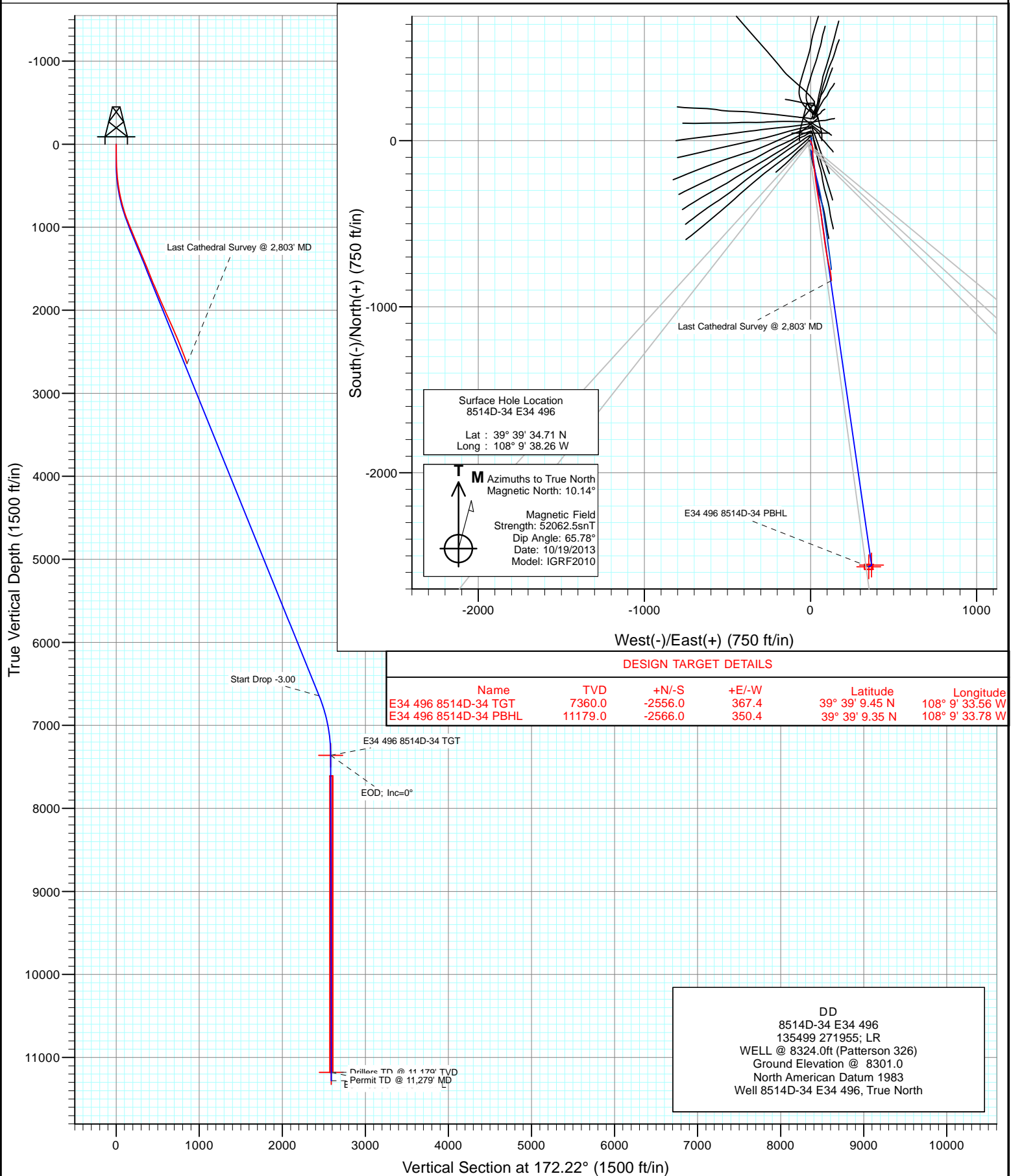




Project: Story Gulch
Site: E34 496 S33-T4S-R96W
Well: 8514D-34 E34 496
Wellbore: DD
Design: DD



Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well 8514D-34 E34 496
Project:	Story Gulch	TVD Reference:	WELL @ 8324.0ft (Patterson 326)
Site:	E34 496 S33-T4S-R96W	MD Reference:	WELL @ 8324.0ft (Patterson 326)
Well:	8514D-34 E34 496	North Reference:	True
Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	DD	Database:	USA EDM 5000 Multi Users DB

Project	Story Gulch		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	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	8514D-34 E34 496					
Well Position	+N/-S	0.0 ft	Northing:	1,676,124.95 ft	Latitude:	39° 39' 34.71 N
	+E/-W	0.0 ft	Easting:	2,251,026.87 ft	Longitude:	108° 9' 38.26 W
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	8,301.0 ft

Wellbore	DD				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	10/19/2013	10.14	65.78	52,062

Design	DD				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction	
	(ft)	(ft)	(ft)	(°)	
	0.0	0.0	0.0	172.22	

		Date			
From	To	Survey (Wellbore)	Tool Name	Description	
()	()				()

Survey										
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Vertical	Dogleg	Build	Formations /	
Depth	(°)	(°)	Depth	(ft)	(ft)	Section	Rate	Rate	Comments	
(ft)			(ft)			(ft)	(°/100ft)	(°/100ft)		
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00		
268.0	2.30	160.90	267.9	-5.1	1.8	5.3	0.86	0.86		
298.0	2.60	169.60	297.9	-6.3	2.1	6.5	1.59	1.00		
329.0	3.20	152.50	328.9	-7.8	2.6	8.1	3.38	1.94		
390.0	5.20	157.40	389.7	-11.8	4.5	12.3	3.33	3.28		
421.0	6.00	158.20	420.5	-14.6	5.6	15.3	2.59	2.58		
512.0	8.60	162.40	510.8	-25.5	9.4	26.6	2.91	2.86		
607.0	11.90	173.30	604.3	-42.1	12.7	43.4	4.01	3.47		
698.0	14.20	179.00	692.9	-62.5	14.0	63.9	2.89	2.53		
790.0	16.70	180.90	781.6	-87.0	14.0	88.1	2.77	2.72		
881.0	19.70	173.20	868.0	-115.3	15.6	116.4	4.22	3.30		
973.0	22.20	172.30	954.0	-148.0	19.8	149.3	2.74	2.72		
1,064.0	22.70	173.10	1,038.1	-182.4	24.2	184.0	0.64	0.55		

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well 8514D-34 E34 496
Project:	Story Gulch	TVD Reference:	WELL @ 8324.0ft (Patterson 326)
Site:	E34 496 S33-T4S-R96W	MD Reference:	WELL @ 8324.0ft (Patterson 326)
Well:	8514D-34 E34 496	North Reference:	True
Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	DD	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
1,155.0	21.70	174.40	1,122.3	-216.6	27.9	218.4	1.22	-1.10	
1,247.0	22.30	171.10	1,207.6	-250.8	32.3	252.9	1.49	0.65	
1,338.0	22.90	173.30	1,291.6	-285.4	37.0	287.8	1.14	0.66	
1,430.0	23.20	168.70	1,376.3	-321.0	42.7	323.8	1.98	0.33	
1,521.0	22.50	169.50	1,460.2	-355.7	49.4	359.1	0.84	-0.77	
1,613.0	21.50	169.70	1,545.5	-389.6	55.6	393.5	1.09	-1.09	
1,704.0	22.00	173.20	1,630.0	-422.9	60.6	427.2	1.53	0.55	
1,795.0	23.40	173.60	1,713.9	-457.8	64.6	462.3	1.55	1.54	
1,887.0	23.10	170.90	1,798.5	-493.8	69.5	498.6	1.20	-0.33	
1,979.0	23.10	172.00	1,883.1	-529.5	74.9	534.7	0.47	0.00	
2,070.0	23.20	171.60	1,966.8	-564.9	80.0	570.5	0.20	0.11	
2,162.0	24.00	172.90	2,051.1	-601.4	84.9	607.3	1.04	0.87	
2,254.0	25.00	171.50	2,134.8	-639.2	90.1	645.5	1.26	1.09	
2,345.0	23.50	170.80	2,217.7	-676.1	95.9	682.8	1.68	-1.65	
2,437.0	23.30	169.10	2,302.2	-712.1	102.2	719.4	0.77	-0.22	
2,529.0	22.10	165.80	2,387.1	-746.7	109.9	754.7	1.90	-1.30	
2,620.0	20.80	169.00	2,471.8	-779.2	117.2	787.9	1.92	-1.43	
2,712.0	20.40	171.90	2,557.9	-811.1	122.6	820.2	1.19	-0.43	
2,803.0	20.20	173.30	2,643.2	-842.4	126.6	851.8	0.58	-0.22	Last Cathedral Survey @ 2,803' MD

Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
E34 496 8514D-34 TGT	0.00	0.00	7,360.0	-2,556.0	367.4	1,673,559.31	2,251,319.27	39° 39' 9.45 N	108° 9' 33.56 W
- hit/miss target									
- Shape									
- survey misses target center by 5024.2ft at 2803.0ft MD (2643.2 TVD, -842.4 N, 126.6 E)									
- Point									
E34 496 8514D-34 PBH	0.00	0.00	11,179.0	-2,566.0	350.4	1,673,549.82	2,251,301.98	39° 39' 9.35 N	108° 9' 33.78 W
- survey misses target center by 8710.9ft at 2803.0ft MD (2643.2 TVD, -842.4 N, 126.6 E)									
- Rectangle (sides W30.0 H50.0 D0.0)									

Survey Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
2,803.0	2,643.2	-842.4	126.6	Last Cathedral Survey @ 2,803' MD

Checked By: _____	Approved By: _____	Date: _____
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