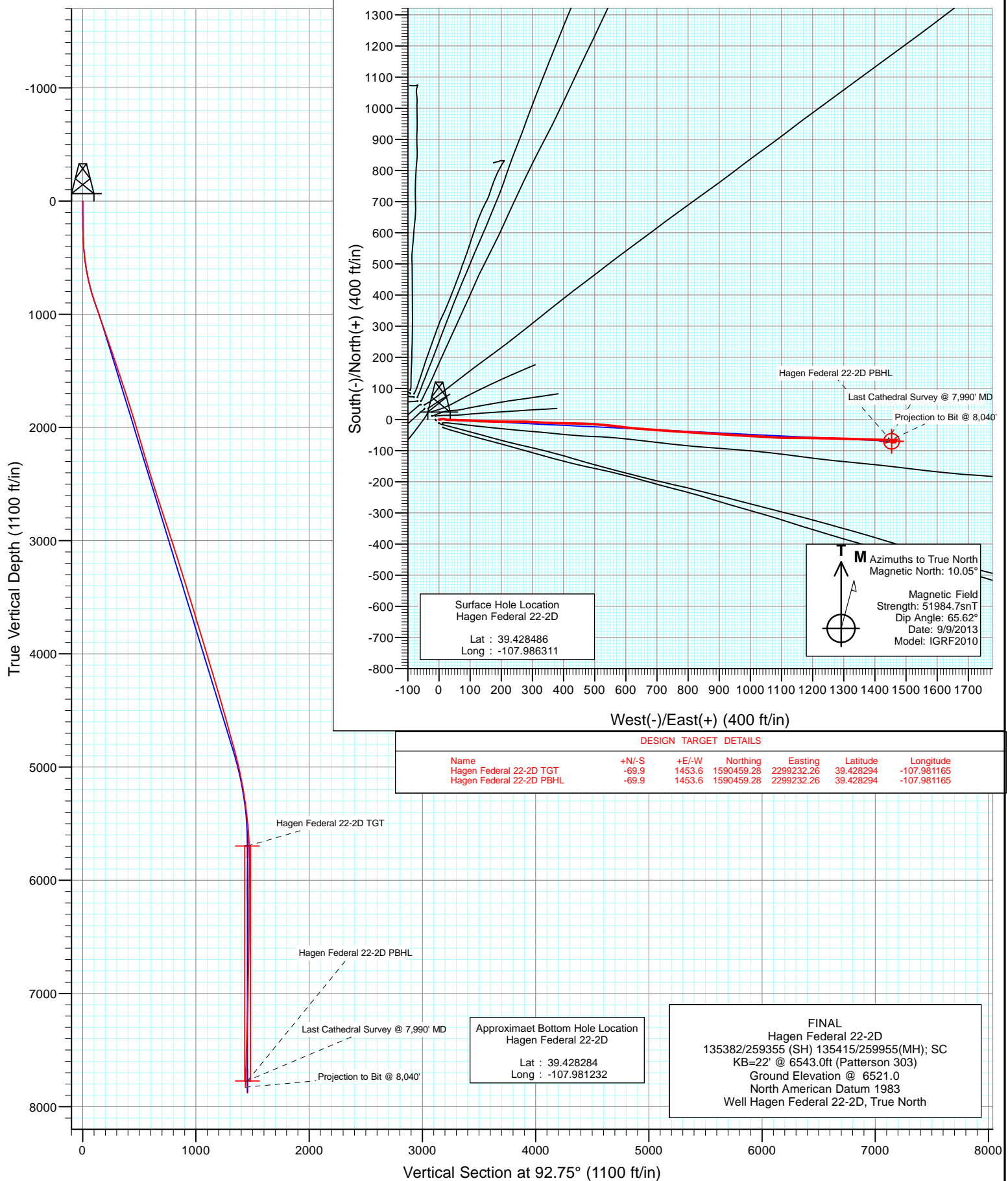


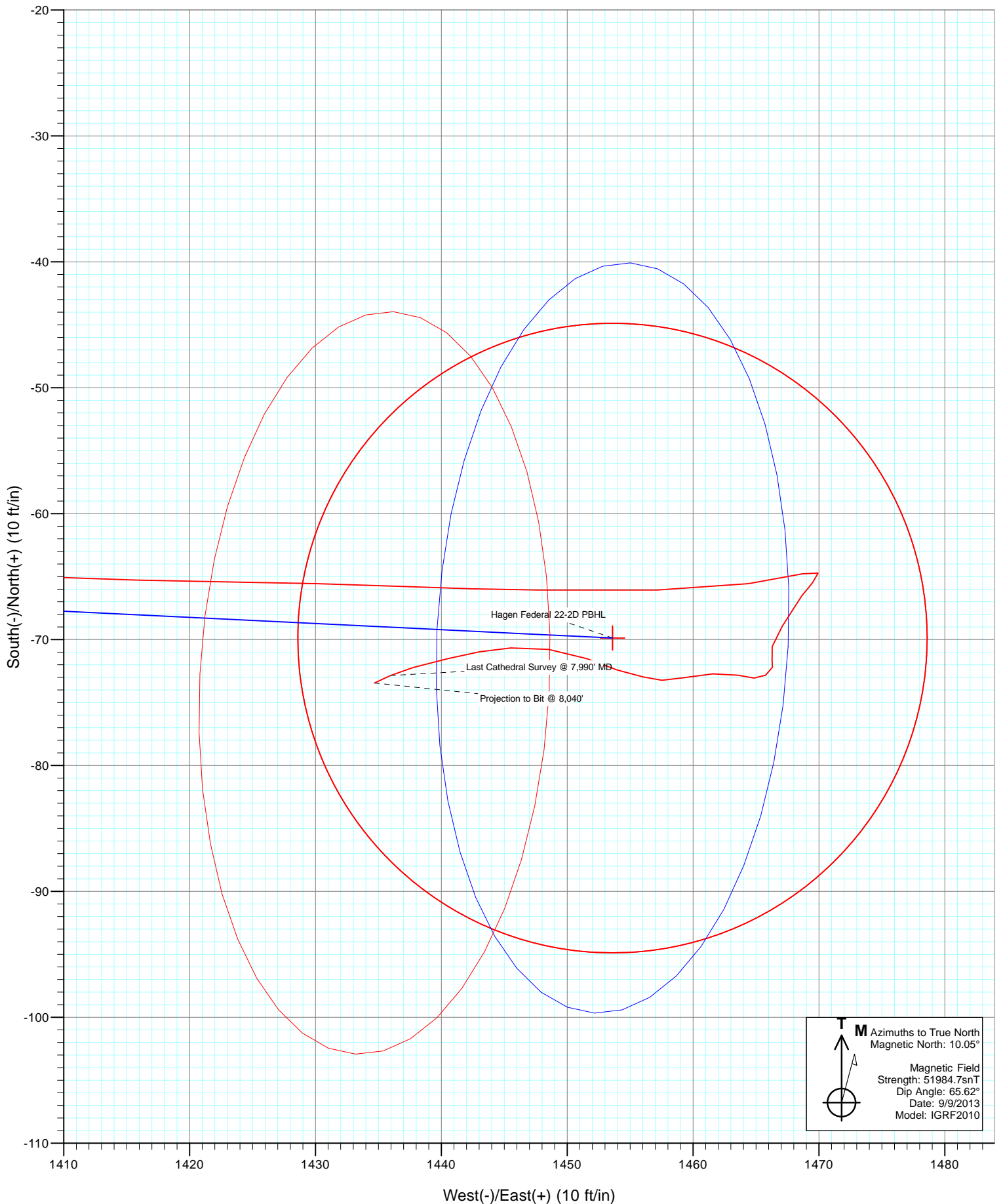


Project: S. Piceance (Parachute)
Site: PC-22 Pad NENW 2 7S 95W
Well: Hagen Federal 22-2D
Wellbore: OH
Design: FINAL



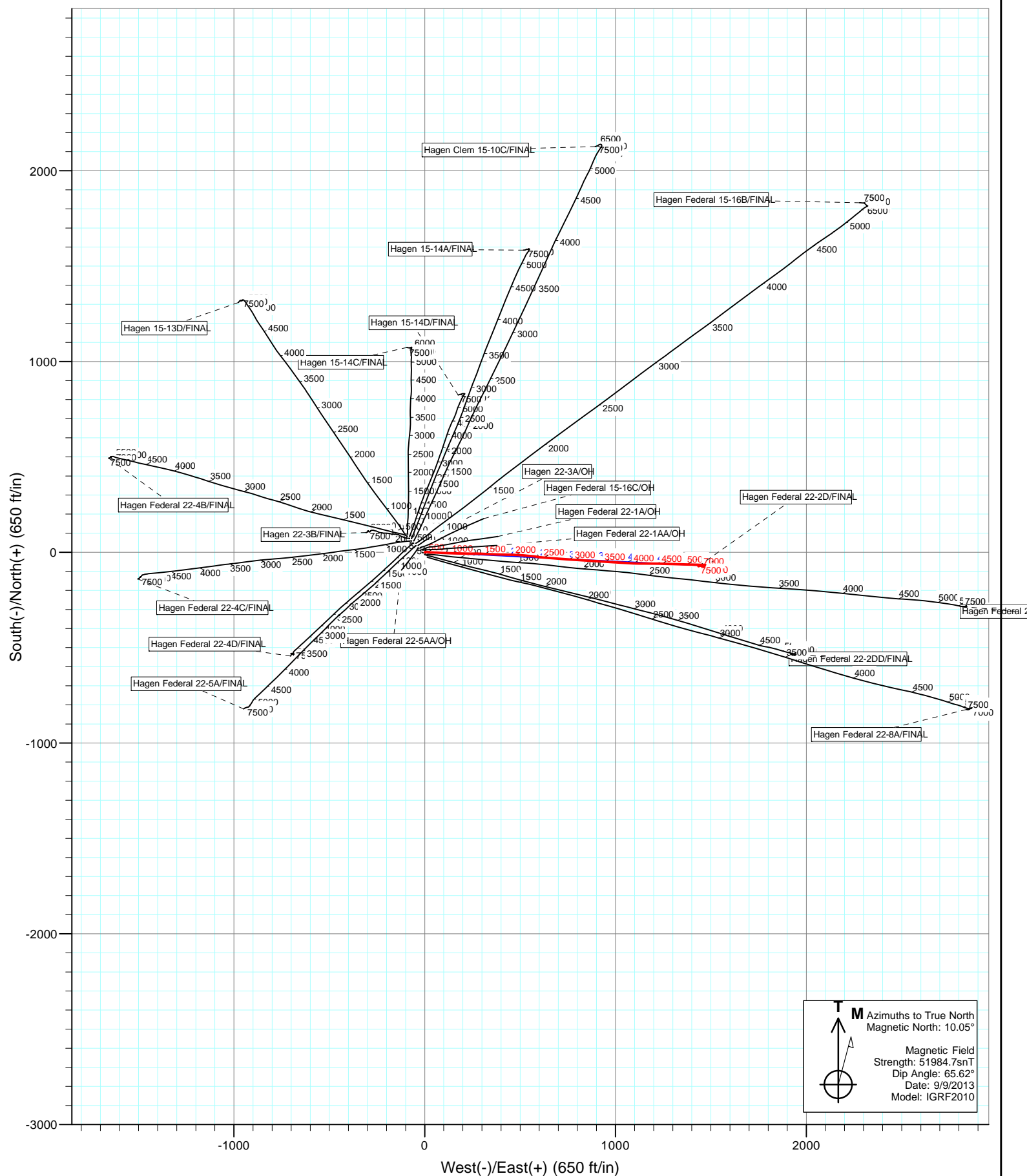


Project: S. Piceance (Parachute)
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Project: S. Piceance (Parachute)
Site: PC-22 Pad NENW 2 7S 95W
Well: Hagen Federal 22-2D
Wellbore: OH
Design: FINAL



Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Hagen Federal 22-2D
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 22-2D	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 22-2D					
Well Position	+N/-S	0.0 ft	Northing:	1,590,568.91 ft	Latitude:	39.428486
	+E/-W	0.0 ft	Easting:	2,297,781.12 ft	Longitude:	-107.986311
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	9/9/2013	10.05	65.62	51,985

Design	FINAL				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.0	0.0	0.0	92.75	

Survey Program	Date	9/15/2013			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
117.0	8,040.0	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		
117.0	0.10	151.40	117.0	-0.1	0.0	0.1	0.09	0.09		
148.0	0.40	133.80	148.0	-0.2	0.1	0.1	0.99	0.97		
179.0	0.70	89.10	179.0	-0.3	0.4	0.4	1.62	0.97		
209.0	0.80	97.10	209.0	-0.3	0.8	0.8	0.48	0.33		
240.0	1.00	96.10	240.0	-0.3	1.3	1.3	0.65	0.65		
270.0	1.40	73.10	270.0	-0.3	1.9	1.9	2.06	1.33		
301.0	1.90	71.90	301.0	0.0	2.7	2.7	1.62	1.61		
331.0	2.70	73.60	330.9	0.4	3.9	3.9	2.68	2.67		
362.0	3.40	81.60	361.9	0.7	5.5	5.5	2.64	2.26		
423.0	4.60	82.00	422.8	1.3	9.7	9.6	1.97	1.97		
453.0	5.50	87.20	452.6	1.5	12.3	12.3	3.36	3.00		
484.0	6.00	101.40	483.5	1.3	15.4	15.3	4.85	1.61		

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 22-2D	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
514.0	6.50	100.90	513.3	0.7	18.6	18.6	1.68	1.67	
545.0	7.60	99.00	544.1	0.0	22.4	22.3	3.63	3.55	
576.0	8.50	97.40	574.8	-0.6	26.7	26.7	2.99	2.90	
667.0	11.80	90.00	664.3	-1.5	42.6	42.7	3.89	3.63	
759.0	15.00	91.90	753.8	-1.9	64.0	64.0	3.51	3.48	
850.0	17.40	92.80	841.2	-2.9	89.3	89.4	2.65	2.64	
941.0	18.70	92.30	927.7	-4.2	117.5	117.6	1.44	1.43	
993.0	18.90	93.60	976.9	-5.0	134.2	134.3	0.89	0.38	
1,060.0	19.30	91.70	1,040.3	-6.0	156.1	156.2	1.10	0.60	
1,151.0	19.60	90.40	1,126.1	-6.6	186.4	186.5	0.58	0.33	
1,243.0	18.90	90.60	1,212.9	-6.9	216.7	216.8	0.76	-0.76	
1,334.0	19.30	89.50	1,298.9	-6.9	246.5	246.6	0.59	0.44	
1,426.0	18.40	91.70	1,386.0	-7.2	276.2	276.3	1.25	-0.98	
1,518.0	17.80	93.10	1,473.4	-8.4	304.8	304.8	0.81	-0.65	
1,609.0	18.00	92.40	1,560.0	-9.7	332.7	332.8	0.32	0.22	
1,700.0	18.30	92.30	1,646.5	-10.9	361.1	361.2	0.33	0.33	
1,791.0	18.40	91.50	1,732.9	-11.8	389.7	389.8	0.30	0.11	
1,883.0	18.50	90.40	1,820.1	-12.3	418.8	418.9	0.39	0.11	
1,975.0	17.00	91.10	1,907.8	-12.7	446.8	446.9	1.65	-1.63	
2,067.0	16.40	93.30	1,995.9	-13.7	473.3	473.4	0.95	-0.65	
2,159.0	16.00	93.20	2,084.2	-15.1	498.9	499.0	0.44	-0.43	
2,250.0	16.00	94.60	2,171.7	-16.8	523.9	524.1	0.42	0.00	
2,342.0	16.50	96.30	2,260.0	-19.3	549.5	549.8	0.75	0.54	
2,433.0	17.10	96.90	2,347.1	-22.3	575.7	576.1	0.69	0.66	
2,525.0	17.60	97.40	2,435.0	-25.7	602.9	603.4	0.57	0.54	
2,617.0	17.80	94.10	2,522.6	-28.5	630.7	631.3	1.11	0.22	
2,709.0	17.10	93.90	2,610.4	-30.4	658.2	658.9	0.76	-0.76	
2,800.0	18.10	94.60	2,697.1	-32.5	685.7	686.4	1.12	1.10	
2,892.0	18.20	95.20	2,784.5	-34.9	714.2	715.1	0.23	0.11	
2,983.0	18.50	94.00	2,870.9	-37.2	742.8	743.7	0.53	0.33	
3,075.0	18.40	93.40	2,958.2	-39.1	771.8	772.8	0.23	-0.11	
3,167.0	18.10	93.30	3,045.5	-40.8	800.6	801.6	0.33	-0.33	
3,258.0	17.20	92.90	3,132.3	-42.3	828.1	829.2	1.00	-0.99	
3,350.0	17.90	93.50	3,220.0	-43.8	855.8	856.9	0.79	0.76	
3,441.0	17.20	94.20	3,306.7	-45.7	883.2	884.4	0.80	-0.77	
3,533.0	16.70	94.00	3,394.7	-47.6	910.0	911.2	0.55	-0.54	
3,625.0	17.40	93.40	3,482.7	-49.3	936.9	938.2	0.78	0.76	
3,716.0	17.10	93.00	3,569.6	-50.8	963.8	965.1	0.35	-0.33	
3,808.0	16.70	93.50	3,657.6	-52.4	990.5	991.9	0.46	-0.43	
3,900.0	16.30	94.00	3,745.8	-54.1	1,016.6	1,018.0	0.46	-0.43	
3,992.0	17.40	92.50	3,833.9	-55.6	1,043.2	1,044.7	1.29	1.20	
4,083.0	17.20	92.80	3,920.8	-56.8	1,070.2	1,071.7	0.24	-0.22	
4,175.0	16.30	92.80	4,008.9	-58.1	1,096.7	1,098.3	0.98	-0.98	
4,266.0	17.00	90.60	4,096.1	-58.9	1,122.8	1,124.3	1.04	0.77	
4,358.0	16.20	89.50	4,184.2	-58.9	1,149.1	1,150.6	0.93	-0.87	
4,450.0	16.70	91.60	4,272.5	-59.2	1,175.1	1,176.6	0.84	0.54	
4,541.0	16.40	91.10	4,359.7	-59.8	1,201.0	1,202.5	0.36	-0.33	
4,632.0	16.30	90.40	4,447.0	-60.1	1,226.6	1,228.1	0.24	-0.11	
4,724.0	15.50	90.70	4,535.5	-60.4	1,251.8	1,253.3	0.87	-0.87	
4,816.0	15.20	91.40	4,624.2	-60.8	1,276.2	1,277.6	0.38	-0.33	
4,907.0	15.60	91.60	4,711.9	-61.4	1,300.4	1,301.8	0.44	0.44	
4,999.0	15.70	91.80	4,800.5	-62.2	1,325.2	1,326.6	0.12	0.11	
5,090.0	14.40	91.80	4,888.4	-62.9	1,348.8	1,350.2	1.43	-1.43	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Hagen Federal 22-2D
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 22-2D	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
5,182.0	12.90	92.20	4,977.8	-63.7	1,370.5	1,372.0	1.63	-1.63	
5,273.0	11.90	91.90	5,066.7	-64.4	1,390.0	1,391.5	1.10	-1.10	
5,365.0	10.40	92.30	5,156.9	-65.0	1,407.8	1,409.3	1.63	-1.63	
5,456.0	9.00	90.70	5,246.6	-65.4	1,423.1	1,424.6	1.57	-1.54	
5,548.0	7.70	92.30	5,337.7	-65.8	1,436.5	1,438.0	1.44	-1.41	
5,639.0	6.50	90.70	5,428.0	-66.1	1,447.7	1,449.2	1.34	-1.32	
5,731.0	5.30	89.10	5,519.5	-66.1	1,457.2	1,458.7	1.32	-1.30	
5,823.0	3.80	81.70	5,611.2	-65.6	1,464.4	1,465.9	1.75	-1.63	
5,914.0	1.70	74.90	5,702.1	-64.8	1,468.7	1,470.1	2.33	-2.31	
6,006.0	0.40	198.60	5,794.1	-64.7	1,469.9	1,471.3	2.12	-1.41	
6,097.0	0.70	216.30	5,885.1	-65.5	1,469.5	1,470.9	0.38	0.33	
6,143.0	0.80	220.10	5,931.1	-65.9	1,469.1	1,470.6	0.24	0.22	
6,188.0	1.00	220.10	5,976.0	-66.5	1,468.7	1,470.2	0.44	0.44	
6,280.0	0.70	202.10	6,068.0	-67.6	1,467.9	1,469.5	0.43	-0.33	
6,372.0	1.30	218.10	6,160.0	-69.0	1,467.1	1,468.7	0.71	0.65	
6,463.0	1.00	191.20	6,251.0	-70.6	1,466.3	1,468.0	0.67	-0.33	
6,554.0	0.40	153.80	6,342.0	-71.6	1,466.3	1,468.0	0.80	-0.66	
6,646.0	0.40	201.20	6,434.0	-72.2	1,466.3	1,468.1	0.35	0.00	
6,737.0	0.70	232.90	6,525.0	-72.8	1,465.8	1,467.6	0.46	0.33	
6,828.0	0.60	283.20	6,616.0	-73.1	1,464.8	1,466.7	0.62	-0.11	
6,920.0	1.00	278.40	6,708.0	-72.8	1,463.6	1,465.4	0.44	0.43	
7,012.0	1.50	269.50	6,799.9	-72.7	1,461.6	1,463.4	0.58	0.54	
7,103.0	1.50	255.50	6,890.9	-73.0	1,459.2	1,461.1	0.40	0.00	
7,194.0	0.70	280.10	6,981.9	-73.2	1,457.5	1,459.4	1.00	-0.88	
7,286.0	1.20	280.10	7,073.9	-73.0	1,456.0	1,457.9	0.54	0.54	
7,377.0	1.50	289.10	7,164.9	-72.4	1,454.0	1,455.8	0.40	0.33	
7,469.0	1.70	291.50	7,256.8	-71.5	1,451.6	1,453.3	0.23	0.22	
7,561.0	2.20	277.50	7,348.8	-70.8	1,448.5	1,450.3	0.75	0.54	
7,652.0	1.60	265.20	7,439.7	-70.7	1,445.5	1,447.3	0.79	-0.66	
7,744.0	1.50	260.70	7,531.7	-71.0	1,443.1	1,444.8	0.17	-0.11	
7,835.0	1.80	255.60	7,622.6	-71.5	1,440.5	1,442.3	0.37	0.33	
7,927.0	1.80	255.40	7,714.6	-72.2	1,437.7	1,439.5	0.01	0.00	
7,990.0	1.60	245.20	7,777.6	-72.9	1,436.0	1,437.8	0.57	-0.32	Last Cathedral Survey @ 7,990' MD
8,040.0	1.60	245.20	7,827.6	-73.4	1,434.7	1,436.6	0.00	0.00	Projection to Bit @ 8,040'

Cathedral Energy Services

Survey Report

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Project:	S. Piceance (Parachute)	TVD Reference:	KB=22' @ 6543.0ft (Patterson 303)
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Well:	Hagen Federal 22-2D	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)		
- Shape									
Hagen Federal 22-2D T(0.00	0.00	5,697.0	-69.9	1,453.6	1,590,459.28	2,299,232.26	39.428294	-107.981165
- actual wellpath misses target center by 15.8ft at 5908.2ft MD (5696.3 TVD, -64.8 N, 1468.5 E)									
- Point									
Hagen Federal 22-2D PI	0.00	0.00	7,773.0	-69.9	1,453.6	1,590,459.28	2,299,232.26	39.428294	-107.981165
- actual wellpath misses target center by 17.8ft at 7984.9ft MD (7772.5 TVD, -72.8 N, 1436.1 E)									
- Circle (radius 25.0)									

Design Annotations				
Measured Depth	Vertical Depth	Local Coordinates		Comment
(ft)	(ft)	+N/-S (ft)	+E/-W (ft)	
7,990.0	7,777.6	-72.9	1,436.0	Last Cathedral Survey @ 7,990' MD
8,040.0	7,827.6	-73.4	1,434.7	Projection to Bit @ 8,040'

Checked By: _____ Approved By: _____ Date: _____