

May 30, 2006  
(Revised August 17, 2006)

*ATS-Chester* Ref. No. 06-2487-MC-A-2006

Mr. William Youngblood, Executive Director  
McCandless Township Sanitary Authority  
418 Arcadia Drive  
Pittsburgh, PA 15237

**RE: EVALUATION OF 3RWW, INC.  
GRANT NO. 99-01-12  
CONTRACT NO. 88 – ONEIDA AVENUE TO INGOMAR ROAD  
TRENCHLESS PIPE REPLACEMENT BY PIPE BURSTING  
ALEX E. PARIS CONTRACTOR**

Dear Mr. Youngblood:

### **INTRODUCTION**

The objective of Contract No. 88 - Oneida Avenue to Ingomar Road: Trenchless Pipe Replacement by Pipe Bursting Project was to demonstrate that the replacement of the existing sewer through the pipe bursting technology, with minimized piping replacement by the standard open cut trench installation, significantly reduced the impact of sewer construction surface disturbance to both property owners and wetland areas. Additionally, the cost-effectiveness of the project would be evaluated with respect to the same project being completed in its entirety by open cut trench excavation.

### **BACKGROUND**

Excessive amounts of infiltration/inflow (I/I) historically resulted in the unseating of the manhole cover at MH#B-36 causing the overflow of sewage from the separate sewer system to an unnamed tributary of Lowries Run, along with causing basement flooding with sewage to an adjacent home. The Corrective Action Plan (CAP) approved by PaDEP in 1994 developed the Lowries Run Sewer System Infiltration Inflow Abatement Program with the ultimate purpose to eliminate separate sewer overflows. To that, the project was considered instrumental towards achieving a successful CAP. By referring to Attachment A: Location Map, the limits of the project area are defined. It is noted on map that the existing sewer was in the immediate areas of the creek and wetland areas.

## **PROGRAM**

The following program of rehabilitation of the sewer system has been accomplished by MTSA in the following sequence, prior to implementation of the 3RWW funded activities:

- Dye testing of downspouts of homes was conducted in order to locate possible sources of direct inflow.
- A continuous flow monitor was installed in the downstream manhole of sewer sub-system. Infiltration/inflow rates and volumes were established to document pre-construction and compared to post construction flow rates.
- All manholes, including interiors and castings, were rehabilitated as necessary for the purpose of infiltration/inflow (I/I) abatement.

## **SUMMARY OF REHABILITATION WORK**

The McCandless Township Sanitary Authority awarded **Contract No. 88**: Oneida Avenue to Ingomar Road, Trenchless Pipe Replacement by Pipe Bursting to Alex E. Paris Contracting Company, Inc., Atlasburg, Pennsylvania 15004, for the pipe bursting of an existing 8-inch diameter interceptor sewer with replacement of a larger size 10" and 12" polyethylene pipe. The project was completed between April, 2002 and March, 2003, with a total of 6,058 linear feet of sewer line being replaced using the pipe bursting technology. Lateral reconnections from homes were also completed by the contractor.

## **INFILTRATION ABATEMENT**

Commencing in August, 2001, a continuous flow monitor was installed within the downstream manhole of the project area. Each day, individual hourly flow rate information was reviewed for the base-low flow rate, between the early morning hours of 1:00 a.m. to 5:00 a.m.; at which time the flow is basically groundwater migration, or infiltration. Days where rainfall events had occurred, or days following rainfall events were excluded from the analysis of monthly average daily infiltration.

With regard to infiltration, the data collected would conclude that the completion of both the pipe bursting project and the lateral replacements was of benefit towards the reduction of infiltration. In referring to Attachment D, wherein the daily minimum flow rates are plotted, it is easily discernible that infiltration has been reduced, as a result of the project.

## **INFLOW ABATEMENT**

Commencing in August, 2001, a continuous flow monitor had been installed within the downstream manhole of the project area. Peak rates of inflow as recorded during various rainfall events are summarized below.

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Summary of Peak Inflow Rates

Date	Total Rainfall Accumulation	Peak Inflow Rate	Average Monthly Flow
<b>Project Area 1: Sunset Place and Moreland Road (Manhole No. B78) – Inwood Road</b>			
August 31, 2001	0.98"	1,212 gpm	135 gpm
October 23, 2001	1.00"	528 gpm	58 gpm
November 25, 2001	0.68"	827 gpm	133 gpm
December 17, 2001	1.52"	680 gpm	123 gpm
January 30, 2002	0.60"	403 gpm	114 gpm
March 25, 2002	1.41"	1,279 gpm	185 gpm
April, 2002	Meter taken out of service.		
<b>Pipe Bursting Project Completion</b>			
September 7, 2002	0.43"	240 gpm	66 gpm
October 3, 2002	0.62"	1,258 gpm	73 gpm
November 17, 2002	0.66"	333 gpm	73 gpm
December 20, 2002	0.41"	303 gpm	71 gpm
January 3, 2003	0.29"	352 gpm	191 gpm
February 23, 2003	0.75"	1,274 gpm	191 gpm
March 9, 2003	0.36"	689 gpm	226 gpm
April 5, 2003	0.69"	368 gpm	119 gpm
May 10, 2003	1.25"	587 gpm	131 gpm

With regard to inflow, the data collected would conclude that the completion of the pipe bursting did, however, benefit towards the reduction of peak rates of inflow, although not documented by the flow monitor. This conclusion is made in regard to the project's success qualitatively measured, in that the overflowing of sewage at MH#B36 and the basement flooding of homes has now ceased.

**TOTAL DAILY SEWAGE FLOWS**

A graphical representation of total sewer flow for pre and post sewer rehabilitation is provided as Attachment C. It may be concluded by a cursory review of the graphs that daily sewer flows have decreased.

**DISCUSSIONS OF TOTAL PROJECT COSTS**

The total construction cost of the project associated with pipe bursting of the interceptor sewers and the replacement of the lateral sewer piping totaled \$571,603, as provided in Attachment B. This cost is considered to be less than completion of the project through standard method of open cut trench excavation, which had been estimated to be \$675,000.

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### ***DISCUSSION OF INFILTRATION/INFLOW REDUCTION AND RELATIONSHIP TO BASE CONTROL SEWER SYSTEM***

As previously mentioned, there was not a quantified benefit realized in relationship to the reduction of infiltration or inflow determined through the limited installation of flow monitors. Qualitatively, however, in relation to the overflow of sewage from MH#B-36; the project is considered to be successful in that there is no longer a separate sewer overflow (SSO) at this location nor is there basement flooding, concluding that the peak rates of extraneous flow (I/I) have significantly decreased.

### ***RECOMMENDATIONS***

The conclusion, as expressed to a cost-effectiveness relationship cannot be made sine there has not been a quantified documentation of reduced inflow, which had occurred at the MH#B-36 overflow. Future projects should include more extensive monitoring that would serve to segregate a specific, minor base area, sewer subsystem where the rehabilitation activity will take place. Additionally, monitors should be installed at overflow locations to properly document the reduction or elimination of overflow rates and volumes.

Should you have any questions or require any additional information, please do not hesitate to contact me at (412) 809-6622 or via email at [wjenko@atschester.com](mailto:wjenko@atschester.com).

Respectfully submitted,



Walter W. Jenko, P.E.  
Senior Project Manager

WWJ/lb

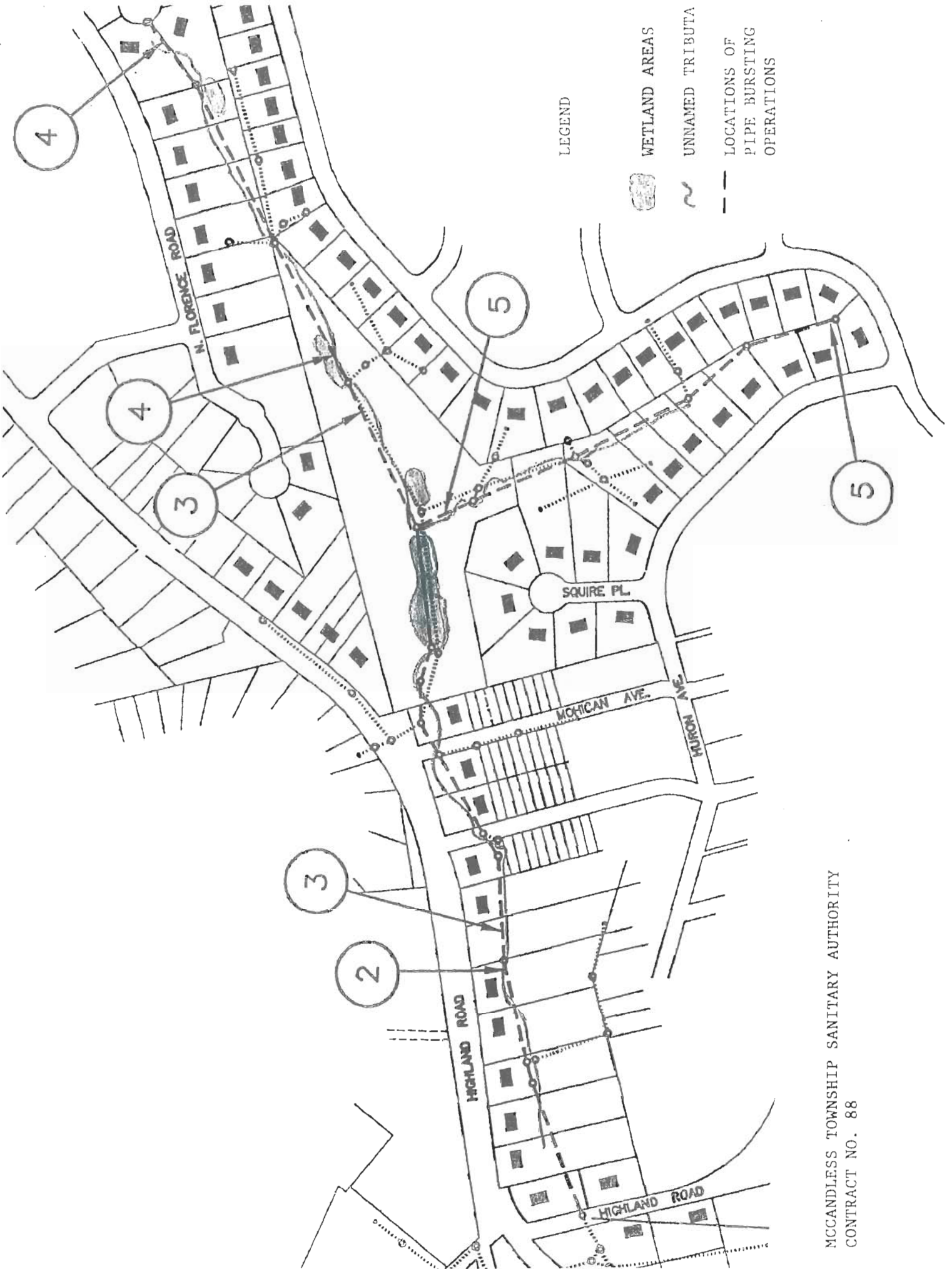
Enclosure

M:\Walter Jenko\06-2487-MC-AVTASK 2006\Ltr -(revised) Eval of 3RWW Inc (Youngblood) doc

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ATTACHMENT A  
LOCATION MAP



LEGEND

WETLAND AREAS

UNNAMED TRIBUTARY

LOCATIONS OF PIPE BURSTING OPERATIONS

MCCANDLESS TOWNSHIP SANITARY AUTHORITY  
 CONTRACT NO. 88

ATTACHMENT B

PERIODIC ESTIMATE  
ALEX E. PARIS CONTRACTING CO., INC.

**ATS-CHESTER ENGINEERS**

Project Description: Trenchless Pipe Replacement by Pipe Bursting - Oneida Avenue to Ingomar Area Project Contract No. 00030 File No. 2487-54 Page 1 of 2

Owner: McCondlless Township Sanitary Authority Contractor: Alex E. Paris Contracting Company, Inc.  
 Address: 418 Arcadia Drive Address: 1595 Smith Township Road  
Pittsburgh, PA 15237 Atlasburg, PA 15004

Periodic Estimate No. 8 - Final (Revised) Periodic Estimate From April 1, 2003 To July 6, 2006

Div No.	Description	Original Contract			Completed This Estimate			Completed to Date			
		Quantity	Unit Cost	Total Cost	Quantity	Total Cost	Quantity	Total Cost	Percent Complete		
1	Clearing and Grubbing	2,000.00	L.F.	9.00	18,000.00	-	-	2,000.00	L.F.	18,000.00	100%
2	8" Sewer Pipe Bursting	1,168.00	L.F.	74.00	86,432.00	-	-	1,168.00	L.F.	86,432.00	100%
3	10" Sewer Pipe Bursting	1,383.00	L.F.	75.00	103,725.00	-	-	1,384.00	L.F.	103,800.00	100%
4	12" Sewer Pipe Bursting	1,583.00	L.F.	77.00	121,891.00	-	-	1,506.00	L.F.	115,962.00	95%
5	15" Sanitary Sewer, 0'-8" Deep	46.00	L.F.	130.00	5,980.00	-	-	39.00	L.F.	5,070.00	85%
6	12" Sanitary Sewer, 0'-8" Deep	72.00	L.F.	120.00	8,640.00	-	-	138.00	L.F.	16,560.00	192%
7	Watertight Manholes, 0'-8" Deep	7.00	Each	2,520.00	17,640.00	-	-	6.00	Each	15,120.00	86%
8	Manhole Depth over 8' Deep	10.00	VF	85.00	850.00	-	-	8.50	VF	722.50	85%
9	Concrete Encasement	25.00	L.F.	125.00	3,125.00	-	-	486.00	L.F.	60,750.00	194%
10	Coarse Aggregate Backfill	100.00	C.Y.	22.00	2,200.00	-	-	85.82	C.Y.	1,888.04	86%
11	Service Sewer Reconnection	20.00	Each	1,250.00	25,000.00	-	-	26.00	Each	32,500.00	130%
12	Erosion & Sedimentation Control	1.00	L.S.	10,700.00	10,700.00	-	-	1.00	L.S.	10,700.00	100%
13	Category A-D Construction Meas.	1.00	L.S.	18,600.00	18,600.00	-	-	1.00	L.S.	18,600.00	100%
14	Test Pit Excavation Backey Pipeline	1.00	L.S.	1,800.00	1,800.00	-	-	1.00	L.S.	1,800.00	100%
15	Remove Existing Concrete Encasement	100.00	L.F.	80.00	8,000.00	-	-	423.00	L.F.	33,840.00	423%
TOTAL					\$ 432,583.00		\$ -			\$ 521,744.54	

SCHEDULE OF CONTRACT CHANGE ORDERS				
Change Order No.	Date	Description	Net Addition in Contract Price	Net Reduction in Contract price
1	04/29/02	Replacement of Additional Manholes	\$ 8,155.00	
2	06/06/02	Replacement of Additional Manholes	5,465.00	
3	06/20/02	Rip-Rap Replacement	36,388.90	
4	06/20/02	Time Extension	-	-
5	06/20/02	Credit for Compaction Test		150.00
TOTALS			\$ 50,008.90	\$ 150.00

ANALYSIS OF ADJUSTED CONTRACT AMOUNT TO DATE

a. ORIGINAL CONTRACT AMOUNT		\$	432,583.00
b. PLUS: ADDITIONS			50,008.90
c. LESS: DEDUCTIONS			150.00
d. ADJUSTED CONTRACT AMOUNT TO DATE		\$	482,741.90

ANALYSIS OF WORK PERFORMED TO DATE

a. COST OF WORK PERFORMED TO DATE		\$	521,744.54
b. COST OF EXTRA WORK PERFORMED TO DATE		\$	49,858.90
c. ADD: MATERIALS STORED AT CLOSE OF THIS PERIOD (ATTACH DETAILED SCHEDULE)			-
d. SUBTOTAL			571,603.44
e. LESS: AMOUNT RETAINED	0.00%		-
f. NET AMOUNT EARNED ON CONTRACT TO DATE			571,603.44
g. LESS: AMOUNT OF PREVIOUS PAYMENTS			571,753.44
h. BALANCE DUE THIS PAYMENT		\$	(150.00)

CERTIFICATION OF CONTRACTOR

According to the best of my knowledge and belief, I certify that all items shown on the face of this Periodic Estimate are correct, that all work has been performed and/or material supplied in full accordance with the requirements of the referenced Contract and/or duly authorized deviations, substitutions, alterations, and/or additions; that the forgoing is a true and correct statement of the contract amount up to and including the last day of the period covered by this Periodic Estimate; that no part of the "Balance Due This Payment" has been received; that all claims against the Contractor represented by the undersigned for labor, materials, expendable equipment, work performed by subcontractors, etc., which were outstanding prior to the date of the last preceding Periodic Estimate, have been paid in accordance with the Contract Documents; and that the undersigned and his subcontractors have - (check applicable line):

- a. Complied with all labor provisions of said contract.
- b. Complied with all the labor provisions of said contract except in those instances where an honest dispute exists with respect to said labor provisions. If (b) is checked, describe briefly the nature of the dispute.

ALEX E. PARIS CONTRACTING CO INC. 8/1/06  
 Name of Contractor Date

*Emanuel A Paris III*  
 Signature

EMANUEL A PARIS III, PRESIDENT  
 Title of Authorized Representative

CERTIFICATION OF THE ENGINEER

This will certify that I have reviewed the information contained on this Periodic Estimate, and that to the best of my knowledge and belief, all work for which payment is herein being requested has been performed in accordance with the Contract Documents.

\_\_\_\_\_  
 Date

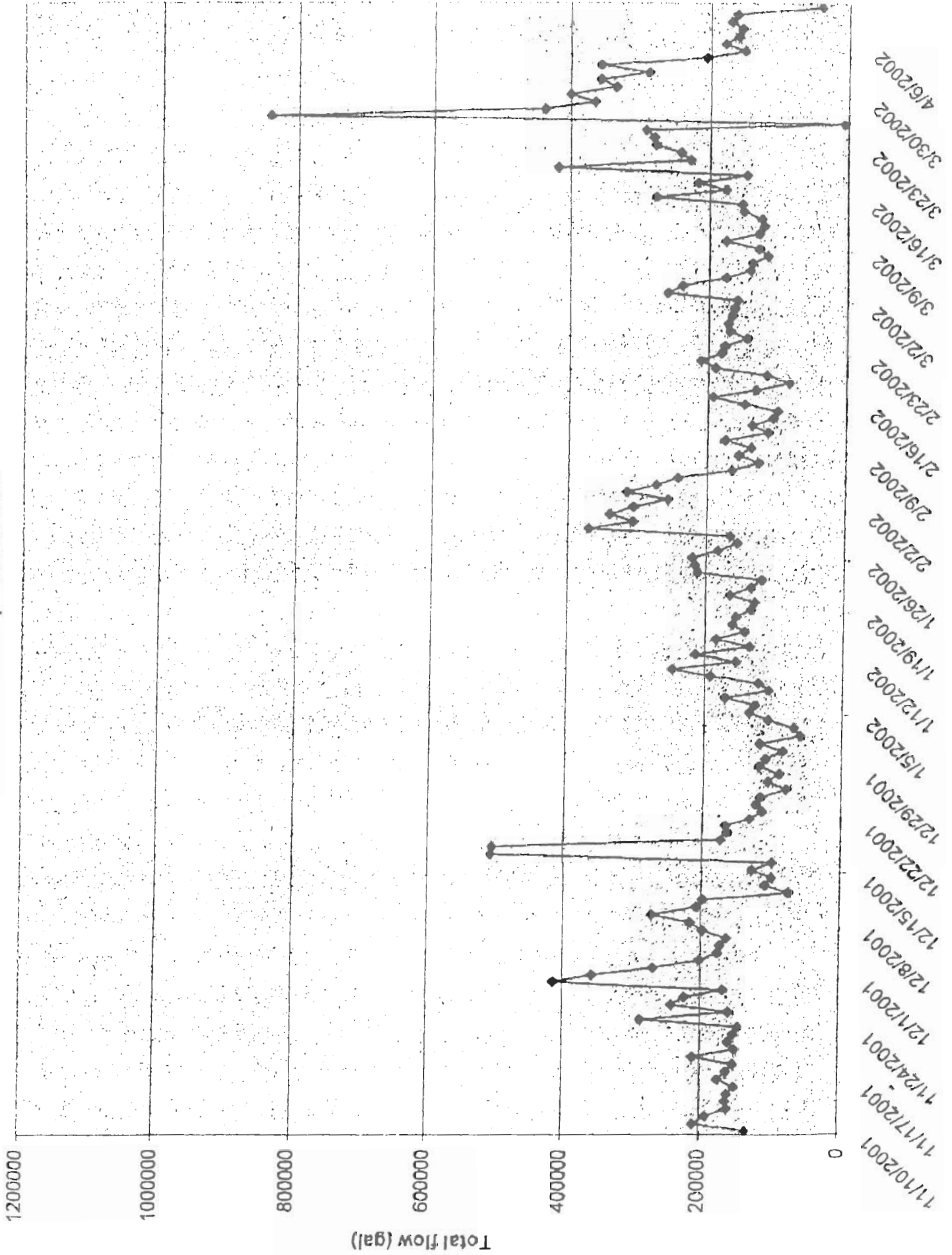
\_\_\_\_\_  
 Date

ATTACHMENT C

GRAPHICAL REPRESENTATION OF PRE AND POST  
SEWER REHABILITATION SEWER TOTAL DAILY  
SEWAGE FLOWS

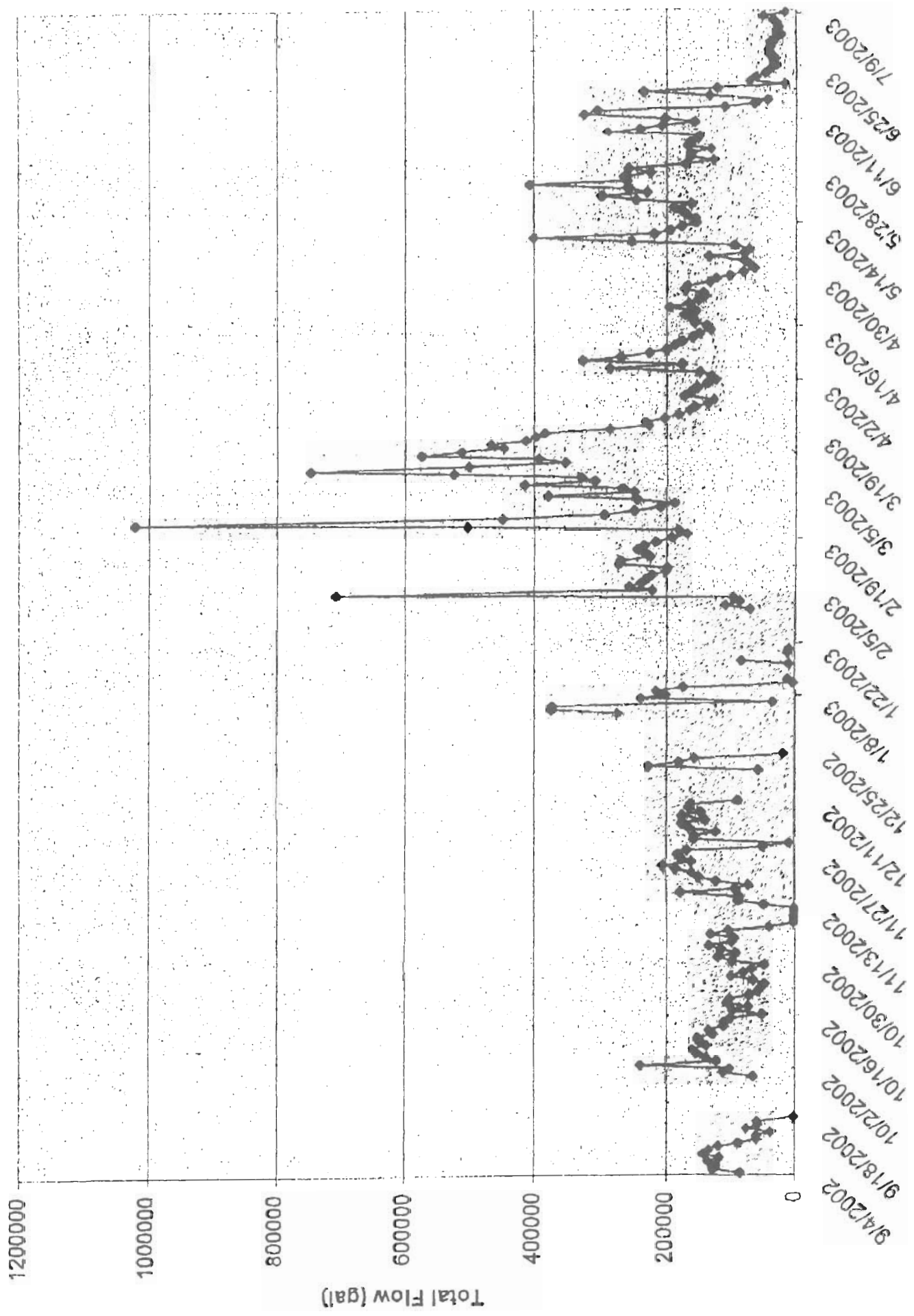
# Oneida St. --Pre-Pipe-Burst Event

◆ Total Flow (gal)



# Oneida St.--Post Pipe-Burst Event

◆ Total Flow (gal)

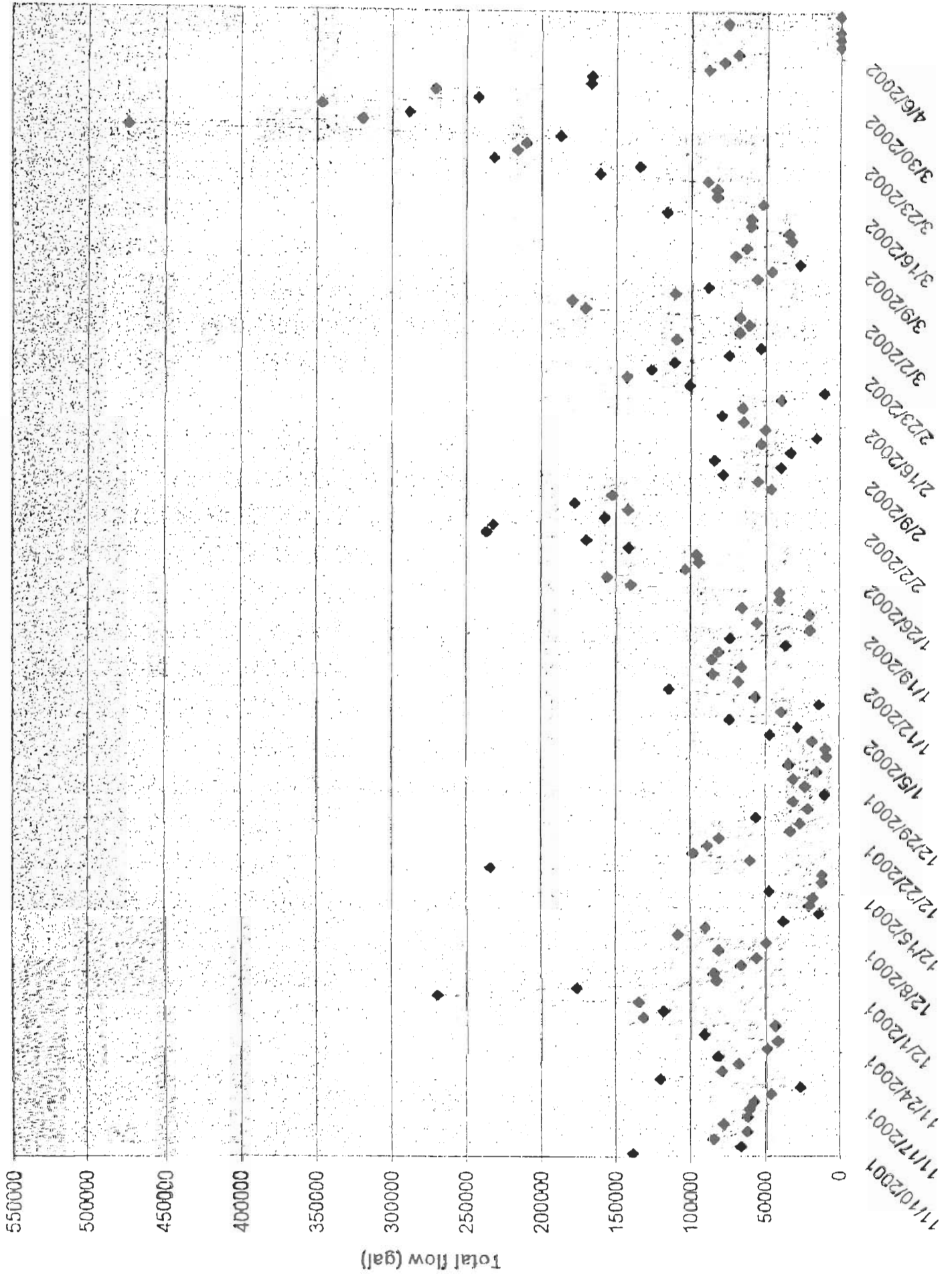


## ATTACHMENT D

### GRAPHICAL REPRESENTATION OF PRE AND POST SEWER REHABILITATION DAILY MINIMUM SEWAGE FLOW RATES

Oneida St.--Pre-Pipe-Burst Event--Minimum Flows GPD

◆ - Min. Flow (gpd)



Oneida St.—Post Pipe-Burst Event—Minimum Flows GPD

◆ Min. Flow (gpd)

