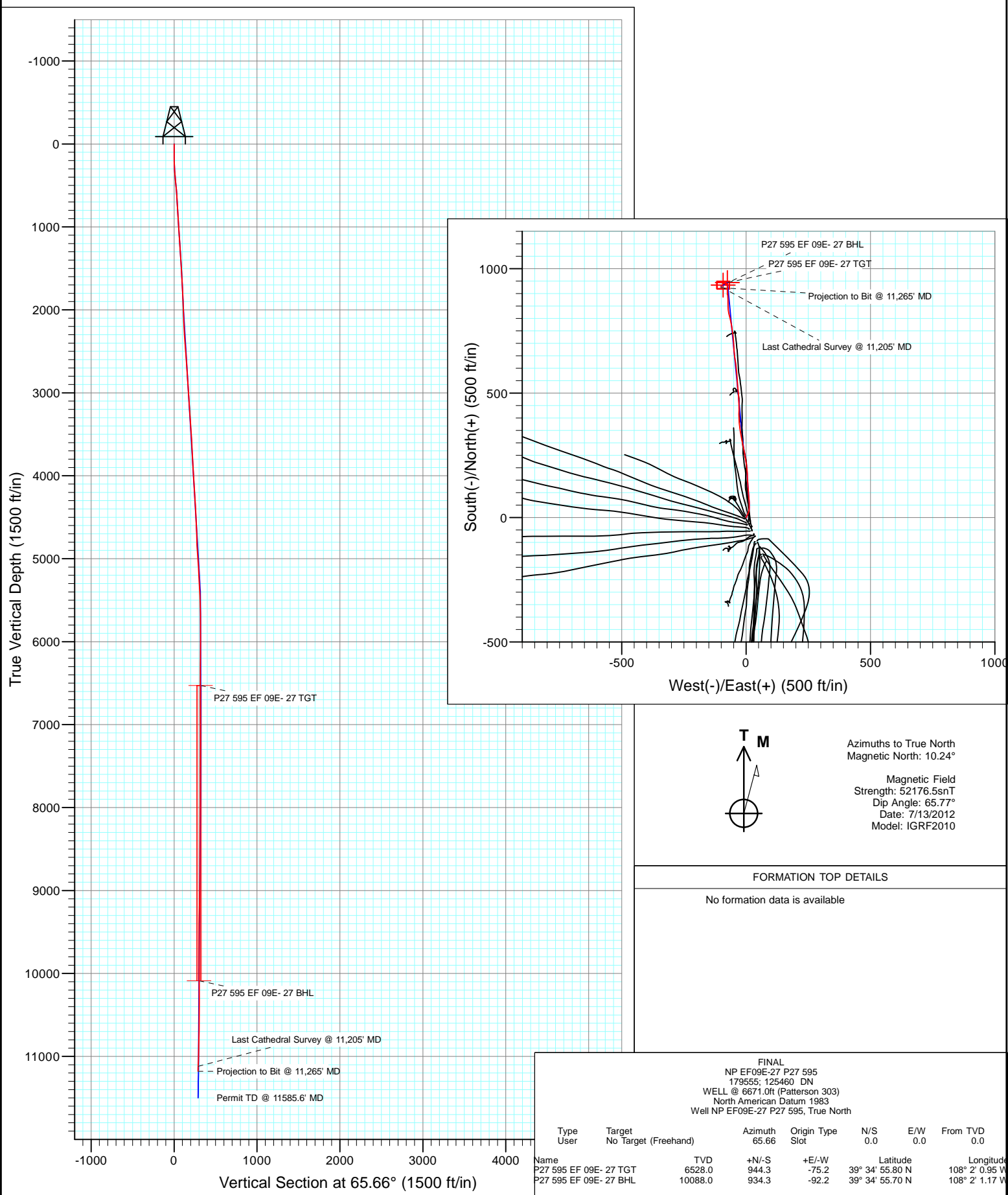


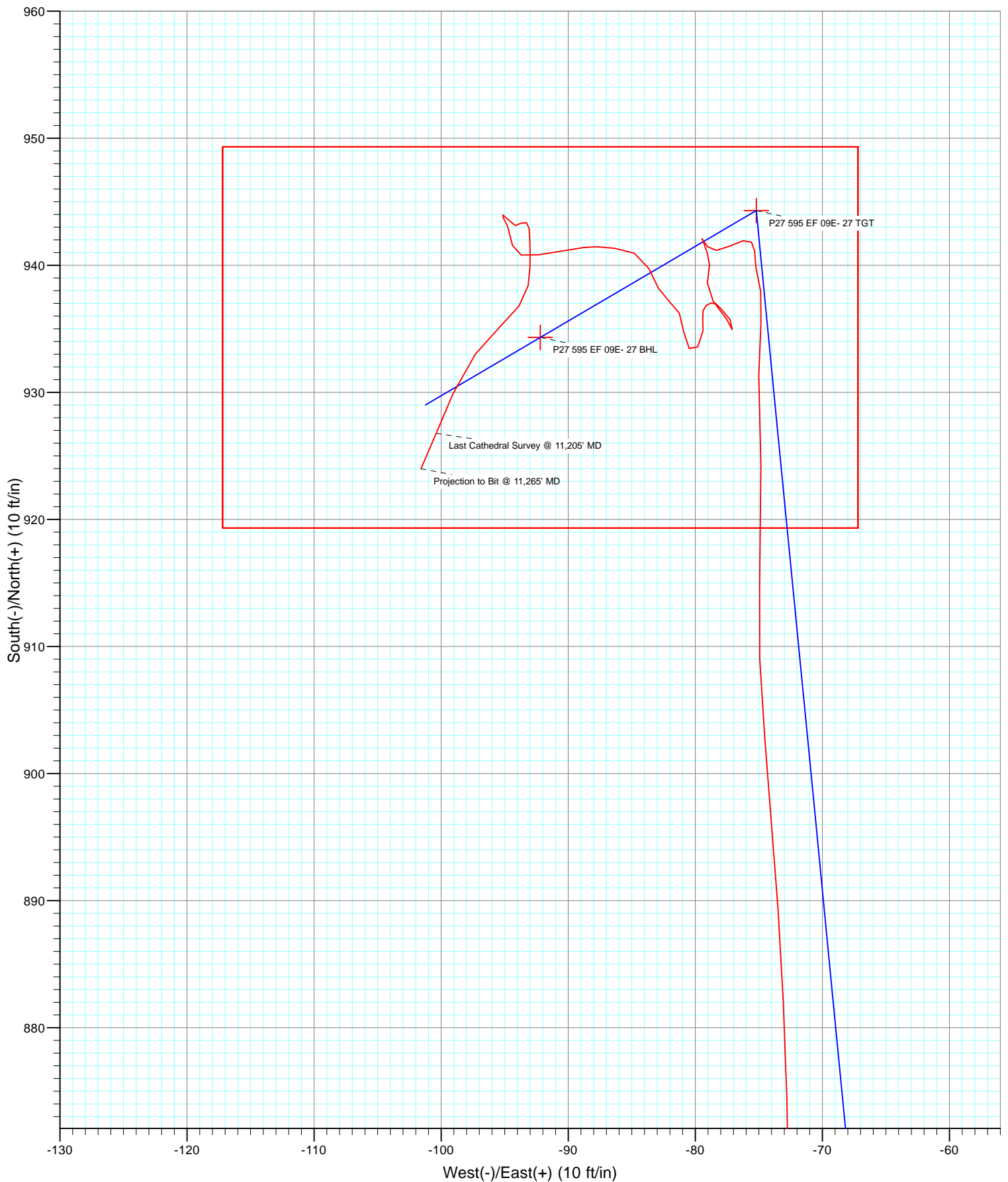


Project: North Piceance
Site: P27 595 (S27-T5S-R95W)
Well: NP EF09E-27 P27 595
Wellbore: DD
Design: FINAL





Project: North Piceance
Site: P27 595 (S27-T5S-R95W)
Well: NP EF09E-27 P27 595
Wellbore: DD
Design: FINAL



Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well NP EF09E-27 P27 595
Project:	North Piceance	TVD Reference:	WELL @ 6671.0ft (Patterson 303)
Site:	P27 595 (S27-T5S-R95W)	MD Reference:	WELL @ 6671.0ft (Patterson 303)
Well:	NP EF09E-27 P27 595	North Reference:	True
Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

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

Site		P27 595 (S27-T5S-R95W)			
Site Position:		Northing:	1,645,842.89 ft	Latitude:	39° 34' 45.45 N
From:	Lat/Long	Easting:	2,286,079.88 ft	Longitude:	108° 1' 59.43 W
Position Uncertainty:	0.0 ft	Slot Radius:	0.000 in	Grid Convergence:	-1.60 °

Well	NP EF09E-27 P27 595					
Well Position	+N/-S	0.0 ft	Northing:	1,645,946.93 ft	Latitude:	39° 34' 46.47 N
	+E/-W	0.0 ft	Easting:	2,286,038.88 ft	Longitude:	108° 1' 59.99 W
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	6,649.0 ft

Wellbore	DD				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	7/13/2012	10.24	65.77	52,176

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	65.66	

Survey Program	Date	7/22/2012			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
50.0	1,790.0	Survey #1 (DD)	Gyro	Gyro	
1,894.0	11,265.0	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	
50.0	0.49	81.50	50.0	0.0	0.2	0.2	0.98	0.98	
100.0	0.37	62.22	100.0	0.1	0.6	0.6	0.37	-0.24	
137.0	0.55	31.46	137.0	0.3	0.8	0.8	0.81	0.49	
169.0	1.00	4.60	169.0	0.8	0.9	1.1	1.77	1.41	
200.0	1.60	19.40	200.0	1.4	1.0	1.5	2.20	1.94	
230.0	2.30	17.40	230.0	2.4	1.4	2.2	2.34	2.33	
261.0	3.10	21.50	260.9	3.8	1.8	3.2	2.65	2.58	
292.0	3.70	23.30	291.9	5.5	2.5	4.6	1.97	1.94	
322.0	4.70	24.80	321.8	7.5	3.4	6.2	3.35	3.33	
353.0	5.90	24.30	352.7	10.1	4.6	8.4	3.87	3.87	
384.0	6.80	24.00	383.5	13.2	6.0	10.9	2.91	2.90	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well NP EF09E-27 P27 595
Project:	North Piceance	TVD Reference:	WELL @ 6671.0ft (Patterson 303)
Site:	P27 595 (S27-T5S-R95W)	MD Reference:	WELL @ 6671.0ft (Patterson 303)
Well:	NP EF09E-27 P27 595	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
414.0	7.70	23.20	413.2	16.7	7.6	13.8	3.02	3.00	
445.0	8.40	20.50	443.9	20.7	9.2	16.9	2.57	2.26	
476.0	8.70	16.30	474.6	25.1	10.6	20.0	2.23	0.97	
506.0	9.10	12.00	504.2	29.6	11.7	22.9	2.59	1.33	
554.0	9.80	3.20	551.6	37.4	12.8	27.0	3.34	1.46	
600.0	10.10	359.00	596.9	45.3	12.9	30.4	1.71	0.65	
692.0	10.30	356.90	687.4	61.6	12.3	36.6	0.46	0.22	
783.0	10.50	355.20	776.9	78.0	11.2	42.3	0.40	0.22	
875.0	11.10	354.50	867.3	95.1	9.6	48.0	0.67	0.65	
966.0	9.80	356.60	956.8	111.6	8.3	53.6	1.49	-1.43	
1,058.0	9.50	356.10	1,047.5	127.0	7.4	59.0	0.34	-0.33	
1,150.0	9.70	356.50	1,138.2	142.3	6.4	64.4	0.23	0.22	
1,241.0	10.50	356.60	1,227.8	158.2	5.4	70.1	0.88	0.88	
1,333.0	10.40	356.70	1,318.3	174.9	4.4	76.1	0.11	-0.11	
1,424.0	11.10	354.40	1,407.7	191.8	3.1	81.9	0.90	0.77	
1,516.0	11.60	355.80	1,497.9	209.8	1.6	87.9	0.62	0.54	
1,607.0	11.90	351.00	1,587.0	228.2	-0.6	93.5	1.12	0.33	
1,699.0	11.30	349.40	1,677.1	246.5	-3.7	98.2	0.74	-0.65	
1,790.0	10.50	348.80	1,766.4	263.4	-7.0	102.2	0.89	-0.88	
1,894.0	10.20	349.60	1,868.8	281.7	-10.5	106.6	0.32	-0.29	
1,985.0	9.90	345.10	1,958.4	297.2	-13.9	109.8	0.92	-0.33	
2,077.0	10.70	349.80	2,048.9	313.3	-17.5	113.2	1.26	0.87	
2,169.0	9.90	346.90	2,139.4	329.4	-20.8	116.8	1.04	-0.87	
2,260.0	10.90	353.50	2,228.9	345.5	-23.5	121.0	1.71	1.10	
2,352.0	11.50	354.90	2,319.1	363.3	-25.3	126.6	0.72	0.65	
2,443.0	11.50	353.70	2,408.3	381.4	-27.1	132.4	0.26	0.00	
2,535.0	10.90	359.10	2,498.6	399.2	-28.3	138.7	1.31	-0.65	
2,626.0	10.60	0.50	2,588.0	416.1	-28.3	145.7	0.44	-0.33	
2,718.0	10.60	359.10	2,678.4	433.1	-28.4	152.6	0.28	0.00	
2,809.0	10.20	357.80	2,767.9	449.5	-28.8	159.0	0.51	-0.44	
2,901.0	9.60	359.30	2,858.5	465.3	-29.2	165.1	0.71	-0.65	
2,992.0	10.50	358.10	2,948.1	481.2	-29.6	171.3	1.02	0.99	
3,084.0	10.40	352.60	3,038.6	497.8	-31.0	176.9	1.09	-0.11	
3,175.0	11.40	354.90	3,128.0	514.9	-32.8	182.3	1.20	1.10	
3,267.0	10.70	356.00	3,218.3	532.5	-34.2	188.3	0.79	-0.76	
3,359.0	11.40	355.60	3,308.6	550.1	-35.5	194.3	0.77	0.76	
3,450.0	11.20	355.80	3,397.8	567.8	-36.9	200.4	0.22	-0.22	
3,542.0	10.60	355.10	3,488.1	585.2	-38.2	206.3	0.67	-0.65	
3,633.0	10.90	353.80	3,577.5	602.1	-39.9	211.8	0.42	0.33	
3,725.0	10.20	351.70	3,668.0	618.8	-42.0	216.7	0.87	-0.76	
3,816.0	9.20	350.90	3,757.7	633.9	-44.3	220.9	1.11	-1.10	
3,908.0	10.00	351.80	3,848.4	649.1	-46.6	225.0	0.88	0.87	
3,999.0	10.40	358.90	3,938.0	665.1	-47.9	230.5	1.45	0.44	
4,091.0	10.90	356.20	4,028.4	682.1	-48.6	236.8	0.77	0.54	
4,182.0	10.30	353.70	4,117.8	698.8	-50.1	242.3	0.83	-0.66	
4,274.0	10.20	358.80	4,208.4	715.1	-51.2	248.1	0.99	-0.11	
4,366.0	10.40	352.50	4,298.9	731.5	-52.4	253.7	1.24	0.22	
4,457.0	11.20	350.80	4,388.3	748.4	-54.9	258.4	0.95	0.88	
4,549.0	9.90	352.10	4,478.7	765.0	-57.4	262.9	1.44	-1.41	
4,640.0	10.70	349.30	4,568.2	781.1	-60.1	267.2	1.04	0.88	
4,732.0	10.90	346.50	4,658.6	797.9	-63.7	270.8	0.61	0.22	
4,823.0	9.60	344.60	4,748.2	813.6	-67.7	273.6	1.48	-1.43	
4,915.0	9.90	351.80	4,838.8	828.8	-70.9	277.0	1.36	0.33	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well NP EF09E-27 P27 595
Project:	North Piceance	TVD Reference:	WELL @ 6671.0ft (Patterson 303)
Site:	P27 595 (S27-T5S-R95W)	MD Reference:	WELL @ 6671.0ft (Patterson 303)
Well:	NP EF09E-27 P27 595	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
5,006.0	9.90	358.00	4,928.5	844.4	-72.3	282.1	1.17	0.00	
5,098.0	9.10	359.80	5,019.2	859.6	-72.6	288.1	0.93	-0.87	
5,189.0	9.80	358.40	5,109.0	874.5	-72.8	294.1	0.81	0.77	
5,281.0	8.80	356.20	5,199.8	889.3	-73.5	299.5	1.15	-1.09	
5,373.0	8.20	354.90	5,290.8	902.9	-74.5	304.2	0.68	-0.65	
5,464.0	6.60	1.90	5,381.0	914.6	-74.9	308.6	2.02	-1.76	
5,556.0	5.50	359.00	5,472.5	924.3	-74.8	312.7	1.24	-1.20	
5,647.0	3.40	358.00	5,563.2	931.3	-75.0	315.5	2.31	-2.31	
5,739.0	1.80	11.00	5,655.1	935.5	-74.8	317.3	1.84	-1.74	
5,830.0	1.40	344.40	5,746.1	938.0	-74.9	318.3	0.92	-0.44	
5,922.0	1.00	355.30	5,838.1	939.8	-75.2	318.8	0.50	-0.43	
6,013.0	0.60	355.70	5,929.0	941.1	-75.3	319.2	0.44	-0.44	
6,105.0	0.40	317.80	6,021.0	941.8	-75.6	319.3	0.41	-0.22	
6,197.0	0.60	253.10	6,113.0	941.9	-76.3	318.7	0.61	0.22	
6,288.0	0.90	245.30	6,204.0	941.5	-77.4	317.5	0.35	0.33	
6,380.0	0.40	269.10	6,296.0	941.2	-78.3	316.5	0.61	-0.54	
6,471.0	0.60	307.70	6,387.0	941.5	-79.0	316.0	0.42	0.22	
6,563.0	0.40	348.70	6,479.0	942.1	-79.5	315.8	0.43	-0.22	
6,612.0	0.03	139.26	6,528.0	942.2	-79.5	315.9	0.88	-0.75	P27 595 EF 09E- 27 TGT
6,654.0	0.40	164.20	6,570.0	942.1	-79.4	315.8	0.88	0.87	
6,746.0	0.30	157.10	6,662.0	941.5	-79.3	315.8	0.12	-0.11	
6,837.0	0.50	161.80	6,753.0	941.0	-79.1	315.7	0.22	0.22	
6,929.0	0.70	175.00	6,845.0	940.0	-78.9	315.5	0.26	0.22	
7,020.0	1.10	194.50	6,936.0	938.6	-79.0	314.8	0.55	0.44	
7,112.0	1.10	130.70	7,028.0	937.2	-78.6	314.6	1.26	0.00	
7,203.0	1.20	154.50	7,119.0	935.8	-77.5	315.0	0.53	0.11	
7,295.0	0.10	14.50	7,211.0	935.0	-77.1	315.1	1.39	-1.20	
7,386.0	0.20	332.60	7,302.0	935.2	-77.1	315.1	0.16	0.11	
7,478.0	0.40	355.90	7,394.0	935.6	-77.2	315.2	0.25	0.22	
7,498.0	0.20	323.50	7,414.0	935.7	-77.3	315.2	1.27	-1.00	
7,564.0	0.50	318.50	7,480.0	936.0	-77.5	315.1	0.46	0.45	
7,656.0	0.40	320.00	7,572.0	936.6	-78.0	314.9	0.11	-0.11	
7,747.0	0.30	308.40	7,663.0	937.0	-78.4	314.7	0.13	-0.11	
7,839.0	0.30	241.50	7,755.0	937.0	-78.8	314.4	0.36	0.00	
7,930.0	0.20	248.00	7,846.0	936.8	-79.1	314.0	0.11	-0.11	
8,022.0	0.50	193.80	7,938.0	936.4	-79.4	313.6	0.45	0.33	
8,113.0	0.40	167.50	8,028.9	935.7	-79.4	313.2	0.25	-0.11	
8,205.0	0.70	184.40	8,120.9	934.8	-79.4	312.9	0.37	0.33	
8,296.0	1.00	209.10	8,211.9	933.6	-79.8	312.0	0.51	0.33	
8,387.0	0.80	334.60	8,302.9	933.5	-80.5	311.4	1.76	-0.22	
8,479.0	1.00	347.60	8,394.9	934.8	-80.9	311.5	0.31	0.22	
8,571.0	0.80	345.90	8,486.9	936.2	-81.3	311.8	0.22	-0.22	
8,662.0	0.80	293.40	8,577.9	937.1	-82.0	311.5	0.78	0.00	
8,754.0	1.10	339.60	8,669.9	938.2	-82.9	311.1	0.86	0.33	
8,845.0	1.10	328.30	8,760.9	939.7	-83.7	311.1	0.24	0.00	
8,937.0	1.00	304.00	8,852.9	940.9	-84.8	310.5	0.49	-0.11	
9,029.0	1.10	266.40	8,944.8	941.3	-86.3	309.3	0.74	0.11	
9,120.0	0.70	289.60	9,035.8	941.5	-87.7	308.1	0.59	-0.44	
9,212.0	0.70	243.50	9,127.8	941.4	-88.8	307.1	0.60	0.00	
9,303.0	1.40	269.30	9,218.8	941.1	-90.4	305.5	0.91	0.77	
9,395.0	1.10	249.80	9,310.8	940.8	-92.3	303.6	0.56	-0.33	
9,486.0	0.80	297.00	9,401.8	940.8	-93.7	302.3	0.89	-0.33	
9,578.0	0.60	347.70	9,493.8	941.6	-94.4	302.0	0.68	-0.22	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well NP EF09E-27 P27 595
Project:	North Piceance	TVD Reference:	WELL @ 6671.0ft (Patterson 303)
Site:	P27 595 (S27-T5S-R95W)	MD Reference:	WELL @ 6671.0ft (Patterson 303)
Well:	NP EF09E-27 P27 595	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
9,669.0	0.40	341.60	9,584.8	942.3	-94.6	302.2	0.23	-0.22	
9,761.0	0.50	348.80	9,676.8	943.0	-94.8	302.3	0.12	0.11	
9,853.0	0.50	319.10	9,768.8	943.7	-95.1	302.3	0.28	0.00	
9,944.0	0.30	107.80	9,859.8	944.0	-95.1	302.3	0.85	-0.22	
10,036.0	0.60	142.50	9,951.8	943.5	-94.6	302.6	0.43	0.33	
10,127.0	0.20	92.30	10,042.8	943.1	-94.2	302.9	0.55	-0.44	
10,172.2	0.28	66.91	10,088.0	943.2	-94.0	303.1	0.30	0.18	P27 595 EF 09E- 27 BHL
10,219.0	0.40	54.10	10,134.8	943.3	-93.7	303.3	0.30	0.25	
10,311.0	0.30	122.90	10,226.8	943.4	-93.3	303.8	0.44	-0.11	
10,402.0	0.40	178.60	10,317.7	942.9	-93.1	303.8	0.37	0.11	
10,494.0	0.60	175.70	10,409.7	942.1	-93.0	303.5	0.22	0.22	
10,585.0	0.80	180.40	10,500.7	941.0	-93.0	303.1	0.23	0.22	
10,676.0	0.70	181.40	10,591.7	939.8	-93.0	302.6	0.11	-0.11	
10,767.0	1.10	188.30	10,682.7	938.4	-93.2	301.8	0.45	0.44	
10,858.0	1.20	218.30	10,773.7	936.8	-93.9	300.5	0.66	0.11	
10,950.0	1.60	226.00	10,865.7	935.1	-95.4	298.5	0.48	0.43	
11,041.0	2.00	218.70	10,956.6	933.0	-97.3	295.8	0.51	0.44	
11,133.0	2.50	202.30	11,048.6	929.9	-99.1	293.0	0.88	0.54	
11,205.0	2.90	203.30	11,120.5	926.8	-100.4	290.5	0.56	0.56	Last Cathedral Survey @ 11,205' MD
11,265.0	2.90	203.30	11,180.4	924.0	-101.6	288.2	0.00	0.00	Projection to Bit @ 11,265' MD

Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
P27 595 EF 09E- 27 TG	0.00	0.00	6,528.0	944.3	-75.2	1,646,892.97	2,285,990.04	39° 34' 55.80 N	108° 2' 0.95 W
- hit/miss target									
- Shape									
- actual wellpath misses target center by 4.8ft at 6612.0ft MD (6528.0 TVD, 942.2 N, -79.5 E)									
- Point									
P27 595 EF 09E- 27 BH	0.00	0.00	10,088.0	934.3	-92.2	1,646,883.46	2,285,972.77	39° 34' 55.70 N	108° 2' 1.17 W
- actual wellpath misses target center by 9.0ft at 10172.2ft MD (10088.0 TVD, 943.2 N, -94.0 E)									
- Rectangle (sides W30.0 H50.0 D0.0)									

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
11,205.0	11,120.5	926.8	-100.4	Last Cathedral Survey @ 11,205' MD	
11,265.0	11,180.4	924.0	-101.6	Projection to Bit @ 11,265' MD	

Checked By: _____ Approved By: _____ Date: _____