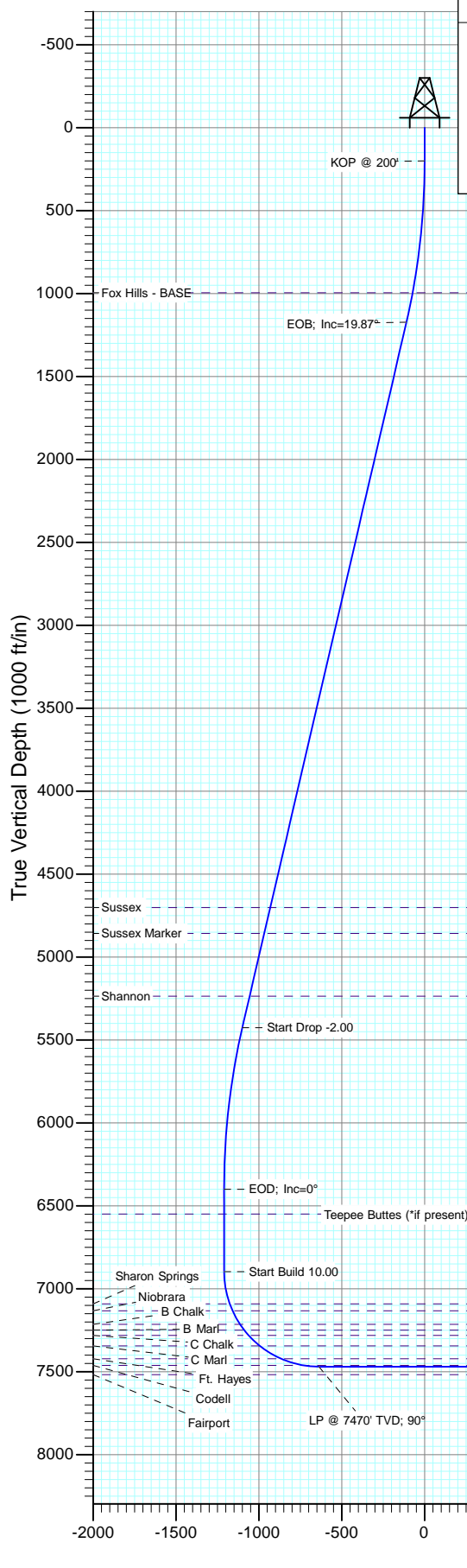
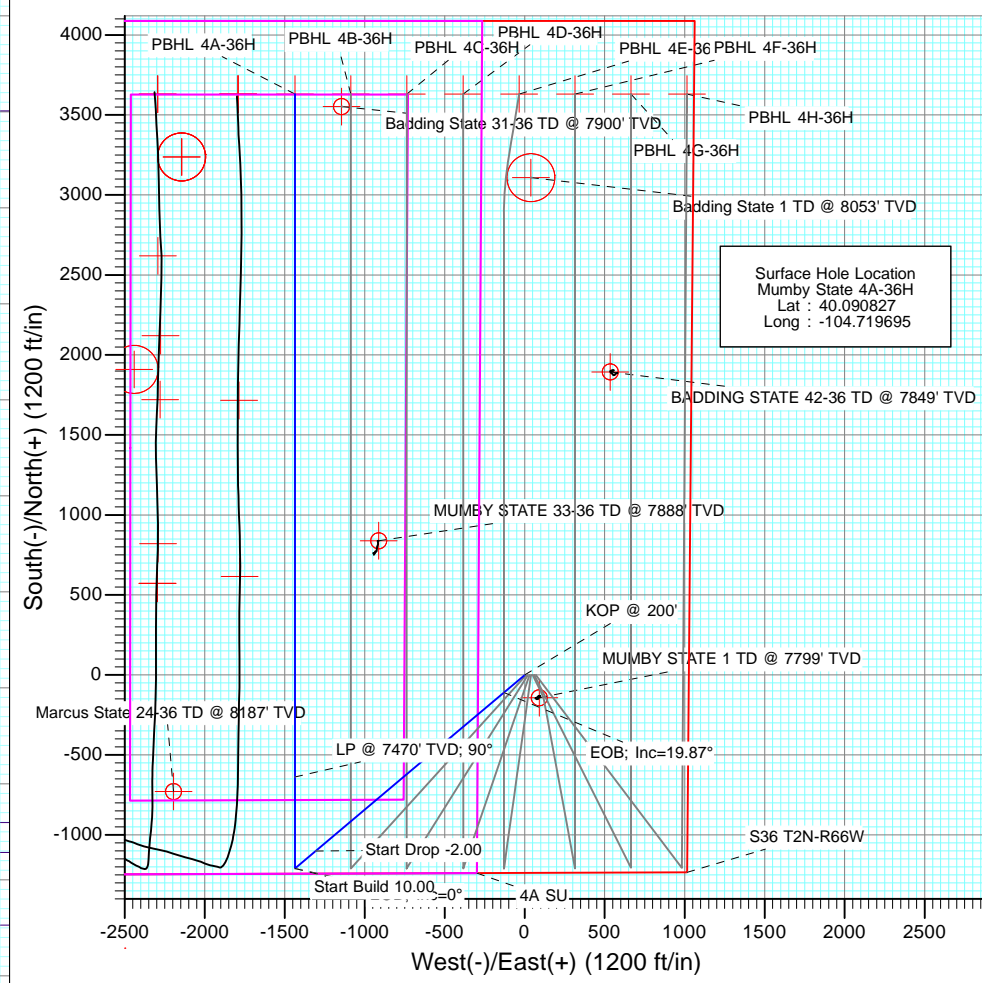




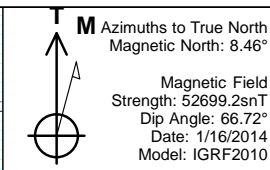
Project: DJ Wattenberg
Site: S36 T2N-R66W (Marcus State, Mumby State)
Well: Mumby State 4A-36H
Wellbore: HZ
Design: Plan #1



SECTION DETAILS											
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Target	Annotation
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0		KOP @ 200'
2	200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.0		EOB; Inc=19.87°
3	1193.6	19.87	229.89	1173.8	-109.9	-130.5	2.00	229.89	-109.9		Start Drop -2.00
4	5715.2	19.87	229.89	5426.2	-1100.1	-1306.0	0.00	0.00	-1100.1		EOD; Inc=0°
5	6708.9	0.00	0.00	6400.0	-1210.0	-1436.5	2.00	180.00	-1210.0		Start Build 10.00
6	7205.9	0.00	0.00	6897.0	-1210.0	-1436.5	0.00	0.00	-1210.0		LP @ 7470' TVD; 90°
7	8105.9	90.00	0.00	7470.0	-637.0	-1436.5	10.00	0.00	-637.0		TD at 12372.3
8	12372.3	90.00	0.00	7470.0	3629.4	-1436.5	0.00	0.00	3629.4	PBHL 4A-36H	



DESIGN TARGET DETAILS					
Name	+N/-S	+E/-W	Northing	Easting	Latitude
PBHL 4A-36H	3629.4	-1436.5	1280512.55	3216849.38	40.100790



FORMATION TOP DETAILS		
TVDPath	MDPath	Formation
995.0	1005.6	Fox Hills - BASE
4702.0	4945.2	Sussex
4858.0	5111.1	Sussex Marker
5236.0	5513.0	Shannon
6549.0	6857.9	Teepee Buttes (*if present)
7091.0	7403.8	Sharon Springs
7133.0	7449.1	Niobrara
7214.0	7541.8	B Chalk
7249.0	7584.9	B Marl
7281.0	7626.7	C Chalk
7344.0	7718.6	C Marl
7422.0	7869.7	Ft. Hayes
7462.0	8010.0	Codell

Plan #1
Mumby State 4A-36H
WELL @ 5049.0ft (Original Well Elev)
Ground Elevation @ 5019.0
North American Datum 1983
Well Mumby State 4A-36H, True North

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Mumby State 4A-36H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	WELL @ 5049.0ft (Original Well Elev)
Project:	DJ Wattenberg	MD Reference:	WELL @ 5049.0ft (Original Well Elev)
Site:	S36 T2N-R66W (Marcus State, Mumby State)	North Reference:	True
Well:	Mumby State 4A-36H	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

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		S36 T2N-R66W (Marcus State, Mumby State)			
Site Position:		Northing:	1,275,942.66 ft	Latitude:	40.088280
From:	Lat/Long	Easting:	3,215,403.58 ft	Longitude:	-104.730140
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	0.50 °

Well	Mumby State 4A-36H					
Well Position	+N/-S	0.0 ft	Northing:	1,276,895.97 ft	Latitude:	40.090827
	+E/-W	0.0 ft	Easting:	3,218,317.72 ft	Longitude:	-104.719695
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	5,019.0 ft

Wellbore	HZ				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
			(°)	(°)	(nT)
	IGRF2010	1/16/2014	8.47	66.72	52,699

Design	Plan #1			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction
	(ft)	(ft)	(ft)	(°)
	0.0	0.0	0.0	0.00

Plan Sections										
Measured Depth	Inclination	Azimuth	Vertical Depth	+N/-S	+E/-W	Dogleg Rate	Build Rate	Turn Rate	TFO	Target
(ft)	(°)	(°)	(ft)	(ft)	(ft)	(°/100ft)	(°/100ft)	(°/100ft)	(°)	
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,193.6	19.87	229.89	1,173.8	-109.9	-130.5	2.00	2.00	0.00	229.89	
5,715.2	19.87	229.89	5,426.2	-1,100.1	-1,306.0	0.00	0.00	0.00	0.00	
6,708.9	0.00	0.00	6,400.0	-1,210.0	-1,436.5	2.00	-2.00	0.00	180.00	
7,205.9	0.00	0.00	6,897.0	-1,210.0	-1,436.5	0.00	0.00	0.00	0.00	
8,105.9	90.00	0.00	7,470.0	-637.0	-1,436.5	10.00	10.00	0.00	0.00	
12,372.3	90.00	0.00	7,470.0	3,629.4	-1,436.5	0.00	0.00	0.00	0.00	PBHL 4A-36H

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Mumby State 4A-36H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	WELL @ 5049.0ft (Original Well Elev)
Project:	DJ Wattenberg	MD Reference:	WELL @ 5049.0ft (Original Well Elev)
Site:	S36 T2N-R66W (Marcus State, Mumby State)	North Reference:	True
Well:	Mumby State 4A-36H	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	KOP @ 200'
300.0	2.00	229.89	300.0	-1.1	-1.3	-1.1	2.00	2.00	
400.0	4.00	229.89	399.8	-4.5	-5.3	-4.5	2.00	2.00	
500.0	6.00	229.89	499.5	-10.1	-12.0	-10.1	2.00	2.00	
600.0	8.00	229.89	598.7	-18.0	-21.3	-18.0	2.00	2.00	
700.0	10.00	229.89	697.5	-28.0	-33.3	-28.0	2.00	2.00	
800.0	12.00	229.89	795.6	-40.3	-47.9	-40.3	2.00	2.00	
900.0	14.00	229.89	893.1	-54.8	-65.1	-54.8	2.00	2.00	
1,000.0	16.00	229.89	989.6	-71.5	-84.9	-71.5	2.00	2.00	
1,005.6	16.11	229.89	995.0	-72.5	-86.1	-72.5	2.00	2.00	Fox Hills - BASE
1,100.0	18.00	229.89	1,085.3	-90.3	-107.2	-90.3	2.00	2.00	
1,193.6	19.87	229.89	1,173.8	-109.9	-130.5	-109.9	2.00	2.00	EOB; Inc=19.87°
1,200.0	19.87	229.89	1,179.8	-111.3	-132.1	-111.3	0.00	0.00	
1,300.0	19.87	229.89	1,273.9	-133.2	-158.1	-133.2	0.00	0.00	
1,400.0	19.87	229.89	1,367.9	-155.1	-184.1	-155.1	0.00	0.00	
1,500.0	19.87	229.89	1,462.0	-177.0	-210.1	-177.0	0.00	0.00	
1,600.0	19.87	229.89	1,556.0	-198.9	-236.1	-198.9	0.00	0.00	
1,700.0	19.87	229.89	1,650.0	-220.8	-262.1	-220.8	0.00	0.00	
1,800.0	19.87	229.89	1,744.1	-242.7	-288.1	-242.7	0.00	0.00	
1,900.0	19.87	229.89	1,838.1	-264.6	-314.1	-264.6	0.00	0.00	
2,000.0	19.87	229.89	1,932.2	-286.5	-340.1	-286.5	0.00	0.00	
2,100.0	19.87	229.89	2,026.2	-308.4	-366.1	-308.4	0.00	0.00	
2,200.0	19.87	229.89	2,120.3	-330.3	-392.1	-330.3	0.00	0.00	
2,300.0	19.87	229.89	2,214.3	-352.2	-418.1	-352.2	0.00	0.00	
2,400.0	19.87	229.89	2,308.4	-374.1	-444.1	-374.1	0.00	0.00	
2,500.0	19.87	229.89	2,402.4	-396.0	-470.1	-396.0	0.00	0.00	
2,600.0	19.87	229.89	2,496.5	-417.9	-496.1	-417.9	0.00	0.00	
2,700.0	19.87	229.89	2,590.5	-439.8	-522.1	-439.8	0.00	0.00	
2,800.0	19.87	229.89	2,684.5	-461.7	-548.1	-461.7	0.00	0.00	
2,900.0	19.87	229.89	2,778.6	-483.6	-574.1	-483.6	0.00	0.00	
3,000.0	19.87	229.89	2,872.6	-505.5	-600.1	-505.5	0.00	0.00	
3,100.0	19.87	229.89	2,966.7	-527.4	-626.1	-527.4	0.00	0.00	
3,200.0	19.87	229.89	3,060.7	-549.3	-652.1	-549.3	0.00	0.00	
3,300.0	19.87	229.89	3,154.8	-571.2	-678.1	-571.2	0.00	0.00	
3,400.0	19.87	229.89	3,248.8	-593.1	-704.1	-593.1	0.00	0.00	
3,500.0	19.87	229.89	3,342.9	-615.0	-730.1	-615.0	0.00	0.00	
3,600.0	19.87	229.89	3,436.9	-636.9	-756.1	-636.9	0.00	0.00	
3,700.0	19.87	229.89	3,530.9	-658.8	-782.1	-658.8	0.00	0.00	
3,800.0	19.87	229.89	3,625.0	-680.7	-808.1	-680.7	0.00	0.00	
3,900.0	19.87	229.89	3,719.0	-702.6	-834.1	-702.6	0.00	0.00	
4,000.0	19.87	229.89	3,813.1	-724.5	-860.1	-724.5	0.00	0.00	
4,100.0	19.87	229.89	3,907.1	-746.4	-886.1	-746.4	0.00	0.00	
4,200.0	19.87	229.89	4,001.2	-768.3	-912.1	-768.3	0.00	0.00	
4,300.0	19.87	229.89	4,095.2	-790.2	-938.1	-790.2	0.00	0.00	
4,400.0	19.87	229.89	4,189.3	-812.1	-964.1	-812.1	0.00	0.00	
4,500.0	19.87	229.89	4,283.3	-834.0	-990.1	-834.0	0.00	0.00	
4,600.0	19.87	229.89	4,377.4	-855.9	-1,016.1	-855.9	0.00	0.00	
4,700.0	19.87	229.89	4,471.4	-877.8	-1,042.1	-877.8	0.00	0.00	
4,800.0	19.87	229.89	4,565.4	-899.7	-1,068.1	-899.7	0.00	0.00	
4,900.0	19.87	229.89	4,659.5	-921.6	-1,094.1	-921.6	0.00	0.00	

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Mumby State 4A-36H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	WELL @ 5049.0ft (Original Well Elev)
Project:	DJ Wattenberg	MD Reference:	WELL @ 5049.0ft (Original Well Elev)
Site:	S36 T2N-R66W (Marcus State, Mumby State)	North Reference:	True
Well:	Mumby State 4A-36H	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
4,945.2	19.87	229.89	4,702.0	-931.5	-1,105.8	-931.5	0.00	0.00	Sussex
5,000.0	19.87	229.89	4,753.5	-943.5	-1,120.1	-943.5	0.00	0.00	
5,100.0	19.87	229.89	4,847.6	-965.4	-1,146.1	-965.4	0.00	0.00	
5,111.1	19.87	229.89	4,858.0	-967.8	-1,149.0	-967.8	0.00	0.00	Sussex Marker
5,200.0	19.87	229.89	4,941.6	-987.3	-1,172.1	-987.3	0.00	0.00	
5,300.0	19.87	229.89	5,035.7	-1,009.2	-1,198.1	-1,009.2	0.00	0.00	
5,400.0	19.87	229.89	5,129.7	-1,031.1	-1,224.1	-1,031.1	0.00	0.00	
5,500.0	19.87	229.89	5,223.8	-1,053.0	-1,250.1	-1,053.0	0.00	0.00	
5,513.0	19.87	229.89	5,236.0	-1,055.8	-1,253.5	-1,055.8	0.00	0.00	Shannon
5,600.0	19.87	229.89	5,317.8	-1,074.9	-1,276.1	-1,074.9	0.00	0.00	
5,700.0	19.87	229.89	5,411.9	-1,096.8	-1,302.1	-1,096.8	0.00	0.00	
5,715.2	19.87	229.89	5,426.2	-1,100.1	-1,306.0	-1,100.1	0.00	0.00	Start Drop -2.00
5,800.0	18.18	229.89	5,506.3	-1,117.9	-1,327.2	-1,117.9	2.00	-2.00	
5,900.0	16.18	229.89	5,601.8	-1,136.9	-1,349.7	-1,136.9	2.00	-2.00	
6,000.0	14.18	229.89	5,698.4	-1,153.8	-1,369.8	-1,153.8	2.00	-2.00	
6,100.0	12.18	229.89	5,795.7	-1,168.5	-1,387.2	-1,168.5	2.00	-2.00	
6,200.0	10.18	229.89	5,893.8	-1,181.0	-1,402.0	-1,181.0	2.00	-2.00	
6,300.0	8.18	229.89	5,992.5	-1,191.2	-1,414.2	-1,191.2	2.00	-2.00	
6,400.0	6.18	229.89	6,091.7	-1,199.3	-1,423.8	-1,199.3	2.00	-2.00	
6,500.0	4.18	229.89	6,191.3	-1,205.1	-1,430.7	-1,205.1	2.00	-2.00	
6,600.0	2.18	229.89	6,291.2	-1,208.7	-1,434.9	-1,208.7	2.00	-2.00	
6,700.0	0.18	229.89	6,391.1	-1,210.0	-1,436.5	-1,210.0	2.00	-2.00	
6,708.9	0.00	0.00	6,400.0	-1,210.0	-1,436.5	-1,210.0	2.00	-2.00	EOD; Inc=0°
6,800.0	0.00	0.00	6,491.1	-1,210.0	-1,436.5	-1,210.0	0.00	0.00	
6,857.9	0.00	0.00	6,549.0	-1,210.0	-1,436.5	-1,210.0	0.00	0.00	Teepee Buttes (*if present)
6,900.0	0.00	0.00	6,591.1	-1,210.0	-1,436.5	-1,210.0	0.00	0.00	
7,000.0	0.00	0.00	6,691.1	-1,210.0	-1,436.5	-1,210.0	0.00	0.00	
7,100.0	0.00	0.00	6,791.1	-1,210.0	-1,436.5	-1,210.0	0.00	0.00	
7,200.0	0.00	0.00	6,891.1	-1,210.0	-1,436.5	-1,210.0	0.00	0.00	
7,205.9	0.00	0.00	6,897.0	-1,210.0	-1,436.5	-1,210.0	0.00	0.00	Start Build 10.00
7,300.0	9.41	0.00	6,990.7	-1,202.3	-1,436.5	-1,202.3	10.00	10.00	
7,400.0	19.41	0.00	7,087.5	-1,177.4	-1,436.5	-1,177.4	10.00	10.00	
7,403.8	19.79	0.00	7,091.0	-1,176.2	-1,436.5	-1,176.2	10.00	10.00	Sharon Springs
7,449.1	24.32	0.00	7,133.0	-1,159.2	-1,436.5	-1,159.2	10.00	10.00	Niobrara
7,500.0	29.41	0.00	7,178.4	-1,136.2	-1,436.5	-1,136.2	10.00	10.00	
7,541.8	33.59	0.00	7,214.0	-1,114.3	-1,436.5	-1,114.3	10.00	10.00	B Chalk
7,584.9	37.90	0.00	7,249.0	-1,089.2	-1,436.5	-1,089.2	10.00	10.00	B Marl
7,600.0	39.41	0.00	7,260.8	-1,079.7	-1,436.5	-1,079.7	10.00	10.00	
7,626.7	42.08	0.00	7,281.0	-1,062.3	-1,436.5	-1,062.3	10.00	10.00	C Chalk
7,700.0	49.41	0.00	7,332.1	-1,009.8	-1,436.5	-1,009.8	10.00	10.00	
7,718.6	51.27	0.00	7,344.0	-995.5	-1,436.5	-995.5	10.00	10.00	C Marl
7,800.0	59.41	0.00	7,390.3	-928.6	-1,436.5	-928.6	10.00	10.00	
7,869.7	66.38	0.00	7,422.0	-866.6	-1,436.5	-866.6	10.00	10.00	Ft. Hayes
7,900.0	69.41	0.00	7,433.4	-838.5	-1,436.5	-838.5	10.00	10.00	
8,000.0	79.41	0.00	7,460.2	-742.3	-1,436.5	-742.3	10.00	10.00	
8,010.0	80.41	0.00	7,462.0	-732.5	-1,436.5	-732.5	10.00	10.00	Codell
8,100.0	89.41	0.00	7,470.0	-642.9	-1,436.5	-642.9	10.00	10.00	
8,105.9	90.00	0.00	7,470.0	-637.0	-1,436.5	-637.0	10.00	10.00	LP @ 7470' TVD; 90°
8,200.0	90.00	0.00	7,470.0	-542.9	-1,436.5	-542.9	0.00	0.00	
8,300.0	90.00	0.00	7,470.0	-442.9	-1,436.5	-442.9	0.00	0.00	
8,400.0	90.00	0.00	7,470.0	-342.9	-1,436.5	-342.9	0.00	0.00	
8,500.0	90.00	0.00	7,470.0	-242.9	-1,436.5	-242.9	0.00	0.00	

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Mumby State 4A-36H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	WELL @ 5049.0ft (Original Well Elev)
Project:	DJ Wattenberg	MD Reference:	WELL @ 5049.0ft (Original Well Elev)
Site:	S36 T2N-R66W (Marcus State, Mumby State)	North Reference:	True
Well:	Mumby State 4A-36H	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
8,600.0	90.00	0.00	7,470.0	-142.9	-1,436.5	-142.9	0.00	0.00	
8,700.0	90.00	0.00	7,470.0	-42.9	-1,436.5	-42.9	0.00	0.00	
8,800.0	90.00	0.00	7,470.0	57.1	-1,436.5	57.1	0.00	0.00	
8,900.0	90.00	0.00	7,470.0	157.1	-1,436.5	157.1	0.00	0.00	
9,000.0	90.00	0.00	7,470.0	257.1	-1,436.5	257.1	0.00	0.00	
9,100.0	90.00	0.00	7,470.0	357.1	-1,436.5	357.1	0.00	0.00	
9,200.0	90.00	0.00	7,470.0	457.1	-1,436.5	457.1	0.00	0.00	
9,300.0	90.00	0.00	7,470.0	557.1	-1,436.5	557.1	0.00	0.00	
9,400.0	90.00	0.00	7,470.0	657.1	-1,436.5	657.1	0.00	0.00	
9,500.0	90.00	0.00	7,470.0	757.1	-1,436.5	757.1	0.00	0.00	
9,600.0	90.00	0.00	7,470.0	857.1	-1,436.5	857.1	0.00	0.00	
9,700.0	90.00	0.00	7,470.0	957.1	-1,436.5	957.1	0.00	0.00	
9,800.0	90.00	0.00	7,470.0	1,057.1	-1,436.5	1,057.1	0.00	0.00	
9,900.0	90.00	0.00	7,470.0	1,157.1	-1,436.5	1,157.1	0.00	0.00	
10,000.0	90.00	0.00	7,470.0	1,257.1	-1,436.5	1,257.1	0.00	0.00	
10,100.0	90.00	0.00	7,470.0	1,357.1	-1,436.5	1,357.1	0.00	0.00	
10,200.0	90.00	0.00	7,470.0	1,457.1	-1,436.5	1,457.1	0.00	0.00	
10,300.0	90.00	0.00	7,470.0	1,557.1	-1,436.5	1,557.1	0.00	0.00	
10,400.0	90.00	0.00	7,470.0	1,657.1	-1,436.5	1,657.1	0.00	0.00	
10,500.0	90.00	0.00	7,470.0	1,757.1	-1,436.5	1,757.1	0.00	0.00	
10,600.0	90.00	0.00	7,470.0	1,857.1	-1,436.5	1,857.1	0.00	0.00	
10,700.0	90.00	0.00	7,470.0	1,957.1	-1,436.5	1,957.1	0.00	0.00	
10,800.0	90.00	0.00	7,470.0	2,057.1	-1,436.5	2,057.1	0.00	0.00	
10,900.0	90.00	0.00	7,470.0	2,157.1	-1,436.5	2,157.1	0.00	0.00	
11,000.0	90.00	0.00	7,470.0	2,257.1	-1,436.5	2,257.1	0.00	0.00	
11,100.0	90.00	0.00	7,470.0	2,357.1	-1,436.5	2,357.1	0.00	0.00	
11,200.0	90.00	0.00	7,470.0	2,457.1	-1,436.5	2,457.1	0.00	0.00	
11,300.0	90.00	0.00	7,470.0	2,557.1	-1,436.5	2,557.1	0.00	0.00	
11,400.0	90.00	0.00	7,470.0	2,657.1	-1,436.5	2,657.1	0.00	0.00	
11,500.0	90.00	0.00	7,470.0	2,757.1	-1,436.5	2,757.1	0.00	0.00	
11,600.0	90.00	0.00	7,470.0	2,857.1	-1,436.5	2,857.1	0.00	0.00	
11,700.0	90.00	0.00	7,470.0	2,957.1	-1,436.5	2,957.1	0.00	0.00	
11,800.0	90.00	0.00	7,470.0	3,057.1	-1,436.5	3,057.1	0.00	0.00	
11,900.0	90.00	0.00	7,470.0	3,157.1	-1,436.5	3,157.1	0.00	0.00	
12,000.0	90.00	0.00	7,470.0	3,257.1	-1,436.5	3,257.1	0.00	0.00	
12,100.0	90.00	0.00	7,470.0	3,357.1	-1,436.5	3,357.1	0.00	0.00	
12,200.0	90.00	0.00	7,470.0	3,457.1	-1,436.5	3,457.1	0.00	0.00	
12,300.0	90.00	0.00	7,470.0	3,557.1	-1,436.5	3,557.1	0.00	0.00	
12,372.3	90.00	0.00	7,470.0	3,629.4	-1,436.5	3,629.4	0.00	0.00	TD at 12372.3

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
PBHL 4A-36H - plan hits target center - Point	0.00	0.00	7,470.0	3,629.4	-1,436.5	1,280,512.55	3,216,849.38	40.100790	-104.724830

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Mumby State 4A-36H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	WELL @ 5049.0ft (Original Well Elev)
Project:	DJ Wattenberg	MD Reference:	WELL @ 5049.0ft (Original Well Elev)
Site:	S36 T2N-R66W (Marcus State, Mumby State)	North Reference:	True
Well:	Mumby State 4A-36H	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,005.6	995.0	Fox Hills - BASE			
4,945.2	4,702.0	Sussex			
5,111.1	4,858.0	Sussex Marker			
5,513.0	5,236.0	Shannon			
6,857.9	6,549.0	Teepee Buttes (*if present)			
7,403.8	7,091.0	Sharon Springs			
7,449.1	7,133.0	Niobrara			
7,541.8	7,214.0	B Chalk			
7,584.9	7,249.0	B Marl			
7,626.7	7,281.0	C Chalk			
7,718.6	7,344.0	C Marl			
7,869.7	7,422.0	Ft. Hayes			
8,010.0	7,462.0	Codell			

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
200.0	200.0	0.0	0.0	KOP @ 200'
1,193.6	1,173.8	-109.9	-130.5	EOB; Inc=19.87°
5,715.2	5,426.2	-1,100.1	-1,306.0	Start Drop -2.00
6,708.9	6,400.0	-1,210.0	-1,436.5	EOD; Inc=0°
7,205.9	6,897.0	-1,210.0	-1,436.5	Start Build 10.00
8,105.9	7,470.0	-637.0	-1,436.5	LP @ 7470' TVD; 90°
12,372.3	7,470.0	3,629.4	-1,436.5	TD at 12372.3

EnCana Oil & Gas (USA) Inc

DJ Wattenberg

S36 T2N-R66W (Marcus State, Mumby State)

Mumby State 4A-36H

HZ

Plan #1

Anticollision Report

16 January, 2014

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Mumby State 4A-36H
Project:	DJ Wattenberg	TVD Reference:	WELL @ 5049.0ft (Original Well Elev)
Reference Site:	S36 T2N-R66W (Marcus State, Mumby State)	MD Reference:	WELL @ 5049.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Mumby State 4A-36H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Reference	Plan #1		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 100.0ft	Error Model:	Systematic Ellipse
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 500.0ft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma		

Survey Tool Program		Date	1/16/2014		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
0.0	12,371.9	Plan #1 (HZ)	Geolink MWD	Geolink MWD	

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
S36 T2N-R66W (Marcus State, Mumby State)						
BADDING STATE 1 (EXISTING) - PDC WELL - NO SUR						Out of range
BADDING STATE 31-36 (EXISTING) - ENCANA WELL -	12,295.0	7,474.0	291.5	212.3	3.681	CC
BADDING STATE 31-36 (EXISTING) - ENCANA WELL -	12,300.0	7,474.0	291.5	212.3	3.677	ES, SF
BADDING STATE 42-36 (EXISTING) - ENCANA WELL -						Out of range
BALLANTYNE WW 01-18D (EXISTING) - NOBLE WELL						Out of range
Marcus State 3A-36H - HZ - FINAL						Out of range
Marcus State 3B-36H - HZ - FINAL						Out of range
Marcus State 3C-36H - HZ - FINAL						Out of range
Marcus State 3D-36H - HZ - FINAL						Out of range
Marcus State 3E-36H - HZ - FINAL						Out of range
Marcus State 3F-36H - HZ - FINAL	11,500.0	11,045.0	402.5	301.1	3.970	CC
Marcus State 3F-36H - HZ - FINAL	11,900.0	11,429.4	406.6	293.0	3.581	ES
Marcus State 3F-36H - HZ - FINAL	12,372.3	11,888.7	427.6	299.4	3.334	SF
MUMBY STATE 1 (EXISTING) - ENCANA WELL - GYRO	0.0	3.9	160.2			
MUMBY STATE 1 (EXISTING) - ENCANA WELL - GYRO	1,200.0	1,180.6	213.5	209.2	48.765	SF
MUMBY STATE 33-36 (EXISTING) - ENCANA WELL - G						Out of range
Mumby State 4B-36H - HZ - Plan #1	200.0	199.0	10.1	9.5	17.023	CC, ES
Mumby State 4B-36H - HZ - Plan #1	12,372.3	12,051.5	429.3	317.7	3.848	SF
Mumby State 4C-36H - HZ - Plan #1	200.0	200.0	19.9	19.3	33.475	CC, ES
Mumby State 4C-36H - HZ - Plan #1	1,200.0	1,204.1	79.2	73.0	12.748	SF
Mumby State 4D-36H - HZ - Plan #1	200.0	199.0	29.9	29.3	50.601	CC, ES
Mumby State 4D-36H - HZ - Plan #1	3,200.0	3,168.6	486.2	462.3	20.332	SF
Mumby State 4E-36H - HZ - Plan #1	200.0	199.0	40.0	39.4	67.623	CC, ES
Mumby State 4E-36H - HZ - Plan #1	600.0	598.4	63.3	61.2	31.383	SF
Mumby State 4F-36H - HZ - Plan #1	200.0	199.0	50.1	49.5	84.646	CC, ES
Mumby State 4F-36H - HZ - Plan #1	800.0	794.6	104.7	101.7	35.389	SF
Mumby State 4G-36H - HZ - Plan #1	200.0	199.0	59.9	59.3	101.196	CC, ES
Mumby State 4G-36H - HZ - Plan #1	800.0	787.7	126.7	123.6	40.986	SF
Mumby State 4H-36H - HZ - Plan #1	200.0	199.0	69.9	69.4	118.224	CC, ES
Mumby State 4H-36H - HZ - Plan #1	800.0	778.2	155.1	152.0	48.961	SF

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Mumby State 4A-36H
Project:	DJ Wattenberg	TVD Reference:	WELL @ 5049.0ft (Original Well Elev)
Reference Site:	S36 T2N-R66W (Marcus State, Mumby State)	MD Reference:	WELL @ 5049.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Mumby State 4A-36H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S36 T2N-R66W (Marcus State, Mumby State) - BADDING STATE 31-36 (EXISTING) - ENCANA WELL													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Total Uncertainty Axis	Separation Factor	Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)				
11,900.0	7,470.0	7,474.0	7,474.0	64.4	13.0	90.00	3,552.1	-1,145.0	490.9	418.5	72.49	6.773		
12,000.0	7,470.0	7,474.0	7,474.0	66.0	13.0	90.00	3,552.1	-1,145.0	414.7	340.6	74.18	5.591		
12,100.0	7,470.0	7,474.0	7,474.0	67.6	13.0	90.00	3,552.1	-1,145.0	350.7	274.8	75.88	4.622		
12,200.0	7,470.0	7,474.0	7,474.0	69.1	13.0	90.00	3,552.1	-1,145.0	306.6	229.0	77.58	3.952		
12,295.0	7,470.0	7,474.0	7,474.0	70.7	13.0	90.00	3,552.1	-1,145.0	291.5	212.3	79.19	3.681 CC		
12,300.0	7,470.0	7,474.0	7,474.0	70.7	13.0	90.00	3,552.1	-1,145.0	291.5	212.3	79.28	3.677 ES, SF		
12,372.3	7,470.0	7,474.0	7,474.0	71.9	13.0	90.00	3,552.1	-1,145.0	301.5	221.0	80.51	3.745		

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Mumby State 4A-36H
Project:	DJ Wattenberg	TVD Reference:	WELL @ 5049.0ft (Original Well Elev)
Reference Site:	S36 T2N-R66W (Marcus State, Mumby State)	MD Reference:	WELL @ 5049.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Mumby State 4A-36H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S36 T2N-R66W (Marcus State, Mumby State) - Marcus State 3F-36H - HZ - FINAL												Offset Site Error: 0.0 ft	
Survey Program: 202-Geolink MWD												Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	
6,700.0	6,391.1	6,552.0	6,471.0	35.7	20.9	41.51	-1,198.2	-1,925.6	495.3	457.9	37.34	13.263	
6,800.0	6,491.1	6,638.6	6,556.7	35.8	21.2	-89.02	-1,201.9	-1,912.9	480.6	443.1	37.46	12.828	
6,900.0	6,591.1	6,728.9	6,646.3	35.8	21.4	-89.21	-1,203.6	-1,902.6	469.1	431.4	37.64	12.462	
7,000.0	6,691.1	6,857.0	6,771.9	35.9	21.8	-87.39	-1,189.6	-1,882.6	453.3	415.0	38.35	11.820	
7,100.0	6,791.1	6,946.7	6,856.2	35.9	22.0	-83.84	-1,163.5	-1,867.4	437.8	398.3	39.52	11.078	
7,200.0	6,891.1	7,030.8	6,931.2	36.0	22.1	-78.92	-1,128.5	-1,853.0	426.0	384.8	41.28	10.321	
7,300.0	6,990.7	7,109.0	6,997.2	35.9	22.3	-74.53	-1,088.5	-1,840.1	419.4	376.6	42.80	9.798	
7,400.0	7,087.5	7,179.6	7,051.7	35.7	22.4	-70.68	-1,045.1	-1,829.2	416.2	372.5	43.66	9.533	
7,490.1	7,169.8	7,243.7	7,096.7	35.4	22.6	-67.38	-1,000.4	-1,820.0	415.4	371.6	43.79	9.487	
7,500.0	7,178.4	7,250.6	7,101.2	35.3	22.6	-67.04	-995.3	-1,819.0	415.4	371.7	43.76	9.493	
7,600.0	7,260.8	7,316.9	7,142.3	34.8	22.7	-64.06	-943.9	-1,810.8	416.3	373.5	42.82	9.722	
7,700.0	7,332.1	7,379.2	7,174.8	34.2	22.9	-61.65	-891.2	-1,805.1	419.1	378.3	40.84	10.264	
7,800.0	7,390.3	7,449.1	7,204.4	33.6	23.1	-59.56	-828.0	-1,800.3	422.1	383.9	38.21	11.047	
7,900.0	7,433.4	7,520.0	7,226.1	32.9	23.4	-58.06	-760.7	-1,796.2	423.9	388.7	35.12	12.069	
8,000.0	7,460.2	7,583.0	7,238.5	32.3	23.6	-57.32	-699.1	-1,793.2	423.8	391.9	31.95	13.267	
8,100.0	7,470.0	7,655.0	7,244.3	31.7	24.0	-57.18	-627.3	-1,791.4	422.5	393.1	29.35	14.395	
8,179.7	7,470.5	7,718.1	7,245.4	31.3	24.3	-57.23	-564.2	-1,790.8	421.4	392.1	29.28	14.392	
8,200.0	7,470.0	7,735.5	7,245.2	31.2	24.4	-57.26	-546.9	-1,790.8	421.3	392.0	29.28	14.386	
8,300.0	7,470.0	7,840.0	7,243.3	30.7	25.1	-57.01	-442.3	-1,790.2	421.7	392.0	29.70	14.199	
8,400.0	7,470.0	7,946.9	7,242.1	30.4	25.9	-56.70	-335.5	-1,788.0	420.6	390.2	30.36	13.852	
8,500.0	7,470.0	8,046.2	7,242.2	30.2	26.8	-56.56	-236.2	-1,785.9	418.8	387.6	31.19	13.427	
8,600.0	7,470.0	8,145.7	7,242.0	30.0	27.7	-56.41	-136.8	-1,784.2	417.5	385.3	32.21	12.960	
8,700.0	7,470.0	8,246.0	7,242.9	30.0	28.8	-56.38	-36.5	-1,782.6	415.6	382.2	33.46	12.422	
8,791.0	7,470.0	8,330.6	7,244.2	30.0	29.7	-56.53	48.1	-1,782.6	414.9	380.1	34.72	11.950	
8,800.0	7,470.0	8,338.7	7,244.3	30.0	29.7	-56.54	56.3	-1,782.6	414.9	380.0	34.84	11.908	
8,900.0	7,470.0	8,440.9	7,244.2	30.2	30.9	-56.59	158.4	-1,783.4	415.6	379.1	36.48	11.394	
9,000.0	7,470.0	8,546.7	7,248.8	30.4	32.1	-57.20	264.0	-1,784.4	414.0	375.5	38.46	10.764	
9,100.0	7,470.0	8,645.4	7,251.4	30.8	33.4	-57.50	362.8	-1,784.4	412.5	372.1	40.43	10.202	
9,200.0	7,470.0	8,745.5	7,250.4	31.2	34.7	-57.21	462.8	-1,782.1	411.1	368.8	42.38	9.702	
9,300.0	7,470.0	8,844.5	7,249.0	31.8	36.0	-56.86	561.8	-1,779.6	409.8	365.4	44.38	9.235	
9,400.0	7,470.0	8,941.7	7,248.6	32.4	37.4	-56.73	659.0	-1,778.4	409.0	362.5	46.51	8.793	
9,441.4	7,470.0	8,981.2	7,248.8	32.7	37.9	-56.74	698.5	-1,778.4	408.9	361.4	47.44	8.618	
9,500.0	7,470.0	9,036.3	7,248.8	33.1	38.7	-56.77	753.6	-1,778.7	409.1	360.4	48.75	8.392	
9,600.0	7,470.0	9,126.4	7,247.6	33.9	39.9	-56.73	843.7	-1,780.0	411.1	360.1	50.97	8.065	
9,700.0	7,470.0	9,225.0	7,245.3	34.8	41.3	-56.69	942.1	-1,783.0	414.9	361.6	53.36	7.776	
9,800.0	7,470.0	9,333.5	7,247.5	35.8	42.9	-57.27	1,050.6	-1,787.3	417.1	360.9	56.24	7.417	
9,900.0	7,470.0	9,434.2	7,249.7	36.8	44.4	-57.75	1,151.2	-1,790.4	418.5	359.4	59.04	7.088	
10,000.0	7,470.0	9,534.6	7,250.2	37.9	45.9	-57.96	1,251.5	-1,792.4	420.0	358.2	61.76	6.800	
10,100.0	7,470.0	9,638.9	7,248.6	39.0	47.5	-57.78	1,355.8	-1,792.5	420.8	356.5	64.36	6.539	
10,200.0	7,470.0	9,742.0	7,249.4	40.2	49.1	-57.85	1,458.9	-1,792.3	420.3	353.2	67.11	6.263	
10,215.8	7,470.0	9,755.9	7,249.5	40.4	49.3	-57.87	1,472.8	-1,792.4	420.3	352.7	67.52	6.224	
10,300.0	7,470.0	9,832.7	7,248.4	41.4	50.5	-57.77	1,549.7	-1,792.7	421.2	351.6	69.63	6.049	
10,400.0	7,470.0	9,935.3	7,247.6	42.7	52.1	-57.78	1,652.2	-1,794.1	422.7	350.3	72.39	5.840	
10,500.0	7,470.0	10,042.8	7,247.7	43.9	53.8	-57.83	1,759.7	-1,794.7	423.2	347.9	75.27	5.622	
10,600.0	7,470.0	10,152.3	7,247.4	45.3	55.5	-57.61	1,869.1	-1,792.1	421.3	343.3	78.01	5.400	
10,700.0	7,470.0	10,249.8	7,247.1	46.6	57.1	-57.31	1,966.6	-1,788.4	418.3	337.8	80.51	5.195	
10,800.0	7,470.0	10,348.0	7,247.1	48.0	58.7	-57.15	2,064.7	-1,786.3	416.5	333.4	83.14	5.010	
10,900.0	7,470.0	10,449.4	7,247.1	49.4	60.4	-56.96	2,166.2	-1,783.8	414.4	328.7	85.78	4.832	
11,000.0	7,470.0	10,545.9	7,246.9	50.8	61.9	-56.76	2,262.6	-1,781.5	412.5	324.2	88.34	4.670	
11,100.0	7,470.0	10,649.3	7,246.3	52.3	63.6	-56.53	2,366.0	-1,779.3	411.1	320.1	90.98	4.518	
11,200.0	7,470.0	10,752.5	7,246.3	53.7	65.3	-56.26	2,469.1	-1,776.0	408.4	314.9	93.57	4.365	
11,300.0	7,470.0	10,848.7	7,246.7	55.2	66.9	-56.10	2,565.3	-1,773.3	405.9	309.7	96.15	4.222	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Mumby State 4A-36H
Project:	DJ Wattenberg	TVD Reference:	WELL @ 5049.0ft (Original Well Elev)
Reference Site:	S36 T2N-R66W (Marcus State, Mumby State)	MD Reference:	WELL @ 5049.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Mumby State 4A-36H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S36 T2N-R66W (Marcus State, Mumby State) - Marcus State 3F-36H - HZ - FINAL													Offset Site Error: 0.0 ft	
Survey Program: 202-Geolink MWD													Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor		
11,400.0	7,470.0	10,950.9	7,247.1	56.7	68.6	-55.96	2,667.5	-1,770.8	403.7	304.8	98.83	4.084		
11,500.0	7,470.0	11,045.0	7,246.8	58.2	70.2	-55.80	2,761.5	-1,769.4	402.5	301.1	101.38	3.970 CC		
11,514.6	7,470.0	11,053.4	7,246.6	58.5	70.3	-55.77	2,769.9	-1,769.3	402.5	300.8	101.67	3.959		
11,600.0	7,470.0	11,135.6	7,245.1	59.8	71.7	-55.58	2,852.2	-1,769.1	403.2	299.4	103.81	3.884		
11,700.0	7,470.0	11,241.0	7,246.1	61.3	73.4	-55.80	2,957.5	-1,770.4	403.7	296.8	106.93	3.775		
11,706.5	7,470.0	11,247.0	7,246.2	61.4	73.5	-55.83	2,963.5	-1,770.5	403.7	296.6	107.14	3.768		
11,800.0	7,470.0	11,334.4	7,248.5	62.8	75.0	-56.27	3,050.8	-1,772.8	404.4	294.2	110.20	3.670		
11,900.0	7,470.0	11,429.4	7,250.3	64.4	76.5	-56.77	3,145.8	-1,776.4	406.6	293.0	113.54	3.581 ES		
12,000.0	7,470.0	11,519.4	7,250.8	66.0	78.0	-57.19	3,235.7	-1,781.1	410.6	293.8	116.76	3.517		
12,100.0	7,470.0	11,623.3	7,251.0	67.6	79.8	-57.66	3,339.3	-1,787.0	415.3	295.0	120.25	3.453		
12,200.0	7,470.0	11,723.9	7,250.0	69.1	81.4	-57.86	3,439.9	-1,791.3	419.5	296.1	123.40	3.399		
12,300.0	7,470.0	11,821.1	7,247.9	70.7	83.1	-57.86	3,537.0	-1,794.7	423.6	297.3	126.26	3.355		
12,372.3	7,470.0	11,888.7	7,245.6	71.9	84.2	-57.82	3,604.4	-1,797.8	427.6	299.4	128.24	3.334 SF		

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Mumby State 4A-36H
Project:	DJ Wattenberg	TVD Reference:	WELL @ 5049.0ft (Original Well Elev)
Reference Site:	S36 T2N-R66W (Marcus State, Mumby State)	MD Reference:	WELL @ 5049.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Mumby State 4A-36H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S36 T2N-R66W (Marcus State, Mumby State) - MUMBY STATE 1 (EXISTING) - ENCANA WELL - GYR													Offset Site Error: 0.0 ft
Survey Program: 100-Gyro													Offset Well Error: 0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	
0.0	0.0	3.9	3.9	0.0	0.0	155.44	-145.7	66.6	160.2				
100.0	100.0	101.9	101.9	0.1	0.1	155.31	-146.2	67.2	160.9	160.7	0.20	805.146	
200.0	200.0	204.3	204.3	0.3	0.2	154.99	-146.3	68.3	161.4	161.0	0.46	348.098	
229.2	229.2	232.7	232.7	0.3	0.2	-75.07	-146.2	68.5	161.4	160.9	0.54	298.297	
300.0	300.0	301.8	301.8	0.5	0.3	-75.88	-146.3	69.5	161.6	160.9	0.73	221.903	
400.0	399.8	400.9	400.9	0.7	0.3	-77.99	-147.3	71.1	162.0	161.0	1.01	160.417	
500.0	499.5	500.5	500.4	0.9	0.4	-81.20	-148.6	72.5	162.3	161.0	1.32	122.652	
600.0	598.7	600.3	600.3	1.2	0.5	-85.48	-150.0	73.5	162.6	160.9	1.68	96.809	
700.0	697.5	699.0	698.9	1.5	0.6	-90.92	-151.1	74.5	163.6	161.5	2.08	78.497	
800.0	795.6	799.4	799.3	1.9	0.7	-97.78	-151.2	75.6	166.0	163.4	2.54	65.437	
900.0	893.1	897.0	896.9	2.3	0.8	-105.16	-151.0	76.0	170.7	167.7	3.02	56.628	
1,000.0	989.6	994.0	993.9	2.8	0.9	-112.91	-150.7	76.1	179.4	175.9	3.50	51.285	
1,100.0	1,085.3	1,088.0	1,087.9	3.3	0.9	-120.61	-149.7	76.8	193.4	189.4	3.96	48.860	
1,200.0	1,179.8	1,180.6	1,180.5	3.9	1.0	-127.65	-149.4	78.0	213.5	209.2	4.38	48.765 SF	
1,300.0	1,273.9	1,274.3	1,274.2	4.6	1.1	-133.84	-150.1	79.4	238.1	233.4	4.73	50.330	
1,400.0	1,367.9	1,370.0	1,369.9	5.2	1.2	-138.90	-151.2	80.5	264.7	259.6	5.04	52.488	
1,500.0	1,462.0	1,465.2	1,465.1	5.8	1.3	-143.10	-151.9	81.0	292.2	286.9	5.32	54.905	
1,600.0	1,556.0	1,559.9	1,559.7	6.4	1.4	-146.76	-151.7	81.1	320.8	315.2	5.57	57.594	
1,700.0	1,650.0	1,654.7	1,654.5	7.1	1.4	-149.91	-151.0	81.0	350.1	344.3	5.80	60.398	
1,800.0	1,744.1	1,748.4	1,748.2	7.7	1.5	-152.61	-149.9	80.6	380.2	374.2	6.01	63.225	
1,900.0	1,838.1	1,840.2	1,840.1	8.3	1.6	-154.82	-149.2	80.6	411.2	405.0	6.23	65.985	
2,000.0	1,932.2	1,934.8	1,934.7	9.0	1.7	-156.63	-149.4	81.3	443.2	436.7	6.46	68.610	
2,100.0	2,026.2	2,033.9	2,033.7	9.6	1.8	-158.25	-150.1	81.1	474.5	467.8	6.68	70.973	

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Mumby State 4A-36H
Project:	DJ Wattenberg	TVD Reference:	WELL @ 5049.0ft (Original Well Elev)
Reference Site:	S36 T2N-R66W (Marcus State, Mumby State)	MD Reference:	WELL @ 5049.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Mumby State 4A-36H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S36 T2N-R66W (Marcus State, Mumby State) - Mumby State 4B-36H - HZ - Plan #1													Offset Site Error: 0.0 ft	
Survey Program: 0-Geolink MWD													Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor		
0.0	0.0	0.0	0.0	0.0	0.0	90.00	0.0	10.1	10.1					
100.0	100.0	99.0	99.0	0.1	0.1	90.00	0.0	10.1	10.1	9.8	0.24	41.428		
200.0	200.0	199.0	199.0	0.3	0.3	90.00	0.0	10.1	10.1	9.5	0.59	17.023 CC, ES		
300.0	300.0	299.1	299.1	0.5	0.5	-144.07	-0.3	9.8	11.2	10.2	0.94	11.839		
400.0	399.8	399.4	399.3	0.7	0.7	-147.08	-2.9	7.5	12.9	11.6	1.30	9.920		
500.0	499.5	499.8	499.5	0.9	0.9	-147.86	-8.1	2.8	14.9	13.3	1.68	8.910		
600.0	598.7	600.2	599.3	1.2	1.1	-147.14	-15.8	-4.3	17.2	15.2	2.09	8.270		
700.0	697.5	700.6	698.8	1.5	1.4	-145.48	-26.2	-13.7	19.8	17.3	2.55	7.787		
800.0	795.6	801.1	797.7	1.9	1.7	-143.26	-39.2	-25.4	22.7	19.6	3.08	7.365		
900.0	893.1	901.7	896.1	2.3	2.1	-140.75	-54.7	-39.5	25.9	22.2	3.72	6.964		
1,000.0	989.6	1,002.2	993.6	2.8	2.6	-138.11	-72.8	-55.9	29.5	25.0	4.48	6.580		
1,100.0	1,085.3	1,102.9	1,090.3	3.3	3.1	-135.48	-93.4	-74.5	33.4	28.0	5.37	6.218		
1,200.0	1,179.8	1,202.9	1,185.7	3.9	3.6	-134.15	-115.6	-94.7	38.3	32.0	6.30	6.075		
1,300.0	1,273.9	1,302.7	1,280.9	4.6	4.2	-134.52	-137.9	-114.9	44.2	37.0	7.17	6.163		
1,400.0	1,367.9	1,402.6	1,376.1	5.2	4.7	-134.81	-160.2	-135.1	50.1	42.1	8.05	6.226		
1,500.0	1,462.0	1,502.4	1,471.3	5.8	5.3	-135.03	-182.5	-155.3	56.0	47.1	8.93	6.274		
1,600.0	1,556.0	1,602.2	1,566.5	6.4	5.8	-135.21	-204.8	-175.6	61.9	52.1	9.81	6.310		
1,700.0	1,650.0	1,702.0	1,661.7	7.1	6.4	-135.36	-227.1	-195.8	67.8	57.1	10.70	6.339		
1,800.0	1,744.1	1,801.9	1,756.8	7.7	6.9	-135.49	-249.4	-216.0	73.8	62.2	11.59	6.363		
1,900.0	1,838.1	1,901.7	1,852.0	8.3	7.5	-135.59	-271.7	-236.2	79.7	67.2	12.49	6.382		
2,000.0	1,932.2	2,001.5	1,947.2	9.0	8.1	-135.68	-294.0	-256.4	85.6	72.2	13.38	6.398		
2,100.0	2,026.2	2,101.3	2,042.4	9.6	8.6	-135.76	-316.3	-276.6	91.5	77.2	14.27	6.412		
2,200.0	2,120.3	2,201.2	2,137.6	10.2	9.2	-135.83	-338.6	-296.8	97.4	82.3	15.17	6.423		
2,300.0	2,214.3	2,301.0	2,232.7	10.9	9.7	-135.90	-360.9	-317.0	103.3	87.3	16.06	6.433		
2,400.0	2,308.4	2,400.8	2,327.9	11.5	10.3	-135.95	-383.2	-337.2	109.3	92.3	16.96	6.442		
2,500.0	2,402.4	2,500.6	2,423.1	12.1	10.9	-136.00	-405.5	-357.4	115.2	97.3	17.86	6.450		
2,600.0	2,496.5	2,600.4	2,518.3	12.8	11.4	-136.05	-427.8	-377.6	121.1	102.3	18.76	6.457		
2,700.0	2,590.5	2,700.3	2,613.5	13.4	12.0	-136.09	-450.1	-397.8	127.0	107.4	19.65	6.463		
2,800.0	2,684.5	2,800.1	2,708.7	14.0	12.5	-136.13	-472.3	-418.0	132.9	112.4	20.55	6.468		
2,900.0	2,778.6	2,899.9	2,803.8	14.7	13.1	-136.16	-494.6	-438.2	138.8	117.4	21.45	6.473		
3,000.0	2,872.6	2,999.7	2,899.0	15.3	13.7	-136.19	-516.9	-458.4	144.8	122.4	22.35	6.477		
3,100.0	2,966.7	3,099.6	2,994.2	15.9	14.2	-136.22	-539.2	-478.6	150.7	127.4	23.25	6.481		
3,200.0	3,060.7	3,199.4	3,089.4	16.6	14.8	-136.25	-561.5	-498.8	156.6	132.5	24.15	6.485		
3,300.0	3,154.8	3,299.2	3,184.6	17.2	15.4	-136.27	-583.8	-519.0	162.5	137.5	25.05	6.489		
3,400.0	3,248.8	3,399.0	3,279.8	17.8	15.9	-136.29	-606.1	-539.2	168.4	142.5	25.95	6.492		
3,500.0	3,342.9	3,498.9	3,374.9	18.5	16.5	-136.31	-628.4	-559.4	174.4	147.5	26.85	6.495		
3,600.0	3,436.9	3,598.7	3,470.1	19.1	17.0	-136.33	-650.7	-579.6	180.3	152.5	27.75	6.497		
3,700.0	3,530.9	3,698.5	3,565.3	19.8	17.6	-136.35	-673.0	-599.9	186.2	157.5	28.65	6.500		
3,800.0	3,625.0	3,798.3	3,660.5	20.4	18.2	-136.37	-695.3	-620.1	192.1	162.6	29.55	6.502		
3,900.0	3,719.0	3,898.2	3,755.7	21.0	18.7	-136.39	-717.6	-640.3	198.0	167.6	30.45	6.504		
4,000.0	3,813.1	3,998.0	3,850.9	21.7	19.3	-136.40	-739.9	-660.5	203.9	172.6	31.35	6.506		
4,100.0	3,907.1	4,097.8	3,946.0	22.3	19.9	-136.42	-762.2	-680.7	209.9	177.6	32.25	6.508		
4,200.0	4,001.2	4,197.6	4,041.2	22.9	20.4	-136.43	-784.5	-700.9	215.8	182.6	33.15	6.510		
4,300.0	4,095.2	4,297.5	4,136.4	23.6	21.0	-136.44	-806.8	-721.1	221.7	187.6	34.05	6.511		
4,400.0	4,189.3	4,397.3	4,231.6	24.2	21.5	-136.46	-829.1	-741.3	227.6	192.7	34.95	6.513		
4,500.0	4,283.3	4,497.1	4,326.8	24.8	22.1	-136.47	-851.3	-761.5	233.5	197.7	35.85	6.514		
4,600.0	4,377.4	4,596.9	4,421.9	25.5	22.7	-136.48	-873.6	-781.7	239.4	202.7	36.75	6.516		
4,700.0	4,471.4	4,696.8	4,517.1	26.1	23.2	-136.49	-895.9	-801.9	245.4	207.7	37.65	6.517		
4,800.0	4,565.4	4,796.6	4,612.3	26.8	23.8	-136.50	-918.2	-822.1	251.3	212.7	38.55	6.518		
4,900.0	4,659.5	4,896.4	4,707.5	27.4	24.4	-136.51	-940.5	-842.3	257.2	217.7	39.45	6.519		
5,000.0	4,753.5	4,996.2	4,802.7	28.0	24.9	-136.52	-962.8	-862.5	263.1	222.8	40.35	6.520		
5,100.0	4,847.6	5,096.1	4,897.9	28.7	25.5	-136.53	-985.1	-882.7	269.0	227.8	41.25	6.521		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Mumby State 4A-36H
Project:	DJ Wattenberg	TVD Reference:	WELL @ 5049.0ft (Original Well Elev)
Reference Site:	S36 T2N-R66W (Marcus State, Mumby State)	MD Reference:	WELL @ 5049.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Mumby State 4A-36H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S36 T2N-R66W (Marcus State, Mumby State) - Mumby State 4B-36H - HZ - Plan #1													Offset Site Error: 0.0 ft	
Survey Program: 0-Geolink MWD													Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor		
5,200.0	4,941.6	5,195.9	4,993.0	29.3	26.0	-136.54	-1,007.4	-902.9	274.9	232.8	42.15	6.523		
5,300.0	5,035.7	5,295.7	5,088.2	29.9	26.6	-136.54	-1,029.7	-923.1	280.9	237.8	43.05	6.523		
5,400.0	5,129.7	5,395.5	5,183.4	30.6	27.2	-136.55	-1,052.0	-943.3	286.8	242.8	43.96	6.524		
5,500.0	5,223.8	5,495.4	5,278.6	31.2	27.7	-136.56	-1,074.3	-963.5	292.7	247.8	44.86	6.525		
5,600.0	5,317.8	5,595.2	5,373.8	31.8	28.3	-136.57	-1,096.6	-983.7	298.6	252.9	45.76	6.526		
5,700.0	5,411.9	5,692.9	5,467.0	32.5	28.8	-136.60	-1,118.3	-1,003.4	304.7	258.0	46.63	6.534		
5,800.0	5,506.3	5,786.3	5,556.7	33.1	29.3	-136.90	-1,137.3	-1,020.7	311.4	264.1	47.26	6.589		
5,900.0	5,601.8	5,879.5	5,647.2	33.6	29.7	-137.23	-1,154.2	-1,035.9	317.7	269.9	47.79	6.648		
6,000.0	5,698.4	5,972.6	5,738.2	34.1	30.1	-137.55	-1,168.8	-1,049.2	323.5	275.3	48.22	6.709		
6,100.0	5,795.7	6,065.7	5,829.7	34.5	30.4	-137.89	-1,181.2	-1,060.4	328.9	280.3	48.57	6.771		
6,200.0	5,893.8	6,158.5	5,921.5	34.8	30.6	-138.23	-1,191.4	-1,069.7	333.8	284.9	48.83	6.835		
6,300.0	5,992.5	6,251.3	6,013.7	35.1	30.8	-138.58	-1,199.4	-1,076.9	338.2	289.2	49.00	6.901		
6,400.0	6,091.7	6,344.0	6,106.0	35.3	31.0	-138.93	-1,205.1	-1,082.1	342.1	293.0	49.08	6.969		
6,500.0	6,191.3	6,436.6	6,198.5	35.5	31.1	-139.29	-1,208.7	-1,085.3	345.5	296.4	49.08	7.039		
6,600.0	6,291.2	6,529.0	6,290.9	35.6	31.2	-139.66	-1,210.0	-1,086.5	348.4	299.4	49.00	7.110		
6,700.0	6,391.1	6,628.3	6,390.1	35.7	31.2	-139.89	-1,210.0	-1,086.5	350.0	301.0	48.97	7.147		
6,800.0	6,491.1	6,728.3	6,490.1	35.8	31.3	90.00	-1,210.0	-1,086.5	350.0	300.8	49.13	7.124		
6,900.0	6,591.1	6,828.3	6,590.1	35.8	31.4	90.00	-1,210.0	-1,086.5	350.0	300.7	49.30	7.099		
6,961.6	6,652.8	6,889.9	6,651.8	35.8	31.4	90.00	-1,210.0	-1,086.5	350.0	300.6	49.40	7.085		
7,000.0	6,691.1	6,928.2	6,690.0	35.9	31.4	89.74	-1,208.4	-1,086.5	350.0	300.7	49.23	7.109		
7,100.0	6,791.1	7,025.4	6,785.9	35.9	31.2	87.21	-1,192.9	-1,086.5	350.4	303.1	47.33	7.403		
7,200.0	6,891.1	7,115.1	6,870.8	36.0	30.9	82.59	-1,164.5	-1,086.5	353.4	309.7	43.72	8.084		
7,300.0	6,990.7	7,200.0	6,946.3	35.9	30.5	76.70	-1,125.7	-1,086.5	360.9	322.0	38.93	9.269		
7,400.0	7,087.5	7,276.3	7,008.5	35.7	30.0	71.62	-1,081.6	-1,086.5	371.1	336.2	34.90	10.633		
7,500.0	7,178.4	7,350.0	7,062.5	35.3	29.5	67.14	-1,031.6	-1,086.5	382.9	351.2	31.74	12.062		
7,600.0	7,260.8	7,426.7	7,111.5	34.8	29.0	63.18	-972.6	-1,086.5	394.9	365.5	29.38	13.439		
7,700.0	7,332.1	7,500.0	7,150.5	34.2	28.4	60.03	-910.6	-1,086.5	406.1	378.2	27.96	14.526		
7,800.0	7,390.3	7,570.7	7,180.3	33.6	27.8	57.65	-846.5	-1,086.5	415.8	388.4	27.34	15.208		
7,900.0	7,433.4	7,641.3	7,202.0	32.9	27.3	55.95	-779.4	-1,086.6	423.1	395.7	27.45	15.413		
8,000.0	7,460.2	7,711.3	7,215.2	32.3	26.8	54.93	-710.7	-1,086.6	427.8	399.5	28.32	15.108		
8,100.0	7,470.0	7,785.2	7,220.0	31.7	26.3	54.56	-637.0	-1,086.6	429.5	399.7	29.80	14.411		
8,135.8	7,470.3	7,815.0	7,220.0	31.5	26.1	54.54	-607.2	-1,086.6	429.6	400.2	29.45	14.587		
8,200.0	7,470.0	7,879.3	7,220.0	31.2	25.7	54.57	-542.9	-1,086.6	429.5	400.7	28.79	14.917		
8,300.0	7,470.0	7,979.3	7,220.0	30.7	25.2	54.57	-442.9	-1,086.6	429.5	401.7	27.80	15.451		
8,400.0	7,470.0	8,079.3	7,220.0	30.4	24.8	54.56	-342.9	-1,086.6	429.5	402.4	27.07	15.865		
8,500.0	7,470.0	8,179.3	7,220.0	30.2	24.6	54.56	-242.9	-1,086.6	429.5	402.8	26.63	16.124		
8,600.0	7,470.0	8,279.3	7,220.0	30.0	24.4	54.56	-142.9	-1,086.6	429.5	403.0	26.50	16.203		
8,700.0	7,470.0	8,379.3	7,220.0	30.0	24.4	54.56	-42.9	-1,086.6	429.5	402.8	26.68	16.095		
8,800.0	7,470.0	8,479.3	7,220.0	30.0	24.5	54.56	57.1	-1,086.6	429.5	402.3	27.16	15.810		
8,900.0	7,470.0	8,579.3	7,220.0	30.2	24.7	54.56	157.1	-1,086.6	429.4	401.5	27.93	15.375		
9,000.0	7,470.0	8,679.3	7,220.0	30.4	25.0	54.56	257.1	-1,086.6	429.4	400.5	28.96	14.826		
9,100.0	7,470.0	8,779.3	7,220.0	30.8	25.5	54.56	357.1	-1,086.6	429.4	399.2	30.24	14.203		
9,200.0	7,470.0	8,879.3	7,220.0	31.2	26.1	54.56	457.1	-1,086.6	429.4	397.7	31.71	13.540		
9,300.0	7,470.0	8,979.3	7,220.0	31.8	26.8	54.56	557.1	-1,086.6	429.4	396.0	33.38	12.867		
9,400.0	7,470.0	9,079.3	7,220.0	32.4	27.6	54.56	657.1	-1,086.6	429.4	394.2	35.19	12.202		
9,500.0	7,470.0	9,179.3	7,220.0	33.1	28.4	54.56	757.1	-1,086.6	429.4	392.3	37.14	11.562		
9,600.0	7,470.0	9,279.3	7,220.0	33.9	29.4	54.56	857.1	-1,086.6	429.4	390.2	39.20	10.954		
9,700.0	7,470.0	9,379.3	7,220.0	34.8	30.5	54.56	957.1	-1,086.6	429.4	388.0	41.36	10.382		
9,800.0	7,470.0	9,479.3	7,220.0	35.8	31.6	54.56	1,057.1	-1,086.7	429.4	385.8	43.60	9.849		
9,900.0	7,470.0	9,579.3	7,220.0	36.8	32.7	54.56	1,157.1	-1,086.7	429.4	383.5	45.91	9.353		
10,000.0	7,470.0	9,679.3	7,220.0	37.9	33.9	54.56	1,257.1	-1,086.7	429.4	381.1	48.28	8.894		
10,100.0	7,470.0	9,779.3	7,220.0	39.0	35.2	54.56	1,357.1	-1,086.7	429.4	378.7	50.70	8.469		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Mumby State 4A-36H
Project:	DJ Wattenberg	TVD Reference:	WELL @ 5049.0ft (Original Well Elev)
Reference Site:	S36 T2N-R66W (Marcus State, Mumby State)	MD Reference:	WELL @ 5049.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Mumby State 4A-36H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S36 T2N-R66W (Marcus State, Mumby State) - Mumby State 4B-36H - HZ - Plan #1													Offset Site Error:	0.0 ft
Survey Program: 0-Geolink MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance				Total		Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Uncertainty Axis	Separation Factor		
10,200.0	7,470.0	9,879.3	7,220.0	40.2	36.5	54.56	1,457.1	-1,086.7	429.4	376.2	53.16	8.076		
10,300.0	7,470.0	9,979.3	7,220.0	41.4	37.8	54.56	1,557.1	-1,086.7	429.4	373.7	55.67	7.713		
10,400.0	7,470.0	10,079.3	7,220.0	42.7	39.2	54.56	1,657.1	-1,086.7	429.4	371.2	58.20	7.377		
10,500.0	7,470.0	10,179.3	7,220.0	43.9	40.6	54.55	1,757.1	-1,086.7	429.4	368.6	60.77	7.065		
10,600.0	7,470.0	10,279.3	7,220.0	45.3	42.1	54.55	1,857.1	-1,086.7	429.4	366.0	63.36	6.776		
10,700.0	7,470.0	10,379.3	7,220.0	46.6	43.5	54.55	1,957.1	-1,086.7	429.4	363.4	65.98	6.508		
10,800.0	7,470.0	10,479.3	7,220.0	48.0	45.0	54.55	2,057.1	-1,086.7	429.3	360.7	68.61	6.258		
10,900.0	7,470.0	10,579.3	7,220.0	49.4	46.5	54.55	2,157.1	-1,086.7	429.3	358.1	71.27	6.025		
11,000.0	7,470.0	10,679.3	7,220.0	50.8	48.0	54.55	2,257.1	-1,086.7	429.3	355.4	73.93	5.807		
11,100.0	7,470.0	10,779.3	7,220.0	52.3	49.5	54.55	2,357.1	-1,086.7	429.3	352.7	76.62	5.604		
11,200.0	7,470.0	10,879.3	7,220.0	53.7	51.1	54.55	2,457.1	-1,086.7	429.3	350.0	79.31	5.413		
11,300.0	7,470.0	10,979.3	7,220.0	55.2	52.6	54.55	2,557.1	-1,086.7	429.3	347.3	82.02	5.234		
11,400.0	7,470.0	11,079.3	7,220.0	56.7	54.2	54.55	2,657.1	-1,086.7	429.3	344.6	84.74	5.066		
11,500.0	7,470.0	11,179.3	7,220.0	58.2	55.8	54.55	2,757.1	-1,086.7	429.3	341.9	87.46	4.908		
11,600.0	7,470.0	11,279.3	7,220.0	59.8	57.3	54.55	2,857.1	-1,086.7	429.3	339.1	90.20	4.760		
11,700.0	7,470.0	11,379.3	7,220.0	61.3	58.9	54.55	2,957.1	-1,086.8	429.3	336.4	92.94	4.619		
11,800.0	7,470.0	11,479.3	7,220.0	62.8	60.5	54.55	3,057.1	-1,086.8	429.3	333.6	95.69	4.486		
11,900.0	7,470.0	11,579.3	7,220.0	64.4	62.2	54.55	3,157.1	-1,086.8	429.3	330.8	98.45	4.360		
12,000.0	7,470.0	11,679.3	7,220.0	66.0	63.8	54.55	3,257.1	-1,086.8	429.3	328.1	101.22	4.241		
12,100.0	7,470.0	11,779.3	7,220.0	67.6	65.4	54.55	3,357.1	-1,086.8	429.3	325.3	103.98	4.128		
12,200.0	7,470.0	11,879.3	7,220.0	69.1	67.0	54.55	3,457.1	-1,086.8	429.3	322.5	106.76	4.021		
12,300.0	7,470.0	11,979.3	7,220.0	70.7	68.7	54.55	3,557.1	-1,086.8	429.3	319.7	109.54	3.919		
12,362.8	7,470.0	12,042.0	7,220.0	71.7	69.7	54.55	3,619.8	-1,086.8	429.3	318.0	111.28	3.857		
12,372.3	7,470.0	12,051.5	7,220.0	71.9	69.9	54.55	3,629.3	-1,086.8	429.3	317.7	111.55	3.848 SF		

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Mumby State 4A-36H
Project:	DJ Wattenberg	TVD Reference:	WELL @ 5049.0ft (Original Well Elev)
Reference Site:	S36 T2N-R66W (Marcus State, Mumby State)	MD Reference:	WELL @ 5049.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Mumby State 4A-36H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S36 T2N-R66W (Marcus State, Mumby State) - Mumby State 4C-36H - HZ - Plan #1													Offset Site Error: 0.0 ft	
Survey Program: 0-Geolink MWD													Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor		
0.0	0.0	0.0	0.0	0.0	0.0	90.00	0.0	19.9	19.9					
100.0	100.0	100.0	100.0	0.1	0.1	90.00	0.0	19.9	19.9	19.6	0.24	81.296		
200.0	200.0	200.0	200.0	0.3	0.3	90.00	0.0	19.9	19.9	19.3	0.59	33.475 CC, ES		
300.0	300.0	300.0	300.0	0.5	0.5	-142.91	0.0	19.9	21.2	20.3	0.94	22.496		
400.0	399.8	400.4	400.4	0.7	0.6	-146.93	-1.5	18.9	24.5	23.2	1.30	18.807		
500.0	499.5	500.9	500.7	0.9	0.8	-148.27	-6.0	16.1	28.5	26.8	1.67	17.006		
600.0	598.7	601.5	600.9	1.2	1.1	-147.80	-13.4	11.4	33.2	31.1	2.08	15.957		
700.0	697.5	702.1	700.8	1.5	1.3	-146.19	-23.9	4.9	38.6	36.0	2.54	15.211		
800.0	795.6	802.8	800.3	1.9	1.6	-143.93	-37.3	-3.5	44.7	41.7	3.07	14.569		
900.0	893.1	903.5	899.1	2.3	2.0	-141.36	-53.7	-13.8	51.7	48.0	3.70	13.952		
1,000.0	989.6	1,004.3	997.2	2.8	2.4	-138.68	-73.0	-25.9	59.5	55.1	4.46	13.349		
1,100.0	1,085.3	1,104.7	1,094.2	3.3	2.9	-136.11	-95.1	-39.7	68.3	63.0	5.33	12.814		
1,200.0	1,179.8	1,204.1	1,189.9	3.9	3.4	-135.27	-117.7	-53.9	79.2	73.0	6.21	12.748 SF		
1,300.0	1,273.9	1,303.4	1,285.5	4.6	3.8	-135.43	-140.3	-68.0	91.1	84.1	7.07	12.884		
1,400.0	1,367.9	1,402.6	1,381.2	5.2	4.3	-135.56	-162.9	-82.2	103.1	95.1	7.94	12.978		
1,500.0	1,462.0	1,501.9	1,476.8	5.8	4.8	-135.65	-185.6	-96.4	115.0	106.2	8.82	13.044		
1,600.0	1,556.0	1,601.2	1,572.4	6.4	5.3	-135.73	-208.2	-110.5	127.0	117.3	9.70	13.092		
1,700.0	1,650.0	1,700.5	1,668.0	7.1	5.8	-135.80	-230.8	-124.7	138.9	128.4	10.58	13.129		
1,800.0	1,744.1	1,799.8	1,763.7	7.7	6.3	-135.85	-253.4	-138.9	150.9	139.4	11.47	13.157		
1,900.0	1,838.1	1,899.0	1,859.3	8.3	6.8	-135.90	-276.0	-153.1	162.8	150.5	12.36	13.179		
2,000.0	1,932.2	1,998.3	1,954.9	9.0	7.3	-135.94	-298.7	-167.2	174.8	161.6	13.25	13.197		
2,100.0	2,026.2	2,097.6	2,050.5	9.6	7.8	-135.98	-321.3	-181.4	186.8	172.6	14.14	13.211		
2,200.0	2,120.3	2,196.9	2,146.2	10.2	8.3	-136.01	-343.9	-195.6	198.7	183.7	15.03	13.223		
2,300.0	2,214.3	2,296.2	2,241.8	10.9	8.8	-136.03	-366.5	-209.7	210.7	194.7	15.92	13.233		
2,400.0	2,308.4	2,395.5	2,337.4	11.5	9.3	-136.06	-389.1	-223.9	222.6	205.8	16.81	13.241		
2,500.0	2,402.4	2,494.7	2,433.1	12.1	9.8	-136.08	-411.8	-238.1	234.6	216.9	17.71	13.248		
2,600.0	2,496.5	2,594.0	2,528.7	12.8	10.3	-136.10	-434.4	-252.3	246.5	227.9	18.60	13.253		
2,700.0	2,590.5	2,693.3	2,624.3	13.4	10.8	-136.12	-457.0	-266.4	258.5	239.0	19.50	13.258		
2,800.0	2,684.5	2,792.6	2,719.9	14.0	11.3	-136.14	-479.6	-280.6	270.4	250.1	20.39	13.263		
2,900.0	2,778.6	2,891.9	2,815.6	14.7	11.8	-136.15	-502.2	-294.8	282.4	261.1	21.29	13.266		
3,000.0	2,872.6	2,991.2	2,911.2	15.3	12.3	-136.17	-524.9	-308.9	294.4	272.2	22.18	13.270		
3,100.0	2,966.7	3,090.4	3,006.8	15.9	12.8	-136.18	-547.5	-323.1	306.3	283.2	23.08	13.272		
3,200.0	3,060.7	3,189.7	3,102.5	16.6	13.3	-136.19	-570.1	-337.3	318.3	294.3	23.97	13.275		
3,300.0	3,154.8	3,289.0	3,198.1	17.2	13.8	-136.20	-592.7	-351.4	330.2	305.4	24.87	13.277		
3,400.0	3,248.8	3,388.3	3,293.7	17.8	14.3	-136.21	-615.3	-365.6	342.2	316.4	25.77	13.279		
3,500.0	3,342.9	3,487.6	3,389.3	18.5	14.8	-136.22	-638.0	-379.8	354.1	327.5	26.66	13.281		
3,600.0	3,436.9	3,586.9	3,485.0	19.1	15.3	-136.23	-660.6	-394.0	366.1	338.5	27.56	13.283		
3,700.0	3,530.9	3,686.1	3,580.6	19.8	15.8	-136.24	-683.2	-408.1	378.0	349.6	28.46	13.284		
3,800.0	3,625.0	3,785.4	3,676.2	20.4	16.3	-136.25	-705.8	-422.3	390.0	360.6	29.36	13.285		
3,900.0	3,719.0	3,884.7	3,771.8	21.0	16.8	-136.25	-728.4	-436.5	402.0	371.7	30.25	13.286		
4,000.0	3,813.1	3,984.0	3,867.5	21.7	17.3	-136.26	-751.1	-450.6	413.9	382.8	31.15	13.287		
4,100.0	3,907.1	4,083.3	3,963.1	22.3	17.8	-136.27	-773.7	-464.8	425.9	393.8	32.05	13.288		
4,200.0	4,001.2	4,182.6	4,058.7	22.9	18.3	-136.27	-796.3	-479.0	437.8	404.9	32.95	13.289		
4,300.0	4,095.2	4,281.8	4,154.4	23.6	18.8	-136.28	-818.9	-493.1	449.8	415.9	33.84	13.290		
4,400.0	4,189.3	4,381.1	4,250.0	24.2	19.3	-136.28	-841.5	-507.3	461.7	427.0	34.74	13.291		
4,500.0	4,283.3	4,480.4	4,345.6	24.8	19.8	-136.29	-864.2	-521.5	473.7	438.0	35.64	13.291		
4,600.0	4,377.4	4,579.7	4,441.2	25.5	20.3	-136.29	-886.8	-535.7	485.6	449.1	36.54	13.292		
4,700.0	4,471.4	4,679.0	4,536.9	26.1	20.8	-136.30	-909.4	-549.8	497.6	460.2	37.43	13.292		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Mumby State 4A-36H
Project:	DJ Wattenberg	TVD Reference:	WELL @ 5049.0ft (Original Well Elev)
Reference Site:	S36 T2N-R66W (Marcus State, Mumby State)	MD Reference:	WELL @ 5049.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Mumby State 4A-36H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S36 T2N-R66W (Marcus State, Mumby State) - Mumby State 4D-36H - HZ - Plan #1												Offset Site Error: 0.0 ft	
Survey Program: 0-Geolink MWD												Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	
0.0	0.0	0.0	0.0	0.0	0.0	90.70	-0.4	29.9	30.0				
100.0	100.0	99.0	99.0	0.1	0.1	90.70	-0.4	29.9	29.9	29.7	0.24	123.142	
200.0	200.0	199.0	199.0	0.3	0.3	90.70	-0.4	29.9	29.9	29.3	0.59	50.601	CC, ES
300.0	300.0	299.0	299.0	0.5	0.5	-141.27	-0.4	29.9	31.3	30.3	0.94	33.205	
400.0	399.8	398.8	398.8	0.7	0.6	-146.51	-0.4	29.9	35.5	34.2	1.30	27.399	
500.0	499.5	499.2	499.2	0.9	0.8	-150.91	-2.0	29.4	42.2	40.5	1.66	25.460	
600.0	598.7	599.7	599.5	1.2	1.0	-152.46	-6.9	27.7	50.3	48.2	2.03	24.715	
700.0	697.5	700.3	699.7	1.5	1.2	-152.20	-15.2	24.8	59.6	57.2	2.44	24.390	
800.0	795.6	800.9	799.6	1.9	1.5	-150.86	-26.9	20.9	70.2	67.3	2.91	24.137	
900.0	893.1	901.4	898.9	2.3	1.8	-148.90	-41.8	15.8	82.2	78.7	3.45	23.798	
1,000.0	989.6	1,001.9	997.5	2.8	2.1	-146.64	-60.0	9.5	95.5	91.4	4.10	23.324	
1,100.0	1,085.3	1,102.3	1,095.2	3.3	2.5	-144.26	-81.4	2.2	110.4	105.5	4.85	22.741	
1,200.0	1,179.8	1,201.4	1,191.1	3.9	3.0	-142.22	-105.1	-5.9	127.0	121.3	5.69	22.313	
1,300.0	1,273.9	1,299.7	1,286.3	4.6	3.4	-141.11	-128.8	-14.0	144.8	138.3	6.55	22.115	
1,400.0	1,367.9	1,398.1	1,381.4	5.2	3.9	-140.25	-152.4	-22.1	162.7	155.3	7.42	21.916	
1,500.0	1,462.0	1,496.4	1,476.5	5.8	4.3	-139.56	-176.1	-30.2	180.6	172.3	8.31	21.731	
1,600.0	1,556.0	1,594.8	1,571.6	6.4	4.8	-138.99	-199.8	-38.3	198.5	189.3	9.21	21.563	
1,700.0	1,650.0	1,693.2	1,666.7	7.1	5.2	-138.52	-223.5	-46.4	216.5	206.3	10.11	21.414	
1,800.0	1,744.1	1,791.5	1,761.9	7.7	5.7	-138.12	-247.2	-54.5	234.4	223.4	11.02	21.280	
1,900.0	1,838.1	1,889.9	1,857.0	8.3	6.1	-137.77	-270.9	-62.6	252.4	240.4	11.93	21.161	
2,000.0	1,932.2	1,988.3	1,952.1	9.0	6.6	-137.48	-294.6	-70.7	270.3	257.5	12.84	21.054	
2,100.0	2,026.2	2,086.6	2,047.2	9.6	7.1	-137.21	-318.3	-78.8	288.3	274.5	13.76	20.958	
2,200.0	2,120.3	2,185.0	2,142.4	10.2	7.5	-136.98	-342.0	-86.9	306.3	291.6	14.67	20.872	
2,300.0	2,214.3	2,283.4	2,237.5	10.9	8.0	-136.78	-365.7	-95.0	324.3	308.7	15.59	20.794	
2,400.0	2,308.4	2,381.7	2,332.6	11.5	8.5	-136.60	-389.3	-103.2	342.2	325.7	16.51	20.723	
2,500.0	2,402.4	2,480.1	2,427.7	12.1	8.9	-136.43	-413.0	-111.3	360.2	342.8	17.44	20.659	
2,600.0	2,496.5	2,578.4	2,522.9	12.8	9.4	-136.28	-436.7	-119.4	378.2	359.9	18.36	20.600	
2,700.0	2,590.5	2,676.8	2,618.0	13.4	9.9	-136.15	-460.4	-127.5	396.2	376.9	19.28	20.546	
2,800.0	2,684.5	2,775.2	2,713.1	14.0	10.3	-136.02	-484.1	-135.6	414.2	394.0	20.21	20.496	
2,900.0	2,778.6	2,873.5	2,808.2	14.7	10.8	-135.91	-507.8	-143.7	432.2	411.1	21.13	20.450	
3,000.0	2,872.6	2,971.9	2,903.4	15.3	11.3	-135.80	-531.5	-151.8	450.2	428.1	22.06	20.408	
3,100.0	2,966.7	3,070.3	2,998.5	15.9	11.7	-135.71	-555.2	-159.9	468.2	445.2	22.99	20.369	
3,200.0	3,060.7	3,168.6	3,093.6	16.6	12.2	-135.62	-578.9	-168.0	486.2	462.3	23.91	20.332	SF

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Mumby State 4A-36H
Project:	DJ Wattenberg	TVD Reference:	WELL @ 5049.0ft (Original Well Elev)
Reference Site:	S36 T2N-R66W (Marcus State, Mumby State)	MD Reference:	WELL @ 5049.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Mumby State 4A-36H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S36 T2N-R66W (Marcus State, Mumby State) - Mumby State 4E-36H - HZ - Plan #1													Offset Site Error:	0.0 ft
Survey Program: 0-Geolink MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Distance		Total		Separation		Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Uncertainty Axis	Factor		
0.0	0.0	0.0	0.0	0.0	0.0	90.52	-0.4	40.0	40.0					
100.0	100.0	99.0	99.0	0.1	0.1	90.52	-0.4	40.0	40.0	39.8	0.24	164.567		
200.0	200.0	199.0	199.0	0.3	0.3	90.52	-0.4	40.0	40.0	39.4	0.59	67.623 CC, ES		
300.0	300.0	299.0	299.0	0.5	0.5	-140.93	-0.4	40.0	41.4	40.4	0.94	43.894		
400.0	399.8	398.8	398.8	0.7	0.6	-145.03	-0.4	40.0	45.5	44.2	1.30	35.111		
500.0	499.5	498.5	498.5	0.9	0.8	-150.37	-0.4	40.0	52.9	51.3	1.65	31.987		
600.0	598.7	598.4	598.4	1.2	1.0	-154.28	-2.1	39.9	63.3	61.2	2.02	31.383 SF		
700.0	697.5	698.4	698.2	1.5	1.2	-155.61	-7.2	39.6	75.8	73.4	2.39	31.653		
800.0	795.6	798.3	797.7	1.9	1.4	-155.32	-15.8	39.0	90.4	87.5	2.81	32.161		
900.0	893.1	898.0	896.7	2.3	1.6	-154.08	-27.9	38.3	106.9	103.6	3.28	32.587		
1,000.0	989.6	997.4	994.9	2.8	1.9	-152.31	-43.4	37.3	125.6	121.7	3.83	32.780		
1,100.0	1,085.3	1,096.4	1,092.1	3.3	2.2	-150.28	-62.1	36.2	146.4	141.9	4.47	32.706		
1,200.0	1,179.8	1,194.1	1,187.5	3.9	2.6	-148.38	-83.3	34.8	169.5	164.3	5.19	32.630		
1,300.0	1,273.9	1,291.0	1,282.0	4.6	3.0	-147.29	-104.7	33.5	194.0	188.0	5.95	32.624		
1,400.0	1,367.9	1,387.9	1,376.5	5.2	3.4	-146.43	-126.0	32.2	218.5	211.7	6.71	32.539		
1,500.0	1,462.0	1,484.8	1,471.0	5.8	3.7	-145.75	-147.3	30.8	243.0	235.5	7.49	32.421		
1,600.0	1,556.0	1,581.8	1,565.6	6.4	4.1	-145.20	-168.7	29.5	267.6	259.3	8.29	32.291		
1,700.0	1,650.0	1,678.7	1,660.1	7.1	4.5	-144.74	-190.0	28.2	292.1	283.1	9.08	32.162		
1,800.0	1,744.1	1,775.6	1,754.6	7.7	4.9	-144.35	-211.4	26.8	316.7	306.8	9.89	32.038		
1,900.0	1,838.1	1,872.5	1,849.1	8.3	5.3	-144.01	-232.7	25.5	341.3	330.6	10.69	31.921		
2,000.0	1,932.2	1,969.4	1,943.6	9.0	5.7	-143.72	-254.0	24.2	366.0	354.5	11.50	31.813		
2,100.0	2,026.2	2,066.3	2,038.2	9.6	6.1	-143.47	-275.4	22.8	390.6	378.3	12.32	31.712		
2,200.0	2,120.3	2,163.2	2,132.7	10.2	6.5	-143.25	-296.7	21.5	415.2	402.1	13.13	31.620		
2,300.0	2,214.3	2,260.1	2,227.2	10.9	6.9	-143.05	-318.0	20.2	439.9	425.9	13.95	31.535		
2,400.0	2,308.4	2,357.0	2,321.7	11.5	7.3	-142.87	-339.4	18.9	464.5	449.7	14.77	31.456		
2,500.0	2,402.4	2,453.9	2,416.2	12.1	7.7	-142.71	-360.7	17.5	489.1	473.6	15.59	31.383		

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Mumby State 4A-36H
Project:	DJ Wattenberg	TVD Reference:	WELL @ 5049.0ft (Original Well Elev)
Reference Site:	S36 T2N-R66W (Marcus State, Mumby State)	MD Reference:	WELL @ 5049.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Mumby State 4A-36H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S36 T2N-R66W (Marcus State, Mumby State) - Mumby State 4F-36H - HZ - Plan #1														Offset Site Error:	0.0 ft
Survey Program: 0-Geolink MWD														Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Distance									
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning		
0.0	0.0	0.0	0.0	0.0	0.0	90.42	-0.4	50.1	50.1						
100.0	100.0	99.0	99.0	0.1	0.1	90.42	-0.4	50.1	50.1	49.8	0.24	205.994			
200.0	200.0	199.0	199.0	0.3	0.3	90.42	-0.4	50.1	50.1	49.5	0.59	84.646 CC, ES			
300.0	300.0	299.0	299.0	0.5	0.5	-140.72	-0.4	50.1	51.4	50.5	0.94	54.583			
400.0	399.8	398.8	398.8	0.7	0.6	-144.09	-0.4	50.1	55.6	54.3	1.30	42.837			
500.0	499.5	498.3	498.3	0.9	0.8	-147.13	-2.0	50.4	63.0	61.3	1.66	37.924			
600.0	598.7	597.5	597.4	1.2	1.0	-148.17	-7.0	51.5	73.7	71.6	2.05	36.021			
700.0	697.5	696.4	695.8	1.5	1.2	-147.81	-15.3	53.4	87.6	85.1	2.47	35.436			
800.0	795.6	794.6	793.4	1.9	1.5	-146.62	-26.9	55.9	104.7	101.7	2.96	35.389 SF			
900.0	893.1	892.1	889.7	2.3	1.7	-145.03	-41.5	59.1	124.9	121.4	3.52	35.512			
1,000.0	989.6	988.7	984.5	2.8	2.1	-143.29	-59.2	63.0	148.5	144.3	4.16	35.650			
1,100.0	1,085.3	1,084.1	1,077.7	3.3	2.5	-141.53	-79.8	67.5	175.2	170.3	4.90	35.755			
1,200.0	1,179.8	1,179.2	1,169.9	3.9	2.9	-140.08	-102.5	72.5	205.0	199.3	5.70	35.999			
1,300.0	1,273.9	1,274.3	1,262.0	4.6	3.3	-139.48	-125.3	77.5	236.0	229.5	6.51	36.242			
1,400.0	1,367.9	1,369.3	1,354.1	5.2	3.7	-139.03	-148.1	82.5	267.1	259.7	7.34	36.371			
1,500.0	1,462.0	1,464.4	1,446.3	5.8	4.1	-138.67	-170.9	87.6	298.1	289.9	8.18	36.437			
1,600.0	1,556.0	1,559.4	1,538.4	6.4	4.5	-138.38	-193.8	92.6	329.2	320.1	9.03	36.465			
1,700.0	1,650.0	1,654.5	1,630.5	7.1	5.0	-138.13	-216.6	97.6	360.2	350.3	9.88	36.472			
1,800.0	1,744.1	1,749.5	1,722.6	7.7	5.4	-137.93	-239.4	102.6	391.3	380.5	10.73	36.466			
1,900.0	1,838.1	1,844.6	1,814.8	8.3	5.8	-137.75	-262.2	107.6	422.3	410.7	11.59	36.452			
2,000.0	1,932.2	1,939.6	1,906.9	9.0	6.3	-137.60	-285.1	112.6	453.4	440.9	12.44	36.434			
2,100.0	2,026.2	2,034.7	1,999.0	9.6	6.7	-137.47	-307.9	117.6	484.5	471.2	13.30	36.413			

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Mumby State 4A-36H
Project:	DJ Wattenberg	TVD Reference:	WELL @ 5049.0ft (Original Well Elev)
Reference Site:	S36 T2N-R66W (Marcus State, Mumby State)	MD Reference:	WELL @ 5049.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Mumby State 4A-36H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S36 T2N-R66W (Marcus State, Mumby State) - Mumby State 4G-36H - HZ - Plan #1											Offset Site Error:		0.0 ft
Survey Program: 0-Geolink MWD											Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	
0.0	0.0	0.0	0.0	0.0	0.0	90.35	-0.4	59.9	59.9				
100.0	100.0	99.0	99.0	0.1	0.1	90.35	-0.4	59.9	59.9	59.6	0.24	246.270	
200.0	200.0	199.0	199.0	0.3	0.3	90.35	-0.4	59.9	59.9	59.3	0.59	101.196	CC, ES
300.0	300.0	299.0	299.0	0.5	0.5	-140.59	-0.4	59.9	61.2	60.3	0.94	64.976	
400.0	399.8	397.9	397.9	0.7	0.6	-142.08	-1.9	60.6	66.0	64.7	1.30	50.827	
500.0	499.5	496.5	496.4	0.9	0.8	-142.48	-6.4	62.9	75.0	73.3	1.68	44.719	
600.0	598.7	594.5	594.0	1.2	1.0	-142.07	-13.9	66.7	88.1	86.1	2.09	42.101	
700.0	697.5	691.7	690.4	1.5	1.3	-141.16	-24.3	71.9	105.4	102.8	2.56	41.141	
800.0	795.6	787.7	785.3	1.9	1.6	-140.04	-37.4	78.4	126.7	123.6	3.09	40.986	SF
900.0	893.1	882.4	878.4	2.3	1.9	-138.86	-53.1	86.3	152.0	148.3	3.69	41.215	
1,000.0	989.6	975.5	969.3	2.8	2.3	-137.69	-71.2	95.4	181.3	177.0	4.35	41.657	
1,100.0	1,085.3	1,069.7	1,060.8	3.3	2.7	-136.85	-91.2	105.4	214.0	208.9	5.07	42.198	
1,200.0	1,179.8	1,163.3	1,151.7	3.9	3.1	-136.68	-111.1	115.4	249.0	243.2	5.82	42.798	
1,300.0	1,273.9	1,256.6	1,242.3	4.6	3.5	-137.13	-130.9	125.3	285.1	278.5	6.58	43.315	
1,400.0	1,367.9	1,349.8	1,332.8	5.2	3.9	-137.49	-150.7	135.3	321.2	313.9	7.35	43.686	
1,500.0	1,462.0	1,443.0	1,423.4	5.8	4.3	-137.77	-170.5	145.2	357.4	349.2	8.13	43.960	
1,600.0	1,556.0	1,536.3	1,514.0	6.4	4.7	-138.00	-190.3	155.1	393.5	384.6	8.91	44.170	
1,700.0	1,650.0	1,629.5	1,604.5	7.1	5.1	-138.19	-210.2	165.1	429.6	419.9	9.69	44.334	
1,800.0	1,744.1	1,722.7	1,695.1	7.7	5.6	-138.35	-230.0	175.0	465.8	455.3	10.48	44.465	

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Mumby State 4A-36H
Project:	DJ Wattenberg	TVD Reference:	WELL @ 5049.0ft (Original Well Elev)
Reference Site:	S36 T2N-R66W (Marcus State, Mumby State)	MD Reference:	WELL @ 5049.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Mumby State 4A-36H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S36 T2N-R66W (Marcus State, Mumby State) - Mumby State 4H-36H - HZ - Plan #1													Offset Site Error:	0.0 ft
Survey Program: 0-Geolink MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor		
0.0	0.0	0.0	0.0	0.0	0.0	90.60	-0.7	69.9	70.0					
100.0	100.0	99.0	99.0	0.1	0.1	90.60	-0.7	69.9	69.9	69.7	0.24	287.709		
200.0	200.0	199.0	199.0	0.3	0.3	90.60	-0.7	69.9	69.9	69.4	0.59	118.224	CC, ES	
300.0	300.0	297.5	297.4	0.5	0.5	-139.13	-2.0	71.0	72.3	71.4	0.94	76.789		
400.0	399.8	395.6	395.4	0.7	0.7	-138.63	-6.0	74.1	79.5	78.2	1.31	60.738		
500.0	499.5	493.0	492.5	0.9	0.9	-137.96	-12.5	79.2	91.4	89.7	1.71	53.604		
600.0	598.7	589.4	588.3	1.2	1.1	-137.23	-21.5	86.2	108.0	105.9	2.14	50.427		
700.0	697.5	684.6	682.3	1.5	1.4	-136.51	-32.9	95.1	129.3	126.7	2.63	49.195		
800.0	795.6	778.2	774.3	1.9	1.8	-135.84	-46.5	105.8	155.1	152.0	3.17	48.961	SF	
900.0	893.1	869.9	863.8	2.3	2.2	-135.21	-62.1	118.0	185.4	181.6	3.76	49.243		
1,000.0	989.6	959.6	950.7	2.8	2.6	-134.61	-79.6	131.6	220.0	215.5	4.42	49.787		
1,100.0	1,085.3	1,048.3	1,036.0	3.3	3.0	-134.05	-98.9	146.7	258.6	253.5	5.12	50.510		
1,200.0	1,179.8	1,139.3	1,123.2	3.9	3.5	-133.87	-119.2	162.6	300.1	294.2	5.87	51.088		
1,300.0	1,273.9	1,229.8	1,210.0	4.6	3.9	-134.40	-139.4	178.4	342.4	335.8	6.65	51.501		
1,400.0	1,367.9	1,320.3	1,296.8	5.2	4.4	-134.81	-159.7	194.3	384.9	377.4	7.43	51.783		
1,500.0	1,462.0	1,410.9	1,383.7	5.8	4.9	-135.14	-179.9	210.1	427.3	419.1	8.22	51.982		
1,600.0	1,556.0	1,501.4	1,470.5	6.4	5.4	-135.41	-200.1	225.9	469.7	460.7	9.01	52.128		

Cathedral Energy Services

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Reference Well:	Mumby State 4A-36H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 5049.0ft (Original Well Elev)
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000 °

Coordinates are relative to: Mumby State 4A-36H
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.50°

