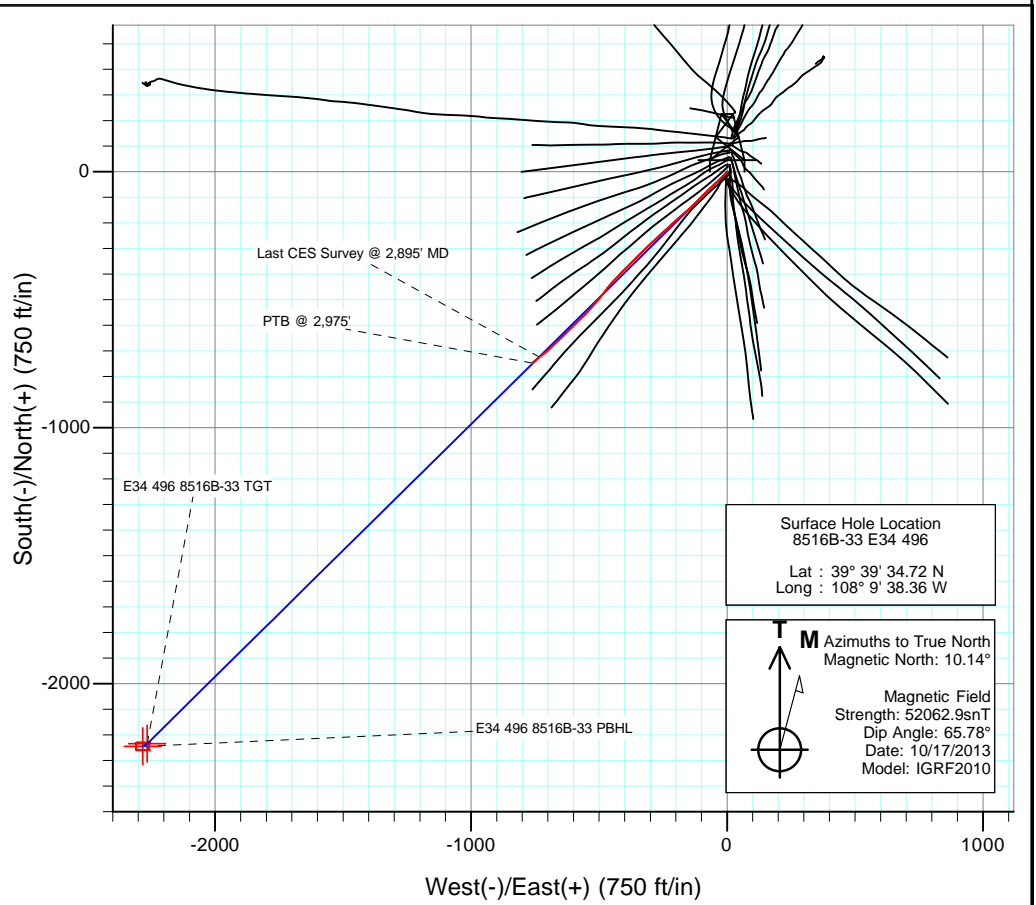
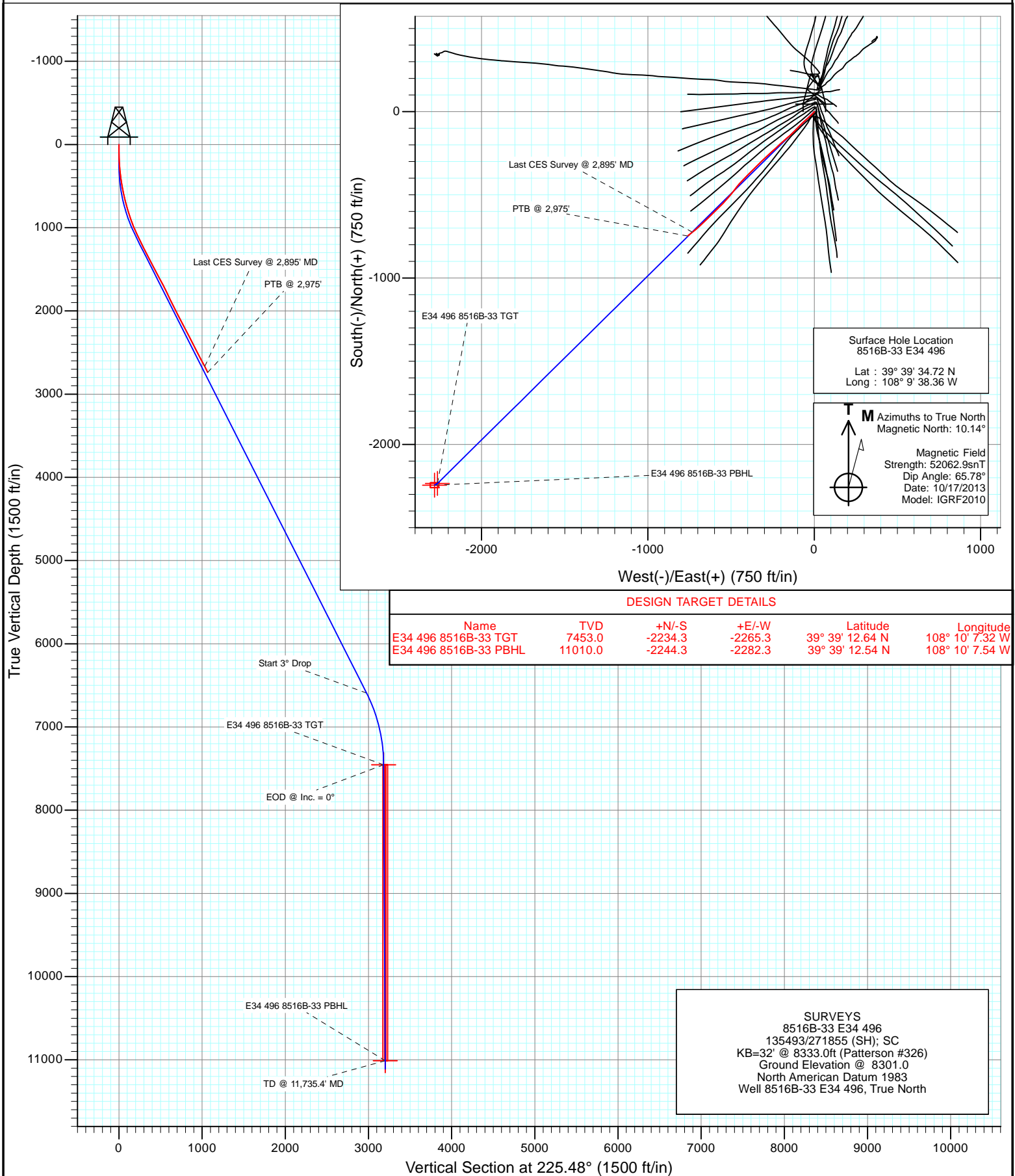




Project: Story Gulch
 Site: E34 496 S33-T4S-R96W
 Well: 8516B-33 E34 496
 Wellbore: DD
 Design: SURVEYS



DESIGN TARGET DETAILS					
Name	TVD	+N/-S	+E/-W	Latitude	Longitude
E34 496 8516B-33 TGT	7453.0	-2234.3	-2265.3	39° 39' 12.64 N	108° 10' 7.32 W
E34 496 8516B-33 PBHL	11010.0	-2244.3	-2282.3	39° 39' 12.54 N	108° 10' 7.54 W

SURVEYS
 8516B-33 E34 496
 135493/271855 (SH); SC
 KB=32' @ 8333.0ft (Patterson #326)
 Ground Elevation @ 8301.0
 North American Datum 1983
 Well 8516B-33 E34 496, True North

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well 8516B-33 E34 496
Project:	Story Gulch	TVD Reference:	KB=32' @ 8333.0ft (Patterson #326)
Site:	E34 496 S33-T4S-R96W	MD Reference:	KB=32' @ 8333.0ft (Patterson #326)
Well:	8516B-33 E34 496	North Reference:	True
Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	SURVEYS	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	8516B-33 E34 496					
Well Position	+N/-S	0.0 ft	Northing:	1,676,126.40 ft	Latitude:	39° 39' 34.72 N
	+E/-W	0.0 ft	Easting:	2,251,019.09 ft	Longitude:	108° 9' 38.36 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	10/17/2013	10.14	65.78	52,063

Design	SURVEYS				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.0	0.0	0.0	225.48	

Survey Program	Date	2/10/2014			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
237.0	2,975.0	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		
237.0	2.70	214.20	236.9	-4.6	-3.1	5.5	1.14	1.14		
298.0	4.90	224.20	297.8	-7.7	-5.8	9.5	3.75	3.61		
329.0	6.20	226.70	328.6	-9.8	-7.9	12.5	4.26	4.19		
421.0	9.40	225.40	419.8	-18.5	-16.9	25.0	3.48	3.48		
512.0	10.70	221.90	509.4	-30.0	-27.8	40.8	1.58	1.43		
607.0	11.60	229.90	602.6	-42.7	-41.0	59.2	1.88	0.95		
698.0	13.90	231.40	691.3	-55.4	-56.5	79.2	2.55	2.53		
790.0	16.20	223.50	780.2	-71.6	-74.0	103.0	3.34	2.50		
881.0	18.90	223.60	866.9	-91.5	-92.9	130.4	2.97	2.97		
973.0	21.40	226.30	953.3	-113.9	-115.3	162.1	2.90	2.72		
1,064.0	24.20	226.20	1,037.2	-138.3	-140.8	197.3	3.08	3.08		
1,155.0	26.30	230.20	1,119.5	-164.1	-169.8	236.1	2.97	2.31		

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well 8516B-33 E34 496
Project:	Story Gulch	TVD Reference:	KB=32' @ 8333.0ft (Patterson #326)
Site:	E34 496 S33-T4S-R96W	MD Reference:	KB=32' @ 8333.0ft (Patterson #326)
Well:	8516B-33 E34 496	North Reference:	True
Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	SURVEYS	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
1,247.0	26.40	228.00	1,201.9	-190.8	-200.6	276.8	1.07	0.11	
1,338.0	26.50	225.70	1,283.4	-218.5	-230.2	317.3	1.13	0.11	
1,430.0	27.30	228.50	1,365.5	-246.8	-260.7	358.9	1.63	0.87	
1,521.0	28.20	227.20	1,446.0	-275.3	-292.1	401.3	1.19	0.99	
1,613.0	27.40	226.30	1,527.4	-304.7	-323.3	444.2	0.98	-0.87	
1,704.0	28.00	224.60	1,607.9	-334.4	-353.5	486.5	1.09	0.66	
1,795.0	27.80	224.00	1,688.4	-364.8	-383.2	529.0	0.38	-0.22	
1,887.0	27.00	226.00	1,770.0	-394.8	-413.1	571.4	1.33	-0.87	
1,979.0	26.40	222.20	1,852.2	-424.4	-441.9	612.7	1.97	-0.65	
2,070.0	25.90	217.50	1,933.9	-455.2	-467.6	652.6	2.34	-0.55	
2,162.0	25.90	218.20	2,016.7	-486.9	-492.3	692.4	0.33	0.00	
2,254.0	27.80	222.10	2,098.8	-518.6	-519.1	733.7	2.82	2.07	
2,345.0	28.10	222.90	2,179.2	-550.1	-547.9	776.3	0.53	0.33	
2,437.0	27.70	225.70	2,260.5	-580.9	-577.9	819.4	1.49	-0.43	
2,529.0	27.90	226.00	2,341.9	-610.8	-608.7	862.3	0.27	0.22	
2,620.0	27.10	226.30	2,422.6	-639.9	-639.0	904.3	0.89	-0.88	
2,712.0	26.80	225.50	2,504.6	-668.9	-669.0	946.0	0.51	-0.33	
2,803.0	27.60	228.50	2,585.5	-697.2	-699.4	987.6	1.74	0.88	
2,895.0	27.70	231.80	2,667.0	-724.6	-732.2	1,030.1	1.67	0.11	Last CES Survey @ 2,895' MD
2,975.0	27.70	231.80	2,737.9	-747.6	-761.4	1,067.1	0.00	0.00	PTB @ 2,975'

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 8516B-33 PBH	0.00	0.00	11,010.0	-2,244.3	-2,282.3	1,673,949.88	2,248,672.07	39° 39' 12.54 N	108° 10' 7.54 W
- survey misses target center by 8542.9ft at 2975.0ft MD (2737.9 TVD, -747.6 N, -761.4 E)									
- Rectangle (sides W30.0 H50.0 D0.0)									
E34 496 8516B-33 TGT	0.00	0.00	7,453.0	-2,234.3	-2,265.3	1,673,959.40	2,248,689.33	39° 39' 12.64 N	108° 10' 7.32 W
- survey misses target center by 5167.7ft at 2975.0ft MD (2737.9 TVD, -747.6 N, -761.4 E)									
- Point									

Survey Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
2,895.0	2,667.0	-724.6	-732.2	Last CES Survey @ 2,895' MD	
2,975.0	2,737.9	-747.6	-761.4	PTB @ 2,975'	

Checked By: _____ Approved By: _____ Date: _____