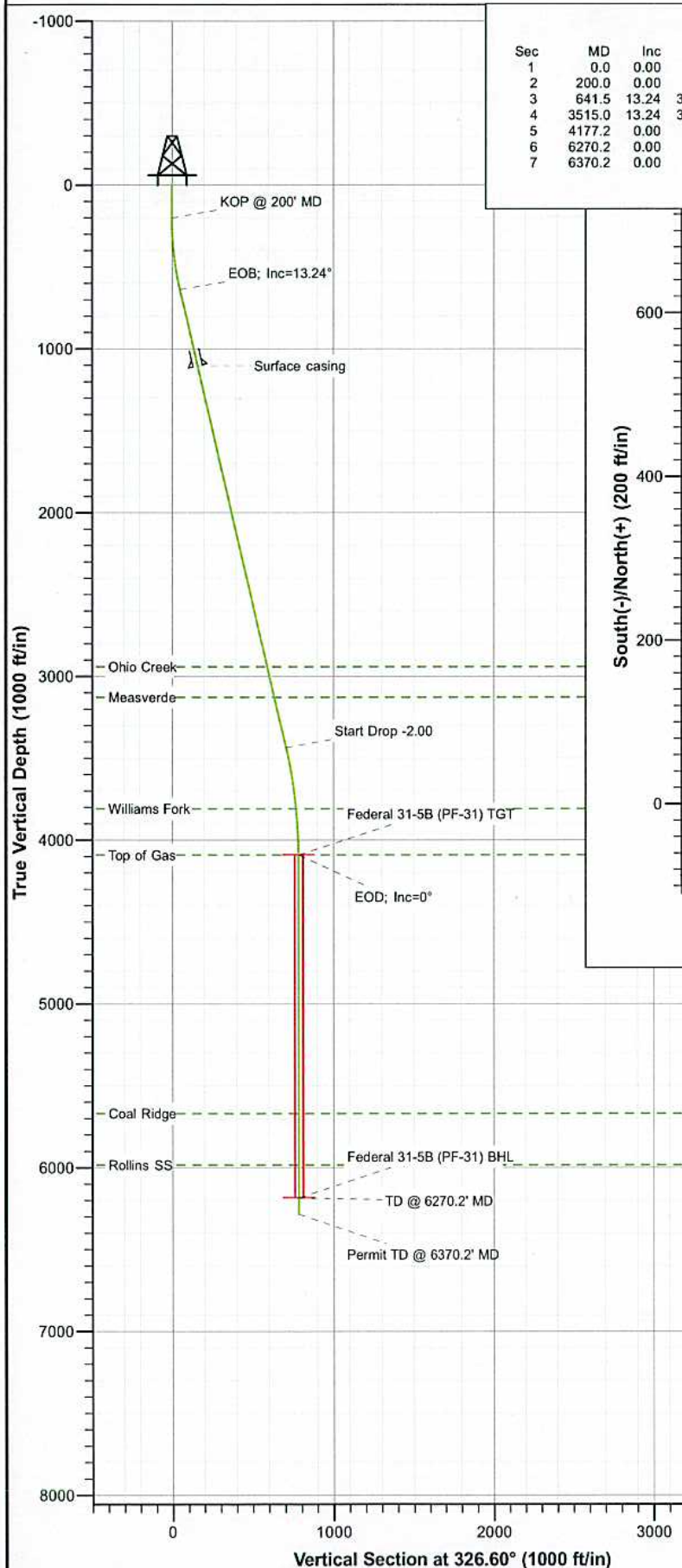
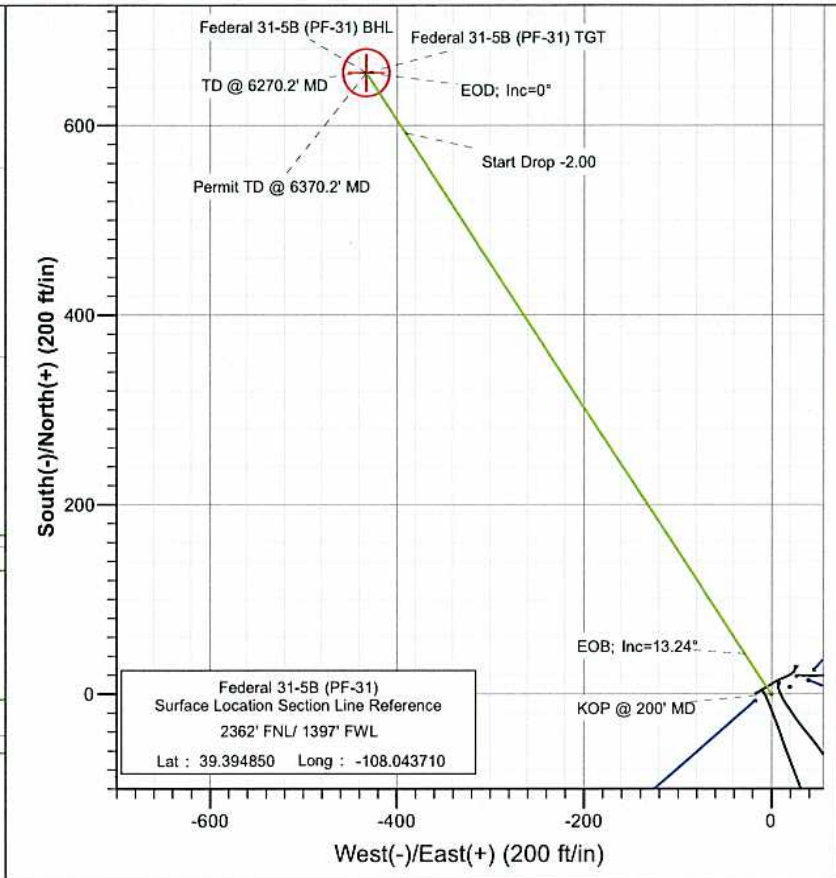




Project: S. Piceance (Parachute)
 Site: SENW S31-T7S-R95W (PF-31 Pad)
 Well: Federal 31-5B (PF-31)
 Wellbore: DD
 Plan: Plan #1



SECTION DETAILS										
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSecl	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.0	
3	641.5	13.24	326.60	637.6	42.4	-28.0	3.00	326.60	50.8	
4	3515.0	13.24	326.60	3434.6	592.0	-390.4	0.00	0.00	709.2	
5	4177.2	0.00	0.00	4091.0	655.6	-432.4	2.00	180.00	785.4	Federal 31-5B (PF-31) TGT
6	6270.2	0.00	0.00	6184.0	655.6	-432.4	0.00	0.00	785.4	Federal 31-5B (PF-31) BHL
7	6370.2	0.00	0.00	6284.0	655.6	-432.4	0.00	0.00	785.4	



FORMATION TOP DETAILS		
TVDPath	MDPath	Formation
2941.0	3007.9	Ohio Creek
3128.0	3200.0	Measverde
3809.0	3894.8	Williams Fork
4091.0	4177.2	Top of Gas
5670.0	5756.2	Coal Ridge
5984.0	6070.2	Rollins SS



Azimuths to True North
 Magnetic North: 10.40°
 Magnetic Field
 Strength: 52270.1nT
 Dip Angle: 65.67°
 Date: 12/21/2010
 Model: IGRF200510

Plan #1 Federal 31-5B (PF-31) 105XXX; BH						
KBE @ 5856.0ft (Original Well Elev) North American Datum 1983 Well Federal 31-5B (PF-31), True North						
Target	Federal 31-5B (PF-31) BH	Azimuth	Origin Type	N/S	E/W	0.0
Name	TVD	+N/-S	+E/-W	Latitude	Longitude	
Federal 31-5B (PF-31) TGT	4091.0	655.6	-432.4	39.396650	-108.045240	
Federal 31-5B (PF-31) BHL	6184.0	655.6	-432.4	39.396650	-108.045240	

Cathedral Energy Services

Planning Report

Database:	EDM 5000.1 US Multi Users DB	Local Co-ordinate Reference:	Well Federal 31-5B (PF-31)
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	KBE @ 5856.0ft (Original Well Elev)
Project:	S. Piceance (Parachute)	MD Reference:	KBE @ 5856.0ft (Original Well Elev)
Site:	SENW S31-T7S-R95W (PF-31 Pad)	North Reference:	True
Well:	Federal 31-5B (PF-31)	Survey Calculation Method:	Minimum Curvature
Wellbore:	DD		
Design:	Plan #1		

Project	S. Piceance (Parachute), Garfield County, CO		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Central Zone		

Site	SENW S31-T7S-R95W (PF-31 Pad)		
Site Position:		Northing:	1,578,802.25 ft
From:	Lat/Long	Easting:	2,281,293.81 ft
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in
		Latitude:	39.394940
		Longitude:	-108.043490
		Grid Convergence:	-1.60 °

Well	Federal 31-5B (PF-31)		
Well Position	+N/-S	0.0 ft	Northing: 1,578,771.22 ft
	+E/-W	0.0 ft	Easting: 2,281,230.74 ft
Position Uncertainty	0.0 ft	Wellhead Elevation:	ft
		Latitude:	39.394850
		Longitude:	-108.043710
		Ground Level:	5,834.0 ft

Wellbore	DD		
Magnetics	Model Name	Sample Date	Declination (°)
	IGRF200510	12/21/2010	10.40
			Dip Angle (°)
			65.67
			Field Strength (nT)
			52,270

Design	Plan #1		
Audit Notes:			
Version:	Phase:	PLAN	Tie On Depth: 0.0
Vertical Section:	Depth From (TVD)	+N/-S (ft)	+E/-W (ft)
	0.0	0.0	0.0
			Direction (°)
			326.60

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.00	0.00	
641.5	13.24	326.60	637.6	42.4	-28.0	3.00	3.00	0.00	326.60	
3,515.0	13.24	326.60	3,434.6	592.0	-390.4	0.00	0.00	0.00	0.00	
4,177.2	0.00	0.00	4,091.0	655.6	-432.4	2.00	-2.00	0.00	180.00	Federal 31-5B (PF-31)
6,270.2	0.00	0.00	6,184.0	655.6	-432.4	0.00	0.00	0.00	0.00	Federal 31-5B (PF-31)
6,370.2	0.00	0.00	6,284.0	655.6	-432.4	0.00	0.00	0.00	0.00	

Cathedral Energy Services

Planning Report

Database: EDM 5000.1 US Multi Users DB
Company: EnCana Oil & Gas (USA) Inc
Project: S. Piceance (Parachute)
Site: SENW S31-T7S-R95W (PF-31 Pad)
Well: Federal 31-5B (PF-31)
Wellbore: DD
Design: Plan #1

Local Co-ordinate Reference: Well Federal 31-5B (PF-31)
TVD Reference: KBE @ 5856.0ft (Original Well Elev)
MD Reference: KBE @ 5856.0ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	KOP @ 200' MD
300.0	3.00	326.60	300.0	2.2	-1.4	2.6	3.00	3.00	
400.0	6.00	326.60	399.6	8.7	-5.8	10.5	3.00	3.00	
500.0	9.00	326.60	498.8	19.6	-12.9	23.5	3.00	3.00	
600.0	12.00	326.60	597.1	34.8	-23.0	41.7	3.00	3.00	
641.5	13.24	326.60	637.6	42.4	-28.0	50.8	3.00	3.00	EOB; Inc=13.24°
700.0	13.24	326.60	694.5	53.6	-35.3	64.2	0.00	0.00	
800.0	13.24	326.60	791.9	72.7	-48.0	87.1	0.00	0.00	
900.0	13.24	326.60	889.2	91.9	-60.6	110.0	0.00	0.00	
1,000.0	13.24	326.60	986.5	111.0	-73.2	132.9	0.00	0.00	
1,100.0	13.24	326.60	1,083.9	130.1	-85.8	155.9	0.00	0.00	
1,120.0	13.24	326.60	1,103.4	133.9	-88.3	160.4	0.00	0.00	Surface casing
1,200.0	13.24	326.60	1,181.2	149.2	-98.4	178.8	0.00	0.00	
1,300.0	13.24	326.60	1,278.6	168.4	-111.0	201.7	0.00	0.00	
1,400.0	13.24	326.60	1,375.9	187.5	-123.6	224.6	0.00	0.00	
1,500.0	13.24	326.60	1,473.2	206.6	-136.3	247.5	0.00	0.00	
1,600.0	13.24	326.60	1,570.6	225.7	-148.9	270.4	0.00	0.00	
1,700.0	13.24	326.60	1,667.9	244.9	-161.5	293.3	0.00	0.00	
1,800.0	13.24	326.60	1,765.3	264.0	-174.1	316.2	0.00	0.00	
1,900.0	13.24	326.60	1,862.6	283.1	-186.7	339.1	0.00	0.00	
2,000.0	13.24	326.60	1,959.9	302.2	-199.3	362.1	0.00	0.00	
2,100.0	13.24	326.60	2,057.3	321.4	-211.9	385.0	0.00	0.00	
2,200.0	13.24	326.60	2,154.6	340.5	-224.6	407.9	0.00	0.00	
2,300.0	13.24	326.60	2,252.0	359.6	-237.2	430.8	0.00	0.00	
2,400.0	13.24	326.60	2,349.3	378.8	-249.8	453.7	0.00	0.00	
2,500.0	13.24	326.60	2,446.6	397.9	-262.4	476.6	0.00	0.00	
2,600.0	13.24	326.60	2,544.0	417.0	-275.0	499.5	0.00	0.00	
2,700.0	13.24	326.60	2,641.3	436.1	-287.6	522.4	0.00	0.00	
2,800.0	13.24	326.60	2,738.7	455.3	-300.2	545.3	0.00	0.00	
2,900.0	13.24	326.60	2,836.0	474.4	-312.8	568.3	0.00	0.00	
3,000.0	13.24	326.60	2,933.3	493.5	-325.5	591.2	0.00	0.00	
3,007.9	13.24	326.60	2,941.0	495.0	-326.5	593.0	0.00	0.00	Ohio Creek
3,100.0	13.24	326.60	3,030.7	512.6	-338.1	614.1	0.00	0.00	
3,200.0	13.24	326.60	3,128.0	531.8	-350.7	637.0	0.00	0.00	Measverde
3,300.0	13.24	326.60	3,225.4	550.9	-363.3	659.9	0.00	0.00	
3,400.0	13.24	326.60	3,322.7	570.0	-375.9	682.8	0.00	0.00	
3,500.0	13.24	326.60	3,420.0	589.1	-388.5	705.7	0.00	0.00	
3,515.0	13.24	326.60	3,434.6	592.0	-390.4	709.2	0.00	0.00	Start Drop -2.00
3,600.0	11.54	326.60	3,517.7	607.2	-400.5	727.4	2.00	-2.00	
3,700.0	9.54	326.60	3,616.0	622.5	-410.5	745.7	2.00	-2.00	
3,800.0	7.54	326.60	3,714.8	634.9	-418.7	760.6	2.00	-2.00	
3,894.8	5.65	326.60	3,809.0	644.0	-424.7	771.5	2.00	-2.00	Williams Fork
3,900.0	5.54	326.60	3,814.2	644.4	-425.0	772.0	2.00	-2.00	
4,000.0	3.54	326.60	3,913.9	651.1	-429.4	779.9	2.00	-2.00	
4,100.0	1.54	326.60	4,013.8	654.8	-431.8	784.3	2.00	-2.00	
4,177.2	0.00	0.00	4,091.0	655.6	-432.4	785.4	2.00	-2.00	EOD; Inc=0° - Top of Gas - Federal 31-5B (PF-31)
4,200.0	0.00	0.00	4,113.8	655.6	-432.4	785.4	0.00	0.00	
4,300.0	0.00	0.00	4,213.8	655.6	-432.4	785.4	0.00	0.00	
4,400.0	0.00	0.00	4,313.8	655.6	-432.4	785.4	0.00	0.00	
4,500.0	0.00	0.00	4,413.8	655.6	-432.4	785.4	0.00	0.00	

Cathedral Energy Services

Planning Report

Database: EDM 5000.1 US Multi Users DB
Company: EnCana Oil & Gas (USA) Inc
Project: S. Piceance (Parachute)
Site: SENW S31-T7S-R95W (PF-31 Pad)
Well: Federal 31-5B (PF-31)
Wellbore: DD
Design: Plan #1

Local Co-ordinate Reference: Well Federal 31-5B (PF-31)
TVD Reference: KBE @ 5856.0ft (Original Well Elev)
MD Reference: KBE @ 5856.0ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
4,600.0	0.00	0.00	4,513.8	655.6	-432.4	785.4	0.00	0.00	
4,700.0	0.00	0.00	4,613.8	655.6	-432.4	785.4	0.00	0.00	
4,800.0	0.00	0.00	4,713.8	655.6	-432.4	785.4	0.00	0.00	
4,900.0	0.00	0.00	4,813.8	655.6	-432.4	785.4	0.00	0.00	
5,000.0	0.00	0.00	4,913.8	655.6	-432.4	785.4	0.00	0.00	
5,100.0	0.00	0.00	5,013.8	655.6	-432.4	785.4	0.00	0.00	
5,200.0	0.00	0.00	5,113.8	655.6	-432.4	785.4	0.00	0.00	
5,300.0	0.00	0.00	5,213.8	655.6	-432.4	785.4	0.00	0.00	
5,400.0	0.00	0.00	5,313.8	655.6	-432.4	785.4	0.00	0.00	
5,500.0	0.00	0.00	5,413.8	655.6	-432.4	785.4	0.00	0.00	
5,600.0	0.00	0.00	5,513.8	655.6	-432.4	785.4	0.00	0.00	
5,700.0	0.00	0.00	5,613.8	655.6	-432.4	785.4	0.00	0.00	
5,756.2	0.00	0.00	5,670.0	655.6	-432.4	785.4	0.00	0.00	Coal Ridge
5,800.0	0.00	0.00	5,713.8	655.6	-432.4	785.4	0.00	0.00	
5,900.0	0.00	0.00	5,813.8	655.6	-432.4	785.4	0.00	0.00	
6,000.0	0.00	0.00	5,913.8	655.6	-432.4	785.4	0.00	0.00	
6,070.2	0.00	0.00	5,984.0	655.6	-432.4	785.4	0.00	0.00	Rollins SS
6,100.0	0.00	0.00	6,013.8	655.6	-432.4	785.4	0.00	0.00	
6,200.0	0.00	0.00	6,113.8	655.6	-432.4	785.4	0.00	0.00	
6,270.2	0.00	0.00	6,184.0	655.6	-432.4	785.4	0.00	0.00	TD @ 6270.2' MD - Federal 31-5B (PF-31) BHL
6,300.0	0.00	0.00	6,213.8	655.6	-432.4	785.4	0.00	0.00	
6,370.2	0.00	0.00	6,284.0	655.6	-432.4	785.4	0.00	0.00	Permit TD @ 6370.2' 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									
Federal 31-5B (PF-31) E - plan hits target center - Circle (radius 25.0)	0.00	0.00	6,184.0	655.6	-432.4	1,579,438.69	2,280,816.89	39.396650	-108.045240
Federal 31-5B (PF-31) T - plan hits target center - Circle (radius 25.0)	0.00	0.00	4,091.0	655.6	-432.4	1,579,438.69	2,280,816.89	39.396650	-108.045240

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
1,120.0	1,103.4	Surface casing	0.000	0.000

Cathedral Energy Services

Planning Report

Database: EDM 5000.1 US Multi Users DB
Company: EnCana Oil & Gas (USA) Inc
Project: S. Piceance (Parachute)
Site: SENW S31-T7S-R95W (PF-31 Pad)
Well: Federal 31-5B (PF-31)
Wellbore: DD
Design: Plan #1

Local Co-ordinate Reference: Well Federal 31-5B (PF-31)
TVD Reference: KBE @ 5856.0ft (Original Well Elev)
MD Reference: KBE @ 5856.0ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,007.9	2,941.0	Ohio Creek		0.00	
3,200.0	3,128.0	Measverde		0.00	
3,894.8	3,809.0	Williams Fork		0.00	
4,177.2	4,091.0	Top of Gas		0.00	
5,756.2	5,670.0	Coal Ridge		0.00	
6,070.2	5,984.0	Rollins SS		0.00	

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
200.0	200.0	0.0	0.0	KOP @ 200' MD
641.5	637.6	42.4	-28.0	EOB; Inc=13.24°
3,515.0	3,434.6	592.0	-390.4	Start Drop -2.00
4,177.2	4,091.0	655.6	-432.4	EOD; Inc=0°
6,270.2	6,184.0	655.6	-432.4	TD @ 6270.2' MD
6,370.2	6,284.0	655.6	-432.4	Permit TD @ 6370.2' MD