

Fairbanks Pipeline Company

PROJECT DESCRIPTION:

Pipeline from Pump Station 1 to Terminus

Case Number: 1050
Pipeline data file: Case2_18in_no_compressor.TOT

Pressure drop formula: General Flow Equation
Pipeline efficiency: 1.00
Compressibility Factor Method: Standing-Katz

Inlet Gas Gravity(Air=1.0): 0.65000
Inlet Gas Viscosity: 0.0000080(lb/ft-sec)
Gas specific heat ratio: 1.29

Calculations Based on Specified Thermal Conductivities of Pipe, Soil and Insulation

Base temperature: 60.00(degF)
Base pressure: 14.70(psia)

Pipeline Inlet temperature: 60 (degF)
Pipeline Inlet pressure: 1440.00(psig)
Pipeline Terminus Delivery pressure: 1213.33(psig)
Minimum pressure: 100.0(psig)
Maximum gas velocity: 50.00(ft/sec)

Inlet Flow rate: 52.00(MMSCFD)
Outlet Flow rate: 40.60(MMSCFD)

CALCULATION OPTIONS:

Branch pipe calculations: NO
Loop pipe calculations: NO
Joule Thompson effect included : NO
Customized Output: NO
Holding Delivery Pressure at terminus

ALL PRESSURES ARE GAUGE PRESSURES, UNLESS OTHERWISE SPECIFIED AS ABSOLUTE PRESSURES

PIPELINE PROFILE DATA

Distance (mi)	Elevation (ft)	Diameter (in)	Thickness (in)	Roughness (in)
0.00	39.00	18.000	0.375	0.000700
57.60	602.00	18.000	0.375	0.000700
104.27	1383.00	18.000	0.375	0.000700
144.05	2763.00	18.000	0.375	0.000700
167.00	4752.00	18.000	0.375	0.000700
170.40	3352.20	18.000	0.375	0.000700
197.54	1568.10	18.000	0.375	0.000700
222.54	1244.50	18.000	0.375	0.000700
242.13	1250.30	18.000	0.375	0.000700
274.82	1250.30	18.000	0.375	0.000700
355.00	139.00	18.000	0.375	0.000700
397.50	443.50	18.000	0.375	0.000700
410.00	443.50	18.000	0.375	0.000700
414.80	904.00	12.000	0.375	0.000700
485.00	755.00	12.000	0.375	0.000700
514.50	440.00	12.000	0.375	0.000700

THERMAL CONDUCTIVITY AND INSULATION DATA

Distance (mi)	Cover (in)	Thermal Conductivity (Btu/hr/ft/degF)			Insul.Thk (in)	Soil Temp (degF)
		Pipe	Soil	Insulation		
0.000	36.000	29.000	0.800	0.020	0.000	29.00
57.600	36.000	29.000	0.800	0.020	0.000	29.00
104.270	36.000	29.000	0.800	0.020	0.000	29.00
144.050	36.000	29.000	0.800	0.020	0.000	29.00
167.000	36.000	29.000	0.800	0.020	0.000	29.00
170.400	36.000	29.000	0.800	0.020	0.000	29.00
197.540	36.000	29.000	0.800	0.020	0.000	29.00
222.540	36.000	29.000	0.800	0.020	0.000	29.00
242.130	36.000	29.000	0.800	0.020	0.000	29.00
274.820	36.000	29.000	0.800	0.020	0.000	29.00
355.000	36.000	29.000	0.800	0.020	0.000	29.00
397.500	36.000	29.000	0.800	0.020	0.000	29.00
410.000	36.000	29.000	0.800	0.020	0.000	29.00
414.800	36.000	29.000	0.800	0.020	0.000	29.00
485.000	36.000	29.000	0.800	0.020	0.000	29.00
514.500	36.000	29.000	0.800	0.020	0.000	29.00

LOCATIONS AND FLOW RATES

Location	Distance (mi)	Flow in/out (MMSCFD)	Gravity	Viscosity (lb/ft-sec)	Pressure (psig)	GasTemp. (degF)
CS-1	0.00	52.0000	0.6500	0.00000800	1440.00	60.00
Livengood	410.00	-11.4000	0.6500	0.00000800	1334.76	29.00
NP	514.50	-40.6000	0.6500	0.00000800	1213.33	29.00

REYNOLD'S NUMBER AND HEAT TRANSFER COEFFICIENT

Distance (mi)	Reynold'sNum.	FrictFactor (Darcy)	Transmission Factor	HeatTransCoeff (Btu/hr/ft2/degF)	CompressibilityFactor (Standing-Katz)
0.000	3,308,246.	0.0102	19.84	0.4594	0.6966
57.600	3,308,246.	0.0102	19.84	0.4594	0.6989
104.270	3,308,246.	0.0102	19.84	0.4594	0.7090
144.050	3,308,246.	0.0102	19.84	0.4594	0.7235
167.000	3,308,246.	0.0102	19.84	0.4594	0.7265
170.400	3,308,246.	0.0102	19.84	0.4594	0.7144
197.540	3,308,246.	0.0102	19.84	0.4594	0.7070
222.540	3,308,246.	0.0102	19.84	0.4594	0.7065
242.130	3,308,246.	0.0102	19.84	0.4594	0.7074
274.820	3,308,246.	0.0102	19.84	0.4594	0.7048
355.000	3,308,246.	0.0102	19.84	0.4594	0.7035
397.500	3,308,246.	0.0102	19.84	0.4594	0.7057
410.000	2,582,976.	0.0102	19.84	0.4582	0.7078
414.800	3,960,564.	0.0110	19.10	0.6015	0.7163
485.000	3,960,564.	0.0110	19.10	0.6015	0.7254
514.500	3,960,564.	0.0110	19.10	0.6015	0.7254

PIPELINE TEMPERATURE AND PRESSURE PROFILE

Distance (mi)	Diameter (in)	Flow (MMSCFD)	Velocity (ft/sec)	Press. (psig)	GasTemp. (degF)	SoilTemp. (degF)	MAOP (psig)	Location
0.00	18.000	52.0000	3.75	1440.00	60.00	29.00	2000.00	CS-1
57.60	18.000	52.0000	3.81	1400.53	29.00	29.00	2000.00	PS-2
104.27	18.000	52.0000	3.92	1352.86	29.00	29.00	2000.00	PS-3
144.05	18.000	52.0000	4.10	1280.21	29.00	29.00	2000.00	PS-4
167.00	18.000	52.0000	4.37	1189.45	29.00	29.00	2000.00	Crest
170.40	18.000	52.0000	4.43	1247.92	29.00	29.00	2000.00	RGV-31
197.54	18.000	52.0000	4.20	1323.24	29.00	29.00	2000.00	RGV-36
222.54	18.000	52.0000	4.07	1333.56	29.00	29.00	2000.00	RGV-40
242.13	18.000	52.0000	4.06	1329.38	29.00	29.00	2000.00	RGV-45
274.82	18.000	52.0000	4.07	1322.82	29.00	29.00	2000.00	PS-5
355.00	18.000	52.0000	4.03	1360.29	29.00	29.00	2000.00	PS-6
397.50	18.000	52.0000	4.01	1337.25	29.00	29.00	2000.00	RGV-65
410.00	18.000	40.6000	4.04	1334.76	29.00	29.00	2000.00	Livengood
414.80	12.000	40.6000	3.19	1312.47	29.00	29.00	2000.00	PS-7
485.00	12.000	40.6000	7.77	1236.50	29.00	29.00	2000.00	FOx
514.50	12.000	40.6000	8.09	1213.33	29.00	29.00	2000.00	NP

LINE PACK VOLUMES AND PRESSURES

Distance (mi)	Pressure (psig)	Line Pack (million std.cu.ft)
0.00	1440.00	0.0000
57.60	1400.53	68.1159
104.27	1352.86	57.6387
144.05	1280.21	46.3457
167.00	1189.45	24.5980
170.40	1247.92	3.5811
197.54	1323.24	30.6518
222.54	1333.56	29.4608
242.13	1329.38	23.1552
274.82	1322.82	38.4355
355.00	1360.29	95.7216
397.50	1337.25	51.0929
410.00	1334.76	14.8409
414.80	1312.47	5.6300
485.00	1236.50	33.3424
514.50	1213.33	13.3007

Total line pack in main pipeline = 535.9112 million standard cubic feet

End of Simulation

Pipeline data file: C:\Documents and Settings\schen\My Documents\chen\Energia Cura\GASMOD\FPC Simulation\Case2 18in no compres

Pressure - (psig)

Inlet Flowrate: 52.00 (MMSCFD) OutletFlowrate:40.60 (MMSCFD)

