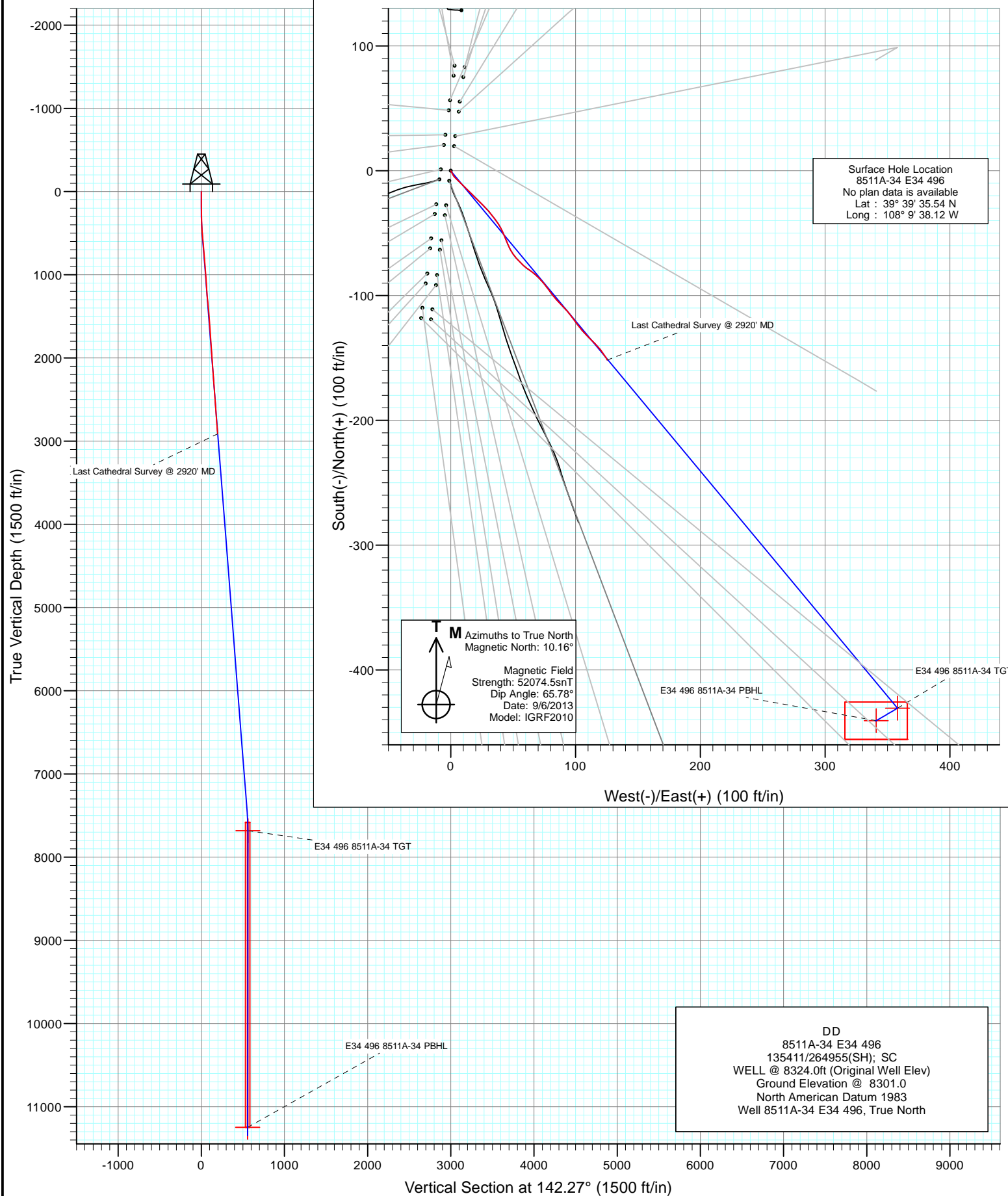




Project: Story Gulch  
Site: E34 496 S33-T4S-R96W  
Well: 8511A-34 E34 496  
Wellbore: DD  
Design: DD



# Cathedral Energy Services

## Survey Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well 8511A-34 E34 496
<b>Project:</b>	Story Gulch	<b>TVD Reference:</b>	WELL @ 8324.0ft (Original Well Elev)
<b>Site:</b>	E34 496 S33-T4S-R96W	<b>MD Reference:</b>	WELL @ 8324.0ft (Original Well Elev)
<b>Well:</b>	8511A-34 E34 496	<b>North Reference:</b>	True
<b>Wellbore:</b>	DD	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	DD	<b>Database:</b>	USA EDM 5000 Multi Users DB

<b>Project</b>	Story Gulch		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Central Zone		

<b>Site</b>	E34 496 S33-T4S-R96W		
<b>Site Position:</b>		<b>Northing:</b>	1,676,257.20 ft
<b>From:</b>	Lat/Long	<b>Easting:</b>	2,251,040.13 ft
<b>Position Uncertainty:</b>	0.0 ft	<b>Slot Radius:</b>	13.200 in
		<b>Latitude:</b>	39° 39' 36.02 N
		<b>Longitude:</b>	108° 9' 38.14 W
		<b>Grid Convergence:</b>	-1.68 °

<b>Well</b>	8511A-34 E34 496		
<b>Well Position</b>	<b>+N/-S</b>	0.0 ft	<b>Northing:</b>
	<b>+E/-W</b>	0.0 ft	<b>Easting:</b>
<b>Position Uncertainty</b>	0.0 ft	<b>Wellhead Elevation:</b>	ft
		<b>Latitude:</b>	39° 39' 35.54 N
		<b>Longitude:</b>	108° 9' 38.12 W
		<b>Ground Level:</b>	8,301.0 ft

<b>Wellbore</b>	DD				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	9/6/2013	10.16	65.78	52,074

<b>Design</b>	DD			
<b>Audit Notes:</b>				
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>
<b>Vertical Section:</b>	<b>Depth From (TVD)</b>	<b>+N/-S</b>	<b>+E/-W</b>	<b>Direction</b>
	(ft)	(ft)	(ft)	(°)
	0.0	0.0	0.0	142.27

<b>Survey Program</b>	<b>Date</b>	9/8/2013		
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
359.0	2,920.0	Survey #1 (DD)	Geolink MWD	Geolink MWD

<b>Survey</b>									
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Vertical Section (ft)</b>	<b>Dogleg Rate (°/100ft)</b>	<b>Build Rate (°/100ft)</b>	<b>Formations / Comments</b>
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
359.0	1.40	151.20	359.0	-3.8	2.1	4.3	0.39	0.39	
421.0	3.30	135.10	420.9	-5.8	3.7	6.9	3.21	3.06	
512.0	4.70	133.30	511.7	-10.2	8.3	13.1	1.54	1.54	
606.0	5.30	135.40	605.3	-15.9	14.2	21.2	0.67	0.64	
698.0	5.30	135.30	696.9	-22.0	20.1	29.7	0.01	0.00	
789.0	4.60	134.00	787.6	-27.5	25.7	37.5	0.78	-0.77	
881.0	4.00	138.30	879.3	-32.4	30.5	44.3	0.74	-0.65	
972.0	4.20	145.40	970.1	-37.6	34.5	50.8	0.60	0.22	
1,063.0	3.70	144.60	1,060.9	-42.7	38.1	57.1	0.55	-0.55	
1,155.0	4.10	154.90	1,152.7	-48.1	41.2	63.2	0.88	0.43	
1,246.0	5.30	159.50	1,243.4	-55.0	44.1	70.4	1.38	1.32	
1,338.0	5.60	152.30	1,335.0	-62.9	47.6	78.9	0.81	0.33	

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## Survey Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well 8511A-34 E34 496
<b>Project:</b>	Story Gulch	<b>TVD Reference:</b>	WELL @ 8324.0ft (Original Well Elev)
<b>Site:</b>	E34 496 S33-T4S-R96W	<b>MD Reference:</b>	WELL @ 8324.0ft (Original Well Elev)
<b>Well:</b>	8511A-34 E34 496	<b>North Reference:</b>	True
<b>Wellbore:</b>	DD	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	DD	<b>Database:</b>	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
1,430.0	5.10	138.00	1,426.6	-69.9	52.5	87.4	1.54	-0.54	
1,521.0	5.10	133.40	1,517.2	-75.7	58.1	95.4	0.45	0.00	
1,613.0	4.20	123.30	1,608.9	-80.4	63.9	102.7	1.32	-0.98	
1,704.0	4.00	131.80	1,699.7	-84.3	69.0	108.9	0.70	-0.22	
1,795.0	4.00	139.40	1,790.4	-88.9	73.5	115.2	0.58	0.00	
1,886.0	3.90	145.50	1,881.2	-93.8	77.3	121.5	0.47	-0.11	
1,978.0	3.80	142.30	1,973.0	-98.8	80.9	127.7	0.26	-0.11	
2,070.0	4.00	137.50	2,064.8	-103.6	85.0	133.9	0.42	0.22	
2,160.0	3.70	134.40	2,154.6	-107.9	89.2	139.9	0.41	-0.33	
2,252.0	4.20	139.20	2,246.4	-112.6	93.5	146.2	0.65	0.54	
2,344.0	4.40	143.00	2,338.1	-117.9	97.8	153.1	0.38	0.22	
2,435.0	3.80	145.90	2,428.9	-123.2	101.6	159.6	0.70	-0.66	
2,527.0	4.20	138.60	2,520.7	-128.3	105.5	166.0	0.70	0.43	
2,618.0	4.80	135.00	2,611.4	-133.5	110.4	173.1	0.73	0.66	
2,710.0	4.10	133.60	2,703.1	-138.4	115.5	180.2	0.77	-0.76	
2,801.0	4.50	141.70	2,793.9	-143.5	120.1	187.0	0.80	0.44	
2,893.0	4.90	149.30	2,885.5	-149.7	124.3	194.5	0.80	0.43	
2,920.0	4.60	149.70	2,912.5	-151.6	125.5	196.7	1.12	-1.11	Last Cathedral Survey @ 2920' MD

Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- hit/miss target									
- Shape									
E34 496 8511A-34 PBHI	0.00	0.00	11,247.0	-440.7	341.0	1,675,757.66	2,251,368.20	39° 39' 31.18 N	108° 9' 33.76 W
- survey misses target center by 8342.3ft at 2920.0ft MD (2912.5 TVD, -151.6 N, 125.5 E)									
- Rectangle (sides W30.0 H50.0 D0.0)									
E34 496 8511A-34 TGT	0.00	0.00	7,682.0	-430.7	358.0	1,675,767.18	2,251,385.50	39° 39' 31.28 N	108° 9' 33.54 W
- survey misses target center by 4783.4ft at 2920.0ft MD (2912.5 TVD, -151.6 N, 125.5 E)									
- Point									

Survey Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
2,920.0	2,912.5	-151.6	125.5	Last Cathedral Survey @ 2920' MD	

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_