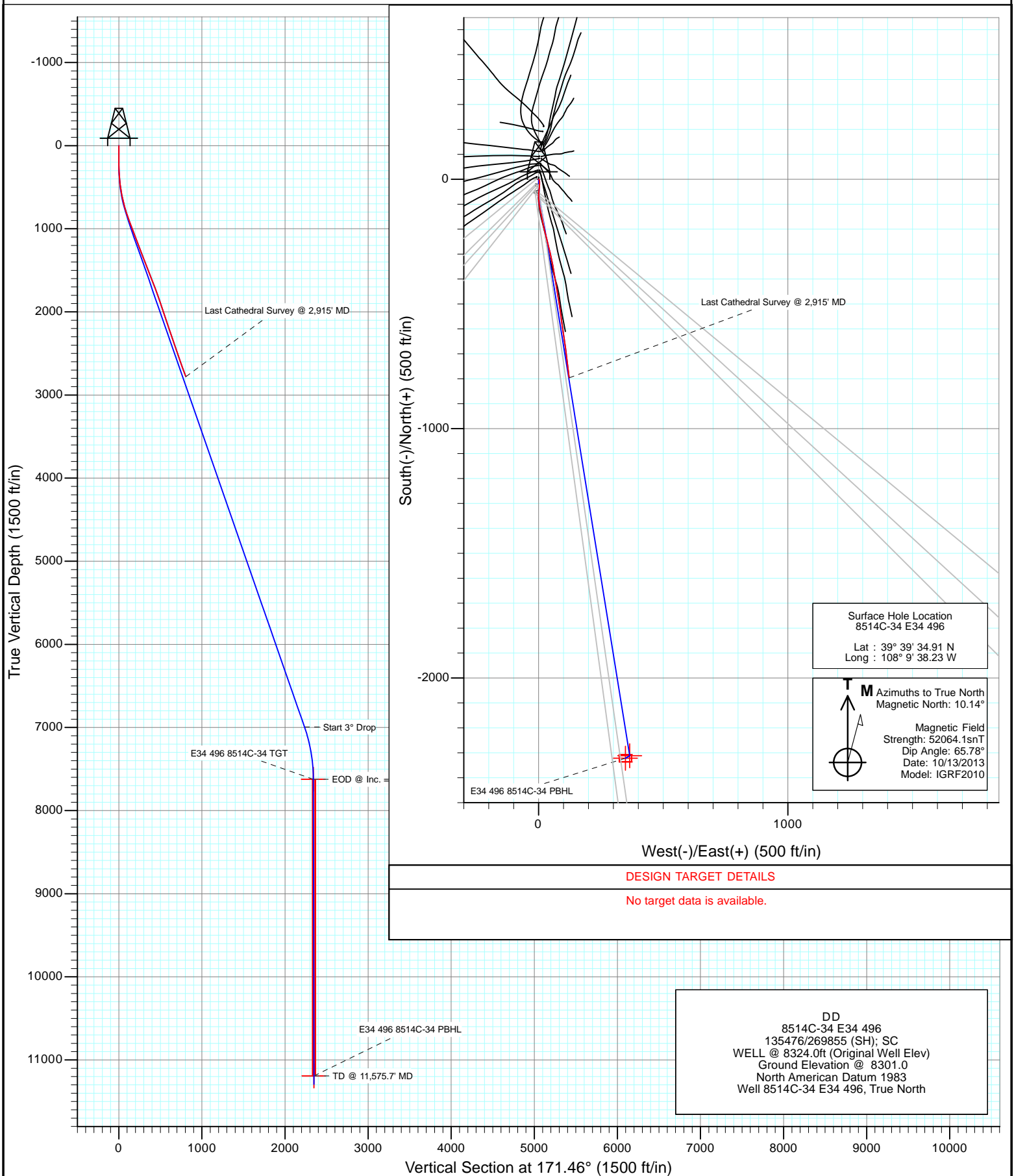




Project: Story Gulch  
Site: E34 496 S33-T4S-R96W  
Well: 8514C-34 E34 496  
Wellbore: DD  
Design: DD



# Cathedral Energy Services

## Survey Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well 8514C-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>	8514C-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		

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

Well	8514C-34 E34 496					
Well Position	+N/-S	0.0 ft	Northing:	1,676,145.11 ft	Latitude:	39° 39' 34.91 N
	+E/-W	0.0 ft	Easting:	2,251,029.81 ft	Longitude:	108° 9' 38.23 W
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	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	10/13/2013	10.15	65.78	52,064

<b>Design</b>	DD				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.0
<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	171.46	

<b>Survey Program</b>	<b>Date</b>	10/15/2013			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
205.0	2,915.0	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		
205.0	0.50	108.70	205.0	-0.3	0.8	0.4	0.24	0.24		
266.0	1.50	143.40	266.0	-1.0	1.6	1.2	1.85	1.64		
358.0	3.80	160.40	357.9	-4.9	3.3	5.3	2.61	2.50		
389.0	4.40	163.20	388.8	-7.0	4.0	7.5	2.04	1.94		
420.0	5.30	177.20	419.7	-9.5	4.4	10.1	4.78	2.90		
481.0	7.10	182.90	480.3	-16.1	4.4	16.6	3.12	2.95		
511.0	8.30	181.40	510.1	-20.1	4.2	20.5	4.06	4.00		
605.0	12.30	184.60	602.5	-36.9	3.2	37.0	4.30	4.26		
697.0	15.00	188.00	691.9	-58.5	0.8	57.9	3.06	2.93		
788.0	17.10	173.30	779.4	-83.4	0.7	82.6	5.01	2.31		
880.0	19.00	170.40	866.9	-111.6	4.8	111.1	2.28	2.07		
971.0	20.50	168.30	952.5	-141.8	10.5	141.8	1.82	1.65		

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## Survey Report

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<b>Site:</b>	E34 496 S33-T4S-R96W	<b>MD Reference:</b>	WELL @ 8324.0ft (Original Well Elev)
<b>Well:</b>	8514C-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
1,063.0	21.30	167.30	1,038.5	-173.9	17.4	174.6	0.95	0.87	
1,155.0	21.40	166.80	1,124.2	-206.5	25.0	208.0	0.23	0.11	
1,246.0	21.40	166.40	1,208.9	-238.8	32.6	241.0	0.16	0.00	
1,337.0	20.60	166.00	1,293.8	-270.5	40.4	273.5	0.89	-0.88	
1,429.0	21.10	166.50	1,379.8	-302.3	48.2	306.1	0.58	0.54	
1,520.0	21.70	169.10	1,464.5	-334.8	55.2	339.3	1.23	0.66	
1,611.0	21.50	170.50	1,549.2	-367.7	61.1	372.7	0.61	-0.22	
1,703.0	20.70	170.50	1,635.0	-400.4	66.6	405.9	0.87	-0.87	
1,794.0	20.40	169.80	1,720.2	-431.9	72.1	437.8	0.43	-0.33	
1,886.0	19.80	171.00	1,806.6	-463.1	77.4	469.4	0.79	-0.65	
1,977.0	18.80	170.60	1,892.5	-492.7	82.2	499.5	1.11	-1.10	
2,069.0	18.30	171.90	1,979.7	-521.7	86.6	528.7	0.71	-0.54	
2,161.0	18.20	172.60	2,067.1	-550.2	90.5	557.6	0.26	-0.11	
2,253.0	18.80	172.10	2,154.3	-579.1	94.4	586.7	0.67	0.65	
2,344.0	19.80	172.70	2,240.2	-609.0	98.4	616.8	1.12	1.10	
2,436.0	19.20	171.40	2,326.9	-639.4	102.6	647.5	0.80	-0.65	
2,527.0	18.80	171.20	2,413.0	-668.7	107.1	677.1	0.45	-0.44	
2,619.0	18.80	172.70	2,500.1	-698.0	111.2	706.8	0.53	0.00	
2,711.0	19.30	173.40	2,587.0	-727.8	114.9	736.8	0.60	0.54	
2,802.0	20.00	173.30	2,672.7	-758.2	118.4	767.4	0.77	0.77	
2,894.0	19.60	172.60	2,759.3	-789.1	122.2	798.5	0.51	-0.43	
2,915.0	19.20	171.90	2,779.1	-796.1	123.2	805.5	2.20	-1.90	Last Cathedral Survey @ 2,915' 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 8514C-34 PBH	0.00	0.00	11,192.0	-2,321.8	348.8	1,673,814.06	2,251,310.50	39° 39' 11.96 N	108° 9' 33.77 W
- survey misses target center by 8553.1ft at 2915.0ft MD (2779.1 TVD, -796.1 N, 123.2 E)									
- Rectangle (sides W30.0 H50.0 D0.0)									
E34 496 8514C-34 TGT	0.00	0.00	7,623.0	-2,311.9	365.8	1,673,823.51	2,251,327.75	39° 39' 12.06 N	108° 9' 33.55 W
- survey misses target center by 5081.3ft at 2915.0ft MD (2779.1 TVD, -796.1 N, 123.2 E)									
- Point									

### Survey Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates	Comment
+N/-S (ft)	+E/-W (ft)		
2,915.0	2,779.1	-796.1	123.2
			Last Cathedral Survey @ 2,915' MD

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