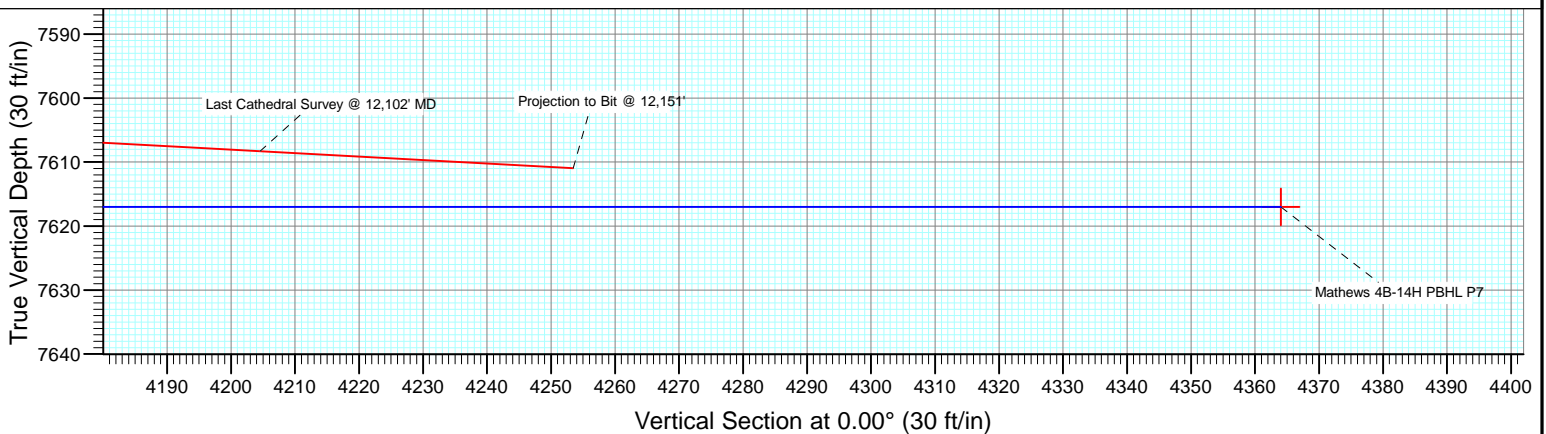
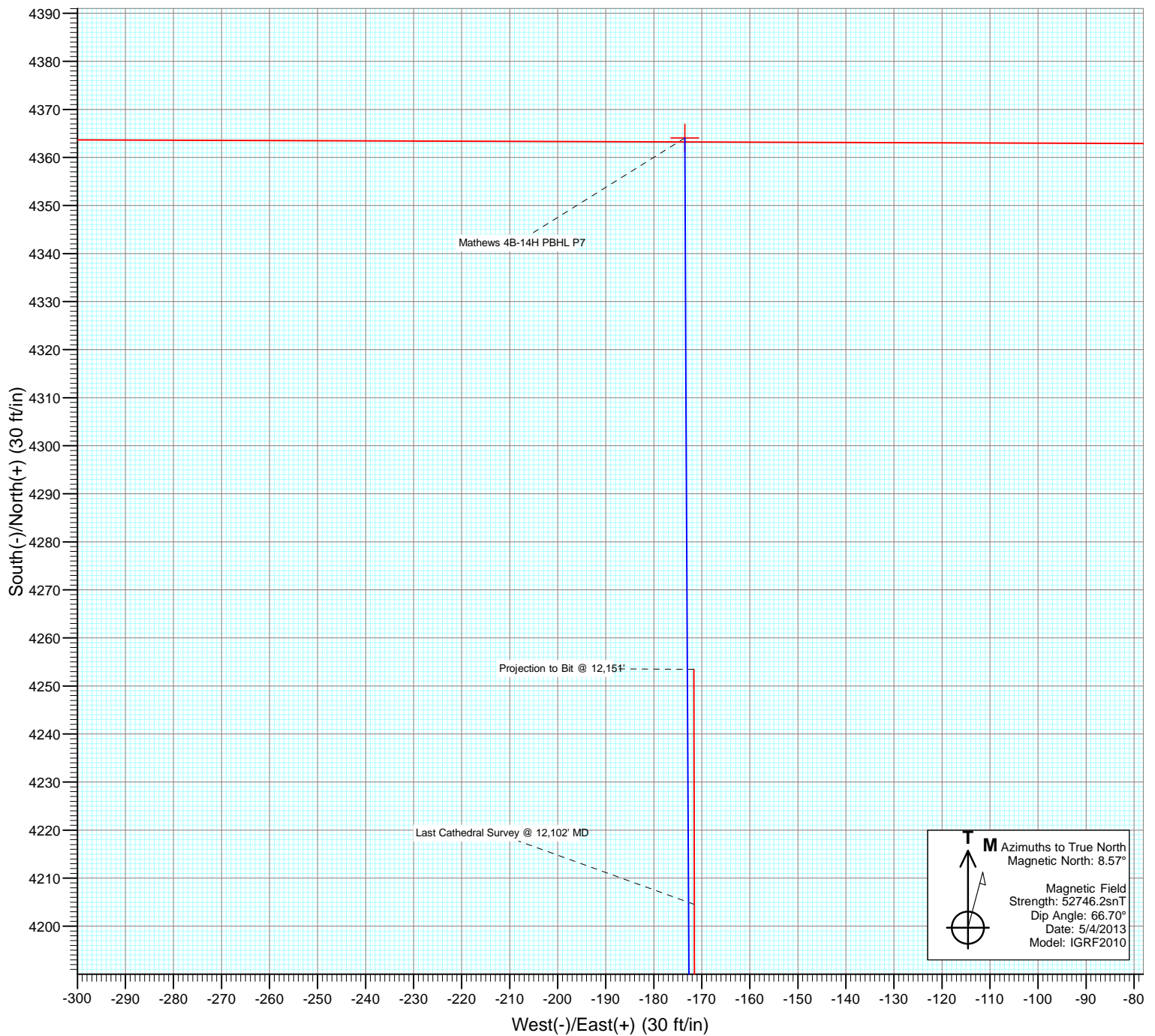




Project: DJ Wattenberg
Site: S14 T1N-R66W (Mathews)
Well: Mathews 4B-14H
Wellbore: HZ
Design: FINAL



Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Mathews 4B-14H
Project:	DJ Wattenberg	TVD Reference:	Well @ 5131.0ft (Ensign 135)
Site:	S14 T1N-R66W (Mathews)	MD Reference:	Well @ 5131.0ft (Ensign 135)
Well:	Mathews 4B-14H	North Reference:	True
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Project	DJ Wattenberg		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site		S14 T1N-R66W (Mathews)			
Site Position:		Northing:	1,260,084.79 ft	Latitude:	40.044810
From:	Lat/Long	Easting:	3,212,836.64 ft	Longitude:	-104.739800
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	0.49 °

Well	Mathews 4B-14H					
Well Position	+N/-S	0.0 ft	Northing:	1,260,254.21 ft	Latitude:	40.045290
	+E/-W	0.0 ft	Easting:	3,212,202.44 ft	Longitude:	-104.742060
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	5,118.0 ft

Wellbore	HZ				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	5/4/2013	8.57	66.70	52,746

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	0.00	

Survey Program	Date	5/28/2013			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
226.0	12,151.0	Survey #1 (HZ)	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		
226.0	0.40	105.50	226.0	-0.2	0.8	-0.2	0.18	0.18		
318.0	1.20	175.20	318.0	-1.3	1.2	-1.3	1.22	0.87		
410.0	2.50	189.30	409.9	-4.2	0.9	-4.2	1.49	1.41		
501.0	2.70	204.50	500.8	-8.1	-0.3	-8.1	0.79	0.22		
593.0	4.00	203.80	592.7	-13.0	-2.5	-13.0	1.41	1.41		
685.0	6.50	200.20	684.3	-20.8	-5.6	-20.8	2.74	2.72		
777.0	8.80	198.80	775.5	-32.4	-9.7	-32.4	2.51	2.50		
869.0	9.00	199.20	866.4	-45.8	-14.3	-45.8	0.23	0.22		
961.0	9.70	196.40	957.1	-60.1	-18.8	-60.1	0.91	0.76		
1,052.0	9.90	198.40	1,046.8	-74.9	-23.5	-74.9	0.43	0.22		
1,144.0	10.50	199.30	1,137.4	-90.3	-28.7	-90.3	0.67	0.65		
1,236.0	9.60	201.40	1,227.9	-105.3	-34.3	-105.3	1.06	-0.98		

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Mathews 4B-14H
Project:	DJ Wattenberg	TVD Reference:	Well @ 5131.0ft (Ensign 135)
Site:	S14 T1N-R66W (Mathews)	MD Reference:	Well @ 5131.0ft (Ensign 135)
Well:	Mathews 4B-14H	North Reference:	True
Wellbore:	HZ	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
1,265.0	8.80	201.10	1,256.6	-109.6	-36.0	-109.6	2.76	-2.76	
1,375.0	8.30	199.90	1,365.4	-125.0	-41.7	-125.0	0.48	-0.45	
1,467.0	7.70	208.80	1,456.5	-136.6	-47.0	-136.6	1.49	-0.65	
1,559.0	8.80	205.50	1,547.5	-148.4	-53.0	-148.4	1.30	1.20	
1,651.0	8.90	201.10	1,638.4	-161.4	-58.5	-161.4	0.74	0.11	
1,742.0	9.20	201.80	1,728.3	-174.7	-63.8	-174.7	0.35	0.33	
1,834.0	8.30	202.40	1,819.2	-187.6	-69.0	-187.6	0.98	-0.98	
1,926.0	8.30	201.30	1,910.2	-200.0	-74.0	-200.0	0.17	0.00	
2,021.0	8.00	199.50	2,004.3	-212.6	-78.7	-212.6	0.41	-0.32	
2,116.0	7.70	203.20	2,098.4	-224.7	-83.4	-224.7	0.62	-0.32	
2,210.0	7.30	201.00	2,191.6	-236.0	-88.0	-236.0	0.52	-0.43	
2,305.0	7.30	201.50	2,285.8	-247.3	-92.4	-247.3	0.07	0.00	
2,400.0	7.10	211.40	2,380.1	-257.9	-97.7	-257.9	1.32	-0.21	
2,495.0	7.00	210.60	2,474.4	-267.9	-103.7	-267.9	0.15	-0.11	
2,589.0	6.90	206.70	2,567.7	-277.9	-109.1	-277.9	0.51	-0.11	
2,684.0	7.50	200.70	2,661.9	-288.8	-113.9	-288.8	1.01	0.63	
2,778.0	7.30	201.30	2,755.1	-300.1	-118.2	-300.1	0.23	-0.21	
2,873.0	7.30	199.30	2,849.4	-311.4	-122.4	-311.4	0.27	0.00	
2,967.0	8.70	197.70	2,942.4	-323.8	-126.5	-323.8	1.51	1.49	
3,062.0	8.70	204.80	3,036.4	-337.2	-131.7	-337.2	1.13	0.00	
3,157.0	7.20	205.80	3,130.4	-349.1	-137.3	-349.1	1.59	-1.58	
3,251.0	6.60	205.60	3,223.8	-359.2	-142.2	-359.2	0.64	-0.64	
3,346.0	6.70	196.80	3,318.1	-369.5	-146.2	-369.5	1.08	0.11	
3,440.0	7.60	197.70	3,411.4	-380.6	-149.7	-380.6	0.96	0.96	
3,535.0	8.30	199.80	3,505.5	-393.1	-153.9	-393.1	0.80	0.74	
3,630.0	7.50	194.10	3,599.6	-405.5	-157.7	-405.5	1.18	-0.84	
3,724.0	6.90	199.20	3,692.8	-416.8	-161.1	-416.8	0.93	-0.64	
3,819.0	5.90	209.20	3,787.2	-426.5	-165.4	-426.5	1.57	-1.05	
3,914.0	3.30	198.90	3,881.9	-433.3	-168.6	-433.3	2.86	-2.74	
4,008.0	2.40	212.70	3,975.8	-437.5	-170.6	-437.5	1.20	-0.96	
4,103.0	1.40	281.00	4,070.8	-439.0	-172.8	-439.0	2.41	-1.05	
4,198.0	1.50	267.50	4,165.7	-438.8	-175.2	-438.8	0.37	0.11	
4,293.0	1.70	359.80	4,260.7	-437.5	-176.4	-437.5	2.43	0.21	
4,388.0	1.10	56.60	4,355.7	-435.6	-175.7	-435.6	1.51	-0.63	
4,483.0	0.90	143.60	4,450.7	-435.7	-174.4	-435.7	1.46	-0.21	
4,577.0	0.70	157.00	4,544.7	-436.8	-173.8	-436.8	0.29	-0.21	
4,672.0	0.40	167.90	4,639.7	-437.6	-173.5	-437.6	0.33	-0.32	
4,767.0	0.20	129.30	4,734.7	-438.1	-173.3	-438.1	0.29	-0.21	
4,862.0	0.40	333.20	4,829.7	-437.9	-173.3	-437.9	0.62	0.21	
4,956.0	0.80	1.10	4,923.7	-436.9	-173.4	-436.9	0.52	0.43	
5,051.0	1.10	8.10	5,018.7	-435.4	-173.3	-435.4	0.34	0.32	
5,146.0	0.80	48.10	5,113.6	-434.0	-172.7	-434.0	0.75	-0.32	
5,241.0	0.70	194.10	5,208.6	-434.1	-172.3	-434.1	1.51	-0.11	
5,336.0	0.20	87.60	5,303.6	-434.7	-172.3	-434.7	0.82	-0.53	
5,430.0	1.00	91.50	5,397.6	-434.7	-171.3	-434.7	0.85	0.85	
5,525.0	1.20	116.00	5,492.6	-435.2	-169.6	-435.2	0.53	0.21	
5,620.0	0.90	213.90	5,587.6	-436.2	-169.1	-436.2	1.68	-0.32	
5,714.0	0.70	219.20	5,681.6	-437.3	-169.9	-437.3	0.23	-0.21	
5,809.0	0.40	217.00	5,776.6	-438.0	-170.5	-438.0	0.32	-0.32	
5,904.0	0.00	3.50	5,871.6	-438.3	-170.7	-438.3	0.42	-0.42	
5,998.0	0.40	53.00	5,965.6	-438.1	-170.4	-438.1	0.43	0.43	
6,093.0	1.50	293.20	6,060.6	-437.4	-171.3	-437.4	1.83	1.16	
6,188.0	1.40	272.30	6,155.5	-436.8	-173.6	-436.8	0.56	-0.11	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Mathews 4B-14H
Project:	DJ Wattenberg	TVD Reference:	Well @ 5131.0ft (Ensign 135)
Site:	S14 T1N-R66W (Mathews)	MD Reference:	Well @ 5131.0ft (Ensign 135)
Well:	Mathews 4B-14H	North Reference:	True
Wellbore:	HZ	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
6,283.0	1.70	253.20	6,250.5	-437.2	-176.1	-437.2	0.62	0.32	
6,378.0	1.60	254.10	6,345.5	-438.0	-178.7	-438.0	0.11	-0.11	
6,473.0	1.00	269.10	6,440.4	-438.3	-180.8	-438.3	0.72	-0.63	
6,567.0	0.90	265.30	6,534.4	-438.4	-182.4	-438.4	0.13	-0.11	
6,631.0	0.80	270.60	6,598.4	-438.4	-183.3	-438.4	0.20	-0.16	
6,694.0	0.50	280.90	6,661.4	-438.4	-184.0	-438.4	0.51	-0.48	
6,757.0	0.80	43.70	6,724.4	-438.0	-184.0	-438.0	1.83	0.48	
6,822.0	0.90	73.60	6,789.4	-437.6	-183.2	-437.6	0.69	0.15	
6,883.0	1.10	80.20	6,850.4	-437.3	-182.2	-437.3	0.38	0.33	
6,947.0	1.40	73.30	6,914.4	-437.0	-180.8	-437.0	0.52	0.47	
7,010.0	1.20	66.40	6,977.4	-436.5	-179.5	-436.5	0.40	-0.32	
7,073.0	1.10	74.00	7,040.4	-436.1	-178.3	-436.1	0.29	-0.16	
7,105.0	1.30	74.60	7,072.4	-435.9	-177.6	-435.9	0.63	0.62	
7,136.0	1.60	55.20	7,103.3	-435.5	-176.9	-435.5	1.84	0.97	
7,168.0	2.00	37.50	7,135.3	-434.9	-176.2	-434.9	2.13	1.25	
7,199.0	3.10	20.30	7,166.3	-433.6	-175.6	-433.6	4.28	3.55	
7,231.0	5.60	2.20	7,198.2	-431.3	-175.3	-431.3	8.82	7.81	
7,262.0	9.10	353.20	7,228.9	-427.3	-175.5	-427.3	11.85	11.29	
7,294.0	13.30	350.90	7,260.3	-421.2	-176.4	-421.2	13.20	13.12	
7,325.0	17.20	352.00	7,290.2	-413.1	-177.6	-413.1	12.61	12.58	
7,357.0	20.90	354.70	7,320.5	-402.7	-178.8	-402.7	11.88	11.56	
7,389.0	23.30	354.50	7,350.1	-390.7	-179.9	-390.7	7.50	7.50	
7,420.0	26.10	356.00	7,378.3	-377.8	-181.0	-377.8	9.26	9.03	
7,452.0	29.50	357.60	7,406.6	-362.9	-181.8	-362.9	10.88	10.62	
7,484.0	33.20	358.10	7,433.9	-346.3	-182.4	-346.3	11.59	11.56	
7,515.0	37.20	358.60	7,459.2	-328.4	-182.9	-328.4	12.94	12.90	
7,547.0	41.50	358.20	7,484.0	-308.2	-183.5	-308.2	13.46	13.44	
7,578.0	45.90	358.60	7,506.4	-286.8	-184.1	-286.8	14.22	14.19	
7,610.0	50.60	358.70	7,527.7	-262.9	-184.6	-262.9	14.69	14.69	
7,642.0	55.50	358.80	7,546.9	-237.3	-185.2	-237.3	15.31	15.31	
7,673.0	60.00	359.70	7,563.5	-211.1	-185.5	-211.1	14.72	14.52	
7,705.0	64.20	0.20	7,578.4	-182.9	-185.5	-182.9	13.20	13.12	
7,736.0	67.50	1.50	7,591.1	-154.6	-185.1	-154.6	11.31	10.65	
7,768.0	70.90	2.70	7,602.5	-124.7	-184.0	-124.7	11.19	10.62	
7,800.0	75.90	3.00	7,611.6	-94.1	-182.5	-94.1	15.65	15.62	
7,831.0	80.70	2.90	7,617.9	-63.8	-180.9	-63.8	15.49	15.48	
7,858.0	85.00	3.60	7,621.2	-37.0	-179.4	-37.0	16.13	15.93	
7,921.0	89.60	2.80	7,624.2	25.8	-175.9	25.8	7.41	7.30	
8,015.0	89.30	0.80	7,625.1	119.7	-173.0	119.7	2.15	-0.32	
8,078.0	89.80	1.10	7,625.6	182.7	-171.9	182.7	0.93	0.79	
8,142.0	90.40	1.10	7,625.5	246.7	-170.7	246.7	0.94	0.94	
8,205.0	89.40	0.70	7,625.6	309.7	-169.7	309.7	1.71	-1.59	
8,300.0	90.70	0.80	7,625.5	404.7	-168.4	404.7	1.37	1.37	
8,394.0	90.20	0.70	7,624.8	498.7	-167.2	498.7	0.54	-0.53	
8,458.0	90.40	0.10	7,624.5	562.7	-166.8	562.7	0.99	0.31	
8,521.0	90.00	0.10	7,624.2	625.7	-166.7	625.7	0.63	-0.63	
8,584.0	90.20	0.50	7,624.1	688.7	-166.3	688.7	0.71	0.32	
8,678.0	91.30	1.20	7,622.9	782.6	-164.9	782.6	1.39	1.17	
8,773.0	91.70	0.20	7,620.4	877.6	-163.8	877.6	1.13	0.42	
8,836.0	90.80	0.80	7,619.0	940.6	-163.2	940.6	1.72	-1.43	
8,900.0	89.10	1.50	7,619.1	1,004.6	-161.9	1,004.6	2.87	-2.66	
8,963.0	88.40	1.60	7,620.5	1,067.5	-160.2	1,067.5	1.12	-1.11	
9,058.0	89.70	2.30	7,622.0	1,162.5	-157.0	1,162.5	1.55	1.37	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Mathews 4B-14H
Project:	DJ Wattenberg	TVD Reference:	Well @ 5131.0ft (Ensign 135)
Site:	S14 T1N-R66W (Mathews)	MD Reference:	Well @ 5131.0ft (Ensign 135)
Well:	Mathews 4B-14H	North Reference:	True
Wellbore:	HZ	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
9,152.0	89.50	1.70	7,622.7	1,256.4	-153.7	1,256.4	0.67	-0.21	
9,247.0	91.00	1.40	7,622.3	1,351.4	-151.2	1,351.4	1.61	1.58	
9,342.0	90.70	0.50	7,620.9	1,446.4	-149.6	1,446.4	1.00	-0.32	
9,436.0	90.50	0.30	7,619.9	1,540.4	-148.9	1,540.4	0.30	-0.21	
9,500.0	90.50	359.50	7,619.3	1,604.3	-149.0	1,604.3	1.25	0.00	
9,563.0	91.20	358.30	7,618.4	1,667.3	-150.2	1,667.3	2.20	1.11	
9,626.0	92.50	358.10	7,616.4	1,730.3	-152.2	1,730.3	2.09	2.06	
9,721.0	91.90	358.10	7,612.7	1,825.1	-155.4	1,825.1	0.63	-0.63	
9,816.0	91.00	358.00	7,610.3	1,920.1	-158.6	1,920.1	0.95	-0.95	
9,879.0	90.90	357.40	7,609.3	1,983.0	-161.1	1,983.0	0.97	-0.16	
9,942.0	91.20	357.30	7,608.1	2,045.9	-164.0	2,045.9	0.50	0.48	
10,005.0	91.50	358.10	7,606.6	2,108.9	-166.6	2,108.9	1.36	0.48	
10,100.0	90.20	357.20	7,605.2	2,203.8	-170.5	2,203.8	1.66	-1.37	
10,195.0	90.00	358.20	7,605.1	2,298.7	-174.3	2,298.7	1.07	-0.21	
10,258.0	90.20	357.30	7,604.9	2,361.6	-176.8	2,361.6	1.46	0.32	
10,321.0	91.00	358.10	7,604.3	2,424.6	-179.3	2,424.6	1.80	1.27	
10,384.0	90.90	357.80	7,603.2	2,487.5	-181.5	2,487.5	0.50	-0.16	
10,448.0	91.80	357.90	7,601.7	2,551.5	-183.9	2,551.5	1.41	1.41	
10,511.0	92.00	358.10	7,599.6	2,614.4	-186.1	2,614.4	0.45	0.32	
10,574.0	91.30	359.80	7,597.8	2,677.4	-187.3	2,677.4	2.92	-1.11	
10,669.0	90.80	0.80	7,596.1	2,772.3	-186.8	2,772.3	1.18	-0.53	
10,764.0	89.30	357.40	7,596.0	2,867.3	-188.3	2,867.3	3.91	-1.58	
10,827.0	89.80	358.70	7,596.5	2,930.3	-190.4	2,930.3	2.21	0.79	
10,890.0	90.30	359.90	7,596.4	2,993.3	-191.2	2,993.3	2.06	0.79	
10,954.0	90.70	0.90	7,595.9	3,057.3	-190.7	3,057.3	1.68	0.62	
11,048.0	90.60	1.10	7,594.8	3,151.2	-189.1	3,151.2	0.24	-0.11	
11,143.0	90.40	1.40	7,594.0	3,246.2	-187.0	3,246.2	0.38	-0.21	
11,238.0	90.90	2.90	7,592.9	3,341.1	-183.5	3,341.1	1.66	0.53	
11,333.0	90.10	2.90	7,592.1	3,436.0	-178.7	3,436.0	0.84	-0.84	
11,428.0	89.10	2.20	7,592.7	3,530.9	-174.4	3,530.9	1.28	-1.05	
11,522.0	89.40	1.40	7,594.0	3,624.9	-171.5	3,624.9	0.91	0.32	
11,617.0	89.40	0.80	7,595.0	3,719.8	-169.7	3,719.8	0.63	0.00	
11,712.0	89.30	0.30	7,596.0	3,814.8	-168.7	3,814.8	0.54	-0.11	
11,806.0	88.70	359.60	7,597.7	3,908.8	-168.8	3,908.8	0.98	-0.64	
11,901.0	89.20	359.90	7,599.4	4,003.8	-169.2	4,003.8	0.61	0.53	
11,996.0	86.90	358.60	7,602.7	4,098.7	-170.5	4,098.7	2.78	-2.42	
12,091.0	87.00	0.10	7,607.7	4,193.5	-171.6	4,193.5	1.58	0.11	
12,102.0	86.90	359.90	7,608.3	4,204.5	-171.6	4,204.5	2.03	-0.91	Last Cathedral Survey @ 12,102' MD Projection to Bit @ 12,151'
12,151.0	86.90	359.90	7,611.0	4,253.5	-171.6	4,253.5	0.00	0.00	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Mathews 4B-14H
Project:	DJ Wattenberg	TVD Reference:	Well @ 5131.0ft (Ensign 135)
Site:	S14 T1N-R66W (Mathews)	MD Reference:	Well @ 5131.0ft (Ensign 135)
Well:	Mathews 4B-14H	North Reference:	True
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Targets									
Target Name									
- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- Shape	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)		
Mathews 4B-14H PBHL	0.00	0.00	7,617.0	4,364.0	-173.5	1,264,616.61	3,211,991.59	40.057270	-104.742680
- actual wellpath misses target center by 110.8ft at 12151.0ft MD (7611.0 TVD, 4253.5 N, -171.6 E)									
- Point									

Design Annotations					
Measured Depth	Vertical Depth	Local Coordinates			
(ft)	(ft)	+N/-S (ft)	+E/-W (ft)	Comment	
12,102.0	7,608.3	4,204.5	-171.6	Last Cathedral Survey @ 12,102' MD	
12,151.0	7,611.0	4,253.5	-171.6	Projection to Bit @ 12,151'	

Checked By: _____ Approved By: _____ Date: _____