

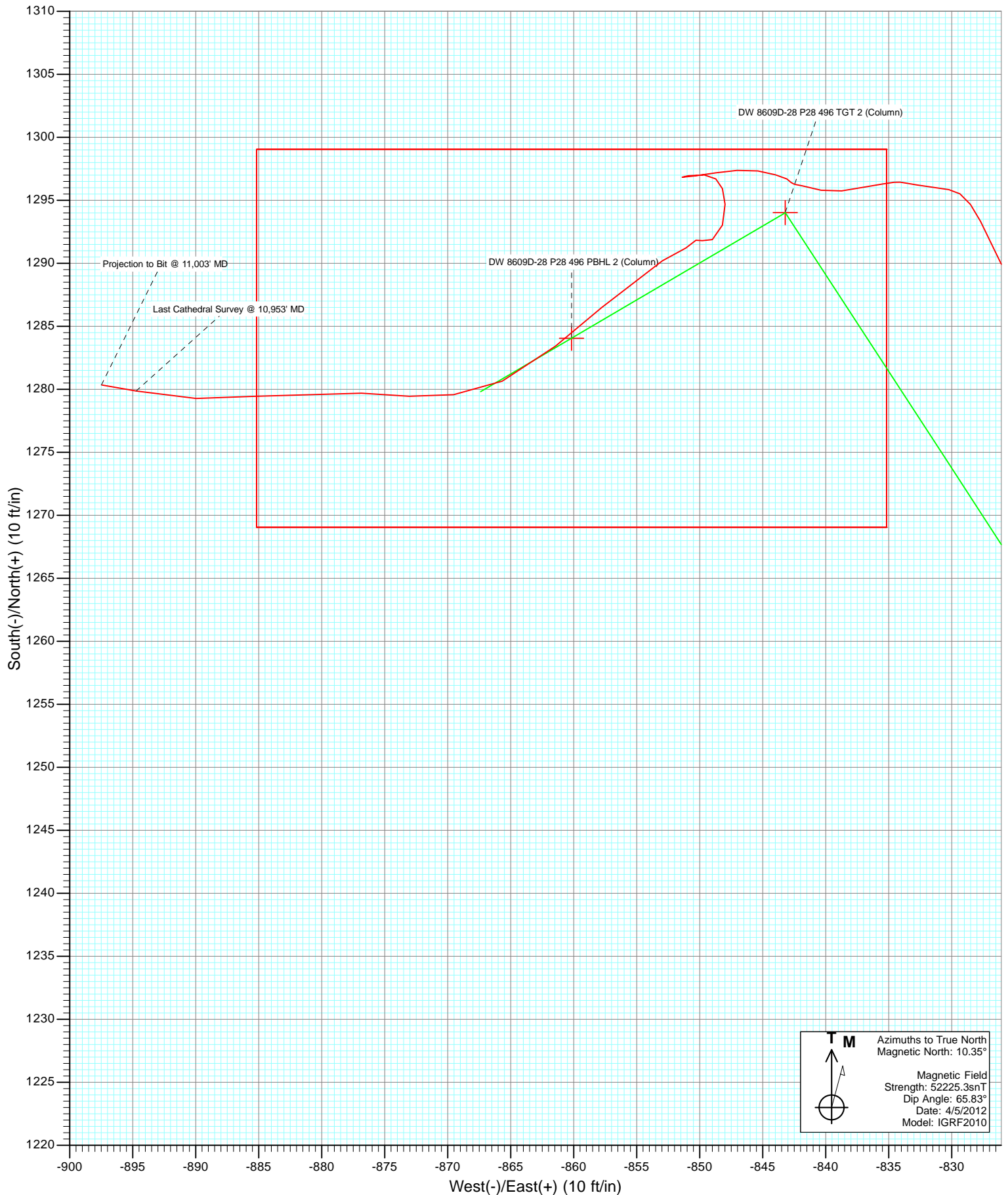
Azimuths to True North
 Magnetic North: 10.35°

Magnetic Field
 Strength: 52225.3snT
 Dip Angle: 65.83°
 Date: 4/5/2012
 Model: IGRF2010

DD DW 8609D-28 (P28 496) 125031/135655 (SH) 125129/142755 (MH); SC						
KBE @ 7813.0ft (Patterson 308) North American Datum 1983 Well DW 8609D-28 (P28 496), True North						
Type	Target	Azimuth	Origin	Type	N/S	E/W From TVD
Target	DW 8609D-28 P28 496 PBHL (Column)	326.18	Slot		0.0	0.0
Name	TV	+N/-S	+E/-W	Latitude	Longitude	
DW 8609D-28 P28 496 TGT 2 (Column)	7222.0	1294.0	-843.2	39° 40' 17.56 N	108° 10' 7.44 W	
DW 8609D-28 P28 496 PBHL 2 (Column)	10802.0	1284.1	-860.2	39° 40' 17.46 N	108° 10' 7.65 W	



Project: Double Willow
Site: S28-T4S-R96W (P28 496)(column pattern)
Well: DW 8609D-28 (P28 496)
Wellbore: DD
Design: FINAL



Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well DW 8609D-28 (P28 496)
Project:	Double Willow	TVD Reference:	KBE @ 7813.0ft (Patterson 308)
Site:	S28-T4S-R96W (P28 496)(column pattern)	MD Reference:	KBE @ 7813.0ft (Patterson 308)
Well:	DW 8609D-28 (P28 496)	North Reference:	True
Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	DD	Database:	USA EDM 5000 Multi Users DB

Project	Double Willow		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Central Zone		

Site	S28-T4S-R96W (P28 496)(column pattern)			
Site Position:		Northing:	1,679,243.29 ft	Latitude: 39° 40' 5.13 N
From:	Lat/Long	Easting:	2,249,687.54 ft	Longitude: 108° 9' 56.55 W
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence: -1.68 °

Well	DW 8609D-28 (P28 496)			
Well Position	+N/-S	0.0 ft	Northing:	1,679,207.55 ft
	+E/-W	0.0 ft	Easting:	2,249,678.31 ft
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft
			Ground Level:	7,780.0 ft

Wellbore	DD				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	4/5/2012	10.35	65.83	52,225

Design	DD			
Audit Notes:				
Version:	1.0	Phase:	ACTUAL	Tie On Depth: 0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction
	(ft)	(ft)	(ft)	(°)
	0.0	0.0	0.0	326.18

Survey Program	Date	4/17/2012		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
175.0	2,055.0	Survey #1 (DD)	MWD	Geolink MWD
2,165.0	11,003.0	Survey #2 (DD)	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	
175.0	0.50	109.80	175.0	-0.3	0.7	-0.6	0.29	0.29	
205.0	0.30	89.40	205.0	-0.3	0.9	-0.8	0.81	-0.67	
234.0	0.20	128.40	234.0	-0.3	1.0	-0.9	0.66	-0.34	
264.0	0.30	307.50	264.0	-0.3	1.0	-0.8	1.67	0.33	
294.0	1.80	328.70	294.0	0.1	0.7	-0.3	5.08	5.00	
324.0	2.70	332.60	324.0	1.2	0.1	0.9	3.04	3.00	
354.0	3.30	322.40	353.9	2.5	-0.7	2.5	2.67	2.00	
385.0	4.50	324.60	384.9	4.2	-2.0	4.6	3.90	3.87	
416.0	5.40	329.50	415.7	6.4	-3.4	7.2	3.21	2.90	
446.0	6.60	328.50	445.6	9.1	-5.0	10.4	4.01	4.00	
476.0	7.20	325.10	475.4	12.1	-7.0	14.0	2.42	2.00	

Cathedral Energy Services

Survey Report

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Site:	S28-T4S-R96W (P28 496)(column pattern)	MD Reference:	KBE @ 7813.0ft (Patterson 308)
Well:	DW 8609D-28 (P28 496)	North Reference:	True
Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	DD	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
506.0	8.00	321.50	505.1	15.3	-9.4	17.9	3.10	2.67	
555.0	9.00	321.60	553.6	21.0	-13.9	25.1	2.04	2.04	
601.0	9.90	326.00	598.9	27.1	-18.3	32.7	2.51	1.96	
647.0	10.50	323.00	644.2	33.7	-23.1	40.8	1.74	1.30	
692.0	12.10	323.60	688.3	40.8	-28.3	49.6	3.57	3.56	
784.0	14.60	324.90	777.8	58.0	-40.7	70.9	2.74	2.72	
875.0	15.20	324.00	865.8	77.0	-54.3	94.2	0.71	0.66	
967.0	13.10	327.70	955.0	95.6	-67.0	116.7	2.48	-2.28	
1,059.0	13.00	330.60	1,044.6	113.4	-77.6	137.5	0.72	-0.11	
1,150.0	13.50	330.00	1,133.2	131.6	-88.0	158.3	0.57	0.55	
1,242.0	13.30	328.10	1,222.7	149.8	-98.9	179.6	0.53	-0.22	
1,333.0	11.90	325.60	1,311.5	166.5	-109.8	199.4	1.65	-1.54	
1,425.0	11.70	324.30	1,401.5	181.9	-120.6	218.2	0.36	-0.22	
1,516.0	12.50	325.50	1,490.5	197.5	-131.5	237.3	0.92	0.88	
1,608.0	13.50	327.80	1,580.2	214.8	-142.9	258.0	1.22	1.09	
1,699.0	12.20	327.80	1,668.9	231.9	-153.7	278.2	1.43	-1.43	
1,791.0	11.90	326.70	1,758.9	248.1	-164.1	297.4	0.41	-0.33	
1,882.0	12.50	328.90	1,847.8	264.3	-174.3	316.6	0.83	0.66	
1,974.0	13.30	328.50	1,937.5	281.9	-185.0	337.1	0.87	0.87	
2,055.0	13.40	327.60	2,016.3	297.8	-194.9	355.8	0.28	0.12	Last Cathedral Survey @ 2,055' MD
2,165.0	11.20	323.60	2,123.8	317.1	-208.0	379.3	2.14	-2.00	
2,257.0	11.30	323.90	2,214.0	331.6	-218.7	397.2	0.13	0.11	
2,348.0	12.10	325.30	2,303.1	346.6	-229.3	415.6	0.93	0.88	
2,440.0	12.70	330.50	2,393.0	363.4	-239.8	435.4	1.38	0.65	
2,531.0	14.00	327.60	2,481.5	381.4	-250.6	456.3	1.61	1.43	
2,623.0	15.40	329.10	2,570.5	401.2	-262.9	479.7	1.58	1.52	
2,714.0	14.90	328.90	2,658.3	421.6	-275.1	503.4	0.55	-0.55	
2,806.0	14.70	327.80	2,747.3	441.6	-287.5	526.9	0.37	-0.22	
2,897.0	14.00	328.20	2,835.4	460.8	-299.4	549.4	0.78	-0.77	
2,989.0	13.60	326.30	2,924.8	479.2	-311.3	571.4	0.66	-0.43	
3,081.0	13.70	326.10	3,014.2	497.3	-323.3	593.1	0.12	0.11	
3,172.0	14.50	325.40	3,102.4	515.6	-335.8	615.3	0.90	0.88	
3,264.0	12.20	322.40	3,191.9	532.8	-348.3	636.5	2.61	-2.50	
3,355.0	12.30	326.80	3,280.9	548.5	-359.5	655.8	1.03	0.11	
3,446.0	14.20	330.10	3,369.4	566.3	-370.3	676.6	2.25	2.09	
3,538.0	13.50	329.10	3,458.8	585.3	-381.5	698.6	0.80	-0.76	
3,629.0	15.00	331.50	3,547.0	604.7	-392.6	720.9	1.77	1.65	
3,720.0	14.20	331.00	3,635.0	624.9	-403.6	743.8	0.89	-0.88	
3,812.0	13.00	328.30	3,724.4	643.5	-414.5	765.3	1.48	-1.30	
3,903.0	15.10	330.20	3,812.7	662.5	-425.8	787.4	2.36	2.31	
3,995.0	13.50	330.20	3,901.9	682.2	-437.1	810.1	1.74	-1.74	
4,086.0	15.50	325.30	3,990.0	701.5	-449.3	832.8	2.58	2.20	
4,178.0	14.30	325.30	4,078.9	720.9	-462.7	856.5	1.30	-1.30	
4,269.0	13.20	324.00	4,167.3	738.6	-475.2	878.1	1.26	-1.21	
4,361.0	14.70	323.50	4,256.5	756.4	-488.4	900.3	1.64	1.63	
4,452.0	13.10	322.50	4,344.9	773.9	-501.5	922.1	1.78	-1.76	
4,544.0	14.90	325.40	4,434.1	791.9	-514.6	944.3	2.10	1.96	
4,635.0	13.60	323.30	4,522.3	810.1	-527.6	966.7	1.54	-1.43	
4,727.0	15.20	326.10	4,611.5	828.8	-540.8	989.6	1.90	1.74	
4,819.0	14.20	326.10	4,700.4	848.2	-553.8	1,012.9	1.09	-1.09	
4,910.0	13.00	325.20	4,788.9	865.9	-565.9	1,034.3	1.34	-1.32	
5,002.0	15.10	324.60	4,878.1	884.1	-578.7	1,056.6	2.29	2.28	
5,093.0	13.50	325.40	4,966.3	902.5	-591.6	1,079.1	1.77	-1.76	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well DW 8609D-28 (P28 496)
Project:	Double Willow	TVD Reference:	KBE @ 7813.0ft (Patterson 308)
Site:	S28-T4S-R96W (P28 496)(column pattern)	MD Reference:	KBE @ 7813.0ft (Patterson 308)
Well:	DW 8609D-28 (P28 496)	North Reference:	True
Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	DD	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
5,185.0	12.70	324.50	5,055.9	919.6	-603.6	1,100.0	0.90	-0.87	
5,276.0	13.60	323.10	5,144.5	936.3	-615.8	1,120.6	1.05	0.99	
5,368.0	15.30	324.40	5,233.6	954.8	-629.4	1,143.6	1.88	1.85	
5,460.0	14.60	332.00	5,322.5	974.9	-641.9	1,167.2	2.26	-0.76	
5,551.0	13.20	331.10	5,410.8	994.2	-652.3	1,189.0	1.56	-1.54	
5,643.0	13.90	323.00	5,500.3	1,012.2	-664.0	1,210.5	2.20	0.76	
5,734.0	13.40	327.40	5,588.7	1,029.8	-676.3	1,232.0	1.27	-0.55	
5,825.0	12.00	324.70	5,677.5	1,046.4	-687.5	1,252.0	1.67	-1.54	
5,917.0	13.80	328.70	5,767.2	1,063.6	-698.7	1,272.5	2.18	1.96	
6,009.0	14.30	331.50	5,856.4	1,082.9	-709.8	1,294.8	0.92	0.54	
6,100.0	13.10	332.10	5,944.8	1,101.9	-720.0	1,316.2	1.33	-1.32	
6,192.0	11.70	329.50	6,034.7	1,119.2	-729.6	1,335.9	1.64	-1.52	
6,284.0	13.70	333.40	6,124.4	1,137.0	-739.2	1,356.0	2.36	2.17	
6,375.0	12.90	333.40	6,213.0	1,155.7	-748.6	1,376.8	0.88	-0.88	
6,467.0	12.10	330.90	6,302.8	1,173.3	-757.9	1,396.6	1.05	-0.87	
6,559.0	11.30	330.40	6,392.9	1,189.6	-767.0	1,415.2	0.88	-0.87	
6,650.0	12.70	326.90	6,481.9	1,205.7	-776.9	1,434.1	1.73	1.54	
6,742.0	11.40	329.60	6,571.9	1,222.0	-787.0	1,453.3	1.54	-1.41	
6,834.0	11.10	330.20	6,662.1	1,237.5	-796.0	1,471.2	0.35	-0.33	
6,925.0	10.50	327.60	6,751.5	1,252.1	-804.8	1,488.2	0.85	-0.66	
7,017.0	8.80	331.30	6,842.2	1,265.4	-812.7	1,503.6	1.97	-1.85	
7,109.0	8.20	329.90	6,933.2	1,277.2	-819.4	1,517.2	0.69	-0.65	
7,200.0	5.70	334.10	7,023.5	1,286.9	-824.6	1,528.1	2.80	-2.75	
7,291.0	3.30	334.00	7,114.2	1,293.3	-827.7	1,535.2	2.64	-2.64	
7,383.0	1.70	276.00	7,206.1	1,295.9	-830.2	1,538.7	3.04	-1.74	
7,474.0	1.50	280.40	7,297.1	1,296.2	-832.7	1,540.4	0.26	-0.22	
7,566.0	0.20	274.80	7,389.1	1,296.4	-834.1	1,541.3	1.41	-1.41	
7,658.0	0.40	265.70	7,481.1	1,296.4	-834.6	1,541.6	0.22	0.22	
7,749.0	0.80	259.60	7,572.1	1,296.3	-835.5	1,542.0	0.44	0.44	
7,841.0	1.00	261.20	7,664.1	1,296.1	-836.9	1,542.6	0.22	0.22	
7,932.0	1.30	260.10	7,755.1	1,295.8	-838.7	1,543.3	0.33	0.33	
8,024.0	0.80	290.80	7,847.1	1,295.8	-840.4	1,544.3	0.80	-0.54	
8,115.0	1.10	277.60	7,938.0	1,296.1	-841.8	1,545.4	0.41	0.33	
8,207.0	0.20	341.30	8,030.0	1,296.4	-842.7	1,546.1	1.12	-0.98	
8,298.0	0.40	296.20	8,121.0	1,296.7	-843.1	1,546.5	0.32	0.22	
8,390.0	0.80	285.70	8,213.0	1,297.0	-844.0	1,547.3	0.45	0.43	
8,481.0	1.00	280.20	8,304.0	1,297.3	-845.4	1,548.3	0.24	0.22	
8,572.0	1.10	263.50	8,395.0	1,297.4	-847.0	1,549.3	0.35	0.11	
8,664.0	1.00	263.40	8,487.0	1,297.2	-848.7	1,550.1	0.11	-0.11	
8,755.0	1.10	260.60	8,578.0	1,296.9	-850.4	1,550.8	0.12	0.11	
8,847.0	0.20	280.40	8,670.0	1,296.8	-851.4	1,551.3	0.99	-0.98	
8,938.0	0.80	81.50	8,761.0	1,297.0	-850.9	1,551.1	1.09	0.66	
9,030.0	0.80	93.20	8,853.0	1,297.0	-849.6	1,550.4	0.18	0.00	
9,121.0	0.50	133.20	8,943.9	1,296.7	-848.7	1,549.7	0.58	-0.33	
9,213.0	0.70	155.90	9,035.9	1,295.9	-848.2	1,548.7	0.33	0.22	
9,305.0	0.90	181.70	9,127.9	1,294.7	-848.0	1,547.6	0.44	0.22	
9,396.0	1.20	191.60	9,218.9	1,293.0	-848.2	1,546.3	0.38	0.33	
9,488.0	0.80	250.60	9,310.9	1,291.9	-849.0	1,545.8	1.14	-0.43	
9,579.0	0.30	304.40	9,401.9	1,291.8	-849.8	1,546.2	0.73	-0.55	
9,671.0	0.40	249.90	9,493.9	1,291.8	-850.3	1,546.5	0.36	0.11	
9,762.0	0.90	224.80	9,584.9	1,291.2	-851.1	1,546.4	0.62	0.55	
9,854.0	0.40	281.00	9,676.9	1,290.8	-851.9	1,546.5	0.82	-0.54	
9,945.0	1.20	229.90	9,767.9	1,290.2	-853.0	1,546.6	1.10	0.88	

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Survey Report

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Site:	S28-T4S-R96W (P28 496)(column pattern)	MD Reference:	KBE @ 7813.0ft (Patterson 308)
Well:	DW 8609D-28 (P28 496)	North Reference:	True
Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	DD	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
10,129.0	2.60	233.50	9,951.8	1,286.5	-857.8	1,546.2	0.76	0.76	
10,220.0	3.40	227.40	10,042.6	1,283.4	-861.4	1,545.7	0.95	0.88	
10,312.0	3.00	247.40	10,134.5	1,280.7	-865.7	1,545.8	1.28	-0.43	
10,403.0	2.10	264.10	10,225.4	1,279.6	-869.5	1,547.0	1.27	-0.99	
10,495.0	2.30	271.80	10,317.3	1,279.5	-873.0	1,548.9	0.39	0.22	
10,586.0	2.50	275.10	10,408.3	1,279.7	-876.8	1,551.2	0.27	0.22	
10,770.0	2.90	262.50	10,592.1	1,279.4	-885.5	1,555.8	0.39	0.22	
10,861.0	2.80	273.60	10,682.9	1,279.3	-890.0	1,558.1	0.62	-0.11	
10,953.0	3.20	280.00	10,774.8	1,279.9	-894.7	1,561.3	0.57	0.43	Last Cathedral Survey @ 10,953' MD
11,003.0	3.20	280.00	10,824.7	1,280.4	-897.5	1,563.2	0.00	0.00	Projection to Bit @ 11,003' MD

Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
DW 8609D-28 P28 496 - - actual wellpath misses target center by 14.6ft at 7325.2ft MD (7148.4 TVD, 1294.8 N, -828.6 E) - Point	0.00	0.00	7,148.0	1,294.0	-843.2	1,680,525.76	2,248,873.44	39° 40' 17.56 N	108° 10' 7.44 W
DW 8609D-28 P28 496 - - actual wellpath misses target center by 12.7ft at 7399.2ft MD (7222.3 TVD, 1295.9 N, -830.7 E) - Point	0.00	0.00	7,222.0	1,294.0	-843.2	1,680,525.76	2,248,873.44	39° 40' 17.56 N	108° 10' 7.44 W
DW 8609D-28 P28 496 I - actual wellpath misses target center by 36.2ft at 10978.3ft MD (10800.1 TVD, 1280.1 N, -896.1 E) - Rectangle (sides W30.0 H50.0 D0.0)	0.00	0.00	10,802.0	1,284.1	-860.2	1,680,516.29	2,248,856.19	39° 40' 17.46 N	108° 10' 7.65 W
DW 8609D-28 P28 496 I - actual wellpath misses target center by 36.5ft at 10984.3ft MD (10806.0 TVD, 1280.2 N, -896.4 E) - Rectangle (sides W30.0 H50.0 D0.0)	0.00	0.00	10,808.0	1,284.1	-860.2	1,680,516.29	2,248,856.19	39° 40' 17.46 N	108° 10' 7.65 W

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Comment
2,055.0	2,016.3	297.8	-194.9	Last Cathedral Survey @ 2,055' MD
10,953.0	10,774.8	1,279.9	-894.7	Last Cathedral Survey @ 10,953' MD
11,003.0	10,824.7	1,280.4	-897.5	Projection to Bit @ 11,003' MD

Checked By: _____ Approved By: _____ Date: _____