

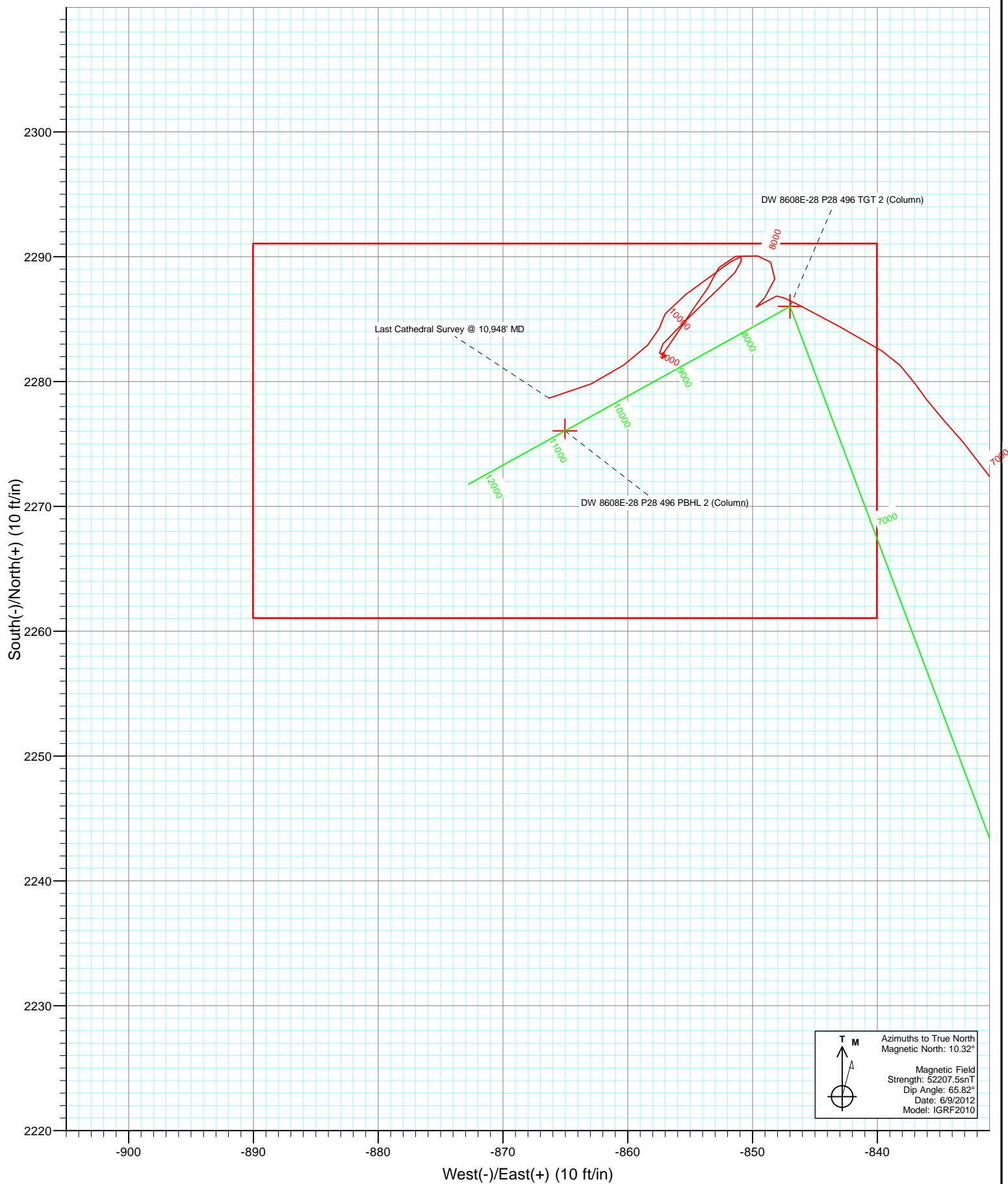
Azimuths to True North
 Magnetic North: 10.32°

Magnetic Field
 Strength: 52207.5nT
 Dip Angle: 65.82°
 Date: 6/9/2012
 Model: IGRF2010

FINAL
 DW 8608E-28 (P28 496)
 125083/139055 (SH) 125138/143455 (MH); SC

KBE @ 7813.0ft (Patterson 308)
 North American Datum 1983
 Well DW 8608E-28 (P28 496), True North

Type	Target	Azimuth	Origin	Type	N/S	E/W	From
Target	DW 8608E-28 P28 496 PBHL (Column)	339.19	Slot		0.0	0.0	TVD
Name	TVD	+N/-S	+E/-W	Latitude	Longitude		
DW 8608E-28 P28 496 TGT 2 (Column)	7265.0	2286.0	-847.0	39° 40' 27.720 N	108° 10' 7.482 W		
DW 8608E-28 P28 496 PBHL 2 (Column)	10845.0	2276.1	-865.0	39° 40' 27.720 N	108° 10' 7.482 W		
				39° 40' 27.622 N	108° 10' 7.715 W		
				39° 40' 27.622 N	108° 10' 7.715 W		



Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well DW 8608E-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 8608E-28 (P28 496)	North Reference:	True
Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	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' 5.127 N
From:	Lat/Long	Easting:	2,249,687.54 ft	Longitude:	108° 9' 56.548 W
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	-1.68 °

Well	DW 8608E-28 (P28 496)					
Well Position	+N/-S	0.0 ft	Northing:	1,679,243.55 ft	Latitude:	39° 40' 5.127 N
	+E/-W	0.0 ft	Easting:	2,249,679.57 ft	Longitude:	108° 9' 56.650 W
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	6/9/2012	10.32	65.82	52,207

Design	FINAL				
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	339.19	

Survey Program	Date	6/23/2012			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
170.0	11,405.0	Survey #1 (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		
170.0	0.50	284.10	170.0	0.2	-0.7	0.4	0.29	0.29		
200.0	0.90	316.30	200.0	0.4	-1.0	0.7	1.82	1.33		
231.0	1.30	301.90	231.0	0.7	-1.5	1.2	1.56	1.29		
261.0	2.20	316.00	261.0	1.3	-2.2	2.0	3.30	3.00		
292.0	3.30	327.40	291.9	2.5	-3.1	3.4	3.95	3.55		
323.0	4.10	332.00	322.9	4.2	-4.1	5.4	2.75	2.58		
353.0	5.40	340.90	352.8	6.5	-5.0	7.9	4.97	4.33		
384.0	6.50	340.40	383.6	9.6	-6.1	11.1	3.55	3.55		
414.0	7.50	342.90	413.4	13.0	-7.2	14.8	3.48	3.33		
445.0	8.10	345.10	444.1	17.1	-8.4	18.9	2.16	1.94		
475.0	9.00	346.90	473.8	21.4	-9.5	23.4	3.13	3.00		
506.0	9.40	347.00	504.4	26.2	-10.6	28.3	1.29	1.29		

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well DW 8608E-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 8608E-28 (P28 496)	North Reference:	True
Wellbore:	DD	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
555.0	10.50	348.90	552.6	34.5	-12.3	36.6	2.34	2.24	
600.0	11.90	349.10	596.8	43.1	-14.0	45.3	3.11	3.11	
646.0	13.50	349.50	641.6	53.0	-15.9	55.2	3.48	3.48	
692.0	14.60	349.80	686.3	64.0	-17.9	66.2	2.40	2.39	
738.0	16.00	348.50	730.6	75.9	-20.2	78.2	3.13	3.04	
783.0	17.10	348.00	773.8	88.5	-22.8	90.8	2.46	2.44	
829.0	19.00	345.90	817.5	102.4	-26.0	104.9	4.37	4.13	
875.0	20.30	345.80	860.8	117.4	-29.8	120.3	2.83	2.83	
921.0	20.70	345.20	903.9	133.0	-33.8	136.3	0.98	0.87	
967.0	22.30	344.80	946.7	149.2	-38.2	153.1	3.49	3.48	
1,058.0	23.80	337.90	1,030.5	182.9	-49.6	188.6	3.39	1.65	
1,150.0	23.10	335.90	1,114.9	216.6	-64.0	225.2	1.15	-0.76	
1,241.0	22.90	338.30	1,198.6	249.3	-77.8	260.7	1.05	-0.22	
1,333.0	23.90	337.90	1,283.1	283.2	-91.5	297.3	1.10	1.09	
1,424.0	22.80	337.30	1,366.6	316.6	-105.2	333.3	1.24	-1.21	
1,516.0	22.10	338.90	1,451.6	349.2	-118.3	368.4	1.01	-0.76	
1,607.0	21.90	339.10	1,536.0	381.0	-130.5	402.5	0.23	-0.22	
1,699.0	21.70	339.30	1,621.4	412.9	-142.7	436.7	0.23	-0.22	
1,791.0	21.50	339.20	1,707.0	444.6	-154.7	470.6	0.22	-0.22	
1,882.0	21.10	339.90	1,791.7	475.6	-166.2	503.6	0.52	-0.44	
1,973.0	20.90	339.60	1,876.7	506.2	-177.5	536.2	0.25	-0.22	
2,080.0	19.90	338.60	1,977.0	541.0	-190.8	573.5	0.99	-0.93	
2,164.0	16.30	334.50	2,056.8	565.0	-201.1	599.6	4.54	-4.29	
2,256.0	14.90	338.00	2,145.4	587.6	-211.1	624.3	1.83	-1.52	
2,348.0	14.60	338.60	2,234.4	609.4	-219.7	647.7	0.37	-0.33	
2,439.0	15.40	338.80	2,322.3	631.3	-228.3	671.2	0.88	0.88	
2,531.0	15.50	341.10	2,411.0	654.3	-236.7	695.7	0.67	0.11	
2,622.0	16.70	348.50	2,498.4	678.7	-243.2	720.8	2.61	1.32	
2,713.0	20.20	349.10	2,584.7	706.9	-248.8	749.2	3.85	3.85	
2,805.0	22.50	345.20	2,670.4	739.5	-256.3	782.3	2.94	2.50	
2,897.0	24.10	346.30	2,754.9	774.8	-265.3	818.5	1.80	1.74	
2,988.0	24.10	340.60	2,838.0	810.4	-275.8	855.5	2.56	0.00	
3,080.0	23.30	336.80	2,922.2	844.8	-289.3	892.5	1.87	-0.87	
3,171.0	22.80	337.40	3,006.0	877.6	-303.1	928.1	0.61	-0.55	
3,263.0	21.90	339.50	3,091.1	910.2	-316.0	963.0	1.31	-0.98	
3,354.0	22.50	334.70	3,175.3	941.8	-329.4	997.4	2.10	0.66	
3,445.0	21.60	331.50	3,259.7	972.3	-344.8	1,031.3	1.65	-0.99	
3,537.0	22.30	333.90	3,345.0	1,002.8	-360.6	1,065.5	1.24	0.76	
3,628.0	24.70	335.10	3,428.4	1,035.6	-376.2	1,101.7	2.69	2.64	
3,720.0	23.80	343.10	3,512.3	1,070.8	-389.7	1,139.4	3.70	-0.98	
3,811.0	23.80	339.70	3,595.6	1,105.6	-401.4	1,176.1	1.51	0.00	
3,902.0	22.20	340.00	3,679.4	1,139.0	-413.6	1,211.6	1.76	-1.76	
3,994.0	22.90	337.60	3,764.3	1,171.8	-426.4	1,246.9	1.26	0.76	
4,085.0	20.50	336.00	3,848.9	1,202.8	-439.6	1,280.5	2.72	-2.64	
4,177.0	21.70	334.90	3,934.7	1,232.9	-453.4	1,313.5	1.37	1.30	
4,269.0	22.40	341.00	4,020.0	1,264.9	-466.3	1,348.0	2.60	0.76	
4,360.0	23.50	340.20	4,103.8	1,298.3	-478.1	1,383.5	1.26	1.21	
4,452.0	21.50	341.80	4,188.8	1,331.6	-489.6	1,418.7	2.27	-2.17	
4,543.0	21.00	339.20	4,273.6	1,362.7	-500.6	1,451.6	1.17	-0.55	
4,635.0	21.70	335.20	4,359.3	1,393.6	-513.6	1,485.1	1.76	0.76	
4,726.0	23.30	337.10	4,443.4	1,425.4	-527.6	1,519.9	1.93	1.76	
4,818.0	21.30	339.20	4,528.5	1,457.8	-540.6	1,554.8	2.34	-2.17	
4,910.0	22.80	337.00	4,613.8	1,489.8	-553.5	1,589.3	1.86	1.63	

Cathedral Energy Services

Survey Report

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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 8608E-28 (P28 496)	North Reference:	True
Wellbore:	DD	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
5,001.0	21.70	336.60	4,698.0	1,521.5	-567.1	1,623.7	1.22	-1.21	
5,093.0	22.30	341.90	4,783.3	1,553.7	-579.3	1,658.2	2.25	0.65	
5,184.0	20.70	343.20	4,868.0	1,585.5	-589.3	1,691.4	1.83	-1.76	
5,276.0	21.40	341.40	4,953.8	1,617.0	-599.4	1,724.4	1.04	0.76	
5,367.0	22.80	340.00	5,038.1	1,649.3	-610.7	1,758.7	1.64	1.54	
5,459.0	21.10	340.00	5,123.5	1,681.6	-622.4	1,793.0	1.85	-1.85	
5,550.0	21.00	341.60	5,208.4	1,712.5	-633.2	1,825.7	0.64	-0.11	
5,642.0	22.60	337.80	5,293.8	1,744.5	-645.1	1,859.9	2.32	1.74	
5,733.0	20.50	339.70	5,378.4	1,775.6	-657.2	1,893.3	2.43	-2.31	
5,825.0	20.30	338.10	5,464.7	1,805.5	-668.8	1,925.3	0.64	-0.22	
5,916.0	21.10	333.00	5,549.8	1,834.8	-682.1	1,957.4	2.17	0.88	
6,008.0	21.00	336.60	5,635.7	1,864.7	-696.1	1,990.3	1.41	-0.11	
6,099.0	21.30	335.90	5,720.5	1,894.7	-709.4	2,023.1	0.43	0.33	
6,191.0	20.70	336.30	5,806.4	1,924.9	-722.7	2,056.1	0.67	-0.65	
6,283.0	18.20	345.50	5,893.2	1,953.7	-732.9	2,086.6	4.29	-2.72	
6,375.0	19.20	344.70	5,980.3	1,982.2	-740.5	2,115.9	1.12	1.09	
6,466.0	21.70	342.60	6,065.6	2,012.7	-749.4	2,147.6	2.86	2.75	
6,558.0	24.10	342.30	6,150.3	2,046.8	-760.2	2,183.4	2.61	2.61	
6,650.0	23.10	346.40	6,234.7	2,082.2	-770.2	2,220.0	2.09	-1.09	
6,741.0	22.10	346.20	6,318.7	2,116.2	-778.5	2,254.7	1.10	-1.10	
6,833.0	20.90	342.40	6,404.3	2,148.7	-787.6	2,288.3	2.00	-1.30	
6,925.0	17.70	342.80	6,491.1	2,177.7	-796.7	2,318.6	3.48	-3.48	
7,016.0	16.50	347.70	6,578.1	2,203.5	-803.5	2,345.2	2.06	-1.32	
7,108.0	13.50	344.30	6,666.9	2,226.6	-809.2	2,368.9	3.40	-3.26	
7,199.0	11.10	340.90	6,755.8	2,245.1	-814.9	2,388.2	2.75	-2.64	
7,291.0	8.40	326.00	6,846.5	2,259.1	-821.6	2,403.6	3.99	-2.93	
7,382.0	5.70	326.00	6,936.8	2,268.3	-827.8	2,414.5	2.97	-2.97	
7,474.0	5.10	317.90	7,028.4	2,275.2	-833.1	2,422.7	1.05	-0.65	
7,565.0	2.50	326.10	7,119.2	2,279.8	-837.0	2,428.4	2.91	-2.86	
7,657.0	2.30	302.20	7,211.1	2,282.5	-839.6	2,431.9	1.10	-0.22	
7,711.2	2.48	299.45	7,265.3	2,283.6	-841.6	2,433.6	0.39	0.33	DW 8608E-28 P28 496 TGT 2 (Column)
7,748.0	2.60	297.80	7,302.0	2,284.4	-843.0	2,434.9	0.39	0.33	
7,840.0	2.00	298.50	7,394.0	2,286.1	-846.3	2,437.6	0.65	-0.65	
7,931.0	0.50	264.80	7,484.9	2,286.9	-848.1	2,439.0	1.77	-1.65	
8,023.0	0.90	230.30	7,576.9	2,286.4	-849.0	2,438.8	0.61	0.43	
8,114.0	0.20	300.30	7,667.9	2,286.0	-849.7	2,438.7	0.94	-0.77	
8,206.0	1.30	51.30	7,759.9	2,286.7	-849.0	2,439.2	1.50	1.20	
8,297.0	1.10	0.20	7,850.9	2,288.2	-848.2	2,440.3	1.15	-0.22	
8,389.0	0.70	323.50	7,942.9	2,289.6	-848.5	2,441.7	0.74	-0.43	
8,480.0	0.90	274.60	8,033.9	2,290.1	-849.6	2,442.5	0.75	0.22	
8,572.0	1.32	264.90	8,125.9	2,290.0	-851.4	2,443.1	0.50	0.46	
8,663.0	1.10	199.70	8,216.8	2,289.1	-852.7	2,442.7	1.45	-0.24	
8,754.0	1.30	215.90	8,307.8	2,287.5	-853.6	2,441.5	0.43	0.22	
8,846.0	1.40	214.20	8,399.8	2,285.7	-854.8	2,440.3	0.12	0.11	
8,938.0	1.70	212.80	8,491.7	2,283.6	-856.2	2,438.8	0.33	0.33	
9,029.0	0.50	222.00	8,582.7	2,282.2	-857.2	2,437.8	1.33	-1.32	
9,121.0	0.30	92.80	8,674.7	2,281.9	-857.2	2,437.6	0.79	-0.22	
9,212.0	0.30	26.00	8,765.7	2,282.1	-856.9	2,437.6	0.36	0.00	
9,395.0	0.50	253.90	8,948.7	2,282.3	-857.5	2,438.0	0.40	0.11	
9,483.0	1.40	37.20	9,036.7	2,283.0	-857.2	2,438.6	2.07	1.02	
9,574.0	1.60	50.40	9,127.7	2,284.7	-855.5	2,439.6	0.44	0.22	
9,666.0	0.80	36.80	9,219.7	2,286.1	-854.2	2,440.4	0.92	-0.87	
9,758.0	1.50	50.50	9,311.7	2,287.3	-852.8	2,441.1	0.81	0.76	

Cathedral Energy Services

Survey Report

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Well:	DW 8608E-28 (P28 496)	North Reference:	True
Wellbore:	DD	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
9,849.0	1.00	38.90	9,402.6	2,288.7	-851.4	2,441.9	0.61	-0.55	
9,941.0	0.40	3.60	9,494.6	2,289.7	-850.9	2,442.6	0.77	-0.65	
10,032.0	0.10	300.50	9,585.6	2,290.0	-850.9	2,442.9	0.40	-0.33	
10,215.0	0.60	233.40	9,768.6	2,289.5	-851.9	2,442.8	0.31	0.27	
10,399.0	2.10	234.10	9,952.6	2,287.0	-855.4	2,441.7	0.82	0.82	
10,490.0	0.80	207.20	10,043.6	2,285.4	-857.0	2,440.8	1.57	-1.43	
10,582.0	0.80	197.20	10,135.5	2,284.2	-857.5	2,439.9	0.15	0.00	
10,673.0	1.30	225.20	10,226.5	2,282.9	-858.4	2,438.9	0.77	0.55	
10,765.0	1.80	234.50	10,318.5	2,281.3	-860.3	2,438.2	0.61	0.54	
10,856.0	2.00	244.70	10,409.4	2,279.8	-862.9	2,437.7	0.43	0.22	
10,948.0	2.50	256.50	10,501.4	2,278.7	-866.3	2,437.8	0.74	0.54	
11,039.0	3.30	256.90	10,592.2	2,277.6	-870.8	2,438.4	0.88	0.88	
11,222.0	4.10	258.20	10,774.9	2,275.1	-882.3	2,440.1	0.44	0.44	
11,290.7	4.47	254.59	10,843.3	2,273.9	-887.3	2,440.8	0.67	0.54	DW 8608E-28 P28 496 PBHL 2 (Column)
11,314.0	4.60	253.50	10,866.6	2,273.4	-889.1	2,440.9	0.67	0.55	
11,405.0	4.70	251.60	10,957.3	2,271.2	-896.1	2,441.4	0.20	0.11	Last Cathedral Survey @ 11,405' MD

Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
DW 8608E-28 P28 496 ° - hit/miss target - Shape - actual wellpath misses target center by 8.6ft at 7647.2ft MD (7201.3 TVD, 2282.2 N, -839.3 E) - Point	0.00	0.00	7,201.0	2,286.0	-847.0	1,681,553.44	2,248,900.01	39° 40' 27.720 N	108° 10' 7.482 W
DW 8608E-28 P28 496 I - actual wellpath misses target center by 23.7ft at 11306.5ft MD (10859.2 TVD, 2273.5 N, -888.5 E) - Rectangle (sides W30.0 H50.0 D0.0)	0.00	0.00	10,861.0	2,276.1	-865.0	1,681,544.00	2,248,881.69	39° 40' 27.622 N	108° 10' 7.713 W
DW 8608E-28 P28 496 ° - actual wellpath misses target center by 5.9ft at 7711.2ft MD (7265.3 TVD, 2283.6 N, -841.6 E) - Point	0.00	0.00	7,265.0	2,286.0	-847.0	1,681,553.44	2,248,900.01	39° 40' 27.720 N	108° 10' 7.482 W
DW 8608E-28 P28 496 I - actual wellpath misses target center by 22.5ft at 11290.7ft MD (10843.3 TVD, 2273.9 N, -887.3 E) - Rectangle (sides W30.0 H50.0 D0.0)	0.00	0.00	10,845.0	2,276.1	-865.0	1,681,544.00	2,248,881.69	39° 40' 27.622 N	108° 10' 7.713 W

Design Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
11,405.0	10,957.3	2,271.2	-896.1	Last Cathedral Survey @ 11,405' MD

Checked By: _____	Approved By: _____	Date: _____
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