

Azimuths to True North  
 Magnetic North: 10.21°

Magnetic Field  
 Strength: 52095.9snT  
 Dip Angle: 65.64°  
 Date: 7/2/2012  
 Model: IGRF2010

FINAL

Gardner 28-3DD

125395/173955 (SH) 125432/174555 (MH); SC

KBE @ 6442.0ft (Nabors M13)

GL @ 6420.0

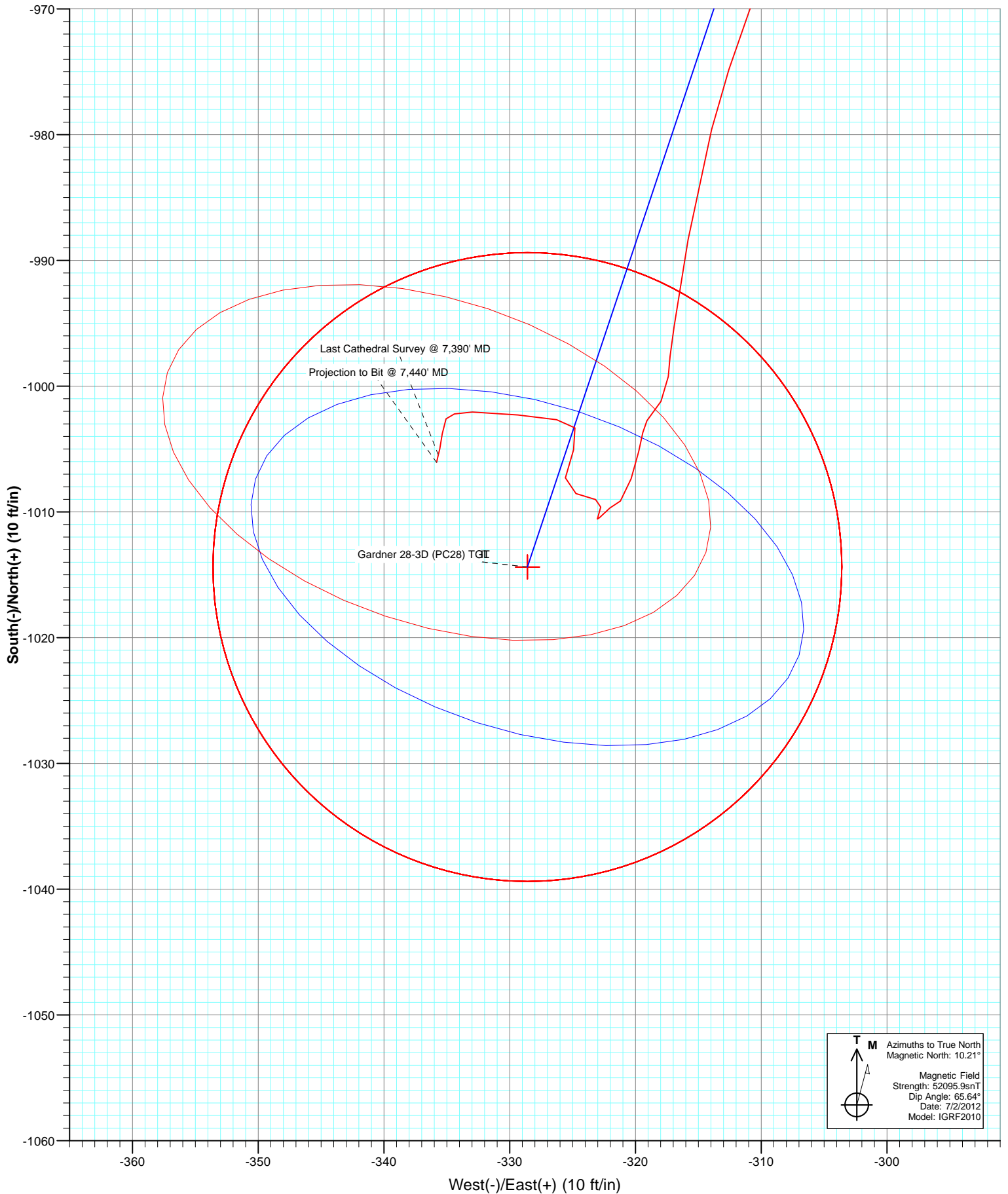
North American Datum 1983

Well Gardner 28-3DD, True North

Type	Target	Azimuth	Origin	Type	N/S	E/W	From TVD
Target	Gardner 28-3DD (PC28) BHL	197.95	Slot		0.0	0.0	0.0
		TVDD	+N/-S	+E/-W	Latitude	Longitude	
Gardner 28-3DD (PC28) TGT		5264.0	-1014.4	-328.6	39.412757	-108.004708	
Gardner 28-3DD (PC28) BHL		7287.0	-1014.4	-328.6	39.412757	-108.004708	



Project: S. Piceance (Parachute)  
Site: NENW Sec28-T7S-R95W (PC-28)  
Well: Gardner 28-3DD  
Wellbore: DD  
Plan: FINAL



# Cathedral Energy Services

## Survey Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well Gardner 28-3DD
<b>Project:</b>	S. Piceance (Parachute)	<b>TVD Reference:</b>	KBE @ 6442.0ft (Nabors M13)
<b>Site:</b>	NENW Sec28-T7S-R95W (PC-28)	<b>MD Reference:</b>	KBE @ 6442.0ft (Nabors M13)
<b>Well:</b>	Gardner 28-3DD	<b>North Reference:</b>	True
<b>Wellbore:</b>	DD	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL	<b>Database:</b>	USA EDM 5000 Multi Users DB

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

<b>Site</b>	NENW Sec28-T7S-R95W (PC-28)			
<b>Site Position:</b>		<b>Northing:</b>	1,585,994.78 ft	<b>Latitude:</b> 39.415560
<b>From:</b>	Lat/Long	<b>Easting:</b>	2,292,840.18 ft	<b>Longitude:</b> -108.003350
<b>Position Uncertainty:</b>	0.0 ft	<b>Slot Radius:</b>	13.200 in	<b>Grid Convergence:</b> -1.58 °

<b>Well</b>	Gardner 28-3DD			
<b>Well Position</b>	<b>+N/-S</b>	0.0 ft	<b>Northing:</b>	1,585,989.75 ft
	<b>+E/-W</b>	0.0 ft	<b>Easting:</b>	2,292,784.92 ft
<b>Position Uncertainty</b>	0.0 ft	<b>Wellhead Elevation:</b>	ft	<b>Ground Level:</b> 6,420.0 ft

<b>Wellbore</b>	DD				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	7/2/2012	10.21	65.64	52,096

<b>Design</b>	FINAL			
<b>Audit Notes:</b>				
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b> 0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>
	0.0	0.0	0.0	197.95

<b>Survey Program</b>	<b>Date</b>	8/6/2012		
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
143.0	1,120.0	Survey #1 (DD)	MWD	Geolink MWD
1,263.0	7,440.0	Survey #2 (DD)	MWD	Geolink MWD

<b>Survey</b>									
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Vertical Section (ft)</b>	<b>Dogleg Rate (°/100ft)</b>	<b>Build Rate (°/100ft)</b>	<b>Formations / Comments</b>
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
143.0	1.80	19.90	143.0	2.1	0.8	-2.2	1.26	1.26	
174.0	1.70	21.60	174.0	3.0	1.1	-3.2	0.36	-0.32	
204.0	0.80	9.10	204.0	3.6	1.3	-3.8	3.12	-3.00	
235.0	0.50	250.50	235.0	3.8	1.2	-4.0	3.64	-0.97	
266.0	1.00	227.90	266.0	3.6	0.9	-3.7	1.84	1.61	
296.0	1.20	231.10	295.9	3.2	0.4	-3.2	0.70	0.67	
327.0	1.70	217.70	326.9	2.6	-0.1	-2.5	1.94	1.61	
358.0	2.40	204.40	357.9	1.7	-0.6	-1.4	2.72	2.26	
389.0	3.20	199.00	388.9	0.3	-1.2	0.1	2.71	2.58	
420.0	4.00	200.90	419.8	-1.6	-1.9	2.1	2.61	2.58	
482.0	6.70	204.50	481.5	-6.9	-4.1	7.8	4.39	4.35	

# Cathedral Energy Services

## Survey Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well Gardner 28-3DD
<b>Project:</b>	S. Piceance (Parachute)	<b>TVD Reference:</b>	KBE @ 6442.0ft (Nabors M13)
<b>Site:</b>	NENW Sec28-T7S-R95W (PC-28)	<b>MD Reference:</b>	KBE @ 6442.0ft (Nabors M13)
<b>Well:</b>	Gardner 28-3DD	<b>North Reference:</b>	True
<b>Wellbore:</b>	DD	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL	<b>Database:</b>	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
574.0	10.30	203.40	572.5	-19.3	-9.6	21.3	3.92	3.91	
667.0	13.10	197.30	663.6	-37.0	-16.1	40.2	3.29	3.01	
759.0	14.80	191.80	752.9	-58.5	-21.6	62.3	2.34	1.85	
850.0	15.20	190.10	840.8	-81.6	-26.0	85.7	0.65	0.44	
941.0	14.70	193.20	928.7	-104.6	-30.8	109.0	1.04	-0.55	
1,035.0	15.30	193.60	1,019.5	-128.3	-36.4	133.2	0.65	0.64	
1,120.0	15.30	195.30	1,101.5	-150.0	-42.0	155.6	0.53	0.00	
1,263.0	15.50	198.50	1,239.3	-186.3	-53.0	193.6	0.61	0.14	
1,358.0	14.70	200.00	1,331.1	-209.7	-61.2	218.3	0.94	-0.84	
1,453.0	13.90	200.30	1,423.1	-231.7	-69.3	241.8	0.85	-0.84	
1,549.0	15.30	198.60	1,516.0	-254.5	-77.3	265.9	1.52	1.46	
1,644.0	14.70	197.10	1,607.8	-277.9	-84.9	290.5	0.75	-0.63	
1,739.0	14.20	195.20	1,699.8	-300.7	-91.5	314.2	0.73	-0.53	
1,834.0	14.20	201.40	1,791.9	-322.8	-98.8	337.5	1.60	0.00	
1,930.0	14.10	202.60	1,885.0	-344.5	-107.6	360.9	0.32	-0.10	
2,025.0	13.40	203.70	1,977.2	-365.3	-116.4	383.4	0.79	-0.74	
2,120.0	13.40	200.00	2,069.7	-385.7	-124.6	405.3	0.90	0.00	
2,215.0	14.20	200.50	2,161.9	-407.0	-132.5	428.0	0.85	0.84	
2,309.0	13.50	199.30	2,253.2	-428.1	-140.1	450.5	0.80	-0.74	
2,404.0	12.80	197.90	2,345.7	-448.6	-147.0	472.1	0.81	-0.74	
2,499.0	13.80	197.60	2,438.1	-469.4	-153.7	493.9	1.06	1.05	
2,595.0	13.40	197.60	2,531.4	-490.9	-160.5	516.5	0.42	-0.42	
2,690.0	12.80	196.90	2,624.0	-511.5	-166.9	538.0	0.65	-0.63	
2,785.0	13.40	197.40	2,716.5	-532.1	-173.3	559.6	0.64	0.63	
2,880.0	13.00	198.50	2,809.0	-552.7	-179.9	581.3	0.50	-0.42	
2,975.0	12.60	199.40	2,901.6	-572.6	-186.8	602.3	0.47	-0.42	
3,071.0	13.00	200.20	2,995.2	-592.6	-194.0	623.6	0.46	0.42	
3,166.0	13.60	197.20	3,087.7	-613.3	-201.0	645.4	0.96	0.63	
3,261.0	13.10	197.60	3,180.1	-634.3	-207.5	667.3	0.54	-0.53	
3,357.0	12.20	196.70	3,273.8	-654.3	-213.7	688.4	0.96	-0.94	
3,452.0	12.80	195.60	3,366.5	-674.1	-219.4	708.9	0.68	0.63	
3,546.0	13.70	195.90	3,458.0	-694.8	-225.3	730.4	0.96	0.96	
3,640.0	13.20	195.10	3,549.5	-715.9	-231.1	752.3	0.57	-0.53	
3,736.0	13.60	195.20	3,642.8	-737.4	-237.0	774.5	0.42	0.42	
3,832.0	13.20	194.80	3,736.2	-758.9	-242.7	796.7	0.43	-0.42	
3,927.0	14.00	196.90	3,828.6	-780.3	-248.8	819.0	0.99	0.84	
4,022.0	13.80	197.00	3,920.8	-802.2	-255.5	841.9	0.21	-0.21	
4,118.0	13.10	198.60	4,014.2	-823.4	-262.3	864.2	0.83	-0.73	
4,212.0	13.20	196.70	4,105.7	-843.8	-268.8	885.6	0.47	0.11	
4,308.0	12.50	198.10	4,199.3	-864.2	-275.2	906.9	0.80	-0.73	
4,403.0	12.70	197.50	4,292.0	-883.9	-281.5	927.6	0.25	0.21	
4,498.0	13.20	198.30	4,384.6	-904.2	-288.0	948.9	0.56	0.53	
4,593.0	12.10	199.00	4,477.3	-923.9	-294.7	969.7	1.17	-1.16	
4,688.0	10.70	199.90	4,570.4	-941.6	-300.9	988.5	1.49	-1.47	
4,783.0	9.10	198.60	4,664.0	-957.0	-306.3	1,004.8	1.70	-1.68	
4,878.0	7.10	200.40	4,758.0	-969.6	-310.8	1,018.2	2.12	-2.11	
4,972.0	5.70	194.30	4,851.4	-979.6	-313.9	1,028.7	1.65	-1.49	
5,067.0	5.10	189.40	4,946.0	-988.3	-315.8	1,037.6	0.80	-0.63	
5,163.0	3.30	188.80	5,041.8	-995.3	-316.9	1,044.5	1.88	-1.87	
5,258.0	1.50	182.20	5,136.7	-999.2	-317.4	1,048.4	1.91	-1.89	
5,353.0	1.10	215.40	5,231.6	-1,001.2	-318.0	1,050.5	0.88	-0.42	
5,385.6	0.86	215.85	5,264.2	-1,001.7	-318.3	1,051.0	0.74	-0.74	Gardner 28-3DD (PC28) TGT
5,448.0	0.40	218.20	5,326.6	-1,002.2	-318.7	1,051.6	0.74	-0.74	

# Cathedral Energy Services

## Survey Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well Gardner 28-3DD
<b>Project:</b>	S. Piceance (Parachute)	<b>TVD Reference:</b>	KBE @ 6442.0ft (Nabors M13)
<b>Site:</b>	NENW Sec28-T7S-R95W (PC-28)	<b>MD Reference:</b>	KBE @ 6442.0ft (Nabors M13)
<b>Well:</b>	Gardner 28-3DD	<b>North Reference:</b>	True
<b>Wellbore:</b>	DD	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL	<b>Database:</b>	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
5,543.0	0.40	212.70	5,421.6	-1,002.7	-319.1	1,052.3	0.04	0.00	
5,638.0	0.80	193.00	5,516.6	-1,003.7	-319.4	1,053.3	0.47	0.42	
5,733.0	1.10	191.60	5,611.6	-1,005.2	-319.7	1,054.8	0.32	0.32	
5,828.0	1.60	198.40	5,706.6	-1,007.4	-320.3	1,057.1	0.55	0.53	
5,923.0	0.80	220.40	5,801.6	-1,009.1	-321.2	1,059.0	0.96	-0.84	
6,018.0	0.50	262.40	5,896.6	-1,009.7	-322.0	1,059.8	0.57	-0.32	
6,113.0	1.00	210.20	5,991.6	-1,010.5	-322.9	1,060.8	0.84	0.53	
6,208.0	0.80	22.60	6,086.6	-1,010.6	-323.0	1,060.9	1.89	-0.21	
6,304.0	0.40	2.30	6,182.5	-1,009.6	-322.8	1,059.9	0.47	-0.42	
6,399.0	0.60	301.90	6,277.5	-1,009.0	-323.2	1,059.5	0.56	0.21	
6,494.0	1.40	280.70	6,372.5	-1,008.5	-324.7	1,059.5	0.91	0.84	
6,589.0	1.30	16.30	6,467.5	-1,007.3	-325.6	1,058.6	2.11	-0.11	
6,684.0	1.50	16.00	6,562.5	-1,005.1	-324.9	1,056.3	0.21	0.21	
6,780.0	0.70	336.30	6,658.5	-1,003.3	-324.8	1,054.6	1.10	-0.83	
6,874.0	1.50	275.70	6,752.5	-1,002.7	-326.3	1,054.4	1.39	0.85	
6,970.0	2.20	278.10	6,848.4	-1,002.3	-329.3	1,055.0	0.73	0.73	
7,065.0	2.20	269.10	6,943.3	-1,002.1	-333.0	1,055.9	0.36	0.00	
7,160.0	0.70	207.30	7,038.3	-1,002.6	-335.1	1,057.1	2.07	-1.58	
7,255.0	0.80	182.60	7,133.3	-1,003.8	-335.4	1,058.3	0.35	0.11	
7,351.0	0.70	196.80	7,229.3	-1,005.0	-335.6	1,059.5	0.22	-0.10	
7,390.0	0.70	192.60	7,268.3	-1,005.5	-335.7	1,060.0	0.13	0.00	Last Cathedral Survey @ 7,390' MD - Gardner 28-3DD
7,440.0	0.70	192.60	7,318.3	-1,006.1	-335.8	1,060.6	0.00	0.00	Projection to Bit @ 7,440' MD

Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
Gardner 28-3D (PC28) 1	0.00	358.42	5,264.0	-1,014.4	-328.6	1,584,984.81	2,292,428.51	39.412757	-108.004708
- actual wellpath misses target center by 16.4ft at 5385.6ft MD (5264.2 TVD, -1001.7 N, -318.3 E)									
- Circle (radius 25.0)									
Gardner 28-3DD (PC28)	0.00	358.42	5,264.0	-1,014.4	-328.6	1,584,984.81	2,292,428.51	39.412757	-108.004708
- actual wellpath misses target center by 16.4ft at 5385.6ft MD (5264.2 TVD, -1001.7 N, -318.3 E)									
- Circle (radius 25.0)									
Gardner 28-3DD (PC28)	0.00	358.42	7,287.0	-1,014.4	-328.6	1,584,984.81	2,292,428.51	39.412757	-108.004708
- actual wellpath misses target center by 21.9ft at 7390.0ft MD (7268.3 TVD, -1005.5 N, -335.7 E)									
- Circle (radius 25.0)									
Gardner 28-3D (PC28) E	0.00	358.42	7,287.0	-1,014.4	-328.6	1,584,984.81	2,292,428.51	39.412757	-108.004708
- actual wellpath misses target center by 21.9ft at 7390.0ft MD (7268.3 TVD, -1005.5 N, -335.7 E)									
- Circle (radius 25.0)									

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
7,390.0	7,268.3	-1,005.5	-335.7	Last Cathedral Survey @ 7,390' MD	
7,440.0	7,318.3	-1,006.1	-335.8	Projection to Bit @ 7,440' MD	

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_