

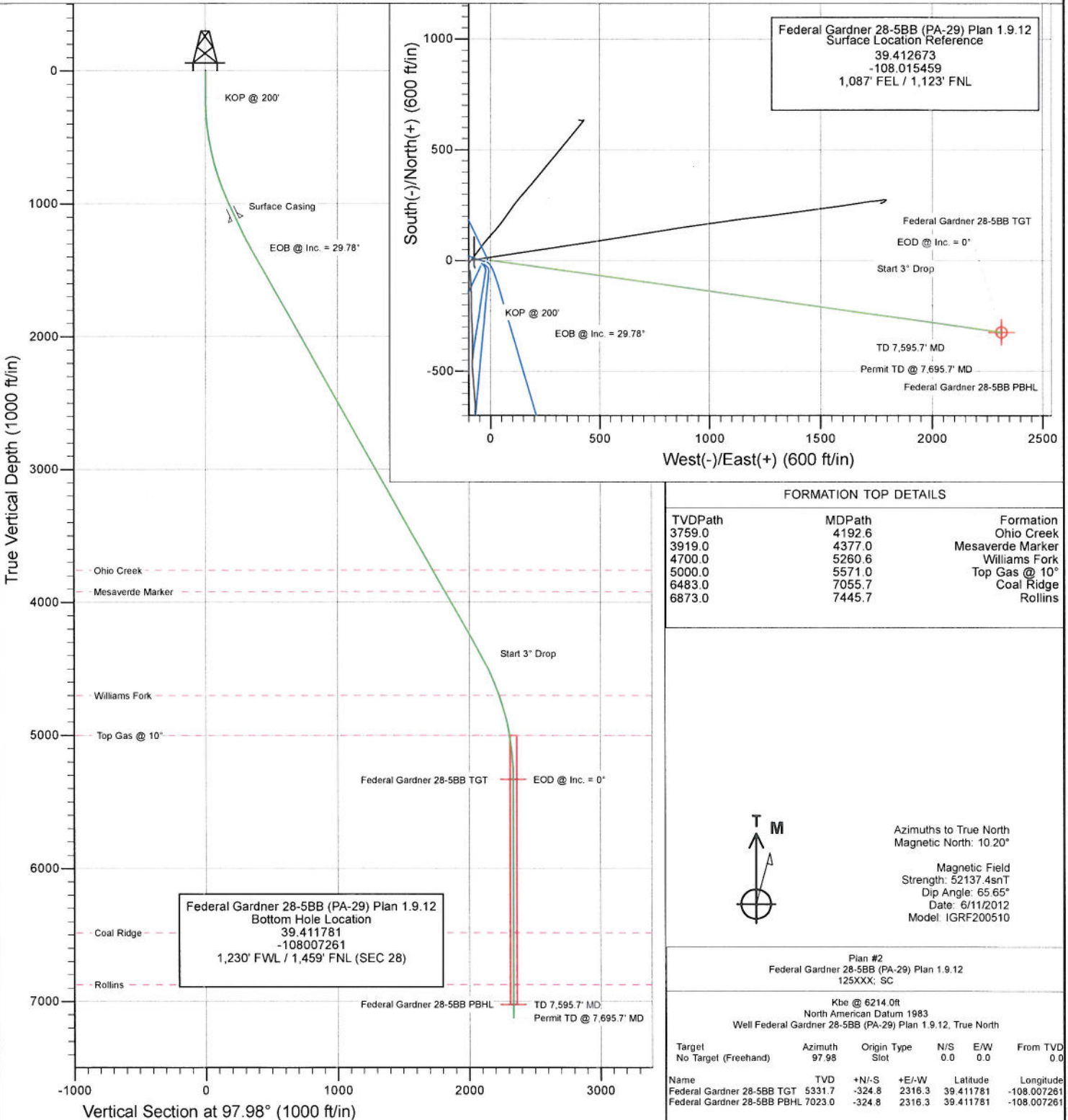


Project: S. Piceance (Parachute)
 Site: PA-29 Pad
 Well: Federal Gardner 28-5BB (PA-29) Plan 1.9.12
 Wellbore: OH
 Design: Plan #2



SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	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	1055.5	25.67	97.68	1027.2	-25.2	186.7	3.00	97.68	188.4	
4	1255.5	25.67	97.68	1207.5	-36.8	272.6	0.00	0.00	275.1	
5	1392.8	29.78	98.03	1329.0	-45.5	335.8	3.00	2.40	338.9	
6	4911.7	29.78	98.03	4383.1	-289.6	2066.5	0.00	0.00	2086.7	
7	5904.4	0.00	0.00	5331.7	-324.8	2316.3	3.00	180.00	2338.9	Federal Gardner 28-5BB TGT
8	7595.7	0.00	0.00	7023.0	-324.8	2316.3	0.00	0.00	2338.9	Federal Gardner 28-5BB PBHL
9	7695.7	0.00	0.00	7123.0	-324.8	2316.3	0.00	0.00	2338.9	



Cathedral Energy Services

Planning Report

Database: USA EDM 5000 Multi Users DB
Company: EnCana Oil & Gas (USA) Inc
Project: S. Piceance (Parachute)
Site: PA-29 Pad
Well: Federal Gardner 28-5BB (PA-29) Plan 1.9.12
Wellbore: OH
Design: Plan #2

Local Co-ordinate Reference: Well Federal Gardner 28-5BB (PA-29) Plan 1.9.1
TVD Reference: Kbe @ 6214.0ft
MD Reference: Kbe @ 6214.0ft
North Reference: True
Survey Calculation Method: Minimum Curvature

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	PA-29 Pad				
Site Position:		Northing:	1,585,028.43 ft	Latitude:	39.412645
From:	Lat/Long	Easting:	2,289,373.78 ft	Longitude:	-108.015520
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	-1.59 °

Well	Federal Gardner 28-5BB (PA-29) Plan 1.9.12					
Well Position	+N/-S	0.0 ft	Northing:	1,585,038.14 ft	Latitude:	39.412673
	+E/-W	0.0 ft	Easting:	2,289,391.29 ft	Longitude:	-108.015459
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	6,192.0 ft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	6/11/2012	10.19	65.65	52,137

Design	Plan #2			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	97.98

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	
1,055.5	25.67	97.68	1,027.2	-25.2	186.7	3.00	3.00	0.00	97.68	
1,255.5	25.67	97.68	1,207.5	-36.8	272.6	0.00	0.00	0.00	0.00	
1,392.8	29.78	98.03	1,329.0	-45.5	335.8	3.00	3.00	0.25	2.40	
4,911.7	29.78	98.03	4,383.1	-289.6	2,066.5	0.00	0.00	0.00	0.00	
5,904.4	0.00	0.00	5,331.7	-324.8	2,316.3	3.00	-3.00	0.00	180.00	Federal Gardner 28-5
7,595.7	0.00	0.00	7,023.0	-324.8	2,316.3	0.00	0.00	0.00	0.00	Federal Gardner 28-5
7,695.7	0.00	0.00	7,123.0	-324.8	2,316.3	0.00	0.00	0.00	0.00	

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TVD Reference: Kbe @ 6214.0ft
MD Reference: Kbe @ 6214.0ft
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'
300.0	3.00	97.68	300.0	-0.3	2.6	2.6	3.00	3.00	
400.0	6.00	97.68	399.6	-1.4	10.4	10.5	3.00	3.00	
500.0	9.00	97.68	498.8	-3.1	23.3	23.5	3.00	3.00	
600.0	12.00	97.68	597.1	-5.6	41.4	41.7	3.00	3.00	
700.0	15.00	97.68	694.3	-8.7	64.5	65.1	3.00	3.00	
800.0	18.00	97.68	790.2	-12.5	92.6	93.5	3.00	3.00	
900.0	21.00	97.68	884.4	-17.0	125.7	126.9	3.00	3.00	
1,000.0	24.00	97.68	976.8	-22.1	163.6	165.1	3.00	3.00	
1,055.5	25.67	97.68	1,027.2	-25.2	186.7	188.4	3.00	3.00	
1,100.0	25.67	97.68	1,067.3	-27.8	205.8	207.7	0.00	0.00	
1,155.5	25.67	97.68	1,117.3	-31.0	229.7	231.7	0.00	0.00	Surface Casing
1,200.0	25.67	97.68	1,157.4	-33.5	248.8	251.0	0.00	0.00	
1,255.5	25.67	97.68	1,207.5	-36.8	272.6	275.1	0.00	0.00	
1,300.0	27.00	97.80	1,247.3	-39.4	292.1	294.8	3.00	3.00	
1,392.8	29.78	98.03	1,329.0	-45.5	335.8	338.9	3.00	3.00	EOB @ Inc. = 29.78°
1,400.0	29.78	98.03	1,335.2	-46.0	339.4	342.5	0.00	0.00	
1,500.0	29.78	98.03	1,422.0	-52.9	388.6	392.1	0.00	0.00	
1,600.0	29.78	98.03	1,508.8	-59.9	437.7	441.8	0.00	0.00	
1,700.0	29.78	98.03	1,595.6	-66.8	486.9	491.5	0.00	0.00	
1,800.0	29.78	98.03	1,682.4	-73.7	536.1	541.2	0.00	0.00	
1,900.0	29.78	98.03	1,769.2	-80.7	585.3	590.8	0.00	0.00	
2,000.0	29.78	98.03	1,856.0	-87.6	634.5	640.5	0.00	0.00	
2,100.0	29.78	98.03	1,942.8	-94.5	683.7	690.2	0.00	0.00	
2,200.0	29.78	98.03	2,029.6	-101.5	732.8	739.8	0.00	0.00	
2,300.0	29.78	98.03	2,116.3	-108.4	782.0	789.5	0.00	0.00	
2,400.0	29.78	98.03	2,203.1	-115.4	831.2	839.2	0.00	0.00	
2,500.0	29.78	98.03	2,289.9	-122.3	880.4	888.8	0.00	0.00	
2,600.0	29.78	98.03	2,376.7	-129.2	929.6	938.5	0.00	0.00	
2,700.0	29.78	98.03	2,463.5	-136.2	978.7	988.2	0.00	0.00	
2,800.0	29.78	98.03	2,550.3	-143.1	1,027.9	1,037.8	0.00	0.00	
2,900.0	29.78	98.03	2,637.1	-150.0	1,077.1	1,087.5	0.00	0.00	
3,000.0	29.78	98.03	2,723.9	-157.0	1,126.3	1,137.2	0.00	0.00	
3,100.0	29.78	98.03	2,810.7	-163.9	1,175.5	1,186.8	0.00	0.00	
3,200.0	29.78	98.03	2,897.5	-170.8	1,224.7	1,236.5	0.00	0.00	
3,300.0	29.78	98.03	2,984.3	-177.8	1,273.8	1,286.2	0.00	0.00	
3,400.0	29.78	98.03	3,071.1	-184.7	1,323.0	1,335.8	0.00	0.00	
3,500.0	29.78	98.03	3,157.9	-191.6	1,372.2	1,385.5	0.00	0.00	
3,600.0	29.78	98.03	3,244.7	-198.6	1,421.4	1,435.2	0.00	0.00	
3,700.0	29.78	98.03	3,331.4	-205.5	1,470.6	1,484.9	0.00	0.00	
3,800.0	29.78	98.03	3,418.2	-212.5	1,519.7	1,534.5	0.00	0.00	
3,900.0	29.78	98.03	3,505.0	-219.4	1,568.9	1,584.2	0.00	0.00	
4,000.0	29.78	98.03	3,591.8	-226.3	1,618.1	1,633.9	0.00	0.00	
4,100.0	29.78	98.03	3,678.6	-233.3	1,667.3	1,683.5	0.00	0.00	
4,192.6	29.78	98.03	3,759.0	-239.7	1,712.8	1,729.5	0.00	0.00	Ohio Creek
4,200.0	29.78	98.03	3,765.4	-240.2	1,716.5	1,733.2	0.00	0.00	
4,300.0	29.78	98.03	3,852.2	-247.1	1,765.7	1,782.9	0.00	0.00	
4,377.0	29.78	98.03	3,919.0	-252.5	1,803.5	1,821.1	0.00	0.00	Mesaverde Marker
4,400.0	29.78	98.03	3,939.0	-254.1	1,814.8	1,832.5	0.00	0.00	
4,500.0	29.78	98.03	4,025.8	-261.0	1,864.0	1,882.2	0.00	0.00	

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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	29.78	98.03	4,112.6	-267.9	1,913.2	1,931.9	0.00	0.00	
4,700.0	29.78	98.03	4,199.4	-274.9	1,962.4	1,981.5	0.00	0.00	
4,800.0	29.78	98.03	4,286.2	-281.8	2,011.6	2,031.2	0.00	0.00	
4,900.0	29.78	98.03	4,373.0	-288.7	2,060.7	2,080.9	0.00	0.00	
4,911.7	29.78	98.03	4,383.1	-289.6	2,066.5	2,086.7	0.00	0.00	Start 3° Drop
5,000.0	27.13	98.03	4,460.7	-295.4	2,108.2	2,128.8	3.00	-3.00	
5,100.0	24.13	98.03	4,550.9	-301.5	2,151.0	2,172.0	3.00	-3.00	
5,200.0	21.13	98.03	4,643.2	-306.8	2,189.1	2,210.5	3.00	-3.00	
5,260.6	19.31	98.03	4,700.0	-309.8	2,209.8	2,231.4	3.00	-3.00	Williams Fork
5,300.0	18.13	98.03	4,737.4	-311.5	2,222.3	2,244.1	3.00	-3.00	
5,400.0	15.13	98.03	4,833.2	-315.5	2,250.7	2,272.7	3.00	-3.00	
5,500.0	12.13	98.03	4,930.3	-318.8	2,274.0	2,296.3	3.00	-3.00	
5,571.0	10.00	98.03	5,000.0	-320.7	2,287.5	2,309.9	3.00	-3.00	Top Gas @ 10°
5,600.0	9.13	98.03	5,028.6	-321.4	2,292.3	2,314.7	3.00	-3.00	
5,700.0	6.13	98.03	5,127.7	-323.3	2,305.4	2,328.0	3.00	-3.00	
5,800.0	3.13	98.03	5,227.4	-324.4	2,313.4	2,336.1	3.00	-3.00	
5,904.4	0.00	0.00	5,331.7	-324.8	2,316.3	2,338.9	3.00	-3.00	EOD @ Inc. = 0°
6,000.0	0.00	0.00	5,427.3	-324.8	2,316.3	2,338.9	0.00	0.00	
6,100.0	0.00	0.00	5,527.3	-324.8	2,316.3	2,338.9	0.00	0.00	
6,200.0	0.00	0.00	5,627.3	-324.8	2,316.3	2,338.9	0.00	0.00	
6,300.0	0.00	0.00	5,727.3	-324.8	2,316.3	2,338.9	0.00	0.00	
6,400.0	0.00	0.00	5,827.3	-324.8	2,316.3	2,338.9	0.00	0.00	
6,500.0	0.00	0.00	5,927.3	-324.8	2,316.3	2,338.9	0.00	0.00	
6,600.0	0.00	0.00	6,027.3	-324.8	2,316.3	2,338.9	0.00	0.00	
6,700.0	0.00	0.00	6,127.3	-324.8	2,316.3	2,338.9	0.00	0.00	
6,800.0	0.00	0.00	6,227.3	-324.8	2,316.3	2,338.9	0.00	0.00	
6,900.0	0.00	0.00	6,327.3	-324.8	2,316.3	2,338.9	0.00	0.00	
7,000.0	0.00	0.00	6,427.3	-324.8	2,316.3	2,338.9	0.00	0.00	
7,055.7	0.00	0.00	6,483.0	-324.8	2,316.3	2,338.9	0.00	0.00	Coal Ridge
7,100.0	0.00	0.00	6,527.3	-324.8	2,316.3	2,338.9	0.00	0.00	
7,200.0	0.00	0.00	6,627.3	-324.8	2,316.3	2,338.9	0.00	0.00	
7,300.0	0.00	0.00	6,727.3	-324.8	2,316.3	2,338.9	0.00	0.00	
7,400.0	0.00	0.00	6,827.3	-324.8	2,316.3	2,338.9	0.00	0.00	
7,445.7	0.00	0.00	6,873.0	-324.8	2,316.3	2,338.9	0.00	0.00	Rollins
7,500.0	0.00	0.00	6,927.3	-324.8	2,316.3	2,338.9	0.00	0.00	
7,595.7	0.00	0.00	7,023.0	-324.8	2,316.3	2,338.9	0.00	0.00	TD 7,595.7' MD
7,600.0	0.00	0.00	7,027.3	-324.8	2,316.3	2,338.9	0.00	0.00	
7,695.7	0.00	0.00	7,123.0	-324.8	2,316.3	2,338.9	0.00	0.00	Permit TD @ 7,695.7' MD

Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
Federal Gardner 28-5BE - hit/miss target - Shape	0.00	0.00	5,331.7	-324.8	2,316.3	1,584,649.35	2,291,697.66	39.411781	-108.007261
Federal Gardner 28-5BE - plan hits target center - Point	0.00	0.00	7,023.0	-324.8	2,316.3	1,584,649.35	2,291,697.66	39.411781	-108.007261
Federal Gardner 28-5BE - plan hits target center - Circle (radius 25.0)	0.00	0.00	7,023.0	-324.8	2,316.3	1,584,649.35	2,291,697.66	39.411781	-108.007261

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MD Reference: Kbe @ 6214.0ft
North Reference: True
Survey Calculation Method: Minimum Curvature

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
1,155.5	1,117.3	Surface Casing	0.000	0.000

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
4,192.6	3,759.0	Ohio Creek			
4,377.0	3,919.0	Mesaverde Marker			
5,260.6	4,700.0	Williams Fork			
5,571.0	5,000.0	Top Gas @ 10°			
7,055.7	6,483.0	Coal Ridge			
7,445.7	6,873.0	Rollins			

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'
1,392.8	1,329.0	-45.5	335.8	EOB @ Inc. = 29.78°
4,911.7	4,383.1	-289.6	2,066.5	Start 3° Drop
5,904.4	5,331.7	-324.8	2,316.3	EOD @ Inc. = 0°
7,595.7	7,023.0	-324.8	2,316.3	TD 7,595.7' MD
7,695.7	7,123.0	-324.8	2,316.3	Permit TD @ 7,695.7' MD