BERGER LAW FIRM, P.C.
ATTORNEYS AT LAW

2104 MARKET STREET
CAMP HILL, PA 17011

TELEPHONE: (717) 920-8900
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EMAIL: publicutilitylaw@bergerlawfirm.net

ORIGINAL

06 NOV 14 P.. 3:26

FIXED UTILITY SERVICES

November 13, 2006

2006 NOV 13 PM 5:02
PA PUC
SECRETARY'S BUREAU

James McNulty, Secretary
PA Public Utility Commission
P.O. Box 3265
Harrisburg, PA 17105-3265

Attn: Wm. David Shrader
Michael Metcalf

RE: Borough of Phoenixville Sewer Fund
Docket No. R-00061625
Responses to Data Requests of the Bureau of Fixed Utility Services

Dear Secretary McNulty:

Enclosed please find the original and three (3) copies of the responses to data requests of the Bureau of Fixed Utility Services, RB-1, RB-2, RS-1 to RS-7, QS-1 to QS-2, and RE-1 to RE-3. The response to RB-3 will be provided shortly.

If you have any questions regarding this matter, please feel free to contact me.

DOCUMENT
FOLDER

Sincerely yours,

Edmund J. Berger

cc: Office of Consumer Advocate
Office of Small Business Advocate

53

ORIGINAL

Responses of Borough of Phoenixville Sewer Fund
To Bureau of Fixed Utility Services Data Requests
Docket No. R-00061625

RB-1 Schedule 2, Page 1 indicates a claim for Construction Work in Progress (CWIP); whereas, Schedules 14 through 17 indicate a Historic Test Year. What type of Test Year is Borough using for this filing?

Response: (Provided by Allen Mason)

The Borough is utilizing a future test year ending December 31, 2006. However, the only future test year adjustment, at this point in time, is for rate case expense as shown on Schedule 18. Schedule 2, page 1 is a balance sheet for the period ending December 31, 2005 and shows construction work in progress as of that date. However, the net plant-in-service, as shown on Schedule 5, is as of the end of the Historic Test Year. No net plant additions during 2006 are claimed, or have been shown, on Schedule 5. Schedules 14 through 17 reflect normalization of expenses for the historic period. No further adjustment of these expenses was necessary because of any change in the future test year.

Responses of Borough of Phoenixville Sewer Fund
To Bureau of Fixed Utility Services Data Requests
Docket No. R-00061625

RB-2 Provide by line item, type, and cost of all utility plant claimed as CWIP with its location (inside or outside the Borough).

Response: (Provided by Allen Mason)

No CWIP is being claimed in this case.

Responses of Borough of Phoenixville Sewer Fund
To Bureau of Fixed Utility Services Data Requests
Docket No. R-00061625

RS-1 Provide the mathematical rationale for the Quarterly Minimum Charges increase.

Response: (Provided by Allen Mason)

In order to keep all rates in the same proportion before the increase as after the increase, and thus to spread the impact to all customers in accordance with the rates they were paying before the increase, it was decided to increase all rates by the same percentage, including the Quarterly Minimum Charge.

Responses of Borough of Phoenixville Sewer Fund
To Bureau of Fixed Utility Services Data Requests
Docket No. R-00061625

RS-2 Why are there 12 flat rate customers?

Response: (Provided by Allen Mason)

There are 12 customers who are served by private wells instead of by Aqua PA. Consequently, these customers cannot be billed based upon their water usage.

Responses of Borough of Phoenixville Sewer Fund
To Bureau of Fixed Utility Services Data Requests
Docket No. R-00061625

RS-3 How does the Borough obtain metered water consumption?

Response: (Provided by Allen Mason)

This data is provided by Aqua PA to the Borough.

Responses of Borough of Phoenixville Sewer Fund
To Bureau of Fixed Utility Services Data Requests
Docket No. R-00061625

RS-4 Your overall annual flow contribution from outside customers is indicated to be about 27 MGY. Provide a breakdown of annual flows per customer as shown on your Active PHIX Customers list.

Response: (Provided by Allen Mason)

Please see attached data showing 2004 and 2005 consumption for each metered customer outside the Borough. With average residential consumption for metered customers of 13,400 gallons, this usage can probably be assumed for the 12 flat rate customers. It is unclear whether this request calls for a breakdown of customer flows inside of the Borough.

Utility Municipal Services - Aqua PA

2004

Schuylkill Township Sewer Customers

Aqua PA Acct #	Borough Acct #	April Gallons Used	April Bill	July Gallons Used	July Bill	October Gallons Usec	October Bill	January Gallons Used	January Bill	Total Gallons	Total Bill
201863	900001	25,700	65.79	23,100	59.14	23,800	60.93	31,300	80.13	103,900	265.98
201865	900003	12,800	32.77	16,000	40.96	9,800	32.00	12,800	32.77	51,400	131.58
201866	900004	10,100	32.00	9,900	32.00	11,000	32.00	10,200	32.00	41,200	105.47
201890	900072	55,600	142.34	27,200	69.63	19,400	49.66	24,300	62.21	126,500	323.84
202693	900184	203,500	520.96	332,500	851.20	235,300	602.37	298,900	765.18	1,070,200	2,739.71
202694	900185	4,153,000	9,811.90	8,197,000	17,962.18	8,582,000	21,969.92	7,780,000	17,153.20	28,712,000	66,897.20
202726	900186	231,100	591.62	0	32.00	0	32.00	0	32.00	231,100	591.62
202624	900187	0	32.00	0	32.00	0	32.00	0	32.00	0	0.00
202695	900200	31,500	80.64	16,600	42.50	19,100	48.90	21,200	54.27	88,400	226.30
201960	900201	16,600	42.50	17,200	44.03	19,900	50.94	17,400	44.54	71,100	182.02
201961	900210	13,600	34.82	14,100	36.10	12,700	32.51	14,100	36.10	54,500	139.52
201962	900211	5,500	32.00	4,400	32.00	5,200	32.00	4,400	32.00	19,500	49.92
201963	900212	8,600	32.00	7,200	32.00	5,800	32.00	7,500	32.00	29,100	74.50
201964	900214	1,700	32.00	1,600	32.00	2,600	32.00	3,100	32.00	9,000	23.04
201965	900215	9,100	32.00	12,700	32.51	10,500	32.00	16,200	41.47	48,500	124.16
201966	900216	13,100	33.54	12,900	33.02	11,600	32.00	15,200	38.91	52,800	135.17
203995	900239	107,700	275.71	99,500	254.72	82,000	209.92	131,800	337.41	421,000	1,077.76
202102	900449	18,500	47.36	17,000	43.52	15,000	38.40	23,600	60.42	74,100	189.70
202103	900450	11,500	32.00	12,700	32.51	16,400	41.98	16,100	41.22	56,700	145.15
202104	900451	12,000	32.00	12,600	32.26	12,100	32.00	15,600	39.94	52,300	133.89
202105	900452	16,000	40.96	18,600	47.62	13,300	34.05	18,000	46.08	65,900	168.70
202106	900453	12,000	32.00	13,800	35.33	11,900	32.00	11,000	32.00	48,700	124.67
202107	900456	22,800	58.37	23,700	60.67	20,600	52.74	19,800	50.69	86,900	222.46
202108	900457	7,400	32.00	11,700	32.00	11,400	32.00	14,800	37.89	45,300	115.97
202109	900458	10,400	32.00	9,800	32.00	8,600	32.00	10,500	32.00	39,300	100.61
202110	900461	12,000	32.00	13,000	33.28	17,000	43.52	24,700	63.23	66,700	170.75
202111	900464	7,800	32.00	8,900	32.00	9,000	32.00	7,700	32.00	33,400	85.50
202112	900465	13,900	35.58	13,300	34.05	12,500	32.00	12,600	32.26	52,300	133.89
202113	900467	32,200	82.43	34,600	88.58	26,500	67.84	22,600	57.86	115,900	296.70
202114	900469	14,700	37.63	12,600	32.26	12,700	32.51	16,500	42.24	56,500	144.64

202115	900470	8,900	32.00	9,900	32.00	7,300	32.00	9,100	32.00	35,200	90.11
202116	900471	15,400	39.42	27,200	69.63	25,100	64.26	21,200	54.27	88,900	227.58
202117	900472	13,500	34.56	18,900	48.38	15,900	40.70	23,300	59.65	71,600	183.30
202118	900473	20,500	52.48	21,300	54.53	43,500	111.36	21,000	53.76	106,300	272.13
202119	900474	11,600	32.00	9,200	32.00	7,700	32.00	9,500	32.00	38,000	97.28
202160	900554	19,100	48.90	32,600	83.46	23,000	58.88	27,300	69.89	102,000	261.12
202177	900600	28,400	72.70	23,200	59.39	13,800	35.33	23,600	60.42	89,000	227.84
202178	900601	9,100	32.00	8,400	32.00	12,600	32.26	10,500	32.00	40,600	103.94
202179	900602	12,900	33.02	15,900	40.70	18,500	47.36	22,400	57.34	69,700	178.43
202180	900603	24,100	61.70	24,400	62.46	29,500	75.52	26,200	67.07	104,200	266.75
202181	900605	7,300	32.00	7,400	32.00	7,500	32.00	10,300	32.00	32,500	83.20
202182	900606	7,900	32.00	-4,800	32.00	3,100	32.00	4,100	32.00	10,300	26.37
202183	900607	25,400	65.02	23,200	59.39	16,200	41.47	25,900	66.30	90,700	232.19
202196	900640	37,100	94.98	35,200	90.11	36,000	92.16	43,800	112.13	152,100	389.38
202197	900641	3,700	32.00	36,500	93.44	30,000	76.80	36,900	94.46	107,100	274.18
202696	900642	12,600	32.26	13,100	33.54	24,900	63.74	160,400	410.62	211,000	540.16
202200	900652	6,700	32.00	9,100	32.00	8,900	32.00	10,200	32.00	34,900	89.34
202227	900700	10,300	32.00	11,300	32.00	9,700	32.00	10,900	32.00	42,200	108.03
202241	900714	19,000	48.64	19,200	49.15	15,500	39.68	16,400	41.98	70,100	179.46
202379	900940	16,000	40.96	14,000	35.84	8,000	32.00	26,500	67.84	64,500	165.12
202380	900941	16,500	42.24	16,400	41.98	12,200	32.00	15,100	38.66	60,200	154.11
202381	900942	8,600	32.00	8,200	32.00	6,700	32.00	7,400	32.00	30,900	79.10
202627	900960	9,000	32.00	8,800	32.00	10,100	32.00	9,100	32.00	37,000	94.72
202383	900970	38,500	98.56	30,200	77.31	27,000	69.12	33,500	85.76	129,200	330.75
202384	900971	38,000	97.28	25,200	64.51	24,900	63.74	22,100	56.58	110,200	282.11
		5,510,500	13,533.63	9,438,200	21,405.89	9,675,300	25,048.58	9,228,600	21,090.74	33,852,600.00	80,057.14

Utility Municipal Services - Aqua PA

Schuylkill Township Sewer Customers

Acct # Aqua PA	Acct # Borough	Gallons Used Per End 03/05	Bill	Gallons Used Per End 06/05	Bill	Gallons Used Per End 09/05	Bill	Gallons Used Per End 12/05	Bill	Total Gals 2005	Total Bill 2005
201863	900001	33,300	85.25	32,700	83.71	37,200	95.23	35,300	90.37	138,500	354.56
201865	900003	11,000	32.00	10,600	32.00	10,000	32.00	12,700	32.51	44,300	128.51
201866	900004	10,100	32.00	12,500	32.00	14,800	37.89	13,800	35.33	51,200	137.22
201890	900072	17,600	45.06	16,400	41.98	14,800	37.89	17,900	45.82	66,700	170.75
202693	900184	281,400	720.38	285,700	731.39	253,400	648.70	351,600	900.10	1,172,100	3,000.58
202694	900185	6,930,000	15,504.20	4,810,000	11,323.00	2,210,000	5,343.00	6,280,000	14,243.20	20,230,000	46,413.40
202726	900186	912,100	2,334.98	287,700	736.51	310,400	794.62	292,800	749.57	1,803,000	4,615.68
202695	900200	20,900	53.50	15,600	39.94	18,000	46.08	16,800	43.01	71,300	182.53
201960	900201	17,400	44.54	21,800	55.81	23,700	60.67	19,700	50.43	82,600	211.46
201961	900210	13,600	34.82	11,900	32.00	10,000	32.00	7,900	32.00	43,400	130.82
201962	900211	46,100	118.02	112,100	286.98	122,200	312.83	10,800	32.00	291,200	749.82
201963	900212	7,200	32.00	7,900	32.00	6,900	32.00	9,900	32.00	31,900	128.00
201964	900214	3,300	32.00	2,600	32.00	1,700	32.00	2,600	32.00	10,200	128.00
201965	900215	13,000	33.28	10,900	32.00	17,400	44.54	12,300	32.00	53,600	141.82
201966	900216	11,100	32.00	11,600	32.00	12,400	32.00	11,700	32.00	46,800	128.00
203995	900239	60,600	155.14	45,500	116.48	100,700	257.79	71,900	184.06	278,700	713.47
202102	900449	18,900	48.38	23,600	60.42	19,100	48.90	14,600	37.38	76,200	195.07
202103	900450	19,400	49.66	11,600	32.00	13,500	34.56	14,300	36.61	58,800	152.83
202104	900451	12,100	32.00	7,300	32.00	9,200	32.00	12,300	32.00	40,900	128.00
202105	900452	19,300	49.41	15,000	38.40	18,400	47.10	18,200	46.59	70,900	181.50
202106	900453	12,200	32.00	7,100	32.00	10,900	32.00	14,100	36.10	44,300	132.10
202107	900456	18,100	46.34	21,600	55.30	31,000	79.36	23,500	60.16	94,200	241.15
202108	900457	8,200	32.00	12,800	32.77	15,100	38.66	12,700	32.51	48,800	135.94
202109	900458	10,700	32.00	11,700	32.00	12,100	32.00	13,400	34.30	47,900	130.30
202110	900461	23,400	59.90	23,600	60.42	23,700	60.67	22,600	57.86	93,300	238.85
202111	900464	3,400	32.00	4,100	32.00	4,300	32.00	4,600	32.00	16,400	128.00
202112	900465	13,100	33.54	12,100	32.00	13,000	33.28	12,900	33.02	51,100	131.84
202113	900467	21,900	56.06	25,200	64.51	20,200	51.71	20,100	51.46	87,400	223.74
202114	900469	16,400	41.98	22,000	56.32	22,000	56.32	7,500	32.00	67,900	186.62
202115	900470	9,400	32.00	8,900	32.00	11,000	32.00	10,900	32.00	40,200	128.00

Utility Municipal Services - Aqua PA

Schuylkill Township Sewer Customers

Acct # Aqua PA	Acct # Borough	Gallons Used Per End 03/05	Bill	Gallons Used Per End 06/05	Bill	Gallons Used Per End 09/05	Bill	Gallons Used Per End 12/05	Bill	Total Gals 2005	Total Bill 2005
202116	900471	18,300	46.85	15,900	40.70	38,900	99.58	17,900	45.82	91,000	232.96
202117	900472	13,400	34.30	12,600	32.26	32,900	84.22	18,900	48.38	77,800	199.17
202118	900473	19,600	50.18	21,300	54.53	27,000	69.12	24,900	63.74	92,800	237.57
202119	900474	8,400	32.00	6,200	32.00	13,900	35.58	16,600	42.50	45,100	142.08
202160	900554	17,400	44.54	30,100	77.06	50,200	128.51	18,400	47.10	116,100	297.22
202177	900600	31,500	80.64	24,300	62.21	21,300	54.53	37,000	94.72	114,100	292.10
202178	900601	9,900	32.00	8,300	32.00	11,800	32.00	8,900	32.00	38,900	128.00
202179	900602	17,300	44.29	18,300	46.85	12,600	32.26	8,200	32.00	56,400	155.39
202180	900603	24,600	62.98	24,000	61.44	25,000	64.00	41,500	106.24	115,100	294.66
202181	900605	6,000	32.00	7,900	32.00	6,800	32.00	8,300	32.00	29,000	128.00
202182	900606	6,600	32.00	9,200	32.00	12,000	32.00	23,600	60.42	51,400	156.42
202183	900607	19,100	48.90	20,500	52.48	21,700	55.55	22,800	58.37	84,100	215.30
202196	900640	16,900	43.26	2,000	32.00	18,100	46.34	0	32.00	37,000	153.60
202197	900641	3,900	32.00	8,200	32.00	0	32.00	0	32.00	12,100	128.00
202696	900642	13,700	35.07	9,600	32.00	13,300	34.05	0	32.00	36,600	133.12
202200	900652	8,300	32.00	8,600	32.00	10,200	32.00	8,300	32.00	35,400	128.00
202227	900700	11,300	32.00	11,800	32.00	11,300	32.00	12,400	32.00	46,800	128.00
202241	900714	16,500	42.24	15,400	39.42	15,200	38.91	18,000	46.08	65,100	166.66
202379	900940	37,300	95.49	37,000	94.72	55,100	141.06	65,400	167.42	194,800	498.69
202380	900941	13,900	35.58	13,300	34.05	17,200	44.03	15,000	38.40	59,400	152.06
202381	900942	8,100	32.00	8,100	32.00	12,300	32.00	11,800	32.00	40,300	128.00
202627	900960	9,800	32.00	8,200	32.00	14,900	38.14	7,700	32.00	40,600	134.14
202383	900970	29,800	76.29	28,400	72.70	34,900	89.34	28,000	71.68	121,100	310.02
202384	900971	23,600	60.42	26,500	67.84	20,400	52.22	20,700	52.99	91,200	233.47
54		8,980,400	20,955.46	6,277,800	15,320.18	3,884,100	9,781.27	7,803,700	18,384.26	26,946,000	64,441.18

Responses of Borough of Phoenixville Sewer Fund
To Bureau of Fixed Utility Services Data Requests
Docket No. R-00061625

RS-5 What are the rates charged to inside customers? Provide your response in the same format as your proposed Tariff Supplement No. 13, Pages 9 and 10.

Response: (Provided by Allen Mason)

Please see attached rate schedule for inside the Borough customers.

BOROUGH OF PHOENIXVILLE

QUARTERLY METERED SEWER RATES
BLOCK RATES

	PER 1,000 GALS
INSIDE BORO QUARTERLY & MONTHLY	$3.45

ADMINISTRATIVE CHARGE INSIDE BORO - PER BILLING	$5.18

OUTSIDE BORO	PER UNIT	PER 1,000 GALS
FOR FIRST ONE MILLION (1,000,000) GALS	$32.00	$2.56
FOR NEXT FOUR MILLION (4,000,000) GALS	$32.00	$2.30
FOR ALL OVER FIVE MILLION (5,000,000) GALS	$32.00	$1.94

QUARTERLY SEWER FLAT RATE

	INSIDE BORO	OUTSIDE BORO
RESIDENTIAL PER DWELLING UNIT	$62.63	$46.49
COMMERCIAL PER DWELLING UNIT	$93.94	$69.73

INSIDE BORO	WTR EFFECTIVE 1/1/05	SWR EFFECTIVE 1/1/06	2% increase
OUTSIDE BORO	WTR EFFECTIVE 2/8/94	SWR EFFECTIVE 1/01/94	

Responses of Borough of Phoenixville Sewer Fund
To Bureau of Fixed Utility Services Data Requests
Docket No. R-00061625

RS-6 In your **STATEMENT OF REASONS FOR PROPOSED INCREASE**, you cite that "At the time, rates for customers inside the Borough of Phoenixville have been increased and have been subsidizing rates fo (sic) service to customers outside the Borough." Beginning with implementation of Tariff Supplement No. 12 to Sewer – Pa.P.U.C. No. 1 Effective: June 4, 1993, provide a chronological account of all rate increases to the inside customers. Include any and all changes to the Borough's rules and regulations during this same time frame.

Response: (Provided by Allen Mason)

See attached.

Responses of Borough of Phoenixville Sewer Fund
To Bureau of Fixed Utility Services Data Requests
Docket No. R-00061625

RS-7 What entity is providing wastewater service to the 22 customers that are indicated to have left the Borough's collection system.

Response: (Provided by Allen Mason)

The Borough does not know where this information is derived from but is unaware of 22 customers who have left the Borough's collection system.

Responses of Borough of Phoenixville Sewer Fund
To Bureau of Fixed Utility Services Data Requests
Docket No. R-00061625

QS-1 Provide a valid copy of your NPDES Permit.

Response: (Provided by Allen Mason)

See attached.

03-8309

Pennsylvania Department of Environmental Protection

2 East Main Street
Norristown, PA 19401

Southeast Regional Office

Phone: 484-250-5970
Fax: 484-250-5971

SEP 21 2006

Mr. Brian Watson
Public Works Director
Borough of Phoenixville
140 Church Street
Phoenixville, PA 19460

SEP 25 2006
CARROLL ENGINEERING CORPORATION

Re: Phoenixville Borough STP
SEW PA0027154
File Type: NPDES
Phoenixville Borough
Chester County

Dear Mr. Watson:

We have prepared the enclosed revised draft National Pollutant Discharge Elimination System (NPDES) permit for review and comment.

Also enclosed are copies of a public notice that we will publish in the *Pennsylvania Bulletin*. You are required, by Department regulations, to post copies of this notice near the entrance to your property and near the discharge site. These postings shall remain for 30 days.

Please review the draft permit carefully. Your written comments on the draft permit, if received within 30 days of publication in the *Pennsylvania Bulletin*, will be considered during preparation of the final permit.

If you have any questions, please call Mr. Ketan Thaker at 484-250-5193.

Sincerely,

Sohan L. Garg, P.E.
Chief, Permits Section
Water Management

Enclosures: Draft Permit
Public Notice

cc: Mr. Mason – Carroll Engineering Corporation
EPA3WP41
Ms. McSparran – Delaware River Basin Commission
Operations Section
Re (GJE04)225-1C

RECEIVED
SEP 25 2006
CARROLL ENGINEERING CORPORATION

3800-PM-WSWM0012 Rev. 4/2005
Permit

DRAFT

SEP 2 1 2006

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER SUPPLY AND WASTEWATER MANAGEMENT

AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM DISCHARGE REQUIREMENTS FOR PUBLICLY OWNED TREATMENT WORKS (POTWs)

NPDES PERMIT NO: PA0027154

In compliance with the provisions of the Clean Water Act, 33 U.S.C. Section 1251 *et seq.* ("the Act") and Pennsylvania's Clean Streams Law, as amended, 35 P.S. Section 691.1 *et seq.*,

Borough of Phoenixville

South Second Avenue

Phoenixville, PA 19460

is authorized to discharge from a facility known as **Phoenixville Borough STP**, located at

is authorized to discharge from a facility known as **Phoenixville Borough STP**, located at **Phoenixville Borough, Chester** to the **Schuylkill River** in Watershed **3D - Manatawny** in accordance with effluent limitations, monitoring requirements and other conditions set forth in Parts A, B and C hereof.

THIS PERMIT SHALL BECOME EFFECTIVE ON

THIS PERMIT SHALL EXPIRE AT MIDNIGHT ON

The authority granted by this permit is subject to the following further qualifications:

1. If there is a conflict between the application, its supporting documents and/or amendments and the terms and conditions of this permit, the terms and conditions shall apply.

2. Failure to comply with the terms, conditions or effluent limitations of this permit is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.

3. A complete application for renewal of this permit, or notice of intent to cease discharging by the expiration date, must be submitted to DEP at least 180 days prior to the above expiration date (unless permission has been granted by DEP for submission at a later date), using the appropriate NPDES permit application form.

   In the event that a timely and complete application for renewal has been submitted and DEP is unable, through no fault of the permittee, to reissue the permit before the above expiration date, the terms and conditions of this permit, including submission of the Discharge Monitoring Reports (DMRs), will be automatically continued and will remain fully effective and enforceable against the discharger until DEP takes final action on the pending permit application.

4. This NPDES permit does not constitute authorization to construct or make modifications to wastewater treatment facilities necessary to meet the terms and conditions of this permit.

DATE PERMIT ISSUED _____ **ISSUED BY** _____

DATE PERMIT AMENDMENT ISSUED _____ **TITLE: Water Management Program Manager**

Permit No. PA0027154

PART A - EFFLUENT LIMITATIONS, MONITORING, RECORDKEEPING AND REPORTING REQUIREMENTS

I. **For Outfall** 001, **Latitude** 40°7'47", **Longitude** 75°30'10", **River Mile Index** 35.07, **Stream Code** 00833

which receives wastewater from Wastewater treatment plant

a. The permittee is authorized to discharge during the period from issuance through expiration.

b. Based on the anticipated wastewater characteristics and flows described in the permit application and its supporting documents and/or amendments, the following effluent limitations and monitoring requirements apply (see also Additional Requirements, Footnotes and Supplemental Information).

Discharge Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) [1]		Concentrations (mg/L)				Minimum [3] Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Minimum	Average Monthly	Average Weekly	Instantaneous Maximum [2]		
FLOW (MGD)	Monitor/Report	Monitor/Report					Continuous	Recorded
$CBOD_5$ (05/01 – 10/31)	667	1,000		20	30	40	2/Week	24 H C
$CBOD_5$ (11/01 – 04/30)	834	1,334		25	40	50	2/Week	24 H C
TOTAL SUSPENDED SOLIDS	1,000	1,500		30	45	60	2/Week	24 H C
AMMONIA as N (05/01 – 10/31)	267			8		16	2/Week	24 H C
AMMONIA as N (11/01 – 04/30)	400			12		24	2/Week	24 H C
FECAL COLIFORM				200 #/ 100 ml		1,000 #/ * 100 ml	2/Week	Grab
DISSOLVED OXYGEN			5.0	Monitor/Report			Daily	Grab
pH (STD)			6.0			9.0	Daily	Grab
COPPER				Monitor/Report	Monitor/Report	Monitor/Report	Quarterly	24 H C

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): Outfall 001

* Shall not exceed in more than 10 percent of samples.

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SEP 2 1 2006

DRAFT
SEP 21 2006

PART A - EFFLUENT LIMITATIONS, MONITORING, RECORDKEEPING AND REPORTING REQUIREMENTS (Con't)

c. All discharges of floating materials, oil, grease, scum, sheen and substances which produce color, tastes, odors, turbidity or settle to form deposits shall be controlled to levels which will not be inimical or harmful to the water uses to be protected or to human, animal, plant or aquatic life.

d. Except as otherwise specified in this permit, the 30-day average percent removal for carbonaceous biochemical oxygen demand and total suspended solids shall not be less than 85 percent.

Footnotes

(1) When sampling to determine compliance with mass effluent limitations, the discharge flow at the time of sampling must be measured and recorded.

(2) The Instantaneous Maximum Discharge Limitations are for compliance use by DEP only. Do not report instantaneous maximums on DMRs or supplemental DMRs unless specifically required on those forms to do so.

(3) This is the minimum number of sampling events required. Permittees are encouraged, and it may be advantageous in demonstrating compliance, to perform more than the minimum number of sampling events.

Supplemental Information

(1) The hydraulic design capacity of 4.0 million gallons per day for the treatment facility is used to prepare the annual Municipal Wasteload Management Report to help determine whether a "hydraulic overload" situation exists, as defined in Title 25 Pa. Code Chapter 94.

(2) The effluent limitations for this outfall were determined using an effluent discharge rate of 4.0 million gallons per day.

PART C

I. OTHER REQUIREMENTS

1. Notification of the designation of the responsible operator must be submitted to the permitting agency by the permittee within 60 days after the effective date of the permit and from time to time thereafter as the operator is replaced.

2. For reporting purposes on the Discharge Monitoring Report, the term "average weekly" shall mean the highest average weekly value observed during the monthly monitoring period.

3. If, at anytime, the DEP determines that the discharge permitted herein creates a public nuisance or causes environmental harm to the receiving water of the Commonwealth, the DEP may require the permittee to adopt such remedial measures as will produce a satisfactory effluent. If the permittee fails to adopt such remedial measures within the time specified by the DEP, the right to discharge herein granted shall, upon notice by the DEP, cease and become null and void.

4. No storm water from pavements, area ways, roofs, foundation drains or other sources shall be admitted to the sanitary sewers associated with the herein approved discharge.

5. The approval herein given is specifically made contingent upon the permittee acquiring all necessary property rights by easement or otherwise, providing for the satisfactory construction, operation, maintenance and replacement of all sewers or sewerage structures associated with the herein approved discharge in, along, or across private property, with full rights of ingress, egress and regress.

6. If there is a change in ownership of this facility or in permittee name, an application for transfer of permit must be submitted to the DEP.

7. The DEP may identify and require certain discharge specific data to be submitted before the expiration date of this permit. Upon notification by the DEP, the permittee will have 12 months from the date of the notice to provide the required data. These data, along with any other data available to the DEP, will be used in completing the Watershed TMDL/WLA Analysis and in establishing discharge effluent limits.

8. The permittee shall submit the results of whole effluent toxicity testing with their next NPDES application, according to Federal Regulation 122.21(j). The permittee shall obtain the appropriate biomonitoring protocol for the testing from the DEP's Regional Office.

9. Instantaneous maximum limitations are imposed to allow for a grab sample to be collected by the appropriate regulatory agency to determine compliance. The permittee does not have to monitor for the instantaneous maximum limitation except for the parameters temperature, oil and grease, pH, and total residual chlorine. However, if grab samples are collected for parameters normally monitored through composite sampling, the results must be reported.

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SEP 2 1 2006

10. Operations and Maintenance Plan

The facility operator shall develop and update yearly a treatment facility operations and maintenance plan. Said plan shall be in writing or in an electronic format. Upon request, this plan shall be submitted to DEP for review. For the purpose of this section, a key wastewater process includes equipment or process that if it fails could cause the discharge of raw wastewater, wastewater that fails to meet NPDES permit conditions, or a failure that could threaten human or environmental health. Included in this definition shall also be any piece of equipment or process that if it should fail, would cause the destruction of wastewater treatment process or equipment that would ultimately lead to the discharge of raw wastewater or wastewater that fails to meet NPDES permit conditions or any condition that may threaten human or environmental health. Said plan shall include:

- Process control strategy that includes a schedule for process control sampling, monitoring, testing, and recordkeeping. The process control strategy shall take into account the specific type of treatment system and shall monitor the efficiency of all biological and physical treatment units.

- A monitoring and compliance plan that details how key wastewater processes shall be monitored and adjusted while the facility is staffed. This plan should include standard operating procedures for any staff members that may not be properly certified.

- A monitoring plan that identifies key processes and equipment that indicates how key processes will be monitored while the treatment facility is not staffed.

- For treatment plants that are impacted by wet weather flows, the operator shall develop and implement a wet weather operations strategy that minimizes or eliminates the wash out of solids from the treatment system while maximizing the flow through the treatment plant.

- An emergency operations plan that identifies how the facility will be operated during times of emergency. The plan should define the potential threats to the facility and how those threats are to be dealt with. The plan should be designed to minimize loss of life and property damage to the facility and should include preventative measures where appropriate. This plan shall also include emergency contact numbers for local emergency response, plant personnel, critical suppliers, vendors and DEP contacts at a minimum. In the development of this plan, a vulnerability assessment of the facility should be conducted and security issues should be addressed as a part of the overall plan. The operator must make the owner aware of potential threats and vulnerabilities.

- A preventative maintenance plan that includes a schedule for preventative maintenance for all equipment within the treatment system. A spare parts inventory shall be included as a part of this plan.

- An emergency maintenance plan that details how key processes will be repaired or replaced in the event of a failure.

- A solids management plan that details how solids produced by the facility will be wasted, treated, and ultimately disposed of.

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SEP 21 2006

12. Phoenixville Borough shall operate and maintain the sewage treatment plant and sewage collection system in a manner which minimizes bypasses from the influent headworks to the aeration tanks at the plant. When bypassing is initiated, the operator in responsible charge to the treatment plant operations shall start the effluent composite sampler, and samples shall be taken of the treatment plant effluent as per details given below:

Sample Location	Parameters (* Composite Samples during bypass)
Treatment Plant Effluent	CBOD5, Total Suspended Solids, Ammonia.
	Parameters (Grab Sampling)
	Dissolved Oxygen, Fecal Coliform, pH, Total Residual Chlorine

*If bypass is for a period of less than 24 hours, a composite sample shall be collected for that period. If bypass is for a period longer than 24 hours, a composite sample shall be collected for each 24-hour period and one composite sample for the remaining period.

- The time, date, duration, and flow for each sampling event shall be reported on a monthly basis using the attached Bypass Report Form, which shall be submitted each month with the DMR.
- This permit requirement does not authorize violation of the NPDES permit, nor does it constitute approval of any bypass.

Grab samples of the treatment plant effluent shall be taken while bypassing is occurring. All sample results shall be incorporated into the monthly DMR sampling results

12. The DEP acknowledges that there may be occasions when the sample holding times might be exceeded with respect to the sampling which is performed during a bypass event. However, all data should be used in completion of the DMR and a note placed in the comment section that one or more samples have exceeded the holding time. These holding time exceedances may possibly contribute to an effluent limit exceedance being noted on the monthly DMR. For compliance purposes, the DEP will only consider the samples which achieved the appropriate holding times for determining compliance with the effluent limits contained in this permit.

13. Collected screenings, slurries, sludges, and other solids shall be handled and disposed of in compliance with 25 Pa. Code, Chapters 271, 273, 275, 283, and 285 (relating to permits and requirements for landfilling, land application, incineration, and storage of sewage sludge), Chapters 262, 263, and 264 (related to permits and requirements for landfilling and storage of hazardous sludge) and applicable Federal Regulations, the Federal Clean Water Act, RCRA and their amendments.

Re 30 (GJE04)225-1D

BYPASS REPORT FORM
COMPOSITE SAMPLING RESULTS OF BYPASS EVENTS

Borough of Phoenixville
NPDES No. PA0027154

Month/Year_____

Bypass Date	Time Beg.	Time End	Volume (MG)	Rainfall (Inches)	$CBOD_5$ (mg/L)	TSS (mg/L)	NH_3-N (mg/L)	D.O. (mg/L)	TRC (mg/L)	pH (S.U.)

(AR04)237-20

Name and Title of
Principal Executive
Officer_____

Signature of
Principal Executive

Responses of Borough of Phoenixville Sewer Fund
To Bureau of Fixed Utility Services Data Requests
Docket No. R-00061625

QS-2 Provide documentation of any and all inflow/infiltration studies conducted on service lines in the two townships, their findings and corrective actions taken.

Response: (Provided by Allen Mason)

See attached.

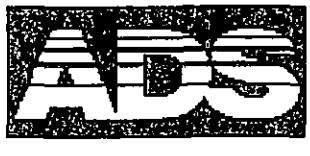
SEWER SYSTEM INFILTRATION & INFLOW STUDY PHOENIXVILLE, PA

Prepared for

CARROLL ENGINEERING CORPORATION

19 July 2002

Prrepared by



ADS Environmental Services
3916 Vero Road
Baltimore, MD 21227

SEWER SYSTEM
INFILTRATION & INFLOW STUDY
PHOENIXVILLE, PA

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INFILTRATION & INFLOW STUDY
PHOENIXVILLE, PA

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EXECUTIVE SUMMARY

ADS Environmental Services (ADS) performed sewer system flow monitoring and Infiltration & Inflow (I/I) Analysis of the Borough of Phoenixville sanitary sewer system, in April and May 2002, under subcontract to Carroll Engineering Corporation (Carroll). The Scope of Services provided for 3 weeks of flow monitoring; due to poor storm conditions Carroll extended the term of the monitoring 3 additional weeks. Carroll provided ADS with sewer system mapping, recommended flow monitoring sites, and breakdowns of system lengths and diameters. The selected sites divided the system into 6 sewer basins, and were sufficient to provide a comprehensive picture of sewer system performance, monitoring the flow of over 80% of the system.

ADS performed the subcontract scope of work in its entirety, following ADS' ISO9001-approved standard procedures for field activities, data editing, and I/I analysis, as required by the subcontract.

The extended monitoring period was sufficient to capture one major storm of 1.75 inches rain, that produced significant Rainfall-Derived Infiltration & Inflow (RDII), and placed a serious hydraulic stress on the system. Two more moderate storms imposed serious RDII, and provided good characterization of the system hydraulic stresses at lower loadings. Seven additional minor storms were recorded. None of the storms, including the major storm of 18 May, approached the one-year rainfall intensity for southeastern Pennsylvania, on any duration basis.

Flow data from all sites were continuous and reliable, as reported in detail in Section 2. Engineering analysis of the flow data revealed serious capacity bottlenecks at two locations, and surfaced other conditions worthy of further investigation. These are reported in Section 3.

ADS performed the I/I analysis, using accepted standards and methods. The results of the analysis were clear and conclusive, and are presented in Section 5 of this Report. The overall Phoenixville system is subject to infiltration of 2,500 gallons per day per inch-diameter mile (gpd/IDM) of sewer. On an average daily basis, infiltration volume is roughly equal to domestic wastewater volume. Major portions of the system have infiltration severity approaching and exceeding 5,000 gpd/IDM. Based on the dry weather infiltration analysis, ADS found 28% of the system to be in need of Sewer System Evaluation Survey (SSES), and an additional 30% of the system to require further flow monitoring in order to avoid wasted cost on unnecessary SSES. ADS found 42% of the system to have low, or moderate but acceptable infiltration.

The Phoenixville sewer system is also subject to major wet weather impacts. In the defining storm, the two poorest-performing sewer basins experienced peak flows double the dry-day peak flow rate. In the defining storm event, one basin delivered a three-day total over 19 gallons of RDII per lineal foot of sewer (not counting the dry weather infiltration component). Flow volumes responded to peak rain intensity very rapidly, within one to two

hours in many cases. The effect of RDII extended past the end of the storms, frequently adding 20% to the daily flow total even two days after the storm event. Although the 18 May storm placed severe stress on the system, storms with greater impacts are expected to occur several times in an average year, as analysis showed 18 May storm to be much less than a one-year storm.

SECTION 1

BACKGROUND, AUTHORIZATION AND PURPOSE

Carroll Engineering Corporation (CARROLL) is consultant to the Borough of Phoenixville, PA, for study of the Borough's sanitary sewerage system. CARROLL selected ADS Environmental Services to provide Infiltration & Inflow Study services, in support of CARROLL's services. CARROLL authorized ADS to perform these services under CARROLL's Subcontract No. ENV./AUTH DEPT. 026, dated 15 April 2002. The subcontract Scope of Services requires ADS to:

- Monitor 6 flow locations and one rainfall location in the Phoenixville system for an initial period of 21 days;
- Quantify flows in the system in a variety of hydraulic conditions including surcharge and backwater;
- Extend the monitoring period if substantial data are not collected during the initial 3 weeks;
- Investigate monitoring sites selected by CARROLL for hydraulic acceptability;
- Install flow monitors and rain gauge, collect and review the data on a regular basis;
- Edit the flow and rain data, and provide a complete report within 60 days of the completion of the monitoring period; Include in the report, monthly summary tables, monthly hydrographs and long tables with depth, velocity and quantity data.
- Conduct a standard ADS Inflow and Infiltration (I/I) analysis, and include it in the report.

The following report will detail ADS' performance of the Scope of Services, the results of the monitoring, and the conduct and findings of the I/I Analysis.

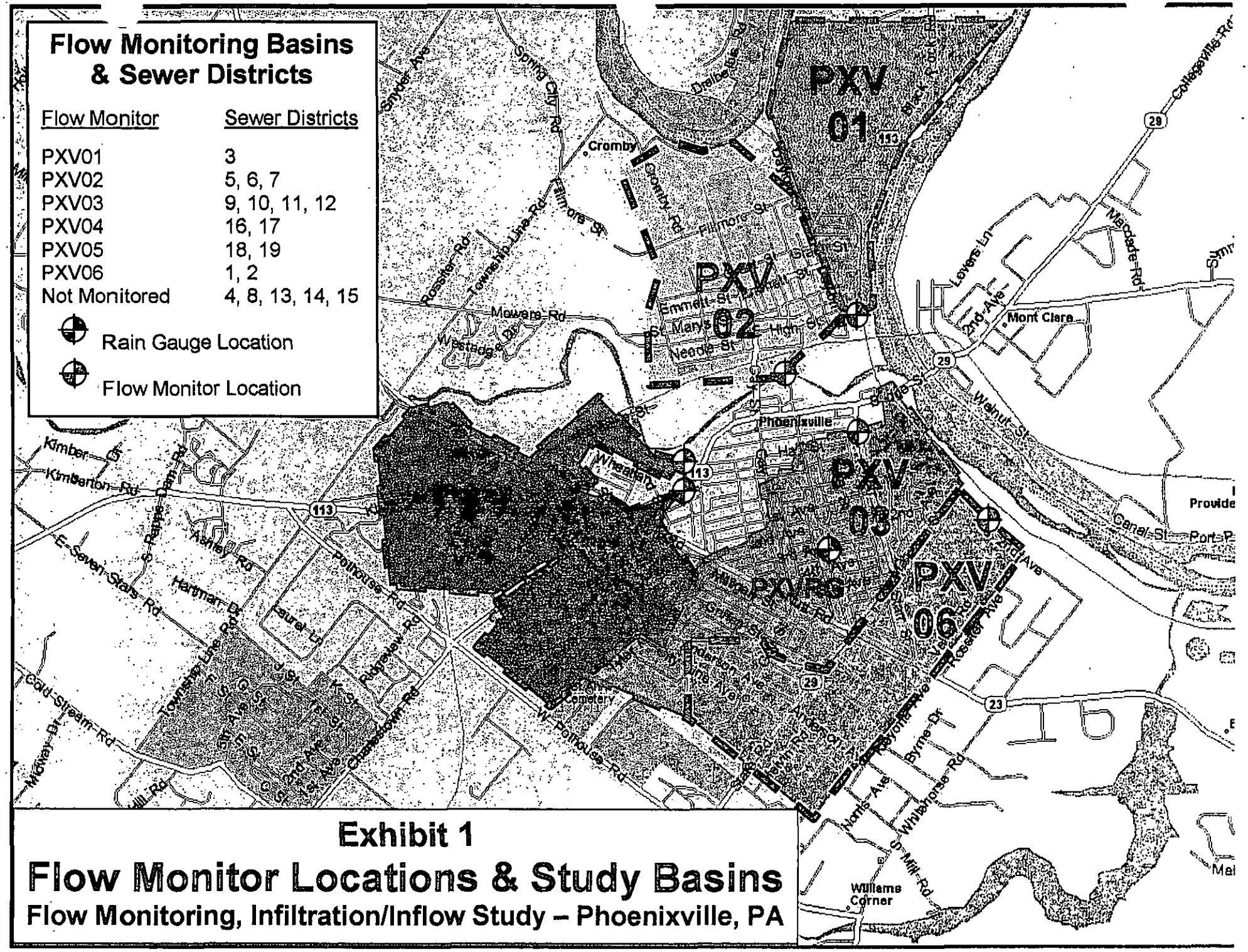
CARROLL selected flow monitoring locations. CARROLL provided system mapping showing the system districts, and sewer length and diameter tables. The selected monitoring locations achieved monitoring of 82% of the total system length. The monitor locations divided the system into basins closely correlated to the system districts or aggregates thereof. The monitoring basins ranged in size from approximately 16,000 lineal feet, to approximately 50,000 lineal feet of tributary sewers.

Flow monitoring locations are described in Table 1, following:

TABLE 1 – FLOW MONITORING SITES

ADS Site Designation	Manhole	Nominal Pipe Dia	Sewer District(s)
PXV01	516	8"	3
PXV02	527	12"	5, 6, 7
PXV03	52	12"	9, 10, 11, 12
PXV04	313	10"	16, 17
PXV05	386	10"	18, 19
PXV06	282	10"	1, 2
(not monitored)			4, 8, 13, 14, 15

Locations of the flow monitors are shown on Exhibit 1 – "Flow Monitor Locations & Study Basins", and on the individual Site Report sheets in the Appendix.


Flow Monitoring Basins & Sewer Districts
Flow Monitor
Sewer Districts
PXV01
3
PXV02
5, 6, 7
PXV03
9, 10, 11, 12
PXV04
16, 17
PXV05
18, 19
PXV06
1, 2
Not Monitored
4, 8, 13, 14, 15
Rain Gauge Location
Flow Monitor Location
PXV 01
PXV 02
PXV 03
PXV 04
PXV 05
PXV 06
Crosby
Phoenixville
Mont Clare
Williams Corner
Exhibit 1
Flow Monitor Locations & Study Basins
Flow Monitoring, Infiltration/Inflow Study – Phoenixville, PA

SECTION 2

STUDY ACTIVITIES

2.1 Field Activities

ADS conducted site investigations to determine the suitability of proposed flow monitoring sites selected by CARROLL, and installed ADS Model 1500 portable flow monitors in each of the selected manholes. ADS documented the selected sites on standard Site Report sheets. Copies of these sheets are attached in Appendix 1.

The ADS portable flow monitors furnished were equipped with quadredundant ultrasonic depth sensors, digital Doppler peak velocity sensors and pressure depth sensors, for each flow monitoring site. This equipment is manufactured by ADS Corporation, and is maintained at ADS' central equipment facility, assuring that it meets original equipment performance specifications each time it is issued to a temporary flow monitoring project. These monitors observe and record flow depth and velocity at fixed sample rates, tailored to the site hydraulic characteristics. The project team established the appropriate sample rate for each site (generally 15 minutes in the case of Phoenixville – 5 minutes where it was deemed appropriate to capture pump station activity), at the time of monitor installation and activation. Each flow monitor acquires approximately 90,000 depth readings and approximately 20,000 velocity readings each month. After internal crosschecking, the monitor stores in its internal memory, approximately 3,000 depth/velocity values per month.

ADS installed all flow monitors and activated the monitors with site-specific installation parameters on 09, 10 and 11 April. The initial monitoring period extended from 12 April through 03 May. Limited rain occurred during the initial period, and CARROLL directed ADS to continue monitoring for an additional 3-week period The monitors were deactivated and removed on 29 May, extending the total monitoring period to 47 days. Flow data coverage was uninterrupted for the entire monitoring period at 5 of the 6 sites. Internal memory malfunctions resulted in data deficiencies from 02 May through part of 13 May at monitoring site PXV06. These deficiencies had no adverse impacts on subsequent I/I analyses; two other significant storms were available for analysis during the study period, and it was possible to reliably quantify I/I from the remainder of the data record.

ADS personnel performed "confirmations" - field measurements of the flow depth and velocity - at the time of monitor installation, to confirm that depths and velocities observed and recorded by the flow monitors corresponded to the field measurements, within a tolerance appropriate to the flow irregularities observed at each site.

Similarly, ADS compared velocity observations recorded by the flow monitor, with instantaneous measurements made using a hand-held electromagnetic velocity meter. At all the Phoenixville sites, velocity confirmations were suitable for development of acceptable

velocity calculations, enabling application of the Continuity Equation for determining flow volumes. With the depth and velocity properly confirmed, depth-velocity relationships could be developed, and reliance on unreliable theoretical equations was obviated.

ADS also installed a tipping-bucket rain gage with monitor, at Joseph Williams Fellowship Hall at 530 South Main Street. The rain gage was installed and activated on 09 April. The rain gauge was calibrated to tip once for every hundredth of an inch of rain, and record the number of "tips" during each 15-minute period. Rain gauge data were collected in the same fashion described for flow data.

ADS field personnel visited each site weekly, to collect the stored data, perform diagnostic evaluations of flow monitor performance and, where necessary, to perform maintenance such as battery replacements and cleaning or replacement of monitor components/sensors.

2.2 Data Editing Activities

The ADS Project Data Analyst ("DA") downloaded and reviewed the weekly data collected by the field crews. The DA reviewed data and confirmations with the Project Engineer and Field Manager, edited the data where necessary, and determined the appropriate technique for calculating volume rate of flow for each time increment at each site. The DA calculated the flow quantities, and prepared the interim preliminary data submittals, as well as the various data summaries and deliverable documents included in this Report.

During data editing any raw data determined to be erroneous were flagged, but none of the raw values were ever changed. ADS' ISO9001-approved processes protect the raw depth and raw velocity data willfully, making it very difficult to change, manipulate or corrupt the raw data. The data are stored in a database that does not support cut, paste or copy commands.

Flow Calculations

After checking the validity of all the depth and velocity data, ADS calculated flow data using the Continuity Equation, shown following:

Continuity Equation:

$$Q = AV$$

Where: Q = flow rate
A = cross-sectional area of flow, and
V = average velocity of flow

2.3 Engineering Analysis

Data Review

The finalized flow data were analyzed graphically, to evaluate the hydraulic behavior of each site and determine whether each site was operating under conditions of unconstrained open-channel flow, or operating under conditions of surcharge or backwater. Each of those conditions was observed at some site at some time during the study. Descriptions of the hydraulic performance of each site are provided in Section 3. ADS engineers evaluated the depth and velocity data on both time-series (hydrograph), and depth-versus-velocity (scattergraph) plots.

Data acquired at PXV04 on 18 May are presented below in both hydrograph and scattergraph format. The following graphs illustrate the signature pattern of the upstream pump station, and document the "backing up" of the site, due to increasing upstream flow rate, and presence of a downstream "bottleneck", causing flow inventory to accumulate in the upstream pipes and manholes, and threatening a sanitary sewer overflow. The rainfall responsible for the increased flow ceased about the same time the depth peaked at PXV04, averting the overflow.

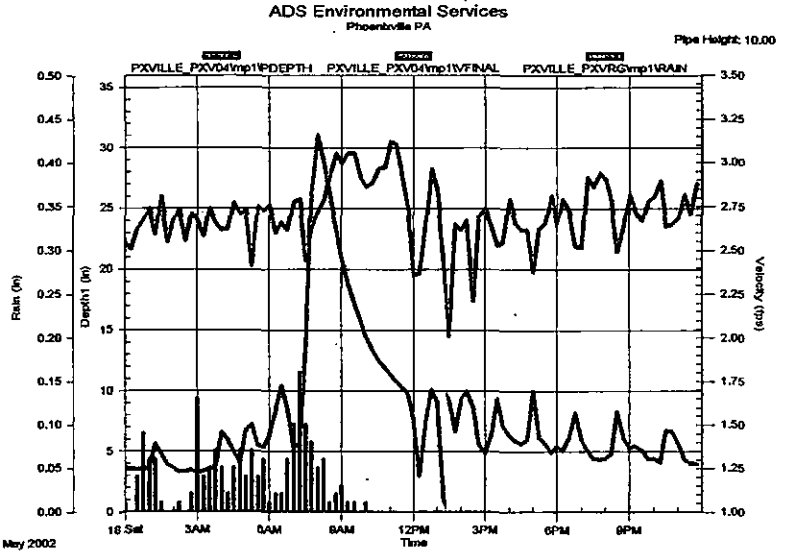


Figure 2-1 – Surcharge hydrograph at PXV04, 18 May

The hydrograph in Figure 2-1 shows 15-minute averages of 5-minute frequency data. The green line shows depth increasing beginning at about 0700 hours, in response to the rain, shown by the blue hyetograph. The reader will note that the velocity, shown by the red line, decreases dramatically at the same time. The rain ends just before 0900 hours, so depth stops increasing, and peaks at about 32 inches (the pipe is 10 inches in diameter). The saw-tooth pattern in both depth and velocity throughout the day indicates the cycling of an upstream pump station. The saw-toothing disappears as pump station activity becomes continuous.

The same event is shown in Figure 2-2 on a scattergraph. Each data point represents a single depth-velocity value, which could be picked off the hydrograph above. All the data points acquired on 18 May are shown. The increase in depth is shown in the sequence of data points stretching to the right across the graph. The data progress quickly to the right in 5-minute steps, across the lower limb of the graph, and turning counterclockwise, proceed more slowly to the left, after the peak depth is attained, ultimately spanning about 5 hours.

Using scattergraphs, ADS engineers can diagnose the following eight types of flow conditions in sewers:

1) Unconstrained open-channel flow
2) Silt or obstacles
3) Bottlenecks
4) SSO downstream
5) SSO upstream
6) Temporary blockage
7) Sags or dams
8) Variable downstream conditions - siphons, pump stations, etc.

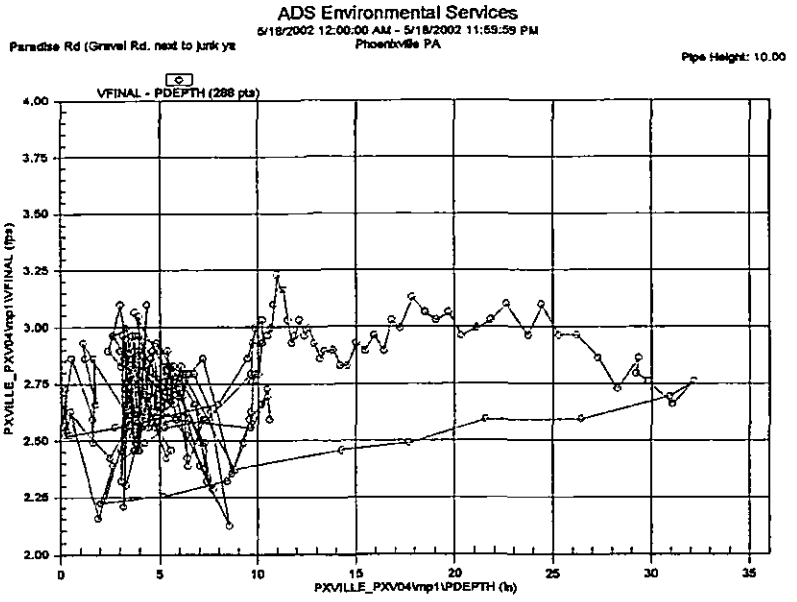


Figure 2-2 – Surcharge scattergraph at PXV04, 18 May

Overflows

Wastewater that escapes the sewer system through overflows or spurting manholes needs to be measured in order to build an accurate hydraulic picture of the collection system. Those flow rates must be measured in order to plan for their containment and transportation in the future. ADS did not observe or document any sanitary sewer overflows during the flow-monitoring period in Phoenixville.

Infiltration & Inflow Analysis

Dry Day Analysis

ADS conducted a Dry Weather Base Infiltration analysis for each basin. Using standard criteria for defining rain and storm recovery days, all the dry days in the monitoring period were isolated. These dry days

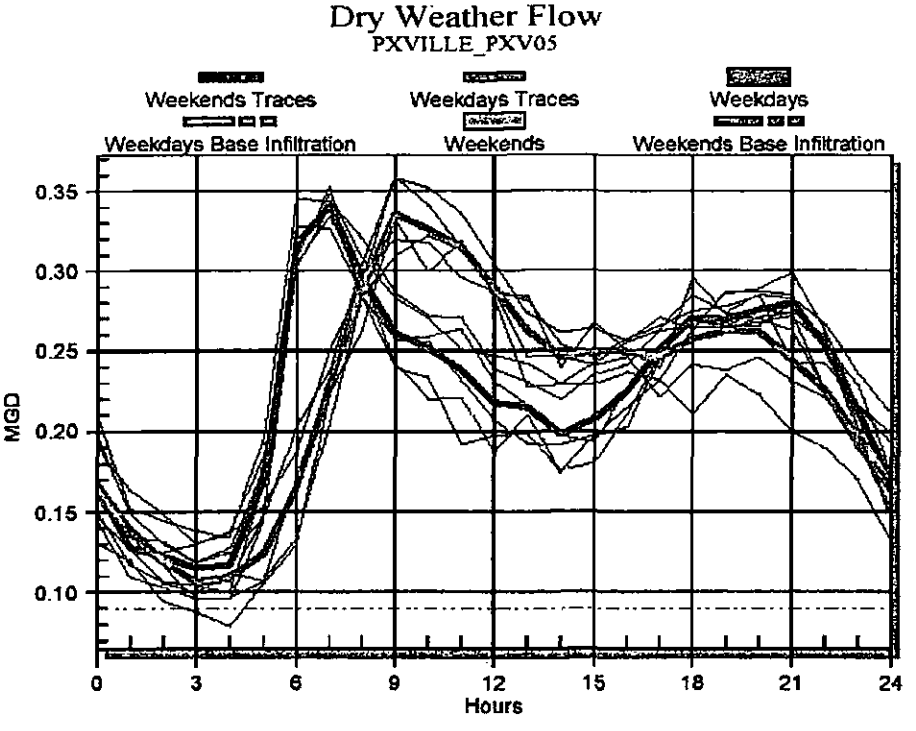


Figure 2-3 – Typical Dry Day Hydrograph with traces

were separated into weekdays and weekend days, to acknowledge the variations in flow patterns. Hourly average flow data were compiled for each dry day, and averaged for each hour, generating a composite dry day hydrograph. The dry day hydrographs for each monitoring site are provided in Appendix 2. Figure 2-3 above shows the Dry Day hydrograph for PXV05, for illustration.

Base Infiltration Total flow quantity for the dry day was determined, and the minimum value used to develop a value for Base Infiltration. The calculation was performed using ADS' standard "88/12" methodology. A national electric power survey found that 88% of electric power is used during the day, and only 12% at night. ADS used this observation and likewise estimates that the nighttime minimum wastewater production rate is 12% of the daily average rate. For most residential and commercial basins, this usually results in an accurate estimate of the amount of wastewater produced. In larger metropolitan sewer systems the estimates may become less clear. relationship between daily average domestic wastewater production and daily minimum flow rate.

Base Infiltration was normalized using the pipe length and diameter tables furnished by CARROLL, and computing "inch-diameter miles" for each basin. Base Infiltration values are shown on Exhibit 2 – Infiltration Severity Ranking by Basins.

Wet Weather Analysis

ADS analyzed the ten storms that impacted Phoenixville during the monitoring period, and presented the results for the 3 most severe storms. Exhibit 3 – Wet Weather Severity by Basins, presents the results of the average Rain-Derived Infiltration & Inflow (RDII) for these 3 storms.

The Storm Event hydrograph in Figure 2-4 illustrates graphically the techniques for calculating RDII rates and volumes.

ADS first examined the study period hydrograph and rainfall record, and using standard definitions for rain events, separated the days into dry days, rain days and recovery period days. ADS then prepared a time-series flow hydrograph for each storm, and superimposed the rainfall hyetograph to define the 3-day storm period. We then superimposed the site's weekday and weekend day Dry Day hydrographs, shown in Figure 2-3 above, over the storm hydrograph to identify the flow increase attributable to the storm. We subtracted the area under the Dry Day hydrograph from the area under the storm flow hydrograph, for a three-day period including the rain day and the two subsequent recovery days. The process is most easily understood by reference to the resulting diagram, shown in Figure 2-4.

The green and light blue lines are the weekday and weekend day Dry Day hydrographs, strung together in a series, to project the flow that would have been recorded in the absence of the storm event. The hourly total rainfall is shown by the vertical magenta hyetograph lines. The actual sewer flow hydrograph recorded by the flow monitor is shown in dark blue. The ordinate of the Dry Day line is subtracted from the ordinate of the flow hydrograph line at each hour point, and the difference is plotted; the brown line traces those difference points, and marks out the hydrograph of the Rainfall-Dependent I & I. The shaded magenta bands along the x-axis identify the rain day, and each of the two recovery days. If the storm of 18 May had not started almost exactly at midnight, the bands would be displaced from the date grid.

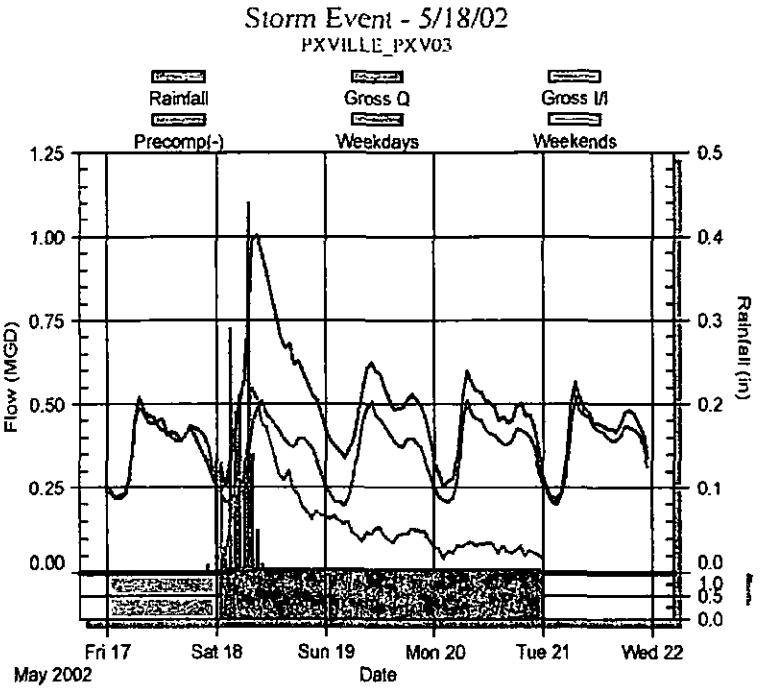


Figure 2-4 – Typical Storm Event Hydrograph, 18 May

Figure 2-4 shows the flow at PXV03, increasing rapidly immediately after onset of the 18 May storm, and reaching a peak of 1.00 mgd just after the time of greatest hourly rainfall intensity. Flow decreases to a about 0.50 mgd over the next half day, but by the time of the regular morning minimum on 19 May, is still about 0.15 mgd greater than the normal dry weather flow for that time of day.

Storm Event Hydrographs for each of the three storms, for all sites, are presented in Appendix 2.

SECTION 3

DATA REVIEW AND SITE HYDRAULIC BEHAVIOR

3.1 Flow Data

All sites exhibited diurnal fluctuations in flow rate, characteristic of small local or regional collection systems with moderate travel time. Most sites exhibited differentiated weekend flow patterns. The average, maximum and minimum flow rates recorded during the flow monitoring period are summarized in Table 3-1, below:

Table 3-1 – SUMMARY OF FLOW & RAIN DATA

Site Designation	Average Daily Flow Rate	Max. Flow Rate	Min. Flow Rate
PXV01	0.110 mgd	0.349 mgd	0.030 mgd
PXV02	0.220 mgd	0.524 mgd	0.055 mgd
PXV03	0.386 mgd	1.048 mgd	0.139 mgd
PXV04	0.382 mgd	1.139 mgd	0.098 mgd
PXV05	0.238 mgd	0.908 mgd	0.058 mgd
PXV06	0.082 mgd	0.473 mgd	0.001 mgd
	Study Period Total	Max. Intensity	
Rain	12.01 inches	0.87 in/hr	

3.2 Rain Gauge Data

Ten (10) identifiable storms occurred during the 47-day monitoring period. Total rainfall for the monitoring period was 12.01 inches. Storm totals ranged from 0.99 inches to 2.30 inches. None of the recorded storms approached the one-year return frequency volume on any duration basis. Figure 5 below shows the daily rainfall hyetograph for the monitoring period. Detailed Rain Data and summaries appear in the tabular data provided in Appendix 1. Hourly rainfall amounts are plotted as hyetographs on the weekly and monthly hydrographs in Appendix 1.

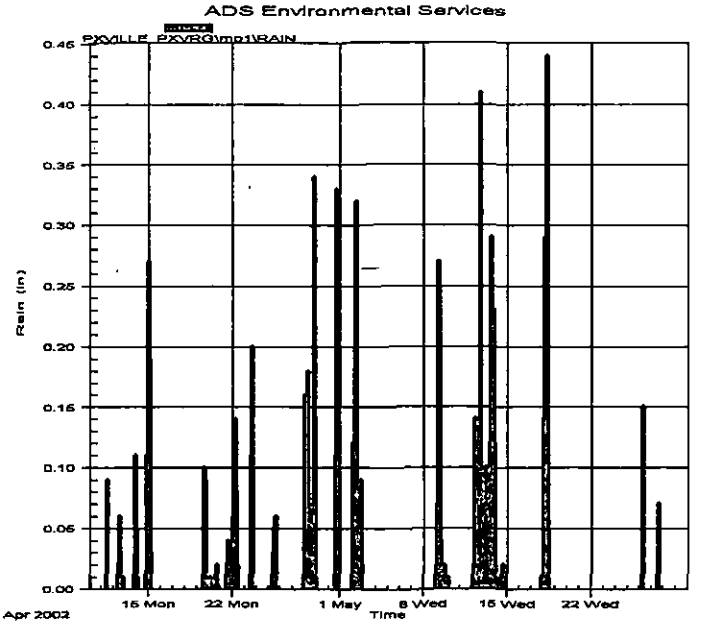


Figure 3-1 – Rainfall Hyetograph for Study Period

3.3 Site Hydraulic Behavior

PXV01 – This site exhibited unconstrained open-channel flow behavior up to a depth of approximately 4 inches, beyond which it entered a backup condition. All backup behavior recorded occurred during the 8 hours starting at just after midnight on 18 May, concurrent with 1.74 inches of rain. The rapid backup, starting only an hour after rain began, indicates a downstream system bottleneck. Flow reached a maximum depth of 9 inches, surcharging the 8-inch pipe.

PXV02 - This site exhibited unconstrained open-channel flow behavior at all times during the monitoring period, never exceeding a depth of 3 inches in the 12-inch pipe.

PXV03 – This site exhibited unconstrained open-channel flow behavior at all times, including the storm event of 18 May, reaching a depth of 7 inches in the 12-inch pipe. The data show evidence of a 3-inch high flow obstruction or "hump" downstream.

PXV04 – This site exhibited a characteristic "pump station upstream" hydraulic behavior. Depth approached or exceeded 80% of the 10-inch pipe diameter at some time on most days. The site evidenced backups characteristic of a downstream "bottleneck" above depths ranging from 5 to 8 inches. Greatest depth of surcharge was 32 inches at 0800 hours on 18 May, near the end of the rainfall event. The system upstream of this monitoring location may be at risk of overflowing in storms of 1-year return frequency or greater.

PXV05 - This site exhibited unconstrained open-channel flow behavior at all times during the monitoring period, never exceeding a depth of 4½ inches in the 10-inch pipe.

PXV06 - This site exhibited unconstrained open-channel flow behavior at all times during the monitoring period, never exceeding a depth of 3 inches in the 10-inch pipe.

SECTION 4

RESULTS OF INFILTRATION & INFLOW ANALYSIS

4.1 Base Infiltration

Dry weather Base Infiltration is shown for each basin in Table 4-1 below. The basin size is shown in both tributary sewer length and inch-diameter miles ("inch-miles", or "IDM"). The total Base Infiltration quantities for each basin are normalized on the inch-miles of pipe in that basin. The Base Infiltration rate is also shown on Exhibit 2 – Infiltration Severity Ranking by Basins. The basins are color-coded on Exhibit 2 to indicate severity ranking. Total dry weather Base Infiltration in the monitored basins is 641,000 gallons per day.

Table 4-1 – BASE INFILTRATION BY MONITORING BASIN

Monitoring Basin	PXV01	PXV02	PXV03	PXV04	PXV05	PXV06
Lineal Feet	16,045	29,542	49,558	24,413	22,145	22,864
Inch-diameter miles	25.05	46.75	76.31	38.32	33.57	36.70
Base Infiltration (mgd)	0.045	0.084	0.183	0.208	0.100	0.021
Infiltration Rate (gpd/IDM)	1,796	1,797	2,398	5,428	2,979	572

Severity of infiltration is expressed as infiltration rate per unit of pipe in contact with the surrounding soil, usually expressed in units of gallons per day per inch-diameter-mile of pipe (abbreviated IDM). Figure 4-1 shows the severity of infiltration in Phoenixville, by basin. ADS recommends that basins with infiltration severity exceeding 2,000 gallons per day per inch mile receive consideration for further investigation and identification of defects, so that cost-effectiveness of rehabilitating the defects may be evaluated.

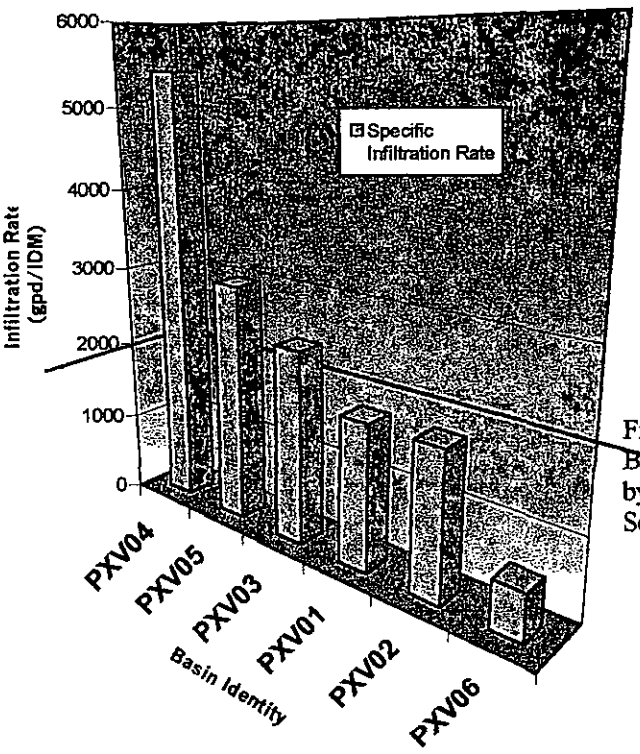
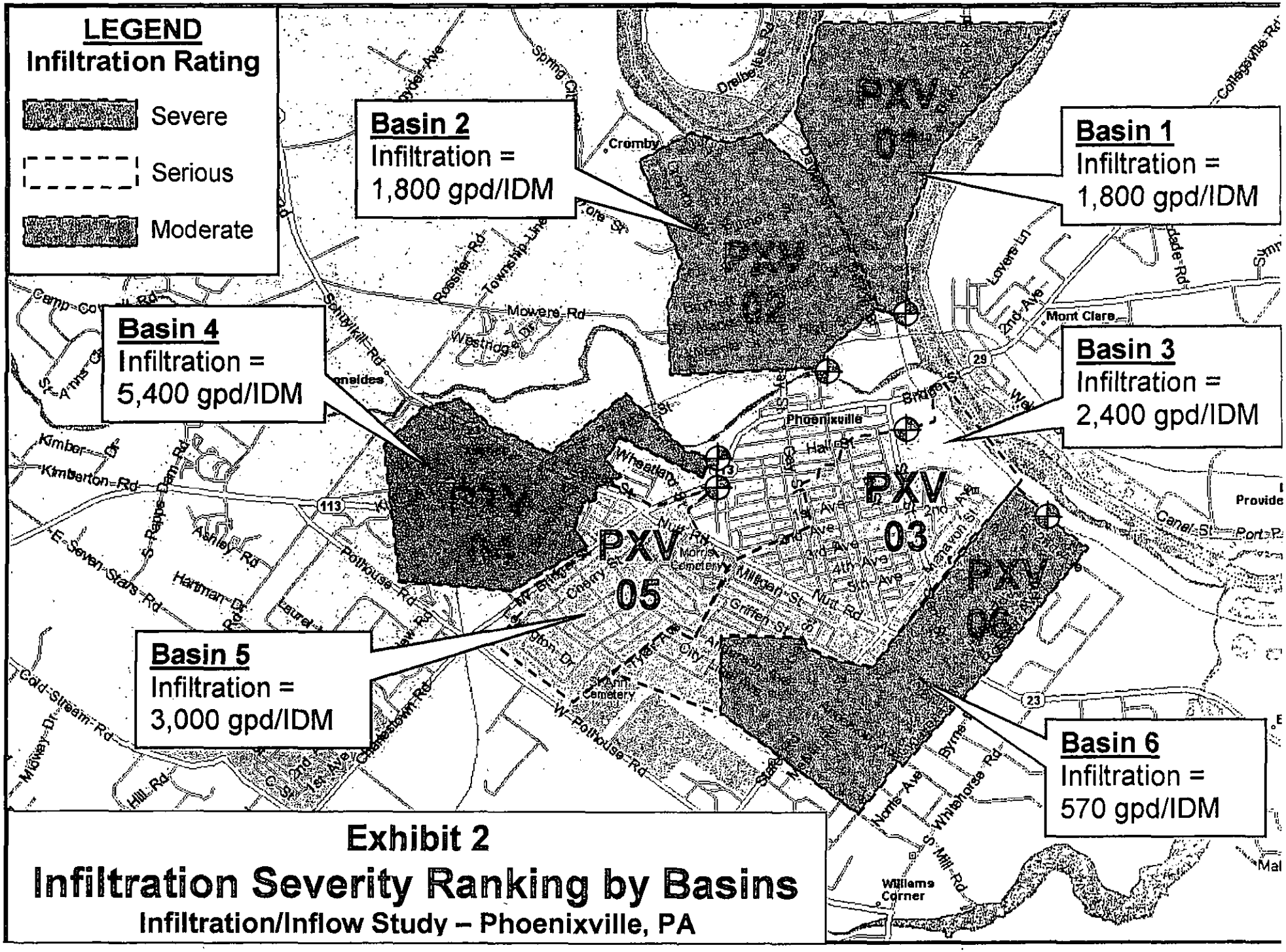


Figure 4-1 Basin Ranking by Infiltration Severity

One Phoenixville basin has a rate below the action threshold, three basins have rates slightly above or


LEGEND
Infiltration Rating
Severe
Serious
Moderate
Basin 1
Infiltration =
1,800 gpd/IDM
Basin 2
Infiltration =
1,800 gpd/IDM
Basin 3
Infiltration =
2,400 gpd/IDM
Basin 4
Infiltration =
5,400 gpd/IDM
Basin 5
Infiltration =
3,000 gpd/IDM
Basin 6
Infiltration =
570 gpd/IDM
PXV 01
PXV 02
PXV 03
PXV 04
PXV 05
PXV 06
Phoenixville
Mont Clare
Cromby
Williams Corner
Exhibit 2
Infiltration Severity Ranking by Basins
Infiltration/Inflow Study – Phoenixville, PA

below the threshold, and two basins exhibit Base Infiltration rates significantly above the threshold. About 500,000 gallons per day of infiltration is sourced in the basins that exceed the action threshold.

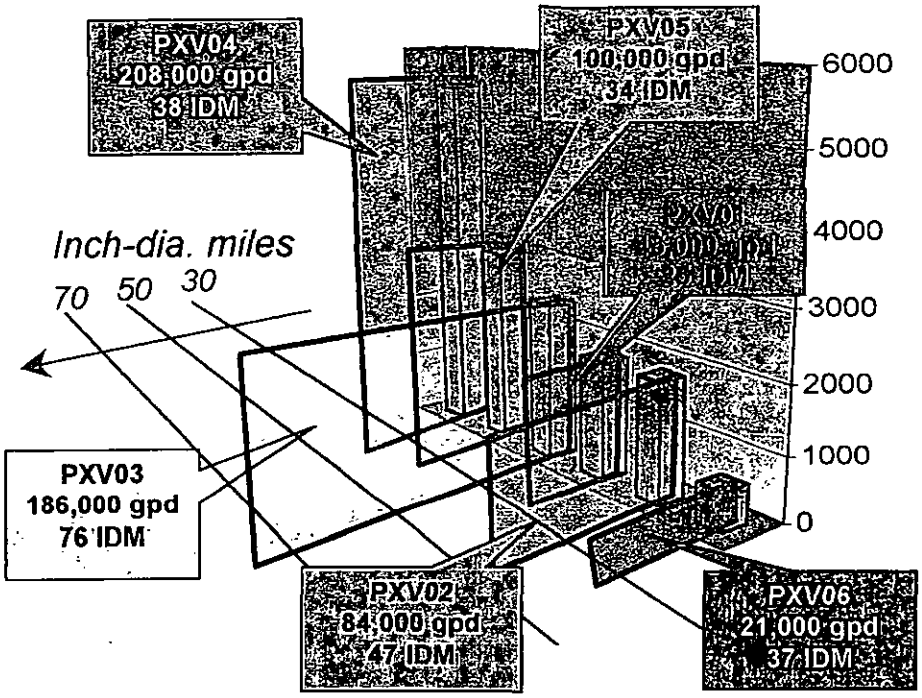


Figure 4-2
Basins Ranked by Severity, showing Total Infiltration and Basin Size

The large size (76 IDM – nearly 10 miles of sewer) of one of the marginal basins, PXV03, may be seen on Figure 4-2. PXV03 is larger than the two most severe basins combined, and its size is likely masking non-uniform infiltration. It may not be necessary to further inspect the entire basin; Stage 2 flow monitoring would enable isolation of the most severe sub-basin(s). This masking effect may be more easily understood by considering the Phoenixville system as a whole – the total system of 257 IDM produces Base Infiltration of 641,000 gallons per day, or 2,500 gpd/IDM. Before this study was undertaken, the system would have appeared to be only 25% above the recommended action level. But by breaking the system down into basins, 42% of the system has been shown to be under the action level, and 28% seriously over the action level. If the sewers in marginal basin PXV03 follow the same proportions, some 30,000 lineal feet of unnecessary internal inspection cost may be avoided.

4.2 Rainfall Dependent Inflow/Infiltration

Total RDII in the three most severe storms of the monitoring period is shown below, in Table 4-2.

Table 4-2 – RDII FOR MAJOR STORMS

Monitoring Basin	PXV01	PXV02	PXV03	PXV04	PXV05	PXV06
Lineal Feet	16,045	29,542	49,558	24,413	22,145	22,864
Total Event RDII 27 Apr (MG)	0.044	0.139	0.180	0.243	0.206	0.065
Total Event RDII 12 May (MG)	0.035	0.124	0.108	0.171	0.054	*
Total Event RDII 18 May (MG)	0.182	0.177	0.462	0.465	0.431	0.185
Inflow Severity - 3 storm average (gpd/MLF) *	5,431	4,961	5,043	11,998	10,399	5,467

Note: Average for PXV06 is for 27 April and 18 May storms only, see Section 2.1.

The total event, rain day, and recovery days RDII volumes are shown graphically on Figure 4-3, for the most severe storm, 18 May. Severity is expressed in gallons of RDII for the entire storm event, per thousand lineal feet of tributary sewer. RDII severity is also shown by Basin location on Exhibit 3.

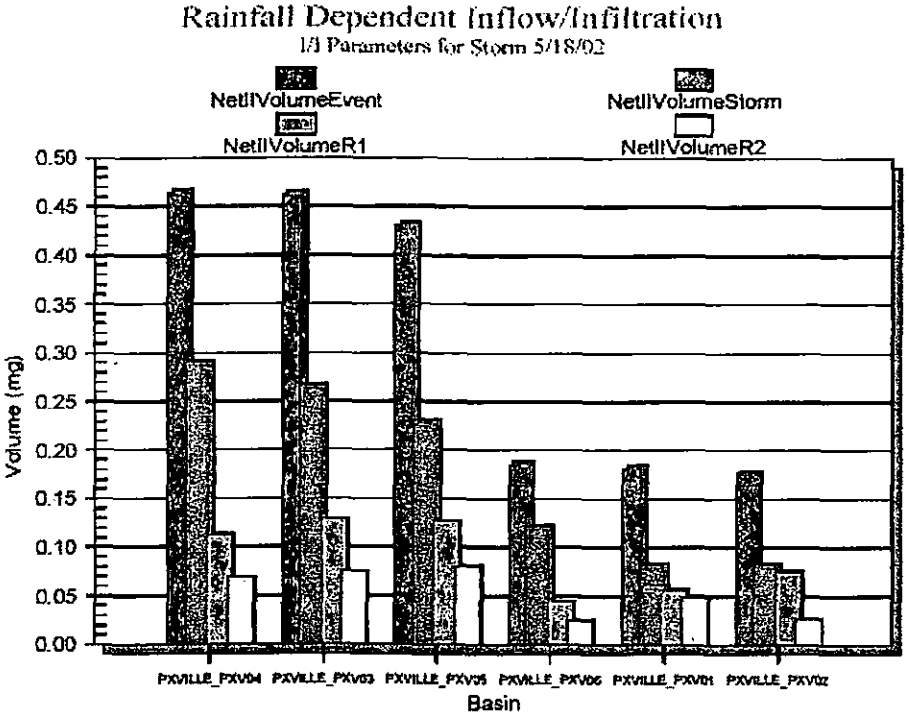


Figure 4-3 – Event, Rain, Recovery RDII Volumes by Basin for 18 May Storm

A series of Storm Event hydrographs are provided in Appendix 2, for all basins in each of the three major storms. As an aid to interpretation, an example is shown in Figure 4-4 below:

- Flow rate scale is shown on the left side, hourly rainfall accumulation scale is shown on the right. The green and light blue lines are the weekday and weekend day Dry Day

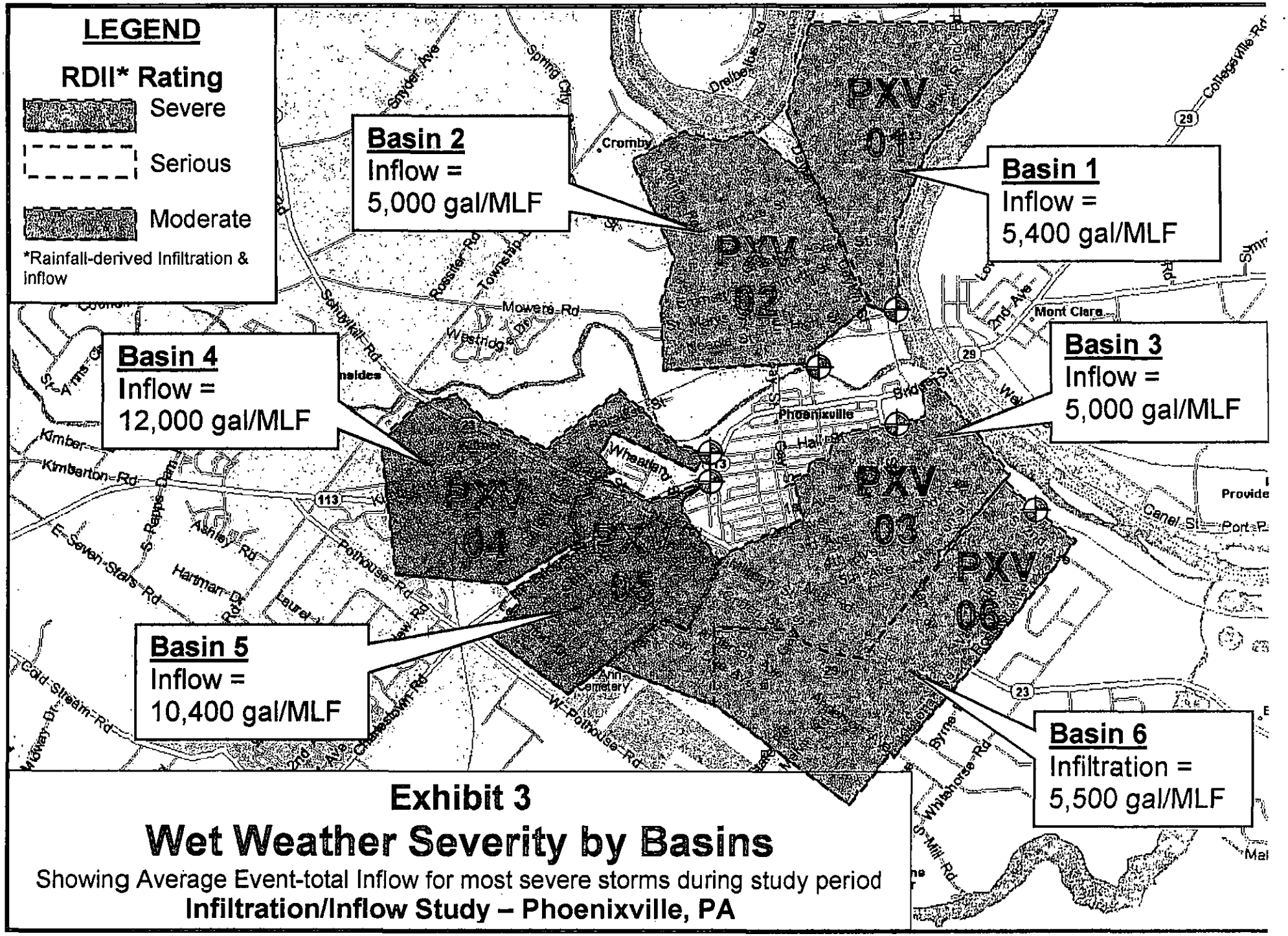


Exhibit 3

Wet Weather Severity by Basins

Showing Average Event-total Inflow for most severe storms during study period

Infiltration/Inflow Study – Phoenixville, PA

hydrographs, strung together in a series, to project the flow that would have been recorded in the absence of the storm event.

- The hourly total rainfall is shown by the vertical magenta hyetograph lines. The graph show slight rainfall, just before midnight on 17 May.
- The actual hourly average sewer flow hydrograph recorded by the flow monitor is shown in dark blue.
- The ordinate of the Dry Day line is subtracted from the ordinate of the flow hydrograph line at each hour point, and the difference is plotted as the brown line;
- The brown line marks the hydrograph of the Rainfall-Dependent I & I. Figure 4-3 shows the RDII rate peaking at just over 0.50 mgd, just after the hour when rainfall accumulation was 0.44 inches.
- The area under each of the curves represents the total volume of flow.
- The shaded magenta bands indicate the three successive 24-hour periods following the beginning of the storm. These periods are called the storm day, recovery one day, and recovery two day, respectively.

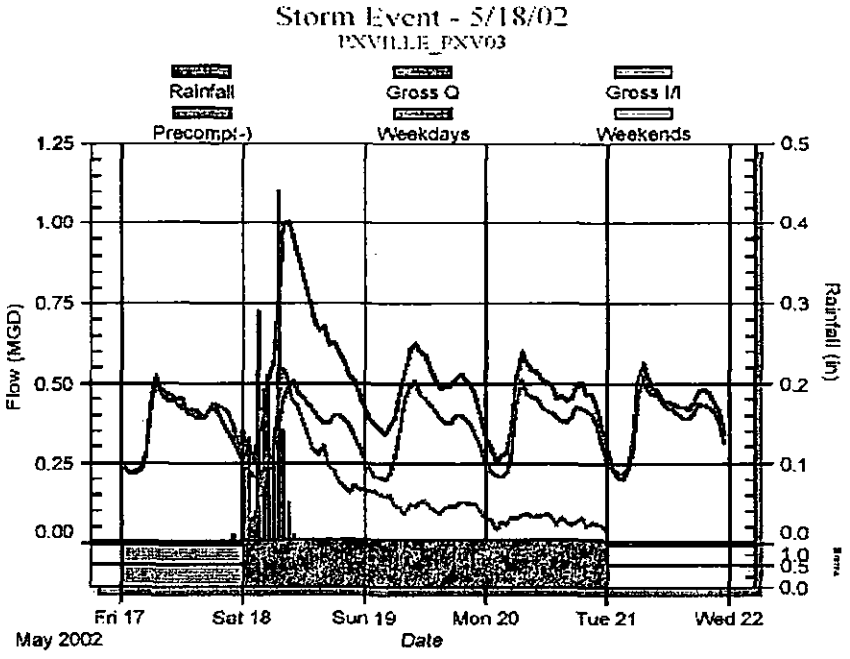


Figure 4-4 – Storm Event Hydrograph for PXV03

SECTION 5

CONCLUSIONS

5.1 Overall System I/I

The flow monitoring program captured flows in 165,000 lineal feet, or roughly 80%, of the Phoenixville system. The monitoring was sufficient to provide a comprehensive overview of system performance in both dry- and wet-weather conditions. Conclusions herein, about the system performance, are limited to the study area. The system is severely impacted by both dry weather infiltration and rainfall-dependent infiltration and inflow.

Infiltration (green bars on Figure 5-1) accounts for 47% to 48% of the dry-weather flow in the system, amounting to 640,000 gpd from the monitored portion of the system. Rainfall-Dependent Infiltration and Inflow (RDII) varies with rainfall intensity and duration, and amounted to 5.25 million gallons in the 47-day monitoring period, 1.76 million gallons on the greatest three rain days, identified as "Wet Weather" on Figure 5-1. On those days, the average flow comprised 37% wastewater, 33% infiltration, and 30% RDII. On 18 May, the most severe day, the RDII represented 57% of the total flow.

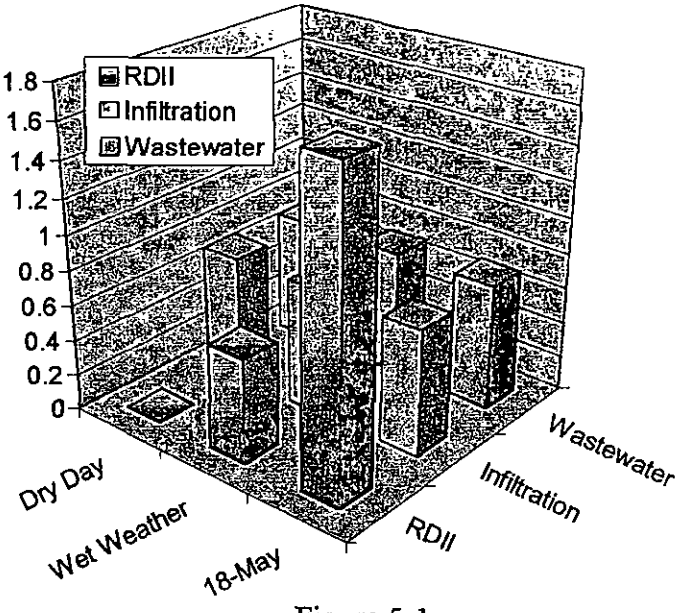


Figure 5-1
Components of Average Daily Flow

5.2 Basin Differences

The monitoring was also sufficient to detect the varying magnitude of the I/I in different parts of the system. Two basins stood out as highest in infiltration severity, and also highest in RDII. Three other basins evidenced moderate infiltration, within guidelines for no further action. Another basin, PXV03, has serious infiltration, and due to its large size, is probably masking areas of severe infiltration among other, more moderate, areas. Comparative severity of both infiltration and RDII is shown on Figure 5-2, Infiltration & Inflow Severity by Basin. The bars compare both infiltration and RDII for each basin, with that documented for Basins 4 and 5, the most severe basin, respectively, in each category.

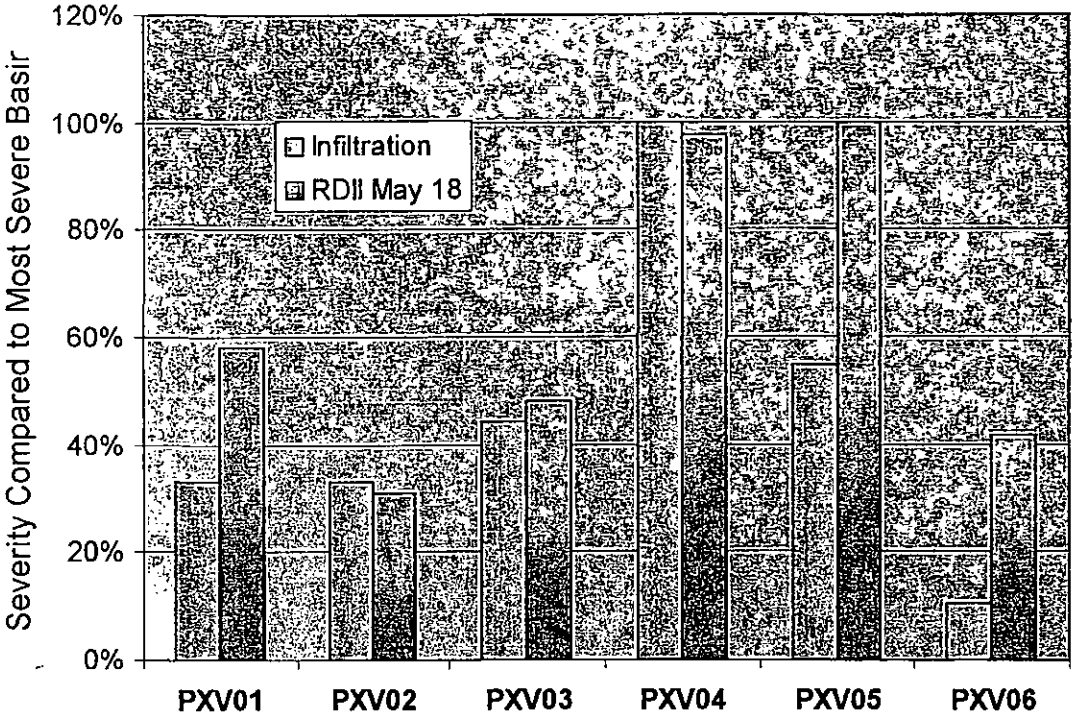


Figure 5-2 Infiltration/Inflow Severity by Basin

5.3 Dry-Weather Infiltration

Infiltration rate was classified into "Moderate or better" with rates lower that 2,000 gallons per day per inch-diameter mile (gpd/IDM), "Serious" with rates between 2,000 gpd/IDM and 5,000 gpd/IDM, and "Severe", over 5,000 gpd/IDM. Basins PXV01, PXV02 and PXV06 (which, together comprise 42% of the study sewer), displayed moderate or better infiltration. Among the remaining 58% of the study sewers, 15% have severe infiltration, and 43% have serious infiltration. Basin PXV03, rated serious, contains nearly 50,000 lineal feet of sewer, three to five times the basin length recommended for optimum I/I characterization. Basin PXV03 may contain a mix of "severe", "serious", and "moderate" infiltration just as the rest of the system does; in that case, the overall breakdown for infiltration severity would be:

Moderate or better	-	98,000 LF (60%)
Serious	-	32,000 LF (19%)
Severe	-	35,000 LF (21%)

5.4 Wet Weather Performance

Despite its brevity, the study period did provide an adequate opportunity to observe the system under mild wet weather stress. Three significant wet weather events occurred, each ceasing just as the system had been driven to, or nearly to overload, and before it could establish equilibrium at full system storage. All basins in the system exhibited a reasonably direct relationship between rainfall amount and RDII volume. Rainfall intensity did not, at any time during the study, approach that of even a one-year storm, considered on any duration basis. This means that the system can be expected to frequently experience greater volumes of RDII than those recorded during the study. A permanent flow and rain monitoring system would provide a detailed characterization of system performance in longer storms, where the system establishes equilibrium under overload.

All the basins exhibited very rapid response to intense rainfall, often reaching peak flow rates within one to two hours of the time of peak rainfall intensity. All the basins recovered from intense rain events only over an extended time – 20% of the total RDII was recorded in the second recovery day.

The wet weather events revealed Basins PXV04 and PXV05 as the most deeply impacted by Rainfall-Dependent Infiltration and Inflow (RDII). In those two basins the flow rate more than doubled, and they delivered a total wastewater volume on that day 516,000 gallons greater than on a dry day.

The defining rain event began just after midnight on 18 May. The rain event extended 10 hours, during which it delivered 1.74 inches of rain, with a peak hourly intensity of 0.44 inches per hour. By 0800 hours, flow rate had peaked in Basins 03, 04, 05, and 06; flow peaked in the other two by 1000 hours. In Basins 04 and 05, the RDII volume during the first 24 hours of this event approximated the entire wastewater flow plus infiltration. Figure 5-3 shows the Storm Event Hydrograph for the event. The normal Dry Day flow is shown by the green/light blue line, and the actual monitored flow by the dark blue line. The hourly rain volume is shown by the magenta bars, and the RDII by the brown line. Storm Event

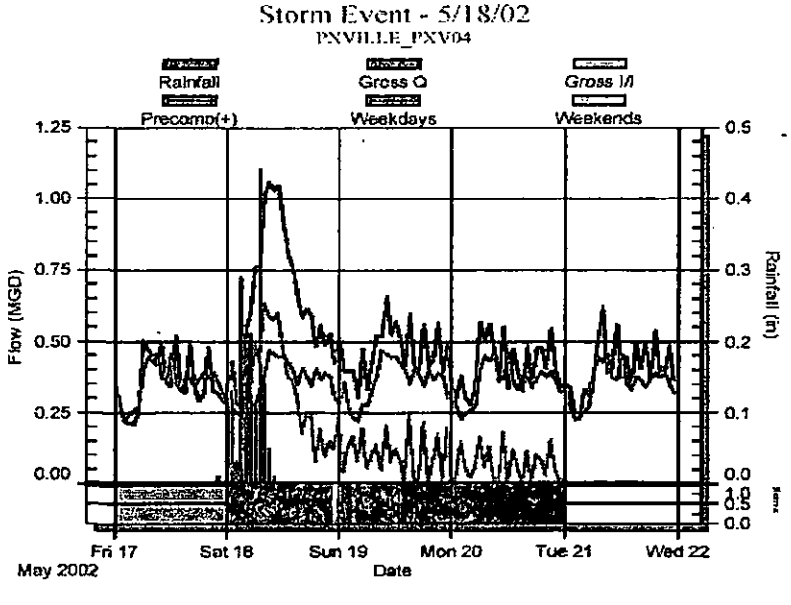


Figure 5-3 – Storm Event Hydrograph for 18 May Storm - SitePXV05

hydrographs are provided for all sites, for each of the three storms, in Appendix 2.

5.5 Hydraulic Performance

PXV01 – Pipe diameter 8". This site never approached the open-channel hydraulic capacity of the pipe. However, a downstream bottleneck caused deterioration of its performance as depth exceeded 5 inches. The bottleneck became evident on 18 May, concurrent with 1.74 inches of rain. As flow depth exceeded 6 inches, the pipe rapidly surcharged to 9 inches, remaining surcharged from 0920 hours to 1215 hours. The discharge through the site peaked at 0.34 mgd during this surcharge. The performance limitation is probably imposed by the limiting capacity of the downstream pump station. This system can be expected to surcharge and possibly overflow, due to the bottleneck, in storms approaching one-year return frequency.

PXV02 – Pipe diameter 12". This high-velocity site achieved flow velocities exceeding 6 feet per second, never approaching the open-channel hydraulic capacity of the pipe. It handled the maximum flow recorded, 0.4965 mgd, at a flow depth less than 3.0 inches.

PXV03 – Pipe diameter 10". This site never approached the open-channel hydraulic capacity of the pipe. It handled the maximum flow recorded, 0.95 mgd at 0700 hours on 18 May, at a flow depth of 7.0 inches. The monitoring data provided evidence that a 3-inch high flow obstruction, or "hump" in the vertical alignment, is present downstream.

PXV04 – Pipe diameter 10". This site exhibited the behavior characteristic of sites with pump stations upstream. Depth approached or exceeded 80% of pipe diameter at some time on most days. The site evidenced backups characteristic of a downstream "bottleneck" above depths ranging from 5 to 8 inches. Greatest depth of surcharge was 32 inches at 0800 hours on 18 May, near the end of the rainfall event. The system upstream of this monitoring location is probably at risk of overflowing in storms of 1-year return frequency or greater.

PXV05 – Pipe diameter 10". This site exhibited unconstrained open-channel flow behavior at all times during the monitoring period, never exceeding a depth of 4½ inches.

PXV06 – Pipe diameter 10". This site exhibited unconstrained open-channel flow behavior at all times during the monitoring period, never exceeding a depth of 3 inches.

Temporary Site Report

REWARD IF FOUND · (256) 430-3366

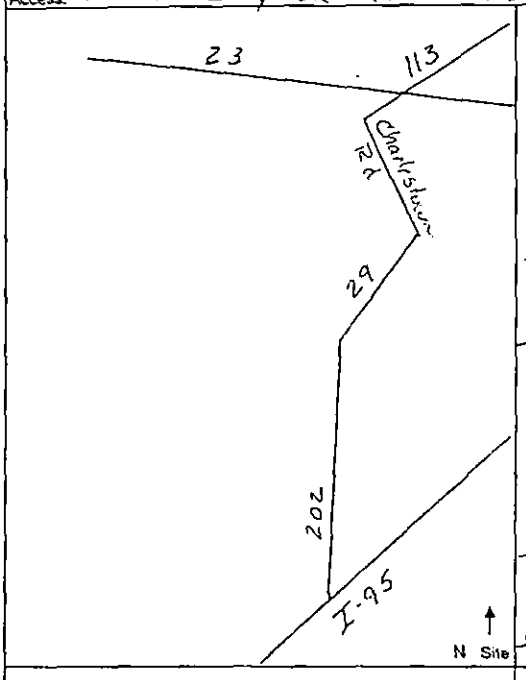
Manhole #	AN	Monitor #
516	PXV-01	1194
V-Sensor #	**Bat Serial #**	**Press. X-ducer #**
5000	3122	10065
Dist. to X-ducer	**Physical Offset**	**Diameter**
8"	1.88	8.0"

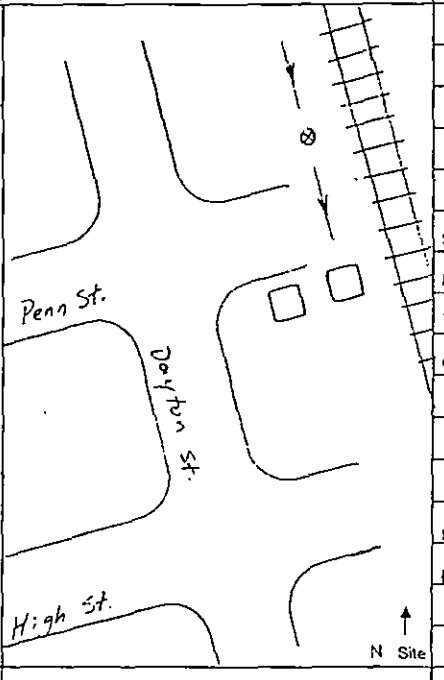
Project/Phase: Phoenixville PA Date: 4/11/02 Name: MEJ

Address/Location: End of Penn St. @ R.R. Tracks

Access: Drive - Stay on Hard Road

INSTALLATION: UVP on Standard R&C





SAFETY: Live Railroad Tracks

Manhole Depth: 5'

Traffic: NONE

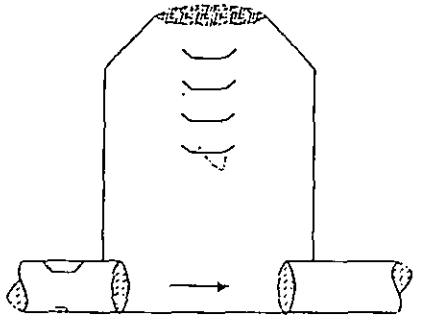
Gas @ Investigation: NEG

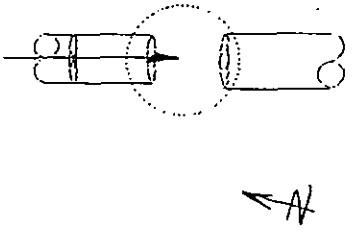
Manhole Condition: POOR

Rain Gauge Zone:

Drop/Fall:

Install QC:


Cross Section


Planar

Comments:

Pipe Type: DIP

	Y	N	?	DISTANCE
Backup				
Trunk				
Lift Sta.				
STP				
Other Input				
Ind. U/S				
L/S U/S	X			

General conditions, overflows, bypasses, weirs, special information, monitor characteristics, surcharge, etc.
* Please make precise drawings of odd-shaped pipes and/or special installation.

RATING: D

Recommended Analysis Days:

Master List of Recommended Days:

Hydraulics: Very Shallow Flow - Generally less than 2"

Additional Comments - Final Data Review

Surcharge: No Recent Evidence Height:

Inv.: DOF: 1.5" +/-: 0.13" Time: 13:10 Vel.: 1.3 fps Silt: Ø

Upstream Manhole: Junction

Downstream Manhole: Junction w/ Drop

Mini System Character: (Residential) Commercial/Industrial/Vacant

Temporary Site Report

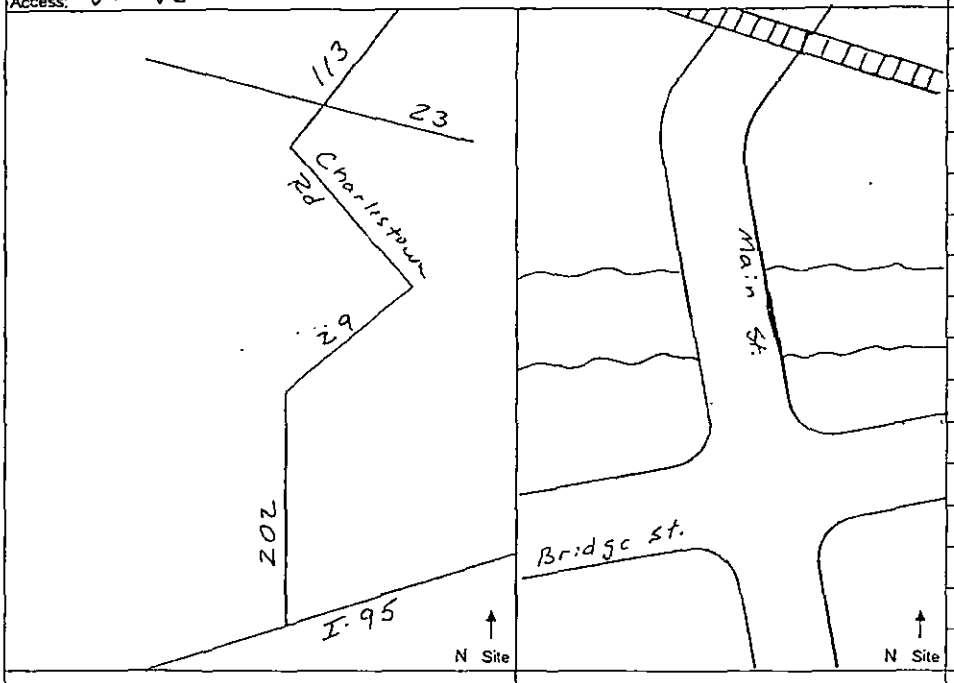
REWARD IF FOUND - (256) 430-3366

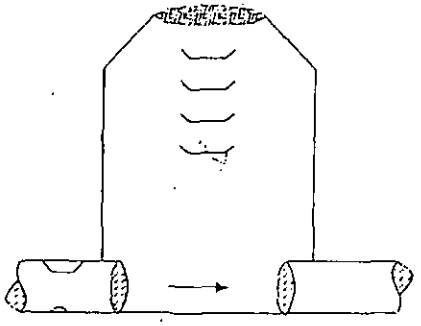
Project/Phase: Phoenixville PA Date: 4/9/02 Name: MEJ

Address/Location: Main St. Just North of Bridge

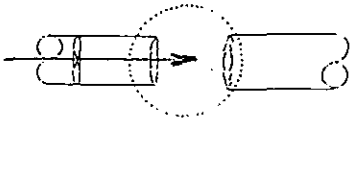
Access: Drive

Manhole #	AN	Monitor #
527	PXV-02	1028
V-Sensor #	Bat Serial #	Press. X-ducer #
5086	5067	8706
Dist. to X-ducer	Physical Offset	Diameter
	1.5	12.0"





Cross Section



Planar

INSTALLATION

UVP on Standard R&C

SAFETY

Manhole Depth: 53"

Traffic: Moderate

Gas @ Investigation: Neg

Manhole Condition: Poor - Saddle M/H Built over Cut-in

Rain Gauge Zone:

Drop/Fall:

Install OC:

Comments:

Pipe Type: VCP

	Y	N	?	DISTANCE
Backup				
Trunk	X			
Lift Sta.	X			
STP				
Other Input				
Ind. U/S				
U/S U/S				

General conditions, overflows, bypasses, weirs, special information, monitor characteristics, surcharge, etc.
* Please make precise drawings of odd-shaped pipes and/or special installation.

RATING: D

Hydraulics: Fast Flow may back-up slightly as line flattens out through M/H

Recommended Analysis Days:

Master List of Recommended Days:

Additional Comments - Final Data Review

Surcharge No Recent Evidence Height:

Inv.: DOF: 2.5 +/-: 0.13" Time: 14:00 Vel.: fps Silt: Ø

Upstream Manhole: Drop Connection

Downstream Manhole: Junction

Mini System Character: (Residential/Commercial/Industrial/Vacant)

Temporary Site Report

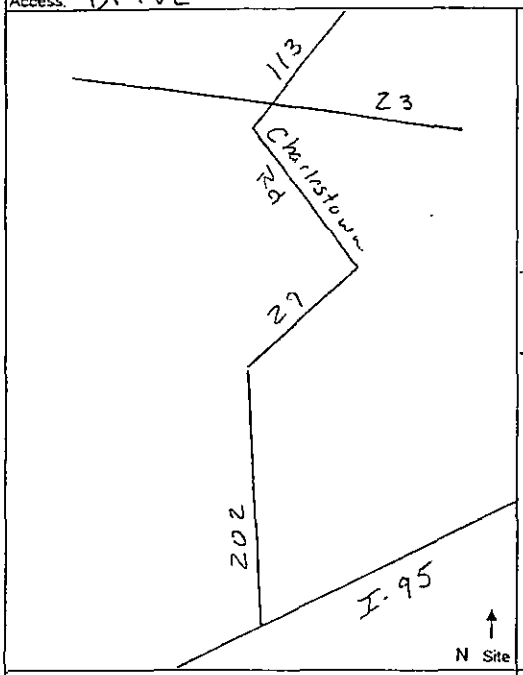
REWARD IF FOUND - (256) 430-3366

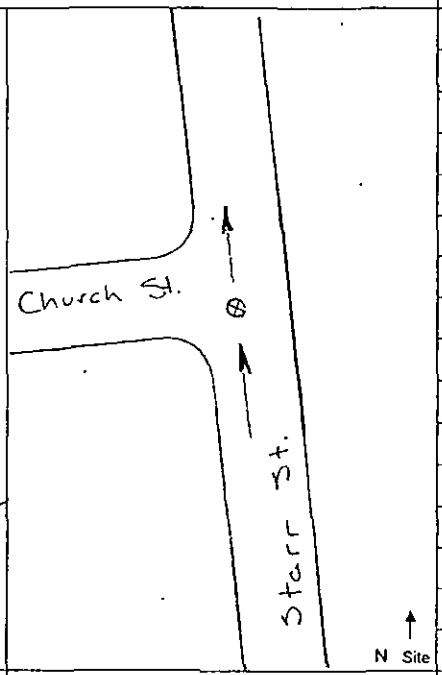
Manhole #	AN	Monitor #
52	PXY-03	1185
V-Sensor #	**Bat Serial #**	**Press. X-ducer #**
6244	14365	8379
Dist. to X-ducer	**Physical Offset**	**Diameter**
	1.5"	12.5"

Project/Phase: Phoenixville, PA Date: 4/10/02 Name: MEJ

Address/Location: Starr St. @ Church St.

Access: Drive





INSTALLATION

UVP on Standard R&C

SAFETY

Manhole Depth: 8' 6"

Traffic: Moderate

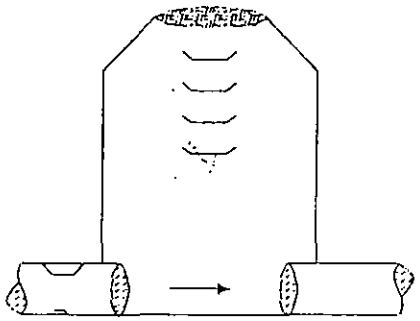
Gas @ Investigation: NEG

Manhole Condition: FAIR/GOOD

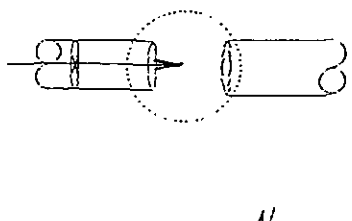
Rain Gauge Zone:

Drop/Fall:

Install QC:



Cross Section



Planar

Comments:

Pipe Type:

	Y	N	?	DISTANCE
Backup				
Trunk	X			
Lift Sta.	X			
STP				
Other Input				
Ind. U/S				
U/S U/S				

General conditions, overflows, bypasses, weirs, special information, monitor characteristics, surcharge, etc.
* Please make precise drawings of odd-shaped pipes and/or special installation.

RATING: B

Hydraulics: Nice Smooth, Even Flow Slight Drawdown as flow enters M/H but we are U/S of this

Recommended Analysis Days:

Master List of Recommended Days:

Additional Comments - Final Data Review

Surcharge: No Evidence Height:

Inv.: DOF: 3.75 +/-: 0.13" Time: 14:56 Vel.: fps Silt: Ø

Upstream Manhole: N/A

Downstream Manhole: N/A

Mini System Character: (Residential) Commercial Industrial Vacant

Temporary Site Report

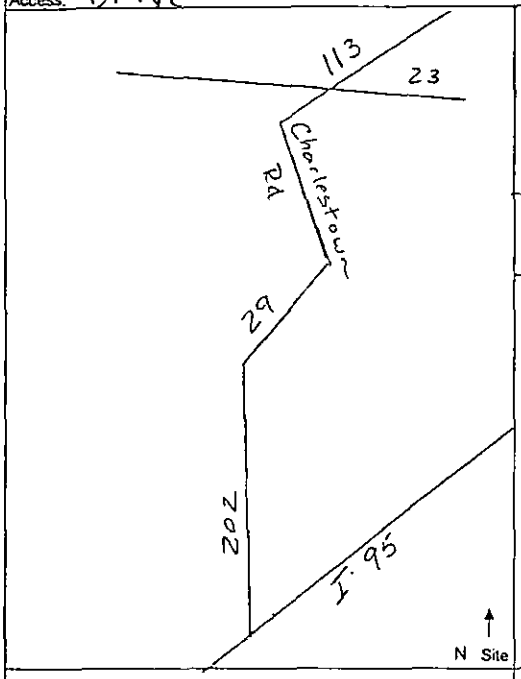
REWARD IF FOUND - (256) 430-3366

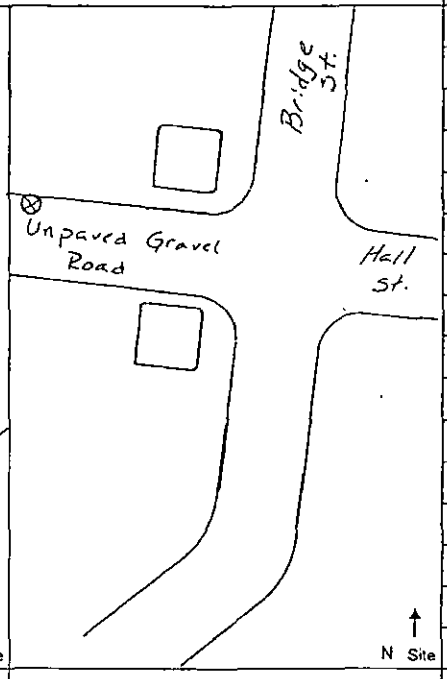
Manhole #	AN	Monitor #
313	PXV-04	1071
V-Sensor #	**Bat Serial #**	**Press. X-ducer #**
9995	15337	10820
Dist. to X-ducer	**Physical Offset**	**Diameter**
	1.5"	10.0"

Project/Phase: Phoenixville PA Date: 4/11/02 Name: MEJ

Address/Location: Along Gravel Rd Across Bridge St. from Hall St.

Access: Drive





INSTALLATION

UVP on Standard R&C

SAFETY

Manhole Depth: 5' 10"

Traffic: NONE

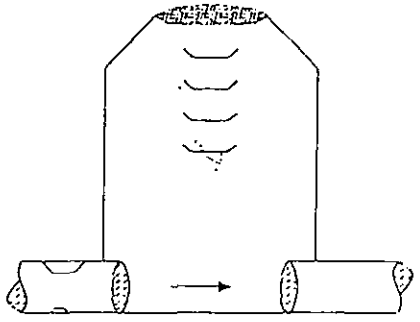
Gas @ Investigation: NEG

Manhole Condition: FAIR

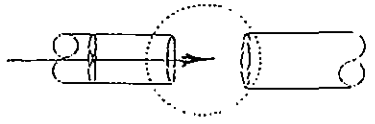
Rain Gauge Zone:

Drop/Fall:

Install OC:



Cross Section



Planar

Comments:

Pipe Type: VCP

	Y	N	?	DISTANCE
Backup				
Trunk	X			
Lift Sta.	X			
STP				
Other Input	X			
Ind. U/S				
U/S U/S	X			

General conditions, overflows, bypasses, weirs, special information, monitor characteristics, surcharge, etc.
* Please make precise drawings of odd-shaped pipes and/or special installation.

RATING: C

Recommended Analysis Days:

Hydraulics: Nice fast, even flow. Site was prone to Back-up Before it was cleaned

Master List of Recommended Days:

Additional Comments - Final Data Review

Surcharge: No Recent Evidence Height:

Inv.: DOF: 4.0 +/-: 0.13" Time: 11:30 Vel.: 3.6 fps Silt: Ø

Upstream Manhole: CNO

Downstream Manhole: NA

Mini System Character: Residential/Commercial/Industrial/Vacant

Temporary Site Report

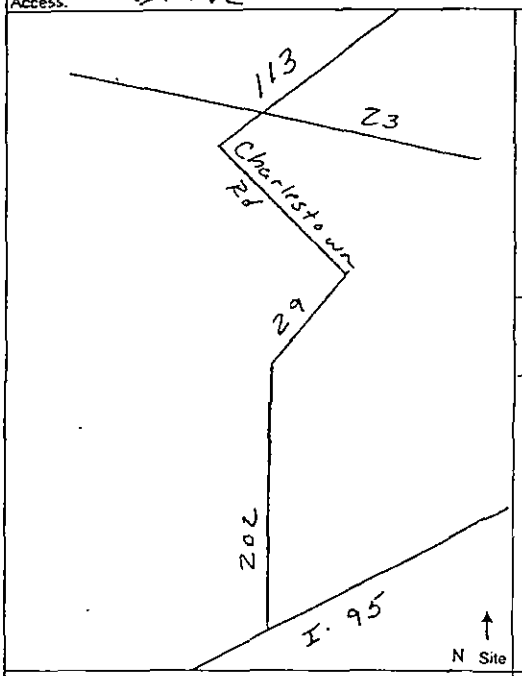
REWARD IF FOUND - (256) 430-3366

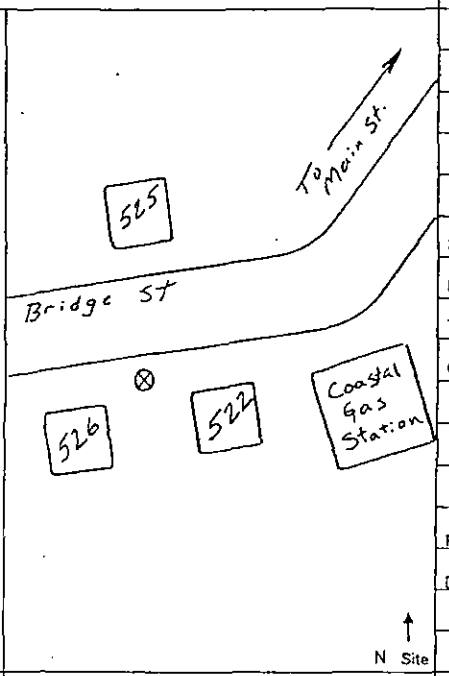
Manhole #	AN	Monitor #
386	PXV-05	1207
V-Sensor #	**Bat Serial #**	**Press. X-ducer #**
7603	14766	9585
Dist. to X-ducer	**Physical Offset**	**Diameter**
	1.5"	10.0"

Project/Phase: Phoenixville PA Date: 4/10/02 Name: MEJ

Address/Location: Sidewalk Between 522 & 526 Bridge Street

Access: Drive





INSTALLATION: UVP on Standard R & C

SAFETY

Manhole Depth: 7'

Traffic: Pedestrian Only

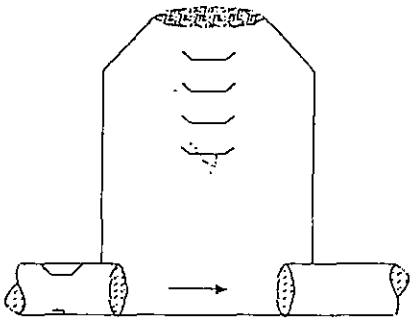
Gas @ Investigation: NEG

Manhole Condition: Fair - Grouted

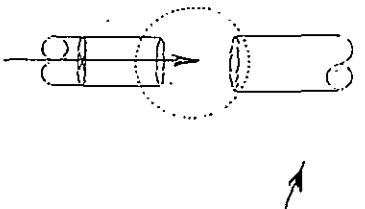
Rain Gauge Zone:

Drop/Fall:

Install OC:



Cross Section



Planar

Comments:

Pipe Type: VCP

	Y	N	?	DISTANCE
Backup				
Trunk				
Lift Sta.	X			
STP				
Other Input	X			
Ind. U/S				
L/S U/S	X			

General conditions, overflows, bypasses, weirs, special information, monitor characteristics, surcharge, etc.
* Please make precise drawings of odd-shaped pipes and/or special installation.

RATING: C

Recommended Analysis Days:

Master List of Recommended Days:

Additional Comments - Final Data Review

Hydraulics: Shallow, Moderately Fast Flow has slight ripples

Surcharge: No Evidence Height:

Inv.: DOF: 2.25 +/-: 0.13" Time: 13:50 Vel.: 4.33 fps Silt: Ø

Upstream Manhole: CNO

Downstream Manhole: N/A

Mini System Character: Residential/Commercial/Industrial/Vacant

Temporary Site Report

REWARD IF FOUND - (256) 430-3386

Manhole #	AN	Monitor #
282	PXV-06	1191
V-Sensor #	**Bat Serial #**	**Press. X-ducer #**
4891	11374	10433
Dist. to X-ducer	**Physical Offset**	**Diameter**
	1.5"	9.88"

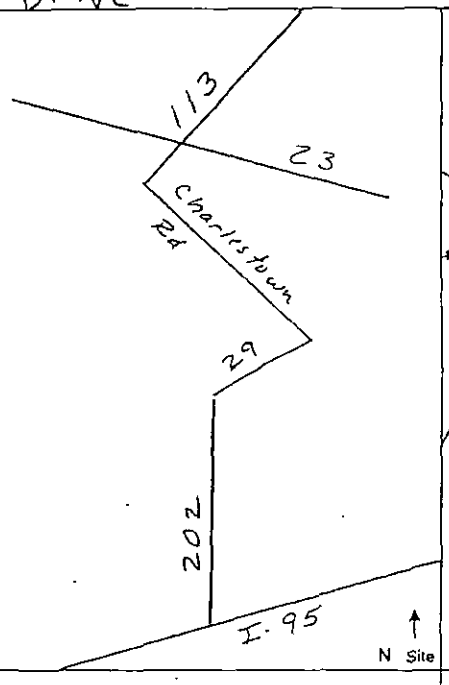
Project/Phase: Phoenixville PA Date: 4/10/02 Name: MCJ

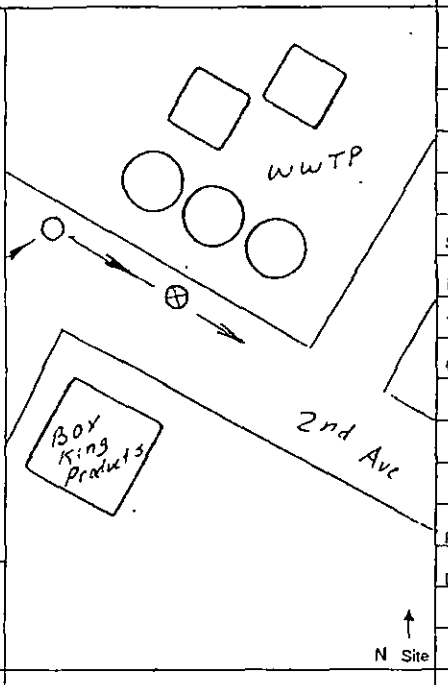
Address/Location: 2nd Ave in Front of WWTP Tanks

Access: Drive

INSTALLATION

UVP on Standard R&C - Keep Pressure out of the Flow





SAFETY

Manhole Depth: 7' 6"

Traffic: Light

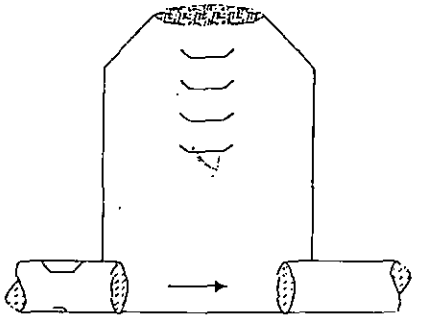
Gas @ Investigation: Neg

Manhole Condition: Good

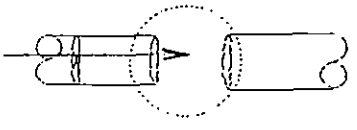
Rain Gauge Zone:

Drop/Fall:

Install QC:



Cross Section



Planar

Comments:

Pipe Type:

	Y	N	?	DISTANCE
Backup				
Trunk		X		
Lift Sta.		X		
STP	X			
Other Input		X		
Ind. U/S	X			
U/S U/S				

General conditions, overflows, bypasses, weirs, special information, monitor characteristics, surcharge, etc.
* Please make precise drawings of odd-shaped pipes and/or special installation.

RATING: B

Recommended Analysis Days:

Hydraulics: Fast Shallow Flow Should be Good Location - Rotate Pressure Sensor out of Flow Due to Low DOF

Master List of Recommended Days:

Surcharge: No Evidence Height:

Additional Comments - Final Data Review

Inv.: DOF: 2.25 +/-: 0.13" Time: 10:02 Vel.: fps Silt: Ø

Upstream Manhole:

Downstream Manhole:

Mini System Character: Residential/Commercial/Industrial/Vacant

Responses of Borough of Phoenixville Sewer Fund
To Bureau of Fixed Utility Services Data Requests
Docket No. R-00061625

A-RE-1 Provide a reconciliation of total revenues of $66,672.70 for Y.E. 12/31/06 shown on Schedule 1 and $66,455.50 for Y.E. 12/31/06 shown on Schedule 3.

Response: (Provided by Allen Mason)

Please see revised Schedules 1 and 3 for the total revenues at Year End 12/31/05. A correction had been made to Schedule 3, which had not been carried through to Schedule 1. These revised schedules eliminate this inconsistency. Schedule 3 has been revised because of a mistake in the numbers shown for metered residential and metered commercial customers.

BOROUGH OF PHOENIXVILLE SEWER FUND (OUTSIDE BOROUGH OPERATIONS)

Schedule 3 (First Revised)

STATEMENT OF REVENUES

Description	Classification of Customers TME 12-31-05 Beginning	End	Historic Test Year Revenues* TME 12-31-05 Beginning Amt.	End Amount	Annualization Adjustments TME 12-31-05	Totals of Annualized TME 12-31--05	Future Test Year Adjustments TME 12-31-06	Future Test Year Level of Operations TME 12-31-06	Proposed Increases	Total Anticipated After Increase
Metered Sales:										
Residential	48	48	10,890.05	9,265.25	-183.99	9,081.26	0.00	9,081.26	8,985.72	18,066.98
Commercial/Multi-Res	3	3	1,597.47	5,065.27	-1,578.75	3,486.52	0.00	3,486.52	3,449.83	6,936.35
Industrial	1	1	816.40	680.80	176.58	857.38	0.00	857.38	848.36	1,705.75
Institutional	2	2	71,644.56	49,212.66	8,477.36	57,690.02	0.00	57,690.02	57,083.04	114,773.07
Total Metered Sales	54	54	84,948.48	64,223.98	6,891.21	71,115.19	0.00	71,115.19	70,366.96	141,482.15
Unmetered Sales:										
Residential	12	12	2,231.52	2,231.52	0.00	2,231.52	0.00	2,231.52	2,208.04	4,439.56
Commerical										
Industrial										
Public Fire										
Private Fire										
Other Water Utilities										
Total Unmetered Sales:	12	12	2,231.52	2,231.52	0.00	2,231.52	0.00	2,231.52	2,208.04	4,439.56
Penalties and Forfeitures										
Other Revenue										
Total Operating Revenue	66	66	87,180.00	66,455.50	6,891.21	73,346.71	0.00	73,346.71	72,575.00	145,921.71

BOROUGH OF PHOENIXVILLE SEWER FUND (OUTSIDE BOROUGH OPERATIONS)

Schedule 1 (First Revised)

SUMMARY SCHEDULE/OPERATING STATEMENTS FOR OUTSIDE BOROUGH CUSTOMERS									
Descriptions	Comparative Income Statement For TME 12/31/04 and 12/31/05 Beginning Amount	Ending Amount	Annualization to 12-31-05	Totals as Annualized	Future Test Year Adjustments	Future Test Year Pro Forma Operating Statement	Proposed Increase	% Increase	Total Anticipated After Increase
Total Operating Revenue	82,288.66	66,455.50	6,891.21	73,346.71		(Before Rate Increase) 73,346.71	72,575.00		145,921.71
Operating Revenue Deductions:									
O & M -- Labor	64,716.91	67,274.13		67,274.13		67,274.13			67,274.13
O & M -- Supplies	18,006.52	19,543.07	206.41	19,749.48		19,749.48			19,749.48
Repair & Maintenance Costs	2,527.42	2,576.81	-73.23	2,503.59		2,503.59			2,503.59
Insurance	6,754.42	6,545.88		6,545.88		6,545.88			6,545.88
Office Expenses	301.46	616.65		616.65		616.65			616.65
Outside Services	17,025.79	13,085.89	-865.22	12,220.67		12,220.67			12,220.67
Miscellaneous	1,198.68	419.65	162.77	582.42	7,500.00	8,082.42			8,082.42
Depreciation Expense	10,153.20	12,831.60		12,831.60		12,831.60			12,831.60
Total Deductions:	120,684.40	122,893.69		122,324.42	7,500.00	129,824.42			129,824.42
Net Operating Income	-38,395.74	-56,438.19		-48,977.70	-7,500.00	-56,477.70	72,575.00	98.95%	16,097.30
Non-Operating Income									
Non-Operating Deductions:				0.00		0.00			0.00
Interest				0.00		0.00			0.00
Other									
Net Income	-38,395.74	-56,438.19	0.00	-48,977.70	-7,500.00	-56,477.70			16,097.30
Dividends Paid - Common Stock									

Responses of Borough of Phoenixville Sewer Fund
To Bureau of Fixed Utility Services Data Requests
Docket No. R-00061625

A-RE-2 Provide a reconciliation of annualized adjustment of $6,674.01 shown on Schedule 1 and $6,891.21 shown on Schedule 3.

Response: (Provided by Allen Mason)

See response to A-RE-1.

Responses of Borough of Phoenixville Sewer Fund
To Bureau of Fixed Utility Services Data Requests
Docket No. R-00061625

A-RE-3 Provide reasons why institutional revenues decreased from $71,644.56 in Y.E. 12/31/04 to $49,212.66 in Y.E. 12/31/05.

Response: (Provided by Allen Mason)

There was a significant decrease in the metered water use of Valley Forge Christian College ("VFCC"). Metered water use in 2004 was 28,712,000 gallons. In 2005, metered water use was 20,230,000 gallons. Because of this, in annualizing outside Borough revenues, metered water use was averaged for the years 2004-2005. The exact reason for VFCC's change in consumption from one year to the next is unknown but is being investigated. However, it is fairly typical. The following shows VFCC's use for the period 2002-2005:

2002: 32,582,300
2003: 17,877,000
2004: 28,712,000
2005: 20,230,000