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Results from the Water Flow Test of the Tank 37 Backflush Valve

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Abstract

A flow test was conducted in the Thermal Fluids Lab with the Tank 37 Backflush Valve to determine the pressure drop of water flow through the material transfer port. The flow rate was varied from 0 to 100 gpm. The pressure drop through the Backflush Valve for flow rates of 20 and 70 gpm was determined to be 0.18 and 1.77 feet of H_2O, respectively.

An equivalent length of the Backflush Valve was derived from the flow test data. The equivalent length was used in a head loss calculation for the Tank 37 Gravity Drain Line. The calculation estimated the flow rate that would fill the line up to the Separator Tank, and the additional flow rate that would fill the Separator Tank. The viscosity of the fluid used in the calculation was 12 centipoise. Two specific gravities were investigated, 1.4 and 1.8. The Gravity Drain Line was assumed to be clean, unobstructed stainless steel pipe. The flow rate that would fill the line up to the Separator Tank was 73 and 75 gpm for the 1.4 or 1.8 specific gravity fluids, respectively. The flow rate that would fill the Separator Tank was 96 and 100 gpm for the 1.4 or 1.8 specific gravity fluids, respectively. These results indicate that concentrate will not back up into the Separator Tank during evaporator normal operation, 15-25 gpm, or pot liftout, 70 gpm.

A noteworthy observation during the flow test was water pouring from the holes in the catheterization tube. Water poured from the holes at 25 gpm and above. Data from the water flow test indicates that at 25 gpm the pressure drop through the Backflush Valve is 0.26 ft of H_2O. A concentrate with a specific gravity of 1.8 and a viscosity of 12 cp will produce the same pressure drop at 20 gpm. This implies that concentrate from the evaporator may spill out into the BFV riser during a transfer.

Background

The 3H Evaporator reduces the volume of tank farm waste by removing water from the radioactive solution. The evaporator typically concentrates tank farm feed to roughly 20 � 40% of the original volume. During the evaporation process, the concentrate is extracted from the evaporator with a steam lift. The concentrate and steam enter the Separator Tank where the steam and concentrate are separated. The steam transfers to a Vent Tank and the concentrate to a Concentrate Receipt Tank, for temporary storage and additional waste processing. The steam lift produces concentrate transfer rates of 15-25 gpm. However, transfer rates of up to 70 gpm can be achieved during the evaporator pot liftout process. The steam and concentrate enter their respective tanks through a pneumatically operated Backflush Valve (BFV).

The BFV is a large multi-port plug valve. The multiple ports provide a material transfer operation, a flush-to-evaporator operation, a flush-to-tank operation, and a catheterization operation. The BFV, shown in Figure 1, consists of a robust support frame, a lead filled radiation shield, service tubes for flushing and catheterization, a valve block assembly, and a shaft assembly. The valve block assembly consists of a stainless steel block containing a carbon seat with three ports to facilitate the different operations. The weighted shaft assembly seats a stainless steel conical plug into the valve block assembly. Three equally spaced jackscrews in the support frame hold the shaft in place and are set to provide a vertical shaft travel of 0.004".

The transfer of concentrate from the evaporator to the Concentrate Receipt Tank is sustained for several days to weeks. The BFV is in the "Bottoms" position during the material transfer operation. The concentrate enters the BFV through the material transfer port from a nozzle connection. The conical plug diverts the concentrate down into the Concentrate Receipt Tank with a mitered bend. The mitered bend has a 2" inner diameter inlet and a 1.75" inner diameter outlet.

The concentrate enters the material transfer port from the Gravity Drain Line (GDL), which is connected to the Separator Tank. There have been indications that flow in the Tank 30 GDL has backed up into the Separator Tank during concentrate transfers. This has caused disruption of the 3H Evaporator normal operation. There are two possible explanations for the back up of the GDL. First, the BFV material transfer port and adjacent GDL are too restrictive, causing a significant pressure drop. Second, there is additional flow resistance due to materials from the concentrate depositing on the ID of the GDL piping.

A flow test was conducted in the Thermal Fluids Lab (TFL) to investigate the first possible explanation for the back up of the GDL. The flow test was conducted with water at room temperature and specifically addressed the pressure drop of the BFV. A single-piece carbon seat, with a 0.0084"-0.0101" interference fit, was installed in the BFV valve block for the test. The test consisted of varying the flow of water through the BFV while measuring the pressure and flow rate upstream of the BFV.

Test Apparatus

The flow test apparatus is shown in Figure 2. Process water was piped directly into the material transfer port of the BFV. The piping consisted of 2" schedule 80 PVC pipe. The water passed through the BFV conical plug and discharged into a drain line, which was open to atmosphere. A throttle valve in the process water piping was used to set the desired flow rate. Measurement and Testing Equipment (M&TE) recorded flow rate, pressure and temperature data downstream of the throttle valve and upstream of the BFV. The straight section of pipe containing the M&TE was located lower than the straight pipe that led into the BFV material transfer port (Figure 3). This location would assure that the instrumented pipe was full of water at all times. The pressure transducer, however, was placed at the level of the upper pipe (using a short length of pneumatic tubing) to negate the 6" head of water separating the two straight sections of 2" PVC pipe. The test was conducted by setting the flow rate and acquiring steady state data. The flow rate was varied from 0 to 100 gpm. The data recorded by the pressure transducer included the pressure drop of the inlet piping and the BFV. The pressure drop of the BFV was analytically extracted from the raw test data. Several tests were conducted to assure repeatable performance.

Test Results

Pressure vs. Flow

The results from the flow test are shown in Figure 4 and 5. Both figures show the corrected pressure versus flow rate squared. The pressure data has been corrected for a zero shift in the output of the pressure transducer (M&TE # TR-20267). A zero shift of approximately +0.09 psig was discovered during the post-test calibration of the instrument. In addition, pressure data from the flow test indicated a non-zero reading at zero flow. The magnitude of the non-zero reading was approximately +0.09 psig. Therefore a correction of �0.09 psig was applied to the pressure data.

Figure 4 shows pressure drop vs. flow data of the entire inlet system (BFV plus inlet piping, see Attachment 3). Figure 5 shows the pressure drop vs. flow data for the BFV exclusively. The pressure drop of the BFV was determined by removing the pressure drop of the inlet piping from the raw, corrected pressure data. The pressure drop of the inlet piping was calculated using Darcy�s equation. This exercise is shown in Attachment 1.

Figure 5 indicates that the BFV pressure drop is related to the flow rate of water by the following expression,

$$Psig = 1.521E\text{-}4 * gpm^2 + 1.386E\text{-}2. \quad (1)$$

This expression indicates that at 20 gpm (normal operation) the pressure drop through the BFV is 0.08 psig (0.18 ft of H_2O), and at 70 gpm (pot liftout) the pressure drop is 0.77 psig (1.77 ft of H_2O).

Flow Rate Required to Fill the Tank 37 GDL and Separator Tank

The BFV pressure drop information of Figure 5 was used to determine the flow capacity of the Tank 37 GDL. Two flow capacities were investigated; 1) the flow rate that would fill the GDL up to the separator Tank, and 2) the flow rate that would fill the GDL and the Separator Tank. The Tank 37 GDL consists of approximately 246� of 3" SCH 40 and 13� of 2" SCH 40 stainless steel pipe (ref. Attachment 3). The 13� section of 2" pipe is located on Tank 37, at the BFV. The 3" section of pipe runs underground from the Separator Tank to Tank 37.

Crane [1] indicates that the resistance coefficient (K) and the equivalent length (L/D) are constant for a specific size of an item, such as a valve or fitting, when the flow is completely turbulent. However, when the flow is transitional it is assumed that the L/D is constant and K varies proportionally with friction factor (f). The flow was transitional for the water flow test, therefore a constant equivalent length was calculated for the BFV using the pressure drop vs. flow information from Figure 5. This exercise is shown in Attachment 2.

The table in Attachment 2 contains test data and calculated data. The test data includes system pressure, temperature, and flow rate. The calculated data includes the piping pressure drop, the BFV pressure drop in psig and feet of water, the BFV friction coefficient (K), the Reynolds number and friction factor (f) associated with the BFV, and the BFV L/D. The chart in Attachment 2 is a plot of the calculated BFV L/D and the flow rate from the table. The chart includes error bands derived from the uncertainty of the M&TE. The error in the BFV L/D calculation increases significantly as the flow rate decreases. The chart values at the higher flow rates have a reasonable error and indicate that the L/D of the BFV is approximately 113.

The flow capacity investigation is shown in Attachment 3. The investigation assumes clean, unobstructed, stainless steel pipes in the GDL. The L/D values for the GDL were combined with the L/D for the BFV to derive a pressure drop for the Tank 37 GDL system at various flow rates. The pressure drop equated to the height of fluid in the GDL. A sketch of the Tank 37 GDL is shown in Attachment 3 along with tabular data of the L/Ds for the straight pipe and fittings. Two fluid specific gravities were investigated, 1.4 and 1.8. These specific gravity values represented the extremes of the evaporator concentrate range. The viscosity of the concentrate used in Attachment 3 was 12 centipoise (2.53 E-4 $lbf\text{-}s/ft^2$) for both specific gravities, which represents the high end of the viscosity range.

The investigation showed that the flow rate that would fill the GDL up to the Separator Tank for a fluid with a specific gravity of 1.4 and a viscosity of 12 centipoise (cp) was 73 gpm. The flow rate for a fluid with a specific gravity of 1.8 and a viscosity of 12 cp was 75 gpm. The flow rate that would fill the GDL and Separator Tank for a fluid with a specific gravity of 1.4 and a viscosity of 12 cp was 96 gpm. The flow rate for a fluid with a specific gravity of 1.8 and a viscosity of 12 cp was 100 gpm. These results indicate that concentrate flowing in the Tank 37 Gravity Drain Line, that is clean and unobstructed, will not back up into the Separator Tank during normal operation or pot liftout.

Leakage from the Catheterization Tube

A noteworthy observation during the flow tests was the flow, or leakage, of water out of the catheterization tube (C-tube) holes. Several sets of these holes are along the length of the C-tube between the valve block and the radiation shield. The holes facilitate the drainage of water during the catheterization process, where a water lance is inserted through the C-tube to clear the BFV and/or GDL of blockage.

During the flow tests, water poured out of the lower C-tube holes at approximately 25 gpm. At 100 gpm, water poured out of nearly every hole in the C-tube between the valve block and the radiation shield. Equation 1 indicates that the pressure drop through the BFV at 25 gpm of water is 0.11 psig (0.26 ft of H_2O). Using Darcy�s equation, a concentrate with a specific gravity of 1.8 and a viscosity of 12 cp would generate the same pressure drop through the BFV at approximately 20 gpm. Therefore, a concentrate from the evaporator with a specific gravity of 1.8 and a viscosity of 12 cp will flow out of the C-tube holes into the BFV riser at approximately 20 gpm. The concentrate that leaked into the riser would drain into the Concentrate Receipt Tank, but residual material would remain on the lower portion of the BFV and the BFV riser.

Reference

1. Crane Catalog No. 60, Crane Supply Co., 1960, Crane Co.
2. L9.5-9114, *M&TE Calibration and Evaluation Process at the Thermal-Fluids Laboratory, Rev.1*, 12/1/98
3. C-CU-H-2618 Rev. 4, Replacement High Level waste Evaporator / 200-H Area / Plan and Profile, Gravity Drain Line 37 / Civil.
4. P-PA-H-2081 (W2010725) Rev. 3, Evaporator Cell Equipment / Flush Water and Spray Piping Sections and Details Sheet 2 / Process.
5. P-PA-H-5720 (W2019853) Rev. 4, Replacement High Level Waste Evaporator / Evaporator Cell Jumper Arr�g�t � Plan.
6. P-PJ-H-7837 Rev. 1, Replacement High Level Waste Evaporator / Separator Drain Jumper Y555-100-124-3 / Piping Details � Process.
7. P-PY-H-4418 Rev. 2, High Level Waste Evaporator / Gravity Drain Line to Tank 37 / Plan and Details / Process � Piping.

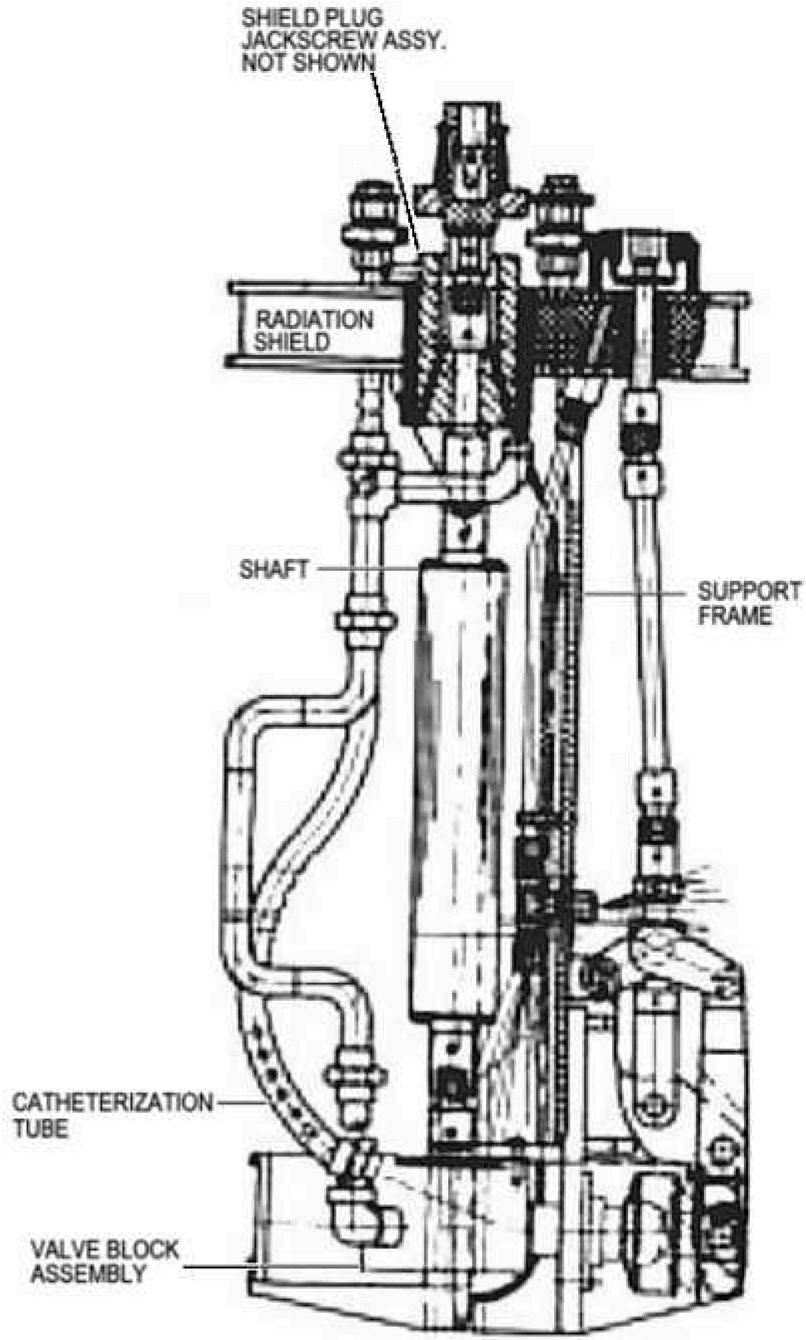

SHIELD PLUG
JACKSCREW ASSY.
NOT SHOWN
RADIATION
SHIELD
SHAFT
SUPPORT
FRAME
CATHETERIZATION
TUBE
VALVE BLOCK
ASSEMBLY

Figure 1 Backflush Valve

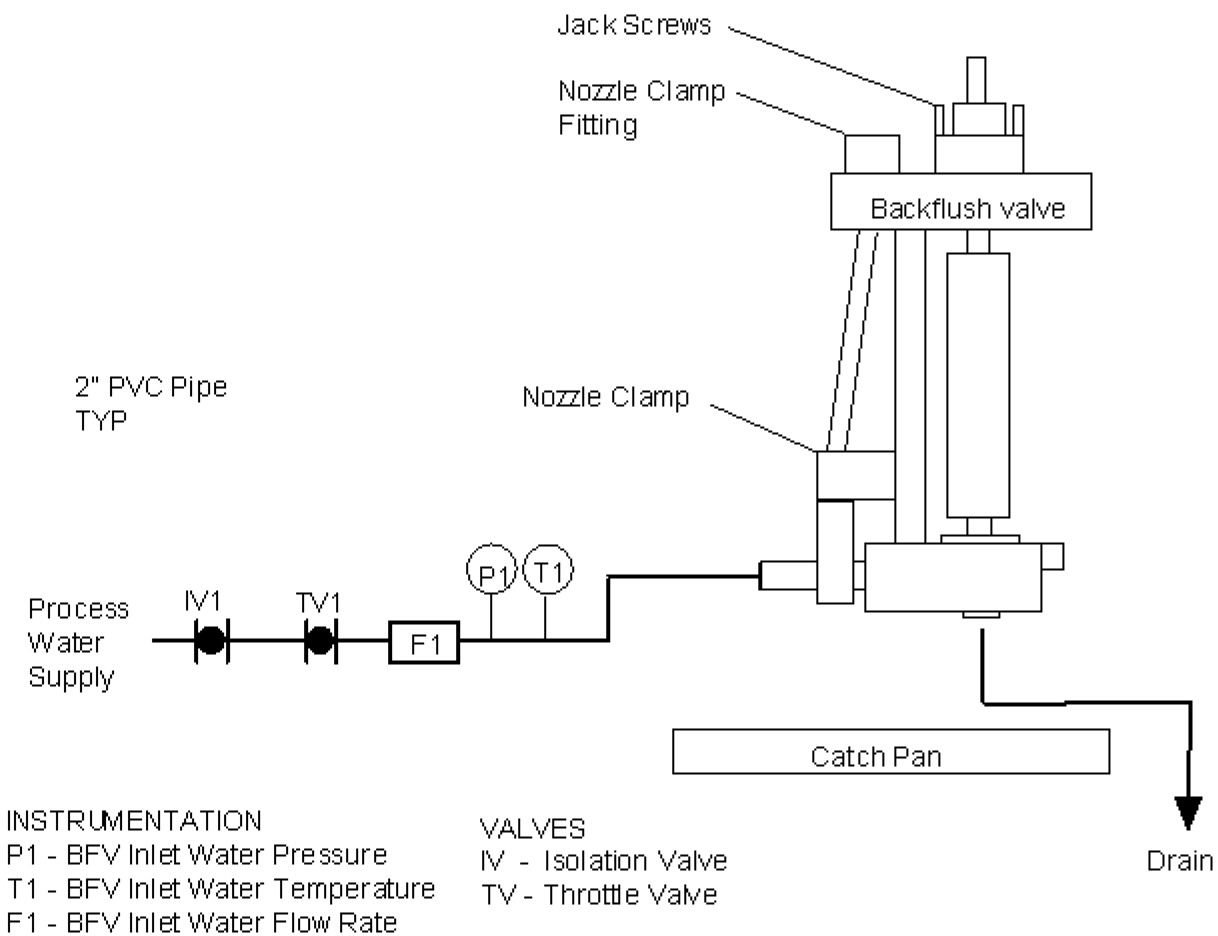


Figure 2 Flow Test Apparatus

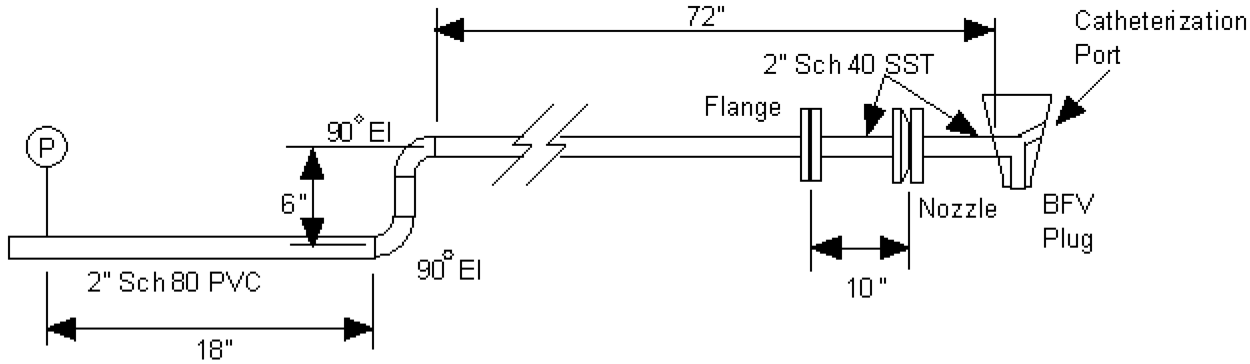


Figure 3 BFV Inlet Piping for Flow Test

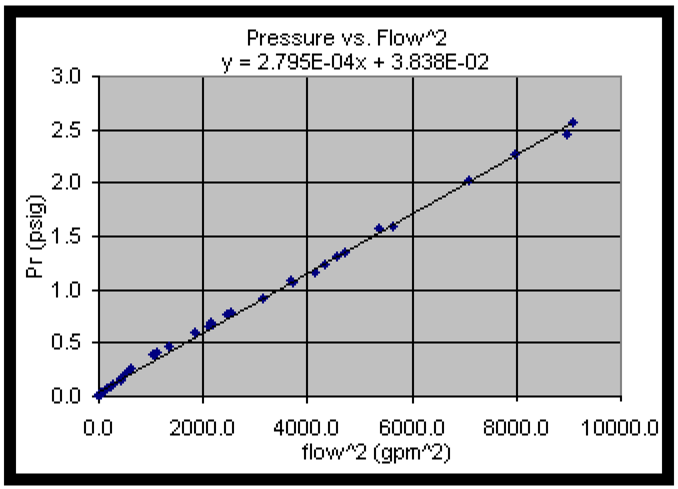


Figure 4 System Pressure Drop vs. Flow^2 (Corrected)

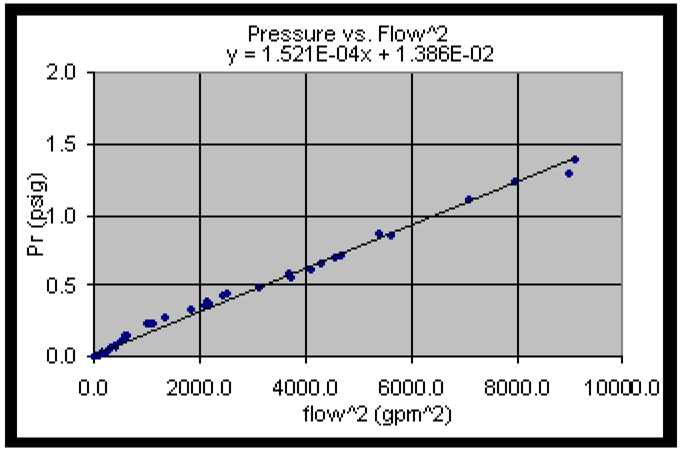


Figure 5 BFV Pressure Drop vs. Flow^2 (Corrected)

Attachment 1

Flow Test Piping Pressure Drop

Pipe Data		
	PVC	**SST**
Size	2"	2"
Schedule	80	40
ID	1.939"	2.067"

L/D Ratio: (Ref. Figure 3, BFV Inlet Piping for Flow Test)			
PVC		**SST**	
Item	**L/D**	**Item**	**L/D**
Straight Pipe	38.2	Straight Pipe	4.8
90^0 Elbow (2)[1]	60	Flange	0
		Nozzle	0
Total	98.2		4.8

Piping Pressure Drop		
Water Properties	Temperature, ^{0}C	21.5
	Density (ρ), ft^3/lb	62.3
	Viscosity (μ), lbf-s/ft^2	2.04 E-5

PVC

Flow Rate	Velocity	Reynolds Number (Re)[1]	Friction Factor (f)[2]	Resistance Coefficient (K)[3]	Pressure Drop (H_L)[3]	Pressure Drop (H_L)[3]
(gpm)	(ft/s)				(ft H_2O)	(psig)
0	0	0	0	0	0	0
20	2.17	3.33 E+4	0.0228	2.24	0.16	0.07
40	4.35	6.67 E+4	0.0194	1.90	0.56	0.24
60	6.52	1.00 E+5	0.0177	1.74	1.15	0.50
80	8.69	1.33 E+5	0.0160	1.57	1.84	0.80
100	10.87	1.67 E+5	0.0156	1.53	2.81	1.21

1 Re=VDρ /μ
2 Moody Diagram, smooth pipe[1]
3 Darcy�s Equation, $H_L = K*(V^2/2g)$, g=32.2 ft/s^2, K = f*(L/D) [1]

SST

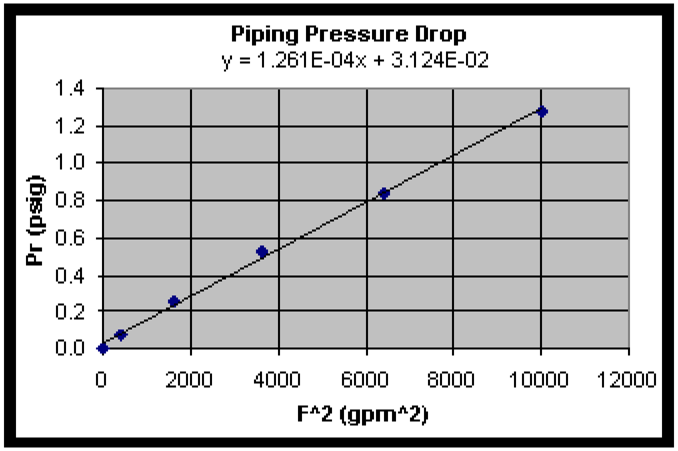
Flow Rate	Velocity	Reynolds Number (Re)[1]	Friction Factor (f)[2]	Resistance Coefficient (K)[3]	Pressure Drop (H_L)[3]	Pressure Drop (H_L)[3]
(gpm)	(ft/s)				(ft H_2O)	(psig)
0	0	0	0	0	0	0
20	1.91	3.13 E+4	0.0257	0.12	0.01	0.00

40	3.82	6.25 E+4	0.0233	0.11	0.03	0.01
60	5.74	9.38 E+4	0.022	0.11	0.05	0.02
80	7.65	1.25 E+5	0.0212	0.10	0.09	0.04
100	9.56	1.56 E+5	0.021	0.10	0.14	0.06

1 Re = VDρ /μ
2 Moody Diagram, D/ε =1000 [1]
3 Darcy�s Equation, $H_L = K*(V^2/2g)$, g=32.2 ft/s^2, K = f*(L/D) [1]

PVC & SST Combined

Flow Rate	Flow Rate^2	Total Pressure Drop (H_L)	Total Pressure Drop (H_L)
(gpm)	(gpm^2)	(ft H_2O)	(psig)
0	0	0	0
20	400	0.17	0.07
40	1600	0.58	0.25
60	3600	1.20	0.52
80	6400	1.94	0.84
100	10000	2.95	1.28



Attachment 2

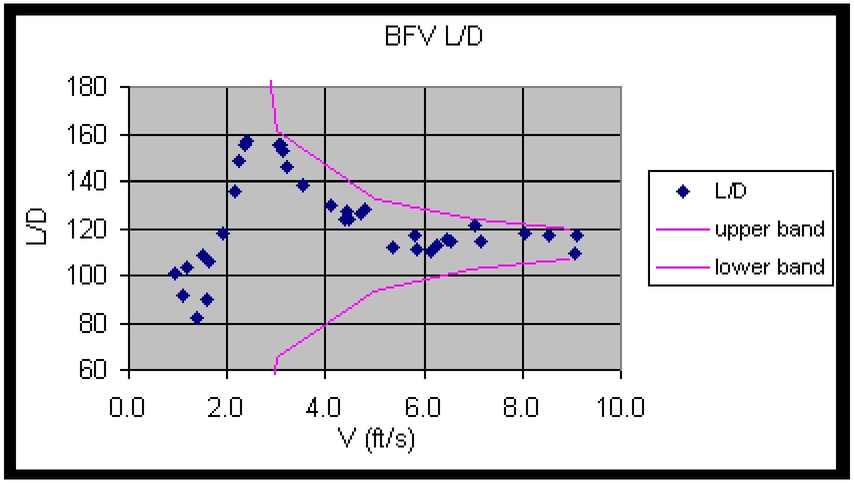
BFV L/D

Test Data			Calculated Data						
Flow	Velocity	Corrected Pressure	Piping Pr. Drop[1]	BFV Pr. Drop (H_L)	BFV Pr. Drop (H_L)	BFV K^2	Reynolds Number[3]	BFV f [4]	BFV L/D[5]
(gpm)	(ft/s)	(psig)	(psig)	(psig)	(ft H_2O)				
15.83	1.51	0.11	0.06	0.04	0.10	2.92	2.3E+04	0.0268	109
25.00	2.39	0.26	0.11	0.15	0.35	3.93	3.7E+04	0.0250	157
36.82	3.52	0.48	0.20	0.27	0.63	3.28	5.4E+04	0.0237	139
45.94	4.39	0.66	0.30	0.37	0.85	2.83	6.7E+04	0.0228	124
49.46	4.73	0.77	0.34	0.43	0.99	2.86	7.2E+04	0.0226	126
61.04	5.84	1.07	0.50	0.56	1.30	2.46	8.9E+04	0.0222	111
68.52	6.55	1.34	0.62	0.72	1.66	2.49	1.0E+05	0.0218	114
74.94	7.16	1.59	0.74	0.85	1.97	2.48	1.1E+05	0.0217	114
89.30	8.54	2.26	1.04	1.23	2.84	2.51	1.3E+05	0.0214	117

64.22	6.14	1.17	0.55	0.62	1.43	2.44	9.4E+04	0.0221	110
43.02	4.11	0.61	0.26	0.34	0.79	3.00	6.3E+04	0.0231	130
24.83	2.37	0.26	0.11	0.15	0.34	3.88	3.6E+04	0.0250	155
14.64	1.40	0.09	0.06	0.03	0.07	2.26	2.1E+04	0.0275	82
12.48	1.19	0.08	0.05	0.03	0.06	2.92	1.8E+04	0.0282	103
23.50	2.25	0.23	0.10	0.13	0.29	3.76	3.4E+04	0.0253	149
32.13	3.07	0.39	0.16	0.23	0.54	3.67	4.7E+04	0.0236	156
46.66	4.46	0.68	0.31	0.38	0.87	2.82	6.8E+04	0.0228	124
65.66	6.28	1.23	0.57	0.65	1.51	2.47	9.6E+04	0.0219	113
46.52	4.45	0.69	0.30	0.39	0.89	2.90	6.8E+04	0.0228	127
73.34	7.01	1.58	0.71	0.87	2.01	2.63	1.1E+05	0.0217	121
94.70	9.05	2.45	1.16	1.29	2.97	2.34	1.4E+05	0.0213	110
60.72	5.81	1.08	0.50	0.59	1.36	2.60	8.9E+04	0.0222	117
33.55	3.21	0.42	0.17	0.24	0.56	3.50	4.9E+04	0.0240	146
20.10	1.92	0.16	0.08	0.08	0.17	3.05	2.9E+04	0.0258	118
9.94	0.95	0.06	0.04	0.02	0.04	2.96	1.5E+04	0.0293	101
16.60	1.59	0.11	0.07	0.04	0.09	2.39	2.4E+04	0.0265	90
22.65	2.17	0.20	0.10	0.11	0.25	3.45	3.3E+04	0.0254	136
11.65	1.11	0.07	0.05	0.02	0.05	2.65	1.7E+04	0.0290	92
16.89	1.61	0.12	0.07	0.05	0.11	2.81	2.5E+04	0.0265	106
32.07	3.07	0.39	0.16	0.23	0.53	3.66	4.7E+04	0.0236	155
50.17	4.80	0.80	0.35	0.45	1.03	2.89	7.4E+04	0.0226	128
67.46	6.45	1.31	0.61	0.70	1.63	2.52	9.9E+04	0.0218	116
84.24	8.05	2.03	0.93	1.10	2.55	2.53	1.2E+05	0.0215	118
95.28	9.11	2.57	1.18	1.39	3.21	2.49	1.4E+05	0.0213	117

56.10	5.36	0.91	0.43	0.49	1.12	2.51	8.2E+04	0.0224	112
32.61	3.12	0.40	0.17	0.24	0.55	3.64	4.8E+04	0.0238	153
20.23	1.93	0.16	0.08	0.08	0.18	3.14	3.0E+04	0.0257	122
10.31	0.99	0.06	0.04	0.02	0.05	3.00	1.5E+04	0.0293	102

1 Psig = 0.0001261∗ gpm^2 + 0.03124 (Attachment 1)
2 Darcy�s Equation, $K = H_L / (V^2/2g)$, g=32.2 ft/s^2 [1]
3 $Re = VD\rho /\mu$
4 Moody Diagram, 2" Sch 40 SST pipe [1]
5 L/D = K / f [1]

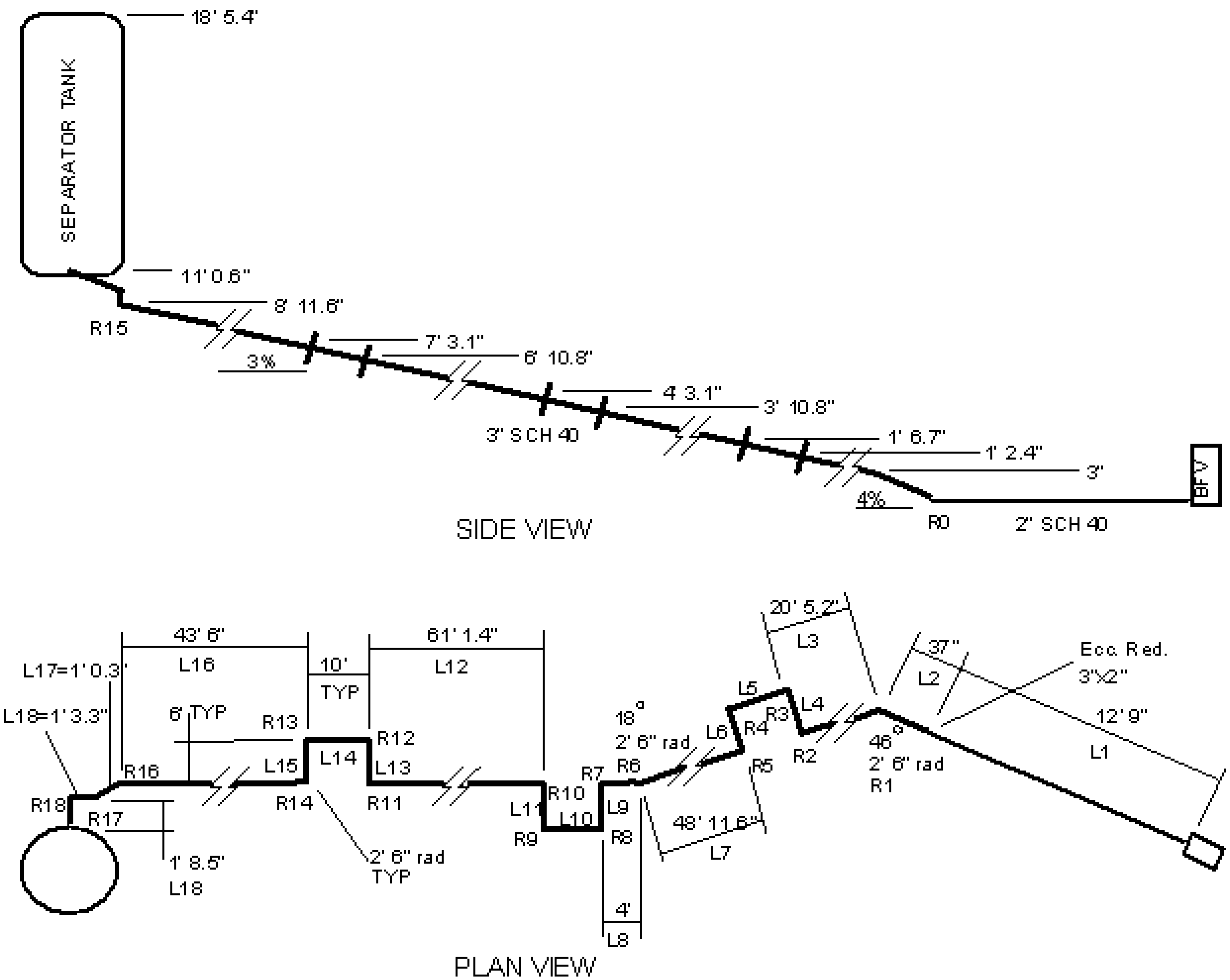


Attachment 3

Tank 37 GDL Pressure Drop

Pipe Data		
Material	SST	SST
Size	2"	3"
Schedule	40	40
ID	2.067"	3.068"

Pipe Configuration: Tank 37 GDL [3][4][5][6][7]



Straight Pipe L/Ds

ITEM	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	L13	L14	L15	L16	L17	L18
L/D	74	14	80	4	20	4	192	16	4	20	4	239	4	20	4	166	4	5

Fitting L/Ds [2]

ITEM	BFV	Red	R0	R1	R2	R3	R4	R5	R6	R7	R8
L/D	113	10	2	18	29	29	29	29	8	29	29
ITEM	R9	R10	R11	R12	R13	R14	R15	R16	R17	R18	Exit
L/D	29	29	29	29	29	29	29	57	16	57	15

GDL Pressure Drop		
Concentrate Properties,		
Case	1	2
Viscosity (μ), lbf-s/ft^2	2.53 E-4 (12 cp)	2.53 E-4 (12 cp)
Specific gravity	1.8	1.4

Case 1

Flow	**2" Flow Velocity**	**Reynolds Number[1]**	**3" Flow Velocity**	**Reynolds Number[1]**	***f* (2")[2]**	***f* (3")[2]**	**2" L/D**	**3" L/D**	**BFV L/D**	**Press. Drop (H_L)[3]**	**Piping Items Included**
(gpm)	(ft/s)		(ft/s)							(ft-in)	
20	1.91	4.54 E+3	0.87	3.06 E+3	0.0385	0.0425	74	60	113	0-5	L1-,L2,part L3 BFV, Red,R0,R1
50	4.78	1.14 E+4	2.17	7.65 E+3	0.0312	0.0338	74	388	113	3-0	L1-L6,part L7 BFV,Red,R0-R5
75[4]	7.17	1.70 E+4	3.26	1.15 E+4	0.0284	0.0308	74	1343	113	11-1	L1-L18 BFV,Red,R0-R18
100[5]	9.56	2.27 E+4	4.34	1.53 E+4	0.0267	0.0285	74	1358	113	18-5	L1-L18,BFV,Red R0-R18,exit,tank

1. Re = VDρ /μ
2. Moody Diagram [1]
1. Darcy�s Equation, $H_L = K*(V^2/2g)$, g=32.2 ft/s^2, K = f*(L/D) [1]
2. Bottom of the Separator Tank
1. Top of the Separator Tank

Case 2

Flow	**2" Flow Velocity**	**Reynolds Number[1]**	**3" Flow Velocity**	**Reynolds Number[1]**	***f* (2")[2]**	***f* (3")[2]**	**2" L/D**	**3" L/D**	**BFV L/D**	**Press. Drop (H_L)[3]**	**Piping Items Included**

(gpm)	(ft/s)		(ft/s)							(ft-in)	
20	1.91	3.53 E+3	0.87	2.38 E+3	0.0407	0.0460	74	62	113	0-6	L1-,L2,part L3 BFV, Red,R0,R1
50	4.78	8.83 E+3	2.17	5.95 E+3	0.0328	0.0359	74	405	113	3-3	L1-L6,part L7 BFV,Red,R0-R5
73[4]	6.98	1.29 E+4	3.17	8.69 E+3	0.0306	0.0323	74	1343	113	11-1	L1-L18 BFV,Red,R0-R18
96[5]	9.18	1.70 E+4	4.17	1.14 E+4	0.0284	0.0313	74	1358	113	18-5	L1-L18,BFV,Red R0-R18,exit,tank

1. Re = VDρ /μ
2. Moody Diagram [1]
1. Darcy�s Equation, $H_L = K*(V^2/2g)$, $g=32.2$ ft/s^2, $K = f*(L/D)$ [1]
2. Bottom of the Separator Tank
1. Top of the Separator Tank

Attachment 4

Flow Test M&TE

The Data Acquisition System (DAS) consisted of a DELL OptiPlex GX300 PC with National Instruments LabView for Windows software, version 6i. The Measurement and Testing Equipment (M&TE) used during flow test are listed in the table below. To ensure accuracy, the M&TE and DAS were calibrated before and after the tests. The cumulative uncertainty of each piece of M&TE are listed in the table. The calibrations and uncertainty analysis were conducted per procedure L9.5-9114, rev. 1 [2].

M&TE #	Description	Service	Designation	DAS Channel	DAS Equation	Range	Uncertainty (+/-)
TR-03043	Type E T/C	Inlet Water Temp	T1	1	Type E T/C	0-300° C	1.7° C
TR-03278	Mag Flow Meter	Inlet Water Flow	F1	5	Gpm=12.364*V-24.764	0-100 gpm	0.95 gpm
TR-20267	Pres. Transducer	Inlet Water Press	P1	6	Psig=0.751*V-1.500	0-6 psig	0.07 psig[1]

1 Not including the +0.09 psig bias error.