

October 15, 2015

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Daniel L. Penatzer, Borough Manager
Ebensburg Municipal Authority
300 West High Street
Ebensburg, PA 15931

RE: Collection System Inflow / Infiltration Study
Proposal
Project No. 15-0016.100

Dear Mr. Penatzer:

As discussed, Stiffler, McGraw & Associates, Inc. is herewith providing a proposal to complete an Inflow and Infiltration Study of your combined sanitary sewer collection system. This study would serve as an overall sanitary sewer evaluation designed to characterize and plan for long-term collection system repairs aimed at reducing wet weather flows resulting in discharges at the Authority's Combined Sewer Overflow (CSO). It is our understanding that the collection system currently experiences rapid response to rainfall. Therefore, we believe that initial investigations should be aimed at identifying and reducing inflow into the system. Following the initial inflow evaluation, a characterization of the infiltration experienced by the system will be completed. This proposal establishes a scope of work designed to identify and characterize the visible and easily accessible portions of the collection system, through smoke testing, flow metering, visual observations and limited internal inspection of the system. We believe that completion of this study will allow for prioritization of system needs and help to define the scope of future projects. The Authority can have the option of eliminating any of the options listed below if they choose.

Scope of Work

Stiffler, McGraw & Associates, Inc. will perform an inflow and infiltration investigation on the Ebensburg Borough Sanitary Sewer Collection System. The following items will be addressed in the study:

1. **System Map**- The Engineer will use existing mapping available from previous Authority projects to plan and conduct field activities. Copies of existing mapping will be used to edit field observations and notes. The majority of information obtained through field investigation will be tabulated and provided to the Authority in picture form. It is the intention of this study to generate an updated system map that will assist with the planning of any future projects.

Daniel L. Penatzer, Borough Manager
RE: Collection System Inflow / Infiltration Study
October 15, 2015
Page Two

2. **Manhole Inventory** - The Engineer will conduct an inspection and inventory of all accessible manholes in the Authority's system. This inventory and inspection will include the recording of manhole statistics including the following:

- A. Manhole Number
- B. Condition/Steps
- C. Opening Size
- D. Material of Construction
- E. Frame & Cover Condition
- F. Leakage
- G. Flow Channel Condition
- H. Measure-downs to pipe inverts
- I. Piping Schematic/Sizes
- J. Potential for Surface Water Inflow
- K. Other Relevant Observations

Upon completion of observations, data collection sheets will be bound and provided to the Authority. Manholes will be classified by need for repairs and a list of priority manhole repairs will be generated in spreadsheet form. Production by our crew is estimated at 25-30 manholes per day.

Please note that Authority personnel should inspect accessibility of each manhole prior to our arrival. Accessible manholes require only lifting of the lid to access the interior. Should manhole lids be covered or blocked due to asphalt, etc., the lid should be cleared by the Authority. Although our crews can do this, time spent opening the manholes will significantly decrease our daily production and will increase costs to the Authority.

3. **Smoke Testing** - The Engineer will provide labor and equipment to smoke test the collection system. Key manhole locations will be selected by the Engineer for setup and use of smoke test equipment. System defects will be documented using pictures and a field numbering system. All system defects will be documented by house number/address, photo record number and observation and provided to the Authority in a bound document. Production by our crew is estimated at 6,000 to 7,000 L.F. per day.

Limited smoke testing was previously performed by the Borough. However, we are not aware of any documentation showing if, or when, the identified areas of potential inflow were eliminated. Public notification of smoke testing will be the Authority's responsibility unless otherwise directed. At a minimum, notifications should consist of a letter to each homeowner and one or more public announcements in the local newspaper. Notification by door knob hanger should also be considered. The local fire department must also be notified of the schedule for smoke testing along with special notification to large employers who may experience down time due to an inadvertent fire alarm. It would be preferable that this work be completed during a period of low groundwater.

4. **Infiltration Analysis** - The Engineer will perform an analysis of the collection system infiltration during wet weather periods to quantify the severity of infiltration for all collection sub-systems as follows:
 - a) **Flow Metering**-Flow analysis will be conducted utilizing portable flow meters. Through the use of meters, data can be obtained in regard to infiltration quantities, normal flow quantities, etc. The meters will be installed at each location for a period of approximately two to three months depending on the quantity of precipitation occurring during the monitoring period. The purpose of this flow analysis is to determine specific areas of high infiltration and to screen those areas for future internal examination. Infiltration will be evaluated between 1-5 a.m., preferably during seasons of high groundwater. For purposes of this proposal, it was assumed that the Engineer would initially monitor the flow at approximately 6 different locations, each location for a period of approximately two months. It is possible that the 6 meters could be deployed at a second location upstream from the initial location for a second two-month monitoring period. The purpose of the second monitoring period will be to attempt to further pinpoint areas that may be contributing excessive flow.
 - b) **Internal Televising**-Internal inspection of the existing sanitary sewer system is to be completed by the Engineer where necessary. Television inspection will be completed using a combination of a tractor driven camera system and a push-type camera system. Television inspection will only be completed in areas where a specific problem has been identified by an alternate method and further investigation is deemed necessary.
5. **Report & Recommendations** - The Engineer will prepare a final report which summarizes the results of field investigations and records review. Each defect will be assigned a repair priority and preliminary cost estimates will be generated and presented in the report for all defects found in the public system and recommendations will be provided on how the issues can be addressed. A listing of all private inflow sources will be

Daniel L. Penatzer, Borough Manager
RE: Collection System Inflow / Infiltration Study
October 15, 2015
Page Four

prepared for the Authority's use in notifying customers of their defect or violation and the nature of the repair to be completed by the homeowner.

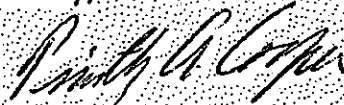
Estimated Costs

System Map	\$7,500.00
Manhole Inventory	\$10,000.00
Smoke Testing	\$16,000.00
Flow Metering	\$17,500.00
Internal Televising	\$10,000.00
Report and Recommendations	<u>\$15,000.00</u>
TOTAL ESTIMATED COST	\$76,000.00

Actual costs for project completion will be invoiced monthly on a time and material basis in accordance with our most recent Schedule of Rates and Charges.

If you should have any questions, please contact our office.

Sincerely,



Timothy A. Cooper, P.E.

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