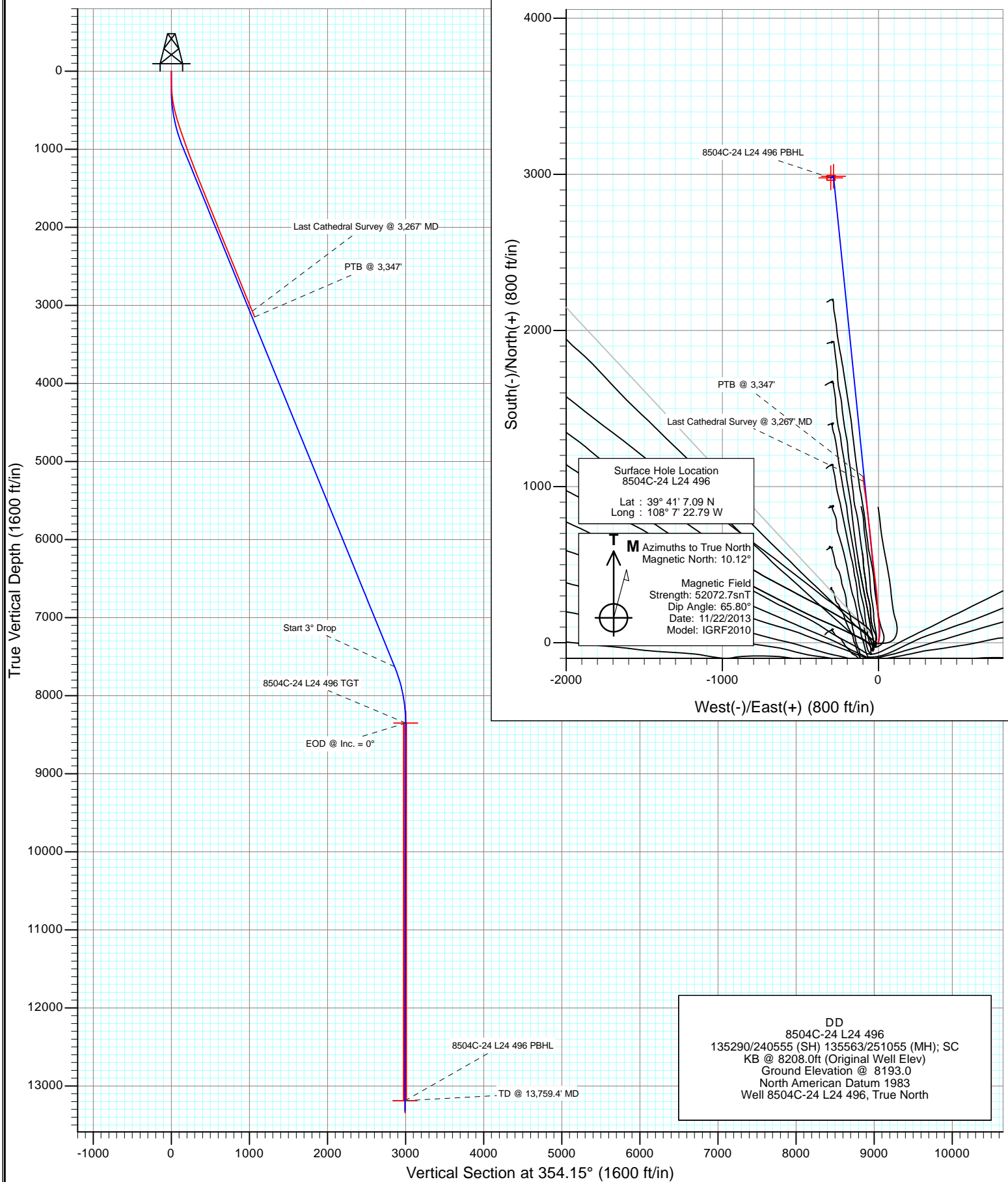




Project: Story Gulch
Site: L24 496
Well: 8504C-24 L24 496
Wellbore: DD
Design: DD



Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well 8504C-24 L24 496
Project:	Story Gulch	TVD Reference:	KB @ 8208.0ft (Original Well Elev)
Site:	L24 496	MD Reference:	KB @ 8208.0ft (Original Well Elev)
Well:	8504C-24 L24 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		L24 496			
Site Position:		Northing:	1,685,024.52 ft	Latitude:	39° 41' 5.72 N
From:	Lat/Long	Easting:	2,261,789.15 ft	Longitude:	108° 7' 23.99 W
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	-1.65 °

Well	8504C-24 L24 496					
Well Position	+N/-S	0.0 ft	Northing:	1,685,160.36 ft	Latitude:	39° 41' 7.09 N
	+E/-W	0.0 ft	Easting:	2,261,886.93 ft	Longitude:	108° 7' 22.79 W
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	8,193.0 ft

Wellbore	DD				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	11/22/2013	10.12	65.80	52,073

Design	DD				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction	
	(ft)	(ft)	(ft)	(°)	
	0.0	0.0	0.0	354.15	

Survey Program	Date	2/21/2014			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
180.0	3,347.0	Survey #1 (DD)	Geolink 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		
180.0	1.30	25.60	180.0	1.8	0.9	1.7	0.72	0.72		
210.0	2.40	331.20	210.0	2.7	0.7	2.6	6.51	3.67		
241.0	3.60	355.30	240.9	4.2	0.3	4.2	5.54	3.87		
272.0	4.80	1.70	271.8	6.5	0.3	6.4	4.15	3.87		
302.0	6.20	26.70	301.7	9.2	1.1	9.1	9.14	4.67		
332.0	7.40	357.30	331.5	12.6	1.7	12.3	12.11	4.00		
363.0	8.40	2.30	362.2	16.8	1.7	16.6	3.91	3.23		
393.0	9.70	10.70	391.8	21.5	2.2	21.2	6.17	4.33		
424.0	11.20	11.00	422.3	27.0	3.3	26.6	4.84	4.84		
453.0	12.00	10.10	450.7	32.8	4.4	32.2	2.83	2.76		
484.0	12.70	9.60	481.0	39.3	5.5	38.5	2.28	2.26		
514.0	13.50	8.50	510.2	46.0	6.6	45.1	2.79	2.67		

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Site:	L24 496	MD Reference:	KB @ 8208.0ft (Original Well Elev)
Well:	8504C-24 L24 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
563.0	14.80	5.10	557.7	57.9	8.0	56.8	3.15	2.65	
609.0	16.30	1.50	602.1	70.2	8.7	69.0	3.88	3.26	
655.0	17.30	357.30	646.1	83.5	8.5	82.2	3.42	2.17	
701.0	18.20	353.70	689.9	97.5	7.4	96.2	3.08	1.96	
793.0	19.00	352.00	777.1	126.6	3.7	125.5	1.05	0.87	
885.0	19.60	353.60	863.9	156.8	-0.1	155.9	0.87	0.65	
977.0	20.00	356.30	950.5	187.8	-2.8	187.1	1.08	0.43	
1,069.0	20.30	356.30	1,036.9	219.4	-4.8	218.8	0.33	0.33	
1,161.0	20.40	356.60	1,123.1	251.3	-6.8	250.7	0.16	0.11	
1,252.0	20.10	356.30	1,208.5	282.8	-8.8	282.2	0.35	-0.33	
1,344.0	21.10	355.30	1,294.6	315.1	-11.1	314.6	1.15	1.09	
1,436.0	21.50	354.60	1,380.3	348.3	-14.1	348.0	0.52	0.43	
1,528.0	22.20	353.00	1,465.7	382.4	-17.8	382.2	1.00	0.76	
1,620.0	22.40	352.10	1,550.8	417.0	-22.3	417.1	0.43	0.22	
1,712.0	21.80	351.50	1,636.1	451.3	-27.3	451.7	0.70	-0.65	
1,804.0	22.00	354.10	1,721.4	485.3	-31.6	486.0	1.08	0.22	
1,895.0	22.90	355.50	1,805.6	519.9	-34.7	520.7	1.15	0.99	
1,987.0	22.20	354.20	1,890.5	555.0	-37.9	556.0	0.93	-0.76	
2,079.0	21.30	353.60	1,976.0	588.9	-41.5	590.1	1.01	-0.98	
2,171.0	21.40	353.70	2,061.7	622.2	-45.2	623.6	0.12	0.11	
2,263.0	22.90	354.70	2,146.9	656.7	-48.7	658.3	1.68	1.63	
2,355.0	22.51	354.20	2,231.7	692.1	-52.1	693.8	0.47	-0.42	
2,447.0	21.40	352.80	2,317.1	726.2	-56.0	728.2	1.33	-1.21	
2,539.0	21.50	352.90	2,402.7	759.6	-60.2	761.8	0.12	0.11	
2,630.0	22.30	353.40	2,487.1	793.3	-64.2	795.7	0.90	0.88	
2,722.0	22.90	353.80	2,572.1	828.5	-68.2	831.1	0.67	0.65	
2,814.0	22.40	353.60	2,657.0	863.7	-72.1	866.5	0.55	-0.54	
2,906.0	21.30	352.00	2,742.3	897.6	-76.3	900.8	1.36	-1.20	
2,997.0	21.50	350.20	2,827.1	930.4	-81.5	933.9	0.75	0.22	
3,089.0	22.90	351.40	2,912.3	964.8	-87.0	968.6	1.60	1.52	
3,181.0	23.30	353.80	2,996.9	1,000.6	-91.7	1,004.7	1.11	0.43	
3,267.0	22.50	353.30	3,076.1	1,033.8	-95.4	1,038.1	0.96	-0.93	Last Cathedral Survey @ 3,267' MD
3,347.0	22.50	353.30	3,150.0	1,064.2	-99.0	1,068.8	0.00	0.00	PTB @ 3,347'

Cathedral Energy Services

Survey Report

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Project:	Story Gulch	TVD Reference:	KB @ 8208.0ft (Original Well Elev)
Site:	L24 496	MD Reference:	KB @ 8208.0ft (Original Well Elev)
Well:	8504C-24 L24 496	North Reference:	True
Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	DD	Database:	USA EDM 5000 Multi Users DB

Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)		
- Shape									
8504C-24 L24 496 PBHI	0.00	0.00	13,190.0	2,977.9	-304.9	1,688,145.79	2,261,668.16	39° 41' 36.52 N	108° 7' 26.69 W
- actual wellpath misses target center by 10222.8ft at 3347.0ft MD (3150.0 TVD, 1064.2 N, -99.0 E)									
- Rectangle (sides W30.0 H50.0 D0.0)									
8504C-24 L24 496 TGT	0.00	0.00	8,351.0	2,987.9	-287.9	1,688,155.33	2,261,685.41	39° 41' 36.62 N	108° 7' 26.47 W
- actual wellpath misses target center by 5548.6ft at 3347.0ft MD (3150.0 TVD, 1064.2 N, -99.0 E)									
- Point									

Design Annotations					
Measured Depth	Vertical Depth	Local Coordinates			
(ft)	(ft)	+N/-S	+E/-W		
		(ft)	(ft)	Comment	
3,267.0	3,076.1	1,033.8	-95.4	Last Cathedral Survey @ 3,267' MD	
3,347.0	3,150.0	1,064.2	-99.0	PTB @ 3,347'	

Checked By: _____ Approved By: _____ Date: _____