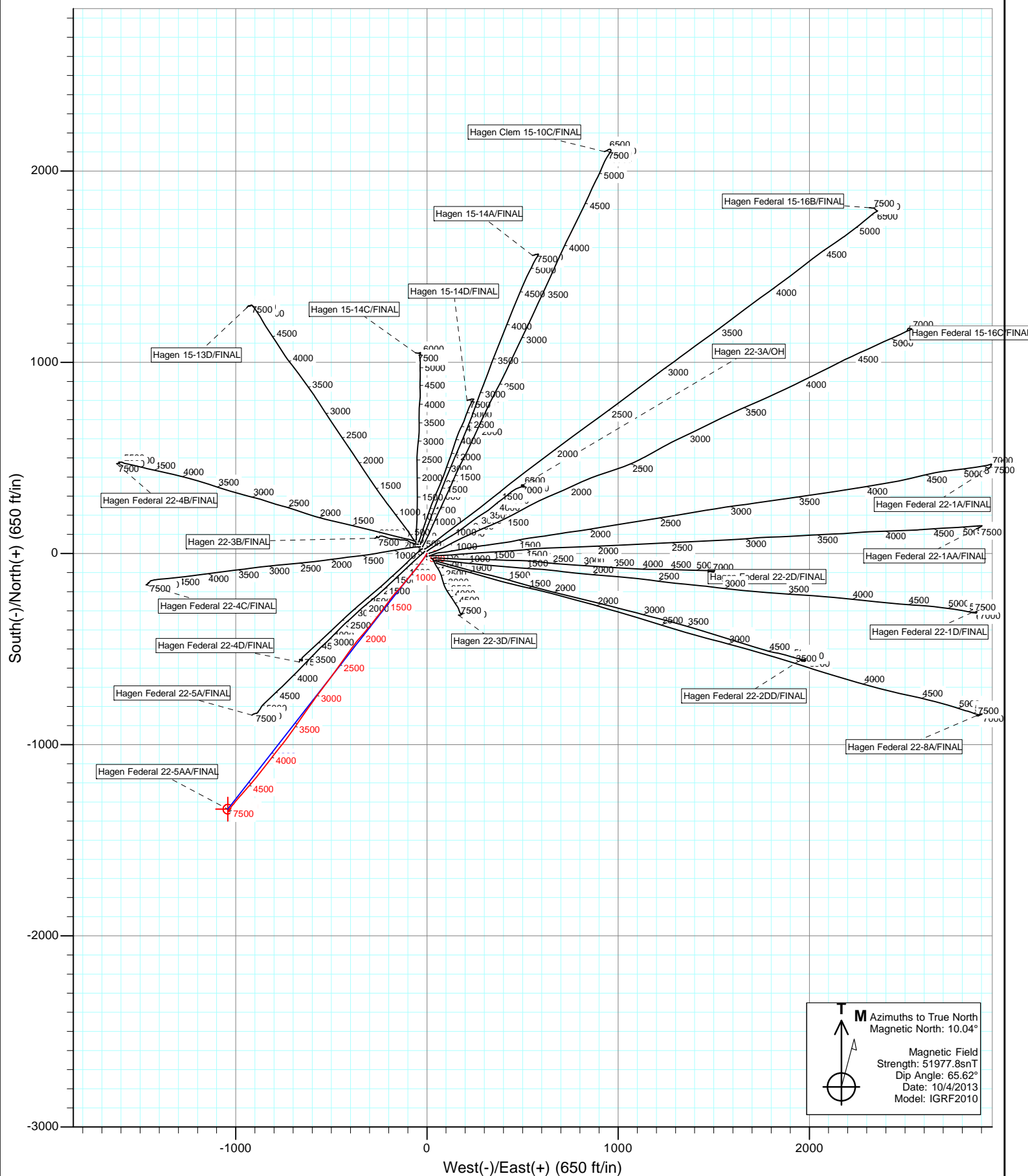


Project: S. Piceance (Parachute)
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Project: S. Piceance (Parachute)
Site: PC-22 Pad NENW 2 7S 95W
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Wellbore: OH
Design: FINAL



Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Hagen Federal 22-5AA
Project:	S. Piceance (Parachute)	TVD Reference:	KB=22' @ 6543.0ft (Patterson 303)
Site:	PC-22 Pad NENW 2 7S 95W	MD Reference:	KB=22' @ 6543.0ft (Patterson 303)
Well:	Hagen Federal 22-5AA	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Project	S. Piceance (Parachute), Garfield County, CO		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Central Zone		

Site	PC-22 Pad NENW 2 7S 95W			
Site Position:		Northing:	1,590,596.09 ft	Latitude: 39.428560
From:	Lat/Long	Easting:	2,297,773.66 ft	Longitude: -107.986340
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence: -1.57 °

Well	Hagen Federal 22-5AA			
Well Position	+N/-S	0.0 ft	Northing:	1,590,593.89 ft
	+E/-W	0.0 ft	Easting:	2,297,747.32 ft
Position Uncertainty	0.0 ft	Wellhead Elevation:	ft	Ground Level: 6,521.0 ft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	10/4/2013	10.04	65.62	51,978

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	217.91

Survey Program	Date	10/14/2013		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
115.0	7,950.0	Survey #1 (OH)	Geolink MWD	Geolink MWD

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	
115.0	0.50	232.40	115.0	-0.3	-0.4	0.5	0.43	0.43	
145.0	0.30	249.30	145.0	-0.4	-0.6	0.7	0.77	-0.67	
176.0	0.30	230.90	176.0	-0.5	-0.7	0.8	0.31	0.00	
217.0	0.40	234.70	217.0	-0.6	-0.9	1.1	0.25	0.24	
267.0	1.10	206.40	267.0	-1.2	-1.3	1.7	1.54	1.40	
298.0	1.40	206.30	298.0	-1.8	-1.6	2.4	0.97	0.97	
328.0	2.20	204.10	328.0	-2.6	-2.0	3.3	2.68	2.67	
359.0	3.00	205.90	358.9	-3.9	-2.6	4.7	2.59	2.58	
390.0	3.60	208.50	389.9	-5.5	-3.4	6.4	1.99	1.94	
481.0	5.60	210.50	480.6	-11.8	-7.0	13.6	2.20	2.20	
573.0	7.50	215.00	572.0	-20.6	-12.7	24.1	2.14	2.07	
665.0	10.40	216.80	662.9	-32.2	-21.1	38.4	3.17	3.15	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Hagen Federal 22-5AA
Project:	S. Piceance (Parachute)	TVD Reference:	KB=22' @ 6543.0ft (Patterson 303)
Site:	PC-22 Pad NENW 2 7S 95W	MD Reference:	KB=22' @ 6543.0ft (Patterson 303)
Well:	Hagen Federal 22-5AA	North Reference:	True
Wellbore:	OH	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
756.0	13.70	216.10	751.8	-47.5	-32.4	57.4	3.63	3.63	
847.0	16.90	218.40	839.6	-66.6	-47.0	81.4	3.58	3.52	
938.0	19.50	218.50	926.0	-88.8	-64.7	109.8	2.86	2.86	
1,029.0	20.90	218.80	1,011.4	-113.3	-84.3	141.2	1.54	1.54	
1,043.0	21.30	219.50	1,024.5	-117.3	-87.5	146.3	3.38	2.86	
1,155.0	21.20	220.30	1,128.9	-148.4	-113.5	186.8	0.27	-0.09	
1,247.0	21.10	221.00	1,214.7	-173.6	-135.1	220.0	0.30	-0.11	
1,339.0	22.50	223.00	1,300.1	-199.0	-158.0	254.0	1.72	1.52	
1,430.0	23.10	217.80	1,384.0	-225.8	-180.8	289.2	2.31	0.66	
1,522.0	23.50	217.00	1,468.5	-254.7	-202.9	325.6	0.55	0.43	
1,613.0	23.70	215.20	1,551.9	-284.1	-224.4	362.0	0.82	0.22	
1,705.0	24.40	218.00	1,635.9	-314.2	-246.7	399.5	1.45	0.76	
1,797.0	22.70	218.50	1,720.2	-343.1	-269.5	436.3	1.86	-1.85	
1,889.0	21.10	219.20	1,805.6	-369.8	-291.0	470.6	1.76	-1.74	
1,980.0	21.40	219.60	1,890.4	-395.3	-311.9	503.6	0.37	0.33	
2,072.0	21.50	220.20	1,976.0	-421.1	-333.5	537.2	0.26	0.11	
2,164.0	21.70	221.20	2,061.6	-446.8	-355.6	571.0	0.46	0.22	
2,255.0	20.30	216.60	2,146.5	-472.1	-376.1	603.6	2.38	-1.54	
2,347.0	20.20	216.20	2,232.9	-497.8	-395.0	635.4	0.19	-0.11	
2,438.0	21.30	216.20	2,318.0	-523.8	-414.0	667.6	1.21	1.21	
2,530.0	22.20	214.50	2,403.4	-551.6	-433.8	701.7	1.19	0.98	
2,621.0	21.80	215.50	2,487.8	-579.5	-453.3	735.7	0.60	-0.44	
2,712.0	20.70	215.30	2,572.6	-606.4	-472.4	768.7	1.21	-1.21	
2,804.0	21.00	216.40	2,658.6	-632.9	-491.6	801.4	0.54	0.33	
2,895.0	22.80	217.30	2,743.0	-660.1	-512.0	835.3	2.01	1.98	
2,987.0	22.40	216.90	2,827.9	-688.3	-533.3	870.7	0.47	-0.43	
3,079.0	22.00	216.50	2,913.1	-716.1	-554.1	905.4	0.46	-0.43	
3,170.0	21.20	217.10	2,997.7	-743.0	-574.1	938.9	0.91	-0.88	
3,262.0	22.10	215.20	3,083.2	-770.4	-594.1	972.9	1.24	0.98	
3,353.0	21.10	215.90	3,167.8	-797.6	-613.6	1,006.3	1.13	-1.10	
3,444.0	21.90	214.50	3,252.5	-824.9	-632.8	1,039.6	1.04	0.88	
3,536.0	20.90	215.00	3,338.2	-852.5	-652.0	1,073.2	1.10	-1.09	
3,627.0	21.80	214.40	3,422.9	-879.7	-670.8	1,106.2	1.02	0.99	
3,718.0	22.90	216.00	3,507.1	-908.0	-690.8	1,140.8	1.38	1.21	
3,810.0	22.60	215.30	3,591.9	-936.9	-711.5	1,176.3	0.44	-0.33	
3,901.0	21.80	215.20	3,676.2	-965.0	-731.3	1,210.7	0.88	-0.88	
3,993.0	21.80	219.20	3,761.6	-992.2	-752.0	1,244.8	1.61	0.00	
4,084.0	21.80	218.30	3,846.1	-1,018.5	-773.1	1,278.6	0.37	0.00	
4,176.0	21.90	218.30	3,931.5	-1,045.4	-794.4	1,312.9	0.11	0.11	
4,267.0	21.60	217.80	4,016.0	-1,071.9	-815.1	1,346.6	0.39	-0.33	
4,359.0	20.80	216.20	4,101.8	-1,098.5	-835.2	1,379.9	1.07	-0.87	
4,451.0	22.10	219.30	4,187.4	-1,125.1	-855.8	1,413.5	1.87	1.41	
4,542.0	21.90	217.70	4,271.8	-1,151.8	-877.0	1,447.6	0.69	-0.22	
4,634.0	20.20	220.30	4,357.6	-1,177.5	-897.8	1,480.6	2.11	-1.85	
4,725.0	18.20	220.20	4,443.6	-1,200.3	-917.1	1,510.5	2.20	-2.20	
4,816.0	16.70	221.20	4,530.4	-1,221.0	-934.9	1,537.8	1.68	-1.65	
4,908.0	16.50	220.70	4,618.6	-1,240.8	-952.1	1,564.0	0.27	-0.22	
5,000.0	14.90	221.70	4,707.1	-1,259.6	-968.5	1,588.9	1.76	-1.74	
5,091.0	13.00	221.70	4,795.4	-1,276.0	-983.1	1,610.7	2.09	-2.09	
5,183.0	10.90	219.10	4,885.4	-1,290.4	-995.5	1,629.8	2.36	-2.28	
5,274.0	8.90	217.20	4,975.1	-1,302.7	-1,005.2	1,645.4	2.23	-2.20	
5,366.0	6.90	223.10	5,066.2	-1,312.4	-1,013.2	1,658.0	2.34	-2.17	
5,457.0	4.80	219.20	5,156.7	-1,319.4	-1,019.4	1,667.3	2.35	-2.31	

Cathedral Energy Services

Survey Report

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Project:	S. Piceance (Parachute)	TVD Reference:	KB=22' @ 6543.0ft (Patterson 303)
Site:	PC-22 Pad NENW 2 7S 95W	MD Reference:	KB=22' @ 6543.0ft (Patterson 303)
Well:	Hagen Federal 22-5AA	North Reference:	True
Wellbore:	OH	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
5,548.0	4.00	208.30	5,247.4	-1,325.1	-1,023.3	1,674.2	1.27	-0.88	
5,640.0	2.30	212.60	5,339.3	-1,329.5	-1,025.8	1,679.2	1.86	-1.85	
5,732.0	0.50	171.20	5,431.3	-1,331.4	-1,026.7	1,681.3	2.12	-1.96	
5,824.0	0.40	157.70	5,523.3	-1,332.1	-1,026.6	1,681.8	0.16	-0.11	
5,915.0	1.00	167.30	5,614.3	-1,333.2	-1,026.3	1,682.4	0.67	0.66	
6,007.0	1.20	187.10	5,706.3	-1,334.9	-1,026.2	1,683.8	0.46	0.22	
6,100.0	1.60	200.20	5,799.2	-1,337.1	-1,026.8	1,685.8	0.55	0.43	
6,190.0	0.70	293.60	5,889.2	-1,338.1	-1,027.7	1,687.2	1.98	-1.00	
6,282.0	1.10	325.20	5,981.2	-1,337.1	-1,028.7	1,687.0	0.68	0.43	
6,373.0	1.10	305.50	6,072.2	-1,335.9	-1,029.9	1,686.8	0.41	0.00	
6,465.0	1.10	290.20	6,164.2	-1,335.1	-1,031.5	1,687.1	0.32	0.00	
6,557.0	1.60	293.40	6,256.1	-1,334.3	-1,033.5	1,687.7	0.55	0.54	
6,648.0	0.50	161.50	6,347.1	-1,334.2	-1,034.5	1,688.3	2.16	-1.21	
6,740.0	1.10	185.40	6,439.1	-1,335.4	-1,034.5	1,689.2	0.73	0.65	
6,832.0	1.50	194.50	6,531.1	-1,337.5	-1,034.9	1,691.1	0.49	0.43	
6,924.0	1.70	190.90	6,623.1	-1,340.0	-1,035.4	1,693.4	0.24	0.22	
7,015.0	2.30	191.30	6,714.0	-1,343.1	-1,036.0	1,696.2	0.66	0.66	
7,106.0	2.20	197.50	6,804.9	-1,346.5	-1,036.9	1,699.5	0.29	-0.11	
7,198.0	0.80	181.00	6,896.9	-1,348.9	-1,037.5	1,701.7	1.58	-1.52	
7,289.0	0.60	40.60	6,987.9	-1,349.1	-1,037.2	1,701.7	1.45	-0.22	
7,381.0	1.30	34.80	7,079.9	-1,347.9	-1,036.3	1,700.2	0.77	0.76	
7,472.0	0.60	44.80	7,170.9	-1,346.7	-1,035.3	1,698.7	0.79	-0.77	
7,564.0	0.70	24.60	7,262.9	-1,345.9	-1,034.8	1,697.6	0.27	0.11	
7,655.0	0.80	44.00	7,353.9	-1,344.9	-1,034.1	1,696.5	0.30	0.11	
7,746.0	0.60	52.50	7,444.9	-1,344.2	-1,033.3	1,695.4	0.25	-0.22	
7,837.0	0.80	33.00	7,535.8	-1,343.3	-1,032.5	1,694.3	0.34	0.22	
7,900.0	0.80	24.30	7,598.8	-1,342.6	-1,032.1	1,693.4	0.19	0.00	Last Cathedral Survey @ 7,900' MD
7,950.0	0.80	24.30	7,648.8	-1,341.9	-1,031.8	1,692.7	0.00	0.00	Projection to Bit @ 7,950'

Targets									
Target Name	- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	
- Shape									Latitude Longitude
Hagen Federal 22-5AA F	- actual wellpath misses target center by 10.7ft at 7935.2ft MD (7634.0 TVD, -1342.1 N, -1031.9 E)	0.00	0.00	7,634.0	-1,337.4	-1,041.5	1,589,285.46	2,296,669.59	39.424880 -107.990120
	- Circle (radius 25.0)								
Hagen Federal 22-5AA 1	- actual wellpath misses target center by 15.9ft at 5787.7ft MD (5487.0 TVD, -1331.9 N, -1026.6 E)	0.00	0.00	5,487.0	-1,337.4	-1,041.5	1,589,285.46	2,296,669.59	39.424880 -107.990120
	- Point								

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
7,900.0	7,598.8	-1,342.6	-1,032.1	Last Cathedral Survey @ 7,900' MD	
7,950.0	7,648.8	-1,341.9	-1,031.8	Projection to Bit @ 7,950'	

Checked By: _____ Approved By: _____ Date: _____