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File #: 190904

April 12, 2022

VIA ELECTRONIC FILING

Rosemary Chiavetta, Secretary
Pennsylvania Public Utility Commission
Commonwealth Keystone Building
400 North Street, 2nd Floor North
P.O. Box 3265
Harrisburg, PA 17105-3265

Re: In The Matter Of The Application Of The York Water Company Under Sections 507, 1102(a)(1), and 1102(a)(3) of the Public Utility Code, for approval of the right of THE YORK WATER COMPANY to (1) acquire certain public wastewater facilities from Franklin County General Authority and the Letterkenny Industrial Development Authority; and (2) begin to offer, render, furnish and supply wastewater service to the public in portions of Letterkenny, Greene, and Hamilton Townships, Franklin County, Pennsylvania
Docket No. A-2021-3029945

Dear Secretary Chiavetta:

Attached for filing are Attachments 2 through 4 for The York Water Company's ("York Water") Response to the Data Requests of the Pennsylvania Public Utility Commission's Bureau of Technical Services ("TUS") Set I, No. 9 in the above-referenced proceeding.

Respectfully submitted,

Devin Ryan

DR/kls
Enclosures

cc: Clinton McKinley (via email – *cmckinley@pa.gov*)

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

December 9, 2019

Letterkenny Township Supervisors
c/o Township Secretary
4924 Orrstown Road
Orrstown, PA 17244

Re: Approval Letter – Special Study
Act 537 Planning
Letterkenny Township Act 537 Update Special Study
DEP CODE NO. B1-28910-ACT
APS ID No. 1006130; AUTH ID No. 1296156
Letterkenny Township, Franklin County

Dear Supervisors:

The Department of Environmental Protection (DEP) has reviewed the proposed Special Study submitted on November 6, 2019, prepared by Martin & martin, Inc., and entitled Act 537 Update Special Study. The proposal is located in Letterkenny Township and consists of the transfer in ownership of the collection, conveyance and treatment facilities from Letterkenny Township to York Water Company. The submission is consistent with the planning requirements in Chapter 71 of DEP's regulations.

The plan is approved with the following comment:

- All sewage permits (NPDES and WQM Part II) currently held by Letterkenny Township must be transferred to York Water Company.

Any person aggrieved by this action may appeal the action to the Environmental Hearing Board (Board), pursuant to Section 4 of the Environmental Hearing Board Act, 35 P.S. § 7514, and the Administrative Agency Law, 2 Pa.C.S. Chapter 5A. The Board's address is:

Environmental Hearing Board
Rachel Carson State Office Building, Second Floor
400 Market Street
P.O. Box 8457
Harrisburg, PA 17105-8457

TDD users may contact the Environmental Hearing Board through the Pennsylvania Relay Service, 800-654-5984.

Appeals must be filed with the Board within 30 days of receipt of notice of this action unless the

Discovery A-9 - Attachment 2

appropriate statute provides a different time. This paragraph does not, in and of itself, create any right of appeal beyond that permitted by applicable statutes and decisional law.

A Notice of Appeal form and the Board's rules of practice and procedure may be obtained online at http://ehb.courtapps.com or by contacting the Secretary to the Board at 717-787-3483. The Notice of Appeal form and the Board's rules are also available in braille and on audiotape from the Secretary to the Board.

IMPORTANT LEGAL RIGHTS ARE AT STAKE. YOU SHOULD SHOW THIS DOCUMENT TO A LAWYER AT ONCE. IF YOU CANNOT AFFORD A LAWYER, YOU MAY QUALIFY FOR FREE PRO BONO REPRESENTATION. CALL THE SECRETARY TO THE BOARD AT 717-787-3483 FOR MORE INFORMATION. YOU DO NOT NEED A LAWYER TO FILE A NOTICE OF APPEAL WITH THE BOARD.

IF YOU WANT TO CHALLENGE THIS ACTION, YOUR APPEAL MUST BE FILED WITH AND RECEIVED BY THE BOARD WITHIN 30 DAYS OF RECEIPT OF NOTICE OF THIS ACTION.

If you have any questions or concerns, please call Michael McNulty at 717.705.4758, and refer to DEP Code No. B1-28910-ACT, Application No. 1006130 and Authorization No. 1296156.

Sincerely,

Maria D. Bebenek, P.E.
Program Manager

cc: York Water Company
Martin & Martin, Inc.
Franklin County Planning Commission

Act 537 Plan Update Special Study

Letterkenny Township

Franklin County, Pennsylvania

October 3, 2019

Table of Contents

DEP Transmittal Letter

Part 1 - General Information

Part 2 - Administrative Completeness Checklist

1. Table of Contents
2. Plan Summary
   - A. Proposed Service Area and Municipal Facilities Being Acquired
   - B. Institutional Arrangements Necessary to Implement Acquisition
   - C. Estimated Cost of Implementing Acquisition
   - D. Letterkenny Township and YWC Commitments
   - E. Implementation Schedule
3. Municipal Adoption
4. Planning Review Documentation
5. Public Notification Documentation
6. Comments and Responses
7. Implementation Schedule

Part 3 - General Plan Content - Letterkenny Township Act 537 Plan Update Special Study

Appendices

Discovery A-9 - Attachment 2

martin and martin, incorporated

37 south main street • suite A • chambersburg, pennsylvania • 17201-2251

(717) 264-6759
(717) 264-7339 (fax)
www.martinandmartininc.com

November 7, 2019

Mr. Timothy Wagner
PA Department of Environmental Protection
Southcentral Regional Office
909 Elmerton Avenue
Harrisburg, PA 17110

Re: Letterkenny Township
Act 537 Plan Update Special Study

Dear Mr. Wagner:

Enclosed find three (3) copies of the Letterkenny Township Act 537 Plan Update Special Study dated October 3, 2019, prepared by our office. We appreciate your assistance with getting this processed through the Department.

On November 5, 2019, a public meeting was held at which time public comment was collected and Letterkenny Township reviewed the contents of the Act 537 Plan revision. The Township reviewed and adopted the resolution, which is attached. The plan is being submitted to the Department for review and approval.

Please contact me if you should have any questions, comments or require additional information.

Sincerely,

MARTIN AND MARTIN, INCORPORATED

Timothy C. Cormany, AICP

Part 2

Administrative Completeness Checklist

3850-FM-BCW0003 6/2016
Checklist

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF CLEAN WATER

ACT 537 PLAN CONTENT AND ENVIRONMENTAL ASSESSMENT CHECKLIST

PART 1 GENERAL INFORMATION

A. Project Information

1. Project Name Letterkenny Township Act 537 Update Special Study

2. Brief Project Description Special study to evaluate the pending asset acquisition of the Letterkenny Township Wastewater System by the York Water Company

B. Client (Municipality) Information

Municipality Name	County	City	Boro	Twp
Letterkenny	Franklin	☐	☐	☒

Municipality Contact Individual - Last Name	First Name	MI	Suffix	Title
Myers	Charles			Chairman

Additional Individual Last Name	First Name	MI	Suffix	Title
Kibbe	Melissa			Secretary

Municipality Mailing Address Line 1	Mailing Address Line 2
4924 Orrstown Road	

Address Last Line -- City	State	ZIP+4
Orrstown	PA	17244

Phone + Ext.	FAX (optional)	Email (optional)
717-532-8716		

C. Site Information

Site (or Project) Name	(Municipal Name) Act 537 Plan
Letterkenny Township Wastewater System	

Site Location Line 1	Site Location Line 2

D. Project Consultant Information

Last Name	First Name	MI	Suffix
Cormany	Timothy	C	

Title	Consulting Firm Name
Vice President of Planning	Martin and Martin, Incorporated

Mailing Address Line 1	Mailing Address Line 2
37 South Main Street	Suite A

Address Last Line – City	State	ZIP+4	Country
Chambersburg	PA	17201	USA

Email	Phone + Ext.	FAX
tcormany@martinandmartininc.com	717-264-6759 + 107	717-264-7339

Discovery A-9 - Attachment 2

PART 2 ADMINISTRATIVE COMPLETENESS CHECKLIST

DEP Use Only	Indicate Page #(s) in Plan	In addition to the main body of the plan, the plan must include items one through eight listed below to be accepted for formal review by DEP. Incomplete plans may be ***denied*** unless the municipality is clearly requesting an advisory review.
_____	TOC	1. **Table of Contents**
		2. **Plan Summary**
_____	Part 2	A. Identify the proposed service areas and major problems evaluated in the plan. (Reference - 25 *Pa. Code* §71.21(a)(7)(i)).
_____	Part 2	B. Identify the alternative(s) chosen to solve the problems and serve the areas of need identified in the plan. Also, include any institutional arrangements necessary to implement the chosen alternative(s). (Reference - 25 *Pa. Code* §71.21(a)(7)(ii)).
_____	Part 2	C. Present the estimated cost of implementing the proposed alternative (including the user fees) and the proposed funding method to be used. (Reference - 25 *Pa. Code* §71.21(a)(7)(ii)).
_____	Part 2	D. Identify the municipal commitments necessary to implement the Plan. (Reference - 25 *Pa. Code* §71.21(a)(7)(iii)).
_____	Part 2	E. Provide a schedule of implementation for the project that identifies the ***major*** milestones with dates necessary to accomplish the project to the point of operational status. (Reference - 25 *Pa. Code* §71.21(a)(7)(iv)).
_____	Part 2	3. **Municipal Adoption:** ***Original***, signed and sealed Resolution of Adoption by the municipality which contains, at a minimum, alternatives chosen and a commitment to implement the Plan in accordance with the implementation schedule. (Reference - 25 *Pa. Code* §71.31(f)) Section V.F. of the Planning Guide.
_____	Part 2	4. **Planning Commission / County Health Department Comments**: Evidence that the municipality has requested, reviewed and considered comments by appropriate official planning agencies of the municipality, planning agencies of the county, planning agencies with area wide jurisdiction (where applicable), and any existing county or joint county departments of health. (Reference - 25 *Pa. Code* §71.31(b)) Section V.E.1 of the Planning Guide.
_____	Part 2	5. **Publication:** Proof of Public Notice which documents the proposed plan adoption, plan summary, and the establishment and conduct of a 30-day comment period. (Reference - 25 *Pa. Code* §71.31(c)) Section V.E.2 of the Planning Guide.
_____	Part 2	6. **Comments and Responses:** Copies of ***all*** written comments received and municipal response to ***each*** comment in relation to the proposed plan. (Reference - 25 *Pa. Code* §71.31(c)) Section V.E.2 of the Planning Guide.
_____	Part 2	7. **Implementation Schedule:** A complete project implementation schedule with milestone dates specific for each existing and future area of need. Other activities in the project implementation schedule should be indicated as occurring a finite number of days from a major milestone. (Reference - 25 *Pa. Code* §71.31(d)) Section V.F. of the Planning Guide. Include dates for the future initiation of feasibility evaluations in the project's implementation schedule for areas proposing completion of sewage facilities for planning periods in excess of five years. (Reference - 25 *Pa. Code* §71.21(c)).
_____	NA	8. **Consistency Documentation:** Documentation indicating that the appropriate agencies have received, reviewed and concurred with the method proposed to resolve identified inconsistencies within the proposed alternative and consistency requirements in 25 *Pa. Code* §71.21.(a)(5)(i-iii). (Reference - 25 *Pa. Code* §71.31(e)). Appendix B of the Planning Guide.

Discovery A-9 - Attachment 2

PART 3 GENERAL PLAN CONTENT CHECKLIST

DEP Use Only	Indicate Page #(s) in Plan		Item Required
_____	Part 3	I.	**Previous Wastewater Planning**
		A.	Identify, describe and briefly analyze all past wastewater planning for its impact on the current planning effort:
_____	Part 3	1.	Previously undertaken under the Pennsylvania Sewage Facilities Act (Act). (Reference - Act 537, 35 P.S. §750.5(d)(1)).
_____	Part 3	2.	Has not been carried out according to an approved implementation schedule contained in the plans. (Reference - 25 *Pa. Code* §71.21(a)(5)(i)(A-D)). Section V.F of the Planning Guide.
_____	Part 3	3.	Is anticipated or planned by applicable sewer authorities or approved under a Chapter 94 Corrective Action Plan. (Reference - 25 *Pa. Code* §71.21(a)(5)(i)(A&B)). Section V.D. of the Planning Guide.
_____	Part 3	4.	Through planning modules for new land development, planning "exemptions" and addenda. (Reference - 25 *Pa. Code* §71.21(a)(5)(i)(A)).
_____	Part 3	II.	**Physical and Demographic Analysis utilizing written description and mapping** (All items listed below require maps, and all maps should show all current lots and structures and be of appropriate scale to clearly show significant information).
_____	Part 3	A.	Identification of planning area(s), municipal boundaries, Sewer Authority/Management Agency service area boundaries. (Reference – 25 *Pa. Code* §71.21(a)(1)(i)).
_____	Part 3	B.	Identification of physical characteristics (streams, lakes, impoundments, natural conveyance, channels, drainage basins in the planning area). (Reference - 25 *Pa. Code* §71.21(a)(1)(ii)).
_____	NA	C.	Soils - Analysis with description by soil type and soils mapping for areas not presently served by sanitary sewer service. Show areas suitable for in-ground onlot systems, elevated sand mounds, individual residential spray irrigation systems (IRSIS), and areas unsuitable for soil dependent systems. (Reference - 25 *Pa. Code* §71.21(a)(1)(iii)). Show Prime Agricultural Soils and any locally protected agricultural soils. (Reference - 25 *Pa. Code* §71.21(a)(1)(iii)).
_____	NA	D.	Geologic Features - (1) Identification through analysis, (2) mapping and (3) their relation to existing or potential nitrate-nitrogen pollution and drinking water sources. Include areas where existing nitrate-nitrogen levels are in excess of 5 mg/L. (Reference - 25 *Pa. Code* §71.21(a)(1)(iii)).
_____	NA	E.	Topography - Depict areas with slopes that are suitable for conventional systems; slopes that are suitable for elevated sand mounds and slopes that are unsuitable for onlot systems. (Reference - 25 *Pa. Code* §71.21(a)(1)(ii)).
_____	NA	F.	Potable Water Supplies - Identification through mapping, description and analysis. Include public water supply service areas and available public water supply capacity and aquifer yield for groundwater supplies. (Reference - 25 *Pa. Code* §71.21(a)(1)(vi)). Section V.C. of the Planning Guide.
_____	NA	G.	Wetlands-Identify wetlands as defined in 25 *Pa. Code* Chapter 105 by description, analysis and mapping. Include National Wetland Inventory mapping and potential wetland areas per the United States Department of Agricultural (USDA) Natural Resources Conservation Service (NRCS) mapped hydric soils. Proposed collection, conveyance and treatment facilities and lines must be located and labeled, along with the identified wetlands, on the map. (Reference - 25 *Pa. Code* §71.21(a)(1)(v)). Appendix B, Section II.I of the Planning Guide.

_____ Part 3 **III. Existing Sewage Facilities in the Planning Area - Identifying the Existing Needs**

A. Identify, map and describe municipal and non-municipal, individual and community sewerage systems in the planning area including:

_____ Part 3

1. Location, size and ownership of treatment facilities, main intercepting lines, pumping stations and force mains including their size, capacity, point of discharge. Also include the name of the receiving stream, drainage basin, and the facility's effluent discharge requirements. (Reference - 25 *Pa. Code* §71.21(a)(2)(i)(A)).

_____ Part 3

2. A narrative and schematic diagram of the facility's basic treatment processes including the facility's National Pollutant Discharge Elimination System (NPDES) permitted capacity, and the Clean Streams Law permit number. (Reference - 25 *Pa. Code* §71.21(a)(2)(i)(A)).

_____ Part 3

3. A description of problems with existing facilities (collection, conveyance and/or treatment), including existing or projected overload under 25 *Pa. Code* Chapter 94 (relating to municipal wasteload management) or violations of the NPDES permit, Clean Streams Law permit, or other permit, rule or regulation of DEP. (Reference - 25 *Pa. Code* §71.21(a)(2)(i)(B)).

_____ Part 3

4. Details of scheduled or in-progress upgrading or expansion of treatment facilities and the anticipated completion date of the improvements. Discuss any remaining reserve capacity and the policy concerning the allocation of reserve capacity. Also discuss the compatibility of the rate of growth to existing and proposed wastewater treatment facilities. (Reference - 25 *Pa. Code* §71.21(a)(4)(i & ii)).

_____ NA

5. A detailed description of the municipality's operation and maintenance (O & M) requirements for small flow treatment facility systems, including the status of past and present compliance with these requirements and any other requirements relating to sewage management programs (SMPs). (Reference – 25 *Pa. Code* §71.21(a)(2)(i)(C)).

_____ Part 3

6. Disposal areas, if other than stream discharge, and any applicable groundwater limitations. (Reference - 25 *Pa. Code* §71.21(a)(4)(i & ii)).

_____ NA

B. Using DEP's publication titled *Act 537 Sewage Disposal Needs Identification* (3800-BK-DEP1949), identify, map and describe areas that utilize individual and community onlot sewage disposal and, unpermitted collection and disposal systems ("wildcat" sewers, borehole disposal, etc.) and retaining tank systems in the planning area including:

_____ NA

1. The types of onlot systems in use. (Reference - 25 *Pa. Code* §71.21(a)(2)(ii)(A)).

_____ NA

2. A sanitary survey complete with description, map and tabulation of documented and potential public health, pollution, and operational problems (including malfunctioning systems) with the systems, including violations of local ordinances, the Act, the Clean Stream Law or regulations promulgated thereunder. (Reference - 25 *Pa. Code* §71.21(a)(2)(ii)(B)).

_____ NA

3. A comparison of the types of onlot sewage systems installed in an area with the types of systems which are appropriate for the area according to soil, geologic conditions, topographic limitations sewage flows, and 25 *Pa. Code* Chapter 73 (relating to standards for sewage disposal facilities). (Reference - 25 *Pa. Code* §71.21(a)(2)(ii)(C)).

_____ NA

4. An individual water supply survey to identify possible contamination by malfunctioning onlot sewage disposal systems consistent with DEP's *Act 537 Sewage Disposal Needs Identification* publication. (Reference – 25 *Pa. Code* §71.21(a)(2)(ii)(B)).

Discovery A-9 - Attachment 2

NA 5. Detailed description of O & M requirements of the municipality for individual and small volume community onlot systems, including the status of past and present compliance with these requirements and any other requirements relating to SMPs. (Reference - 25 *Pa. Code* §71.21(a)(2)(i)(C)).

NA C. Identify wastewater sludge and septage generation, transport and disposal methods. Include this information in the sewage facilities alternative analysis including:

NA 1. Location of sources of wastewater sludge or septage (Septic tanks, holding tanks, wastewater treatment facilities). (Reference – 25 *Pa. Code* §71.71).

NA 2. Quantities of the types of sludges or septage generated. (Reference - 25 *Pa. Code* §71.71).

NA 3. Present disposal methods, locations, capacities and transportation methods. (Reference - 25 *Pa. Code* §71.71).

Part 3 **IV. Future Growth and Land Development**

A. Identify and briefly summarize all municipal and county planning documents adopted pursuant to the Pennsylvania Municipalities Planning Code (Act 247) including:

NA 1. All land use plans and zoning maps that identify residential, commercial, industrial, agricultural, recreational and open space areas. (Reference - 25 *Pa. Code* §71.21(a)(3)(iv)).

NA 2. Zoning or subdivision regulations that establish lot sizes predicated on sewage disposal methods. (Reference – 25 *Pa. Code* §71.21(a)(3)(iv)).

NA 3. All limitations and plans related to floodplain and stormwater management and special protection (25 *Pa. Code* Chapter 93) areas. (Reference - 25 *Pa. Code* §71.21(a)(3)(iv)) Appendix B, Section II.F of the Planning Guide.

NA B. Delineate and describe the following through map, text and analysis.

NA 1. Areas with existing development or plotted subdivisions. Include the name, location, description, total number of equivalent dwelling units (EDUs) in development, total number of EDUs currently developed and total number of EDUs remaining to be developed (include time schedule for EDUs remaining to be developed). (Reference - 25 *Pa. Code* §71.21(a)(3)(i)).

NA 2. Land use designations established under the Pennsylvania Municipalities Planning Code (35 P.S. 10101-11202), including residential, commercial and industrial areas. (Reference - 25 *Pa. Code* §71.21(a)(3)(ii)). Include a comparison of proposed land use as allowed by zoning and existing sewage facility planning. (Reference - 25 *Pa. Code* §71.21(a)(3)(iv)).

NA 3. Future growth areas with population and EDU projections for these areas using historical, current and future population figures and projections of the municipality. Discuss and evaluate discrepancies between local, county, state and federal projections as they relate to sewage facilities. (Reference - 25 *Pa. Code* §71.21(a)(1)(iv) and (a)(3)(iii)).

NA 4. Zoning, and/or subdivision regulations; local, county or regional comprehensive plans; and existing plans of any other agency relating to the development, use and protection of land and water resources with special attention to: (Reference - 25 *Pa. Code* §71.21(a)(3)(iv)).

--public ground/surface water supplies
--recreational water use areas
--groundwater recharge areas
--industrial water use
--wetlands

NA 5. Sewage planning necessary to provide adequate wastewater treatment for 5 and 10-year future planning periods based on projected growth of existing and proposed wastewater collection and treatment facilities. (Reference - 25 *Pa. Code* §71.21(a)(3)(v)).

Part 3 **V. Identify Alternatives to Provide New or Improved Wastewater Disposal Facilities**

A. Conventional collection, conveyance, treatment and discharge alternatives including:

NA 1. The potential for regional wastewater treatment. (Reference - 25 *Pa. Code* §71.21(a)(4)).

NA 2. The potential for extension of existing municipal or non-municipal sewage facilities to areas in need of new or improved sewage facilities. (Reference - 25 *Pa. Code* §71.21(a)(4)(i)).

NA 3. The potential for the continued use of existing municipal or non-municipal sewage facilities through one or more of the following: (Reference - 25 *Pa. Code* §71.21(a)(4)(ii)).

NA a. Repair. (Reference - 25 *Pa. Code* §71.21(a)(4)(ii)(A)).

NA b. Upgrading. (Reference - 25 *Pa. Code* §71.21(a)(4)(ii)(B)).

NA c. Reduction of hydraulic or organic loading to existing facilities. (Reference - 25 *Pa. Code* §71.71).

NA d. Improved O & M. (Reference - 25 *Pa. Code* §71.21(a)(4)(ii)(C)).

NA e. Other applicable actions that will resolve or abate the identified problems. (Reference - 25 *Pa. Code* §71.21(a)(4)(ii)(D)).

NA 4. Repair or replacement of existing collection and conveyance system components. (Reference - 25 *Pa. Code* §71.21(a)(4)(ii)(A)).

NA 5. The need for construction of new community sewage systems including sewer systems and/or treatment facilities. (Reference - 25 *Pa. Code* §71.21(a)(4)(iii)).

NA 6. Use of innovative/alternative methods of collection/conveyance to serve needs areas using existing wastewater treatment facilities. (Reference - 25 *Pa. Code* §71.21(a)(4)(ii)(B)).

NA B. The use of individual sewage disposal systems including IRSIS systems based on:

NA 1. Soil and slope suitability. (Reference - 25 *Pa. Code* §71.21(a)(2)(ii)(C)).

NA 2. Preliminary hydrogeologic evaluation. (Reference - 25 *Pa. Code* §71.21(a)(2)(ii)(C)).

NA 3. The establishment of a SMP. (Reference - 25 *Pa. Code* §71.21(a)(4)(iv)). See also Part "F" below.

NA 4. The repair, replacement or upgrading of existing malfunctioning systems in areas suitable for onlot disposal considering: (Reference - 25 *Pa. Code* §71.21(a)(4)).

NA a. Existing technology and sizing requirements of 25 *Pa. Code* Chapter 73. (Reference - 25 *Pa. Code* §73.31-§73.72).

NA b. Use of expanded absorption areas or alternating absorption areas. (Reference - 25 *Pa. Code* §73.16).

NA c. Use of water conservation devices. (Reference - 25 *Pa. Code* §71.73(b)(2)(iii)).

NA C. The use of small flow sewage treatment facilities or package treatment facilities to serve individual homes or clusters of homes with consideration of: (Reference - 25 *Pa. Code* §71.64(d)).

NA 1. Treatment and discharge requirements. (Reference - 25 *Pa. Code* §71.64(d)).

NA 2. Soil suitability. (Reference - 25 *Pa. Code* §71.64(c)(1)).

NA 3. Preliminary hydrogeologic evaluation. (Reference - 25 *Pa. Code* §71.64(c)(2)).

NA 4. Municipal, Local Agency or other controls over O & M requirements through a SMP. (Reference - 25 *Pa. Code* §71.64(d)). See Part "F" below.

NA D. The use of community land disposal alternatives including:

NA 1. Soil and site suitability. (Reference - 25 *Pa. Code* §71.21(a)(2)(ii)(C)).

NA 2. Preliminary hydrogeologic evaluation. (Reference - 25 *Pa. Code* §71.21(a)(2)(ii)(C)).

NA 3. Municipality, Local Agency or other controls over O & M requirements through a SMP. (Reference - 25 *Pa. Code* §71.21(a)(2)(ii)(C)). See Part "F" below.

NA 4. The rehabilitation or replacement of existing malfunctioning community land disposal systems. (See Part "V", B, 4, a, b, c above). See also Part "F" below.

NA E. The use of retaining tank alternatives on a temporary or permanent basis including: (Reference - 25 *Pa. Code* §71.21(a)(4)).

NA 1. Commercial, residential and industrial use. (Reference - 25 *Pa. Code* §71.63(e)).

NA 2 Designated conveyance facilities (pumper trucks). (Reference - 25 *Pa. Code* §71.63(b)(2)).

NA 3. Designated treatment facilities or disposal site. (Reference - 25 *Pa. Code* §71.63(b)(2)).

NA 4. Implementation of a retaining tank ordinance by the municipality. (Reference - 25 *Pa. Code* §71.63(c)(3)). See Part "F" below.

NA 5. Financial guarantees when retaining tanks are used as an interim sewage disposal measure. (Reference - 25 *Pa. Code* §71.63(c)(2)).

NA F. SMPs to assure the future O & M of existing and proposed sewage facilities through:

NA 1. Municipal ownership or control over the O & M of individual onlot sewage disposal systems, small flow treatment facilities, or other traditionally non-municipal treatment facilities. (Reference - 25 *Pa. Code* §71.21(a)(4)(iv)).

NA 2. Required inspection of sewage disposal systems on a schedule established by the municipality. (Reference - 25 *Pa. Code* §71.73(b)(1)).

NA 3. Required maintenance of sewage disposal systems including septic and aerobic treatment tanks and other system components on a schedule established by the municipality. (Reference - 25 *Pa. Code* §71.73(b)(2)).

NA 4. Repair, replacement or upgrading of malfunctioning onlot sewage systems. (Reference - 25 *Pa. Code* §71.21(a)(4)(iv) and §71.73(b)(5)) through:

NA a. Aggressive pro-active enforcement of ordinances that require O & M and prohibit malfunctioning systems. (Reference - 25 *Pa. Code* §71.73(b)(5)).

NA b. Public education programs to encourage proper O & M and repair of sewage disposal systems.

NA 5. Establishment of joint municipal SMPs. (Reference - 25 *Pa. Code*

Discovery A-9 - Attachment 2

§71.73(b)(8)).

NA 6. Requirements for bonding, escrow accounts, management agencies or associations to assure O & M for non-municipal facilities. (Reference - 25 *Pa. Code* §71.71).

NA G. Non-structural comprehensive planning alternatives that can be undertaken to assist in meeting existing and future sewage disposal needs including: (Reference - 25 *Pa. Code* §71.21(a)(4)).

1. Modification of existing comprehensive plans involving:

NA a. Land use designations. (Reference - 25 *Pa. Code* §71.21(a)(4)).

NA b. Densities. (Reference - 25 *Pa. Code* §71.21(a)(4)).

NA c. Municipal ordinances and regulations. (Reference - 25 *Pa. Code* §71.21(a)(4)).

NA d. Improved enforcement. (Reference - 25 *Pa. Code* §71.21(a)(4)).

NA e. Protection of drinking water sources. (Reference - 25 *Pa. Code* §71.21(a)(4)).

NA 2. Consideration of a local comprehensive plan to assist in producing sound economic and consistent land development. (Reference - 25 *Pa. Code* §71.21(a)(4)).

NA 3. Alternatives for creating or changing municipal subdivision regulations to assure long-term use of on-site sewage disposal that consider lot sizes and protection of replacement areas. (Reference - 25 *Pa. Code* §71.21(a)(4)).

NA 4. Evaluation of existing local agency programs and the need for technical or administrative training. (Reference - 25 *Pa. Code* §71.21(a)(4)).

NA H. A no-action alternative which includes discussion of both short-term and long-term impacts on: (Reference - 25 *Pa. Code* §71.21(a)(4)).

NA 1. Water quality/public health. (Reference - 25 *Pa. Code* §71.21(a)(4)).

NA 2. Growth potential (residential, commercial, industrial). (Reference - 25 *Pa. Code* §71.21(a)(4)).

NA 3. Community economic conditions. (Reference - 25 *Pa. Code* §71.21(a)(4)).

NA 4. Recreational opportunities. (Reference - 25 *Pa. Code* §71.21(a)(4)).

NA 5. Drinking water sources. (Reference - 25 *Pa. Code* §71.21(a)(4)).

NA 6. Other environmental concerns. (Reference - 25 *Pa. Code* §71.21(a)(4)).

Part 3 **VI. Evaluation of Alternatives**

A. Technically feasible alternatives identified in Section V of this checklist must be evaluated for consistency with respect to the following: (Reference - 25 *Pa. Code* §71.21(a)(5)(i)).

NA 1. Applicable plans developed and approved under **Sections 4 and 5 of the Clean Streams Law or Section 208 of the Clean Water Act** (33 U.S.C.A. 1288). (Reference - 25 *Pa. Code* §71.21(a)(5)(i)(A)). Appendix B, Section II.A of the Planning Guide.

NA 2. Municipal wasteload management **Corrective Action Plans or Annual Reports** developed under 25 *Pa. Code* Chapter 94. (Reference - 25 *Pa. Code* §71.21(a)(5)(i)(B)). The municipality's recent Wasteload Management (25 *Pa. Code* Chapter 94) Reports should be examined to determine if the proposed alternative is consistent with the recommendations and findings of the report. Appendix B, Section II.B of the Planning Guide.

NA 3. Plans developed under **Title II of the Clean Water Act** (33 U.S.C.A.

Discovery A-9 - Attachment 2

1281-1299) or **Titles II and VI of the Water Quality Act of 1987** (33 U.S.C.A 1251-1376). (Reference - 25 *Pa. Code* §71.21(a)(5)(i)(C)). Appendix B, Section II.E of the Planning Guide.

____ NA

4. **Comprehensive plans** developed under the Pennsylvania Municipalities Planning Code. (Reference - 25 *Pa. Code* §71.21(a)(5)(i)(D)). The municipality's comprehensive plan must be examined to assure that the proposed wastewater disposal alternative is consistent with land use and all other requirements stated in the comprehensive plan. Appendix B, Section II.D of the Planning Guide.

____ NA

5. **Antidegradation requirements** as contained in 25 *Pa. Code* Chapters 93, 95 and 102 (relating to water quality standards, wastewater treatment requirements and erosion control) and the Clean Water Act. (Reference - 25 *Pa. Code* §71.21(a)(5)(i)(E). Appendix B, Section II.F of the Planning Guide.

____ NA

6. **State Water Plans** developed under the Water Resources Planning Act (42 U.S.C.A. 1962-1962 d-18). (Reference - 25 *Pa. Code* §71.21(a)(5)(i)(F)). Appendix B, Section II.C of the Planning Guide.

____ NA

7. **Pennsylvania Prime Agricultural Land Policy** contained in Title 4 of the Pennsylvania Code, Chapter 7, Subchapter W. Provide narrative on local municipal policy and an overlay map on prime agricultural soils. (Reference - 25 *Pa. Code* §71.21(a)(5)(i)(G)). Appendix B, Section II.G of the Planning Guide.

____ NA

8. **County Stormwater Management Plans** approved by DEP under the Storm Water Management Act (32 P.S. 680.1-680.17). (Reference - 25 *Pa. Code* §71.21(a)(5)(i)(H)). Conflicts created by the implementation of the proposed wastewater alternative and the existing recommendations for the management of stormwater in the county Stormwater Management Plan must be evaluated and mitigated. If no plan exists, no conflict exists. Appendix B, Section II.H of the Planning Guide.

____ NA

9. **Wetland Protection.** Using wetland mapping developed under Checklist Section II.G, identify and discuss mitigative measures including the need to obtain permits for any encroachments on wetlands from the construction or operation of any proposed wastewater facilities. (Reference - 25 *Pa. Code* §71.21(a)(5)(i)(I)) Appendix B, Section II.I of the Planning Guide.

____ NA

10. **Protection of rare, endangered or threatened plant and animal species** as identified by the Pennsylvania Natural Diversity Inventory (PNDI). (Reference - 25 *Pa. Code* §71.21(a)(5)(i)(J)). Provide DEP with a copy of the completed *PNDI Manual Project Submission Form*. Also provide a copy of the response letters from the 4 jurisdictional agencies regarding the findings of the PNDI search. Appendix B, Section II.J of the Planning Guide.

____ NA

11. **Historical and archaeological resource protection** under P.C.S. Title 37, Section 507 relating to cooperation by public officials with the Pennsylvania Historical and Museum Commission (PHMC). (Reference - 25 *Pa. Code* §71.21(a)(5)(i)(K)). Provide DEP with a completed copy of a *Cultural Resource Notice* and a return receipt for its submission to PHMC. Provide a copy of the response letter or review stamp from the Bureau of Historic Preservation (BHP) indicating the project will have no effect on, or that there may be potential impacts on, known archaeological and historical sites and any avoidance and mitigation measures required. Appendix B, Section II.K of the Planning Guide.

NA B. Provide for the resolution of any inconsistencies in any of the points identified in Section VI.A. of this checklist by submitting a letter from the appropriate agency stating that the agency has received, reviewed and concurred with the resolution of identified inconsistencies. (Reference - 25 *Pa. Code* §71.21(a)(5)(ii)). Appendix B of the Planning Guide.

Part 3 C. Evaluate alternatives identified in Section V of this checklist with respect to applicable water quality standards, effluent limitations or other technical, legislative or legal requirements. (Reference - 25 *Pa. Code* §71.21(a)(5)(iii)).

Part 3 D. Provide cost estimates using present worth analysis for construction, financing, ongoing administration, O & M and user fees for alternatives identified in Section V of this checklist. Estimates shall be limited to areas identified in the plan as needing improved sewage facilities within 5 years from the date of plan submission. (Reference - 25 *Pa. Code* §71.21(a)(5)(iv)).

Part 3 E. Provide an analysis of the funding methods available to finance the proposed alternatives evaluated in Section V of this checklist. Also provide documentation to demonstrate which alternative and financing scheme combination is the most cost-effective; and a contingency financial plan to be used if the preferred method of financing cannot be implemented. The funding analysis shall be limited to areas identified in the plan as needing improved sewage facilities within 5 years from the date of the plan submission. (Reference - 25 *Pa. Code* §71.21(a)(5)(v)).

Part 3 F. Analyze the need for immediate or phased implementation of each alternative proposed in Section V of this checklist including: (Reference - 25 *Pa. Code* §71.21(a)(5)(vi)).

NA 1. A description of any activities necessary to abate critical public health hazards pending completion of sewage facilities or implementation of SMPs. (Reference - 25 *Pa. Code* §71.21(a)(5)(vi)(A)).

NA 2. A description of the advantages, if any, in phasing construction of the facilities or implementation of a SMP justifying time schedules for each phase. (Reference - 25 *Pa. Code* §71.21(a)(5)(vi)(B)).

Part 3 G. Evaluate administrative organizations and legal authority necessary for plan implementation. (Reference - 25 *Pa. Code* §71.21(a)(5)(vi)(D)).

Part 3 **VII. Institutional Evaluation**

A. Provide an analysis of all existing wastewater treatment authorities, their past actions and present performance including:

NA 1. Financial and debt status. (Reference - 25 *Pa. Code* §71.61(d)(2)).

NA 2. Available staff and administrative resources. (Reference - 25 *Pa. Code* §71.61(d)(2))

NA 3. Existing legal authority to:

NA a. Implement wastewater planning recommendations. (Reference - 25 *Pa. Code* §71.61(d)(2)).

NA b. Implement system-wide O & M activities. (Reference - 25 *Pa. Code* §71.61(d)(2)).

NA c. Set user fees and take purchasing actions. (Reference - 25 *Pa. Code* §71.61(d)(2)).

NA d. Take enforcement actions against ordinance violators. (Reference - 25 *Pa. Code* §71.61(d)(2)).

NA e. Negotiate agreements with other parties. (Reference - 25 *Pa. Code* §71.61(d)(2)).

Discovery A-9 - Attachment 2

NA f. Raise capital for construction and O & M of facilities. (Reference - 25 *Pa. Code* §71.61(d)(2)).

Part 3 B. Provide an analysis and description of the various institutional alternatives necessary to implement the proposed technical alternatives including:

Part 3 1. Need for new municipal departments or municipal authorities. (Reference - 25 *Pa. Code* §71.61(d)(2)).

Part 3 2. Functions of existing and proposed organizations (sewer authorities, onlot maintenance agencies, etc.). (Reference - 25 *Pa. Code* §71.61(d)(2)).

Part 3 3. Cost of administration, implementability, and the capability of the authority/agency to react to future needs. (Reference - 25 *Pa. Code* §71.61(d)(2)).

Part 3 C. Describe all necessary administrative and legal activities to be completed and adopted to ensure the implementation of the recommended alternative including:

Part 3 1. Incorporation of authorities or agencies. (Reference - 25 *Pa. Code* §71.61(d)(2)).

Part 3 2. Development of all required ordinances, regulations, standards and inter-municipal agreements. (Reference - 25 *Pa. Code* §71.61(d)(2)).

Part 3 3. Description of activities to provide rights-of-way, easements and land transfers. (Reference - 25 *Pa. Code* §71.61(d)(2)).

Part 3 4. Adoption of other municipal sewage facilities plans. (Reference - 25 *Pa. Code* §71.61(d)(2)).

Part 3 5. Any other legal documents. (Reference - 25 *Pa. Code* §71.61(d)(2)).

Part 3 6. Dates or timeframes for items 1-5 above on the project's implementation schedule.

Part 3 D. Identify the proposed institutional alternative for implementing the chosen technical wastewater disposal alternative. Provide justification for choosing the specific institutional alternative considering administrative issues, organizational needs and enabling legal authority. (Reference - 25 *Pa. Code* §71.61(d)(2)).

Part 3 **VIII. Implementation Schedule and Justification for Selected Technical & Institutional Alternatives**

A. Identify the technical wastewater disposal alternative which best meets the wastewater treatment needs of each study area of the municipality. Justify the choice by providing documentation which shows that it is the best alternative based on:

Part 3 1. Existing wastewater disposal needs. (Reference - 25 *Pa. Code* §71.21(a)(6)).

Part 3 2. Future wastewater disposal needs. (5 and 10 year growth areas). (Reference - 25 *Pa. Code* §71.21(a)(6)).

Part 3 3. O & M considerations. (Reference - 25 *Pa. Code* §71.21(a)(6)).

NA 4. Cost-effectiveness. (Reference - 25 *Pa. Code* §71.21(a)(6)).

Part 3 5. Available management and administrative systems. (Reference - 25 *Pa. Code* §71.21(a)(6)).

NA 6. Available financing methods. (Reference - 25 *Pa. Code* §71.21(a)(6)).

Part 3 7. Environmental soundness and compliance with natural resource planning and preservation programs. (Reference - 25 *Pa. Code* §71.21(a)(6)).

Discovery A-9 - Attachment 2

____ NA B. Designate and describe the capital financing plan chosen to implement the selected alternative(s). Designate and describe the chosen back-up financing plan. (Reference - 25 *Pa. Code* §71.21(a)(6))

____ Part 3 C. Designate and describe the implementation schedule for the recommended alternative, including justification for any proposed phasing of construction or implementation of a SMP. (Reference – 25 *Pa. Code* §71.31(d))

____ NA **IX. Environmental Report (ER) generated from the UER Process**

____ NA A. Complete an ER as required by the UER process and as described in the DEP Technical Guidance (381-5511-111). Include this document as "Appendix A" to the Act 537 Plan Update Revision. ***Note: An ER is required only for Wastewater projects proposing funding through any of the funding sources identified in the UER.***

Discovery A-9 - Attachment 2

PENNVEST I.D. No. _____

ADDITIONAL REQUIREMENTS FOR PENNVEST PROJECTS

Municipalities that propose to implement their official sewage facilities plan updates with PENNVEST funds must meet 6 additional requirements to be eligible for such funds. See *A Guide for Preparing Act 537 Update Revisions* (362-0300-003), Appendix N for greater detail or contact the DEP regional office serving your county listed in Appendix J of the same publication.

DEP Use Only	Indicate Page #(s) in Plan	Item Required
_____	NA	1. Environmental Impact Assessment. (Planning Phase) The UER replaces the Environmental Impact Assessment that was a previous requirement for PENNVEST projects.
_____	NA	2. Cost Effectiveness (Planning Phase) The cost-effectiveness analysis should be a present-worth (or equivalent uniform annual) cost evaluation of the principle alternatives using the interest rate that is published annually by the Water Resources Council. Normally, for PENNVEST projects the applicant should select the most cost-effective alternative based upon the above analysis. Once the alternative has been selected the user fee estimates should be developed based upon interest rates and loan terms of the selected funding method.
_____		3. Second Opinion Project Review. (Design Phase)
_____		4. Minority Business Enterprise/Women's Business Enterprise (Construction Phase)
_____		5. Civil Rights. (Construction Phase)
_____		6. Initiation of Operation/Performance Certification. (Post-construction Phase)

PLAN SUMMARY

Letterkenny Township Minor Act 537 Update Special Study

The Pennsylvania Sewage Facilities Act ("Act 537") requires municipalities to prepare, adopt, periodically update and implement plans that address sewage-related needs and problems. In general, such plans must identify the methods for providing sewage services within areas of the municipality within a reasonable future period. A guide for preparing an Act 537 (Plan) points out three main objectives of establishing such a plan:

- To protect the health, safety and welfare of the citizens living in the municipality, by correcting malfunctioning on-lot systems, overloaded treatment plants and/or sewer lines.
- To prevent future sewage disposal problems from occurring.
- To provide protection for both the groundwater and surface water of the Commonwealth of Pennsylvania.

As required by law, the Letterkenny Township Act 537 Official Sewage Facilities Plan was adopted in 2003.

A. Proposed Service Area and Municipal Facilities Being Acquired

This Act 537 Plan Update Special Study was prepared pending the acquisition of Letterkenny Township Municipal Authority (LTMA) wastewater system by the York Water Company (YWC). As documented by this Act 537 Plan Update Special Study, the acquisition of the LTMA wastewater system by YWC, and the subsequent operation of that system by YWC, assures operation of the system and implementation of related Act 537 Plan provisions by a technically-competent and financially-sound entity, assuring that the Act 537 Plan objectives will continue to be met.

Figure 1 shows the approved Act 537 Planning Area and sewage facilities in the planning area. Municipal facilities being acquired by YWC include the gravity and Septic Tank Effluent Gravity (STEG) collection system, customer service laterals from the main to the limits of the rights-of-way or easement as applicable, and the wastewater treatment plant (WWTP).

B. Institutional Arrangements Necessary to Implement Acquisition

The LTMA wastewater system provides service to 185 customers. The customer base is primarily residential with three commercial customers.

This Special Study addresses the institutional arrangements for ownership and operation of the LTMA system. The proposed asset acquisition does not require new departments or municipal authorities. YWC will obtain the certificated franchise territory from the Pennsylvania Public Utility Commission (PUC). YWC will own and operate the wastewater collection system and WWTP. As owner and operator of the wastewater system, YWC will be responsible for the operation, maintenance, repair, replacement, and monitoring of all elements of the wastewater system. Legal actions required to implement the sale of LTMA wastewater system to YWC are comparable to similar asset acquisitions completed by YWC and will include items such as change in ownership of assets and transfer of permits, right-of-ways, easements, and property.

C. Estimated Cost of Implementing Acquisition

The purchase price for Letterkenny Township wastewater assets is $225,000. This purchase price is exclusively for the acquisition of the wastewater assets currently in place and owned and operated by LTMA. The cost of implementing the acquisition has yet to be determined, but would include all legal and associated costs with the Pennsylvania Public Utility Commission filing, title work, and

other transaction costs necessary to close the acquisition, which will occur after the PUC has issued an Order approving the application filing.

D. Letterkenny Township and YWC Commitments

As the purchasing entity, YWC commitments include all tasks and responsibilities required to own, operate, maintain, and upgrade the Letterkenny Township wastewater system. This includes compliance with applicable environmental regulations, investment in and maintenance of infrastructure, investigation of and response to any reports of sewer overflows, completion of reporting requirements such as Chapter 94 Wasteload Management Reports, review and approval of planning modules for new connections with respect to the available collection, conveyance and treatment capacity.

E. Implementation Schedule

The implementation schedule for the proposed asset acquisition is provided in Part 2, Section 7.

Part 2

Section 3

Municipal Adoption

TOWNSHIP OF LETTERKENNY

RESOLUTION NO. 2019-1
APPROVAL OF ACT 537 PLAN UPDATE SPECIAL STUDY

RESOLUTION OF THE SUPERVISORS OF LETTERKENNY TOWNSHIP, FRANKLIN COUNTY, PENNSYLVANIA (hereinafter "the municipality").

WHEREAS, Section 5 of the Act of January 24, 1966, P.L. 1535, No. 537, known as the "Pennsylvania Sewage Facilities Act," as amended, and the Rules and Regulations of the Department of Environmental Protection (Department) adopted thereunder, Chapter 71 of Title 25 of the Pennsylvania Code, requires the municipality to adopt an-Official Sewage Facilities Plan providing for sewage services adequate to prevent contamination of waters and/or environmental health hazards with sewage wastes, and to revise said plan whenever it is necessary to meet the sewage disposal needs of the municipality, and

WHEREAS, Martin and Martin, Incorporated has prepared an Act 537 Plan Update Special Study, dated October 3, 2019 on behalf of Letterkenny Township, which provides for sewage facilities in a portion of Letterkenny Township, and

The alternative of choice to be implemented is for the acquisition of the Letterkenny Township wastewater system by York Water Company. The public sewer service area shall remain the same as previously approved through the municipality and the Department. The key implementation activities/dates include the approval of the Act 537 Plan Update Special Study prior to the closing of the acquisition by December 31, 2019.

WHEREAS, Letterkenny Township finds that the Act 537 Plan Update Special Study described above conforms to applicable zoning, subdivision, other municipal ordinances and plans and to a comprehensive program of pollution control and water quality management.

NOW, THEREFORE, BE IT RESOLVED that the Supervisors of the Township of Letterkenny hereby adopt and submit to the Department of Environmental Protection for its approval as an update to the "Official Plan" of the municipality, the above referenced Act 537 Plan Update Special Study. The municipality hereby assures the Department of the complete and timely implementation of the said plan as required by law.

Resolved this 5th day of November, 2019.

LETTERKENNY TOWNSHIP
BOARD OF SUPERVISORS

Charles H. Myers

Charles H. Myers, Chairman

I, Melissa Kibbe, Township Secretary for the Letterkenny Township Board of Supervisors hereby state that the foregoing is a true copy of the Township's Resolution No. 2019-1 adopted November 5, 2019.

Melissa W. Kibbe

Melissa W. Kibbe, Secretary/Treasurer

Part 2

Section 3

Planning Review Documentation

Discovery A-9 - Attachment 2

martin and martin, incorporated

37 south main street • suite A • chambersburg, pennsylvania • 17201-2251

(717) 264-6759
(717) 264-7339 (fax)
www.martinandmartininc.com

October 3, 2019

Charles H. Myers, Chairman
Letterkenny Township
4924 Orrstown Road
Orrstown, PA 17244

RE Letterkenny Township
Act 537 Plan Update Special Study

Dear Mr. Myers:

Enclosed find three (3) copies of the Letterkenny Township Act 537 Plan Update Special Study dated October 2019, prepared by our office. We appreciate your assistance with getting this processed through the Township.

We delivered a copy to the Franklin County Planning Commission and the following statement was included on the transmittal letter:

"Should you have any questions, or require any additional information, please contact me. You are also welcome to submit any written comments to the undersigned and/or Charles H. Myers at Letterkenny Township, 4924 Orrstown Road, Orrstown, PA 17244."

If you do receive any comments please forward them to our office.

Sincerely,

MARTIN AND MARTIN, INCORPORATED

Timothy C. Cormany, AICP

Discovery A-9 - Attachment 2

martin and martin, incorporated

37 south main street • suite A • chambersburg, pennsylvania • 17201-2251

(717) 264-6759
(717) 264-7339 (fax)
www.martinandmartininc.com

October 3, 2019

Rochelle Barvinchack, Planner
Franklin County Planning Commission
340 N. 2nd St.
Chambersburg, PA 17201

RE: Letterkenny Township
Act 537 Plan Update Special Study

Dear Ms. Barvinchack:

On behalf of Letterkenny Township, please find enclosed a copy of the Letterkenny Township Act 537 Plan Update Special Study dated October 3, 2019, prepared by our office. The plan is a special study required for the acquisition of the Letterkenny Township Municipal Authority wastewater assets by the York Water Company. The intention of the plan is to cover the existing public sewer service area where Act 537 planning approvals have already been granted, with no proposed expansion. The plan will soon be advertised and available at the Township Building for the 30-day public review period.

Should you have any questions, or require any additional information, please contact our office at your earliest convenience. You are also welcome to submit any written comments to me and/or Charles H. Myers (Chairman) or Melissa W. Kibbe (Secretary/Treasurer) at Letterkenny Township, 4924 Orrstown Road, Orrstown, PA 17244. Comments would be appreciated prior to the public meeting scheduled for 9:00am, Tuesday, November 5.

Sincerely,

MARTIN AND MARTIN, INCORPORATED

Timothy C. Cormany, AICP

Discovery A-9 - Attachment 2

FRANKLIN COUNTY
PENNSYLVANIA
Established 1784

Franklin County Planning Department
218 North Second Street
Chambersburg, PA 17201
Phone: 717-261-3855
Fax: 717-264-8667
Email: planning@franklincountypa.gov

October 4, 2019

Melissa Kibbe, Secretary/Treasurer
Letterkenny Township
4924 Orrstown Road
Orrstown, PA 17244

RE: Letterkenny Township
Act 537 Plan Update Special Study

Dear Ms. Kibbe,

The Franklin County Planning Department has reviewed the PA Act 537 Special Study for the acquisition of the Letterkenny Township Municipal Authority wastewater assets by the York Water Company. The intention of the plan is to cover the existing public sewer service area where Act 537 planning approvals have already been granted, with no proposed expansion.

The PA Act 537 Special Study is consistent with local planning policies as identified in the comprehensive plan *Franklin County Forward.* The Special Study is recommended for approval.

Sincerely,

Rochelle Barvinchack
Planner

CC: Tim Cormany, AICP, Martin & Martin Engineering

LETTERKENNY TOWNSHIP
Board of Supervisors
4924 Orrstown Road
Orrstown, PA 17244

Phone: 717-532-8716 **Email: letterkenny@embarqmail.com** **Fax: 717-532-7134**

October 22, 2019

Tim Cormany, AICP
Martin and Martin, Incorporated
37 South Main Street
Suite A
Chambersburg, PA 17201

RE: Letterkenny Township
Act 537 Plan Update Special Study

Dear Mr. Cormany:

At the regularly schedule Letterkenny Township Planning Commission meeting on October 22, 2019, the Planning Commission reviewed the Letterkenny Township Act 537 Plan Update Special Study as prepared by the Martin and Martin, Incorporated. The Planning Commission approved the plan and recommended to the Letterkenny Township Board of Supervisors for approval.

Should you have any questions or require additional information, please contact me.

Sincerely,

Bill Fluke, Chairman
Letterkenny Township Planning Commission

Part 2

Section 5

Public Notification Documentation

PUBLIC NOTICE

In accordance with the requirements of Title 25, Chapter 71 of the Pennsylvania Code, Letterkenny Twp, Franklin Co, is accepting written comments over the next 30 days on an Act 537 Plan Update for the York Water Company's (YWC) proposed acquisition of the Letterkenny Township Municipal Authority's (LTMA) wastewater treatment system. The Plan Update incorporates the proposed acquisition of the LTMA system by the YWC, the subsequent operation of that system by YWC, and the dissolution of LTMA. It assures efficient operation of the system and implementation of related Act 537 provisions by a technically competent and financially sound entity. The Plan Update can be reviewed during normal business hours at the Township office located at 4924 Orrstown Road, Orrstown, PA. Written comments must be submitted to the Township by Nov. 4. Prior to formal adoption of the Plan Update and transmittal to the PA Dept of Environmental Protection for review and approval, the Letterkenny Township Board of Supervisors will hold a special public meeting at the Township office at 9:00 a.m. on Tuesday, November 5 to gather additional public comment, if any.

Melissa Kibbe, Manager
Letterkenny Township Board of Supervisors

Discovery A-9 - Attachment 2

Proof of Publication of Notice in

THE NEWS-CHRONICLE

LETTERKENNY TOWNSHIP

PUBLIC NOTICE – COMMENTS ON WASTEWATER SYSTEM

COMMONWEALTH OF PENNSYLVANIA

John Zimmerman, being duly sworn according to law, deposes and says that he is the General Manager of "The News-Chronicle," which is a bi-weekly newspaper of general circulation published in Shippensburg Borough, Cumberland County, Pennsylvania, by Latrobe Printing and Publishing Company, a corporation duly organized and existing under the laws of the Commonwealth of Pennsylvania having its principal place of business at 512 West King Street (P.O. Box 100), Shippensburg, Pennsylvania; that he is authorized to and does make this affidavit on its behalf; that the printed notice, advertisement of publication attached hereto is the same as was printed in the regular editions and issues of "The News-Chronicle" on the following date(s)

OCTOBER 3, 10, 2019

Copy of Notice of
Publication Attached

Affiant further deposes that neither he nor "The News-Chronicle" and The Latrobe Printing and Publishing Company have any interest in the subject matters of the aforesaid notice or advertisement, and that the facts set forth in the foregoing affidavit are true and correct.

John Zimmerman

Sworn and subscribed before me this

31st Day of October, 2019

NOTARY PUBLIC

Commonwealth of Pennsylvania
Notarial Seal
HARRY JOHN HARTMAN, Notary Public
CUMBERLAND TWP, ADAMS COUNTY
My Commission Expires Aug 28, 2021

To: "The News-Chronicle"
Shippensburg, PA 17257
For publishing the notice attached hereto:

On the stated date(s)	$	150.00
Affidavit	$	5.00
	$	155.00

Discovery A-9 - Attachment 2

Chamber chatter

The "Chamber Chatter" column will appear bi-weekly in The News-Chronicle to keep the community informed of Shippensburg Area Chamber of Commerce developments. Prepared by chamber staff, the column is intended to heighten awareness of and interest in chamber events and initiatives to strengthen the community fabric.

Chamber welcomes new members

The chamber continues to grow and we are excited to welcome into membership the following businesses:

Korey Paff State Farm Agency, 40 Shippensburg Shopping Center; CFPM Insurance, 3 W. Main St. in Waynesboro; Aliff Counseling Services LLC, 20 E. Burd St., Suite 1; Sekula Enterprises LLC (Five Star Painting), 8250 Newburg Road; WellSpan Shippensburg Health Campus, 97 Progress Boulevard; and Castleigg Wine Shop, 110 S. Hanover St. in Carlisle.

We thank these and all of our members for their support and investment with the chamber.

If you would like more information on our members, visit: www.shippensburg.org.

If your business would like to talk with the staff on how you can join the chamber and the many benefits and programs available, please contact us at: chamber@shippensburg.org. A staff member would be happy to answer any questions you may have.

CLASSIFIEDS

The Lakeside Printing & Publishing Company endeavors to publish only truthful advertising and would appreciate having its attention called to any advertising not conforming to the advertising of honesty. Readers are warned to investigate any type of offering, to not invest or send money in response to any unsolicited or questionable ads. Although we do our best to screen all ads, please investigate before you make any cash transaction.

ANNOUNCEMENTS

LEGALS

ESTATE NOTICE

NOTICE is hereby given that in the estate of the decedent set forth below the Register of Wills has granted letters to the persons named. All persons having claims or demands against the said estate are requested to make known the same and all persons indebted to said estate are requested to make payment without delay to the executor, administrator, or estate attorney named below.

Estate of DOROTHY JANE CRESSLER, AKA DORITHY J. CRESSLER, deceased, late of the Borough of Shippensburg, Franklin County, Pennsylvania

Executrix: Nancy C. Thompson
24 Montgomery Avenue
Shippensburg, PA 17257

Attorney: RACHEL C. SCHRECK, ESQUIRE
THE SCHRECK FIRM, P.C.
74 North Second Street
Chambersburg, PA 17201

LETTERS TESTAMENTARY

Notice is hereby given that Letters Testamentary in the Estate of Daniel L. Stine, late of Southampton Township, Cumberland County, Pennsylvania, have been granted to Kenneth L. Stine. All persons knowing themselves to be indebted to the said Estate will make payment immediately, and those having claims will present them for settlement to:

Kenneth L. Stine, Executor c/o Thomas P. Gleason, Esquire 825 West King Street, Suite E Shippensburg, PA 17257 (717) 532-3270

LETTERS TESTAMENTARY

Notice is hereby given that Letters Testamentary for the Estate of Gaylen R. DeWalt, late of Lurgan Township, Franklin County, Pennsylvania, have been granted to Devon M. Highlands. All persons knowing themselves to be indebted to the said Estate will make payment immediately, and those having claims will present them for settlement to:

Devon M. Highlands, Executor c/o Thomas P. Gleason, Esquire 825 West King Street, Suite E Shippensburg, PA 17257 (717) 532-3270

NOTICE

Notice is hereby given that Letterkenny Township intends to offer for public sale a 1990 John Deere 544H Payloader, 3500 lb of wooden snow fence, approx. 40 wood fence posts, and 3 tires w/wheels (1400X20/1100X20). Items will be offered for sale at Marion Auction Service, 5176 Horst Rd, Chbg, PA, on Wed, Oct 16 and Thurs, Oct 17, 2019 beginning at 8:00 AM. For more information, contact Charles Myers at 717-372-4298 or visit www.marionauction.com. Auctioneers FL#3496.

Melissa W. Kibler, Manager/Letterkenny Township

PUBLIC NOTICE

In accordance with the requirements of Title 25, Chapter 71 of the Pennsylvania Code, Letterkenny Twp, Franklin Co, is accepting written comments over the next 30 days on an Act 537 Plan Update for the York Water Company's (YWC) proposed acquisition of the Letterkenny Township Municipal Authority's (LTMA) wastewater treatment system. The Plan Update incorporates the proposed acquisition of the LTMA system by the YWC, the subsequent operation of that system by YWC and the dissolution of LTMA. It assures efficient operation of the system and implementation of related Act 537 provisions by a technically competent and financially sound entity. The Plan Update can be reviewed during normal business hours at the Township office located at 4921 Orrstown Road, Orrstown, PA. Written comments must be submitted to the Township by Nov. 4. Prior to formal adoption of the Plan Update and transmittal to the PA Dept of Environmental Protection for review and approval, the Letterkenny Township Board of Supervisors will hold a special public meeting at 7:00 p.m. on Tuesday, November 5 to gather additional public comments. Tony.

Melissa Kibler, Manager/Letterkenny Township Board of Supervisors

Public Notice

The Board of Supervisors of Hopewell Township, Cumberland County, will be holding a special meeting on Wednesday, October 9, 2019 at 9:00AM for preparing a budget for the year 2020 and other business. The proposed budget can be reviewed after November 4th at the Township Municipal building. It can be examined at the Township during office hours (phone 423-6582).

Kimberly S. Myers, Township Secretary Board of Supervisors

YARD/GARAGE SALES

YARD SALE

LARGE GARAGE Sale, 10 Hoy Drive Shippensburg. October 3 & 4, 8am-5pm, October 5, 8am-1pm. Items for every room in the house, oak pedestal table with 2 extension boards and 4 chairs, 2 cots with mattresses, gas fireplace, mens sweaters L-XL, womens clothing 1-XL, kitchen items, and much more.

BUSINESS SERVICES

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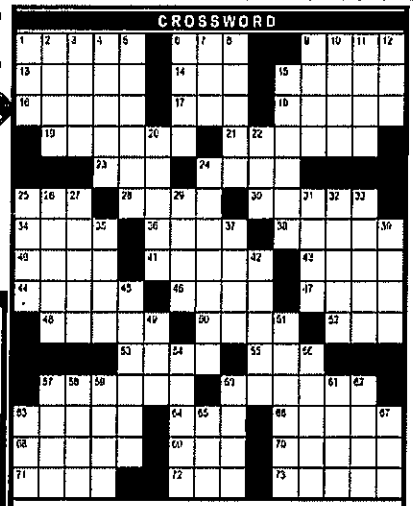
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					5	3		

Fill in the blank squares in the grid, making sure that every row, column and 3-by-3 box includes all digits 1 through 9.

CROSSWORD



THEME: SCARY MOVIES

ACROSS
1. Will alternative
6. Put into service
9. Balloon a string
13. Conversation starter
14. "Platoon" setting
15. "Four" prefix
16. Macaroni shape
17. Dunk value
18. "The Dark Knight" star
19. "Marion Crane stops at a motel
21. "Eccentric scientist teleports himself
23. Sonny and Cher, e.g.
24. "What "The Swarm" attackers do
25. Hot tub feature
28. Think, archaic
30. Kentucky Derby sound
34. "American Psycho" weapon, pl.
36. Andy's radio partner
38. Dished out
40. Drunkard
41. Type of turn, pl.
43. Spare in a trunk
44. Pore in a leaf
45. Straight out of bottle, as in whiskey
47. Port of Yemen
48. Angry growl
50. Whiskey grain, pl.
52. Is in Paris
53. "What a ____!"
55. Carnut
57. "Chris Washington meets his girlfriend's family
60. "Girl bullied at school
63. Type of renewable energy
64. Caviar
66. Abstains from food
68. Opposite of binary
69. Barley bristle
70. Web mag
71. Department store department
72. "Sematary resident
73. Saw again

DOWN
1. "____-Wolf of London"
2. Counseling, e.g.
3. Friendly vestments
4. Frank Wright's middle name
5. Showing cleavage
6. "Do ____ others..."
7. "Photographer and oncological trapped by Jigsaw
8. Bring character to life
9. Bone to pick
10. And others
11. Pretentiously artistic
12. Morse Code dash
15. Like Murder Mystery Party
20. Pertaining to hours
22. Type of farm house
24. Two for the price of one deals
25. "It terrorized Amity
28. Highway departures
27. Part of morrise joint
29. "Boy brings grief to adoptive parents, with The
31. 9th letter of Greek alphabet
32. Move like on ice
33. "Jack Torrance's catchphrase "____ Johnny!"
35. "Brave New World" drug
37. Don't go
39. Fender-bender damage
42. Funerary art form
45. Weapon storage
49. Romanian money
51. The Beach Boys' "____ Girl"
54. Seatbelt, e.g.
56. Feed in a meadow
57. "____ Girl"
58. Panache
59. Before feathers
60. One tenth of a dime
61. a.k.a. The Islamic State
62. Tallest volcano in Europe
63. Math class total
65. Be in the red
67. Do needlework

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4	9	3	7	2	8	5	6	1
5	7	6	9	1	4	8	3	2
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3	8	4	5	7	2	6	1	9
7	1	2	6	8	9	3	4	5
6	5	9	4	3	1	2	8	7
2	6	7	8	4	5	1	9	3
8	4	1	2	9	3	7	5	6
9	3	5	1	6	7	4	2	8

OCTOBER 3	OCTOBER 4	OCTOBER 5	OCTOBER 6	OCTOBER 7
74° / 58°	67° / 40°	65° / 53°	73° / 62°	69° / 49°

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Letterkenny Township
Act 537 Plan Update Special Meeting
November 5, 2019

The Letterkenny Township Board of Supervisors held a special public meeting on Tuesday, November 5, 2019, for the purpose of presenting the Act 537 Plan Update Special Study. Tim Cormany, Planner from Martin and Martin, Inc., was the presenter.

The meeting was called to order at 9:00 a.m. No one from the public was in attendance and no public comment was received.

Charles H. Myers, Board Chairman, signed Resolution 2019-1 "Approval of Act 537 Plan Update Special Study," witnessed by Melissa W Kibbe. The plan will be forwarded to DEP.

The meeting adjourned at 9:20 p.m.

Respectfully submitted,

Melissa W Kibbe

Melissa W Kibbe
Manager/Secretary/Treasurer

Discovery A-9 - Attachment 2

Letterkenny Township
Regular Meeting
October 22, 2019

PRESENT WERE:
Supervisors: Horn, Myers, Norton

Manager: Kibbe
Solicitor: Rahauser

The regular monthly meeting of the Letterkenny Township Board of Supervisors was held on October 22, 2019, at the Letterkenny Township Building. The meeting was called to order at 7:00 p.m. by Chairman Myers who led the Pledge of Allegiance.

The September 24, 2019, Minutes were approved by the board following a motion by Horn, seconded by Norton. Paying the bills as listed was approved by the Board following a motion by Norton, seconded by Horn. The Treasurer's Report was approved by the board following a motion by Norton, seconded by Horn.

Subdivision Plans – None

Visitors
-One student attended to fulfill a Civics class requirement.
-Richard and Pamela Fogelsonger, 24 Warwick Dr, requested a waiver regarding Ordinance 2018-1 "Regulating Parking in Hillview Estates and Kensington Heights" so that Mr. Fogelsonger could continue to park his "work truck" along the street in front of his home. After lengthy discussion, a compromise was reached.
-Kibbe shared a written report from Eric Varner that provided information on the number and type of Fire and EMS calls for the PHFD in July, August, and September.

Information/Discussion Items
-The Manager updated the Board on the two remaining, ongoing citizen complaints. One has been resolved, and the other needs follow-up from the District Justice Office.
-Myers shared his proposal for a new lien to shed to be built beside the existing Storage Building. A cost estimate will be prepared and shared at the upcoming Budget Meeting.
-Myers requested approval for new LED lighting to replace the failing fluorescent lighting in the garage/shop. A cost estimate will be prepared and shared at the upcoming Budget Meeting.
-A special public meeting pertaining to the Act 537 Plan Update prepared by Martin and Martin has been scheduled and advertised for November 5, 2019, at 9:00 a.m.
-Board members were given a draft copy of the proposed 2020 Budget to be reviewed prior to the Budget Meeting on November 12, 2019.

Action Items
-Following a motion by Horn, seconded by Norton, the Board gave approval for Myers and Kibbe to sign Resolution 2019-1 "Approving the Act 537 Plan Update" after the November 5th meeting.

There being no further business, the meeting adjourned at 8:00 p.m. following a motion by Horn, seconded by Norton.

Respectfully submitted,

Melissa W Kibbe

Melissa W Kibbe
Manager

Part 2

Section 6

Comments and Responses

NO PUBLIC COMMENTS RECEIVED

Part 2

Section 7

Implementation Schedule

Activity	
Meeting with PaDEP	August 15, 2019
Update special study to DEP Guidance	August-October 2019
Prepare draft resolution and public notice	September 2019
Attend and explain special study to Letterkenny Township Planning Commission	September 24, 2019
Attend and explain special study to Letterkenny Township Supervisors	September 24, 2019
Submit special Study to Letterkenny Township and Franklin County Planning Commission	October 3, 2019
Advertise public notice in newspaper	October 3 and 11, 2019
Incorporate comments received from Letterkenny Township and Franklin County Planning Commission into the Plan	November 2019
Public Meeting / Letterkenny Township Resolution Adoption	November 5, 2019
Formal submission to PaDEP	November 7, 2019
PaDEP Approval of Act 537 Plan Special Study	December 31, 2019

Letterkenny Township

Act 537 Plan Update Special Study

Part 3 – General Plan Content

Table of Contents

Introduction 1

I. Previous Wastewater Planning 1

A. Past Wastewater Planning Impact on Current Planning Effort 1

1. Previous Act 537 Planning

2. Planning that Has Not Been Carried out According to Approved Plan Implementation Schedule 2

3. Anticipated or Planning by Sewer Authority or Approved Under Chapter 94 Corrective Action Plan 2

4. Planning Modules for New Land Development, Planning "Exemptions" and Addenda 2

II. Physical and Demographic Analysis 2

A. Planning Area and Wastewater Service Area 2

B. Physical Characteristics 3

III. Existing Sewage Facilities in the Planning Area 3

A. Identify, Map, and Describe Municipal Sewage Systems in the Planning Area 3

1. Location, Size and Ownership of Treatment Facilities, Interceptors, Pumping Stations, and Force Mains 3

2. Treatment Process Narrative and Schematic 3

3. Description of Problems with Existing Facilities 4

4. Scheduled Treatment Facility Upgrades 4

5. Disposal Areas 4

IV. Future Growth and Land Development 5

V. Identify Alternatives to Provide New or Improved Wastewater Disposal Facilities 5

VI. Evaluation of Alternatives 5

A. Evaluation of Selected Alternative 5

B. Proposed Purchase Price and Costs of Implementing Proposed Acquisition 7

C. Analyze the Need for Immediate or Phased Implementation of the Proposed Alternative 7

D. Evaluate Administrative Organizations and Legal Authority Necessary for Plan Implementation 7

VII. Institutional Evaluation 9

A. Analysis and Description of Institutional Alternatives Necessary to Implement Proposed Alternatives 9

1. Need for New Municipal Departments or Municipal Authorities 9

2. Functions of Existing and Proposed Organizations 9

3. Cost of Administration and Capability of Authority/Agency to Reaction to Future Needs 9

B. Description of Administrative and Legal Activities 10

1. Incorporation of Authorities or Agencies 10

2. Ordinances, Regulations, Standards, Agreements, Inter-Municipal0 Agreements 10

3. Transfer of Rights-of-Way, Easements, and Land Transfer 11

4. Adoption of Other Municipal Sewage Facilities Plans 11

5. Other Legal Documents 11

6. Dates or Timeframes for Items 1 to 5 Above 11

C. Justification for Choosing Specific Institutional Alternative 11

VIII. Implementation Schedule and Justification for Selected Alternatives 14

A. Identify Technical Wastewater Disposal Alternative 14

1. Existing Wastewater Disposal Needs 14

2. Future Wastewater Disposal Needs 14

3. Operation and Maintenance Considerations 15

4. Available Management and Administrative Systems 15

5. Environmental Soundness and Compliance with Natural Resources Planning and Preservation Programs 15

B. Designate and Describe Implementation Schedule 15

List of Attachments

Figure 1 Planning and Wastewater Service Areas, and Collection System and Facilities

Appendix A Independent Auditor's Report of LTMA

Appendix B York Water Company SEC Filing

Introduction

This Act 537 Plan Update Special Study is being prepared pending the acquisition of the Letterkenny Township Municipal Authority (LTMA) wastewater system by the York Water Company (YWC). As documented by this Act 537 Plan Update Special Study, the contemplated acquisition of the Letterkenny Township system by YWC, and the subsequent operation of that system by YWC, assures operation of the system and implementation of related Act 537 Plan provisions by a technically-competent and financially-sound entity, assuring that the Act 537 Plan objectives will continue to be met. Figure 1 shows the Act 537 planning area, which matches the previously approved Act 537 Planning Area, and the location of existing Letterkenny Township wastewater facilities.

Upon closing of the proposed transaction, YWC would assume the operation and management of the existing wastewater collection and treatment facilities currently owned by Letterkenny Township. This Special Study addresses the institutional arrangements for ownership and operation of the Letterkenny Township system.

On June 25, 2019 Letterkenny Township executed an Asset Purchase Agreement with YWC. This Act 537 Plan Update Special Study (1) evaluates the administrative and financial capabilities of YWC and YWC's ability to successfully operate and maintain Letterkenny Township's sewage collection and treatment system, (2) sets forth the allocation of responsibilities and process for implementation of the Act 537 Plan's requirements, and (3) discusses "General Plan Content" items that are relevant to the scope and objective of this Act 537 Plan Update.

I. Previous Wastewater Planning

A. Past Wastewater Planning Impact on Current Planning Effort

1. Previous Act 537 Planning

Letterkenny Township Act 537 Plan - March 2003

Letterkenny Township prepared an Act 537 Official Sewage Facilities Plan in March 2003. The plan indicated three (3) areas requiring sewage facilities: Upper Strasburg, Pleasant Hall, and the Kensington Heights Area. Cumberland Franklin Joint Municipal Authority (CFJMA) extended their collection system in 2009 to serve the Upper Strasburg and Pleasant Hall areas. The Kensington Heights area is served by Hamilton Township Municipal Authority. The Roxbury Holiness Camp Area is served by its own private system.

At the time of the Act 537 Plan there were two (2) areas in the Township served by public sewer. The first area is the residential subdivision known as Hill View Estates near the Village of Roxbury. The collection system and treatment plant were installed in 1980 by the developer. The system was expanded and dedicated to LTMA in 1994. This system is the subject of this Act 537 Plan Update Special Study.

The second area is known as Old Kensington Heights. In the late 1970's when Hamilton Township Municipal Authority installed an expansive collection system, the new Kensington Heights system was connected to it. Letterkenny Township has since transferred ownership, maintenance, and revenue of the collection lines to Hamilton Township.

2. Planning that Has Not Been Carried out According to Approved Plan Implementation Schedule

   The areas identified in the 2003 Act 537 Plan as needing sewage collection and treatment have been addressed.

3. Anticipated or Planning by Sewer Authority or Approved Under Chapter 94 Corrective Action Plan

   Ultraviolet light disinfection equipment was installed at the WWTP and became operational in November 2018. It was determined that the WWTP outfall needs to be relocated, and is currently at the design/permit stage. The 2019 engineering evaluation concluded that the treatment facility tanks, processes, and appurtenances, including the aeration system, conform to the design guidelines of the Domestic Wastewater Facilities Manual. The report also noted that final-effluent aeration practices in the existing chlorine-contact tank must improve to consistently meet discharge-permit requirements for dissolved oxygen. These improvements require that operating staff optimize air flow (increase) to the existing final-effluent aeration system in the chlorine-contact tank. This practice requires relocation and reinstallation of the flow-meter downstream of the new ultraviolet light wastewater disinfection unit. Flow-meter relocation will resolve the problem of excessive diffused air interfering with the flow-metering weir.

4. Planning Modules for New Land Development, Planning "Exemptions" and Addenda

   The projected growth area for the LTMA service area is significantly limited at this time. The recent Skyline Drive extensions and the recently developed Dollar General retail store are the only system additions of note in recent years. Lurgan Township is currently updating its Act 537 Plan and is proposing connection to the LTMA system for the village of Roxbury and 90-100 associated EDUs. This would require a significant investment and expansion of the existing WWTP, if approved. YWC would be involved with any future agreements with Lurgan Township to coordinate such a service request.

II. Physical and Demographic Analysis

A. Planning Area and Wastewater Service Area

LTMA is a municipally owned wastewater system that serves a small portion of Letterkenny Township in Franklin County, Pennsylvania. Letterkenny Township is situated in the north-central section of Franklin County, Pennsylvania. The wastewater treatment plant (WWTP) and sanitary collection system provide service to 185 customers. The customer base is mainly residential with three commercial customers.

Figure 1 shows the area served by LTMA.

B. Physical Characteristics

Letterkenny Township is a rural township located in the north-central section of Franklin County, Pennsylvania, about 10 miles north of the Borough of Chambersburg. The Township consists of 42.6 square miles and is bounded by the Townships of Fannett, Metal, St. Thomas, Hamilton, Greene, Southampton, and Lurgan.

The approved 2003 Act 537 Official Sewage Plan contains more detailed background information regarding physical characteristics and related topics such as soils, geologic features, and topography.

III. Existing Sewage Facilities in the Planning Area

A. Identify, Map, and Describe Municipal Sewage Systems in the Planning Area

1. Location and Ownership of Interceptors and Force Mains

The Letterkenny Township wastewater system, which is shown in Figure 1, provides wastewater collection and treatment services to 185 customer connections. The Wastewater System's collection system consists of the following:

Sanitary Sewer Pipe

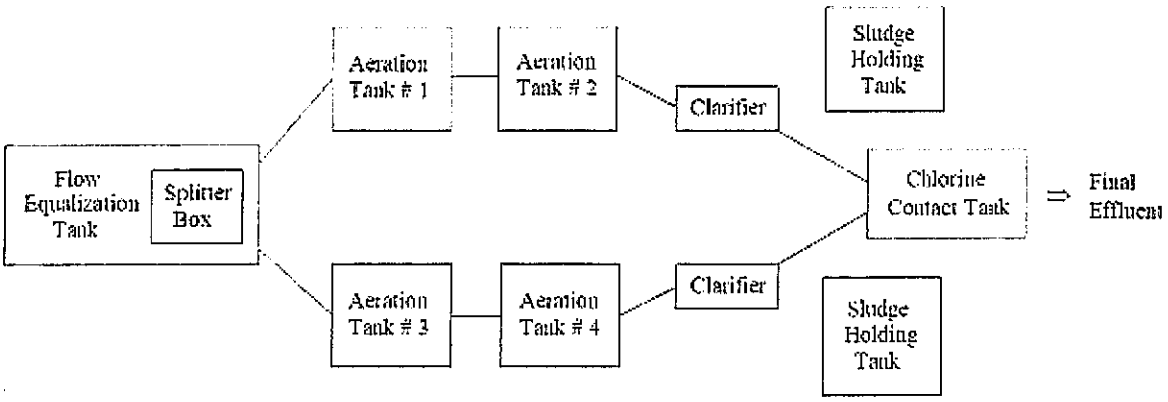
Diameter	Material	Footage	System
2"	PVC	585	Septic Tank Effluent Gravity (STEG)
2.5"	PVC	679	Septic Tank Effluent Gravity (STEG)
3"	PVC	116	Septic Tank Effluent Gravity (STEG)
4"	PVC	1,730	Septic Tank Effluent Gravity (STEG)
6"	PVC	8,247	Hillview Estates
8"	PVC	10,834	Interceptors, Cardinal Rd. (West), Skyline Dr.
Total		22,190	

The Septic Tank Effluent Gravity (STEG) component runs along Mountain Road (SR 4004) and is a combination system whereby solids are collected in septic tanks and liquids feed via gravity through small diameter pipes to Manhole LT9 and then continue to the WWTP via 8" PVC interceptors. Approximately 25 effluent pumps and septic tanks comprise the STEG system.

2. Treatment Process Narrative and Schematic

The Letterkenny Township Municipal Authority (LTMA) facilities operate a 0.042 MGD wastewater treatment plant. The treatment plant is an extended aeration, activated sludge type and was constructed by the developer of Hillview Estates in the late 1980's. The original design flow of the plant was 0.017 MGD and design organic removal was approximately 33.3 lbs/day. In 1995 the plant was upgraded to handle 0.042 MGD of flow and 82.2 lbs/day BOD removal. The purpose of the upgrade was to accommodate the remaining EDUs in Hillview Estates and allow connection of the Mountain Road residences and the Roxbury Holiness Camp Byers Conference Center and Legacy Retreat Center. In addition, collection capacity for Skyline Drive was made available. The Letterkenny Township WWTP schematic is shown in Figure 2.

Figure 2: Letterkenny Township Municipal Wastewater Treatment Plant Schematic



3. Description of Problems with Existing Facilities

LTMA entered into a Consent Order & Agreement (COA) on September 11, 2018, chiefly as a result of solids accumulation within the intermittent stream discharge point as well as DMR effluent violations that occurred between 2013 and 2018. The COA required several actions including an engineering evaluation of treatment plant operation and facilities, improvements to the disinfection system, and relocation of the outfall approximately 200' to discharge directly into the receiving stream. LTMA installed ultraviolet light disinfection equipment that became operational in November 2018. The outfall relocation remains at the design/permit stage. The engineering evaluation concluded in December 2018 and confirmed that the treatment facility tanks, processes, and appurtenances, including the aeration system, conform to the design guidelines of the Domestic Wastewater Facilities Manual.

However the report also noted that final-effluent aeration practices in the existing chlorine-contact tank must improve to consistently meet discharge-permit requirements for dissolved oxygen. These improvements require that operating staff optimize air flow (increase) to the existing final-effluent aeration system in the chlorine-contact tank. This practice requires relocation and reinstallation of the flow-meter downstream of the new ultraviolet light wastewater disinfection unit. Flow-meter relocation will resolve the problem of excessive diffused air interfering with the flow-metering weir.

4. Scheduled Treatment Facility Upgrades

YWC plans to continue operating the WWTP after the acquisition and make necessary capital improvements as warranted by the condition and performance of the various WWTP components.

5. Disposal Areas

Other than the outfall to the Conodoguinet Creek, the WWTP does not use any disposal areas for effluent.

IV. Future Growth and Land Development

Letterkenny Township is rural in nature and the population is scattered throughout the Township. Concentrations exist in Pleasant Hall, Upper Strasburg, Hill View Estates and the Kensington Heights area. The U.S. Census indicates the population for Letterkenny Township was 2,074 in the year 2000, and 2,318 in the year 2010. The population for 2017 was estimated to be 2,400 (2013-2017 American Community Survey 5-Year Estimates). Due to the Township's rural nature, minimal population growth is anticipated. The LTMA system currently serves 185 wastewater customers with no additional customers anticipated in 2019 and 4 additional customers anticipated in 2020.

V. Identify Alternatives to Provide New or Improved Wastewater Disposal Facilities

The Letterkenny Township wastewater system will require investment to continue to provide safe, reliable, and adequate wastewater conveyance and treatment services for Township residents. Letterkenny Township has determined that the sale of its wastewater assets is in the best long-term interest of its residents. The Township has reached an agreement with YWC to purchase the wastewater facilities.

Letterkenny Township is exiting the wastewater business primarily due to the lack of trained plant operators, increased regulations, and administrative burden on a small, rural township. YWC will be able to provide expertise and other benefits due to economies of scale.

VI. Evaluation of Alternatives

A. Evaluation of Selected Alternative

YWC has superior institutional and financial capabilities, and is well qualified to own, operate, improve and maintain the Letterkenny Township wastewater system in an efficient and effective manner. Proper management of the sewer facilities is a key element in the long-term performance of the wastewater system. Management includes ownership, operation, maintenance, repairs, replacement, and planned growth of the facilities. The Township has taken this into account while identifying potential buyers. The Township selected YWC because of the financial stability and proven experience in the operation and maintenance of wastewater systems.

The transaction will result in affirmative public benefits of a substantial nature. Reasons outlined below establish YWC's commitment and ability to address any currently unmet or future Letterkenny Township wastewater needs.

First, YWC has extensive experience in the operation of wastewater collection and treatment systems. YWC, as a large and long-established public utility, has the managerial, technical, and financial fitness to operate the System in a safe and efficient manner in compliance with the Pennsylvania Public Utility Code, the Pennsylvania Clean Streams Law, and all other applicable statutory and regulatory requirements.

Second, Letterkenny Township 's current customers will benefit in several ways from becoming YWC customers. YWC is a large, financially-sound company that has the capacity to finance necessary capital additions and improvements that will benefit its customers. In addition, given its size, its access to capital, and its recognized strengths in system planning, capital budgeting,

and construction management, YWC is well-positioned to ensure that high quality wastewater service meeting all applicable state and federal regulatory requirements is provided to Letterkenny Township's customers. Additionally, YWC is subject to the jurisdiction of the PA Public Utility Commission and must comply with its Code.

Third, Letterkenny Township's current customers will benefit from enhanced and proven customer service that YWC provides. These customer service enhancements include, but are not limited to, additional bill payment options, extended customer service and call center hours, enhanced customer information and education programs, and access to YWC's customer assistance program.

Finally, the transaction will benefit YWC's existing customers and Letterkenny Township's current customers in the long-term by expanding YWC's customer base. There will be no immediate rate impact on YWC's existing customers, and it is expected that the transaction will help YWC maintain reasonable rates for all its customers going forward. Customers who benefit from near-term improvements will one day help pay for improvements on behalf of other customers in other parts of the YWC system. Being able to spread the costs of investing in and maintaining public wastewater systems over a growing customer base, particularly in a time of increased environmental requirements, is essential to the continued success of wastewater systems and maintaining reasonable rates for customers. Indeed, the Pennsylvania General Assembly recognized, as a matter of public policy, the importance of consolidation and cost sharing in the passage of Act 11 of 2012. There is also a clear legislative intent associated with Section 1329 and its allowance of fair market valuation for ratemaking purposes. The General Assembly intended to facilitate the acquisition of municipal water and wastewater systems by investor-owned utilities for the benefit of municipal corporations and their customers.

The proposed sale and transfer of the Letterkenny Township wastewater system to YWC serves the public interest for numerous reasons:

- YWC is a technically-competent, economically-strong operator with substantial and deep experience in wastewater system operations.
- YWC's larger base and breadth of operations allow for economies of scale across the spectrum of operations, including purchasing power for commodities, more efficient staffing and shared support, and application of the latest technological capabilities.
- By transferring the wastewater assets to YWC, the system and its customers will become part of an exponentially larger customer base, under regulatory arrangements (including Pennsylvania Act 11) that allow a spreading of system costs across that larger base, thereby reducing potential rate shock and burdens that are inherent in having a small system bear major capital and operating expenses.
- The transfer offers prospects for improved customer service and operations under YWC ownership of the System.
- YWC will have better and more varied access to capital to make required System expenditures and improvements and comply with applicable legal requirements, such as collection system and pump station improvements.
- The transaction will bring additional expert oversight of the System from the Public Utility Commission and other agencies that routinely monitor utility operations and

participate in utility proceedings.

- As a private entity, YWC will be a taxpayer that will be paying additional property taxes that will increase revenues to the Township.

B. Proposed Purchase Price and Costs of Implementing Proposed Acquisition

Per the June 25, 2019 Agreement of Wastewater Collection System Sale Agreement, the purchase price for the Assets is $225,000.

The estimated costs of operating the Letterkenny Township Wastewater System are shown in the Independent Auditor's Report in Appendix A.

C. Analyze the Need for Immediate or Phased Implementation of the Proposed Alternative

All changes related to the proposed sale of the Letterkenny Township Wastewater System to YWC will be in effect on the date the acquisition closes.

D. Evaluate Administrative Organizations and Legal Authority Necessary for Plan Implementation

The York Water Company (YWC) is the oldest investor-owned water utility in the United States and is duly organized under the laws of the Commonwealth of Pennsylvania. YWC has operated continuously since 1816. YWC owns and operates three wastewater collection systems and two wastewater treatment systems. YWC operates within its franchised water territory, which covers 39 municipalities within York County, Pennsylvania and nine municipalities within Adams County, Pennsylvania. YWC's wastewater operations include portions of four municipalities in York County, Pennsylvania. YWC is regulated by the Pennsylvania Public Utility Commission (PUC) for both water and wastewater in the areas of billing, payment procedures, dispute processing, terminations, service territory, debt and equity financing and rate setting. YWC must obtain PUC approval before changing any practices associated with the aforementioned areas.

YWC's business does not require large amounts of working capital and is not dependent on any single customer or a very few customers for a material portion of its business. Increases in revenues are generally dependent on YWC's ability to obtain rate increases from the PUC in a timely manner and in adequate amounts and to increase volumes of water sold through increased consumption and increases in the number of customers served. YWC continuously looks for water and wastewater acquisition and expansion opportunities both within and outside its current service territory as well as additional opportunities to enter into bulk water contracts with municipalities and other entities to supply water.

YWC has agreements with several municipalities to provide sewer billing and collection services. YWC also has a service line protection program on a targeted basis in order to further diversify its business. Under this optional program, customers pay a fixed monthly fee, and YWC will repair or replace damaged customer service lines, as needed, subject to an annual maximum dollar amount. YWC continues to review and consider opportunities to expand both initiatives.

As a regulated utility, YWC operates within an exclusive franchised territory that is substantially

free from direct competition with other public utilities, municipalities and other entities. Although YWC has been granted an exclusive franchise for each of its existing community water and wastewater systems, the ability of YWC to expand or acquire new service territories may be affected by currently unknown competitors obtaining franchises to surrounding systems by application or acquisition. These competitors may include other investor-owned utilities, nearby municipally-owned utilities and sometimes competition from strategic or financial purchasers seeking to enter or expand in the water and wastewater industry. The addition of new service territory and the acquisition of other utilities are generally subject to review and approval by the PUC.

Provisions of water and wastewater service are subject to regulation under the federal Safe Drinking Water Act, the Clean Water Act and related state laws, and under federal and state regulations issued under these laws. In addition, YWC is subject to federal and state laws and other regulations relating to solid waste disposal, dam safety and other aspects of its operations.

The Clean Water Act regulates discharges from water and wastewater treatment facilities into lakes, rivers, streams and groundwater. YWC complies with this Act by obtaining and maintaining all required permits and approvals for discharges from its water and wastewater facilities and by satisfying all conditions and regulatory requirements associated with the permits.

PADEP monitors the quality of wastewater discharge effluent under the provisions of the National Pollutant Discharge Elimination System, or NPDES. YWC submits monthly reports to the DEP showing the results of its daily effluent monitoring and removal of sludge and biosolids. YWC is not aware of any significant environmental remediation costs necessary from the handling and disposal of waste material from its wastewater operations.

YWC has a strong and ongoing commitment to investing in and maintaining infrastructure, and an established track record of successfully managing large capital investment projects in order to continually provide reliable service to the communities it serves. In general, YWC has a more positive future financial outlook than Letterkenny Township. In this regard, the contemplated transaction will provide a public benefit to Letterkenny Township system customers because they will join YWC's large customer base. Because of its size and expertise in wastewater management and the leveraging of economies of scale, YWC will be able to improve efficiencies and lower the costs that would otherwise be incurred to operate the Letterkenny Township system and fund necessary improvements to the system. These efficiencies will help keep rates lower for the Letterkenny Township system customers than they would be if not allowed to become part of YWC's customer base.

Capital expenditures and operating costs required as a result of water quality standards and environmental requirements have been traditionally recognized by state public utility commissions as appropriate for inclusion in establishing rates. The capital expenditures currently required as a result of water quality standards and environmental requirements have been budgeted in the Company's capital program and represent less than 10% of its expected total capital expenditures over the next five years. YWC is currently in compliance with wastewater environmental standards and does not anticipate any major capital expenditures for its current wastewater business.

VII. Institutional Evaluation

A. Analysis and Description of Institutional Alternatives Necessary to Implement Proposed Alternatives

1. Need for New Municipal Departments or Municipal Authorities

Following the acquisition, the Letterkenny Township Sewer System will be owned and operated by YWC. Letterkenny Township Operations will become part of the existing YWC organizational structure, and no new departments or authorities will be created as part of this acquisition. LTMA will be legally dissolved and cease to exist. YWC will operate and maintain the Letterkenny Township Wastewater Treatment System utilizing a licensed operator supervised by existing staff from YWC. System staff will receive additional support from the YWC company-wide engineering, operations, human relations, legal and other service teams. Where necessary, operating staff will be supplemented with specialized services provided by both company-level and corporate parent and affiliate personnel, bringing specialized expertise and talents to bear to address particular issues and concerns.

2. Functions of Existing and Proposed Organizations

Upon closing the acquisition of the Letterkenny Township sewer system, the existing Letterkenny Township sewer customers will become direct customers of YWC. As direct customers of YWC, the wastewater tariff as approved by the Pennsylvania Public Utilities Commission (PUC) will define the rates, rules and regulations governing the furnishing of wastewater collection and disposal service. After the acquisition is completed, YWC will own and maintain one (1) WWTP and all collection system mains including customer service laterals from the main to the limits of the rights-of-way or easement as applicable. Laterals beyond that point on private property are the responsibility of the owner for proper operation and maintenance.

YWC would respond to and investigate and respond to any reports of sewer overflows. If the overflow is discovered within the YWC owned and maintained collection system, YWC will stabilize the situation and make corrective actions as necessary to eliminate the overflow. Blocked laterals within the right-of-way shall also be corrected by YWC. Blockage on the homeowner's side of the service is the responsibility of the homeowner..

3. Cost of Administration and Capability of Authority/Agency to Reaction to Future Needs

The Independent Auditor's Report for the year ended December 31, 2018 for the Letterkenny Township Municipal Authority is included in Appendix A.

YWC's Securities and Exchange Commission (SEC) Form 10-K Annual Report for the year ended December 31, 2018 is included in Appendix B.

YWC anticipates that the operations expenses will be similar to that of Letterkenny Township during its first year of operation. YWC will not be assuming any of Letterkenny Township's debt. Instead, Letterkenny Township will address its debt prior to closing.

B. Description of Administrative and Legal Activities

1. Incorporation of Authorities or Agencies

As owner and operator of the wastewater system, YWC will be responsible for the operation, maintenance, repair, replacement, and monitoring of all elements of the wastewater system within the former Letterkenny Township direct service territory, from the laterals at the point of the road right- of-way through the collection system piping.

2. Ordinances, Regulations, Standards, Agreements, Inter-Municipal Agreements

The Agreement of Wastewater Collection System Sale between YWC and Letterkenny Township contains provisions related to rates. YWC must keep 2019 rate of $45 per month until a new rate is approved by the PUC. YWC anticipates applying for a new rate in 4 to 5 years after acquisition of the system. After acquisition, YWC will implement quarterly billing.

Letterkenny Township has existing sewer ordinances that will remain in effect after the acquisition. Township supervisors are committed to the enforcement of all ordinances, codes and policies of the Township regarding planning, evaluation, design, construction, monitoring and maintenance of the wastewater facilities.

Letterkenny Township will maintain authority to enforce plumbing code and on-lot residential and commercial ordinances, in cooperation with YWC, including grease trap, sump pump and lateral inspection.

Letterkenny Township is expected to update/amend, maintain, and enforce ordinances (1) prohibiting or regulating the discharge into the sewage system of fats, oils, grease, acids and other prohibited substances consistent with the regulations governing the wastewater system (which are consolidated into the YWC IPP Regulations required by PaDEP); and (2) prohibiting the discharge into any sanitary sewer of surface or groundwater. YWC will work with Letterkenny Township if the ordinances need updating.

Letterkenny Township will remain responsible for sewage facilities planning in accordance with Act 537. YWC will be responsible for the ownership, operation, maintenance, upgrade, expansion, permitting and compliance.

YWC will be responsible for preparing the annual Chapter 94 Report as well as other wastewater system permits and notifications, including industrial discharge permitting and sanitary sewer overflow notifications. YWC will also be responsible for review and approval of planning modules for new connections with respect to the available collection, conveyance and treatment capacity.

Complaints regarding the public sewer system will be directed to YWC with the ability to contact the Township if issues are not adequately handled to obtain assistance in resolving problems. Private sewer systems and on-lot systems will be the responsibility of the property owner.

After the acquisition, agreements and inter-municipal agreements can be negotiated by YWC with other sewer authorities or municipalities. If new development or redevelopment is proposed, YWC will cooperate with Letterkenny Township in the review and approval of sewage facility planning modules for such projects. YWC will accept, convey, and treat all

domestic sewage flows from such development/redevelopment projects within the certificated franchise are. YWC will accept, convey and treat new or increased industrial wastewaters of quantities and physical/chemical characteristics consistent with YWC's IPP regulations, all applicable federal and state regulations and NPDES permit requirements, and the hydraulic and treatment capacity of the Letterkenny Township WWTP.

Letterkenny Township shall be the responsible party for any municipal separate storm sewer system (MS4). If any existing combined sewer systems, which there are none currently known, are separated into separate sanitary only systems and MS4 stormwater systems, the facilities and assets relating to the MS4 systems will be conveyed to and become the responsibility of the involved municipality or responsible party.

3. Transfer of Rights-of-Way, Easements, and Land Transfers

   Pursuant to the Agreement of Wastewater Collection System Sale, Letterkenny Township will convey to YWC all of Letterkenny Township's rights to all real and personal property comprising the wastewater system, including all property owned in fee, all easements, and all rights-of-way for the wastewater system's collection, pumping, and discharge facilities. As a PUC-regulated public utility, YWC has the right to obtain rights-of-way within municipal streets and highways for underground water and wastewater lines, and YWC anticipates cooperating with the involved municipalities in the siting and installation of such facilities. Where the acquisition of easements or other rights to private property are necessary, YWC endeavors to negotiate an amicable purchase of such rights on mutually acceptable terms where feasible. Where necessary, as a PUC-regulated facility, YWC may exercise the power of eminent domain to acquire easements or property under the provisions of the Eminent Domain Code.

4. Adoption of Other Municipal Sewage Facilities Plans

   Letterkenny Township would be responsible for any required adoption of other municipal sewage facilities plans that impact the sewage disposal needs of Letterkenny Township. YWC, as owner and operator of the Letterkenny Township wastewater system, would provide stakeholder input and be involved in the planning process of other municipal sewage facility plans that may affect the Letterkenny Township wastewater system.

5. Other Legal Documents

   Not Applicable

6. Dates or Timeframes for Items 1 to 5 Above

   Items 1 to 5 above would be in effect at the date of the closing.

C. Justification for Choosing Specific Institutional Alternative

YWC is the Nation's oldest investor-owned provider of water and wastewater services. As a leading water and wastewater provider in Pennsylvania, YWC brings significant expertise and has extensive technical experience in upgrading, operating, and maintaining sewer facilities. YWC provides well-maintained and reliable water and wastewater service and has extensive local knowledge due to our decades of experience providing services to numerous communities in nearby York and Adams Counties. Given YWC's existing

platform in relation to operation of water and wastewater systems in the region, YWC is best positioned to provide wastewater service to Letterkenny Township on a cost-effective basis.

YWC currently employs approximately 110 professionals with expertise in all areas of water and wastewater utility operations including engineering, regulatory compliance, water and WWTP operation and maintenance, distribution and collection system operation and maintenance, material management, risk management, human resources, legal, accounting, and customer service. YWC is well positioned to address the projected operating and capital expense requirements for the Letterkenny Township Municipal Authority sewer system area. YWC's current market valuation is approximately $400 million.

Additional information about reasons for public benefits provided by the proposed Letterkenny Township Municipal Authority wastewater system transfer to YWC is provided in Section VI(A).

As a PUC-regulated public utility, the rates charged by YWC for water and wastewater services are regulated by the PUC through a process, which provides clear and robust opportunities for involvement and participation by affected communities and consumers.

The PUC is composed of five commissioners, appointed by the Governor with the advice and consent of the Pennsylvania Senate. The commissioners serve terms of five years. The PUC is an independent commission, meaning that it is not under the direction of the Governor or any other political entity. It is charged with making regulatory decisions, including decisions relating to rates, based on the evidence and applicable law.

In order to provide economical and efficient service to a community, the state grants to water and wastewater companies the right to provide service within a specified geographic area, subject to regulation by the PUC of both the quality and terms of service and the rates charged for those services. The ratemaking and approval process involves multiple steps, and is subject to articulated criteria for assuring fair and reasonable rates.

The Rate Filing: When a regulated utility such as YWC seeks an increase or change in its base rates, it must file a request with the PUC that shows the proposed new rates and effective date, and must prove that the increase is needed. The utility also must notify customers at least 60 days in advance. The notice must include the amount of the proposed rate increase, the proposed effective date, and how much more the consumer can expect to pay.

YWC seeks rate increases only when warranted. Because rate proceedings are time-consuming and complex, as a general matter, YWC typically files rate proceedings on a 3 to 4 year cycle. As noted below, in these periodic rate proceedings, YWC has been seeking to utilize the authorities provided under Pennsylvania's Act 11 to more broadly spread costs over its larger customer base in order to moderate cost increases and mitigate to the extent possible major increases impacting localized systems, where major capital improvements are required to meet environmental or other regulatory mandates.

How the PUC Sets Rates: The PUC ratemaking process ensures the lowest reasonable rate for consumers while maintaining the financial stability of utilities. Under the Public Utility Code, a utility is entitled to recovery of its reasonably incurred expenses and a fair return on its investment. The PUC evaluates each utility's request for a rate increase based on those criteria.

In a rate proceeding, YWC is required to provide detailed information concerning its historic and

projected costs of operation (including predictive and preventive maintenance, repair and replacement) and its historic and projected program of capital improvements across all elements of its water and wastewater systems. Annualized costs are typically projected to a future "test" year, which is usually one year following the rate proceeding. The process of determining those costs, and allocating such costs among different classes of consumers (e.g., residential, commercial and industrial customers) involves a series of evaluations and cost-of-service studies. Only those costs determined to be "reasonable and prudent" may be recovered, and in rate proceedings, the PUC will examine whether costs claimed are appropriately justified and reasonable.

The PUC Review Process: The PUC rate review process is far more detailed and arduous than that followed by municipalities and municipal authorities. By operation of law, the rate request is suspended for up to seven months if the PUC does not act before the proposed effective date for the rate increase for water and wastewater companies. The PUC uses that time to investigate and determine what, if any, of the requested increase is justified.

The PUC's Bureau of Investigation and Enforcement {I&E) and public advocates, including the state's Office of Consumer Advocate (OCA) and Office of Small Business Advocate (OSBA), intervene and participate in that process. I&E reviews the company's records and their request and presents its view on what is in the public interest. Individual consumers may become formal parties by filling out a formal complaint form. OCA and OSBA represent consumers and small businesses respectively, and likewise examine in detail the background and materials submitted by the utility. Prior to hearings on the proposed rates, I&E, OCA, OSBA and others submit information requests to the utility and obtain responses to better understand and investigate the facts behind the proposed rates.

When the PUC investigates a rate increase, it is assigned to an Administrative Law Judge (ALJ), who is an attorney with experience in administrative law. The ALJ presides at formal hearings, which are open to the public and conducted like a formal court proceeding. At the formal hearing, the utility, I&E, OCA, OSBA and other parties present their cases and are subject to cross-examination. Consumers may speak for themselves, or an attorney may represent individual consumers or groups of consumers. Consumers also can have their say informally by writing or calling the PUC or completing the objection/ comment form. Consumers also may testify at public input hearings.

By providing testimony, consumers place their views in the official record on the case. Public input hearings are conducted by the ALJ in the utility's service territory. Consumer testimony becomes part of the record on which the PUC will base its decision.

Following the conclusion of hearings before the ALJ, the entire record of testimony, documents and other evidence is compiled. Proposed findings of fact and briefs may be submitted by the formal parties. After weighing the evidence and hearing the arguments, the ALJ writes a recommended decision addressing each issue in the case within the limits set by law. The recommended decision may approve, disapprove or modify the original request. The ALJ's report and recommended decision are presented to the PUC Commissioners. Parties to the rate case may file exceptions to the ALJ's report, and responses to objections presented by other parties.

Finally, the matter is brought before the PUC Commissioners for a vote and final decision. The Commissioners make the final decision, authorizing rates that: (1) permit revenues that allow the company to meet its reasonable expenses, pay interest on its debt and provide a fair return

to stockholders so it will continue to attract investment; and (2) assign the proper rate for residential, commercial and industrial customers that reflects the cost of service.

Together with the 60-day notice period, the PUC's administrative rate review and hearing process takes about nine months. Decisions made by the PUC may be appealable. Aggrieved parties may seek review of the PUC's determinations through an appeal to the Commonwealth Court. The Commonwealth Court's decisions, in turn, may be subject to review by the Supreme Court of Pennsylvania if that court grants a petition to allow appeal.

Collection System Improvement Charge Process: The paragraphs above describe the process for a base rate proceeding, which sets the basic water and wastewater rates for YWC's systems. In the period between periodic base rate cases, the Public Utility Code allows for wastewater companies to calculate and assess a Collection System Improvement Charge (CISC), which allows a limited surcharge on customer bills to accelerate the replacement of existing aging facilities that might otherwise be deferred until completion of a base rate case. Eligible projects involve principally replacement investments, not system expansions or extensions of facilities to serve new customers. System improvement charges are designed to provide ratepayers with improved service quality; greater rate stability; fewer main breaks; fewer service interruptions; and increased safety. The maximum amount of a CISC is a cumulative 5% above base rates. The CISC process involves an annual review by the PUC and reconciliation of recoverable costs and revenues associated with the charge, and an annual reconciliation hearing under Section 1307(e) of the Public Utility Code. The PUC conducts audits to assure that funds generated from a CISC surcharge are spent on CISC-eligible projects.

VIII. Implementation Schedule and Justification for Selected Alternatives

A. Identify Technical Wastewater Disposal Alternative

As indicated above, the selected alternative involves a sale of the Letterkenny Township Municipal Authority wastewater system to YWC, with YWC becoming the owner and operator of all wastewater system assets within the direct service territory. Responsibilities for implementation of elements of the Act 537 Plan would be assigned as described above.

The selected alternative is the best alternative based on the following considerations:

1. Existing Wastewater Disposal Needs

   The selected alternative assures that existing wastewater needs will be managed by a well-experienced, technically-competent, economically-sound public utility company with deeper resources, broader experience, and stronger access to capital than Letterkenny Township. YWC has a strong record of managing water and wastewater systems, for marshalling resources, planning and constructing capital projects, and managing systems on a sustainable basis using modern preventive and predictive maintenance methods and leading edge system management technologies. The depth of resources brought by YWC and its parent and affiliated companies, which supplement a sound staffing plan for the local system, assure proper long-term capability of meeting existing wastewater needs.

2. Future Wastewater Disposal Needs

   Likewise, the selected alternative provides a means of meeting future wastewater disposal

needs. System acquisition by YWC, which opens the door to broader access to capital together with the potential for spreading costs over a broader customer base via Act 11, promises improved capabilities to meet these current and future wastewater needs.

3. Operation and Maintenance Considerations

The selected alternative provides a foundation to sustain over the long-term and improve operational and maintenance practices. YWC's preventive and predictive maintenance programs, coupled with the engineering and operational experience of YWC engineering and operations management and staff, will bring more modern methods, practices and technologies to the Letterkenny Township wastewater system. YWC's platform offers the capability of supporting the system with shared services and expert staff, providing more cost-effective and efficient staffing. YWC's purchasing practices for key inputs, such as chemicals and commodities, offer market volume purchasing and negotiating advantages.

4. Available Management and Administrative Systems

YWC has been a leader in water and wastewater system-sustainable management. Under the selected alternative, YWC brings predictive/preventive maintenance programs, system automation and monitoring systems, a well-experienced engineering and operations management team, and well-developed programs for capital investment and system improvement.

5. Environmental Soundness and Compliance with Natural Resources Planning and Preservation Programs

Under the selected alternative, the Letterkenny Township wastewater system will be operated in a manner that best assures compliance with applicable environmental regulations, including the Pennsylvania Clean Streams Law and Clean Water Act. The basic wastewater system will remain as currently contemplated by the Act 537 Plan (and hence no significant changes are anticipated in relation to the system's consistency with natural resource planning or preservation programs). In short, YWC is bringing to the Letterkenny Township Municipal Authority wastewater system the expertise and resources necessary to address any water quality and environmental problems.

B. Designate and Describe Implementation Schedule

Meeting with PaDEP	August 15, 2019
Update special study to DEP Guidance	August-October 2019
Prepare draft resolution and public notice	September 2019
Attend and explain special study to Letterkenny Township Planning Commission	September 24, 2019
Attend and explain special study to Letterkenny Township Supervisors	September 24, 2019
Submit special Study to Letterkenny Township and Franklin County Planning Commission	October 3, 2019

Advertise public notice in newspaper	October 3 and 11, 2019
Incorporate comments received from Letterkenny Township and Franklin County Planning Commission into the Plan	November 2019
Public Meeting / Letterkenny Township Resolution Adoption	November 5, 2019
Formal submission to PaDEP	November 7, 2019
PaDEP Approval of Act 537 Plan Special Study	December 31, 2019

Appendix A

Independent Auditor's Report of LTMA

INDEPENDENT AUDITOR'S REPORT

To the Board of Directors
Letterkenny Township
Municipal Authority
Orrstown, Pennsylvania

We have audited the accompanying statement of assets, liabilities, and net assets-modified accrual basis of Letterkenny Township Municipal Authority, a component unit, as of December 31, 2018, and the related statements of revenues, expenses, and change in net assets-modified accrual basis, and statement of cash flows for the year then ended. These financial statements are the responsibility of the Authority's management. Our responsibility is to express an opinion on these financial statements based on our audit.

We conducted our audit in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. Our audit also includes examining, on a test basis, evidence supporting the amounts and disclosures in financial statements as well as evaluating the overall financial statement presentation. We believe that our audit provides a reasonable basis for our opinion.

In conducting the Audit, we reviewed the following: minutes from the meetings, insurance policies, budget, permits, bank statements and deposits, invoices for expenses, list of overdue customers and found everything in order.

In our opinion, the financial statements referred to above present fairly in all material respects the financial position of Letterkenny Municipal Authority as of December 31, 2018.

In accordance with the general elected auditor's standards, we have also issued our report dated May 20, 2019 on our consideration of Letterkenny Township Municipal Authority's internal control over financial reporting and our tests of its compliance with certain provisions of laws, regulations, contracts and grants.

Letterkenny Township Elected Auditors

Mike Shaffer
Kathy Johnson
Debra Fluke

May 20, 2019

LETTERKENNY TOWNSHIP MUNICIPAL AUTHORITY
FRANKLIN COUNTY, PENNSYLVANIA
Statement of Revenue and Expenses
For the Year Ended December 31, 2018

Revenues	
Sewer System Revenue	$ 87,149
Grant Monies	50,090
Connection Fees	20,775
Interest Earnings	330
Miscellaneous	96
Inspection Fees	100
Total Revenues	$ 158,540
Operating Expenses	
Mileage Reimbursement	176
Engineer	8044
Collection (Non-Payment) DJ Fees	522
Hillview T.P.	
Chapter 94 Report	525
Telephone Charges	686
Chemical Supplies	1911
Daily Operations	12,898
Electric	9,431
Equipment	24,989
Lab Test/Oversite	4,180
Main Repairs/Supplies	6668
Main Repairs/Service	4,341
Sludge Removal	23,515
Permits	4,413
Total Hillview T.P.	$ 93,557
Clerk Bond	0
Mountain Road- Pump Tanks	370
Skyline Drive Project	64,202
Auditors	1,386
Board Expense	1,375
Insurance	666
Legal	4,000
Office Supplies	873
Secretarial/Admin Wages	3,460
Advertising	0
Misc	0
Total Expenses	$ 178,631
Net Ordinary Income	$ (- 20,091)
Net Income	$ (-20,091)

LETTERKENNY TOWNSHIP MUNICIPAL AUTHORITY
FRANKLIN COUNTY, PENNSYLVANIA

Statement of Assets, Liabilities, Reserves,

For the year ending December 31, 2018

Assets

Current Assets		
Cash in Bank		$ 62,913
Investments		0
Property, Plant and Equipment		
Property, Plant and Equipment	514,603	
Less: Accumulated Depreciation	- 317,627	
Total Property, Plant and Equipment		196,976
Total Assets		259,889

Liabilities

Current Liabilities	None
Total Current Liabilities	None
Long-Term Indebtedness	None
Total Liabilities and Reserves	$ 259,889

LETTERKENNY TOWNSHIP MUNCIPAL AUTHORITY
Statement of Cash Flows
FOR THE YEAR ENDED DECEMBER 31, 2018

CASH FLOWS FROM OPERATING ACTIVITIES	
Grant Monies received from State	$ 50,090
Cash received from customers	108,120
Cash paid to suppliers	178,631
NET CASH PROVIDED (USED) BY OPERATING ACTIVITIES	(-20,421)
CASH FLOWS FROM INVESTING ACTIVITIES	
Interest received	330
NET CASH PROVIDED (USED) BY INVESTING ACTIVITIES	330
NET INCREASE (DECREASE) IN CASH	(-20,091)
CASH AT BEGINNING OF YEAR	83,005
CASH/INVESTMENTS AT END OF YEAR	$ 62,914
RECONCILIATION OF OPERATING INCOME TO NET CASH PROVIDED (USED) BY OPERATING ACTIVITIES	
Net operating income	$ (-20,091)
Adjustments to reconcile operating income to net cash Provided (used) by operating activities	
Depreciation	13,596
TOTAL ADJUSTMENTS	13,596
NET CASH PROVIDED (USED) BY OPERATING ACTIVITIES	$ (-6,495)

LETTERKENNY TOWNSHIP MUNICIPAL AUTHORITY
FRANKLIN COUNTY, PENNSYLVANIA
Notes to Financial Statements
December 31, 2018

Summary of Significant Accounting Policies

Purpose of Authority

The authority has been incorporated under the provisions of the Municipal Authorities Act of 1945 for the purpose of constructing a sewer to benefit the Township of Letterkenny, Franklin County.

Basis of Accounting

These Accompanying financial statements have been prepared on the modified accrual basis of accounting.

Property, Plant and Equipment

This account includes engineering and mapping costs together with interim financing costs and administrative expenses of the Authority for the initial system as well as cost of improvements since the system was originally constructed. These costs are being depreciated using the straight-line method over their estimated useful lives.

Appendix B

York Water Company SEC Filing

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 10-K

(Mark One)

☒ ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d)OF THE SECURITIES EXCHANGE ACT OF 1934
For the fiscal year ended December 31, 2018

OR

☐ TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For the transition period from _____to_____

Commission file number 001-34245

THE YORK WATER COMPANY
(Exact name of registrant as specified in its charter)

"That good York water"
SINCE 1816

PENNSYLVANIA	23-1242500
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification No.)
130 EAST MARKET STREET, YORK, PENNSYLVANIA	17401
(Address of principal executive offices)	(Zip Code)

Registrant's telephone number, including area code (717) 845-3601

Securities registered pursuant to Section 12(b) of the Act:	None (Title of Each Class)	The NASDAQ Global Select Market (Name of Each Exchange on Which Registered)
Securities registered pursuant to Section 12(g) of the Act:	COMMON STOCK, NO PAR VALUE (Title of Class)	

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act.
☐ YES ☒ NO

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act.
☐ YES ☒ NO

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days.
☒ YES ☐ NO

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T (§ 232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files).
☒ YES ☐ NO

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§ 229.405 of this chapter) is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. ☒

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer ☐ Accelerated filer ☒ Non-accelerated filer ☐

Small reporting company ☒ Emerging growth company ☐

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act).
☐ YES ☒ NO

The aggregate market value of the Common Stock, no par value, held by nonaffiliates of the registrant on June 30, 2018 was $410,673,686.

As of March 12, 2019 there were 12,945,790 shares of Common Stock, no par value, outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the Proxy Statement for the Company's 2019 Annual Meeting of Shareholders are incorporated by reference into Part I and Part III.

Discovery A-9 - Attachment 2

TABLE OF CONTENTS

Forward-Looking Statements		3
PART I		
Item 1.	Business	4
Item 1A.	Risk Factors	8
Item 1B.	Unresolved Staff Comments	8
Item 2.	Properties	8
Item 3.	Legal Proceedings	9
Item 4.	Mine Safety Disclosures	9
PART II		
Item 5.	Market for the Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities	10
Item 6.	Selected Financial Data	10
Item 7.	Management's Discussion and Analysis of Financial Condition and Results of Operation	10
Item 7A.	Quantitative and Qualitative Disclosures About Market Risk	20
Item 8.	Financial Statements and Supplementary Data	20
Item 9.	Changes in and Disagreements with Accountants on Accounting and Financial Disclosure	52
Item 9A.	Controls and Procedures	52
Item 9B.	Other Information	53
PART III		
Item 10.	Directors, Executive Officers and Corporate Governance	54
Item 11.	Executive Compensation	54
Item 12.	Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters	55
Item 13.	Certain Relationships and Related Transactions, and Director Independence	55
Item 14.	Principal Accounting Fees and Services	55
PART IV		
Item 15.	Exhibits and Financial Statement Schedules	56
Item 16.	Form 10-K Summary	60
Signatures		62

FORWARD-LOOKING STATEMENTS

Certain statements contained in this annual report and in documents incorporated by reference constitute "forward-looking statements" within the meaning of Section 21E of the Securities Exchange Act of 1934 and Section 27A of the Securities Act of 1933. Words such as "may," "should," "believe," "anticipate," "estimate," "expect," "intend," "plan" and similar expressions are intended to identify forward-looking statements. These forward-looking statements include certain information relating to the Company's business strategy and future prospects; including, but not limited to:

- the amount and timing of rate increases and other regulatory matters including the recovery of costs recorded as regulatory assets;
- expected profitability and results of operations;
- trends;
- goals, priorities and plans for, and cost of, growth and expansion;
- strategic initiatives;
- availability of water supply;
- water usage by customers; and
- the ability to pay dividends on common stock and the rate of those dividends.

The forward-looking statements in this Annual Report reflect what the Company currently anticipates will happen. What actually happens could differ materially from what it currently anticipates will happen. The Company does not intend to make a public announcement when forward-looking statements in this Annual Report are no longer accurate, whether as a result of new information, what actually happens in the future or for any other reason. Important matters that may affect what will actually happen include, but are not limited to:

- changes in weather, including drought conditions or extended periods of heavy rainfall;
- levels of rate relief granted;
- the level of commercial and industrial business activity within the Company's service territory;
- construction of new housing within the Company's service territory and increases in population;
- changes in government policies or regulations, including the tax code;
- the ability to obtain permits for expansion projects;
- material changes in demand from customers, including the impact of conservation efforts which may impact the demand of customers for water;
- changes in economic and business conditions, including interest rates, which are less favorable than expected;
- loss of customers;
- changes in, or unanticipated, capital requirements;
- the impact of acquisitions;
- changes in accounting pronouncements;
- changes in the Company's credit rating or the market price of its common stock; and
- the ability to obtain financing.

THE YORK WATER COMPANY

PART I

Item 1. Business.

The York Water Company (the "Company") is the oldest investor-owned water utility in the United States and is duly organized under the laws of the Commonwealth of Pennsylvania. The Company has operated continuously since 1816. The primary business of the Company is to impound, purify to meet or exceed safe drinking water standards and distribute water. The Company also owns and operates three wastewater collection systems and two wastewater treatment systems. The Company operates within its franchised water territory, which covers 39 municipalities within York County, Pennsylvania and nine municipalities within Adams County, Pennsylvania. The Company's wastewater operations include portions of four municipalities in York County, Pennsylvania. The Company is regulated by the Pennsylvania Public Utility Commission, or PPUC, for both water and wastewater in the areas of billing, payment procedures, dispute processing, terminations, service territory, debt and equity financing and rate setting. The Company must obtain PPUC approval before changing any practices associated with the aforementioned areas.

Water service is supplied through the Company's own distribution system. The Company obtains the bulk of its water supply from both the South Branch and East Branch of the Codorus Creek, which together have an average daily flow of 73.0 million gallons. This combined watershed area is approximately 117 square miles. The Company has two reservoirs, Lake Williams and Lake Redman, which together hold up to approximately 2.2 billion gallons of water. The Company supplements its reservoirs with a 15-mile pipeline from the Susquehanna River to Lake Redman which provides access to an additional supply of 12.0 million gallons of untreated water per day. The Company also owns seven wells which are capable of providing a safe yield of approximately 366,000 gallons per day to supply water to its customers in Carroll Valley Borough and Cumberland Township, Adams County. As of December 31, 2018, the Company's average daily availability was 35.4 million gallons, and average daily consumption was approximately 19.5 million gallons. The Company's service territory had an estimated population of 199,000 as of December 31, 2018. Industry within the Company's service territory is diversified, manufacturing such items as fixtures and furniture, electrical machinery, food products, paper, ordnance units, textile products, air conditioning systems, laundry detergent, barbells and motorcycles.

The Company's water business is somewhat dependent on weather conditions, particularly the amount and timing of rainfall. Revenues are particularly vulnerable to weather conditions in the summer months. Prolonged periods of hot and dry weather generally cause increased water usage for watering lawns, washing cars, and keeping golf courses and sports fields irrigated. Conversely, prolonged periods of dry weather could lead to drought restrictions from governmental authorities. Despite the Company's adequate water supply, customers may be required to cut back water usage under such drought restrictions which would negatively impact revenues. The Company has addressed some of this vulnerability by instituting minimum customer charges which are intended to cover fixed costs of operations under all likely weather conditions.

The Company's business does not require large amounts of working capital and is not dependent on any single customer or a very few customers for a material portion of its business. Increases in revenues are generally dependent on the Company's ability to obtain rate increases from the PPUC in a timely manner and in adequate amounts and to increase volumes of water sold through increased consumption and increases in the number of customers served. The Company continuously looks for water and wastewater acquisition and expansion opportunities both within and outside its current service territory as well as additional opportunities to enter into bulk water contracts with municipalities and other entities to supply water.

The Company has agreements with several municipalities to provide sewer billing and collection services. The Company also has a service line protection program on a targeted basis in order to further diversify its business. Under this optional program, customers pay a fixed monthly fee, and the Company will repair or replace damaged customer service lines, as needed, subject to an annual maximum dollar amount. The Company continues to review and consider opportunities to expand both initiatives.

Competition

As a regulated utility, the Company operates within an exclusive franchised territory that is substantially free from direct competition with other public utilities, municipalities and other entities. Although the Company has been granted an exclusive franchise for each of its existing community water and wastewater systems, the ability of the Company to expand or acquire new service territories may be affected by currently unknown competitors obtaining franchises to surrounding systems by application or acquisition. These competitors may include other investor-owned utilities, nearby municipally-owned utilities and sometimes competition from strategic or financial purchasers seeking to enter or expand in the water and wastewater industry. The addition of new service territory and the acquisition of other utilities are generally subject to review and approval by the PPUC.

Water and Wastewater Quality and Environmental Regulations

Provisions of water and wastewater service are subject to regulation under the federal Safe Drinking Water Act, the Clean Water Act and related state laws, and under federal and state regulations issued under these laws. In addition, the Company is subject to federal and state laws and other regulations relating to solid waste disposal, dam safety and other aspects of its operations.

The federal Safe Drinking Water Act establishes criteria and procedures for the U.S. Environmental Protection Agency, or EPA, to develop national quality standards. Regulations issued under the Act, and its amendments, set standards on the amount of certain contaminants allowable in drinking water. Current requirements are not expected to have a material impact on the Company's operations or financial condition as it already meets or exceeds standards. In the future, the Company may be required to change its method of treating drinking water and may incur additional capital investments if new regulations become effective.

Under the requirements of the Pennsylvania Safe Drinking Water Act, or SDWA, the Pennsylvania Department of Environmental Protection, or DEP, monitors the quality of the finished water supplied to customers. The DEP requires the Company to submit weekly reports showing the results of daily bacteriological and other chemical and physical analyses. As part of this requirement, the Company conducts over 70,000 laboratory tests annually. Management believes that the Company complies with the standards established by the agency under the SDWA. The DEP assists the Company by regulating discharges into the Company's watershed area to prevent and eliminate pollution.

The federal Groundwater Rule establishes rules for community water supplies serving between 100 and 500 customers. This rule requires additional testing of water from well sources, and under certain circumstances requires demonstration and maintenance of effective disinfection. The Company holds public water supply permits issued by the DEP, which establishes the groundwater source operating conditions for its wells, including demonstrated 4-log treatment of viruses. All of the satellite systems operated by the Company are in compliance with the federal Groundwater Rule.

The Clean Water Act regulates discharges from water and wastewater treatment facilities into lakes, rivers, streams and groundwater. The Company complies with this Act by obtaining and maintaining all required permits and approvals for discharges from its water and wastewater facilities and by satisfying all conditions and regulatory requirements associated with the permits.

The DEP monitors the quality of wastewater discharge effluent under the provisions of the National Pollutant Discharge Elimination System, or NPDES. The Company submits monthly reports to the DEP showing the results of its daily effluent monitoring and removal of sludge and biosolids. The Company is not aware of any significant environmental remediation costs necessary from the handling and disposal of waste material from its wastewater operations.

Lead and copper may enter drinking water primarily through plumbing materials. The Company is required to comply with the Lead and Copper Rule established by the EPA and administered by the DEP. The Company must monitor drinking water at customer taps for compliance with this rule. If lead concentrations exceed an action level, the Company must undertake a number of additional actions to control corrosion, inform the public about steps they should take to protect their health and may be required to replace lead service lines under its control. See "Management's Discussion and Analysis – Environmental Matters" for a discussion of the Company's compliance with the Lead and Copper rule.

The DEP and the Susquehanna River Basin Commission, or SRBC, regulate the amount of water withdrawn from streams in the watershed to assure that sufficient quantities are available to meet the needs of the Company and other regulated users. Through its Division of Dam Safety, the DEP regulates the operation and maintenance of the Company's impounding dams. The Company routinely inspects its dams and prepares annual reports of their condition as required by DEP regulations. The DEP reviews these reports and inspects the Company's dams. The DEP most recently inspected the Company's dams in 2017 and noted no significant violations.

Since 1980, the DEP has required any new dam to have a spillway that is capable of passing the design flood without overtopping the dam. The design flood is either the Probable Maximum Flood, or PMF, or some fraction of it, depending on the size and location of the dam. PMF is very conservative and is calculated using the most severe combination of meteorological and hydrologic conditions reasonably possible in the watershed area of a dam.

The Company engaged a professional engineer to analyze the spillway capacities at the Lake Williams and Lake Redman dams and validate the DEP's recommended flood design for the dams. Management presented the results of the study to the DEP in December 2004, and DEP then requested that the Company submit a proposed schedule for the actions to address the spillway capacities. Thereafter, the Company retained an engineering firm to prepare preliminary designs for increasing the spillway capacities to pass the PMF through armoring the dams with roller compacted concrete. Management has met with the DEP on a regular basis to review the preliminary design and discuss scheduling, permitting, and construction requirements. The Company is currently completing preliminary work on the dams as well as the final design and the permitting process. The Company expects to finalize its plans in 2019 and begin armoring one of the dams in 2020. The second dam is expected to be armored in a year or two following the first dam armoring. The cost to armor each dam is expected to be approximately $5.5 million.

Capital expenditures and operating costs required as a result of water quality standards and environmental requirements have been traditionally recognized by state public utility commissions as appropriate for inclusion in establishing rates. The capital expenditures currently required as a result of water quality standards and environmental requirements have been budgeted in the Company's capital program and represent less than 10% of its expected total capital expenditures over the next five years. The Company is currently in compliance with wastewater environmental standards and does not anticipate any major capital expenditures for its current wastewater business.

Growth

During the three year period ended December 31, 2018, the Company continued to grow the number of customers and its distribution facilities.

The following table sets forth certain of the Company's summary statistical information.

(In thousands of dollars)	For the Years Ended December 31,		
	2018	2017	2016
Revenues:			
Residential	$31,281	$31,257	$30,218
Commercial and industrial	13,578	13,729	13,760
Other	3,578	3,603	3,606
Total	$48,437	$48,589	$47,584
Average daily water consumption (gallons per day)	19,517,000	18,378,000	18,798,000
Miles of water mains at year-end	980	973	967
Miles of wastewater mains at year-end	19	19	8
Additional water distribution mains installed/acquired (ft.)	36,598	31,709	46,368
Wastewater collection mains acquired (ft.)	-	57,386	-
Number of customers at year-end	70,263	69,604	67,052
Population served at year-end	199,000	198,000	196,000

Executive Officers of the Registrant

The Company presently has 109 full time employees including the officers detailed in the information set forth under the caption "Executive Officers of the Company" of the 2019 Proxy Statement incorporated herein by reference.

Available Information

The Company makes available free of charge, on or through its website (www.yorkwater.com), its annual report on Form 10-K, its quarterly reports on Form 10-Q, current reports on Form 8-K, and amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Exchange Act as soon as reasonably practicable after the Company electronically files such material with, or furnishes it to, the SEC. The SEC also maintains a website at www.sec.gov that contains reports, proxy statements, and other information about SEC registrants, including the Company.

Shareholders may request, without charge, copies of the Company's financial reports. Such requests, as well as other investor relations inquiries, should be addressed to:

Molly E. Norton	The York Water Company	(717) 718-2942
Investor Relations &	130 East Market Street	(800) 750-5561
Communications Administrator	York, PA 17401	mollyn@yorkwater.com

Item 1A. Risk Factors.

Not applicable.

Item 1B. Unresolved Staff Comments.

None.

Item 2. Properties.

Source of Water Supply

The Company owns two impounding dams located in York and Springfield Townships adjoining the Borough of Jacobus to the south. The lower dam, the Lake Williams Impounding Dam, creates a reservoir covering approximately 165 acres containing about 870 million gallons of water. The upper dam, the Lake Redman Impounding Dam, creates a reservoir covering approximately 290 acres containing about 1.3 billion gallons of water.

In addition to the two impounding dams, the Company owns a 15-mile pipeline from the Susquehanna River to Lake Redman that provides access to a supply of an additional 12.0 million gallons of water per day.

The Company also owns three satellite water systems in Adams County, Pennsylvania. The Carroll Valley Water System consists of two groundwater wells capable of providing a safe yield of approximately 100,000 gallons per day with a current average daily consumption of 16,000 gallons per day. The Western Cumberland Water System consists of three groundwater wells capable of providing a safe yield of 144,000 gallons per day with a current average daily consumption of 20,000 gallons per day. The Eastern Cumberland Water System consists of two groundwater wells capable of providing a safe yield of 122,000 gallons per day with a current average daily consumption of 29,000 gallons per day.

As of December 31, 2018, the Company's present average daily availability was 35.4 million gallons, and daily consumption was approximately 19.5 million gallons.

Pumping Stations

The Company's main pumping station is located in Spring Garden Township on the south branch of the Codorus Creek about four miles downstream from the Company's lower impounding dam. The pumping station presently houses pumping equipment consisting of three electrically driven centrifugal pumps and two diesel-engine driven centrifugal pumps with a combined pumping capacity of 68.0 million gallons per day. The pumping capacity is more than double peak requirements and is designed to provide an ample safety margin in the event of pump or power failure. A large diesel backup generator is installed to provide power to the pumps in the event of an emergency. The untreated water is pumped approximately two miles to the filtration plant through pipes owned by the Company.

The Susquehanna River Pumping Station is located on the western shore of the Susquehanna River several miles south of Wrightsville, PA. The pumping station is equipped with three Floway Vertical Turbine pumps rated at 6 million gallons per day each. The pumping station pumps water from the Susquehanna River approximately 15 miles through a combination of 30 inch and 36 inch ductile iron main to the Company's upper impounding dam, located at Lake Redman.

In 2018, the new Lake Redman Pumping Station, located in York Township adjacent to Lake Redman, was put into service. The pumping station is designed to provide a redundant source with the capacity to pump 20 million gallons per day of untreated water through a company-owned 36 inch force main approximately 3.5 miles to the filtration plant, meeting the Company's daily consumption needs.

Treatment Facilities

The Company's water filtration plant is located in Spring Garden Township about one-half mile south of the City of York. Water at this plant is filtered through twelve dual media filters having a rated capacity of 39.0 million gallons per day, or MGD, with a maximum supply of 42.0 MGD for short periods if necessary. Based on an average daily consumption in 2018 of approximately 19.5 million gallons, the Company believes the pumping and filtering facilities are adequate to meet present and anticipated demands.

The Company's sediment recycling facility is located adjacent to its water filtration plant. This state of the art facility employs cutting edge technology to remove fine, suspended solids from untreated water. The Company estimates that through this energy-efficient, environmentally friendly process, approximately 600 tons of sediment will be removed annually, thereby improving the quality of the Codorus Creek watershed.

The Company's two wastewater treatment facilities are located in East Manchester and Lower Windsor Townships. The two wastewater treatment plants are each small, packaged, extended aeration activated sludge facilities with a combined average daily flow capacity of 167,000 gallons. With a projected maximum daily demand of 77,000 gallons, the plants' flow paths offer both capacity and operational redundancy for maintenance, high flow events, and potential growth.

Distribution and Collection

The distribution system of the Company has approximately 980 miles of water main lines which range in diameter from 2 inches to 36 inches. The distribution system includes 31 booster stations and 34 standpipes and reservoirs capable of storing approximately 58.1 million gallons of potable water. All booster stations are equipped with at least two pumps for protection in case of mechanical failure. Following a deliberate study of customer demand and pumping capacity, the Company installed standby generators at all critical booster stations to provide an alternate energy source or emergency power in the event of an electric utility interruption.

The three wastewater collection systems of the Company have a combined approximate 95,000 feet of 6 inch and 8 inch gravity collection mains and 5,000 feet of 6 inch pressure force main along with three sewage pumping stations each rated at 80 gallons per minute.

Other Properties

The Company's distribution center and material and supplies warehouse are located in Springettsbury Township, and are composed of three one-story concrete block buildings aggregating 30,680 square feet.

The administrative and executive offices of the Company are located in one three-story and one two-story brick and masonry buildings, containing a total of approximately 21,861 square feet, in the City of York, Pennsylvania.

All of the Company's properties described above are held in fee by the Company. There are no material encumbrances on such properties.

In 1976, the Company entered into a Joint Use and Park Management Agreement with York County under which the Company licensed use of certain of its lands and waters for public park purposes for a period of 50 years. Under the agreement, York County has agreed not to erect a dam upstream on the East Branch of the Codorus Creek or otherwise obstruct the flow of the creek.

Item 3. Legal Proceedings.

There are no material legal proceedings involving the Company.

Item 4. Mine Safety Disclosures.

Not applicable.

PART II

Item 5. Market for the Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities.

Market Information

The common stock of The York Water Company is traded on the NASDAQ Global Select Market under the symbol YORW.

Shareholders of record (excluding individual participants in securities positions listings) as of December 31, 2018 numbered approximately 1,999.

Securities Authorized for Issuance under Equity Compensation Plans

The information required by this item with respect to securities authorized for issuance under equity compensation plans is set forth in Part III, Item 12 of this Annual Report.

Purchases of Equity Securities by the Company

The Company did not repurchase any of its securities during the fourth quarter of 2018.

Item 6. Selected Financial Data.

Not applicable.

Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations.

(All dollar amounts are stated in thousands of dollars.)

Overview

The York Water Company (the "Company") is the oldest investor-owned water utility in the United States, operated continuously since 1816. The Company also operates three wastewater collection systems and two wastewater treatment systems. The Company is a purely regulated water and wastewater utility. Profitability is largely dependent on water revenues. Due to the size of the Company and the limited geographic diversity of its service territory, weather conditions, particularly rainfall, economic, and market conditions can have an adverse effect on revenues. While the economy in general continued to improve, market conditions were volatile. The Company experienced decreased revenues in 2018 compared to 2017 as a result of giving back to customers the benefit of tax reform and lower per capita consumption, which were partially offset by revenues from the distribution system improvement charge, or DSIC, an increase in the number of customers served, and the West York Borough wastewater acquisition.

The Company's business does not require large amounts of working capital and is not dependent on any single customer or a very few customers for a material portion of its business. In 2018, operating revenue was derived from the following sources and in the following percentages: residential, 65%; commercial and industrial, 28%; and other, 7% which is primarily from the provision for fire service, but includes other water and wastewater service-related income. The diverse customer mix helps to reduce volatility in consumption.

The Company seeks to grow revenues by increasing the volume of water sold through increases in the number of customers served, making timely and prudent investments in infrastructure replacements, expansion and improvements, and timely filing for rate increases. The Company continuously looks for acquisition and expansion opportunities both within and outside its current service territory as well as through contractual services and bulk water supply. The Company's wastewater business provides additional opportunities to expand.

The Company has entered into agreements with several municipalities to provide sewer billing and collection services. The Company also has a service line protection program on a targeted basis. The Company continues to review and consider opportunities to expand both initiatives to further diversify the business.

In addition to increasing revenue, the Company consistently focuses on minimizing costs without sacrificing water quality or customer service. Paperless billing, expanding online services, negotiation of favorable electric, banking and other costs, as well as taking advantage of the Tax Cuts and Jobs Act of 2017, or the 2017 Tax Act, and the IRS tangible property regulations, or TPR, are examples of the Company's recent efforts to minimize costs.

Performance Measures

Company management uses financial measures including operating revenues, net income, earnings per share and return on equity to evaluate its financial performance. Additional statistical measures including number of customers, customer complaint rate, annual customer rates and the efficiency ratio are used to evaluate performance quality. These measures are calculated on a regular basis and compared with historical information, budget and the other publicly-traded water and wastewater companies.

The Company's performance in 2018 was strong under the above measures. Although operating revenues declined slightly in 2018 compared to 2017, the cause of the decline was primarily due to reduced revenue to offset the benefit of the lower income tax rate pursuant to the 2017 Tax Act which will be returned to customers. This was partially offset by the collection of a DSIC and increases in the number of customers. Other net expenses were higher in 2018, primarily due to a decreased allowance for funds used during construction. The Company incurred lower income taxes primarily due to a higher volume of assets improvements eligible for the tax benefit under the IRS TPR and the full impact of the 2017 Tax Act. The overall effect was an increase in net income in 2018 over 2017 of 3.1% and a return on year end common equity of 10.6%, slightly lower than the 2017 result of 10.9% but consistent with the five-year historical average of 10.6%.

The efficiency ratio, which is calculated as net income divided by revenues, is used by management to evaluate its ability to control expenses. Over the five previous years, the Company's ratio averaged 25.2%. In 2018, the ratio was higher than the average at 27.6% due primarily to lower income taxes than are included in the historical average. Management is confident that its ratio will compare favorably to that of its peers. Management continues to look for ways to decrease expenses and increase efficiency as well as to file for rate increases promptly when needed.

2018 Compared with 2017

Net income for 2018 was $13,376, an increase of $402, or 3.1%, from net income of $12,974 for 2017. The primary contributing factors to the increase were lower income taxes, which were partially offset by increased operating expenses and a decreased allowance for funds used during construction.

Operating revenues for the year decreased $152, or 0.3%, from $48,589 for 2017 to $48,437 for 2018. The Company reduced revenue by $1,600 for the year by recording a regulatory liability for the benefit of the lower tax rate effective January 1, 2018 resulting from the enactment of the 2017 Tax Act, which it has agreed to give back to customers as part of its recently approved PPUC rate order, including the gross-up of revenue necessary to return the effect of the temporary tax difference. Total per capita consumption for 2018 was approximately 1.0% lower than 2017. The decreased revenues were partially offset by revenues from the DSIC of $1,072 and the 2017 West York Borough wastewater acquisition of $126. Growth in the water customer base also added to revenues. The average number of water customers served in 2018 increased as compared to 2017 by 671 customers, from 67,061 to 67,732 customers. The average number of wastewater customers served in 2018 increased as compared to 2017 period by 279 customers, from 2,012 to 2,291 customers, due to the acquisition. The Company expects revenues for 2019 to increase due to an increase in rates effective March 1, 2019, and the continued increase in the number of water and wastewater customers from acquisitions and growth within the Company's service territory. Other regulatory actions and weather patterns could impact results.

Operating expenses for 2018 increased $1,024, or 4.1%, from $24,896 for 2017 to $25,920 for 2018. The increase was primarily due to higher expenses of approximately $280 for distribution system maintenance, $241 for depreciation, and $217 for wages and employee benefits. Also adding to the increase were higher expenses of $82 for information technology, $77 for West York Borough wastewater operating expenses, $64 for purchased power, $56 for water treatment, and $48 for a consulting engagement. Other expenses increased by a net of $190. The increase was partially offset by lower expenses of approximately $142 for health insurance, $49 for legal expenses due to the absence of expenses for a tariff modification and lead disclosure, and $40 for bad debts. In 2019, the Company expects depreciation expense to continue to rise due to additional investment in utility plant, and other expenses to increase at a moderate rate as costs to treat water and to maintain and extend the distribution system continue to rise.

Interest on debt for 2018 increased $161, or 3.0%, from $5,348 for 2017 to $5,509 for 2018. The increase was primarily due to interest on line of credit borrowings. The average debt outstanding under the lines of credit was $7,206 for 2018 and $3,132 for 2017. The weighted average interest rate on the lines of credit was 3.20% for 2018 and 1.76% for 2017. Interest expense for 2019 is expected to be slightly lower due to the refinancing of 10.17% and 9.60% Senior Notes with 4.54% Senior Notes.

Allowance for funds used during construction decreased $635, from $864 for 2017 to $229 in 2018, due to a planned lower volume of eligible construction. Eligible 2017 construction expenditures included an investment in an additional raw water pumping station and force main project. Allowance for funds used during construction for 2019 is expected to increase based on a projected increase in the amount of eligible construction.

Other income (expenses), net for 2018 reflects decreased expenses of $387 as compared to 2017. Lower retirement expenses of approximately $184 due primarily to an increase in the discount rate, lower charitable contributions of $139, and higher earnings on life insurance policies of $37 were the primary reasons for the decrease. Other expenses decreased by a net of $27. For 2019, other income (expenses) will be largely determined by the change in market returns and discount rates for retirement programs and related assets.

Income taxes for 2018 decreased $2,052, or 45.2%, compared to 2017 due to the effects of the 2017 Tax Act, and a higher volume of asset improvements eligible for the tax benefit under the IRS TPR. The Company's effective tax rate was 15.7% for 2018 and 25.9% for 2017. The Company's effective tax rate for 2019 will largely be determined by the level of eligible asset improvements expensed for tax purposes that would have been capitalized for tax purposes prior to the implementation of the TPR.

Rate Matters

See Note 10 to the Company's financial statements included herein for a discussion of its rate matters.

Effective January 1, 2019 the Company's tariff included a DSIC on revenues of 4.82%. The DSIC reset to zero when new base rates took effect on March 1, 2019.

The benefit from the implementation of the IRS TPR impacts the rate matters of the Company. The most recent rate order took into account the lower income taxes which resulted from the implementation of the IRS TPR, as well as the lower income taxes from the 2017 Tax Act, effectively reducing the amount of revenue required and lowering the Company's rate increase.

Acquisitions and Growth

See Note 2 to the Company's financial statements included herein for a discussion of completed acquisitions included in financial results.

On October 8, 2013, the Company signed an agreement to purchase the wastewater collection and treatment assets of SYC WWTP, L.P. in Shrewsbury and Springfield Townships, York County, Pennsylvania. Completion of the acquisition is contingent upon receiving approval from all required regulatory authorities. Closing is expected in 2019, at which time the Company will add approximately 30 commercial and industrial wastewater customers.

On October 25, 2018, the Company signed an agreement to purchase the wastewater collection assets of the Jacobus Borough Sewer Authority in York County, Pennsylvania. Completion of the acquisition is contingent upon receiving approval from all required regulatory authorities. Closing is expected in the third quarter of 2019 at which time the Company will add approximately 700 wastewater customers. These wastewater customers are currently water customers of the Company.

On December 28, 2018, the Company signed an agreement to purchase the wastewater collection and treatment assets of Felton Borough in York County Pennsylvania. Completion of the acquisition is contingent upon receiving approval from all required regulatory authorities. Closing is expected in 2019 at which time the Company will add approximately 130 wastewater customers.

On March 4, 2019, the Company signed an agreement to purchase the wastewater collection assets of West Manheim Township in York County, Pennsylvania. Completion of the acquisition is contingent upon receiving approval from all required regulatory authorities. Closing is expected in the first quarter of 2020 at which time the Company will add approximately 1,800 wastewater customers. These wastewater customers are currently water customers of the Company.

In total, these acquisitions are expected to be immaterial to Company results. The Company is also pursuing other bulk water contracts and acquisitions in and around its service territory to help offset any further declines in per capita water consumption and to grow its business.

On May 10, 2017, the Company signed an emergency interconnect agreement with Dallastown-Yoe Water Authority. The effectiveness of this agreement is contingent upon receiving approval from all required regulatory authorities. Approval is expected to be granted in 2019 at which time the Company will begin construction of a water main extension to a single point of interconnection and either supply a minimum agreed upon amount of water to the authority, receive a payment in lieu of water, or provide water during an emergency, at current tariff rates.

Capital Expenditures

During 2018, the Company invested $16,882 in construction expenditures for routine items and the completion of a raw water pumping station, as well as various replacements and improvements to infrastructure including company-owned lead service lines as discussed in Note 8 to the financial statements included herein. The Company replaced or relined approximately 50,000 feet of main in 2018. The Company was able to fund construction expenditures using internally-generated funds, line of credit borrowings, proceeds from its stock purchase plans, and customer advances and contributions from developers, municipalities, customers or builders. See Notes 1, 4 and 5 to the Company's financial statements included herein.

The Company anticipates construction and acquisition expenditures for 2019 and 2020 of approximately $21,479 and $21,209, respectively, exclusive of any acquisitions not yet approved. In addition to routine transmission and distribution projects, a portion of the anticipated 2019 and 2020 expenditures will be for additional main extensions, spillway improvements and the armoring of one of the dams, replacing a water storage tank, expansion of a wastewater treatment plant, and various replacements of infrastructure. The Company intends to use primarily internally-generated funds for its anticipated 2019 and 2020 construction and fund the remainder through line of credit borrowings, proceeds from its stock purchase plans and customer advances and contributions (see Note 1 to the Company's financial statements included herein). Customer advances and contributions are expected to account for between 5% and 10% of funding requirements in 2019 and 2020. Potential debt and equity offerings may be utilized if required. The Company believes it will have adequate credit facilities and access to the capital markets, if necessary, during 2019 and 2020, to fund anticipated construction and acquisition expenditures.

Liquidity and Capital Resources

Cash

The Company manages its cash through a cash management account that is directly connected to a line of credit. Excess cash generated automatically pays down outstanding borrowings under the line of credit arrangement. If there are no outstanding borrowings, the cash is used as an earnings credit to reduce banking fees. Likewise, if additional funds are needed beyond what is generated internally for payroll, to pay suppliers, or for debt service, funds are automatically borrowed under the line of credit. The Company fully utilized its cash on hand in 2017. As of December 31, 2018, the Company borrowed $9,508 under its lines of credit and incurred a cash overdraft on its cash management account of $1,070. The cash management facility and the other lines of credit are expected to provide the necessary liquidity and funding for the Company's operations, capital expenditures, acquisitions and potential buybacks of stock for the foreseeable future.

Accounts Receivable

The accounts receivable balance tends to follow the change in revenues but is also affected by the timeliness of payments by customers and the level of the reserve for doubtful accounts. In 2018, the accounts receivable – customers balance increased due to an increase in revenue from increased customer counts and the DSIC. Other receivables increased due to the timing of a large receivable to fund a capital project which was received in January 2019. A reserve is maintained at a level considered adequate to provide for losses that can be reasonably anticipated based on inactive accounts with outstanding balances. Management periodically evaluates the adequacy of the reserve based on past experience, agings of the receivables, adverse situations that may affect a customer's ability to pay, current economic conditions, and other relevant factors. If the status of these factors deteriorates, the Company may incur additional expenses for uncollectible accounts and experience a reduction in its internally-generated funds.

Internally-generated Funds

The amount of internally-generated funds available for operations and construction depends on the Company's ability to obtain timely and adequate rate relief, changes in regulations, customers' water usage, weather conditions, customer growth and controlled expenses. In 2018, the Company generated $18,372 internally as compared to $20,110 in 2017. The decrease from 2017 was primarily due to higher income taxes paid.

Credit Lines

Historically, the Company has borrowed $15,000 to $20,000 under its lines of credit before refinancing with long-term debt or equity capital. As of December 31, 2018, the Company maintained unsecured lines of credit aggregating $41,500 with four banks at interest rates ranging from LIBOR plus 1.15% to LIBOR plus 1.25%. The Company had $9,508 in outstanding borrowings under its lines of credit as of December 31, 2018. The weighted average interest rate on line of credit borrowings as of December 31, 2018 was 3.60%. The Company expects to renew these lines of credit as they mature under similar terms and conditions.

The Company has taken steps to manage the risk of reduced credit availability. It has maintained committed lines of credit that cannot be called on demand and obtained a 2-year revolving maturity on most of its facilities. One of the Company's banks recently reduced the interest rate on its line of credit and extended the maturity from one year to two years. There is no guarantee that the Company will be able to obtain sufficient lines of credit with favorable terms in the future. If the Company is unable to obtain sufficient lines of credit or to refinance its line of credit borrowings with long-term debt or equity when necessary, it may have to eliminate or postpone capital expenditures. Management believes the Company will have adequate capacity under its current lines of credit to meet financing needs throughout 2019.

Long-term Debt

The Company's loan agreements contain various covenants and restrictions. Management believes it is currently in compliance with all of these restrictions. See Note 6 to the Company's financial statements included herein for additional information regarding these restrictions.

The Pennsylvania Economic Development Financing Authority Series 2014 bonds contain special redemption provisions. Under these provisions, representatives of deceased beneficial owners have the right to request redemption prior to the stated maturity of all or part of their holding in the bonds. The Company is not obligated to redeem any individual holding exceeding $25, or aggregate holdings exceeding $300 in any annual period. In 2017 and 2018, no bonds were retired under these provisions. Currently, no additional bonds that meet the special provisions have been tendered for redemption.

The York County Industrial Development Authority Series 2006 bonds are subject to optional redemption provisions that allow the Company to redeem all or a portion of the bonds on or after October 1, 2016. The Company may refinance these bonds prior to maturity in 2036 to take advantage of lower interest rates.

On January 31, 2019, the Company entered into a note purchase agreement with certain institutional investors relating to the private placement of $20,000 aggregate principal amount of the Company's senior notes. The senior notes bear interest at 4.54% per annum payable semiannually and mature on January 31, 2049. The senior notes are unsecured and unsubordinated obligations of the Company. The Company received net proceeds, after deducting issuance costs, of approximately $19,820. The net proceeds were used to refinance the $11,000 aggregate principal amount of the Company's 10.17% Series A Senior Notes due February 1, 2019 and the 9.60% Series B Senior Notes due February 1, 2019, and to refinance line of credit borrowings incurred by the Company as interim financing for various capital projects of the Company.

The Company's total long-term debt as a percentage of the total capitalization, defined as total common stockholders' equity plus total long-term debt, was 43.2% as of December 31, 2018, compared with 43.7% as of December 31, 2017. The Company began using its lines of credit in 2017 due primarily to increased capital expenditures. The Company expects to allow the debt percentage to trend upward until it approaches fifty percent before considering additional equity. A debt to total capitalization ratio between forty-six and fifty percent has historically been acceptable to the PPUC in rate filings. Due to its recent ability to generate more cash internally, the Company has been able to keep its ratio below fifty percent. See Note 6 to the Company's financial statements included herein for the details of its long-term debt outstanding as of December 31, 2018.

Income Taxes, Deferred Income Taxes and Uncertain Tax Positions

The 2017 Tax Act, among other things, reduces the federal statutory corporate tax rate for tax years beginning in 2018 from 34% to 21%, eliminates certain deductions, and eliminates bonus depreciation on qualified water and wastewater property.

The Company filed for a change in accounting method under the IRS TPR effective in 2014. Under the change in accounting method, the Company is permitted to deduct the costs of certain asset improvements that were previously being capitalized and depreciated for tax purposes as an expense on its income tax return. As a result of the ongoing deduction, the net income tax benefits of $1,307 and $1,796 for the years ended December 31, 2018 and 2017, respectively, reduced income tax expense and flowed-through to net income. The ongoing deduction results in a reduction in the effective income tax rate, a net reduction in income tax expense, and a reduction in the amount of income taxes currently payable. It also results in increases to deferred tax liabilities and regulatory assets representing the appropriate book and tax basis difference on capital additions. The Company expects to continue to expense these asset improvements in the future.

The Company's effective tax rate will largely be determined by the level of eligible asset improvements expensed for tax purposes that would have been capitalized for tax purposes prior to the implementation of the TPR.

The Company has a substantial deferred income tax asset primarily due to the excess accumulated deferred income taxes on accelerated depreciation from the 2017 Tax Act and the differences between the book and tax balances of the pension and deferred compensation plans. The Company does not believe a valuation allowance is required due to the expected generation of future taxable income during the periods in which those temporary differences become deductible.

The Company has seen an increase in its deferred income tax liability amounts primarily as a result of the accelerated and bonus depreciation deduction available for federal tax purposes which creates differences between book and tax depreciation expense. The Company expects this trend to continue as it makes significant investments in capital expenditures subject to accelerated depreciation or TPR, but at a more modest rate due to the elimination of bonus depreciation on qualified water and wastewater property.

The Company has determined there are no uncertain tax positions that require recognition as of December 31, 2018. See Note 14 to the Company's financial statements included herein for additional details regarding income taxes.

Common Stock

Common stockholders' equity as a percent of the total capitalization was 56.8% as of December 31, 2018, compared with 56.3% as of December 31, 2017. The ratio increased slightly in 2018 due to the absence of share repurchases. The volume of share repurchases and higher debt from capital expenditures, among other things, could reduce this percentage in the future. It is the Company's intent to target a ratio between fifty and fifty-four percent.

Credit Rating

On February 9, 2018, Standard & Poor's affirmed the Company's credit rating at A-, with a stable outlook. The Company's ability to maintain its credit rating depends, among other things, on adequate and timely rate relief, which it has been successful in obtaining, its ability to fund capital expenditures in a balanced manner using both debt and equity and its ability to generate cash flow. In 2019, the Company's objectives are to continue to maximize its funds provided by operations and maintain a strong capital structure in order to be able to attract capital.

Physical and Cyber Security

The Company maintains security measures at its facilities, and collaborates with federal, state and local authorities and industry trade associations regarding information on possible threats and security measures for water and wastewater utility operations. The costs incurred are expected to be recoverable in water and wastewater rates and are not expected to have a material impact on its business, financial condition, or results of operations.

The Company relies on information technology systems in connection with the operation of the business, especially with respect to customer service, billing, accounting, and in some cases, the monitoring and operation of treatment, storage and pumping facilities. In addition, the Company relies on these systems to track utility assets and to manage maintenance and construction projects, materials and supplies, and human resource functions. The information technology systems may be vulnerable to damage or interruption from cyber security attacks or other cyber-related events, including, but not limited to, power loss, computer systems failures, internet, telecommunications or data network failures, physical and electronic loss of data, computer viruses, intentional security breaches, hacking, denial of service actions, misappropriation of data, and similar events. In some cases, administration of certain functions may be outsourced to third-party service providers that could also be targets of cyber security attacks. A loss of these systems, or major problems with the operation of these systems, could harm the business, financial condition, and results of operations of the Company through the loss or compromise of customer, financial, employee, or operational data, disruption of billing, collections or normal field service activities, disruption of electronic monitoring and control of operational systems, and delays in financial reporting and other normal management functions.

Possible impacts associated with a cyber security attack or other events may include remediation costs related to lost, stolen, or compromised data, repairs to data processing systems, increased cyber security protection costs, adverse effects on our compliance with regulatory and environmental laws and regulation, including standards for drinking water, litigation, and reputational damage.

The Company has implemented processes, procedures and controls to prevent or limit the effect of these possible events, and maintains insurance to help defray costs associated with cyber security attacks. The Company has not experienced a material impact on business or operations from these attacks. Although the Company does not believe its systems are at a materially greater risk of cyber security attacks than other similar organizations and despite the implementation of robust security measures, the Company cannot provide assurance that the insurance will fully cover the costs of a cyber security event, and its robust security measures do not guarantee that reputation and financial results will not be adversely affected by such an incident.

Environmental Matters

The Company entered into a consent order agreement with the Pennsylvania Department of Environmental Protection in December 2016 after the Company determined it exceeded the action level for lead as established by the Lead and Copper Rule, or LCR, issued by the U.S. Environmental Protection Agency. Under the agreement, the Company committed to exceed the LCR replacement schedule by replacing all of the remaining known company-owned lead service lines within four years from the agreement. The cost for these service line replacements was approximately $2,341 through December 31, 2018 and is included in utility plant. As of December 31, 2018, all known company-owned lead service lines have been replaced. Any additional company-owned lead service lines that are discovered will be replaced but are not expected to have a material impact on the financial position of the Company.

Due to its exceedance in 2016, the Company was required under the LCR to complete two rounds of compliance testing at the customer's tap in 2017. The water samples did not exceed the action level either time. As a result, the Company was able to reduce its monitoring to annual compliance tests beginning in 2018. The Company completed its compliance testing at the customer's tap in 2018 and the water samples did not exceed the action level. In addition, the Company performed in excess of the required actions under the LCR. Specifically, the Company provided the affected customers with a free water test and a 200 gallon per month credit to flush their line in order to reduce any lead content until their lead service line has been replaced. The cost of the water tests and flushing credits was $4 and $16 for the years ended December 31, 2018 and 2017, respectively. Additional amounts for water tests and flushing credits are not expected to have a material impact on the financial position of the Company.

The Company was granted approval by the PPUC to modify its tariff to include the cost of the replacement of lead customer-owned service lines that are discovered when the Company replaces its lead service lines, and to include the cost of the annual replacement of up to 400 lead customer-owned service lines whenever they are discovered, regardless of the material used for the company-owned service line over nine years from the agreement. The tariff modification allows the Company to replace customer-owned service lines at its own initial cost. The Company will record the costs as a regulatory asset to be recovered in future base rates to customers, over a four-year period. The cost for the customer-owned lead service line replacements under the four-year tariff modification was approximately $304 through December 31, 2018 and is included as a regulatory asset. All known customer-owned lead service lines that are connected to a company-owned lead service line have been replaced by December 31, 2018. Based on its experience, the Company estimates that lead customer-owned service lines replacements will cost $910 under the nine-year tariff modification. This estimate is subject to adjustment as more facts become available.

Dividends

During 2018, the Company's dividend payout ratios relative to net income and net cash provided by operating activities were 65.0% and 46.7%, respectively. During 2017, the Company's dividend payout ratios relative to net income and net cash provided by operating activities were 64.1% and 40.9%, respectively. During the fourth quarter of 2018, the Board of Directors increased the dividend by 4.02% from $0.1666 per share to $0.1733 per share per quarter.

The Company's Board of Directors declared a dividend in the amount of $0.1733 per share at its January 2019 meeting. The dividend is payable on April 15, 2019 to shareholders of record as of February 28, 2019. While the Company expects to maintain this dividend amount in 2019, future dividends will be dependent upon the Company's earnings, financial condition, capital demands and other factors and will be determined by the Company's Board of Directors. See Note 6 to the Company's financial statements included herein for restrictions on dividend payments.

Inflation

The Company is affected by inflation, most notably by the continually increasing costs incurred to maintain and expand its service capacity. The cumulative effect of inflation results in significantly higher facility replacement costs which must be recovered from future cash flows. The ability of the Company to recover this increased investment in facilities is dependent upon future rate increases, which are subject to approval by the PPUC. The Company can provide no assurances that its rate increases will be approved by the PPUC; and, if approved, the Company cannot guarantee that these rate increases will be granted in a timely or sufficient manner to cover the investments and expenses for which the rate increase was sought.

Critical Accounting Estimates

The methods, estimates, and judgments the Company used in applying its accounting policies have a significant impact on the results reported in its financial statements. The Company's accounting policies require management to make subjective judgments because of the need to make estimates of matters that are inherently uncertain. The Company's most critical accounting estimates include: regulatory assets and liabilities, revenue recognition, accounting for its pension plans, and income taxes.

Regulatory Assets and Liabilities

Generally accepted accounting principles define accounting standards for companies whose rates are established by or are subject to approval by an independent third-party regulator. In accordance with the accounting standards, the Company defers costs and credits on its balance sheet as regulatory assets and liabilities when it is probable that these costs and credits will be recognized in the rate-making process in a period different from when the costs and credits were incurred. These deferred amounts are then recognized in the statement of income in the period in which they are reflected in customer rates. If the Company later finds that these assets and liabilities cannot be included in rate-making, they are adjusted appropriately. See Note 1 for additional details regarding regulatory assets and liabilities.

Revenue Recognition

Operating revenues include amounts billed to metered water and certain wastewater customers on a cycle basis and unbilled amounts based on both actual and estimated usage from the latest meter reading to the end of the accounting period. Estimates are based on average daily usage for those particular customers. The unbilled revenue amount is recorded as a current asset on the balance sheet. Actual results could differ from these estimates and would result in operating revenues being adjusted in the period in which the actual usage is known. Based on historical experience, the Company believes its estimate of unbilled revenues is reasonable.

The Company adopted Accounting Standards Update No. 2014-09 beginning January 1, 2018. See Note 1 to the Company's financial statements included herein for details on the adoption of this standard.

Pension Accounting

Accounting for defined benefit pension plans requires estimates of future compensation increases, mortality, the discount rate, and expected return on plan assets as well as other variables. These variables are reviewed annually with the Company's pension actuary. The Company used compensation increases of 2.5% to 3.0% in 2017 and 2018.

The Company adopted a new mortality table in 2014, the RP-2014, using the white collar table for the administrative and general plan and the blue collar table for the union plan. Using the new mortality table increased the life expectancy of pension plan participants, resulting in a significant increase to the pension benefit obligation, and ultimately, a decline in the Company's funded status of the plans. In 2015, the Social Security Administration released new underlying data creating an Adjusted RP-2014 mortality table. A new mortality improvement scale was released in each subsequent year. The Company adopted each of the improvement scales in the years they were released. These changes partially offset the increase in the pension benefit obligation realized in 2014.

The Company selected its December 31, 2018 and 2017 discount rates based on the FTSE Pension Liability Index, formerly the Citi Pension Liability Index. This index uses spot rates for durations out to 30 years and matches them to expected disbursements from the plan over the long term. The Company believes this index most appropriately matches its pension obligations. The present values of the Company's future pension obligations were determined using a discount rate of 4.10% at December 31, 2018 and 3.5% at December 31, 2017.

Adopting a new mortality table that represents a change in life expectancy and choosing a different discount rate normally changes the amount of pension expense and the corresponding liability. In the case of the Company, these items change its liability, but do not have an impact on its pension expense. The PPUC, in a previous rate settlement, agreed to grant recovery of the Company's contribution to the pension plans in customer rates. As a result, under the accounting standards regarding rate-regulated activities, expense in excess of the Company's pension plan contribution can be deferred as a regulatory asset and expensed as contributions are made to the plans and are recovered in customer rates. Therefore, these changes affect regulatory assets rather than pension expense.

The Company's estimate of the expected return on plan assets is primarily based on the historic returns and projected future returns of the asset classes represented in its plans. The target allocation of pension assets is 50% to 70% equity securities, 30% to 50% fixed income securities, and 0% to 10% cash reserves. The Company used 6.75% as its expected rate of return in 2017 and 2018. A decrease in the expected pension return would normally cause an increase in pension expense; however due to the aforementioned rate settlement, the Company's expense would continue to be equal to its contributions to the plans. The change would instead be recorded in regulatory assets.

Lower discount rates and underperformance of assets could cause future required contributions and expense to increase substantially. If this were to happen, the Company would have to consider changes to its pension plan benefits and possibly request additional recovery of expenses through increased rates charged to customers. See Note 11 to the Company's financial statements included herein for additional details regarding the pension plans.

Income Taxes

The Company estimates the amount of income tax payable or refundable for the current year and the deferred income tax liabilities and assets that results from estimating temporary differences resulting from the treatment of certain items, such as depreciation, for tax and financial statement reporting. Generally, these differences result in the recognition of a deferred tax asset or liability on the balance sheet and require the Company to make judgments regarding the probability of the ultimate tax impact of the various transactions entered into. Based on these judgments, it may require tax reserves or valuation allowances on deferred tax assets to reflect the expected realization of future tax benefits. The Company believes its determination of what qualifies as a repair expense tax deduction versus a capital cost as it relates to the IRS TPR ongoing and catch-up deductions is consistent with the regulations. The Company also believes it has appropriately applied the provisions of the 2017 Tax Act including properly applying the accounting standards related to the 2017 Tax Act. Actual income taxes could vary from these estimates and changes in these estimates could increase income tax expense in the period that these changes in estimates occur.

Other critical accounting estimates are discussed in the Significant Accounting Policies Note to the Financial Statements

Off-Balance Sheet Transactions

The Company does not use off-balance sheet transactions, arrangements or obligations that may have a material current or future effect on financial condition, results of operations, liquidity, capital expenditures, capital resources or significant components of revenues or expenses. The Company does not use securitization of receivables or unconsolidated entities. For risk management purposes, the Company uses a derivative financial instrument, an interest rate swap agreement discussed in Note 7 to the financial statements included herein. The Company does not engage in trading or other risk management activities, does not use other derivative financial instruments for any purpose, has no material lease obligations, no guarantees and does not have material transactions involving related parties.

Impact of Recent Accounting Pronouncements

See Note 1 to the Company's financial statements included herein for a discussion on the effect of new accounting pronouncements.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk.

Not applicable.

Item 8. Financial Statements.

Report of Independent Registered Public Accounting Firm

To the Stockholders and the Board of Directors of
The York Water Company

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying balance sheets of The York Water Company (the "Company") as of December 31, 2018 and 2017, the related statements of income, common stockholders' equity, and cash flows for the years then ended, and the related notes and financial statement schedule listed in Item 15(a)2 (collectively referred to as the "financial statements"). We also have audited the Company's internal control over financial reporting as of December 31, 2018, based on criteria established in *Internal Control – Integrated Framework: (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

In our opinion, the financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2018 and 2017, and the results of its operations and its cash flows for the years then ended, in conformity with accounting principles generally accepted in the United States of America. Also in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2018, based on criteria established in *Internal Control – Integrated Framework: (2013)* issued by COSO.

Basis for Opinions

The Company's management is responsible for these financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management's Report on Internal Control over Financial Reporting. Our responsibility is to express an opinion on the Company's financial statements and an opinion on the Company's internal control over financial reporting based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) ("PCAOB") and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud and whether effective internal control over financial reporting was maintained in all material respects.

Our audits of the financial statements included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

Definition and Limitations of Internal Control Over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

/s/Baker Tilly Virchow Krause, LLP

We have served as the Company's auditor since 2003.

York, Pennsylvania
March 12, 2019

THE YORK WATER COMPANY

Balance Sheets
(In thousands of dollars, except per share amounts)

	Dec. 31, 2018	Dec. 31, 2017
ASSETS		
UTILITY PLANT, at original cost	$ 380,784	$ 365,767
Plant acquisition adjustments	(3,108)	(3,234)
Accumulated depreciation	(78,519)	(73,746)
Net utility plant	299,157	288,787
OTHER PHYSICAL PROPERTY, net of accumulated depreciation of $410 in 2018 and $387 in 2017	714	737
CURRENT ASSETS:		
Cash and cash equivalents	2	2
Accounts receivable, net of reserves of $305 in 2018 and 2017	4,811	4,547
Unbilled revenues	2,427	2,459
Materials and supplies inventories, at cost	876	906
Prepaid expenses	895	697
Total current assets	9,011	8,611
OTHER LONG-TERM ASSETS:		
Note receivable	255	255
Deferred regulatory assets	32,353	30,331
Other assets	3,650	3,309
Total other long-term assets	36,258	33,895
Total Assets	**$ 345,140**	**$ 332,030**

The accompanying notes are an integral part of these statements.

THE YORK WATER COMPANY

Balance Sheets
(In thousands of dollars, except per share amounts)

	Dec. 31, 2018	Dec. 31, 2017
STOCKHOLDERS' EQUITY AND LIABILITIES		
COMMON STOCKHOLDERS' EQUITY:		
Common stock, no par value, authorized 46,500,000 shares, issued and outstanding 12,943,536 shares in 2018 and 12,872,742 shares in 2017	$ 81,305	$ 79,201
Retained earnings	44,890	40,204
Total common stockholders' equity	126,195	119,405
PREFERRED STOCK, authorized 500,000 shares, no shares issued	-	-
LONG-TERM DEBT, excluding current portion	93,328	90,098
COMMITMENTS	-	-
CURRENT LIABILITIES:		
Short-term borrowings	1,000	1,000
Current portion of long-term debt	30	44
Accounts payable	3,030	3,136
Dividends payable	1,999	1,892
Accrued compensation and benefits	1,191	1,134
Accrued income taxes	150	531
Accrued interest	992	989
Deferred regulatory liabilities	2,104	123
Other accrued expenses	345	296
Total current liabilities	10,841	9,145
DEFERRED CREDITS:		
Customers' advances for construction	6,849	6,324
Deferred income taxes	36,962	34,754
Deferred employee benefits	4,715	7,075
Deferred regulatory liabilities	24,710	24,372
Other deferred credits	1,815	2,196
Total deferred credits	75,051	74,721
Contributions in aid of construction	39,725	38,661
Total Stockholders' Equity and Liabilities	**$ 345,140**	**$ 332,030**

The accompanying notes are an integral part of these statements.

THE YORK WATER COMPANY

Statements of Income
(In thousands of dollars, except per share amounts)

	Year Ended December 31 2018	2017
OPERATING REVENUES	$ 48,437	$ 48,589
OPERATING EXPENSES:		
Operation and maintenance	9,670	8,891
Administrative and general	8,095	8,103
Depreciation and amortization	7,010	6,769
Taxes other than income taxes	1,145	1,133
	25,920	24,896
Operating income	22,517	23,693
OTHER INCOME (EXPENSES):		
Interest on debt	(5,509)	(5,348)
Allowance for funds used during construction	229	864
Other pension costs	(1,285)	(1,220)
Other income (expenses), net	(85)	(472)
	(6,650)	(6,176)
Income before income taxes	15,867	17,517
Income taxes	2,491	4,543
Net Income	**$ 13,376**	**$ 12,974**
Basic Earnings Per Share	**$ 1.04**	**$ 1.01**
Diluted Earnings Per Share	**$ 1.04**	**$ 1.01**
Cash Dividends Declared Per Share	**$ 0.6731**	**$ 0.6472**

The accompanying notes are an integral part of these statements.

THE YORK WATER COMPANY

Statements of Common Stockholders' Equity
(In thousands of dollars, except per share amounts)
For the Years Ended December 31, 2018 and 2017

	Common Stock Shares	Common Stock Amount	Retained Earnings	Total
Balance, December 31, 2016	12,852,295	$ 78,513	$ 35,548	$ 114,061
Net income	-	-	12,974	12,974
Dividends	-	-	(8,318)	(8,318)
Retirement of common stock	(37,229)	(1,263)	-	(1,263)
Issuance of common stock under dividend reinvestment, direct stock and employee stock purchase plans	56,171	1,905	-	1,905
Stock-based compensation	1,505	46	-	46
Balance, December 31, 2017	12,872,742	79,201	40,204	119,405
Net income	-	-	13,376	13,376
Dividends	-	-	(8,690)	(8,690)
Issuance of common stock under dividend reinvestment, direct stock and employee stock purchase plans	67,051	2,024	-	2,024
Stock-based compensation	3,743	80	-	80
Balance, December 31, 2018	12,943,536	$ 81,305	$ 44,890	$ 126,195

The accompanying notes are an integral part of these statements.

THE YORK WATER COMPANY

Statements of Cash Flows
(In thousands of dollars, except per share amounts)

	Year Ended December 31	
	2018	**2017**
CASH FLOWS FROM OPERATING ACTIVITIES:		
Net income	$ 13,376	$ 12,974
Adjustments to reconcile net income to net cash provided by operating activities:		
Depreciation and amortization	7,010	6,769
Stock-based compensation	80	46
Increase in deferred income taxes	58	2,484
Other	295	54
Changes in assets and liabilities:		
Increase in accounts receivable and unbilled revenues	(483)	(572)
Decrease in recoverable income taxes	-	282
Increase in materials and supplies, prepaid expenses, regulatory and other assets	(6,094)	(507)
Increase (decrease) in accounts payable, accrued compensation and benefits, accrued expenses, deferred employee benefits, regulatory liabilities, and other deferred credits	4,508	(2,018)
Increase (decrease) in accrued interest and taxes	(378)	599
Net cash provided by operating activities	18,372	20,111
CASH FLOWS FROM INVESTING ACTIVITIES:		
Utility plant additions, including debt portion of allowance for funds used during construction of $128 in 2018 and $483 in 2017	(16,882)	(24,602)
Acquisitions of water and wastewater systems	-	(472)
Cash received from surrender of life insurance policies	108	-
Net cash used in investing activities	(16,774)	(25,074)
CASH FLOWS FROM FINANCING ACTIVITIES:		
Customers' advances for construction and contributions in aid of construction	1,998	1,642
Repayments of customer advances	(409)	(413)
Proceeds of long-term debt issues	28,762	22,878
Repayments of long-term debt	(25,691)	(17,533)
Borrowings under short-term line of credit agreements	-	1,000
Changes in cash overdraft position	301	769
Repurchase of common stock	-	(1,263)
Issuance of common stock	2,024	1,905
Dividends paid	(8,583)	(8,229)
Net cash provided by (used in) financing activities	(1,598)	756
Net change in cash and cash equivalents	-	(4,207)
Cash and cash equivalents at beginning of period	2	4,209
Cash and cash equivalents at end of period	$ 2	$ 2
Supplemental disclosures of cash flow information:		
Cash paid during the period for:		
Interest, net of amounts capitalized	$ 5,236	$ 4,652
Income taxes	2,901	758

Supplemental schedule of non-cash investing and financing activities:
Accounts payable includes $1,100 in 2018 and $1,498 in 2017 for the construction of utility plant.

The accompanying notes are an integral part of these statements.

Notes to Financial Statements

(In thousands of dollars, except per share amounts)

1. Significant Accounting Policies

The primary business of The York Water Company, or the Company, is to impound, purify and distribute water. The Company also operates three wastewater collection and two treatment systems. The Company operates within its franchised territory located in York and Adams Counties, Pennsylvania, and is subject to regulation by the Pennsylvania Public Utility Commission, or PPUC.

The following summarizes the significant accounting policies employed by The York Water Company.

Utility Plant and Depreciation

The cost of additions includes contracted cost, direct labor and fringe benefits, materials, overhead and, for certain utility plant, allowance for funds used during construction. In accordance with regulatory accounting requirements, water and wastewater systems acquired are recorded at estimated original cost of utility plant when first devoted to utility service and the applicable depreciation is recorded to accumulated depreciation. The difference between the estimated original cost less applicable accumulated depreciation, and the purchase price and acquisition costs, is recorded as an acquisition adjustment within utility plant as permitted by the PPUC. At December 31, 2018 and 2017, utility plant includes a net credit acquisition adjustment of $3,108 and $3,234, respectively. For those amounts approved by the PPUC, the net acquisition adjustment is being amortized over the remaining life of the respective assets. Certain amounts are still awaiting approval from the PPUC before amortization will commence. Amortization amounted to $58 in each of the two years in the period ended December 31, 2018.

Upon normal retirement of depreciable property, the estimated or actual cost of the asset is credited to the utility plant account, and such amounts, together with the cost of removal less salvage value, are charged to the reserve for depreciation. To the extent the Company recovers cost of removal or other retirement costs through rates after the retirement costs are incurred, a regulatory asset is reported. Gains or losses from abnormal retirements are reflected in income currently.

The straight-line remaining life method is used to compute depreciation on utility plant cost, exclusive of land and land rights. Annual provisions for depreciation of transportation and mechanical equipment included in utility plant are computed on a straight-line basis over the estimated service lives. Such provisions are charged to clearing accounts and apportioned therefrom to operating expenses and other accounts in accordance with the Uniform System of Accounts as prescribed by the PPUC.

The Company charges to maintenance expense the cost of repairs and replacements and renewals of minor items of property. Maintenance of transportation equipment is charged to clearing accounts and apportioned therefrom in a manner similar to depreciation. The cost of replacements, renewals and betterments of units of property is capitalized to the utility plant accounts.

The following remaining lives are used for financial reporting purposes:

Utility Plant Asset Category	December 31, 2018	December 31, 2017	Approximate range of remaining lives
Mains and accessories	$190,679	$182,927	11 – 86 years
Services, meters and hydrants	74,178	71,183	18 – 52 years
Operations structures, reservoirs and water tanks	61,868	53,610	9 – 59 years
Pumping and treatment equipment	32,575	29,814	8 – 31 years
Office, transportation and operating equipment	13,531	12,787	3 – 24 years
Land and other non-depreciable assets	3,202	3,196	-
Utility plant in service	376,033	353,517	
Construction work in progress	4,751	12,250	-
Total Utility Plant	$380,784	$365,767	

The effective rate of depreciation was 2.21% in 2018 and 2.26% in 2017, on average utility plant, net of customers' advances and contributions. Larger depreciation provisions resulting from allowable accelerated methods are deducted for tax purposes.

Cash and Cash Equivalents
For the purposes of the statements of cash flows, the Company considers all highly liquid debt instruments purchased with an original maturity of three months or less to be cash equivalents except for those instruments earmarked to fund construction expenditures or repay long-term debt.

The Company periodically maintains cash balances in major financial institutions in excess of the federally insured limit by the Federal Deposit Insurance Corporation (FDIC). The Company has not experienced any losses and believes it is not exposed to any significant credit risk on cash and cash equivalents.

Accounts Receivable
Accounts receivable are stated at outstanding balances, less a reserve for doubtful accounts. The reserve for doubtful accounts is established through provisions charged against income. Accounts deemed to be uncollectible are charged against the reserve and subsequent recoveries, if any, are credited to the reserve. The reserve for doubtful accounts is maintained at a level considered adequate to provide for losses that can be reasonably anticipated. Management's periodic evaluation of the adequacy of the reserve is based on past experience, agings of the receivables, adverse situations that may affect a customer's ability to pay, current economic conditions, and other relevant factors. This evaluation is inherently subjective. Unpaid balances remaining after the stated payment terms are considered past due.

Materials and Supplies Inventories
Materials and supplies inventories are stated at cost. Costs are determined using the average cost method.

Note Receivable
Note receivable is recorded at cost and represent amounts due from a municipality for construction of water mains in their municipality. Management, considering current information and events regarding the borrowers' ability to repay their obligations, considers a note to be impaired when it is probable that the Company will be unable to collect all amounts due according to the contractual terms of the note agreement. When a note is considered to be impaired, the carrying value of the note is written down. The amount of the impairment is measured based on the present value of expected future cash flows discounted at the note's effective interest rate.

Regulatory Assets and Liabilities

The Company is subject to the provisions of generally accepted accounting principles regarding rate-regulated entities. The accounting standards provide for the recognition of regulatory assets and liabilities as allowed by regulators for costs or credits that are reflected in current customer rates or are considered probable of being included in future rates. The regulatory assets or liabilities are then relieved as the cost or credit is reflected in rates. Regulatory assets represent costs that are expected to be fully recovered from customers in future rates while regulatory liabilities represent amounts that are expected to be refunded to customers in future rates. These deferred costs have been excluded from the Company's rate base and, therefore, no return is being earned on the unamortized balances.

Regulatory assets and liabilities are comprised of the following:

	December 31,		Remaining Recovery
	2018	2017	Periods
Assets			
Income taxes	$21,432	$18,564	Various
Postretirement benefits	3,071	5,382	5 – 10 years
Unrealized swap losses	1,799	2,172	1 – 11 years
Utility plant retirement costs	4,841	3,994	5 years
Customer-owned lead service line replacements	304	191	4 years
Income taxes on customers' advances for construction and contributions in aid of construction	577	-	Various
Service life study expenses	18	23	4 years
Rate case filing expenses	311	5	3 years
	$32,353	$30,331	
Liabilities			
Excess accumulated deferred income taxes on accelerated depreciation	$14,184	$14,348	Various
Income taxes	6,979	6,260	Various
IRS TPR catch-up deduction	3,887	3,887	15 years
Revenue reduction for tax rate change	1,764	-	2 years
	$26,814	$24,495	

The regulatory asset for income taxes includes (a) deferred state income taxes related primarily to differences between book and tax depreciation expense, (b) deferred income taxes related to the differences that arise between specific asset improvement costs capitalized for book purposes and deducted as a repair expense for tax purposes, and (c) deferred income taxes associated with the gross-up of revenues related to the differences. These assets are recognized for ratemaking purposes on a cash or flow-through basis and will be recovered in rates as they reverse.

Postretirement benefits include the difference between contributions and deferred pension expense and the underfunded status of the pension plans. The underfunded status represents the difference between the projected benefit obligation and the fair market value of the assets. This asset is expected to be recovered in future years as additional contributions are made or markets continue to generate positive returns. The recovery period is dependent on contributions made to the plans, plan asset performance and the discount rate used to value the obligations. The period is estimated at between 5 and 10 years.

The Company uses regulatory accounting treatment to defer the mark-to-market unrealized gains and losses on its interest rate swap to reflect that the gain or loss is included in the ratemaking formula when the transaction actually settles. The value of the swap as of the balance sheet date is recorded as part of other deferred credits. Realized gains or losses on the swap will be recorded as interest expense in the statement of income over its remaining life of 11 years.

Utility plant retirement costs represents costs already incurred for the removal of assets, which are expected to be recovered over a five-year period in rates, through depreciation expense.

The Company was granted approval by the PPUC to modify its tariff to replace lead customer-owned service lines that are discovered when the Company replaces its lead service lines over the remaining three years, and to include the cost of the annual replacement of up to 400 lead customer-owned service lines whenever they are discovered, regardless of the material used for the company-owned service line over nine years. The tariff modification allows the Company to replace customer-owned service lines at its own initial cost and record the costs as a regulatory asset to be recovered in future base rates to customers. The recovery period was established in the most recent rate order at four years.

Service life study expenses are deferred and amortized over their remaining life of four years. Rate case filing expenses are deferred and amortized over their life of three years.

Pursuant to the Tax Cuts and Jobs Act of 2017, or 2017 Tax Act, customers' advances for construction and contributions in aid of construction are considered taxable income. The Company's tariff allows the Company to record these income taxes for inclusion in rate base. This asset is recognized for ratemaking purposes on a cash or flow-through basis and will be recovered in rates as it reverses.

Under normalization rules applicable to public utility property included in the 2017 Tax Act, the excess accumulated deferred income taxes on accelerated depreciation from lowering of the enacted federal statutory corporate tax rate is recorded as a regulatory liability. The benefit will be given back to customers in rates over the remaining regulatory life of the property.

The regulatory liability for income taxes includes deferred taxes related to excess accumulated deferred income taxes on accelerated depreciation, other postretirement benefits, customers' advances for construction and contributions in aid of construction, and bad debts, as well as deferred investment tax credits. These liabilities will be given back to customers in rates, as tax deductions occur over the next 1 to 50 years.

The regulatory liability for the Internal Revenue Service, or IRS, tangible property regulations, or TPR, catch-up deduction represents the tax benefits realized on the Company's 2014 income tax return for qualifying capital expenditures made prior to 2014. The Company received approval from the PPUC in its most recent rate order to amortize the catch-up deduction over 15 years beginning March 1, 2019.

Pursuant to a rate order approved by the PPUC, the Company has agreed to return the 2018 income tax savings pursuant to the 2017 Tax Act, the associated tax gross-up, and the excess accumulated deferred income taxes on accelerated depreciation to customers as a reconcilable negative surcharge on bills. The liability will be given back to customers as a negative surcharge on bills over one year beginning March 1, 2019.

Other Assets
Other assets consist mainly of the cash value of life insurance policies held as an investment by the Company for reimbursement of costs and benefits associated with its supplemental retirement and deferred compensation programs.

Deferred Debt Expense
Deferred debt expense is amortized on a straight-line basis over the term of the related debt and is presented on the balance sheet as a direct reduction from long-term debt.

Customers' Advances for Construction
Customer advances are cash payments from developers, municipalities, customers or builders for construction of utility plant, and are refundable upon completion of construction, as operating revenues are earned. If the Company loans funds for construction to the customer, the refund amount is credited to the note receivable rather than paid out in cash. After all refunds to which the customer is entitled are made, any remaining balance is transferred to contributions in aid of construction.

Contributions in Aid of Construction
Contributions in Aid of Construction is composed of (i) direct, non-refundable contributions from developers, customers or builders for construction of water infrastructure and (ii) customer advances that have become non-refundable. Contributions in aid of construction are deducted from the Company's rate base, and therefore, no return is earned on property financed with contributions. The PPUC requires that contributions received remain on the Company's balance sheets indefinitely as a long-term liability.

Interest Rate Swap Agreement
The Company is exposed to certain risks relating to its ongoing business operations. The primary risk managed by using derivative instruments is interest rate risk. The Company utilizes an interest rate swap agreement to convert its variable-rate debt to a fixed rate. Interest rate swaps are contracts in which a series of interest rate cash flows are exchanged over a prescribed period. The notional amount on which the interest payments are based is not exchanged. The Company has designated the interest rate swap agreement as a cash flow hedge, classified as a financial derivative used for non-trading activities.

The accounting standards regarding accounting for derivatives and hedging activities require companies to recognize all derivative instruments as either assets or liabilities at fair value on the balance sheets. In accordance with the standards, the interest rate swap is recorded on the balance sheets in other deferred credits at fair value.

The Company uses regulatory accounting treatment rather than hedge accounting to defer the unrealized gains and losses on its interest rate swap. Instead of the effective portion being recorded as other comprehensive income and the ineffective portion being recognized in earnings, the entire unrealized swap value is recorded as a regulatory asset. Based on current ratemaking treatment, the Company expects the gains and losses to be recognized in rates and in interest expense as the swap settlements occur. Swap settlements are recorded in the income statement with the hedged item as interest expense. Swap settlements resulted in the reclassification from regulatory assets to interest expense of $236 in 2018 and $301 in 2017. The overall swap result was a (gain) loss of $(137) in 2018 and $209 in 2017. During the twelve months ending December 31, 2019, the Company expects to reclassify $199 (before tax) from regulatory assets to interest expense.

The interest rate swap will expire on October 1, 2029.

Stock-Based Compensation
The Company records compensation expense in the financial statements for stock-based awards based on the grant date fair value of those awards. Stock-based compensation expense is recognized over the requisite service periods of the awards on a straight-line basis, which is generally commensurate with the vesting term. Forfeitures are recognized as they occur.

Income Taxes
Certain income and expense items are accounted for in different time periods for financial reporting than for income tax reporting purposes.

Deferred income taxes are accounted for under the asset and liability method. Deferred tax assets and liabilities are recognized for the future tax consequences attributable to differences between the financial statement carrying amounts of existing assets and liabilities and their respective tax bases and tax credit carryforwards. Deferred tax assets and liabilities are measured using enacted tax rates expected to apply to taxable income in the years in which those temporary differences are expected to be recovered or settled. The effect on deferred tax assets and liabilities of a change in tax rates is recognized in income in the period that includes the enactment date. To the extent such income taxes increase or decrease future rates, an offsetting regulatory asset or liability has been recorded.

Investment tax credits have been deferred and are being amortized to income over the average estimated service lives of the related assets. As of December 31, 2018 and 2017, deferred investment tax credits amounted to $578 and $618, respectively.

The Company filed for a change in accounting method under the IRS TPR effective in 2014. Under the change in accounting method, the Company is permitted to deduct the costs of certain asset improvements that were previously being capitalized and depreciated for tax purposes as an expense on its income tax return. The Company is permitted to make this deduction for prior years (the "catch-up deduction") and each year going forward, beginning with 2014 (the "ongoing deduction"). The ongoing deduction results in a reduction in the effective income tax rate, a net reduction in income tax expense, and a reduction in the amount of income taxes currently payable. The catch-up deduction resulted in a decrease in current income taxes payable and an increase to regulatory liabilities. The Company received approval from the PPUC in its most recent rate order to amortize the catch-up deduction, recorded as a regulatory liability, over 15 years beginning March 1, 2019. Both the ongoing and catch-up deductions resulted in increases to deferred tax liabilities and regulatory assets representing the appropriate book and tax basis difference on capital additions.

The 2017 Tax Act, among other things, reduces the federal statutory corporate tax rate for tax years beginning in 2018 from 34% to 21%, eliminates certain deductions, and eliminates bonus depreciation on qualified water and wastewater property. This resulted in the remeasurement of the federal portion of the Company's deferred taxes as of December 31, 2017 to the 21% rate. The effect was recognized in income for the year ended December 31, 2017 for all deferred tax assets and liabilities except accelerated depreciation. Under normalization rules applicable to public utility property included in the 2017 Tax Act, the excess accumulated deferred income taxes on accelerated depreciation is recorded as a regulatory liability. The regulatory liability is a temporary difference, so a deferred tax asset is recorded including the gross-up of revenue necessary to return, in rates, the effect of the temporary difference.

Allowance for Funds Used During Construction
Allowance for funds used during construction (AFUDC) represents the estimated cost of funds used for construction purposes during the period of construction. These costs are reflected as non-cash income during the construction period and as an addition to the cost of plant constructed. AFUDC includes the net cost of borrowed funds and a rate of return on other funds. The PPUC approved rate of 10.04% was applied for 2018 and 2017. AFUDC is recovered through water and wastewater rates as utility plant is depreciated.

Use of Estimates in the Preparation of Financial Statements
The preparation of financial statements in conformity with accounting principles generally accepted in the United States of America requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. Actual results could differ from those estimates.

Reclassifications
Certain 2017 amounts have been reclassified to conform to the 2018 presentation. Such reclassifications had no effect on the balance sheets, net income, the statements of common stockholders' equity, or the statements of cash flows.

Impact of Recent Accounting Pronouncements
In May 2017, the Financial Accounting Standards Board (FASB) issued Accounting Standards Update (ASU) No. 2017-09, *Compensation – Stock Compensation (Topic 718): Scope of Modification Accounting*. This ASU clarifies when a change to the terms or conditions of a share-based payment award must be accounted for as a modification. The guidance requires modification accounting if the fair value, vesting condition or the classification of the award is not the same immediately before and after a change to the terms and conditions of the award. The ASU is effective for annual periods beginning after December 15, 2017, and interim periods within those fiscal years, with early adoption available. The Company adopted the standard effective January 1, 2018. The adoption did not have an impact on its financial position, results of operations and cash flows.

In March 2017, the FASB issued ASU No. 2017-07, *Compensation – Retirement Benefits (Topic 715): Improving the Presentation of Net Periodic Pension Cost and Net Periodic Post-Retirement Benefit Cost.* This ASU requires employers to report the service cost component in the same line item as other compensation costs arising from services rendered by employees during the reporting period. The other components of net benefit costs will be presented in the income statement separately from the service cost and outside of a subtotal of income from operations. In addition, only the service cost component may be eligible for capitalization where applicable. The ASU is effective for annual periods beginning after December 15, 2017, and interim periods within those fiscal years, with early adoption available. The Company adopted the standard on January 1, 2018. The adoption of this standard resulted in the reclassification on the statements of income of the components of net periodic pension cost other than service cost from operating expenses to other pension costs in other income (expenses) of $1,285 and $1,220 for the years ended December 31, 2018 and 2017, respectively.

In August 2016, the FASB issued ASU No. 2016-15, *Statement of Cash Flows (Topic 320): Classification of Certain Cash Receipts and Cash Payments.* This ASU clarifies how certain cash receipts and payments should be presented in the statement of cash flows. The ASU is effective for fiscal years beginning after December 15, 2017, and interim periods within those fiscal years, with early adoption available. The Company adopted the standard on January 1, 2018. The adoption did not have an impact on its financial position, results of operations and cash flows.

In February 2016, the FASB issued ASU No. 2016-02, *Leases (Topic 842)*, which replaces the existing guidance in Accounting Standard Codification 840 – Leases. This ASU requires a dual approach for lessee accounting under which a lessee would account for leases as finance leases or operating leases. Both finance leases and operating leases will result in the lessee recognizing a right-of-use asset and a corresponding lease liability. For finance leases, the lessee would recognize interest expense and amortization of the right-of-use asset, and for operating leases, the lessee would recognize a straight-line total lease expense. This ASU is effective for fiscal years beginning after December 15, 2018, and for interim periods within those fiscal years. The Company will adopt the standard effective January 1, 2019. The Company did not identify any material leases under this standard and determined adoption will not have a material effect on its financial position, results of operations and cash flows.

In May 2014, the FASB issued ASU No. 2014-09, *Revenue from Contracts with Customers.* This ASU supersedes the revenue recognition requirements in Accounting Standards Codification 605—Revenue Recognition and most industry-specific guidance throughout the Codification. The standard requires that an entity recognizes revenue to depict the transfer of promised goods or services to customers in an amount that reflects the consideration to which the company expects to be entitled in exchange for those goods or services. In August 2015, the FASB issued ASU No. 2015-14, *Revenue from Contracts with Customers (Topic 606): Deferral of the Effective Date*, deferring the effective date of this amendment for public companies by one year to fiscal years beginning after December 15, 2017. Early adoption was permitted for fiscal years beginning after December 15, 2016, the original effective date. The standard permits the use of either a retrospective or cumulative effect transition method. The Company adopted the standard on January 1, 2018. The Company determined that the revenue recognized under the new standard is materially the same as it recognized under previous guidance. In addition, the Company determined the timing of when the revenue is recognized is materially the same as it recognized under previous guidance. As a result, there is no impact on its results of operations or cash flows. The Company has complied with the new disclosure requirements included in this standard which does have a significant impact on its disclosures. The Company selected the modified retrospective transition method but based on the determination that there was no change to its revenue recognition, no cumulative effect of the changes was required to be recorded.

2. Acquisitions

On January 6, 2017, the Company completed the acquisition of the water assets of Stockham's Village Mobile Home Park in Adams County, Pennsylvania. The Company began operating the existing system through an interconnection with its current distribution system on January 9, 2017. The acquisition resulted in the addition of approximately 80 new water customers with purchase price and acquisition costs of approximately $24, which is more than the depreciated original cost of the assets. The Company recorded an acquisition adjustment of approximately $17 and will seek approval from the PPUC to amortize the acquisition adjustment over the remaining life of the acquired assets.

On February 23, 2017, the Company completed the acquisition of the wastewater collection assets of West York Borough in York County, Pennsylvania. The Company began operating the existing collection facilities on February 27, 2017. The acquisition resulted in the addition of approximately 1,700 wastewater customers, representing more than 2,200 units, with purchase price and acquisition costs of approximately $448, which is more than the depreciated original cost of the assets. The Company recorded an acquisition adjustment of approximately $358 and will seek approval from the PPUC to amortize the acquisition adjustment over the remaining life of the acquired assets.

3. Accounts Receivable and Contract Assets

Accounts receivable and contract assets are summarized in the following table:

	As of Dec. 31, 2018	As of Dec. 31, 2017	Change
Accounts receivable – customers	$4,731	$4,661	$70
Other receivables	385	191	194
	5,116	4,852	264
Less: allowance for doubtful accounts	(305)	(305)	-
Accounts receivable, net	$4,811	$4,547	$264
Unbilled revenue	$2,427	$2,459	$(32)

Differences in timing of revenue recognition, billings, and cash collections result in receivables and contract assets. Generally, billing occurs subsequent to revenue recognition, resulting in a contract asset reported as unbilled revenue on the balance sheet. The Company does not receive advances or deposits from customers before revenue is recognized so no contract liabilities are reported. Accounts receivable are recorded when the right to consideration becomes unconditional and are presented separately on the balance sheet. The changes in accounts receivable – customers and in unbilled revenue were primarily due to normal timing difference between performance and the customer's payments.

4. Note Receivable and Customers' Advances for Construction

The Company entered into an agreement with a municipality to extend water service into a previously formed water district. The Company loaned funds to the municipality to cover the costs related to the project. The municipality concurrently advanced these funds back to the Company in the form of customers' advances for construction. The municipality is required by enacted ordinance to charge application fees and water revenue surcharges (fees) to customers connected to the system, which are remitted to the Company. The note principal and the related customer advance are reduced periodically as operating revenues are earned by the Company from customers connected to the system and refunds of the advance are made. There is no due date for the notes or expiration date for the advance.

The Company recorded interest income of $105 in 2018 and $98 in 2017. The interest rate on the note outstanding is 7.5%.

Included in the accompanying balance sheets at December 31, 2018 and 2017 were the following amounts related to this project.

	2018	2017
Note receivable, including interest	$255	$255
Customers' advances for construction	305	306

The Company has other customers' advances for construction totaling $6,544 and $6,018 at December 31, 2018 and 2017, respectively.

5. Common Stock and Earnings Per Share

Net income of $13,376 and $12,974 for the years ended December 31, 2018 and 2017, respectively, is used to calculate both basic and diluted earnings per share. Basic net income per share is based on the weighted average number of common shares outstanding. Diluted net income per share is based on the weighted average number of common shares outstanding plus potentially dilutive shares. The dilutive effect of employee stock-based compensation is included in the computation of diluted net income per share. The dilutive effect of stock-based compensation is calculated using the treasury stock method and expected proceeds upon exercise or issuance of the stock-based compensation.

The following table summarizes the shares used in computing basic and diluted net income per share:

	2018	2017
Weighted average common shares, basic	12,903,568	12,849,123
Effect of dilutive securities:		
Employee stock-based compensation	268	48
Weighted average common shares, diluted	12,903,836	12,849,171

Under the employee stock purchase plan, all full-time employees who have been employed at least ninety consecutive days may purchase shares of the Company's common stock limited to 10% of gross compensation. The purchase price is 95% of the fair market value (as defined). Shares issued during 2018 and 2017 were 5,187 and 4,770, respectively. As of December 31, 2018, 65,639 authorized shares remain unissued under the plan.

The Company has a Dividend Reinvestment and Direct Stock Purchase and Sale Plan ("the Plan"), which is available to both current shareholders and the general public. On October 3, 2016, the Company filed a Registration Statement on Form S-3 with the Securities and Exchange Commission (SEC) to authorize an additional 331,000 shares and rollover the unissued 170,240 shares authorized under the 2013 Form S-3, for issuance under the new Prospectus for the Plan. Under the optional dividend reinvestment portion of the Plan, holders of the Company's common stock may purchase additional shares instead of receiving cash dividends. The purchase price is 95% of the fair market value (as defined). Under the direct stock purchase portion of the Plan, purchases are made monthly at 100% of the stock's fair market value, as defined in the new Prospectus. The Registration Statement was declared effective by the SEC on November 16, 2016. Shares issued during 2018 and 2017 were 61,864 and 51,401, respectively. As of December 31, 2018, 379,374 authorized shares remain unissued under the plan.

On March 11, 2013, the Board of Directors, or the Board, authorized a share repurchase program granting the Company authority to repurchase up to 1,200,000 shares of the Company's common stock from time to time. The stock repurchase program has no specific end date and the Company may repurchase shares in the open market or through privately negotiated transactions. The Company may suspend or discontinue the repurchase program at any time. During 2018 and 2017, the Company repurchased and retired 0 and 37,229, shares, respectively. As of December 31, 2018, 618,004 shares remain available for repurchase.

6. Long-Term Debt and Short-Term Borrowings

Long-term debt as of December 31, 2018 and 2017 is summarized in the following table:

	2018	2017
10.17% Senior Notes, Series A, due 2019	6,000	6,000
9.60% Senior Notes, Series B, due 2019	5,000	5,000
1.00% Pennvest Note, due 2019	30	74
10.05% Senior Notes, Series C, due 2020	6,500	6,500
8.43% Senior Notes, Series D, due 2022	7,500	7,500
Variable Rate Pennsylvania Economic Development Financing Authority Exempt Facilities Revenue Bonds, Series 2008A, due 2029	12,000	12,000
4.75% York County Industrial Development Authority Revenue Bonds, Series 2006, due 2036	10,500	10,500
4.50% Pennsylvania Economic Development Financing Authority Exempt Facilities Revenue Refunding Bonds, Series 2014, due 2038	14,870	14,870
5.00% Monthly Senior Notes, Series 2010A, due 2040	15,000	15,000
4.00% - 4.50% York County Industrial Development Authority Exempt Facilities Revenue Bonds, Series 2015, due 2029 - 2045	10,000	10,000
Committed Line of Credit, due 2020	8,508	5,389
Total long-term debt	95,908	92,833
Less discount on issuance of long-term debt	(204)	(215)
Less unamortized debt issuance costs	(2,346)	(2,476)
Less current maturities	(30)	(44)
Long-term portion	$ 93,328	$ 90,098

Payments due by year as of December 31, 2018:

2019	2020	2021	2022	2023
$30	$27,008	$-	$7,500	$-

Payments due in 2020 include payback of the committed line of credit. The committed line of credit is reviewed annually, and upon favorable outcome, would likely be extended for another year. Payments due in 2020 also include potential payments of $12,000 on the variable rate bonds (due 2029) which would only be payable if all bonds were tendered and could not be remarketed, or in the event the Company was unable to, or chose not to, renew the letter of credit backing the bonds. There is currently no such indication of this happening.

The 10.17% Senior Notes, Series A and 9.60% Senior Notes, Series B are not included in current maturities as they have been refinanced with 4.54% Senior Notes, Series 2019 issued January 31, 2019. See Note 15 for additional information regarding this issue. As such, they are not included in payments due in 2019.

Fixed Rate Long-Term Debt

The Pennsylvania Economic Development Financing Authority, or PEDFA, Series 2014 Bonds contain both optional and special redemption provisions. Under the optional provisions, the Company can redeem all or a portion of the bonds on or after May 1, 2019. Under the special provisions, representatives of deceased beneficial owners of the bonds have the right to request redemption prior to the stated maturity of all or part of their interest in the bonds beginning on or after May 1, 2014. The Company is not obligated to redeem any individual interest exceeding $25, or aggregate interest exceeding $300, in any annual period. In 2018 and 2017, no bonds were retired under these provisions. Currently, no additional bonds that meet the special provisions have been tendered for redemption.

Variable Rate Long-Term Debt

On May 7, 2008, the PEDFA issued $12,000 aggregate principal amount of PEDFA Exempt Facilities Revenue Refunding Bonds, Series A of 2008 (the "Series A Bonds") for the Company's benefit pursuant to the terms of a trust indenture, dated as of May 1, 2008, between the PEDFA and Manufacturers and Traders Trust Company, as trustee. The PEDFA then loaned the proceeds of the offering of the Series A Bonds to the Company pursuant to a loan agreement, dated as of May 1, 2008, between the Company and the PEDFA. The loan agreement provides for a $12,000 loan with a maturity date of October 1, 2029. Amounts outstanding under the loan agreement are the Company's direct general obligations. The proceeds of the loan were used to redeem the PEDFA Exempt Facilities Revenue Bonds, Series B of 2004 (the "2004 Series B Bonds"). The 2004 Series B Bonds were redeemed because the bonds were tendered and could not be remarketed due to the downgrade of the bond insurer's credit rating.

Borrowings under the loan agreement bear interest at a variable rate as determined by PNC Capital Markets, as remarketing agent, on a periodic basis elected by the Company, which has currently elected that the interest rate be determined on a weekly basis. The remarketing agent determines the interest rate based on the current market conditions in order to determine the lowest interest rate which would cause the Series A Bonds to have a market value equal to the principal amount thereof plus accrued interest thereon. The variable interest rate under the loan agreement averaged 1.46% in 2018 and 0.88% in 2017. As of December 31, 2018 and 2017, the interest rate was 1.75% and 1.78%, respectively.

The holders of the $12,000 Series A Bonds may tender their bonds at any time. When the bonds are tendered, they are subject to an annual remarketing agreement, pursuant to which a remarketing agent attempts to remarket the tendered bonds according to the terms of the indenture. In order to keep variable interest rates down and to enhance the marketability of the Series A Bonds, the Company entered into a Reimbursement, Credit and Security Agreement with PNC Bank, National Association ("the Bank") dated as of May 1, 2008. This agreement provides for a direct pay letter of credit issued by the Bank to the trustee for the Series A Bonds. The Bank is responsible for providing the trustee with funds for the timely payment of the principal and interest on the Series A Bonds and for the purchase price of the Series A Bonds that have been tendered or deemed tendered for purchase and have not been remarketed. The Company's responsibility is to reimburse the Bank the same day as regular interest payments are made, and within fourteen months for the purchase price of tendered bonds that have not been remarketed. The reimbursement period for the principal is immediate at maturity, upon default by the Company, or if the Bank does not renew the Letter of Credit. The current expiration date of the Letter of Credit is June 30, 2020. It is reviewed annually for a potential extension of the expiration date.

The Company may elect to have the Series A Bonds redeemed, in whole or in part, on any date that interest is payable for a redemption price equal to the principal amount thereof plus accrued interest to the date of redemption. The Series A Bonds are also subject to mandatory redemption for the same redemption price in the event that the IRS determines that the interest payable on the Series A Bonds is includable in gross income of the holders of the bonds for federal tax purposes.

Interest Rate Swap Agreement

In connection with the issuance of the PEDFA 2004 Series B Bonds, the Company entered into an interest rate swap agreement with a counterparty, in the notional principal amount of $12,000. The Company elected to retain the swap agreement for the 2008 Series A Bonds. Interest rate swap agreements derive their value from underlying interest rates. These transactions involve both credit and market risk. The notional amounts are amounts on which calculations, payments, and the value of the derivative are based. Notional amounts do not represent direct credit exposure. Direct credit exposure is limited to the net difference between the calculated amounts to be received and paid, if any. Such difference, which represents the fair value of the swap, is reflected on the Company's balance sheets. See Note 7 for additional information regarding the fair value of the swap.

The interest rate swap will terminate on the maturity date of the 2008 Series A Bonds (which is the same date as the maturity date of the loan under the loan agreement), unless sooner terminated pursuant to its terms. In the event the interest rate swap terminates prior to the maturity date of the 2008 Series A Bonds, either the Company or the swap counterparty may be required to make a termination payment to the other based on market conditions at such time. The Company is exposed to credit-related losses in the event of nonperformance by the counterparty. The Company controls the credit risk of its financial contracts through credit approvals, limits and monitoring procedures, and does not expect the counterparty to default on its obligations. Notwithstanding the terms of the swap agreement, the Company is ultimately obligated for all amounts due and payable under the loan agreement.

The interest rate swap agreement contains provisions that require the Company to maintain a credit rating of at least BBB- with Standard & Poor's. On February 9, 2018, Standard & Poor's affirmed the Company's credit rating at A-, with a stable outlook and adequate liquidity. If the Company's rating were to fall below this rating, it would be in violation of these provisions, and the counterparty to the derivative could request immediate payment if the derivative was in a liability position. The Company's interest rate swap was in a liability position as of December 31, 2018. If a violation was triggered on December 31, 2018, the Company would have been required to pay the counterparty approximately $1,852.

The Company's interest rate swap agreement provides that it pays the counterparty a fixed interest rate of 3.16% on the notional amount of $12,000. In exchange, the counterparty pays the Company a floating interest rate (based on 59% of the U.S. Dollar one-month LIBOR rate) on the notional amount. The floating interest rate paid to the Company is intended, over the term of the swap, to approximate the variable interest rate on the loan agreement and the interest rate paid to bondholders, thereby managing its exposure to fluctuations in prevailing interest rates. The Company's net payment rate on the swap averaged 1.97% in 2018 and 2.50% in 2017.

As of December 31, 2018, there was a spread of 31 basis points between the variable rate paid to bondholders and the variable rate received from the swap counterparty, which equated to an overall effective rate of 3.47% (including variable interest and swap payments). As of December 31, 2017, there was a spread of 91 basis points which equated to an overall effective rate of 4.07% (including variable interest and swap payments).

Line of Credit Borrowings

As of December 31, 2018, the Company maintained unsecured lines of credit aggregating $41,500 with four banks. The first line of credit, in the amount of $13,000, is a committed line of credit with a revolving 2-year maturity (currently May 2020) and carries an interest rate of LIBOR plus 1.20%. The Company had $6,508 and $5,389 outstanding under this line of credit as of December 31, 2018 and 2017, respectively. The second line of credit, in the amount of $11,000, is a committed line of credit, which matures in May 2020 and carries an interest rate of LIBOR plus 1.25%. The third line of credit, in the amount of $7,500, is a committed line of credit, which matures in June 2020 and carries an interest rate of LIBOR plus 1.15%. The Company had $2,000 outstanding under this line of credit as of December 31, 2018. The fourth line of credit, in the amount of $10,000, is a committed line of credit, which matures in September 2019 and carries an interest rate of LIBOR plus 1.20%. The Company had $1,000 outstanding under this line of credit as of December 31, 2018 and 2017. Average borrowings outstanding under the lines of credit were $7,206 in 2018 and $3,132 in 2017. The average cost of borrowings under the lines of credit was 3.20% during 2018 and 1.76% during 2017. The weighted average interest rate on the line of credit borrowings was 3.60% as of December 31, 2018 and 2.65% as of December 31, 2017.

Debt Covenants and Restrictions

The terms of the debt agreements carry certain covenants and limit in some cases the Company's ability to borrow additional funds, to prepay its borrowings and include certain restrictions with respect to declaration and payment of cash dividends and the Company's acquisition of its stock. Under the terms of the most restrictive agreements, the Company cannot borrow in excess of 60% of its utility plant, and cumulative payments for dividends and acquisition of stock since December 31, 1982 may not exceed $1,500 plus net income since that date. As of December 31, 2018, none of the earnings retained in the business are restricted under these provisions. The Company's Pennvest Loan, which will mature in 2019, is secured by $800 of receivables. Other than this loan, the Company's debt is unsecured.

The Company's lines of credit require it to maintain a minimum equity to total capitalization ratio (defined as the sum of equity plus funded debt) and a minimum interest coverage ratio (defined as net income plus interest expense plus income tax expense divided by interest expense). As of December 31, 2018, the Company was in compliance with these covenants.

7. Fair Value of Financial Instruments

The accounting standards regarding fair value measurements establish a fair value hierarchy which indicates the extent to which inputs used in measuring fair value are observable in the market. Level 1 inputs include quoted prices for identical instruments and are the most observable. Level 2 inputs include quoted prices for similar assets and observable inputs such as interest rates, commodity rates and yield curves. Level 3 inputs are not observable in the market and include management's own judgments about the assumptions market participants would use in pricing the asset or liability.

The Company has recorded its interest rate swap liability at fair value in accordance with the standards. The liability is recorded under the caption "Other deferred credits" on the balance sheets. The table below illustrates the fair value of the interest rate swap as of the end of the reporting period.

Description	December 31, 2018	Fair Value Measurements at Reporting Date Using Significant Other Observable Inputs (Level 2)
Interest Rate Swap	$1,815	$1,815

Fair values are measured as the present value of all expected future cash flows based on the LIBOR-based swap yield curve as of the date of the valuation. These inputs to this calculation are deemed to be Level 2 inputs. The balance sheet carrying value reflects the Company's credit quality as of December 31, 2018. The rate used in discounting all prospective cash flows anticipated to be made under this swap reflects a representation of the yield to maturity for 30-year debt on utilities rated A- as of December 31, 2018. The use of the Company's credit quality resulted in a reduction in the swap liability of $37 as of December 31, 2018. The fair value of the swap reflecting the Company's credit quality as of December 31, 2017 is shown in the table below.

Description	December 31, 2017	Fair Value Measurements at Reporting Date Using Significant Other Observable Inputs (Level 2)
Interest Rate Swap	$2,196	$2,196

The carrying amount of current assets and liabilities that are considered financial instruments approximates fair value as of the dates presented. The Company's total long-term debt, with a carrying value of $95,908 at December 31, 2018, and $92,833 at December 31, 2017, had an estimated fair value of approximately $105,000 and $108,000, respectively. The estimated fair value of debt was calculated using a discounted cash flow technique that incorporates a market interest yield curve with adjustments for duration and risk profile. These inputs to this calculation are deemed to be Level 2 inputs. The Company recognized its credit rating in determining the yield curve and did not factor in third party credit enhancements including bond insurance on the 2006 York County Industrial Development Authority issue and the letter of credit on the 2008 PEDFA Series A issue.

Customers' advances for construction and note receivable have carrying values at December 31, 2018 of $6,849 and $255, respectively. At December 31, 2017, customers' advances for construction and note receivable had carrying values of $6,324 and $255, respectively. The relative fair values of these amounts cannot be accurately estimated since the timing of future payment streams is dependent upon several factors, including new customer connections, customer consumption levels and future rate increases.

8. Commitments

Based on its capital budget, the Company anticipates construction and acquisition expenditures for 2019 and 2020 of approximately $21,479 and $21,209, respectively, exclusive of any acquisitions not yet approved. The Company plans to finance ongoing capital expenditures with internally-generated funds, borrowings against the Company's lines of credit, proceeds from the issuance of common stock under its dividend reinvestment and direct stock purchase and sale plan and ESPP, potential common stock or debt issues and customer advances and contributions.

The Company entered into a consent order agreement with the Pennsylvania Department of Environmental Protection in December 2016 after the Company determined it exceeded the action level for lead as established by the Lead and Copper Rule, or LCR, issued by the U.S. Environmental Protection Agency. Under the agreement, the Company committed to exceed the LCR replacement schedule by replacing all of the remaining known company-owned lead service lines within four years from the agreement. The cost for these service line replacements was approximately $2,341 through December 31, 2018 and is included in utility plant. As of December 31, 2018, all known company-owned lead service lines have been replaced. Any additional company-owned lead service lines that are discovered will be replaced but are not expected to have a material impact on the financial position of the Company.

Due to its exceedance in 2016, the Company was required under the LCR to complete two rounds of compliance testing at the customer's tap in 2017. The water samples did not exceed the action level either time. As a result, the Company was able to reduce its monitoring to annual compliance tests beginning in 2018. The Company completed its compliance testing at the customer's tap in 2018 and the water samples did not exceed the action level. In addition, the Company performed in excess of the required actions under the LCR. Specifically, the Company provided the affected customers with a free water test and a 200 gallon per month credit to flush their line in order to reduce any lead content until their lead service line has been replaced. The cost of the water tests and flushing credits was $4 and $16 for the years ended December 31, 2018 and 2017, respectively. Additional amounts for water tests and flushing credits are not expected to have a material impact on the financial position of the Company.

The Company was granted approval by the PPUC to modify its tariff to include the cost of the replacement of lead customer-owned service lines that are discovered when the Company replaces its lead service lines, and to include the cost of the annual replacement of up to 400 lead customer-owned service lines whenever they are discovered, regardless of the material used for the company-owned service line over nine years from the agreement. The tariff modification allows the Company to replace customer-owned service lines at its own initial cost. The Company will record the costs as a regulatory asset to be recovered in future base rates to customers, over a four-year period. The cost for the customer-owned lead service line replacements under the four-year tariff modification was approximately $304 through December 31, 2018 and is included as a regulatory asset. All known customer-owned lead service lines that are connected to a company-owned lead service line have been replaced by December 31, 2018. Based on its experience, the Company estimates that lead customer-owned service lines replacements will cost $910 under the nine-year tariff modification. This estimate is subject to adjustment as more facts become available.

As of December 31, 2018, approximately 35% of the Company's full-time employees are under union contract. The current contract was ratified in December 2017 and expires on April 30, 2020.

The Company is involved in certain legal and administrative proceedings before various courts and governmental agencies concerning water service and other matters. The Company expects that the ultimate disposition of these proceedings will not have a material effect on the Company's financial position, results of operations and cash flows.

9. Revenue

The following table shows the Company's revenues disaggregated by service and customer type.

	2018	2017
Water utility service:		
Residential	$30,348	$30,417
Commercial and industrial	13,351	13,538
Fire protection	2,931	2,968
Wastewater utility service:		
Residential	933	840
Commercial and industrial	227	191
Billing and revenue collection services	64	63
Collection services	54	62
Other revenue	22	38
Total Revenue from Contracts with Customers	47,930	48,117
Rents from regulated property	507	472
Total Operating Revenue	$48,437	$48,589

Utility Service

The Company provides utility service as a distinct and single performance obligation to each of its water and wastewater customers. The transaction price is detailed in the tariff pursuant to an order by the PPUC and made publicly available. There is no variable consideration and no free service, special rates, or subnormal charges to any customer. Due to the fact that the contract includes a single performance obligation, no judgment is required to allocate the transaction price. The performance obligation is satisfied over time through the continuous provision of utility service through a stand-ready obligation to perform and the transfer of water or the collection of wastewater through a series of distinct transactions that are identical in nature and have the same pattern of transfer to the customer. The Company uses an output method to recognize the utility service revenue over time. The stand-ready obligation is recognized through the passage of time in the form of a fixed charge and the transfer of water or the collection of wastewater is recognized at a per unit rate based on the actual or estimated flow through the meter. Each customer is invoiced every month and the invoice is due within twenty days. The utility service has no returns or warranties associated with it. No revenue is recognized from performance obligations satisfied in prior periods and no performance obligations remain unsatisfied as of the end of the reporting period. A contract asset for unbilled revenue is recognized for the passage of time and the actual or estimated usage from the latest meter reading to the end of the accounting period. The methodology is standardized and consistently applied to reduce bias and the need for judgment.

Billing and Revenue Collection Service

The Company provides billing and revenue collection service as distinct performance obligations to four municipalities within the service territory of the Company. The municipalities provide wastewater service to their residents and the Company acts as the billing and revenue collection agent for the municipalities. The transaction price is a fixed amount per bill prepared as established in the contract. There is no variable consideration. Due to the fact that both the billing performance obligation and the revenue collection performance obligation are materially complete by the end of the reporting period, the Company does not allocate the transaction price between the two performance obligations. The performance obligations are satisfied at a point in time when the bills are sent as the municipalities receive all the benefits and bears all of the risk of non-collection at that time. Each municipality is invoiced when the bills are complete and the invoice is due within thirty days. The billing and revenue collection service has no returns or warranties associated with it. No revenue is recognized from performance obligations satisfied in prior periods and no performance obligations remain unsatisfied as of the end of the reporting period.

Collection Service

The Company provides collection service as a distinct and single performance obligation to several municipalities within the service territory of the Company. The municipalities provide wastewater service to their residents. If those residents are delinquent in paying for their wastewater service, the municipalities request that the Company post for and shut off the supply of water to the premises of those residents. When the resident is no longer delinquent, the Company will restore water service to the premises. The transaction price for each posting, each shut off, and each restoration is a fixed amount as established in the contract. There is no variable consideration. Due to the fact that the contract includes a single performance obligation, no judgment is required to allocate the transaction price. The performance obligation is satisfied at a point in time when the posting, shut off, or restoration is completed as the municipalities receive all the benefits in the form of payment or no longer providing wastewater service. Each municipality is invoiced periodically for the posting, shut offs, and restorations that have been completed since the last billing and the invoice is due within thirty days. The collection service has no returns or warranties associated with it. No revenue is recognized from performance obligations satisfied in prior periods and no performance obligations remain unsatisfied as of the end of the reporting period. A contract asset for unbilled revenue is recognized for postings, shut offs, and restorations that have been completed from the last billing to the end of the accounting period.

Service Line Protection Plan

The Company provides service line protection as a distinct and single performance obligation to current water customers that choose to participate. The transaction price is detailed in the plan's terms and conditions and made publicly available. There is no variable consideration. Due to the fact that the contract includes a single performance obligation, no judgment is required to allocate the transaction price. The performance obligation is satisfied over time through the continuous provision of service line protection through a stand-ready obligation to perform. The Company uses an output method to recognize the service line protection revenue over time. The stand-ready obligation is recognized through the passage of time. A customer has a choice to prepay for an entire year or to pay in advance each month. The service line protection plan has no returns or extended warranties associated with it. No revenue is recognized from performance obligations satisfied in prior periods and no material performance obligations remain unsatisfied as of the end of the reporting period.

10. Rate Matters

From time to time, the Company files applications for rate increases with the PPUC and is granted rate relief as a result of such requests. The most recent rate request was filed by the Company on May 30, 2018 and sought an annual increase in water rates of $6,399 and an annual increase in wastewater rates of $289. Effective March 1, 2019, the PPUC authorized an increase in water rates designed to produce approximately $3,361 in additional annual revenues and an increase in wastewater rates designed to produce approximately $289 in additional annual revenues.

The PPUC permits water utilities to collect a distribution system improvement charge, or DSIC. The DSIC allows the Company to add a charge to customers' bills for qualified replacement costs of certain infrastructure without submitting a rate filing. This surcharge mechanism typically adjusts periodically based on additional qualified capital expenditures completed or anticipated in a future period. The DSIC is capped at 5% of base rates, and is reset to zero when new base rates that reflect the costs of those additions become effective or when a utility's earnings exceed a regulatory benchmark. The DSIC reset to zero when the new base rates took effect March 1, 2019. The DSIC provided revenues of $1,971 in 2018 and $899 in 2017. The DSIC is subject to audit by the PPUC.

On May 17, 2018, the PPUC, in conjunction with its review of the effects of the 2017 Tax Act, issued an order which directed utilities with pending rate cases, including the Company, to address the issues related to the 2017 Tax Act in the context of an overall review of the Company's rates and rate structure in lieu of any immediate action. The PPUC expected the Company and the other interested parties to address the effect of the federal tax rate reduction on the rates charged during the rate case review, including whether a retroactive surcharge or other measure is necessary to account for the tax rate change that became effective January 1, 2018. As part of a rate order approved by the PPUC, the Company has agreed to return $2,117 to customers as a reconcilable negative surcharge on their bills generated from March 2019 through February 2020. Based on this agreement, the Company recorded a regulatory liability of $1,764 as of December 31, 2018 by reducing revenue by $1,600 for the year ended December 31, 2018 and recording the gross-up of revenue necessary to return, in rates, the effect of this temporary tax difference, and reclassified $164 from excess accumulated deferred income taxes on accelerated depreciation recorded at December 31, 2017.

11. Employee Benefit Plans

Pensions

The Company maintains a general and administrative and a union-represented defined benefit pension plan covering all of its employees hired prior to May 1, 2010. Employees hired after May 1, 2010 are eligible for an enhanced 401(k) plan rather than a defined benefit plan. The benefits under the defined benefit plans are based upon years of service and compensation near retirement. The Company amended its defined benefit pension plans in 2014, generally limiting the years of eligible service under the plans to 30 years. The Company's funding policy is to contribute annually the amount permitted by the PPUC to be collected from customers in rates, but in no case less than the minimum Employee Retirement Income Security Act (ERISA) required contribution.

The following table sets forth the plans' funded status as of December 31, 2018 and 2017. The measurement of assets and obligations of the plans is as of December 31, 2018 and 2017.

Obligations and Funded Status **At December 31**	**2018**	**2017**
Change in Benefit Obligation		
Pension benefit obligation beginning of year	$44,636	$40.754
Service cost	1,015	1,080
Interest cost	1,515	1,592
Actuarial (gain) loss	(4,140)	2,645
Benefit payments	(1,515)	(1,435)
Pension benefit obligation end of year	41,511	44,636
Change in Plan Assets		
Fair value of plan assets beginning of year	41,439	35,467
Actual return on plan assets	(1,600)	5,107
Employer contributions	2,300	2,300
Benefits paid	(1,515)	(1,435)
Fair value of plan assets end of year	40,624	41,439
Funded Status of Plans at End of Year	$(887)	$(3,197)

The accounting standards require that the funded status of defined benefit pension plans be fully recognized on the balance sheets. They also call for the unrecognized actuarial gain or loss, the unrecognized prior service cost and the unrecognized transition costs to be adjustments to shareholders' equity (accumulated other comprehensive income). Due to a rate order granted by the PPUC, the Company is permitted under the accounting standards to defer the charges otherwise recorded in accumulated other comprehensive income as a regulatory asset. Management believes these costs will be recovered in future rates charged to customers. The liability for the funded status of the Company's pension plans is recorded in "Deferred employee benefits" on its balance sheets.

In 2018, the plans recognized a significant actuarial gain. The Company adopted the new mortality improvement scale (MP-2018) but recognized a 60 basis point increase in the discount rate. In 2017, the plans recognized a significant actuarial loss. The Company adopted the new mortality improvement scale (MP-2017) and recognized a 50 basis point decrease in the discount rate. The Company uses the corridor method to amortize actuarial gains and losses. Gains and losses over 10% of the greater of pension benefit obligation or the market value of assets are amortized over the average future service of plan participants expected to receive benefits.

Changes in plan assets and benefit obligations recognized in regulatory assets are as follows:

	2018	2017
Net gain (loss) arising during the period	$252	$(66)
Recognized net actuarial loss	(406)	(493)
Recognized prior service credit	13	13
Total changes in regulatory asset during the year	$(141)	$(546)

Amounts recognized in regulatory assets that have not yet been recognized as components of net periodic benefit cost consist of the following at December 31:

	2018	2017
Net loss	$8,742	$8,895
Prior service credit	(89)	(101)
Regulatory asset	$8,653	$8,794

Components of net periodic benefit cost are as follows:

	2018	2017
Service cost	$1,015	$1,080
Interest cost	1,515	1,592
Expected return on plan assets	(2,793)	(2,395)
Amortization of loss	406	493
Amortization of prior service credit	(13)	(13)
Rate-regulated adjustment	2,170	1,543
Net periodic benefit cost	$2,300	$2,300

Pension service cost is recorded in operating expenses. All other components of net periodic pension cost are recorded as other pension costs in other income (expenses).

The rate-regulated adjustment set forth above is required in order to reflect pension expense for the Company in accordance with the method used in establishing water rates. The Company is permitted by rate order of the PPUC to expense pension costs to the extent of contributions and defer the remaining expense to regulatory assets to be collected in rates at a later date as additional contributions are made. During 2018, the deferral decreased by $2,170.

The estimated costs for the defined benefit pension plans relating to the December 31, 2018 balance sheet that will be amortized from regulatory assets into net periodic benefit cost over the next fiscal year are as follows:

Net loss	$508
Net prior service credit	(13)
	$495

The Company plans to contribute $2,300 to the plans in 2019.

The following benefit payments, which reflect expected future service, as appropriate, are expected to be paid in each of the next five years and the subsequent five years in the aggregate:

2019	2020	2021	2022	2023	2024-2028
$1,855	$1,865	$1,929	$2,006	$2,177	$12,017

The following tables show the projected benefit obligation, the accumulated benefit obligation and the fair value of plan assets as of December 31:

	2018	2017
Projected benefit obligation	$41,511	$44,636
Fair value of plan assets	40,624	41,439

	2018	2017
Accumulated benefit obligation	$39,100	$41,390
Fair value of plan assets	40,624	41,439

Weighted-average assumptions used to determine benefit obligations at December 31:

	2018	2017
Discount rate	4.10%	3.50%
Rate of compensation increase	2.50% - 3.00%	2.50% - 3.00%

Weighted-average assumptions used to determine net periodic benefit cost for years ended December 31:

	2018	2017
Discount rate	3.50%	4.00%
Expected long-term return on plan assets	6.75%	6.75%
Rate of compensation increase	2.50% - 3.00%	2.50% - 3.00%

The selected long-term rate of return on plan assets was primarily based on the asset allocation of each of the plan's assets (approximately 50% to 70% equity securities and 30% to 50% fixed income securities). Analysis of the historic returns of these asset classes and projections of expected future returns were considered in setting the long-term rate of return.

The investment objective of the Company's defined benefit pension plans is that of Growth and Income. The weighted-average target asset allocations are 50% to 70% equity securities, 30% to 50% fixed income securities, and 0% to 10% reserves (cash and cash equivalents). Within the equity category, the Company's target allocation is approximately 60-95% large cap, 0-25% mid cap, 0-10% small cap, 0-25% International Developed Nations, and 0-10% International Emerging Nations. Within the fixed income category, its target allocation is approximately 15-55% U.S. Treasuries, 0-22% Federal Agency securities, 0-40% corporate bonds, 15-55% mortgage-backed securities, 0-20% international, and 0-20% high yield bonds. The Company's investment performance objectives over a three to five year period are to exceed the annual rate of inflation as measured by the Consumer Price Index by 3%, and to exceed the annualized total return of specified benchmarks applicable to the funds within the asset categories.

Further guidelines within equity securities include: (1) holdings in any one company cannot exceed 5% of the portfolio; (2) a minimum of 20 individual stocks must be included in the domestic stock portfolio; (3) a minimum of 30 individual stocks must be included in the international stock portfolio; (4) equity holdings in any one industry cannot exceed 20-25% of the portfolio; and (5) only U.S.-denominated currency securities are permitted.

Further guidelines for fixed income securities include: (1) fixed income holdings in a single issuer are limited to 5% of the portfolio; (2) acceptable investments include money market securities, U.S. Government and its agencies and sponsored entities' securities, mortgage-backed and asset-backed securities, corporate securities and mutual funds offering high yield bond portfolios; (3) purchases must be limited to investment grade or higher; (4) non-U.S. dollar denominated securities are not permissible; and (5) high risk derivatives are prohibited.

The fair values of the Company's pension plan assets at December 31, 2018 and 2017 by asset category and fair value hierarchy level are as follows. The majority of the valuations are based on quoted prices on active markets (Level 1), with the remaining valuations based on broker/dealer quotes, active market makers, models, and yield curves (Level 2).

	Total Fair Value		Quoted Prices in Active Markets for Identical Assets (Level 1)		Significant Other Observable Inputs (Level 2)	
Asset Category	2018	2017	2018	2017	2018	2017
Cash and Money Market Funds (a)	$1,498	$1,968	$1,498	$1,968	$-	$-
Equity Securities:						
Common Equity Securities (b)	512	2,606	512	2,606	-	-
Equity Mutual Funds (c)	23,637	23,416	23,637	23,416	-	-
Fixed Income Securities:						
U.S. Treasury Obligations	591	1,106	-	-	591	1,106
Corporate and Foreign Bonds (d)	5,315	5,153	-	-	5,315	5,153
Fixed Income Mutual Funds (e)	9,071	7,190	9,071	7,190	-	-
Total Plan Assets	$40,624	$41,439	$34,718	$35,180	$5,906	$6,259

(a) The portfolios are designed to keep up to one year of distributions in immediately available funds. The Company was more heavily-weighted in cash as of December 31, 2017 due to the timing of employer contributions.

(b) This category includes investments in U.S. common stocks and foreign stocks trading in the U.S. widely distributed among consumer discretionary, consumer staples, healthcare, information technology, financial services, telecommunications, industrials, real estate, and energy. The individual stocks are primarily large cap stocks which track with the S&P 500.

(c) This category currently includes a majority of investments in closed-end mutual funds as well as domestic equity mutual funds and international mutual funds which give the portfolio exposure to mid and large cap index funds as well as international diversified index funds.

(d) This category currently includes only U.S. corporate bonds and notes widely distributed among consumer discretionary, consumer staples, healthcare, information technology and financial services.

(e) This category includes fixed income investments in mutual funds which include government, corporate and mortgage securities of both the U.S. and other countries. The mortgage-backed securities and non-U.S. corporate and sovereign investments add further diversity to the fixed income portion of the portfolio.

Defined Contribution Plan

The Company has a savings plan pursuant to the provisions of section 401(k) of the Internal Revenue Code. For employees hired before May 1, 2010, this plan provides for elective employee contributions of up to 15% of compensation and Company matching contributions of 100% of the participant's contribution, up to a maximum annual Company contribution of $2.8 for each employee.

Employees hired after May 1, 2010 are entitled to an enhanced feature of the plan. This feature provides for elective employee contributions of up to 15% of compensation and Company matching contributions of 100% of the participant's contribution, up to a maximum of 4% of the employee's compensation. In addition, the Company will make an annual contribution of $1.2 to each employee's account whether or not they defer their own compensation. Employees eligible for this enhanced 401(k) plan feature are not eligible for the defined benefit plans. As of December 31, 2018, 43 employees were participating in the enhanced feature of the plan. The Company's contributions to both portions of the plan amounted to $287 in 2018 and $266 in 2017.

Deferred Compensation

The Company has non-qualified deferred compensation and supplemental retirement agreements with certain members of management. The future commitments under these arrangements are offset by corporate-owned life insurance policies. At December 31, 2018 and 2017, the present value of the future obligations was approximately $3,955 and $3,981, respectively. The insurance policies included in other assets had a total cash value of approximately $3,402 and $3,152 at December 31, 2018 and 2017, respectively. The Company's net expenses under the plans amounted to $32 in 2018 and $252 in 2017.

Other

The Company has a retiree life insurance program which pays the beneficiary of a retiree $2 upon the retiree's death. At December 31, 2018 and 2017, the present value of the future obligations was approximately $107 and $120, respectively. There is no trust or insurance covering this future liability, instead the Company will pay these benefits out of its general assets. The Company's net (income) expenses under the plan amounted to $(10) in 2018 and $19 in 2017.

12. Stock-Based Compensation

On May 2, 2016, the Company's stockholders approved The York Water Company Long-Term Incentive Plan, or LTIP. The LTIP was adopted to provide the incentive of long-term stock-based awards to officers, directors and key employees. The LTIP provides for the granting of nonqualified stock options, incentive stock options, stock appreciation rights, performance restricted stock grants and units, restricted stock grants and units, and unrestricted stock grants. A maximum of 100,000 shares of common stock may be issued under the LTIP over the ten-year life of the plan. The maximum number of shares of common stock subject to awards that may be granted to any participant in any one calendar year is 2,000. Shares of common stock issued under the LTIP may be treasury shares or authorized but unissued shares. The LTIP is administered by the Compensation Committee of the Board, or the full Board, provided that the full Board administers the LTIP as it relates to awards to non-employee directors of the Company. The Company filed a registration statement with the SEC on May 11, 2016 covering the offering of stock under the LTIP. The LTIP was effective on July 1, 2016.

On November 21, 2016, the Board awarded stock to non-employee directors effective November 28, 2016. This stock award vested immediately. On the same date, the Compensation Committee awarded restricted stock to officers and key employees effective November 28, 2016. This restricted stock award vests ratably over three years beginning November 28, 2016.

On April 26, 2017, the Board awarded stock to non-employee directors effective May 1, 2017. This stock award vested immediately. On April 26, 2017, the Compensation Committee awarded restricted stock to officers and key employees effective May 1, 2017. This restricted stock award vests ratably over three years beginning May 1, 2017. In addition, the Board of Directors accelerated the vesting period for restricted stock granted in 2016 to two retiring officers from three years to their 2017 retirement dates, both of which have been fully recognized as of December 31, 2017.

On May 7, 2018, the Board awarded stock to non-employee directors effective May 7, 2018. This stock award vested immediately. On May 7, 2018, the Compensation Committee awarded restricted stock to officers and key employees effective May 7, 2018. This restricted stock award vests ratably over three years beginning May 7, 2018.

On November 20, 2018, the Board accelerated the vesting period for restricted stock granted in 2016, 2017, and 2018 to one retiring officer from three years to that officer's 2019 retirement date.

The restricted stock awards provide the grantee with the rights of a shareholder, including the right to receive dividends and to vote such shares, but not the right to sell or otherwise transfer the shares during the restriction period. As a result, the awards are included in common shares outstanding on the balance sheet. Restricted stock awards result in compensation expense valued at the fair market value of the stock on the date of the grant and are amortized ratably over the restriction period.

The following table summarizes the stock grant amounts and activity for the years ended December 31, 2017 and 2018.

	Number of Shares	Grant Date Weighted Average Fair Value
Nonvested at beginning of the year 2017	660	$37.20
Granted	1,505	$38.00
Vested	(1,038)	$37.75
Forfeited	-	-
Nonvested at end of the year 2017	1,127	$37.76
Granted	3,743	$32.70
Vested	(1,790)	$33.90
Forfeited	-	-
Nonvested at end of the year 2018	3,080	$33.85

For the years ended December 31, 2018 and 2017, the statement of income includes $80 and $46 of stock-based compensation and related recognized tax benefits of $23 and $18, respectively. The total fair value of the shares vested in the years ended December 31, 2018 and 2017 was $61 and $39, respectively. Total stock-based compensation related to nonvested awards not yet recognized is $104 at December 31, 2018 which will be recognized over the remaining three-year vesting period.

13. Taxes Other than Income Taxes

The following table provides the components of taxes other than income taxes:

	2018	2017
Regulatory Assessment	$261	$231
Property	345	344
Payroll, net of amounts capitalized	538	539
Other	1	19
Total taxes other than income taxes	$1,145	$1,133

14. Income Taxes

The provisions for income taxes consist of:

	2018	2017
Federal current	$1,715	$1,213
State current	718	846
Federal deferred	216	2,514
State deferred	(119)	9
Federal investment tax credit, net of current utilization	(39)	(39)
Total income taxes	$2,491	$4,543

A reconciliation of the statutory Federal tax provision to the total provision follows:

	2018	2017
Statutory Federal tax provision	$3,332	$5,956
State income taxes, net of Federal benefit	471	563
IRS TPR ongoing deduction	(1,307)	(1,796)
Tax-exempt interest	(22)	(33)
Amortization of investment tax credit	(39)	(39)
Cash value of life insurance	(13)	(9)
Domestic production deduction	-	(177)
Change in enacted federal tax rate	-	134
Other, net	69	(56)
Total income taxes	$2,491	$4,543

The Company filed for a change in accounting method under the IRS TPR effective in 2014. Under the change in accounting method, the Company is permitted to deduct the costs of certain asset improvements that were previously being capitalized and depreciated for tax purposes as an expense on its income tax return. The Company was permitted to make this deduction for prior years (the "catch-up deduction") and for each year going forward (the "ongoing deduction"). As a result of the catch-up deduction, income tax benefits of $3,887 were deferred as a regulatory liability. The Company received approval from the PPUC in its most recent rate order to amortize the catch-up deduction, recorded as a regulatory liability, over 15 years beginning March 1, 2019. As a result of the ongoing deduction, the net income tax benefits of $1,307 and $1,796 for the years ended December 31, 2018 and 2017, respectively, reduced income tax expense and flowed-through to net income. The ongoing deduction results in a reduction in the effective income tax rate, a net reduction in income tax expense, and a reduction in the amount of income taxes currently payable. Both the ongoing and catch-up deductions result in increases to deferred tax liabilities and regulatory assets representing the appropriate book and tax basis difference on capital additions.

The 2017 Tax Act, among other things, reduces the federal statutory corporate tax rate for tax years beginning in 2018 from 34% to 21%, eliminates certain deductions, and eliminates bonus depreciation on qualified water and wastewater property. This resulted in the remeasurement of the federal portion of the Company's deferred taxes as of December 31, 2017 to the 21% rate. The effect was recognized in income for the year ended December 31, 2017 for all deferred tax assets and liabilities except accelerated depreciation. Under normalization rules applicable to public utility property included in the 2017 Tax Act, the excess accumulated deferred income taxes on accelerated depreciation is recorded as a regulatory liability. The regulatory liability is a temporary difference, so a deferred tax asset is recorded including the gross-up of revenue necessary to return, in rates, the effect of the temporary difference.

The tax effects of temporary differences between book and tax balances that give rise to significant portions of the deferred tax assets and deferred tax liabilities as of December 31, 2018 and 2017 are summarized in the following table:

	2018	2017
Deferred tax assets:		
Reserve for doubtful accounts	$88	$88
Compensated absences	147	147
Deferred compensation	1,143	1,150
Excess accumulated deferred income taxes on accelerated depreciation	4,098	4,145
Deferred taxes associated with the gross-up of revenues necessary to return, in rates, the effect of temporary differences	2,077	1,736
Customers' advances for construction and contributions in aid of construction	577	-
Revenue reduction for tax rate change	333	-
Pensions	256	924
Other costs deducted for book, not for tax	40	42
Total deferred tax assets	8,759	8,232
Deferred tax liabilities:		
Accelerated depreciation	28,479	27,785
Basis differences from IRS TPR	9,367	7,579
Investment tax credit	411	439
Deferred taxes associated with the gross-up of revenues necessary to recover, in rates, the effect of temporary differences	6,124	5,291
Tax effect of pension regulatory asset	887	1,555
Other costs deducted for tax, not for book	453	337
Total deferred tax liabilities	45,721	42,986
Net deferred tax liability	$36,962	$34,754

In accordance with accounting standards, the net deferred tax liability is classified as a noncurrent deferred income tax liability on the balance sheets.

No valuation allowance was required for deferred tax assets as of December 31, 2018 and 2017. In assessing the value of deferred tax assets, management considers whether it is more likely than not that some portion or all of the deferred tax assets will not be realized. The ultimate realization of deferred tax assets is dependent upon the generation of future taxable income during the periods in which those temporary differences become deductible. Management considers the scheduled reversal of deferred tax liabilities, projected future taxable income, and tax planning strategies in making this assessment. Based upon expected future taxable income and the current regulatory environment, management believes it is more likely than not that the Company will realize the benefits of these deductible differences.

The Company determined that there were no uncertain tax positions meeting the recognition and measurement test of the accounting standards recorded in the years that remain open for review by taxing authorities, which are 2015 through 2017 for both federal and state income tax returns. The Company has not yet filed tax returns for 2018. The Company believes that it has fully complied with any changes pursuant to the 2017 Tax Act and has not taken any new positions in its 2018 income tax provision, apart from compliance with the 2017 Tax Act.

The Company's policy is to recognize interest and penalties related to income tax matters in other expenses. The Company paid interest and penalties of $1 and $0 for the years ended December 31, 2018 and 2017, respectively.

15. Subsequent Events

On January 31, 2019, the Company entered into a note purchase agreement with certain institutional investors relating to the private placement of $20,000 aggregate principal amount of the Company's senior notes. The senior notes bear interest at 4.54% per annum payable semiannually and mature on January 31, 2049. The senior notes are unsecured and unsubordinated obligations of the Company. The Company received net proceeds, after deducting issuance costs, of approximately $19,820. The net proceeds were used to refinance the $11,000 aggregate principal amount of the Company's 10.17% Series A Senior Notes due February 1, 2019 and the 9.60% Series B Senior Notes due February 1, 2019, and to refinance line of credit borrowings incurred by the Company as interim financing for various capital projects of the Company.

Item 9. Changes in and Disagreements with Accountants on Accounting and Financial Disclosure.

None.

Item 9A. Controls and Procedures.

Evaluation of Disclosure Controls and Procedures

The Company's management, with the participation of the Company's President and Chief Executive Officer and Chief Financial Officer, evaluated the effectiveness of the Company's disclosure controls and procedures as of the end of the period covered by this report. Based upon this evaluation, the Company's President and Chief Executive Officer along with the Chief Financial Officer concluded that the Company's disclosure controls and procedures as of the end of the period covered by this report are effective such that the information required to be disclosed by the Company in reports filed under the Securities Exchange Act of 1934 is (i) recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms and (ii) accumulated and communicated to the Company's management, including the President and Chief Executive Officer and Chief Financial Officer, as appropriate to allow timely decisions regarding disclosure. A controls system cannot provide absolute assurance, however, that the objectives of the controls system are met, and no evaluation of controls can provide absolute assurance that all control issues and instances of fraud, if any, within a company have been detected.

No change in the Company's internal control over financial reporting occurred during the Company's most recent fiscal quarter that has materially affected, or is reasonably likely to materially affect, the Company's internal control over financial reporting.

Management's Report on Internal Control Over Financial Reporting

Management of the Company is responsible for establishing and maintaining adequate internal control over financial reporting, as such term is defined in Rule 13a-15(f) under the Securities Exchange Act of 1934. Internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Management evaluated the Company's internal control over financial reporting as of December 31, 2018. In making this assessment, management used the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission (COSO) in *Internal Control-Integrated Framework (2013 framework)*. As a result of this assessment and based on the criteria in the COSO framework, management has concluded that, as of December 31, 2018, the Company's internal control over financial reporting was effective.

Item 9B. Other Information.

None.

PART III

Item 10. Directors, Executive Officers and Corporate Governance.

Directors of the Registrant

The information set forth under the caption "Election of Directors" of the 2019 Proxy Statement is incorporated herein by reference.

Executive Officers of the Registrant

The information set forth under the caption "Executive Officers of the Company" of the 2019 Proxy Statement is incorporated herein by reference.

Compliance with Section 16(a) of the Exchange Act

The information set forth under the caption "Section 16(a) Beneficial Ownership Reporting Compliance" of the 2019 Proxy Statement is incorporated herein by reference.

Code of Ethics

The information set forth under the caption "Code of Ethics" of the 2019 Proxy Statement is incorporated herein by reference.

Audit Committee

The information set forth under the caption "Board Committees and Functions" of the 2019 Proxy Statement is incorporated herein by reference.

Item 11. Executive Compensation.

The information set forth under the caption "Compensation of Directors and Executive Officers" of the 2019 Proxy Statement is incorporated herein by reference.

Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters.

Securities Authorized for Issuance under Equity Compensation Plans

The following table provides information for the equity compensation plan of the Company as of December 31, 2018:

Plan Category	Number of securities to be issued upon exercise of outstanding options, warrants and rights	Weighted-average exercise price of outstanding options, warrants and rights	Number of securities remaining available for future issuance under equity compensation plans (excluding securities reflected in column (a))
	(a)	(b)	(c)
Equity compensation plans approved by security holders*	-	-	93,521
Equity compensation plans not approved by security holders	-	-	0

*Amounts are subject to adjustment to reflect stock dividends, stock splits, or other relevant changes in capitalization.

In addition, the Company has an employee stock purchase plan that allows employees to purchase stock at a 5% discount up to a maximum of 10% of their gross compensation. Under this plan, 65,639 authorized shares remain unissued as of December 31, 2018.

The information set forth under the caption "Security Ownership of Certain Beneficial Owners and Management" of the 2019 Proxy Statement is incorporated herein by reference.

Item 13. Certain Relationships and Related Transactions, and Director Independence.

The information set forth under the caption "Director Independence" of the 2019 Proxy Statement is incorporated herein by reference.

Item 14. Principal Accounting Fees and Services.

The information set forth under the caption "Principal Accountant's Fees and Services" of the 2019 Proxy Statement is incorporated herein by reference.

PART IV

Item 15. Exhibits and Financial Statement Schedules.

(a) Certain documents filed as part of the Form 10-K.

1. The financial statements set forth under Item 8 of this Form 10-K.

Report of Independent Registered Public Accounting Firm
Balance Sheets as of December 31, 2018 and 2017
Statements of Income for Years Ended December 31, 2018 and 2017
Statements of Common Stockholders' Equity for Years Ended December 31, 2018 and 2017
Statements of Cash Flows for Years Ended December 31, 2018 and 2017
Notes to Financial Statements

2. Financial Statement schedules.

Schedule Number	Schedule Description	Page Number
II	Valuation and Qualifying Accounts for the years ended December 31, 2018 and 2017	61

The report of the Company's independent registered public accounting firm with respect to the financial statement schedule appears on page 21.

All other financial statements and schedules not listed have been omitted since the required information is included in the financial statements or the notes thereto, or is not applicable or required.

3. Exhibits required by Item 601 of Regulation S-K.

Exhibit Number	Exhibit Description	Page Number of Incorporation By Reference
3	Amended and Restated Articles of Incorporation	Incorporated herein by reference. Filed previously with the Securities and Exchange Commission as Exhibit 3.1 to Form 8-K dated May 4, 2010.
3.1	Amended and Restated By-Laws	Incorporated herein by reference. Filed previously with the Securities and Exchange Commission as Exhibit 3.1 to Form 8-K dated January 26, 2012.

Exhibit Number	Exhibit Description	Page Number of Incorporation By Reference
4.1	Dividend Reinvestment and Direct Stock Purchase and Sale Plan	Incorporated herein by reference. Filed previously with the Securities and Exchange Commission on Form S-3 dated October 3, 2016 (File No. 333-213942).
4.2	Indenture, dated as of October 1, 2010, by and between The York Water Company and Manufacturers and Traders Trust Company, as trustee, relative to the $15,000,000 5.0% Monthly Senior Notes	Incorporated herein by reference. Filed previously with the Securities and Exchange Commission as Exhibit 4.1 to the Company's October 8, 2010 Form 8-K.
4.3	First Supplemental Indenture, dated as of October 1, 2010, by and between The York Water Company and Manufacturers and Traders Trust Company, as trustee (which includes the form of Note)	Incorporated herein by reference. Filed previously with the Securities and Exchange Commission as Exhibit 4.2 to the Company's October 8, 2010 Form 8-K.
10.1	Articles of Agreement Between The York Water Company and Springettsbury Township relative to Extension of Water Mains dated April 17, 1985	Incorporated herein by reference. Filed previously with the Securities and Exchange Commission as Exhibit 10.1 to the Company's 1989 Form 10-K.
10.2	Note Agreement relative to the $6,000,000 10.17% Senior Notes, Series A and $5,000,000 9.60% Senior Notes, Series B dated January 2, 1989	Incorporated herein by reference. Filed previously with the Securities and Exchange Commission as Exhibit 4.5 to the Company's 1989 Form 10-K.
10.3	Note Agreement relative to the $6,500,000 10.05% Senior Notes, Series C dated August 15, 1990	Incorporated herein by reference. Filed previously with the Securities and Exchange Commission as Exhibit 4.6 to the Company's 1990 Form 10-K.
10.4	Note Agreement relative to the $7,500,000 8.43% Senior Notes, Series D dated December 15, 1992	Incorporated herein by reference. Filed previously with the Securities and Exchange Commission as Exhibit 4.7 to the Company's 1992 Form 10-K.
10.5	Promissory Note between The York Water Company and the Pennsylvania Infrastructure Investment Authority for $800,000 at 1.00% dated August 24, 1999	Incorporated herein by reference. Filed previously with the Securities and Exchange Commission as Exhibit 4.2 to the Company's 2000 Form 10-K.

Exhibit Number	Exhibit Description	Page Number of Incorporation By Reference
10.6	Loan Agreement between The York Water Company and York County Industrial Development Authority, dated as of October 1, 2006 relative to the $10,500,000 4.75% Exempt Facilities Revenue Bonds	Incorporated herein by reference. Filed previously with the Securities and Exchange Commission as Exhibit 10.3 to the Company's September 15, 2009 Form 8-K.
10.7	Trust Indenture dated October 1, 2006 between the York County Industrial Development Authority and Manufacturers and Traders Trust Company, as trustee	Incorporated herein by reference. Filed previously with the Securities and Exchange Commission as Exhibit 10.4 to the Company's September 15, 2009 Form 8-K.
10.8	Variable Rate Loan Agreement between The York Water Company and Pennsylvania Economic Development Financing Authority, dated as of May 1, 2008 relative to the $12,000,000 Exempt Facilities Revenue Bonds	Incorporated herein by reference. Filed previously with the Securities and Exchange Commission as Exhibit 10.1 to the Company's May 12, 2008 Form 8-K.
10.9	Trust Indenture dated as of May 1, 2008 between Pennsylvania Economic Development Financing Authority and Manufacturers and Traders Trust Company, as trustee	Incorporated herein by reference. Filed previously with the Securities and Exchange Commission as Exhibit 10.5 to the Company's September 15, 2009 Form 8-K.
10.10	Reimbursement, Credit and Security Agreement, dated as of May 1, 2008 between The York Water Company and PNC Bank, National Association	Incorporated herein by reference. Filed previously with the Securities and Exchange Commission as Exhibit 10.3 to the Company's May 12, 2008 Form 8-K.
10.11	Loan Agreement between The York Water Company and Pennsylvania Economic Development Financing Authority, entered into April 25, 2014 and dated as of April 1, 2014 relative to the $14,880,000 4.50% Exempt Facilities Revenue Refunding Bonds	Incorporated herein by reference. Filed previously with the Securities and Exchange Commission as Exhibit 10.1 to the Company's April 28, 2014 Form 8-K.
10.12	Trust Indenture entered into April 25, 2014 and dated as of April 1, 2014 between Pennsylvania Economic Development Financing Authority and Manufacturers and Traders Trust Company, as trustee	Incorporated herein by reference. Filed previously with the Securities and Exchange Commission as Exhibit 10.2 to the Company's April 28, 2014 Form 8-K.
10.13	Loan Agreement between The York Water Company and York County Industrial Development Authority, entered into July 23, 2015 and dated as of July 1, 2015 relative to the $10,000,000 4.00% - 4.50% Exempt Facilities Revenue Bonds.	Incorporated herein by reference. Filed previously with the Securities and Exchange Commission as Exhibit 10.1 to the Company's July 24, 2015 Form 8-K.

Exhibit Number	Exhibit Description	Page Number of Incorporation By Reference
10.14	Trust Indenture entered into July 23, 2015 and dated as of July 1, 2015 between York County Industrial Development Authority and Manufacturers and Traders Trust Company, as trustee	Incorporated herein by reference. Filed previously with the Securities and Exchange Commission as Exhibit 10.2 to the Company's July 24, 2015 Form 8-K.
10.15*	Cash Incentive Plan	Incorporated herein by reference. Filed previously with the Securities and Exchange Commission as Exhibit 10.1 to the Company's January 28, 2005 Form 8-K.
10.16*	Form of Amended and Restated Change in Control Agreement made as of November 5, 2008 between The York Water Company and each of the individuals listed on a schedule attached thereto, which plans are identical in all material respects except as indicated in Schedule 10.16	Incorporated herein by reference. Filed previously with the Securities and Exchange Commission as Exhibit 10.16 to the Company's March 6, 2018 Form 10-K.
10.17*	Form of Amended and Restated Supplemental Retirement Plan made as of January 1, 2009 between The York Water Company and each of the individuals listed on a schedule attached thereto, which plans are identical in all material respects except as indicated in Schedule 10.17	Incorporated herein by reference. Filed previously with the Securities and Exchange Commission as Exhibit 10.17 to the Company's March 6, 2018 Form 10-K.
10.18*	Form of Amended and Restated Deferred Compensation Plan made as of July 1, 2015 between The York Water Company and each of the individuals listed on a schedule attached thereto, which plans are identical in all material respects except as indicated in Schedule 10.18	Incorporated herein by reference. Filed previously with the Securities and Exchange Commission as Exhibit 10.18 to the Company's March 6, 2018 Form 10-K.
10.19*	Form of Amended and Restated Deferred Compensation Plan made as of January 1, 2009 between The York Water Company and each of the individuals listed on a schedule attached thereto, which plans are identical in all material respects except as indicated in Schedule 10.19	Incorporated herein by reference. Filed previously with the Securities and Exchange Commission as Exhibit 10.19 to the Company's March 8, 2011 Form 10-K.
10.20*	Long-Term Incentive Plan	Incorporated herein by reference. Filed previously with the Securities and Exchange Commission on Form S-8 dated May 11, 2016 (File No. 333-211287).

Exhibit Number	Exhibit Description	Page Number of Incorporation By Reference
10.21*	Employee Stock Purchase Plan	Incorporated herein by reference. Filed previously with the Securities and Exchange Commission as Exhibit 10.21 to the Company's March 7, 2017 Form 10-K.
10.22	Note Agreement relative to the $20,000,000 4.54% Senior Notes, dated January 31, 2019	Incorporated herein by reference. Filed previously with the Securities and Exchange Commission as Exhibit 10.1 to the Company's February 5, 2019 Form 8-K.
14	Company Code of Conduct	Incorporated herein by reference. Filed previously with the Securities and Exchange Commission as Exhibit 14 to the Company's August 6, 2014 Form 10-Q.
23	Consent of Baker Tilly Virchow Krause, LLP, Independent Registered Public Accounting Firm	Filed herewith.
31.1	Certification pursuant to Rule 13a-15(f) and 15d-15(f)	Filed herewith.
31.2	Certification pursuant to Rule 13a-15(f) and 15d-15(f)	Filed herewith.
32.1	Certification pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002	Filed herewith.
32.2	Certification pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002	Filed herewith.
101.INS	XBRL Instance Document	Filed herewith.
101.SCH	XBRL Taxonomy Extension Schema	Filed herewith.
101.CAL	XBRL Taxonomy Extension Calculation Linkbase	Filed herewith.
101.DEF	XBRL Taxonomy Extension Definition Linkbase	Filed herewith.
101.LAB	XBRL Taxonomy Extension Label Linkbase	Filed herewith.
101.PRE	XBRL Taxonomy Extension Presentation Linkbase	Filed herewith.

* Management contracts and compensatory plans or arrangements required to be filed as exhibits pursuant to Item 15(a)(3) of this Annual Report.

Item 16. Form 10-K Summary.

None.

THE YORK WATER COMPANY

SCHEDULE II VALUATION AND QUALIFYING ACCOUNTS

FOR THE TWO YEARS ENDED DECEMBER 31, 2018

Description	Balance at Beginning of Year	Additions: Charged to Cost and Expenses	Additions: Recoveries	Deductions	Balance at End of Year
FOR THE YEAR ENDED DECEMBER 31, 2018					
Reserve for uncollectible accounts	$305,000	$250,884	$57,633	$308,517	$305,000
FOR THE YEAR ENDED DECEMBER 31, 2017					
Reserve for uncollectible accounts	$305,000	$290,897	$25,900	$316,797	$305,000

The Deductions column above represents write-offs of accounts receivable during the applicable year.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

THE YORK WATER COMPANY
(Registrant)

Dated: March 11, 2019

By: /s/Jeffrey R. Hines
Jeffrey R. Hines
President and CEO

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the registrant and in the capacities and on the dates indicated.

By: /s/Jeffrey R. Hines
Jeffrey R. Hines
(Principal Executive Officer
and Director)

Dated: March 11, 2019

By: /s/Matthew E. Poff
Matthew E. Poff
(Principal Accounting Officer
and Chief Financial Officer)

Dated: March 11, 2019

Directors:	Date:
By: /s/James H. Cawley James H. Cawley	March 11, 2019
By: /s/Cynthia A. Dotzel Cynthia A. Dotzel	March 11, 2019
By: /s/Michael W. Gang Michael W. Gang	March 11, 2019
By: /s/Jeffrey R. Hines Jeffrey R. Hines	March 11, 2019
By: /s/George W. Hodges George W. Hodges	March 11, 2019
By: /s/George Hay Kain, III George Hay Kain, III	March 11, 2019
By: /s/Jody L. Keller Jody L. Keller	March 11, 2019
By: /s/Erin C. McGlaughlin Erin C. McGlaughlin	March 11, 2019
By: /s/Robert P. Newcomer Robert P. Newcomer	March 11, 2019
By: /s/Steven R. Rasmussen Steven R. Rasmussen	March 11, 2019
By: /s/Ernest J. Waters Ernest J. Waters	March 11, 2019

EXHIBIT 23

Consent of Independent Registered Public Accounting Firm

We consent to the incorporation by reference in the Registration Statements on Form S 3 (File No. 333 213942) and Forms S-8 (File Nos. 333 191497 and 333 211287) of The York Water Company of our report dated March 12, 2019, relating to the financial statements, the financial statement schedule and the effectiveness of internal control over financial reporting, which appear in this Form 10-K.

/s/Baker Tilly Virchow Krause, LLP
York, Pennsylvania
March 12, 2019

EXHIBIT 31.1
CERTIFICATIONS

I, Jeffrey R. Hines, certify that:

1. I have reviewed this report on Form 10-K of The York Water Company;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

   a) designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   b) designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   c) evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   d) disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of registrant's board of directors (or persons performing the equivalent function):

   a) all significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   b) any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: March 11, 2019

/s/Jeffrey R. Hines
Jeffrey R. Hines
President and CEO

EXHIBIT 31.2
CERTIFICATIONS

I, Matthew E. Poff, certify that:

1. I have reviewed this report on Form 10-K of The York Water Company;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

   a) designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   b) designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   c) evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   d) disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of registrant's board of directors (or persons performing the equivalent function):

   a) all significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   b) any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: March 11, 2019

/s/Matthew E. Poff
Matthew E. Poff
Chief Financial Officer

EXHIBIT 32.1

CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Annual Report of The York Water Company on Form 10-K for the period ending December 31, 2018 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Jeffrey R. Hines, Chief Executive Officer of the Company, certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that, to my knowledge:

(1) The Report fully complies with the requirements of Section 13(a) of the Securities Exchange Act of 1934; and

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

THE YORK WATER COMPANY

/s/Jeffrey R. Hines
Jeffrey R. Hines
Chief Executive Officer

Date: March 11, 2019

EXHIBIT 32.2

CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Annual Report of The York Water Company on Form 10-K for the period ending December 31, 2018 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Matthew E. Poff, Chief Financial Officer of the Company, certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that, to my knowledge:

(1) The Report fully complies with the requirements of Section 13(a) of the Securities Exchange Act of 1934; and

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

THE YORK WATER COMPANY

/s/Matthew E. Poff
Matthew E. Poff
Chief Financial Officer

Date: March 11, 2019

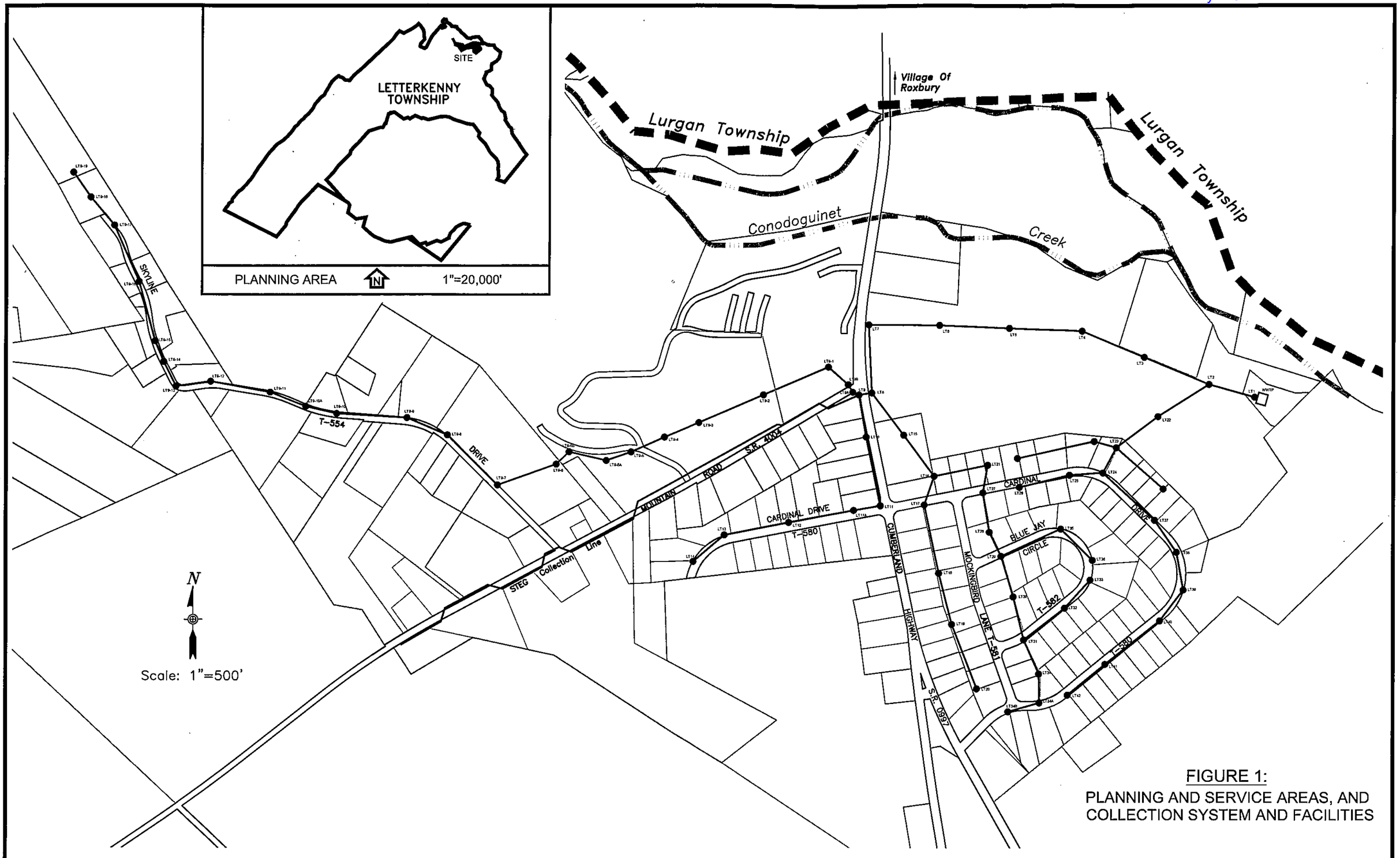
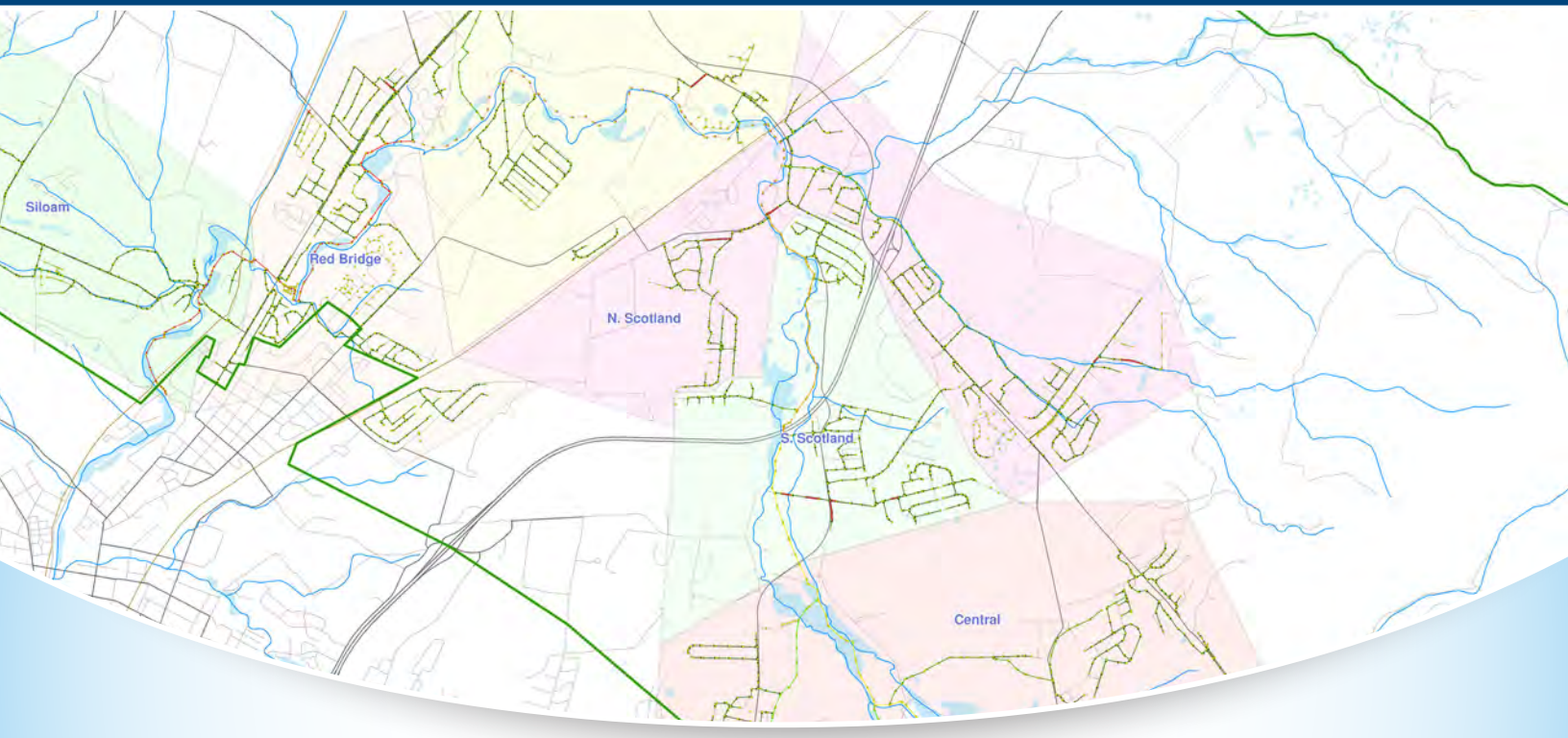


FIGURE 1:
PLANNING AND SERVICE AREAS, AND
COLLECTION SYSTEM AND FACILITIES

Discovery A-9 - Attachment 3

Submitted to:

Greene Township Municipal Authority
Act 537 Plan Update Amendment



Submitted by:

Gannett Fleming

Excellence Delivered ***As Promised***

March 2013

ISO 9001:2008 CERTIFIED

Greene Township Municipal Authority
Franklin County, Pennsylvania

Act 537 Plan Update Amendment

March 2013

Gannett Fleming
Excellence Delivered As Promised

Contents

Section	Title	Page
1.0	**INTRODUCTION**	1
2.0	**EXISTING CONDITIONS**	2
3.0	**POPULATION PROJECTIONS AND FUTURE FLOWS**	3
4.0	**PHASED IMPROVEMENTS APPROACH**	4
5.0	**PHASE II - INFLOW AND INFILTRATION PROGRAM**	8
5.1	Conveyance Facilities	8
5.1.1	*Comprehensive Sewer System Evaluation Survey Approach*	9
5.1.2	*Background*	10
5.1.3	*Findings/Recommendation*	11
5.2	Phase III Planning and Preparation	17
6.0	**EVALUATION OF ALTERNATIVES**	17
6.1	Consistency Analysis	17
6.1.1	*Comprehensive Water Quality Management Plan*	18
6.1.2	*Municipal Wasteload Management Plans*	18
6.1.3	*Title II of the Clean Water Act*	19
6.1.4	*Comprehensive Planning*	19
6.1.5	*Chapter 93, 95, and 102 Anti-degradation Requirements*	20
6.1.6	*State Water Plan*	20
6.1.7	*Prime Agricultural Land Policy*	22
6.1.8	*County Stormwater Management Plans*	23
6.1.9	*Wetlands*	23
6.1.10	*Pennsylvania Natural Diversity Inventory*	24
6.1.11	*Historical and Archeological Resource Protections*	25
6.1.12	*Water Quality Standards and Effluent Limitations*	26
6.1.13	*Resolution of Inconsistencies*	26
6.2	Phase I Alternative Evaluation	26
7.0	**FUNDING METHODS**	28
8.0	**CONCLUSIONS**	29

Tables

Table	Title	Page
2-1	Green Township Municipal Authority Existing System Data	2
3-1	Greene Township Municipal Authority Planning Projections	4
4-1	Phase I Alternatives for Evaluation	8
5-1	Basin Prioritization	13
5-2	Phased Sewer System Evaluation Survey Priority Basins	14
5-3	Rain Derived Inflow and Infiltration Reduction Program Schedule and Costs	15
6-1	Phase I Alternatives Advantages and Disadvantages	27
6-2	Phase I Alternatives Estimated Construction Cost	28
8-1	Implementation Schedule	30

Figures

Figure	Title	Page
4-1	Phase I Alternative Proposed Conveyance Route	6
5-1	Sewer System Evaluation Survey Program Flowchart	10

Appendices

Appendix	Title
A	2013 Sewer System Model Enhancement and Capacity Evaluation Report 2013 Capacity Evaluation
B	Exhibits
C	Pennsylvania Natural Diversity Index – Project Environmental Reviews
D	Pennsylvania Natural Diversity Index – Inquiries
E	Pennsylvania Natural Diversity Index – Responses
F	Pennsylvania Historical Museum Commission Cultural Resource – Inquiry
G	Pennsylvania Historical Museum Commission Letter
H	Planning Level Opinion of Probable Costs

1.0 INTRODUCTION

The Greene Township Municipal Authority (GTMA) was incorporated by the Supervisors of Greene Township, Franklin County, Pennsylvania, to provide wastewater collection and conveyance service to most Greene Township residents. The GTMA also provides service to a small portion of neighboring Guilford Township. All of the GTMA Sewer System is tributary to the Chambersburg Borough conveyance system and Wastewater Treatment Plant (WWTP).

The GTMA submitted an Act 537 Plan Update to the Pennsylvania Department of Environmental Protection (PADEP) in December 2008 to serve as the Official Sewage Facilities Plan of Greene Township. PADEP provided comments on the submission in a September 3, 2009 letter addressed to the Greene Township Supervisors, Act 537 Planning APS ID No. 63205 DEP Code No. G2-28907-ACT deficiencies letter (2009 PADEP Letter). The 2009 PADEP Letter contained four (4) review comments, chief among them was the failure of the Plan Update to provide for the resolution of existing sewage facility problems and the failure of the Plan Update to provide for the future disposal needs of Greene Township.

GTMA's February 2009 Wasteload Management Report (Chapter 94 Report) had identified a hydraulic overload within the GTMA sewer system that was not adequately addressed by the December 2008 Plan Update. In response to the hydraulic overload, GTMA prepared a Corrective Action Plan (CAP) in July 2009 to address the overload. The CAP included several broad action items, including preparation of an amendment to the adopted, December 2008 Act 537 Plan Update. In October 2009, the PADEP approved the CAP. The CAP was updated in June 2012.

GTMA reported overflows from its Fayetteville interceptor as a result of wet weather events in early 2010. In April 2010, PADEP established a connection prohibition for facilities tributary to the Fayetteville interceptor. GTMA entered into a Consent Order and Agreement (COA) with PADEP in August 2010. The COA called for GTMA to undertake a comprehensive Inflow and Infiltration Plan to identify sources of extraneous flow and to undertake the necessary improvements to eliminate overflows.

This Act 537 Plan Update Amendment was undertaken to address the comments in the 2009 PADEP Letter and to develop, evaluate, and select an approach to ultimately eliminate sanitary sewer overflows (SSOs) and provide adequate capacity to provide for future disposal needs of Greene Township.

2.0 EXISTING CONDITIONS

The GTMA sewer system consists of approximately 13.7 miles of interceptor that conveys the wastewater from Greene Township residents, some of Guilford Township residents, and the wastewater generated at the Chambersburg Water Treatment Plant to the Chambersburg Borough conveyance system. The GTMA sewer system has approximately 110 miles of collection sewers, 4.8 miles of force main pressure pipes, and eleven (11) lift stations. Table 2-1 provides additional GTMA system and population information.

TABLE 2-1
GREENE TOWNSHIP MUNICIPAL AUTHORITY
EXISTING SYSTEM DATA

Description	Existing Data
2010 Population (1)	16,700
Equivalent Dwelling Units (2)	7,300
Average Dry Weather Flow (3)	2.6 mgd
Sewer Interceptor Length (4)	13.7 miles

Notes:
(1) 2010 Population taken from Census Data reported to Pennsylvania State Data Center.
(2) Equivalent Dwelling Units taken from Greene Township Chapter 94 Report for 2011.
(3) Average Dry Weather Flow (ADWF) taken from 2013 Capacity and Evaluation Report, Table 1, measured in million gallons per day (mgd).
(4) Length of interceptor in GTMA estimated from mapping and modeling data and information.

As part of the 2013 GTMA Sewer System Model Enhancement and Capacity Evaluation (2013 Capacity Evaluation), GTMA's sewer system was studied to determine the hydraulic capacity of the existing interceptor with current flows based on flow metering data collected during 2011 and estimated future flows. The 2013 Capacity Evaluation report is provided in Appendix A. The results of the 2013 Capacity Evaluation provided a means to identify short-term and long-term improvement needs for the GTMA interceptor. The existing interceptor in Fayetteville and portions of Oak Hill are undersized to adequately convey the peak flows monitored during specific storm events during 2011. As a result, SSOs have been reported

in the Fayetteville Basin while the system is experiencing peak flows. In addition, flow monitoring at the Penn Hall meter, located directly upstream of GTMA's connection to the Chambersburg sewer system, have recorded flows at or near 0.0 million gallons per day (mgd) during storm events. Based on the Penn Hall meter calibration and cleaning records, this zero flow reading could be potentially due to Chambersburg sewer system back-ups into the GTMA sewer system that require additional investigation. Additional information on the 2011 flow metering is provided in The 2013 Capacity Evaluation report in Appendix A.

3.0 POPULATION PROJECTIONS AND FUTURE FLOWS

Based on long-term projections available from the Pennsylvania State Data Center, the Franklin County population is projected to increase from 129,313 in 2000, according to the 2000 Census, to 148,596 in 2030. However, the 2010 Franklin County Census counted 149,618 people, which was more than the most recent Pennsylvania State Data Center projections for 2030.

The Franklin County Planning Commission was contacted for available population projections for Greene Township over the next 20 years and to resolve this apparent discrepancy. The Planning Commission indicated it is currently in the process of developing new population projections. Given the lack of available data, 20-year population projections developed by GTMA staff were used for this Plan Update. The GTMA population projections were based on current Greene Township zoning, available undeveloped land, and the historical rate of new growth within Greene Township before the national slow-down in housing development in 2008.

The Flow Projections Section of the 2011 GTMA Chapter 94 Report included both population projections and wastewater flow projections. The Report projects 80 new equivalent dwelling units (EDUs) will be added within Greene Township per year over the next 5 years. In addition to these 400 new EDUs, GTMA staff expects another 1,600 new EDUs to be added to the sewer system in years 6 through 20, resulting in a total increase of 2,000 EDUs for the next 20 years. Based on a planning estimate of 225 gallons per day (gpd) per EDU, the additional 2,000 EDUs that are expected over the next 20 years will contribute an additional average flow of 0.45 mgd. A peaking factor of 2.0 was applied to the average flow for consideration of peak

flow sewer pipe design. The new sewers serving the new EDUs are not expected to contribute as much inflow or infiltration as the existing aging infrastructure, since the new sewers and connections will be made in accordance with GTMA's specifications, will be air tested during construction, and construction will be overseen by GTMA inspectors. The peak flow from the 20-year additional population is expected to be approximately 0.90 mgd. A summary of the projected flows and EDUs is provided in Table 3-1.

TABLE 3-1
GREENE TOWNSHIP MUNICIPAL AUTHORITY
PLANNING PROJECTIONS

Description	Existing	5 Year Growth	Years 5, 20 Growth	Estimated 2030
Population (1)	16,700	960	3,840	21,500
Equivalent Dwelling Units (2)	7,300	400	1,600	9,300
Average Dry Weather Flow (3)	2.6 mgd	0.09 mgd	0.36 mgd	3.05 mgd
Peak Flow (4)	8.5 mgd	0.18 mgd	0.72 mgd	9.4 mgd

Notes:
(1) Existing population counted from 2010 census data from the Pennsylvania State Data Center. Projected population estimated from GTMA projected new EDUs at 2.4 people per EDU.
(2) Existing Equivalent Dwelling Units developed by GTMA staff for Chapter 94 Report and the Act 537 Plan Update Amendment.
(3) Existing ADWF taken from dry weather days in 2011 flow metering data as described in the 2013 Capacity Evaluation Report. Projected ADWF estimated at 225 gpd/EDU. See Section 3 for justification.
(4) Existing peak flow taken from 2011 flow metering data during peak storm events as described in the 2013 Capacity Evaluation Report. Projected peak flows estimated from projected ADWF with a 2.0 peaking factor.

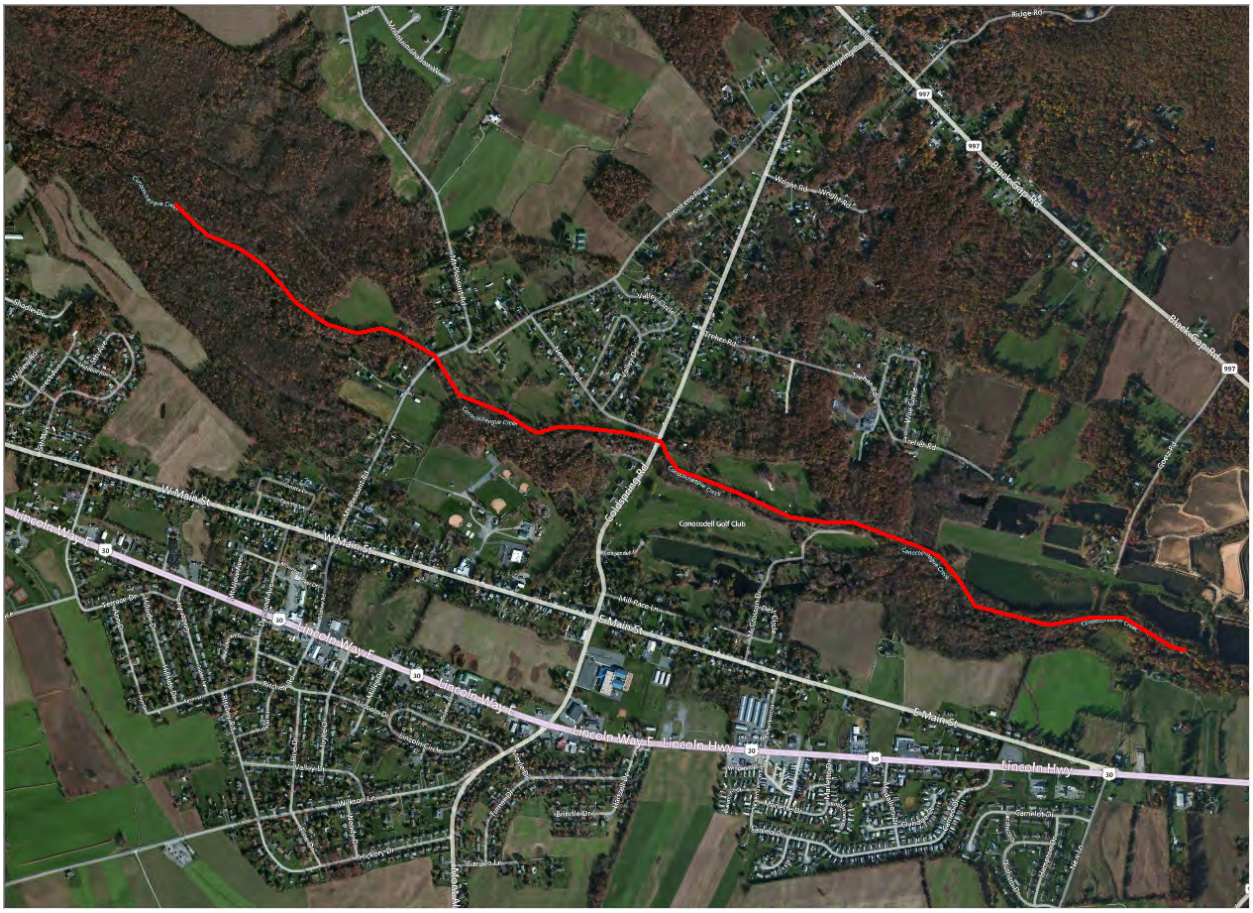
4.0 PHASED IMPROVEMENTS APPROACH

GTMA experienced overflows from its Fayetteville interceptor in early 2010. As a result of the overflows and as a condition of the subsequent CAP, GTMA completed an interceptor capacity evaluation and needs assessment, as explained in the 2013 Capacity Evaluation, in Appendix A. The 2013 Capacity Evaluation report identified short-term and long-term improvement needs for the GTMA interceptor. The 2013 Capacity Evaluation report also identified potential problems within the downstream Chambersburg system, which could cause backups within the GTMA sewer system. These backups rendered the GTMA flow metering ineffective in quantifying the magnitude of peak flows in the lower reaches of the GTMA sewer

system. Due to the extent and cost of capital improvements identified in the Capacity Evaluation report and the unknowns related to Chambersburg backups and GTMA peak flows, a three-phased improvement concept has been identified to meet the current and long-term system needs. The phased concept includes short-term interceptor improvements to address known capacity needs in the Fayetteville Basin and long-term measures to reduce inflow and infiltration (I&I) and address capacity issues in other portions of the system, for which the extent of improvement needs cannot be defined at this time, as described in the 2013 Capacity Evaluation report.

Phase I involves increasing the capacity of the undersized interceptor in the Fayetteville and the Oak Hill Basins. Figure 4-1 shows the tentative route for Phase I improvements. Phase I improvements will help to mediate the peak flow issues in the Fayetteville area of the GTMA sewer system; however, according to modeling analyses, Phase I improvements are not expected to impact the flows Chambersburg is receiving from GTMA, due to the constrained flows in Chambersburg interceptor and the downstream GTMA basins. Phase II will include investigation of the capacity in the Chambersburg interceptor and based on the findings of the investigation, improvements may be necessary upstream or downstream of the Penn Hall meter.

FIGURE 4-1
PHASE I ALTERNATIVE
PROPOSED CONVEYANCE ROUTE
(Red Segment to be Replaced or Paralleled)



Phase II is a program to further identify system deficiencies including: better assessment of peak flows in the system; investigation of downstream capacity in the Chambersburg system available for GTMA flows; and more detailed investigation of sources of I&I and rehabilitation of identified sources to reduce I&I.

Phase III involves undertaking the necessary improvements beyond those completed in Phase I and II, to address the long-term capacity needs in the GTMA interceptor, and addressing the Chambersburg interceptor capacity if necessary.

As part of the 2013 Capacity Evaluation, the Authority's sewer system was studied to determine the hydraulic capacity of the existing interceptor with current and future flows. The existing interceptor in Fayetteville and portions of Oak Hill are undersized to adequately convey the peak flows monitored during specific storm events during 2011. Therefore, two (2) Phase I alternatives were developed to alleviate the peak flow capacity inadequacies. Alternative 1 involves replacing approximately 2.5 miles of the existing interceptor in portions of Fayetteville and Oak Hill with 24-inch diameter sewer. The larger sewer would be placed in the same trench as the existing interceptor. Alternative 2 rehabilitates the existing interceptor with new manholes and runs a parallel sewer along the existing interceptor. The parallel sewer would add approximately 2.5 miles of 12- and 18-inch diameter main adjacent to the existing interceptor in portions of Fayetteville and Oak Hill.

Other Alternatives were considered, but eliminated to address the existing and projected future needs. These other alternatives included flow equalization, pumping excess peak flows to a point lower in the GTMA system, and system rehabilitation to reduce peak flows. The rehabilitation option was eliminated from consideration since the existing Fayetteville interceptor was determined to be undersized to convey future flows even with significant I & I reduction.

Table 4-1 summarizes the two technically feasible Phase I alternatives to increase the capacity of the undersized interceptor in Fayetteville and Oak Hill Basins.

TABLE 4-1
PHASE I ALTERNATIVES FOR EVALUATION (1)

No.	Fayetteville Interceptor Alternative	Required Conveyance Improvement
1	Replace Existing Portions of Interceptor in Fayetteville and Oak Hill Basins	➢ Install approximately 12,750 linear feet of 24- inch interceptor ➢ Replace existing manholes with new manholes
2	Install a parallel sewer along portions of the Fayetteville and Oak Hill interceptors	➢ Install approximately 6,650 feet of 12-inch parallel sewer ➢ Install approximately 5,900 feet of 18-inch parallel sewer ➢ Install approximately 10 feet of connecting sewers to the existing interceptor ➢ Replace the manholes on the existing interceptor with new manholes

Notes:
(1) Estimate of probable cost for each alternative is provided in Chapter 6.2.

5.0 PHASE II – INFLOW AND INFILTRATION PROGRAM

Phase II is a program to identify system deficiencies including, better assessment of peak flows in the system, investigation of downstream capacity in the Chambersburg system available for GTMA flows, and more detailed investigation of sources of I&I and rehabilitation of identified sources to reduce I&I. This phase will be used to assess the results of the Phase I improvements and help quantify peak flows associated with the downstream GTMA sewer basins that could not be determined to date due to potential backflows from the Chambersburg interceptor. Field investigations as part of Phase II will commence during the Phase I construction period.

GTMA will continue to monitor flows with their existing meters, and incorporate a digital rain gage to understand the hydrological contributors. The details of the I&I program associated with Phase II are described below.

5.1 Conveyance Facilities

As discussed throughout the 2013 Capacity Evaluation (Appendix A) and this Plan Update Amendment, the GTMA collection and conveyance system is impacted by wet weather flows resulting in hydraulic overload conditions. GTMA's Inter-municipal Agreement (IMA)

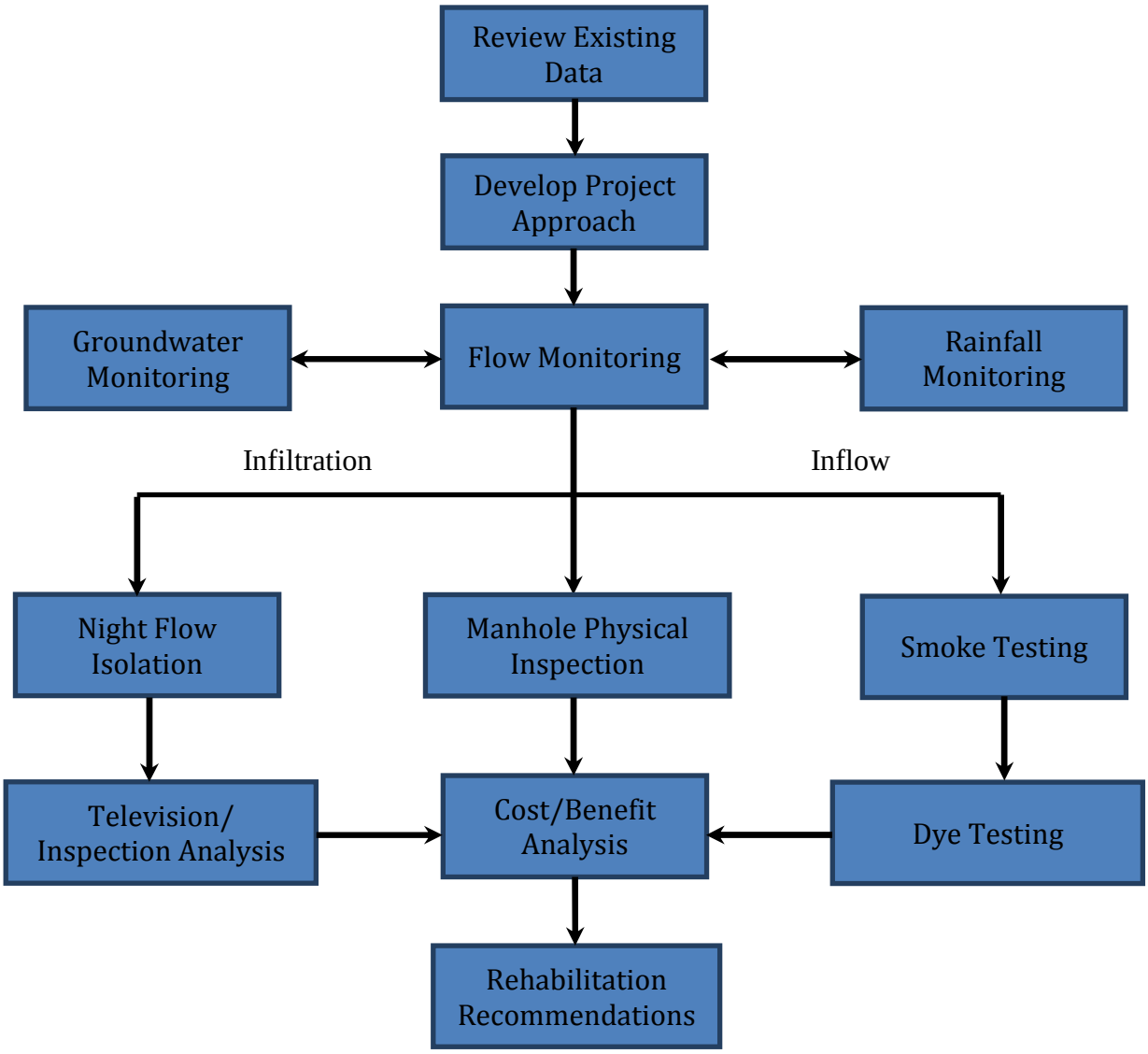
with Chambersburg Borough permits an annual flow of 1.84 mgd. The average annual flow during the period from 2009 to 2010 was 2.3 mgd. The cumulative ADWF for the system was estimated to be 2.6 mgd, based upon the 2011 flow monitoring period. Peak flows during the monitoring period were greater than 8.5 mgd. This indicates portions of the collection systems capture excessive amounts of I&I, further reinforced by the flow metering, model development and analysis, and the capacity evaluation. Recapturing a portion of this capacity through sewer system rehabilitation is typically a cost-effective wastewater conveyance alternative. As detailed herein, a systematic approach for prioritization of rehabilitation of existing sewer sections will be implemented through a comprehensive multi-year Sewer System Evaluation Survey (SSES) program.

5.1.1 Comprehensive Sewer System Evaluation Survey Approach

As part of this Plan Update Amendment, GTMA will implement a multi-year SSES Program. Within the first 5 years following Phase I completion, high priority sewersheds will be addressed. Lower priority sewersheds will be addressed in subsequent years. The main objective is to identify sources of I&I and determine the most cost-effective approach to address reduction of this extraneous flow, which essentially uses system capacity that could otherwise be used for conveyance and treatment of wastewater from new system users. Recapturing a portion of this capacity can be the most cost-effective wastewater conveyance alternative. Rehabilitation of existing sewer sections will be implemented through the SSES program according to the established priority framework provided in the 2013 Capacity Evaluation Report. The rehabilitation will be performed to address National Association of Sewer Service Companies (NASSCO) -coded defects of the highest priority.

The SSES will be completed in accordance with the Environmental Protection Agency (EPA) Handbook "Sewer System Infrastructure Analysis and Rehabilitation Handbook" (EPA/625 6-9/030, 1991). The methods identified in the EPA Handbook prescribed a multi-phased approach, generally involving: (1) analysis, (2) evaluation, and (3) rehabilitation. Figure 5-1 outlines a thorough SSES program.

FIGURE 5-1
SEWER SYSTEM EVALUATION SURVEY
PROGRAM FLOWCHART



5.1.2 Background

The Authority has been performing sewer system investigation and repair since 2002. The program was intensified during the past 5 years, and the GTMA reports it has spent $2.4 million on inspection equipment, flow meters, and sewer system rehabilitation during this time. Based upon the historical analyses and documentation, GTMA staff believes that system issues still exist in the drainage basins east of Interstate 81. Recent flow monitoring and the 2013 Capacity Evaluation support this conclusion.

Other tasks performed by GTMA include:

- Development of comprehensive sewer system mapping, using an electronic Geographic Information System (GIS) database.
- Operation and Maintenance (O&M) activities: cleared/grubbed 4.5 miles of previously neglected easement and performed internal closed-circuit television (CCTV) inspection of 12 miles of interceptor.
- Acquisition of flow meters and implementation of a flow monitoring program (16 selected sites).
- Development of a computer model of the Authority's collection/conveyance system, utilizing Bentley's SewerGEMS software (with the existing GIS data, and recorded flow metering data).
- Completed a hydraulic capacity analysis of the interceptor system utilizing the hydraulic model.
- Initiated planning of hydraulic improvements to the interceptor system.

5.1.3 Findings/Recommendation

In accordance with the CAP, the GTMA has 16 metering locations throughout the system, some installed as early as 2009. Utilizing this broad flow monitoring program, and the Comprehensive I&I Plan mandated by the COA, GTMA has expressed a commitment to thoroughly assess and rehabilitate their collection/conveyance system.

Through flow analyses and hydraulic modeling, the sewersheds were prioritized, as described in the 2013 Capacity Evaluation. The metered basins were compared and prioritized based on peak flows experienced during a November 2011 storm event. For the purpose of calculating ADWF for use in the model, each meter site was evaluated based on the data for days with no precipitation and no precipitation in the previous 2 days. After calculating the ADWF for each meter, a flow balance of all the meters was developed and analyzed. The ADWF and peak flow per EDU in each basin or sub-basin contributing flow to each meter was also reviewed

to further assess the validity of the meter data for use in setting model inflows. ADWF and peak flow per linear computation (linear feet or inch-mile) were also analyzed.

Table 5-1 shows the prioritization for each metered basin. First Priority Basins: include Oak Hill Basin (Manhole 503), Mount Pleasant Road Sub-Basin (Manhole 139), Newman Road Sub-Basin (Manhole 99), and Trayer Howe Sub-Basin (Manhole 248) in Fayetteville, and Black Gap Road Sub-Basin (Manhole 35) in Greene Knolls. The First Priority Basins will be the initial focus of the comprehensive SSES. The Second Priority Basins include: Hidden Valley Sub-Basin (Manhole 200) in Fayetteville, and sub-basin contributing to Manhole 672 in the Central Basin.

TABLE 5-1
BASIN PRIORITIZATION

Red – First Priority Yellow – Second Priority

Primary Basin	Manhole ID	EDUs	Linear Feet (LF)	11/23/11 Metered Peak Flow (mgd)	11/23/11 Metered Peak Sewer Capacity			ADWF (mgd)	Cumulative Average Dry Weather Flow Sewer Capacity		
					(gpd/ LF)	(gpd/ inch-mile	gpd/ EDU		(gpd/ LF)	(gpd/ inch-mile	gpd/ EDU
Greene Knolls	**35**	125	12,793	0.88	69	45,478	7,040	0.31	6	4,008	1325
	378	120	10,028	0.18	18	15,000	1,500				
	561	234	27,552	0.82	16	10,653	1,720				
Fayetteville	**248**	180	19,037	1.1	58	38,136	6,111	0.19	10	6,553	1,050
	225	232	16,506	0.53	32	20,784	2,284	0.10	6	3,804	418
	200	70	13,595	0.54	40	26,216	7,714	0.15	11	7,136	2,100
	138	92	5,581	1.5	269	169,891	16,304	0.08	14	8,948	859
	99	184	20,081	1.30	65	42,727	7,065	0.04	2	1,216	201
	523	1264	36,678	1.79	9	9,441	1,417	0.89	16	7,680	459
Oak Hill	**503**	98	5,051	4.3	497	316,351	25,602	1.18	57	36,565	2,959
Central (1)	**672**	732	69,929	7.0	39	23,276	3,689	1.54	5	3,103	492
S. Scotland (2)	**639**	616	61,363	5.40	-9	-4,635	-877	1.76	4	1,888	357
N. Scotland	**630**	1108	87,940	8.50	10	5,737	870	2.16	5	2,759	361
Greenvillage	**1049A**	1267	104,067	8.50	0.01	2,511	395	2.34	2	904	142
Red Bridge (3)(4)	**1021**	1190	89,575	9.30	9	4,518	755	2.56	2	1,244	185
Siloam (3)(4)	**MC1**	412	49,452	8.69	-12	-5,971	-1,119	2.64	2	784	194

Notes:
(1) Central Basin accepts flow from Guilford Township which ranges from 0.18 to 0.42 mgd.
(2) Missing flow metering data for South Scotland Basin during the November 23, 2011 Storm. Metered Peak Flow reported from May 26, 2011 Storm Event. Flow metering data recorded less than upstream flow meter during peak (5/26/2011) and ADWF. Scaled downstream meter average dry weather flow used.
(3) Red Bridge and Siloam dry weather flow metering data was less than upstream metering data. Adjusted Red Bridge and Siloam data to 20% of Siloam meter reading for ADWF, and scaled Red Bridge.
(4) Table includes length of main in basins that contribute to metering data only. Due to its location, the Penn Hall meter in Siloam includes some main in Red Bridge.

The SSES will initially target televising the sewer mains in the First Priority Basins. Structural and O&M deficiencies will be scrutinized during the field inspections. Concurrent manhole inspections will be performed during the CCTV operations. Defects identified will be categorized using the universally-recognized defect coding system developed by the NASSCO.

Guidelines of the NASSCO Pipeline Assessment and Certification Program (PACP) and the Manholes Assessment and Certification Program (MACP) will be followed. Flow isolation and smoke testing field investigations will also be utilized as warranted. Second Priority Basins will be addressed after completion of the First Priority Basins. Other basins will be reassessed during subsequent years. Table 5-2 summarizes the sizes of the priority basins

TABLE 5-2
PHASED SEWER SYSTEM EVALUATION SURVEY
PRIORITY BASINS

Primary Basin	Manhole ID	EDUs	Linear Feet (LF)
FIRST PRIORITY			
Greene Knolls	35	125	12,793
Fayetteville	248	180	19,037
	138	92	5,581
	99	184	20,081
Oak Hill	503	98	5,051
	TOTAL	679	62,543
SECOND PRIORITY			
Fayetteville	200	70	13,595
Central	672	732	69,929
	TOTAL	802	83,524

Following SSES field investigation tasks for First Priorities, a comprehensive summary that highlights all defects will be developed. A rehabilitation program will be developed to address the defects and deficiencies identified during the First Priority Basins investigation. Depending upon the findings, the recommended rehabilitation program is anticipated to include, but not be limited to:

- External point repairs (excavate and replacement) of sewers
- Removal of sediment, protrusions, roots, and other obstructions
- Internal cured-in-place point repairs of sewers

- Cured-in-place lining of sewers
- Chemical grouting of pipe joints
- Manhole repair (cementitious, epoxy, cured-in-place)
- Removal of extraneous flow contributors (cross-connections, downspouts, area drains, etc.)
- Lateral repairs (cleanout caps, etc.).

The Second Priority Basins will be addressed after completion of the First Priority Basins, in accordance with the estimated duration in Table 5-3. Other basins will be reassessed during subsequent years.

TABLE 5-3
RAIN DERIVIED INFLOW AND INFILTRATION
REDUCTION PROGRAM SCHEDULE AND COSTS

Description	**Duration**	**Estimated Costs**
FIRST PRIORITY BASINS		
➢ Field Investigations	18 Months	$ 150,000
➢ Summary of Findings	1 Month	$ 5,000
➢ Rehabilitation Design and Permitting	8 Months	To Be Determined
➢ Rehabilitation - Bid Phase	3 Months	To Be Determined
➢ Rehabilitation - Construction	12 Months	To Be Determined
SECOND PRIORITY BASINS		
➢ Field Investigations	24 Months	$ 200,000
➢ Summary of Findings	1 Month	$ 7,000
➢ Rehabilitation Design	8 Months	To Be Determined
➢ Rehabilitation - Bid Phase	3 Months	To Be Determined
➢ Rehabilitation - Construction	12 Months	To Be Determined
Reassess Lower Priority Basins	1 Month	To Be Determined

Projected costs can be impacted by inflation and other external factors. The GTMA can also affect the ultimate costs by utilizing staff to perform some field investigation and minor O&M and rehabilitation functions.

Costs for the rehabilitation process is site specific and depends to a large extent on the type of rehabilitation undertaken. In order of increasing costs, rehabilitation could involve grouting of leaking pipe joints; removal of inflow sources; internal lining of sewers, manholes, and laterals; and dig-up and replacement of the sewers. Digging-up and replacing sewers is usually only completed if the physical condition of the existing facility is too degraded to allow for a less-costly trenchless repair technique. Average costs for lining an existing 8-inch diameter sewer main, in 2013 dollars, is about $40 to $50/LF. This cost is much lower than the average cost to dig-up and replace an existing 8-inch diameter main that is about 8-feet deep within an existing right-of-way (about $100 to $120/LF, in 2013 Dollars).

Sewer system rehabilitation is generally less expensive than replacement of existing conveyance facilities with larger capacity facilities. Some of the sewer rehabilitation steps, such as cleaning and televising, should be part of an overall sewer system operation and preventative maintenance program. Sanitary sewers have a limited life and in some cases represent the largest investment in public infrastructure by the municipal owner. All sewers will eventually require rehabilitation or replacement. Proactive sewer system owners implement comprehensive preventative maintenance programs to achieve certain system goals. The Water Environment Federation Manual of Practice, "Wastewater Collection Systems Management" lists the following goals of a typical sewer system preventative maintenance program:

- Prevent public health hazards;
- Protect municipal investment by increasing the useful life and capacities of the systems;
- Use operating funds efficiently;
- Convey wastewater with minimal inflow, infiltration, and exfiltration; and
- Identify and remedy system deficiencies.

5.2 Phase III Planning and Preparation

As part of Phase II, existing unknowns need to be quantified, such as the Chambersburg interceptor capacity, and undefined peak flows in North and South Scotland, Greenvillage, Red Bridge, and Siloam Basins. These unknowns are explained in the 2013 Capacity Evaluation Report. In addition, the improvements made through Phase I and Phase II SSES Program need to be assessed to better understand the new GTMA interceptor and system. In order to continue into Phase III, the system's response to peak flows will need to be re-defined to accommodate the new and rehabilitated sewers. Therefore, it is not feasible to identify the potential Phase III improvements at the current time. The flow metering and investigations will continue through Phase I and Phase II. The flow metering data and the Chambersburg capacity information will contribute to the planning data necessary for Phase III implementation. GTMA will plan Phase III improvements after Phase I and Phase II SSES Program is completed.

6.0 EVALUATION OF ALTERNATIVES

6.1 Consistency Analysis

Wastewater management alternatives developed as part of the Act 537 Plan Update Amendment planning process must be evaluated in terms of their relationship to the goals and objectives of various planning, environmental, and natural resource laws and policies of the Commonwealth of Pennsylvania. Chapter 71.21 (a) (5) of PADEP's regulations requires that the Act 537 Plan address the consistency of each wastewater management alternative with twelve of the Commonwealth's goals and policies. If a recommended alternative is determined to conflict with or is inconsistent with one of the goals and objectives, the conflict and inconsistencies must be resolved before PADEP will approve the alternative.

The following sections discuss the 12 evaluation categories and the consistency analysis. Based on the following analysis, the two (2) Phase I alternatives, Phase II, and III are consistent with all 12 criteria.

6.1.1 Comprehensive Water Quality Management Plan

Sections 4 and 5 of the Clean Streams Law require consideration be given to water quality management and pollution control in a watershed as a whole. Section 208 of the Clean Water Act calls for the development of plans that identify the facilities necessary to meet anticipated municipal and industrial waste treatment needs. Comprehensive Water Quality Management Plans (COWAMP) have been developed under Sections 4 and 5 of the Clean Streams Law and 208 of the Clean Water Act for areas in Pennsylvania.

The COWAMP was completed in the late 1970's and is no longer readily available. In the area of water quality protection, the State Water Plan includes compliance with the COWAMP and the provisions of Chapter 93 and Chapter 16 of the Pennsylvania Code. All applicable protected uses of waters of the Commonwealth are protected by the water quality and toxicity standards in Chapter 93, and Chapter 16, respectively.

The consistency analysis of the phased alternatives required by Chapter 71.21 (a)(5)(i)-(iii) of the Pennsylvania Code will be satisfied through consistency with Chapter 93 and the current State Water Plan. Chapter 6.1.5 evaluates the alternatives with respect to Chapter 93, while Chapter 6.1.6 includes a discussion on the current State Water Plan. The wastewater in the GTMA interceptor is conveyed to the Chambersburg Wastewater Treatment Plant (WWTP) where it is treated to meet applicable water quality and toxicity standards. The Fayetteville Interceptor Improvements (Phase I) and the investigation and rehabilitation of sewers and manholes and additional improvements (Phase II and III) are conveyance alternatives, not water treatment and discharge options. As such, they do not change the current practice of treatment at the Chambersburg WWTP and will not affect the water quality or pollution control in the watershed. Therefore, the phased alternatives are consistent with the current plan for water quality compliance within the watershed.

6.1.2 Municipal Wasteload Management Plans

When sewage collection or treatment facilities are overloaded, either hydraulically or organically, untreated sewage may be discharged into the environment. In order to prevent the environmental and public health hazards associated with these potential discharges,

municipalities that own or operate sewage treatment facilities are required to submit an annual wasteload management report to PADEP that demonstrates the facilities are meeting the municipal wasteload management requirements of Chapter 94. Wastewater generated in Greene Township, in portions of Guilford Township, and from the Chambersburg Water Treatment Plant is conveyed to the Chambersburg WWTP via sewage facilities owned by the GTMA. GTMA annually provides sewer system information to the Borough of Chambersburg for use in preparing the Chambersburg WWTP Wasteload Management Report.

As addressed in Section 3, the Act 537 Plan Amendment includes population projections and wastewater flow projections. These projections were based on information from the 2011 Greene Township Chapter 94 Report. Phase I and Phase II were developed based on the future wastewater needs of Greene Township which are, therefore, consistent with the municipal wasteload management requirements of the Chambersburg Chapter 94. The proposed alternatives were developed to address the current hydraulic overload within the GTMA sewer system and are consistent with the Chapter 94 Report.

6.1.3 Title II of the Clean Water Act

Title II of the Clean Water Act requires the development and implementation of wastewater treatment management plans and practices which provide for the application of the best practical waste treatment technology before discharging into receiving waters. The GTMA facilities are designed to collect and convey wastewater to the Chambersburg WWTP. Therefore, the alternatives do not change the treatment approach and are consistent with the title of the Clean Water Act.

6.1.4 Comprehensive Planning

Both Franklin County and Greene Township have developed Comprehensive Plans to guide future land development. The wastewater management alternatives are consistent with the Greene Township Comprehensive Plan related to growth, land use, and development within the Township, and the adequacy of the sewer facilities. Phase I alternatives provide adequate sewer capacity in Fayetteville and Oak Hill to meet the existing peak flows of the 20-year planned

growth. The Phase II SSES and Phase III activities are expected to free up adequate conveyance capacity to meet the 20-year growth needs of the area.

6.1.5 Chapter 93, 95, and 102 Anti-degradation Requirements

Chapters 93 and 95 under Pennsylvania's Clean Streams Law classifies all surface waters according to uses to be protected and establishes water quality criteria which need to be maintained in the surface waters. These classifications, known as Water Quality Standards, establish the guidelines and procedures for wastewater effluent discharge limits. Chapter 16 of the Pennsylvania Code establishes the guidelines and procedures for development of criteria for toxic substances in order to protect the water uses list in Chapter 93.

Projects proposing a wastewater effluent discharge to special protection waters are required to justify the discharge alternative against all available alternatives. Because the GTMA owns and maintains a sewer conveyance system which does not involve direct discharges from its system after the Act 537 Plan Update Amendment is implemented, the water quality criteria in Chapters 93 and 95 are not applicable and the alternatives are therefore consistent.

Chapter 102 of the Pennsylvania Code requires a soil erosion and sedimentation control plan be prepared and followed for any construction activity impacting greater than one acre. Any sewer system improvements constructed during implementation of the selected alternative will be completed in compliance with necessary erosion and sedimentation control plans.

6.1.6 State Water Plan

The Commonwealth of Pennsylvania enacted the Water Resources Planning Act (Act 220) in 2002, requiring the State Water Plan be updated by March 2008 and every 5 years thereafter. The State Water Plan is available electronically on PADEP's website. The updated Plan replaces the original State Water Plan, completed in 1983.

The State Water Plan includes the State Water Plan Principles, summarizing the planning principles and recommendations, a Water Atlas, providing a plan for proper water and land resources management, and a Digital Water Atlas that allows for mapping of important planning

components. The following recommendations were taken from the State Water Plan Principles section for the Potomac River Basin:

1) Address land use planning and growth: The State Water Plan identified growth management as an important priority of the Potomac region. Strategies to help mediate the migration include implementing sound land use practices, regional planning, and regional regulatory program, and proper management of water resources when making decisions on competing land use decisions as priorities of the Potomac region. This information serves as a basis for making decisions on land use planning, for identifying and analyzing Critical Water Planning Areas, and for making comprehensive preparations in advance of extreme floods and droughts.

2) Develop land use programs that protect water quality and quantity and preserve the ecological integrity of groundwater and surface water, including springs, streams, lakes, and wetlands: A high priority of the Potomac region is to maintain water quality and ecological integrity of groundwater and surface water. Protection of natural soil is necessary in order to achieve the integrity of the water.

A main component of the State Water Plan was to address the planning and growth of the region due to migration of people and businesses. Important land use planning is essential to maintain the proper balance of water resources, natural environment and the emerging population.

The Water Atlas lists information on the major tributaries of the Potomac. Greene Township lies within the Conococheague Watershed. An Act 167 Stormwater Management Plan has been adopted for the Concococheague Creek Watershed. Implementation of the alternatives will not directly change the impervious coverage of the area and are therefore consistent with the pertinent Act 167 Plans.

The Digital Water Atlas provides the ability to select a general area and map, among other planning components, population projections, geology and surface water quality. The

population projections shown on the Digital Water Atlas for Greene Township include a 20-50% increase in population from 2000 to 2030. As described in Section 3, an estimated 2,000 EDUs increase of approximately 27% from existing are projected for the 20-year planning period. The population projections included in this Act 537 Plan Amendment are consistent with the projections prepared as part of the Digital Water Atlas.

A review of the State Water Plan indicated that inconsistencies do not exist between the water quality management goals and objectives of the State Water Plan and this Act 537 Plan Amendment. According to the State Water Plan Atlas and Principals, the updated State Water Plan will help planners determine how to meet current and future water supply and wastewater disposal needs by protecting community growth and development. The alternatives discussed in the Act 537 Plan Amendment are consistent with the State Plan's goal of well-managed water resources.

6.1.7 Prime Agricultural Land Policy

The policy was established to protect prime agricultural land from irreversible conversions to uses that result in the loss of the land as an environmental or essential food source resource. According to the United States Department of Agriculture (USDA) Soil Conservation Service (SCS) Soil Survey of Franklin County the majority of Greene Township is underlain by prime agricultural soils, as shown in Exhibit 1 in Appendix B. However, from the standpoint of this Act 537 Plan Amendment, prime agricultural soils are not a concern since there are no existing agricultural lands in the phased improvement areas. All of the proposed phased improvements will either replace or rehabilitate the existing sewer system in existing sewer rights-of-way (ROW), and will therefore not impact any existing agricultural operations.

The proposed phased alternatives would not remove any existing farmlands from production. Therefore, the alternatives of the Plan are consistent with the Prime Agricultural Land Policy.

6.1.8 County Stormwater Management Plans

The Storm Water Management Act (Pennsylvania Act 167) of 1978 states that inadequate management of stormwater resulting from development throughout a watershed increases flood flows and velocities, contributes to erosion and sedimentation, overtaxes the carrying capacity of streams and storm sewers, greatly increases the cost of public facilities to carry and control storm water, undermines flood plain management and flood control efforts in downstream communities, reduces groundwater recharge and threatens public health and safety. This act requires each county in Pennsylvania to adopt a stormwater management plan for each watershed. The plan is to be a joint effort between the County Planning Agency and the municipalities located in the particular watershed. The major issues to be addressed in a stormwater management plan include the assessment of projected land development patterns, potential impact of runoff quality, and the present and projected development in flood prone areas. The main objective of a stormwater management plan is to establish regulations for the control of stormwater runoff.

According to the PADEP website, a stormwater management plan, under Act 167, was approved by PADEP for the Conococheague Creek watershed. The Plan was approved on November 10, 2003, and Greene Township adopted a Stormwater Management Ordinance on June 22, 2004. Any earth disturbance activities in Greene Township must comply with the Township's Stormwater Management Ordinance.

The alternatives considered for the Plan Update Amendment will not change the amount of impervious coverage. Construction of the improvements will need to be undertaken in accordance with the Green Township Stormwater Management Ordinance. Therefore, the alternatives are consistent with the Stormwater Management Plan for the Conococheaque Creek Watershed.

6.1.9 Wetlands

Areas identified as wetlands by the National Wetlands Inventory (NWI) are mapped on Exhibit 2, in Appendix B. Wetlands are defined by Pennsylvania Title 25, Chapter 105 as those areas that are inundated or saturated by surface of groundwater at a frequency and duration

sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions; including swamps, marshes, bogs and similar areas. The three (3) essential characteristics possessed by wetlands are: (1) hydrophytic vegetation, (2) hydric soils, and (3) wetland hydrology, the driving force creating wetlands. Much of the land located along stream corridors in the Planning Area contains NWI wetlands. Sanitary sewers are typically placed along stream corridors to minimize pumping requirements. Therefore, some temporary wetland impacts potentially could occur during implementation of the wastewater management alternatives.

Based on Exhibit 2 the Phase I alternatives will be constructed in or near wetlands. The Phase I alternative may have a potential impact on NWI wetlands within Franklin County along Conococheague Creek. Since the conveyance relies on gravity flow, the existing sewer route will need to be maintained. A formal wetland delineation would be required to document the extent of jurisdictional wetlands occurring within the limits of disturbance. Additional environmental assessments may also be required. These assessments will be completed as part of design of the Phase I chosen alternative.

If wetland encroachment cannot be avoided, PADEP and U.S. Army Corps of Engineers approval will be necessary. Construction through wetlands, if permitted, may require the use of a U.S. Army Corp of Engineer Nationwide Permit 12 and a PADEP General Permit BDWM-GP-5.

6.1.10 Pennsylvania Natural Diversity Inventory

The Pennsylvania Natural Heritage Program, formally known as the Pennsylvania Natural Diversity Inventory (PNDI), maintains a database containing site information on regulated plant and animal species, outstanding geological features, and significant natural communities. A PNDI Project Environmental review, conducted on the PNDI website, acts as a screening tool to determine if any impacts are anticipated to federally listed, proposed, or candidate species if the construction project were to occur in the area and if any further review is required by state or federal agencies.

A PNDI Project Environmental Review was performed for the Phase I alternatives on February 5, 2013. The results from the Project Environmental Review are included in Appendix C.

The Project Environmental Review concluded that further review was required by the Pennsylvania Game Commission (PGC), the Pennsylvania Department of Conservation and Natural Resources (DCNR), and the Pennsylvania Fish and Boat Commission (PFBC), to determine if there may be potential impacts. These inquiries were made on behalf of the Authority in correspondence dated February 14, 2013 and are included in Appendix D.

The DCNR responded in a letter dated February 26, 2013. The letter indicates certain species of special interest may be located in the project area. Therefore, DCNR is requesting a field survey be completed by a qualified botanist and a copy of the survey should be submitted to its office for review. The response letter is included in Appendix E.

The PGC and the PFBC have yet to respond to the inquiries. It is believed according to the PNDI Environmental Review, the Northern Longeared Bat may be in the vicinity of Phase I alternatives. If this is the case, the bat species will only be impacted if trees will need to be removed during construction. Due to the construction site being in the existing sewer ROW that has been maintained by GTMA, minimal impact to the species is expected. However, GTMA will conduct the necessary surveys and modify the construction schedule, as necessary, to minimize impact to the bat species if it is found to be within the area.

6.1.11 Historical and Archeological Resource Protections

Pennsylvania Title 37, Section 507 requires cooperation between public officials and the Pennsylvania Historical and Museum Commission (PHMC). A cultural resource notice request was sent to the PHMC Bureau of Historic Preservation (BHP) on February 12, 2013 for a list of know historical sites and potential impacts on known archeological and historic sites within the planning area by implementation of either of the alternatives. A copy of the letter of request to the PHMC BHP is included in Appendix F.

The PHMC BHP responded with a letter dated February 21, 2013, stating that the proposed construction activities should not have an effect on historical buildings, structures, or archaeological resources located in the project area. A copy of the response letter is located in Appendix G.

6.1.12 Water Quality Standards and Effluent Limitations

The phased alternatives will not have any effects on how Chambersburg treats the sewage at the WWTP. As previously stated, GTMA's system conveys wastewater but does not have a permit for a direct stream discharge. Therefore, inconsistencies do not exist between the phased alternatives introduced in this Plan Update Amendment and the water quality standards and effluent limitations.

6.1.13 Resolution of Inconsistencies

Based on the above analyses, it does not appear that there are any substantial inconsistencies, at the planning stage, between the phased alternatives and the various goals and objectives of the planning, environmental and natural resource laws and policies of the Commonwealth of Pennsylvania. Additional wetlands delineation and vegetation species assessments and other environmental assessments are expected to be required as part of the design of the Phase I interceptor improvements.

6.2 Phase I Alternative Evaluation

A number of factors were considered to determine the best alternative option for Phase I. Table 6-1 includes the major advantages and disadvantages for each alternative. Preliminary planning-level project cost estimates were prepared for each alternative. Alternative 1 will replace the existing interceptor pipe and manholes with new, larger pipe and pre-cast manholes that will located within the same trench as the existing interceptor. No new rights-of-way will be needed to complete the Alternative 1 construction. However, since Alternative 2 involves a parallel sewer, additional rights-of-way along the 2.5 mile route will need to be acquired. GTMA staff expects this ROW acquisition will be both costly and time consuming. Estimated costs for this effort have not been developed as it will involve multiple properties.

TABLE 6-1
PHASE I ALTERNATIVES
ADVANTAGES AND DISADVANTAGES

Phase I Alternative No.	Alternative Description	Advantages	Disadvantages
1	Replace Existing Portions of Interceptor in Fayetteville and Oak Hill Basins	➢ Removes old facilities from the system that may be contributing excessive I/I ➢ Does not require acquisition of any land or rights-of-way ➢ Estimated O&M costs less than Alt. 2	➢ Highest estimated construction cost option (when not considering potential land acquisition costs)
2	Install a parallel sewer along portions of the Fayetteville and Oak Hill interceptors	➢ Provides flexibility in taking portions of existing interceptor out of service for cleaning ➢ Lower construction costs than Alt. 1	➢ Requires acquisition of rights-of-way of land ➢ O&M costs are expected to be greater than Alt. 1 given greater length of sewers

Opinions of probable construction cost were developed on a 2013 basis to determine the lowest cost alternative. As demonstrated in Table 6-2, Alternative 1 has the highest planning level estimated project cost. However, the Authority has estimated that additional land easements for Alternative 2 would be difficult to acquire and this cost is not included. The estimated breakdown of costs is provided in Table H-1 and Table H-2 in Appendix H. The planning level construction cost estimate provided in the 2013 Capacity Evaluation was provided at a higher-level of detail and included a higher contingency value to account for associated unknown project costs.

TABLE 6-2
PHASE I ALTERNATIVES
ESTIMATED PROJECT COST [1]

Phase I Alternative No.	Alternative Description	Estimated Project Cost (2013 dollars)
1	Replace Existing Portions of Interceptor in Fayetteville and Oak Hill Basins	$ 5,700,000
2	Install a parallel sewer along portions of the Fayetteville and Oak Hill interceptors	$ 5,000,000[2]

Notes:

(1) Estimate of probable project cost for each alternative is given in Appendix H.

(2) Estimate does not include land acquisition costs associated with Alternative 2.

Based on the evaluation of the Phase I alternatives, the selected wastewater management approach to meet the existing and projected 20-year peak flows is Alternative 1, replacing the existing interceptor with a larger 24-inch sewer. This alternative does not require additional land or rights-of-way acquisition and eliminates older sewers that may be contributing excessive I&I. An evaluation of potential financing methods, along with an estimate of the user rate impact is included in Section 7.

7.0 FUNDING METHODS

PADEP guidelines for preparation of ACT 537 Plans specify that an analysis of funding methods available to finance the proposed improvements needed within the next 5 years must be undertaken. The PADEP requires that Act 537 Plans quantify the anticipated impacts of the selected capital improvements and funding mechanisms on system user rates. Over the next five years, GTMA will need to finance Phase I, the beginning of Phase II investigations, and its share of the Chambersburg WWTP improvements

The planning-level opinion of probable project cost for Alternative 1, in 2013 dollars, is $5.7 million, including a 25% allowance of costs for Engineering, Legal, Financial and Administrative expenses. The estimated breakdown of project costs is provided in Appendix H. The GTMA is in the process of securing a 2013 series of bonds totaling $27 million. Approximately $20 million of the bond funds will be used to finance GTMA's portion of the

Chambersburg WWTP improvements. The remaining bond balance of approximately $7 million will be used for Phase I improvements. GTMA selected use of sewer revenue bonds as the method of financing given the amount of the funds required, the timing of when capital improvement funds are needed, the current market rate for bonds compared to PENNVEST loans, and the certainty provided by use of bonding versus the extended application process and competition for limited PENNVEST funds.

GTMA's residential sewer rates are currently set at $452/year/EDU. Incorporation of the debt service payments from the 2013 bonds into GTMA's budget is expected to increase residential user rates to approximately $700/year/EDU. The GTMA Sewer User Rates with the 2013 bond are approximately 1.2% of the median household income of the service area, which is slightly below the average user rate for Pennsylvania. The balance of the Phase I and Phase II improvements will be financed by "pay as you go", with GTMA increasing its user rates as needed. The GTMA may consider additional borrowing for Phase II rehabilitation depending on the extent of the rehabilitation needed. GTMA will undertake an analysis of financing options for Phase II rehabilitation, once the costs are better defined after the Phase II investigations are completed.

8.0 CONCLUSIONS

GTMA has invested in a phased approach to manage the current and projected 20-year flows to mediate the sanitary sewer overflows that the system has recently reported in Fayetteville. Phase I improvements will commence after PADEP approval of the Act 537 Amendment. The Phase I alternative of choice is Alternative 1: replace sections of the existing interceptor in Fayetteville and Oak Hill Basins. Concurrently with Phase I, Phase II investigations will begin. After the completion of Phase I, Phase II investigations will continue including flow data monitoring and analyses. Table 8-1 gives an implementation schedule for completion of the improvements and investigations identified in this Act 537 Plan Amendment. The alternatives discussed in the Act 537 Plan Update Amendment are consistent with areas defined in Appendix B of the Pennsylvania Sewage Facilities Act, A Guide for Preparing Act 537 Update Revisions.

TABLE 8-1
IMPLEMENTATION SCHEDULE

Project Component	Start	End
I. Preliminary Items		
1. Adopt Act 537 Plan Update Amendment	4/23/2013	5/7/2013
2. Submit Act 537 Plan Update Amendment to PADEP for Review and Approval	5/12/2013	5/12/2013
3. PADEP Act 537 Plan Update Amendment Approval	5/13/2013	10/13/2013
4. Environmental Assessment for Phase I	5/1/2013	4/1/2014
II. Phase I – Fayetteville Interceptor Improvements	Duration after DEP Approval of GTMA Act 537 Plan Update Amendment	
1. Field Survey and Design	7 Months (after Task I.4. completion)	
2. Permitting	4 Months (after Task II.1. completion)	
3. Bid Phase	4 Months (after Task II.2. completion)	
4. Construction	1 Year (after Task II.3. completion)	
III. Phase II – SSES Program and Additional Investigations	Duration during/after Phase I Completion	
1. First Priority Basins		
a. Field Investigations	1.5 Years (initiated during Task II.3 and completed 1 month after Task II.4. completion)	
b. Finding Summary	1 Month (after Task III.1.a. completion)	
c. Rehabilitation - Design and Permitting	8 Months (after Task III.1.b. completion)	
d. Rehabilitation - Bid Phase	3 Months (after Task III.1.c. completion)	
e. Rehabilitation - Construction	1 Year (after Task III.1.d. completion)	
2. Second Priority Basins		
f. Field Investigations	2 Years (after Task III.1. completion)	
g. Finding Summary	1 Month (after Task III.2.f. completion)	
h. Rehabilitation - Design and Permitting	8 Months (after Task III.2.g. completion)	
i. Rehabilitation - Bid Phase	3 Months (after Task III.2.h. completion)	
j. Rehabilitation - Construction	1 Year (after Task III.2.i. completion)	
3. Evaluation of Metering and Additional Activities Required for Phase III	7.5 Years (concurrently during Task III.1. and Task III.2)	
IV. Phase III -	8 Years (after Task III completion)	

Appendix A

Gannett Fleming

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2013 Sewer System Model Enhancement and Capacity Evaluation Report – 2013 Capacity Evaluation

Gannett Fleming

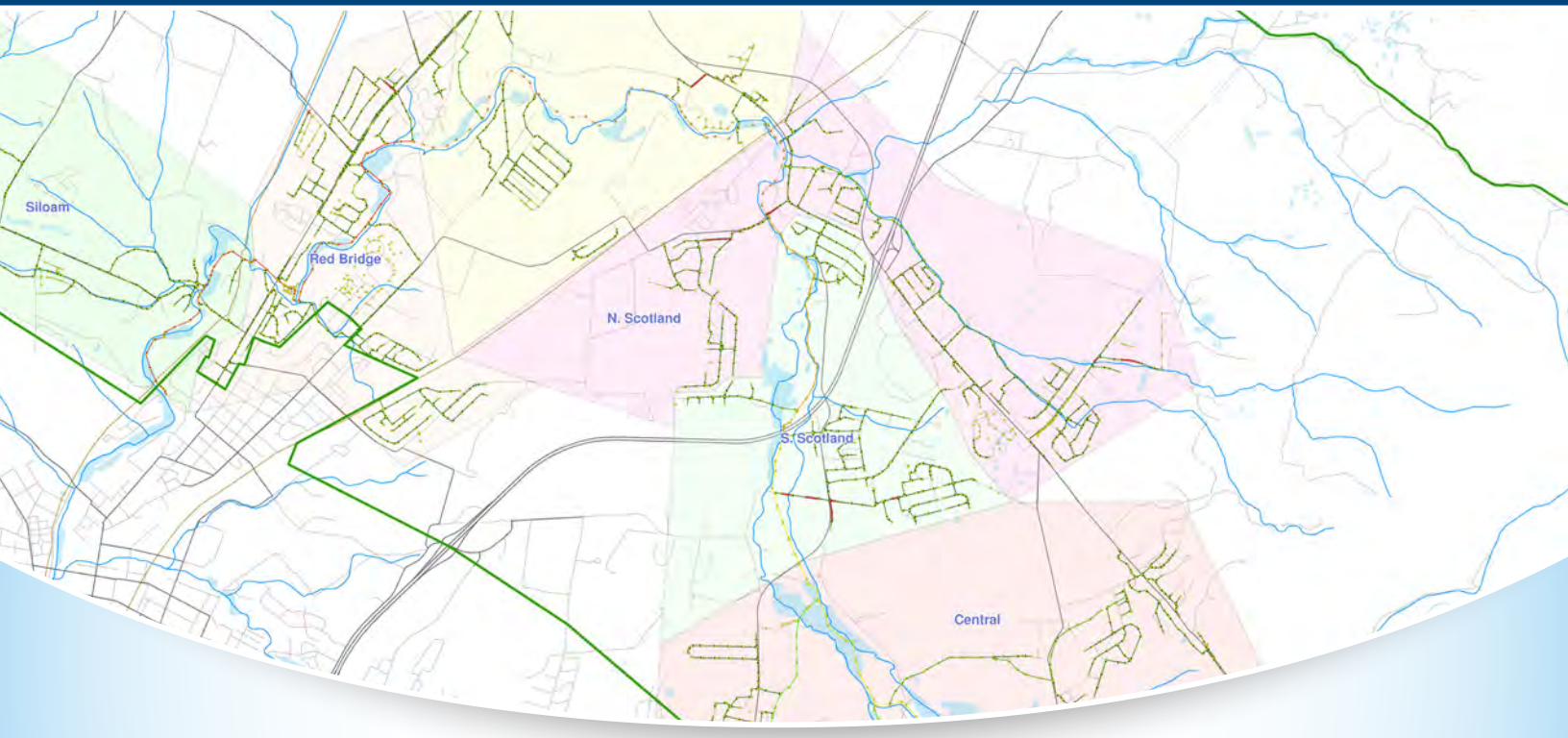
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Discovery A-9 - Attachment 3

Submitted to:

GREENE TOWNSHIP MUNICIPAL AUTHORITY
263-5324

Greene Township Municipal Authority
Sewer System Enhancement and Capacity Evaluation Report



Submitted by:

Gannett Fleming

Excellence Delivered ***As Promised***

January 2013

ISO 9001:2008 CERTIFIED

Table of Contents

Section	Title	Page
1.0	BACKGROUND	1-1
2.0	MODEL INTERCEPTOR UPDATE	2-1
3.0	AVERAGE DRY WEATHER FLOWS	3-1
3.1	Flow Metering Data	3-1
3.2	Average Dry Weather Flow Assignment	3-2
4.0	WET WEATHER FLOWS	4-1
4.1	Rainfall Data	4-1
4.2	System Design Event Selection	4-1
4.3	Model Simulation of Design Event	4-3
5.0	INTERCEPTOR CAPACITY ANALYSIS AND SYSTEM NEEDS ASSESSMENT	5-1
5.1	Greene Knolls Basin	5-3
5.2	Fayetteville Basin	5-3
5.21	Trayer Home – Route 30 Sub-Basin	5-4
5.22	Rite Spot Sub-Basin	5-4
5.2.3	Hidden Valley Road Sub-Basin	5-4
5.2.4	Newman Road Sub-Basin	5-5
5.2.5	Mount Pleasant Road Sub-Basin	5-5
5.3	Oak Hill Basin	5-5
5.4	Central Basin	5-6
5.5	South and North Scotland Basin	5-6
5.6	Greenvillage Basin	5-7
5.7	Red Bridge Basin	5-7
5.8	Siloam Basin	5-7
5.9	Projected Flow Analysis	5-8

Table of Contents

6.0 IMPROVEMENTS 6-1

6.1 Improvement Concept 6-1

6.2 Phase I: Fayetteville Interceptor Improvements 6-2

6.3 Phase II: Inflow and Infiltration Reduction 6-5

6.4 Phase III: System Improvements 6-6

Figures **Title** **Page**

1 System Schematic of Metering Locations 3-2

2 Greenvillage Basin Daily Metered Peak Flows 4-3

3 Design Storm Modeled Peak Inflows 4-5

Tables **Title** **Page**

1 Model ADWF Summary 3-3

2 Interceptor Capacity Assessment 5-2

3 High Priority Ranking Basins/Sub-Basins for I&I Investigation/Reduction 6-5

4 Medium Priority Ranking Basins/Sub-Basins for I&I Investigation/Reduction 6-6

Appendices **Title**

A Model ADWF Sub-Basin Assignment

B 2011 Metered Peak Flows for Identified Storm Events

C Modeled Sewer Profiles During November 22 Storm

D Modeled Sewer Profiles for November 22 Storm After Completion of Phase I Improvements

Abbreviation	Definition
ADWF	Average Dry Weather Flow
CAP	Corrective Action Plan
DIP	Ductile Iron Pipe
EDU	Equivalent Dwelling Unit
GF	Gannett Fleming, Inc.
GIS	Geographic Information System
gpd	Gallons per day
GTMA	Greene Township Municipal Authority
I&I	Inflow and infiltration
mgd	Million gallons per day
NDCD	National Climatic Data Center
NOAA	National Oceanic and Atmospheric Administration
PADEP	Pennsylvania Department of Environmental Protection
SSO	Sanitary sewer overflows
WTP	Wastewater Treatment Plant

1.0 BACKGROUND

In accordance with the Greene Township Municipal Authority (GTMA) Corrective Action Plan (CAP) approved by the Pennsylvania Department of Environmental Protection (PADEP) in October 2009 and updated in June 2012, Gannett Fleming (GF) developed a computer model of the GTMA sewer system in April 2012 during Phase I of the Modeling and Analyses Project. Phase I consisted of developing a model of GTMA's sewer system in Bentley's SewerGEMS software using GTMA's existing Geographic Information System (GIS) data and flow metering data recorded in 2011. The model was subsequently used to complete a preliminary hydraulic capacity analysis of GTMA's interceptor system. The results of this Phase I effort are documented in the Sewer System Model Development and Analysis Modeling Report, dated April 2012 (2012 Report). Phase II of the Modeling and Analyses Project enhanced the sewer model to perform more detailed analysis of GTMA's sewer system interceptor capacity. A map of the GTMA sewer system is provided in Exhibit 1.

Phase II Modeling and Analyses includes the following primary components:

1. Model Interceptor Update: The simulation of the GTMA interceptor within the model was updated to address data needs identified during the Phase I effort.
2. Average Dry Weather Flow (ADWF) Update: As part of the Phase I effort, flows in the model were primarily assigned as inflow at the metering locations along the interceptor. As part of Phase II, the system ADWF, which includes sanitary flow as well as base infiltration, was allocated to tributary sewers connecting to the interceptor to better replicate the spatial distribution of flows along the interceptor. Additional flow meter data available during 2012 was also evaluated to further assess the flow assignment in the model.
3. Wet Weather Flow Update: A more refined allocation of wet weather flows, similar to the spatial allocation of the ADWF, was also completed during Phase II. In addition, the flows for the modeled wet weather simulation were categorized to represent the portion of flow contributed from the ADWF versus those flows

attributed to rainfall derived inflow and infiltration (I&I). The updated wet weather simulation was then verified against meter data to confirm a reasonable match between model and field results.

4. Future Year Flows: Based on estimates of potential growth in the system provided by GTMA, a future year flow scenario was established in the model.
5. Interceptor Capacity and Improvement Identification: The updated model was used to identify areas of predicted surcharges and overflows, and to identify recommendations for interceptor improvements in the Fayetteville Basin, as well as potential long-term improvements for the interceptor system beyond Fayetteville, for a selected design storm. The model was also used along with evaluation of the flow meter data to identify sewer basins where rehabilitation may be applicable to address capacity issues.

The CAP includes a requirement for GTMA to submit an amendment to the Greene Township Act 537 Sewage Facilities Plan to address hydraulic overload conditions within the GTMA sewer system. This Phase 2 Modeling Report will serve as a foundation document for GTMA's use in meeting the Act 537 Plan amendment requirement of the CAP. It is expected this Report will be included as an Appendix to the Greene Township Act 537 Plan amendment.

RED BRIDGE BASIN

GREENVILLAGE BASIN

NORTH SCOTLAND BASIN

SILOAM BASIN

PENN HALL METER

CENTRAL BASIN

SOUTH SCOTLAND BASIN

MH 99 NEWMAN ROAD SUB-BASIN

FAYETTEVILLE BASIN

MH 35 BLACK GAP ROAD SUB-BASIN

OAK HILL BASIN

MH 138 MT. PLEASANT ROAD SUB-BASIN

MH 200 HIDDEN VALLEY SUB-BASIN

MH 248 TRAYER HOWE SUB-BASIN

MH 225 RITE SPOT SUB-BASIN

MH 378 METER

GREENE KNOLLS BASIN

Legend

- BASIN BOUNDARY
- PUMP STATION (PS)
- METER (M)
- INTERCEPTOR

SEWER SIZE
- Missing Diameter
- <= 8-inch
- 10-inch
- 12-inch
- 15-inch or 16-inch
- 18-inch
- 21-inch
- 24-inch
- 27-inch
- 30-inch

GREENE TOWNSHIP MUNICIPAL AUTHORITY

2012 EXISTING SYSTEM

N W E S

EXHIBIT 1
JANUARY 2013

5,000 2,500 0 5,000 Feet

1 Inch = 5,000 Feet

GREENE TOWNSHIP MUNICIPAL AUTHORITY

Gannett Fleming

2.0 MODEL INTERCEPTOR UPDATE

The 2012 Report identified several data needs to refine the simulation of the GTMA Interceptor. Specific needs were identified during the development of the model in Phase I. During Phase II, the needs most critical to the model simulation of the interceptor were resolved through use of record drawings provided by GTMA and/or additional information provided by GTMA based on field observation. Specific updates to the model interceptor made during Phase II included the following:

- Update of several interceptor diameters
- Identification and simulation of drop manholes along the interceptor
- Identification and simulation of bolted manholes along the interceptor
- Revision of the sewer profile in Oak Hill near manhole 515
- Refinement of the Siloam siphons simulations.

3.0 AVERAGE DRY WEATHER FLOWS

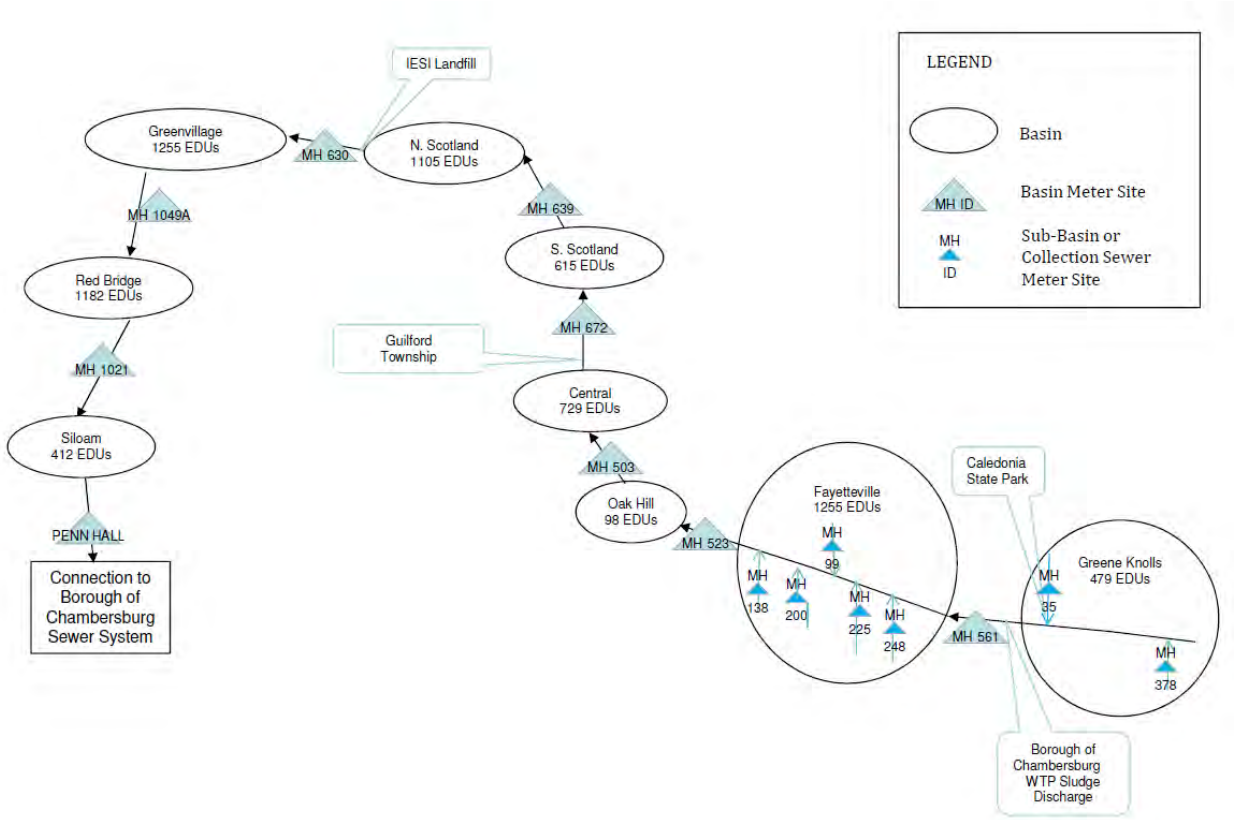
3.1 Flow Metering Data

As part of GTMA's CAP, flow metering of basins within the GTMA sanitary sewer system began in the summer of 2009. Meters are located along the interceptor at nine (9) sites corresponding to the downstream reach of each of its primary sewer basins. Additionally, GTMA also has metering sites located in the collection sewers measuring depth and velocity for five (5) sub-basins that are tributary to the interceptor in the Fayetteville Basin and for two (2) sub-basins tributary to the interceptor in Greene Knolls Basin (at Manhole 378 and the Black Gap Road Sub-Basin at Manhole 35). The Fayetteville sub-basin data included flow recordings from:

- Trayer Howe Sub-Basin at Manhole 248
- Rite Spot Sub-Basin at Manhole 225
- Newman Road Sub-Basin at Manhole 99
- Hidden Valley Sub-Basin at Manhole 200, and
- Mount Pleasant Sub-Basin at Manhole 138.

The data from the nine (9) sites along the interceptor and from the Black Gap Road Sub-Basin site were used during the Phase I analyses. The additional sub-basin meters were not considered in the Phase I analyses but were considered during the Phase II analyses. A schematic identifying basin and sub-basin flow metering sites used for the Phase II analyses is provided in Figure 1.

FIGURE 1: System Schematic of Metering Locations



3.2 Average Dry Weather Flow Assignment

Details of the methodology for establishing the ADWF by basin are provided in the 2012 Report. In summary, available meter data from the metering sites was used to establish an average flow per basin for dry weather days. A dry weather day was defined as day with no precipitation and no precipitation in the previous 2 days. The metering data includes different recording increments for the metering sites. The increments range between every 15-minutes to hourly recorded data. The ADWF per basin was calculated in available increments over a 24-hour period. These average flows were then used to establish an average dry weather diurnal flow pattern for each basin. The cumulative ADWF for the system was estimated to be 2.6 mgd.

Updated Equivalent Dwelling Unit (EDU) counts were provided by GTMA and verified by GF through collecting data associated with available mapped customers for each incoming collection sewer to the interceptor. The EDU counts were utilized along with the sub-basin metering data to improve the spatial distribution of dry weather flows in the model. Based on review of available data, an estimated average sanitary flow of 125 gallons per day (gpd) per EDU was applied to the estimated number of EDU's per sub-basin to establish the allocation of average daily sanitary flows through the interceptor system. The calculated diurnal patterns were then applied to the sanitary flows based on the metering data. The base infiltration for each metered basin and sub-basin was then calculated as the difference between the ADWF and the average sanitary flow. The estimated base infiltration for non-metered sub-basins was based on the base infiltration for the basin and distributed based on the percentage of EDUs for the sub-basin relative to that in the basin. Table 1 provides a summary of the model ADWF assignment by basin and Appendix A contains a table summarizing modeled sub-basin ADWF.

TABLE 1: Model ADWF Summary

Meter ID	Basin	EDUs	Base Sanitary Flow (mgd)	Base Infiltration (mgd)	Basin ADWF (mgd)	Cumulative ADWF (mgd)
MH 561	Greene Knolls	479	0.07	0.24	0.31	0.31
MH 523	Fayetteville	1264	0.16	0.42	0.58	0.89
MH 503	Oak Hill	98	0.01	0.28	0.29	1.18
MH 672	Central	732	0.09	0.27	0.36	1.54
MH 639	South Scotland	616	0.08	0.14	0.22	1.76
MH 630	North Scotland	1108	0.14	0.27	0.41	2.17
MH 1049A	Greenvillage	1267	0.16	0.01	0.17	2.34
MH 1021	Red Bridge	1190	0.14	0.07	0.23	2.57
PENN HALL	Siloam	412	0.05	0.01	0.06	2.63
TOTAL		7166	0.90	1.71	2.63	

4.0 WET WEATHER FLOWS

4.1 Rainfall Data

GTMA currently owns and maintains one (1) manual recording rain gauge, which is generally read every 1 to 10 days. Rain data with a minimum sampling frequency of 1-hour, or preferably 15-minutes, is required to establish a correspondence between rainfall intensity and rainfall derived I&I, which is necessary in developing a predictive sewer system hydrologic model. The National Oceanic and Atmospheric Administration (NOAA) provides publicly available weather data through the National Climatic Data Center (NCDC) database. The Fayetteville Station is the closest NOAA observational station that recorded at a frequency of one-hour or less during 2011. The station maintained 15-minute precipitation data during 2011 and is located greater than ten (10) miles from the GTMA system. Given the often significant spatial variation in storm events, the distance of this rain station makes it of limited use in assessing rainfall response in the GTMA system. Based on the lack of rainfall data within a reasonable proximity to the GTMA system that samples at a frequency of 1 hour or less, it was determined that a reasonably well-calibrated predictive hydrologic model of the system could not be developed at this time.

4.2 System Design Event Selection

2011 was an unusually wet weather year in South-Central Pennsylvania with several rainfall events of historical significance, including Tropical Storm Lee. Therefore, due to the wet antecedent conditions and rainfall events of historical significance, it was determined appropriate to utilize GTMA recorded flow meter data from 2011 to establish a "system design event" that was simulated in the model to assess system response.

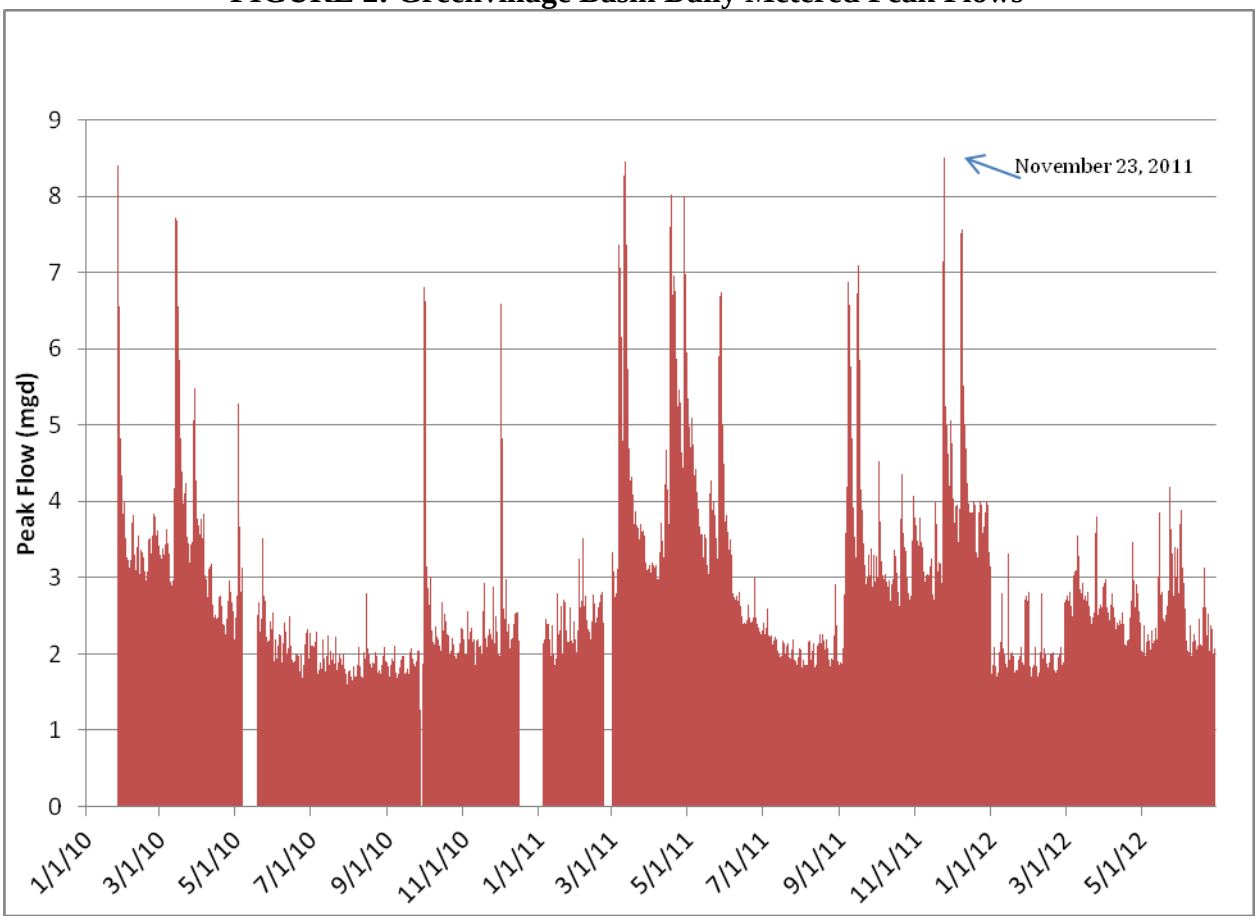
Rainfall data from the GTMA rainfall gauge as well as precipitation data from the NOAA Fayetteville Station were used to identify the approximate dates of the peak rainfall events experienced in the GTMA system in 2011. From this data and a review of GTMA flow metering data, eight (8) significant 2011 storm events were identified. Table B1 in Appendix B provides the metered peak flows recorded at the GTMA metering sites during these eight (8) storm events.

A sewer system's I&I response to a given rainfall event may not be directly correlated to the significance of the rainfall event. Prior experience in model analyses and assessments of metering data indicates that antecedent conditions, including ground saturation, stream flow levels, and the time of year, amongst other variables, have a significant impact on the I&I response to a given rainfall event. For example, a lesser rainfall event may produce a more significant I&I response, depending upon the antecedent conditions. Thus, it is important to consider the sewer system response, and not simply the significance of the rainfall event in identifying a system design event rather than simply selecting a design storm.

A graphical representation of metered peak flows at GTMA's Greenvillage Basin metering site (Manhole 1049A) between January 2010 and June 2012 is provided in Figure 2. The largest recorded peak flow for the period occurred on November 23, 2011, corresponding to a rainfall event that began on November 22, 2011 (November 22 Storm). At a minimum, the system response to the November 22 Storm can be considered to have a return frequency of at least two (2) years as the sampling provided a record of 2.5 years. However, given the fact that 2011 was a wet year with several storm events with a high return frequency (likely in excess of ten (10) years), it can be assumed that the November 22 Storm produced a system response with a return frequency well in excess of two (2) years.

Based on review of available data, the November 22 Storm was selected as the system design event. Typical industry standard calls for selection of design storms with return frequencies of two (2) to five (5) years. It is believed that selection of the November 22 Storm as the system design event will result in a very conservative assessment of system peak flow response. This conservative approach is considered appropriate for use in identifying improvements for the Fayetteville interceptor, which has previously been deemed beyond capacity. The use of the November 22 Storm also provides a means to measure the capacity throughout the interceptor system under a worst-case peak flow event. However, use of the November 22 Storm may be overly conservative in predicting the long-term need for system upgrade in other portions of the system.

FIGURE 2: Greenvillage Basin Daily Metered Peak Flows



4.3 Model Simulation of Design Event

The model was set up to simulate the November 22 Storm. The available metering data was utilized to determine the flows for the event by basin and sub-basin for the sub-basins that were metered. It was assumed that the sanitary flows and base infiltration flows during the November 22 Storm were consistent with the ADWF to estimate the rainfall derived I&I component of the recorded flows for the November 22 Storm. This rainfall derived I&I component can then be applied to any dry weather flow condition, including assessment of future sanitary flows to assess the system under the design event. The rainfall derived I&I component of the November 22 Storm was allocated to sub-basins at the incoming collection sewers based on the approximate area of the sub-basin and the length of sewer in a given sub-basin relative to

the total for that basin. The design event was simulated in the model for 96 hours to account for attenuation and system response.

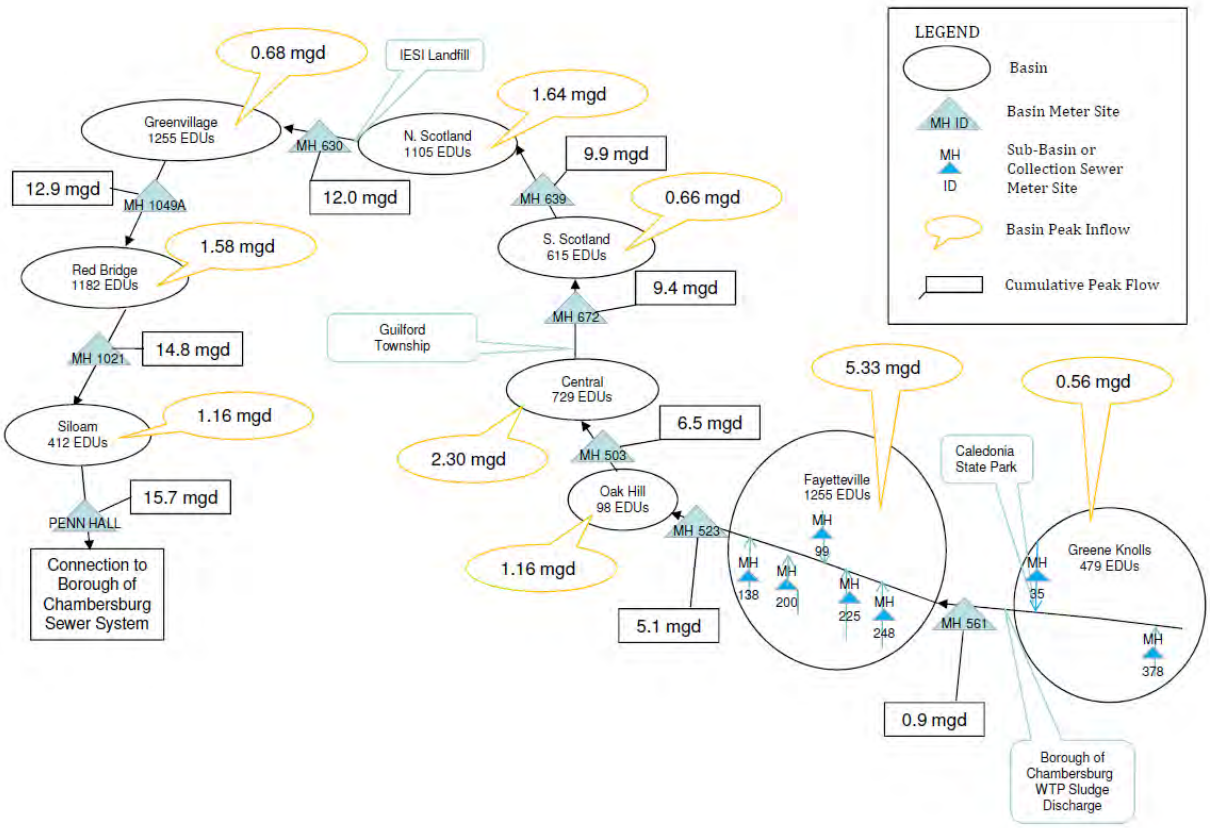
Evaluation of the flow meter data for the November 22 Storm shows decreases in flow proceeding downstream along the interceptor at Manholes 523, 561, and Penn Hall Meter. Further, the sub-basin meters in Fayetteville recorded more flow than the Fayetteville Basin meter located on the interceptor at Manhole 523. Sanitary sewer overflows (SSOs) were reported during this storm event, which would account for the flow loss in the Fayetteville Basin.

Manhole 1049A flow data indicates marginal increase in flow of 0.01 mgd for the Greenvillage Basin compared with the upstream North Scotland Basin. The South Scotland meter at Manhole 630 did not record flow data during the design storm. The flow data at the Oak Hill Basin metering site Manhole 503, indicates intervals during the peak of the storm where the flow decreased and leveled out close to zero mgd. The Penn Hall Meter, Red Bridge, and North Scotland meters also indicate flow decreases during the peak of the November 22 Storm. The observations suggest a backflow condition from the Chambersburg system during the November 22 Storm. This backflow condition appears to constrain the flow that can enter the GTMA interceptor.

The results of the meter data evaluation were used to approximate the potential flow that would have entered the GTMA interceptor during the November 22 Storm if the system was not constrained by capacity of the existing interceptor or by the downstream capacity in Chambersburg. The unconstrained inflows to the Fayetteville Basin were established through use of the sub-basin meters in Fayetteville. The unconstrained inflows to the basins for which metering data suggested no flow increase were estimated through evaluation of peak flows from the eight (8) other storm events identified during 2011. The largest peak inflow read at each of these metering sites for the other storm events was used to estimate the unconstrained peak flow for a given basin during the design event. For the purpose of assessing the potential unconstrained flow in the GTMA system, the discharge of flow from the GTMA interceptor to Chambersburg was simulated as a free outfall (potential backflow condition from the

Chambersburg system was not simulated). Figure 3 provides a schematic of the peak inflows added to each basin in the model for the November 22 Storm.

FIGURE 3: Design Storm Modeled Peak Inflows



5.0 INTERCEPTOR CAPACITY ANALYSIS AND SYSTEM NEEDS ASSESSMENT

The sewer model was utilized to assess the capacity of the existing GTMA interceptor relative to the November 22 Storm. The model simulation of the approximated flows for the November 22 Storm predicts the occurrence of overflows and backflow that is believed to have occurred during the event. Model results predict that surcharging occurred along the majority of the interceptor during the November 22 Storm. The model predicted overflows in the Fayetteville Basin at or near sites that have had reported SSOs. Other basins where the modeled peak flow predicted overflows include: Oak Hill, Central, North Scotland, Greenvillage, Red Bridge, and Siloam. Profiles of the interceptor showing the model-predicted water level, which reflect the surcharging, during the November 22 Storm are provided in Appendix C.

The model simulation of the November 22 Storm predicts the peak flow at the Penn Hall meter location to be approximately 8.8 mgd as opposed to the metered peak flow of approximately 8.7 mgd. If the GTMA interceptor, as well as the Chambersburg interceptor, were able to convey all inflows into the system during the November 22 Storm, the cumulative system peak flow ("unconstrained peak flow") at the Penn Hall meter is estimated to be approximately 15.1 mgd. Given the unknowns in the volume of overflow and extent of backwater and system constraint impacts, the actual unconstrained peak flow for the November 22 Storm cannot be accurately predicted. It is believed that the method used to establish the unconstrained peak flows as part of the current evaluation is a conservative approach for evaluating potential Fayetteville interceptor improvements.

A comparison of the full pipe flow capacity of the interceptor with the estimated unconstrained peak flow experienced during the November 22 Storm was made to provide a means to identify specific areas that may require improvement in order to adequately convey existing peak flows. The full pipe flow capacity is the amount a specific section of the interceptor can convey without becoming surcharged. The comparison is provided in Table 2.

TABLE 2: Interceptor Capacity Assessment

Basin	Metering Site	Cumulative Full Pipe Flow Capacity (mgd)	Cumulative ADWF (mgd)	Full Pipe Flow Capacity to ADWF Ratio	Unconstrained Peak Flow for Nov 22 Storm (mgd)	Full Pipe Flow Capacity to Unconstrained Peak Flow Ratio
Greene Knolls	35	1.0	0.31	3:1	0.9	1:1
	378					
	561					
Fayetteville	248	2.1	0.89	2:1	6.5	less than 1:1
	225					
	200					
	138					
	99					
	523					
Oak Hill	503	2.8	1.18	2:1	7.3	less than 1:1
Central	672	4.6	1.54	3:1	9.7	less than 1:1
South Scotland	639	6.0	1.76	3:1	10.2	less than 1:1
North Scotland	630	7.6	2.17	4:1	12.1	less than 1:1
Greenvillage	1049A	7.6	2.34	3:1	12.5	less than 1:1
Red Bridge	1021	13.0	2.57	5:1	14.1	less than 1:1
Siloam	MC1 (Penn Hall)	13.0	2.63	5:1	15.1	less than 1:1

The results presented in Table 2 further indicate that the interceptor capacity is not sufficient to convey the peak flows of the November 22 Storm without surcharging. Further review of Table 2 indicates that the interceptor in the Fayetteville and Oak Hill Basins can convey only two (2) times the ADWF. This, coupled with the model-predicted surcharging and overflows during the November 22 Storm, indicate that the interceptor is undersized in this area. Table 2 further shows that the interceptor in the Greene Knolls, Central, South Scotland, and Greenvillage Basins can convey only three (3) times the ADWF, in the North Scotland Basin the interceptor can convey four (4) times the ADWF, and in the Red Bridge and Siloam Basins the interceptor can convey five (5) times the ADWF. This suggests that a significant portion of the interceptor may be undersized even if aggressive measures are undertaken to control I&I in the

system. A summary of the capacity analyses and needs assessment for each basin, which includes potential impact of I&I reduction, is presented below.

5.1 Greene Knolls Basin

The Greene Knolls Basin is comprised of approximately 50,400 linear feet of sewer ranging in size from 4- to 10-inch pipe, including the 5,200 feet of 10-inch interceptor. There are 479 total EDUs in the Greene Knolls Basin, with 125 EDUs in Black Gap Road Sub-Basin and 120 EDUs in the sub-basin metered by MH 378. The Greene Knolls Basin conveys flow from the Caledonia State Park and from the Borough of Chambersburg Water Treatment Plant (WTP) Sludge Discharge. The Chambersburg WTP sludge discharge averaged approximately 10,000 gpd during 2010 and 2011 and discharges approximately 600 gpm for 5 minutes during a typical tank cleaning. The Black Gap Road Sub-Basin has an area-velocity meter that recorded peak flows up to 0.88 mgd during the November 22 Storm. This peak flow was calculated to be 45,200 gpd per inch-mile of tributary sewer and 7,000 gpd per EDU. Given the length of main in the sub-basin and the number of EDUs, the Black Gap Road Sub-Basin experiences significant I&I compared to a typical sanitary sewer system. Flow metering at Manhole 378 in the Greene Knolls Basin recorded a peak of 0.18 mgd during the November 22 Storm, which is calculated to be 15,000 gpd per inch-mile and approximately 1,500 gpd per EDU. According to the 2011 metering data and compared with the other basins/sub-basins, the rest of Greene Knolls Basin and the Manhole 378 sub-basin are considered lower priority areas for I&I investigation.

5.2 Fayetteville Basin

The Fayetteville Basin is comprised of approximately 111,500 linear feet of sewer ranging in size from 4- to 15-inch pipe. The interceptor ranges in size from 12 to 15 inches and is approximately 12,340 linear feet in length. There are 1,264 EDUs in the Fayetteville Basin. The sewer model simulation results indicate a full pipe flow capacity in the Fayetteville interceptor of 2.1 mgd. The existing cumulative ADWF conveyed is approximately 0.90 mgd, which provides a ratio of only 2:1 full pipe capacity to ADWF. Considering a typical design

sanitary flow peaking factor of 4:1, the sewer can be considered undersized for existing flows. The metered peak flow during the November 22 Storm was 1.8 mgd. The peak recorded flow at the Fayetteville Basin meter is less than the cumulative peak flows upstream in the Greene Knolls basin and in the metered Fayetteville sub-basins, which is evidence of SSOs in the basin during this event

5.2.1 Trayer Howe - Route 30 Sub-Basin

The Trayer Howe Sub-Basin flows into a portion of the Fayetteville's 12-inch interceptor. There are 180 EDUs in the sub-basin and approximately 19,000 linear feet of sewer. A metered peak flow for the sub-basin of 1.1 mgd was recorded during the November 22 Storm. The metered peak flow corresponds to 38,100 gpd per inch-mile and approximately 6,100 gpd per EDU. Given the peak flows, length of main and EDUs in the sub-basin compared with the rest of the sewer system, significant I&I is experienced in Trayer Howe.

5.2.2 Rite Spot Sub-Basin

There are approximately 16,500 feet of gravity main, a lift station and approximately 800 feet of force main in the Rite Sport Sub-Basin. 232 EDUs are accounted for in the sub-basin. The peak flow during the November 22 Storm was recorded to be 0.53 mgd and is approximately 20,800 gpd per inch-mile and 2,300 gpd per EDU. (These calculations include assumptions for approximately 4,300 feet of sewers with unknown diameters. For these sewers, an 8-inch diameter was assumed.) The 2011 peak flow calculations, when compared with the other basins, indicate Rite Spot Sub-Basin as a lower priority area for I&I rehabilitation or repair.

5.2.3 Hidden Valley Road Sub-Basin

The Hidden Valley Road Sub-Basin includes 70 EDUs that contribute flow to the approximate 13,600 feet of 8-inch sewer. During the November 22 Storm, a peak flow of 0.54 mgd was metered, which is approximately 26,200 gpd per inch-mile and 7,700 gpd per EDU. This sub-basin has a higher peak flow per EDU compared with the other basins, but has an average peak flow per length of sewer. This combination could be contributed to the location

of the sewers, the soil-type, and density of the basin. When compared with calculations of the other sub-basins and basins, Hidden Valley would be ranked as medium priority for additional I&I investigation and rehabilitation.

5.2.4 Newman Road Sub-Basin

The Newman Road Sub-Basin is comprised of 184 EDUs that contribute flow to the approximately 20,100 feet of 8-inch sewer. The recorded peak flow of 1.3 mgd during the November 22 Storm equates to approximately 42,700 gpd per inch-mile and 7,100 gpd per EDU. When compared with the other basins, Newman Road Sub-Basin is ranked as a higher priority for repairs to the sewers to reduce the I&I.

5.2.5 Mount Pleasant Road Sub-Basin

There are 92 EDUs that contribute flow to the approximate 5,600 feet of 8- and 10-inch sewers in the Mount Pleasant Road Sub-Basin. The meter recorded 1.5 mgd for a peak flow during the November 22 Storm. The peak flow is calculated to be approximately 169,900 gpd per inch-mile and 16,300 gpd per EDU. These calculations place the Mount Pleasant Road Sub-Basin as one of the highest ranking candidates for I&I investigation and repair.

5.3 Oak Hill Basin

The Oak Hill Basin includes 98 EDUs contributing flow to approximately 5,100 feet of 8- and 10-inch sewers as well as the 6,200 feet of 15- and 18-inch interceptor. The metered peak flow during the November 22 Storm was 4.3 mgd, of which approximately 2.5 mgd is attributed to the Oak Hill Basin flows. The calculations of approximately 316,400 gpd per inch-mile and 25,600 gpd per EDU would prioritize and rank this basin as one of the highest basins identified for I&I repair. However, as established during the capacity analysis, this basin is also undersized relative to the system ADWF. Therefore, an interceptor upgrade is needed along with I&I investigation extending into the sub-basin tributary sewers and subsequent rehabilitation and repair to reduce I&I.

5.4 Central Basin

The Central Basin is comprised of approximately 75,800 linear feet of sewer ranging in size from 8- to 18-inch, including approximately 5,800 feet of 18-inch interceptor. There are 732 EDUs in the Central Basin. The basin also receives flow from Guilford Township ranging between 0.18 and 0.42 mgd. Metered peak flows of 7.0 mgd occurred during the November 22 Storm. The Basin peak flow of approximately 2.7 mgd calculates to approximately 23,300 gpd per inch-mile and 3,700 gpd per EDU. The metering data also showed surcharging during the November 22 Storm and indication of potential backflow. The Central Basin is considered a medium priority area for I&I investigation and should be considered for additional investigation to better asses peak flows.

5.5 South and North Scotland Basin

There are 616 EDUs that contribute flow to the approximate 61,400 feet of 4- to 21-inch of sewers in the South Scotland Basin, including 10,700 feet of 18- and 21-inch interceptor. The flow meter did not record any data for six of the eight storm events during 2011, including the November 22 Storm. A peak flow of 5.4 mgd was recorded during the May 26, 2011 storm event. However, the upstream Central Basin recorded a peak flow of 5.9 mgd during the same storm at approximately the same time. Given this discrepancy and the lack of data from other storm events, the metering data was not used to assess the peak flow per inch-mile or per EDU for the South Scotland Basin. Therefore, the South and North Scotland Basins were considered from a combined perspective to assess the approximate flow per inch-mile and flow per EDU.

The North Scotland Basin includes 1,108 EDUs that contribute flow to approximately 93,100 feet of 4- to 24-inch gravity sewers, including approximately 3,200 feet of 21- and 24-inch interceptor. A metered peak flow of 8.5 mgd occurred during the November 22 Storm. The estimated combined South and North Scotland Basin peak flow of 1.5 mgd is approximately 5,700 gpd per inch-mile and 900 gpd per EDU. Both the South and North Scotland Basins should be targeted for additional study and investigation to better assess flows and needs.

5.6 Greenvillage Basin

The Greenvillage Basin has 1,267 EDUs that convey flow to the approximate 104,000 linear feet of gravity sewer ranging in size from 4 to 24-inches, including 13,500 feet of 24-inch interceptor. The basin also includes 4 lift stations, and approximately 7,100 feet of force main. The 2011 peak flow of 8.5 mgd was recorded during the November 22 Storm, which is approximately equal to the peak flow measured upstream at the North Scotland Basin. The meter data for the Greenvillage Basin suggests potential periods of backflow. Additional study and investigation should be conducted to better assess peak flows and determine if backflow conditions limit the flow that would otherwise be conveyed to the interceptor within this Basin.

5.7 Red Bridge Basin

There are 1,190 EDUs that contribute flow to the approximate 105,100 feet of 6- to 30-inch gravity sewers in the Red Bridge Basin, including approximately 9,000 feet of 24- and 30-inch interceptor. The Basin also includes a lift station and approximately 1,300 feet of force main. The peak flow recorded during 2011 was 9.3 mgd during the November 22 Storm. The recorded Basin peak flow corresponds to 4,500 gpd per inch-mile and 760 gpd per EDU. The Red Bridge meter at Manhole 1021A is upstream of two (2) of Red Bridge sub-basins. Therefore, the calculations for the flows per inch-mile and EDU only include the approximate 180 inch-mile of main and the 1,058 EDUs that contribute to the meter. Based on these values, the Basin is not currently considered a high priority area to conduct I&I repair. The metering data did indicate potential backflow through the basin meter. Therefore, this basin should also be targeted for additional study and investigation to better determine the peak flows in the Basin.

5.8 Siloam Basin

The Siloam Basin has approximately 41,000 linear feet of 4- to 30-inch gravity sewers, including approximately 6,600 feet of 30-inch interceptor. The Basin also includes a lift station and approximately 6,100 feet of force main. There are 1,197 EDUs that contribute flow to the

Siloam Basin. The 2011 peak flow of 8.7 mgd occurred during the November 22 Storm. Immediately before the peak flow, the meter was submerged for multiple hours with a flow reading of 0.0 mgd. The metering data suggest a potential backflow condition through the meter, potentially originating in the Chambersburg sewer system. Therefore, this basin should also be targeted for additional study and investigation to determine the peak flows. Such investigation would include a determination of the capacity of the Chambersburg interceptor.

5.9 Projected Flow Analysis

A future year sanitary flow scenario was assigned to the model using planning information provided by GTMA. An estimated growth within the GTMA sewer system of 2,000 new households with an average sanitary flow of 225 gpd per household was added to the existing system flows and modeled for the projected future year condition. It was assumed that half of this growth will occur north of Interstate 81, and half south of the Interstate. A peaking factor of 2:1 was applied to the average sanitary flow associated with this growth to account for diurnal fluctuations and some I&I. The future sanitary and peak flows were analyzed for the existing system design event. Model results indicate that the needs to accommodate future flows are similar to those identified to accommodate the existing flows due to the significant peaks currently experienced in the system during the November 22 Storm.

6.0 IMPROVEMENTS

6.1 Improvement Concept

The results of the interceptor capacity evaluation and needs assessment provided a means to identify short- and long-term improvement needs for the GTMA interceptor. In addition, the evaluation and needs assessment provided a means to identify areas of the GTMA system which should be targeted for I&I reduction or additional investigation. As discussed in Section 5, the capacity evaluation indicates that the majority of the interceptor may be undersized to convey current peak flows. However, as also noted in Section 5, there is some uncertainty with regard to the extent of peak flows experienced by the system due to current SSOs and backflow conditions. Additional investigation is also required to better assess the ability of the Chambersburg interceptor to accept peak flows from the GTMA system. Due to the extent and cost of capital improvements that may be needed, the uncertainty with regard to the magnitude of peak flows, and the actual capacity of the Chambersburg interceptor to accept peak flows from the GTMA system; a three-phased improvement concept to meet current and long-term system needs has been identified. The concept includes short-term interceptor improvements to address known capacity needs in the Fayetteville Basin and long-term measures to reduce I&I and address capacity issues in other portions of the system, for which the extent of improvement needs cannot be completely defined at this time.

- Phase I involves increasing the capacity of the undersized interceptor in the Fayetteville and Oak Hill Basins. The objective of the Phase I improvements is to address the immediate concern of SSOs in the Fayetteville Basin.

- Phase II involves additional investigations to better determine peak flows in the system, investigation of downstream capacity in the Chambersburg system, available for GTMA flows, and more detailed investigation of sources of I&I and rehabilitation of identified source basins to reduce I&I.

- Phase III involves undertaking the necessary improvements to address long-term capacity issues beyond those completed in Phase I and Phase II in the GTMA interceptor.

6.2 Phase I: Fayetteville Interceptor Improvements

Phase I of the improvement concept involves improvements to the interceptor in the Fayetteville and Oak Hill Basins to address the current capacity deficiencies and reported SSOs in Fayetteville area. Two (2) alternatives were analyzed to address these issues, and are described below with planning level opinions of probable construction cost. For the purpose of the current study, the main improvements were assumed to follow the alignment of the existing interceptor. The planning level opinions of probable construction are based on 2012 unit pricing from other GF sewer installation projects and include a 25% contingency allowance to account for project unknowns. There is always uncertainty during the planning stage as to the precise content of all items that will need to be undertaken or encountered as part of a construction project. These uncertainties represent risks to the magnitude of the actual project cost and are accounted for in the planning-level estimate as contingency. The level of contingency will decrease as the project moves from planning stage, to preliminary design, to final design, bidding, and construction.

- Alternative No. 1: Install approximately 12,750 linear feet of 24-inch interceptor in the Fayetteville and the Oak Hill Basins from Fayetteville's Manhole 554 to Oak Hill's Manhole 513 (44 manholes). Exhibit 2 provides a map locating the Interceptor Improvement. The improvement will replace existing manholes and interceptor with new manholes and interceptor. The new interceptor will maintain the existing connections to the collection sewers in approximately the same location. Based on feedback from GTMA, Ductile Iron Pipe (DIP) was assumed for the new pipe material. The planning level opinion of probable construction cost of Alternative No. 1 is estimated to be approximately $5.6 million in 2013 dollars. Bypass pumping was included in the cost estimate. The improvement will mitigate the surcharging

and overflows in the area of the improvement. Profiles of the new main showing model-predicted water levels for the November 22 Storm are provided in Appendix D.

- Alternative No. 2: Install a parallel sewer along portions of the Fayetteville and Oak Hill interceptors. The improvement will include approximately 6,650 feet of 12-inch and 5,900 feet of 18-inch main between Fayetteville Manhole 553 to Oak Hill Manhole 513. A map showing the proposed improvement is provided in Exhibit 3. The existing interceptor will remain connected to the system and the new interceptor will serve as a relief line. Based on feedback from GTMA, it is assumed that the existing interceptor manholes will need to be rehabilitated as part of Alternative No. 2. Therefore, rehabilitation of the manholes on the existing Fayetteville and Oak Hill interceptor (approximately 44 manholes) are included in this alternative's planning level opinion of probable cost. Approximately 43 new manholes will be added along the parallel interceptor. For a cost comparison to Alternative No. 1, it was assumed the relief line will have 10 connections to the existing interceptor. Alternative No. 2 does not require by-pass pumping as the existing main will remain in service during construction of the parallel line. At this stage of analyses, the evaluation of Alternative No. 2 assumes the parallel main can be installed in existing right-of-way. The planning-level opinion of probable construction cost of Alternative No. 2 is approximately $4.7 million in 2013 dollars.

Based on the cost comparison of the above alternatives, Alternative No. 2 is estimated to be the more economical alternative. However, additional more detailed evaluation is required to better assess details of each alternative and refine the opinion of probable construction costs. Overall project costs of the alternatives include construction cost plus other costs GTMA would expend to complete the improvement project and represent the anticipated total cost for which financing will be needed. For planning-level purposes, project costs are considered to equal the estimated construction cost plus a 25% allowance to cover other project related costs such as

engineering design, permitting, environmental assessments, legal costs, bidding costs, financing costs and inspection costs during construction. Using this 25% allowance, results in a planning-level opinion of total project costs in excess of approximately $5.9 million and $6.9 million for the two alternatives.

Discovery A-9 - Attachment 3

RED BRIDGE BASIN

GREENVILLAGE BASIN

NORTH SCOTLAND BASIN

SILOAM BASIN

PENN HALL METER

CENTRAL BASIN

Fayetteville Interceptor Improvement
ALTERNATIVE NO. 1
Approximately 12,800 feet of 24-inch Sewer from MH 554 to MH 513

MH 99 NEWMAN ROAD SUB-BASIN

SOUTH SCOTLAND BASIN

FAYETTEVILLE BASIN

MH 35 BLACK GAP ROAD SUB-BASIN

OAK HILL BASIN

MH 138 MT. PLEASANT ROAD SUB-BASIN

MH 200 HIDDEN VALLEY SUB-BASIN

MH 248 TRAYER HOWE SUB-BASIN

MH 225 RITE SPOT SUB-BASIN

MH 378 METER

GREENE KNOLLS BASIN

Legend

BASIN BOUNDARY

PUMP STATION

METER

IMPROVEMENT

INTERCEPTOR

SEWER SIZE

- Missing Diameter
- <= 8-inch
- 10-inch
- 12-inch
- 15-inch or 16-inch
- 18-inch
- 21-inch
- 24-inch
- 27-inch
- 30-inch

GREENE TOWNSHIP MUNICIPAL AUTHORITY
PHASE I - INTERCEPTOR IMPROVEMENT
ALTERNATIVE NO. 1

N W E S

EXHIBIT 2
JANUARY 2013

5,000 2,500 0 5,000 Feet

1 Inch = 5,000 Feet

GREENE TOWNSHIP MUNICIPAL AUTHORITY

Gannett Fleming

Discovery A-9 - Attachment 3

RED BRIDGE BASIN

GREENVILLAGE BASIN

NORTH SCOTLAND BASIN

SILOAM BASIN

PENN HALL METER

CENTRAL BASIN

Fayetteville Interceptor Improvement ALTERNATIVE NO. 2 Approximately 6,650 feet of 12-inch Sewer from MH 553 to MH 533

MH 99 NEWMAN ROAD SUB-BASIN

SOUTH SCOTLAND BASIN

FAYETTEVILLE BASIN

MH 35 BLACK GAP ROAD SUB-BASIN

OAK HILL BASIN

MH 138 MT. PLEASANT ROAD SUB-BASIN

MH 200 HIDDEN VALLEY SUB-BASIN

MH 248 TRAYER HOWE SUB-BASIN

MH 225 RITE SPOT SUB-BASIN

MH 378 METER

GREENE KNOLLS BASIN

Fayetteville Interceptor Improvement ALTERNATIVE NO. 2 Approximately 5,900 feet of 18-inch Sewer from MH 533 to MH 513

Legend

BASIN BOUNDARY

PS PUMP STATION

M METER

12- INCH IMPROVEMENT

18- INCH IMPROVEMENT

INTERCEPTOR

SEWER SIZE

Missing Diameter

<= 8-inch

10-inch

12-inch

15-inch or 16-inch

18-inch

21-inch

24-inch

27-inch

30-inch

GREENE TOWNSHIP MUNICIPAL AUTHORITY

FAYETTEVILLE INTERCEPTOR IMPROVEMENT ALTERNATIVE NO. 2

N W E S

EXHIBIT 3
JANUARY 2013

5,000 2,500 0 5,000 Feet

1 Inch = 5,000 Feet

GREENE TOWNSHIP MUNICIPAL AUTHORITY

Gannett Fleming

6.3 Phase II: Inflow and Infiltration Reduction

Phase II includes activities to be undertaken by GTMA to reduce I&I in prioritized basins as well as further metering and field investigations to assess system peak flows. As described in Section 5, the metered basins were compared and prioritized based on peak flow and basin size. I&I reduction could be an important component to reduce the extent of additional interceptor improvements needed for Phase III and to reduce the downstream capacity requirements within the Chambersburg system for GTMA'S flows. Table 3 provides a summary of the highest priority basins/sub-basins for I&I investigation and reduction activities based on the November 2011 flow meterings.

TABLE 3: High Priority Ranking Basins/Sub-Basins for I&I Investigation/Reduction

Rank	Basin	Meter Site	Estimated Peak I&I		Peak I&I with 20% Reduction		Peak I&I with 50% Reduction	
			(gpd/inch-mile)	(gpd/ EDU)	(gpd/inch-mile)	(gpd/ EDU)	(gpd/inch-mile)	(gpd/ EDU)
1	Oak Hill Basin	MH 503	316,400	25,600	253,100	20,500	158,200	12,800
2	Fayetteville - Mount Pleasant Road	MH 138	169,900	16,300	135,900	13,000	85,000	8,200
3	Greene Knolls - Black Gap Road	MH 35	45,200	7,300	36,200	5,900	22,600	3,700
4	Fayetteville - Newman Road	MH 99	42,700	7,100	34,200	5,700	21,400	3,600
5	Fayetteville - Trayer Howe	MH 248	38,100	6,100	30,500	4,900	19,100	3,100

Table 3 provides the estimated peak I&I flow and a potential 20 or 50 percent flow reduction in I&I. Based on experience, a 20% reduction in I&I can be considered a reasonable goal that can be achieved through a comprehensive sewer system rehabilitation program. An I&I reduction of up to 50% may be possible but is considered difficult to achieve. Based on the results of the analyses completed for the modeling to date, the Oak Hill Basin and Mount Pleasant Road Sub-Basin in Fayetteville are the highest ranked basins/sub-basins for additional I&I investigation.

Table 4 provides the ranking of medium priority basins/sub-basins for potential I&I investigation and reduction. These basins and/or sub-basins should be targeted after the high priority basins listed in Table 3 have been addressed.

TABLE 4: Medium Priority Ranking Basins/Sub-Basins for I&I Investigation/Reduction

Rank	Basin	Meter Site	Estimated Peak I&I		Peak I&I with 20% Reduction		Peak I&I with 50% Reduction	
			(gpd/ inch-mile)	(gpd/ EDU)	(gpd/ inch-mile)	(gpd/ EDU)	(gpd/ inch-mile)	(gpd/ EDU)
1	Fayetteville - Hidden Valley	MH 200	26,200	7,700	21,000	6,200	13,100	3,900
2	Central Basin	MH 672	23,300	3,700	18,600	3,000	11,700	1,900

Sewer basins that should be further inspected and investigated to better assess peak flows include North Scotland, South Scotland, Greenvillage, Red Bridge, and Siloam. The metering data for this list of basins show signs of inconsistency and/or backflow that make it difficult to establish peak flows and assess the need for facility upgrades in these basins.

6.4 Phase III: System Improvements

Phase III improvements would be initiated after Phase I is completed and the milestones of Phase II are achieved. Model results indicate significant surcharging and the occurrence of SSOs during simulation of the November 22 Storm within the GTMA inceptor, even if the Phase I improvements are implemented. The Phase III improvements would include system improvements needed to address the capacity issues not resolved in Phase I or II.

The model was used to determine the extent of improvements beyond the Phase I improvements needed to convey the estimated peak flows of the November 22 Storm, if no I&I reduction is achieved. For the purpose of this study, these improvements were assumed to consist of replacement of the existing interceptor. A summary of the upgrades, beyond the identified Phase I improvement, required to avoid surcharging during the November 22 Storm are provided below:

- Oak Hill Basin: Replace the existing 15- and 18-inch interceptor downstream of the Phase I improvements (Manhole 513) with approximately 3,200 feet of 24-inch main.
- Central Basin: Replace the existing 18-inch sewer with approximately 6,200 feet of 26-inch sewer.
- South Scotland: Replace the existing 18- and 21-inch interceptor with approximately 8,600 linear feet of 26-inch and approximately 2,100 linear feet of 30-inch sewer.
- North Scotland: Replace the existing 21- and 24-inch sewer with approximately 2,700 feet of 30-inch sewer.
- Greenvillage: Replace the existing 24-inch sewer with approximately 13,500 feet of 30-inch sewer.
- Red Bridge: Replace the existing 24-, 27-, and 30-inch sewer with approximately 2,300 feet of 30-inch sewer and 6,600 feet of 36-inch sewer.
- Siloam: Replace the existing 30-inch sewer with approximately 7,000 feet of 36-inch sewer.

The improvements noted above are consistent with the model simulation of the November 22 Storm that indicates upgrades are required to the majority of the interceptor. Given the extent of these improvements and the associated capital cost, it not considered feasible or prudent to implement them in the short-term. The additional analysis and I&I investigations and rehabilitation to be performed in Phase II are intended to better refine the design peak flows for the remainder of the Interceptor. As previously noted, the November 22 Storm produced a system response well in excess of a two-year event and its use is thus considered conservative for a design storm. Furthermore, I&I reduction that is achieved in Phase II may reduce the extent of improvements required in Phase III. Additional metering and modeling analyses, to be completed in conjunction with Phase II, will better assess the long-term improvements needs of the interceptor. Thus, the implementation of Phase II and Phase III are seen as a long-term plan to identify the most cost-effective, and sustainable solution to meet the current and long-term needs in the GTMA system.

Appendix A
Model ADWF Sub-Basin Assignment

Model Sub-Basin ADWF Summary

Basin	Sub-Basin/MH ID	EDUs	Base Infiltration (mgd)	Base Sanitary Flow (mgd)	Sub-Basin ADWF (mgd)
Greene Knolls	Black Gap Road	125	0.08	0.02	0.1
Greene Knolls	378	120	0.04	0.02	0.05
Greene Knolls	344	60	0.03	0.01	0.04
Greene Knolls	561B	160	0.09	0.02	0.11
Greene Knolls	562	6	0.00	0.00	0.00
Greene Knolls	412	8	0.00	0.00	0.01
Fayetteville	Trayer Howe	180	0.16	0.023	0.18
Fayetteville	Rite Spot	232	0.06	0.029	0.09
Fayetteville	108	133	0.00	0.017	0.02
Fayetteville	Newman Rd	184	0.01	0.023	0.03
Fayetteville	Hidden Valley	70	0.13	0.009	0.14
Fayetteville	202	211	0.00	0.026	0.03
Fayetteville	118	162	0.00	0.020	0.02
Fayetteville	Mt. Pleasant Rd	92	0.06	0.012	0.07
Oak Hill	274	98	0.28	0.01	0.29
Central	4000	402	0.15	0.05	0.20
Central	582	56	0.02	0.01	0.03
Central	1565A	274	0.10	0.03	0.13
S. Scotland	709	362	0.08	0.05	0.13
S. Scotland	663.01	69	0.02	0.01	0.02
S. Scotland	657A	51	0.01	0.01	0.02
S. Scotland	812	134	0.03	0.02	0.05
N. Scotland	826	397	0.10	0.05	0.15
N. Scotland	822	50	0.01	0.01	0.02
N. Scotland	796B	629	0.15	0.08	0.23
N. Scotland	836	32	0.01	0.00	0.01
Greenvillage	625	70	0.001	0.01	0.009
Greenvillage	859	94	0.001	0.01	0.013
Greenvillage	SYC20	68	0.001	0.01	0.009
Greenvillage	1192	203	0.002	0.03	0.027
Greenvillage	1180	832	0.008	0.10	0.112

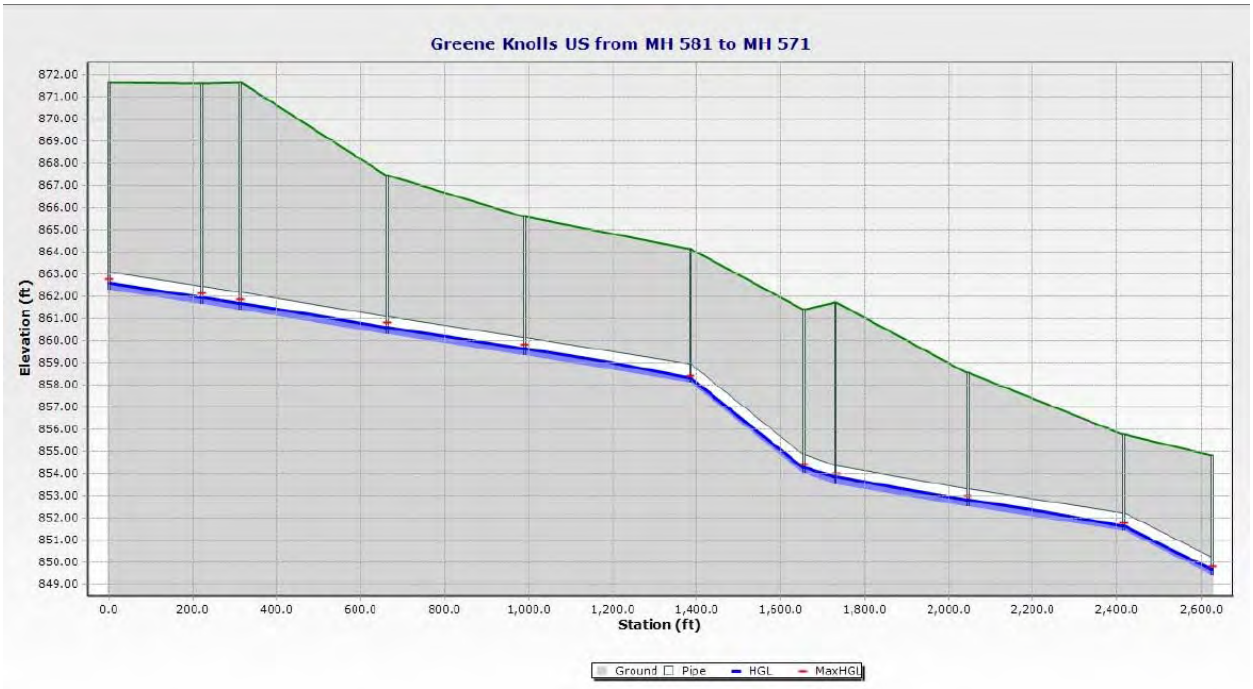
Basin	Sub-Basin/MH ID	EDUs	Base Infiltration (mgd)	Base Sanitary Flow (mgd)	Sub-Basin ADWF (mgd)
Red Bridge	1248	350	0.02	0.04	0.07
Red Bridge	1047.1	12	0.001	0.00	0.003
Red Bridge	1267B	40	0.003	0.01	0.008
Red Bridge	1043A	5	0.0005	0.00	0.001
Red Bridge	1294A	17	0.001	0.00	0.004
Red Bridge	1288A	290	0.02	0.04	0.06
Red Bridge	1309	262	0.01	0.03	0.05
Red Bridge	RIF1	60	0.006	0.01	0.01
Red Bridge	1315	22	0.002	0.00	0.005
Red Bridge	1318	13	0.0003	0.00	0.002
Red Bridge	1331	119	0.0026	0.01	0.02
Siloam	1017.1	29	0.0006	0.00	0.004
Siloam	1410	365	0.0081	0.05	0.05
Siloam	1352	18	0.0004	0.00	0.003

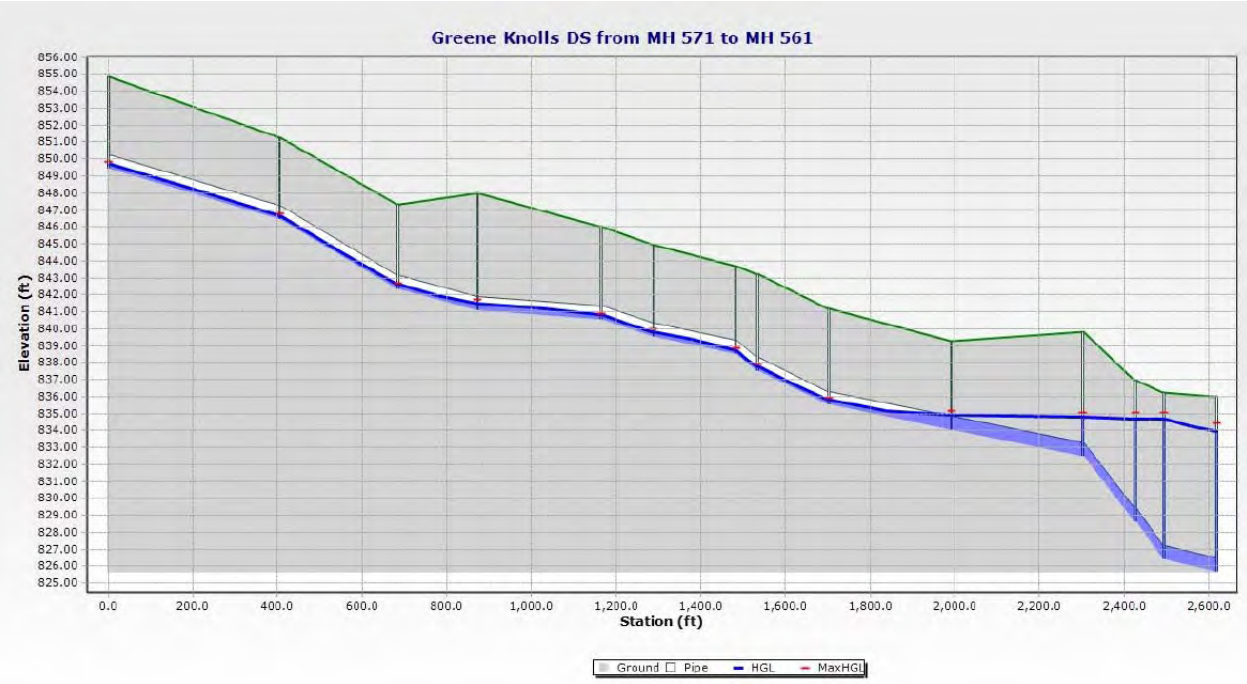
Appendix B
2011 Metered Peak Flows for Identified Storm Events

TABLE B1: Metered Peak Flow from Identified 2011 Storm Events

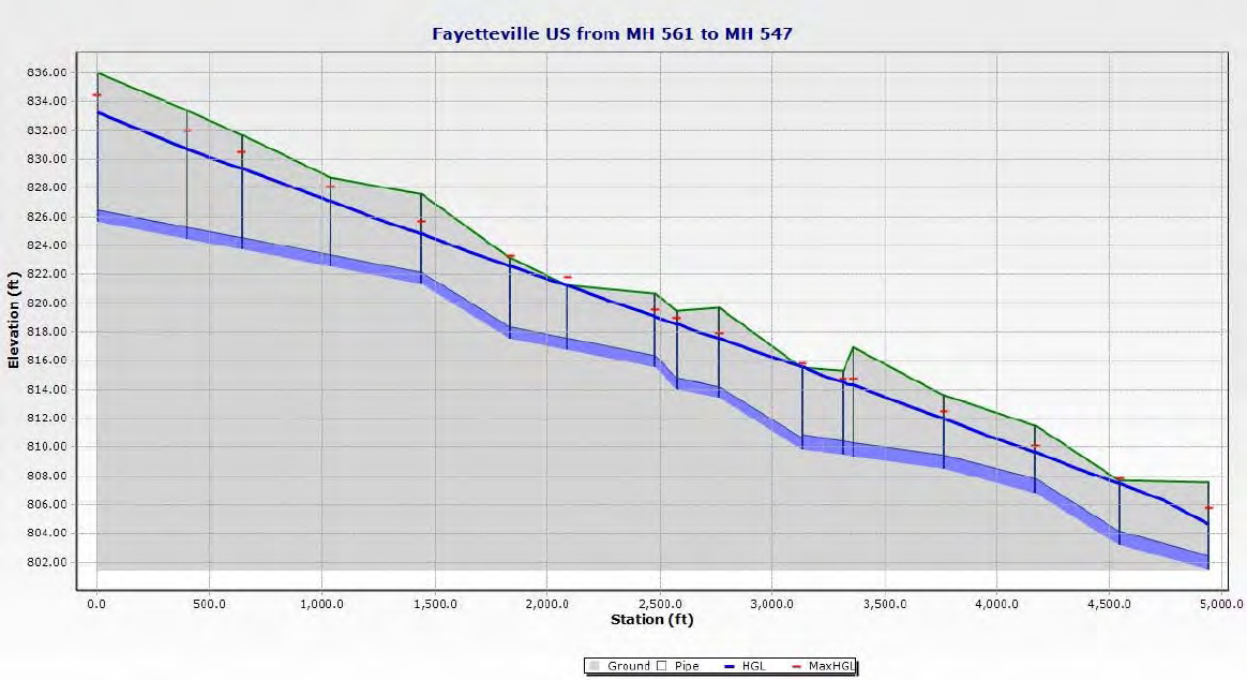
Basin	Meter Site	Recorded Peak Flow (mgd)							
		10-Feb-2011	5-Mar-2011	16-Apr-2011	28-Apr-2011	26-May-2011	20-Jun-2011	22-Nov-2011	29-Nov-2011
Black Gap Road	MH 35	0.11	0.36	0.26	0.50	NO DATA	0.18	0.88	0.64
Collection Sewer - Greene Knolls	MH 378	NO DATA	NO DATA	NO DATA	NO DATA	NO DATA	0.10	0.18	0.25
Greene Knolls	MH 561	NO DATA	0.86	0.60	0.69	0.57	0.42	0.82	0.56
Trayer Howe - Fayetteville	MH 248	0.45	1.07	0.77	1.10	0.71	0.21	1.08	0.76
Rite Spot - Fayetteville	MH 225	0.31	0.40	0.47	0.56	0.26	0.20	0.53	0.36
Newman Road - Fayetteville	MH 99	0.03	1.05	1.28	1.25	1.03	0.03	1.25	0.28
Hidden Valley - Fayetteville	MH 200	NO DATA	0.72	NO DATA	NO DATA	NO DATA	0.14	0.54	0.36
Mt. Pleasant Rd - Fayetteville	MH 138	NO DATA	NO DATA	1.62	1.57	0.36	0.18	1.45	0.62
Fayetteville	MH 523	NO DATA	NO DATA	NO DATA	NO DATA	1.83	1.05	1.79	1.86
Oak Hill	MH 503	0.78	3.25	3.50	3.47	3.21	1.62	4.31	2.10
Central	MH 672	NO DATA	NO DATA	NO DATA	NO DATA	5.94	1.74	6.97	3.70
South Scotland	MH 639	NO DATA	NO DATA	NO DATA	NO DATA	5.40	1.21	NO DATA	NO DATA
North Scotland	MH 630	2.63	8.48	8.10	7.61	7.16	2.73	8.49	5.71
Greenvillage	MH 1049A	2.79	7.36	8.02	8.00	6.74	2.99	8.50	5.07
Red Bridge	MH 1021	6.36	9.16	7.42	8.66	4.88	2.32	9.34	4.41
Siloam	MC1	1.96	6.32	7.57	7.85	6.12	2.82	8.69	4.36

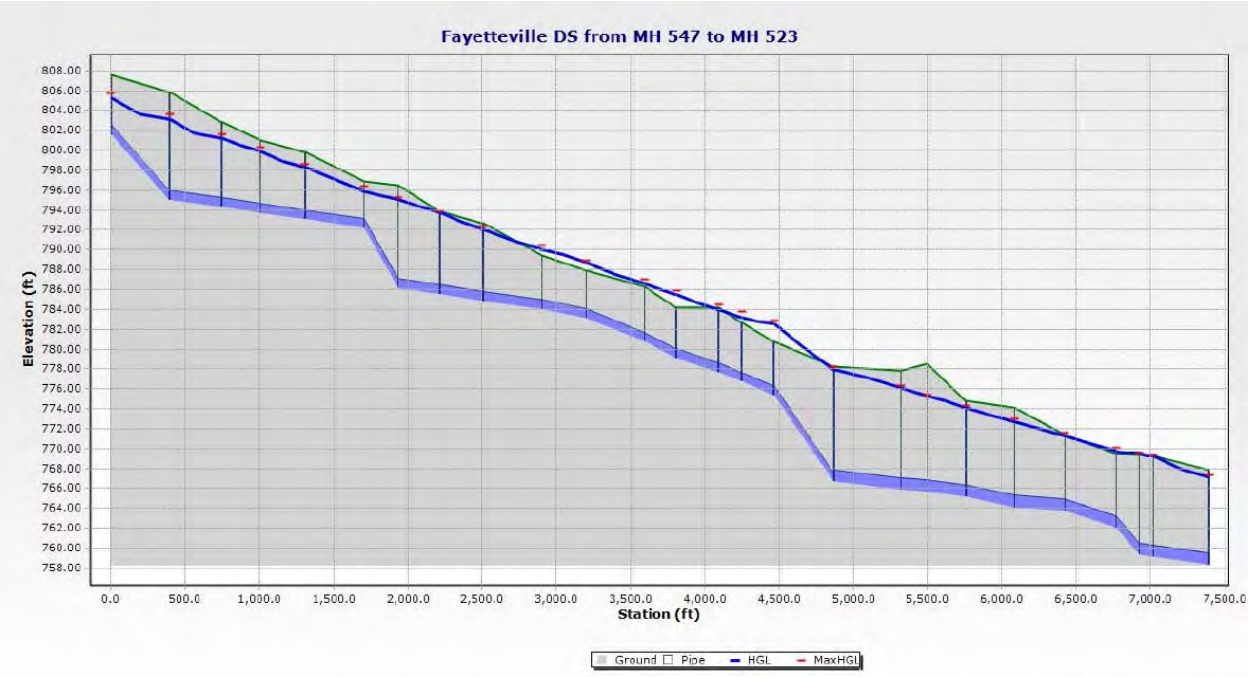
Appendix C
Modeled Sewer Profiles During November 22 Storm

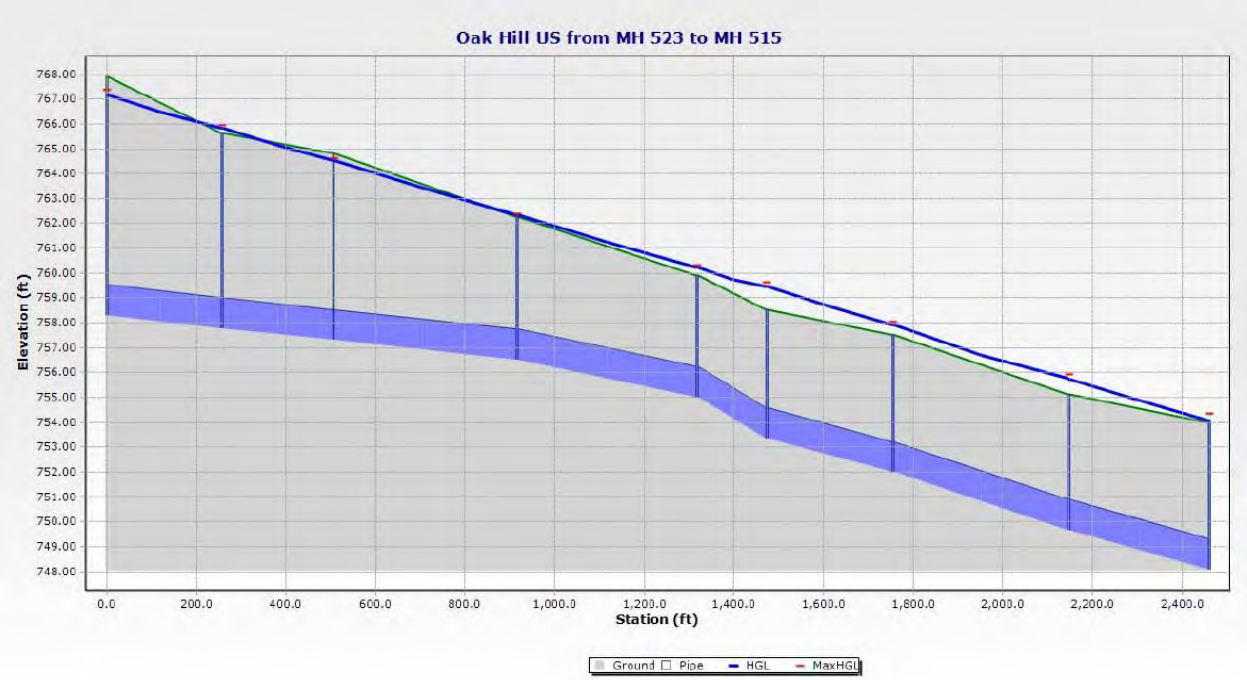

Greene Knolls US from MH 581 to MH 571
Elevation (ft)
872.00
871.00
870.00
869.00
868.00
867.00
866.00
865.00
864.00
863.00
862.00
861.00
860.00
859.00
858.00
857.00
856.00
855.00
854.00
853.00
852.00
851.00
850.00
849.00
0.0
200.0
400.0
600.0
800.0
1,000.0
1,200.0
1,400.0
1,600.0
1,800.0
2,000.0
2,200.0
2,400.0
2,600.0
Station (ft)
Ground
Pipe
HGL
MaxHGL

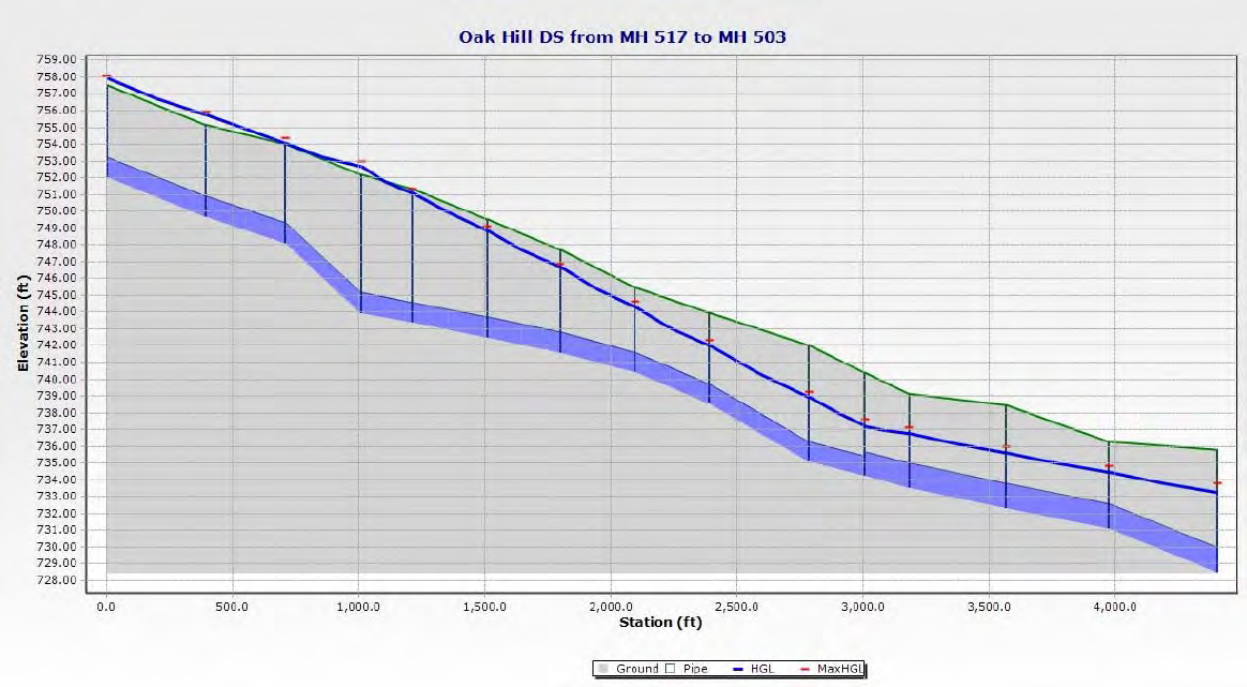

Greene Knolls DS from MH 571 to MH 561
Elevation (ft)
856.00
855.00
854.00
853.00
852.00
851.00
850.00
849.00
848.00
847.00
846.00
845.00
844.00
843.00
842.00
841.00
840.00
839.00
838.00
837.00
836.00
835.00
834.00
833.00
832.00
831.00
830.00
829.00
828.00
827.00
826.00
825.00
0.0
200.0
400.0
600.0
800.0
1,000.0
1,200.0
1,400.0
1,600.0
1,800.0
2,000.0
2,200.0
2,400.0
2,600.0
Station (ft)
Ground
Pipe
HGL
MaxHGL

Appendix C

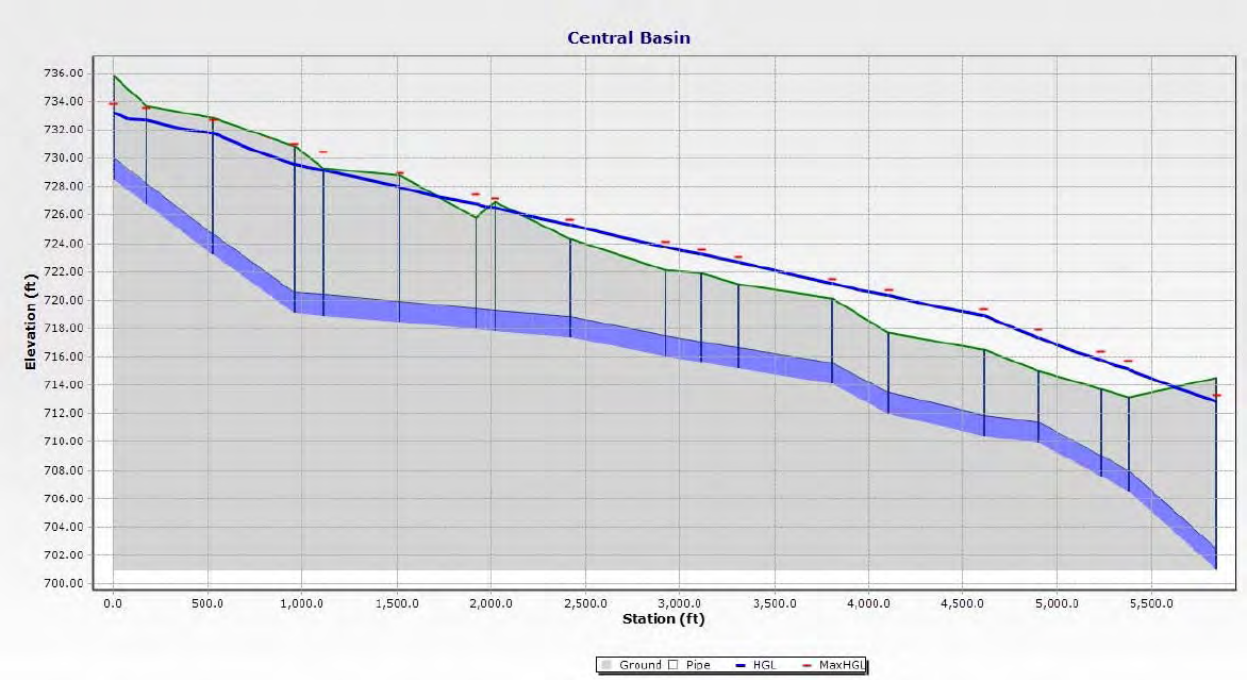

Fayetteville US from MH 561 to MH 547
Elevation (ft)
836.00
834.00
832.00
830.00
828.00
826.00
824.00
822.00
820.00
818.00
816.00
814.00
812.00
810.00
808.00
806.00
804.00
802.00
0.0
500.0
1,000.0
1,500.0
2,000.0
2,500.0
3,000.0
3,500.0
4,000.0
4,500.0
5,000.0
Station (ft)
Ground
Pipe
HGL
MaxHGL

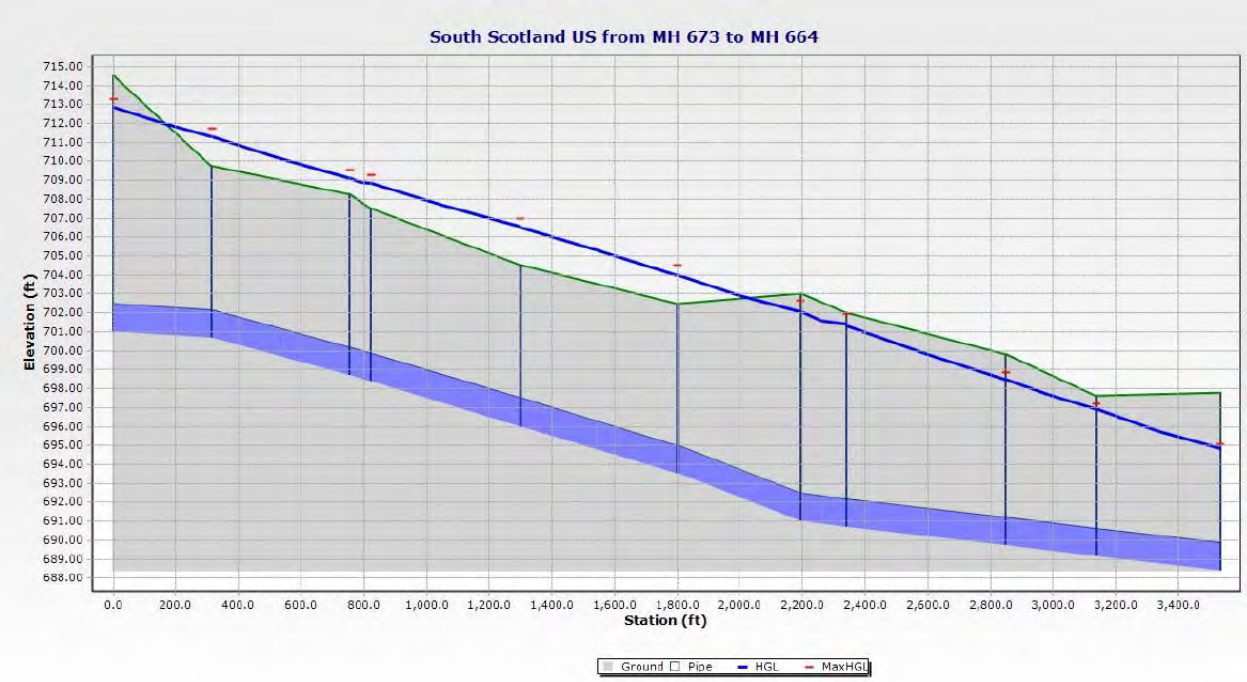

Fayetteville DS from MH 547 to MH 523
Elevation (ft)
808.00
806.00
804.00
802.00
800.00
798.00
796.00
794.00
792.00
790.00
788.00
786.00
784.00
782.00
780.00
778.00
776.00
774.00
772.00
770.00
768.00
766.00
764.00
762.00
760.00
758.00
0.0
500.0
1,000.0
1,500.0
2,000.0
2,500.0
3,000.0
3,500.0
4,000.0
4,500.0
5,000.0
5,500.0
6,000.0
6,500.0
7,000.0
7,500.0
Station (ft)
Ground
Pipe
HGL
MaxHGL


Oak Hill US from MH 523 to MH 515
Elevation (ft)
768.00
767.00
766.00
765.00
764.00
763.00
762.00
761.00
760.00
759.00
758.00
757.00
756.00
755.00
754.00
753.00
752.00
751.00
750.00
749.00
748.00
0.0
200.0
400.0
600.0
800.0
1,000.0
1,200.0
1,400.0
1,600.0
1,800.0
2,000.0
2,200.0
2,400.0
Station (ft)
Ground
Pipe
HGL
MaxHGL

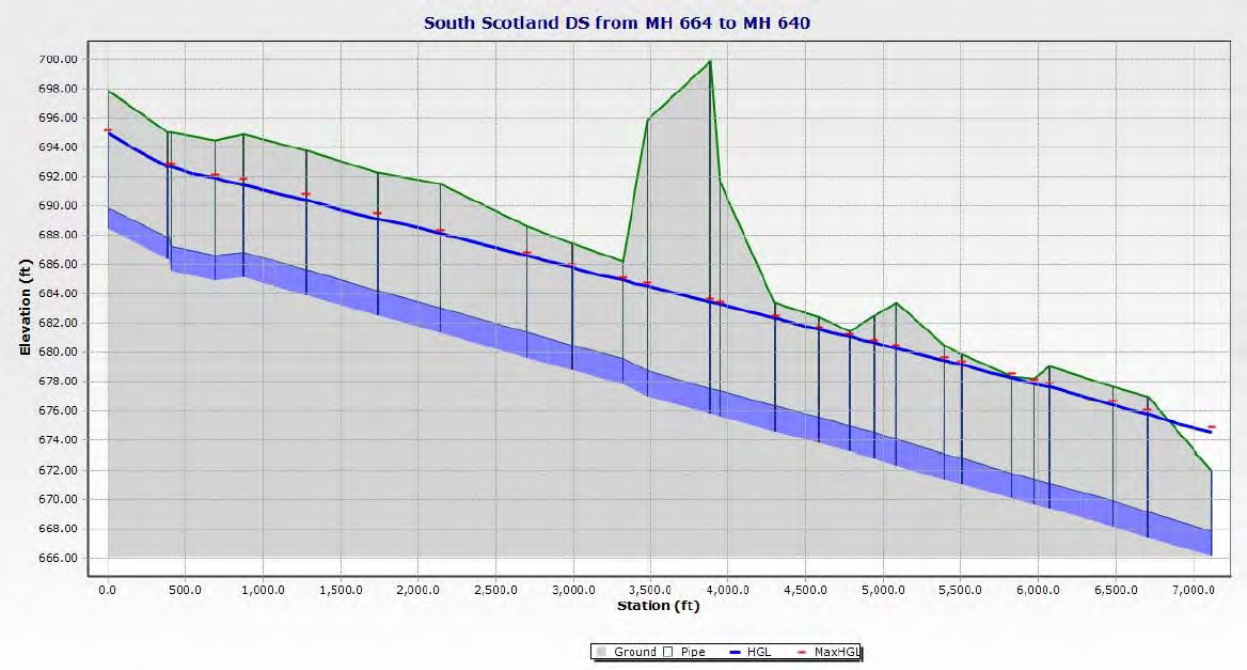

Oak Hill DS from MH 517 to MH 503
Elevation (ft)
759.00
758.00
757.00
756.00
755.00
754.00
753.00
752.00
751.00
750.00
749.00
748.00
747.00
746.00
745.00
744.00
743.00
742.00
741.00
740.00
739.00
738.00
737.00
736.00
735.00
734.00
733.00
732.00
731.00
730.00
729.00
728.00
0.0
500.0
1,000.0
1,500.0
2,000.0
2,500.0
3,000.0
3,500.0
4,000.0
Station (ft)
Ground
Pipe
HGL
MaxHGL

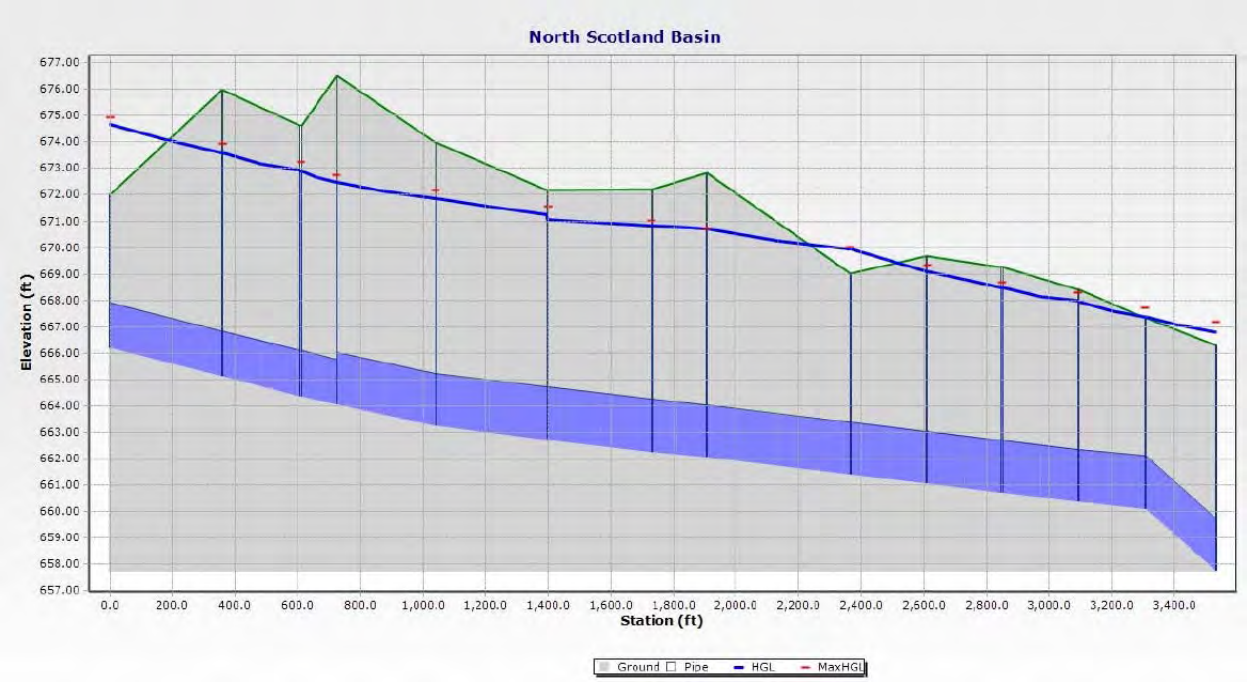
Appendix C


Central Basin
Elevation (ft)
736.00
734.00
732.00
730.00
728.00
726.00
724.00
722.00
720.00
718.00
716.00
714.00
712.00
710.00
708.00
706.00
704.00
702.00
700.00
0.0
500.0
1,000.0
1,500.0
2,000.0
2,500.0
3,000.0
3,500.0
4,000.0
4,500.0
5,000.0
5,500.0
Station (ft)
Ground
Pipe
HGL
MaxHGL

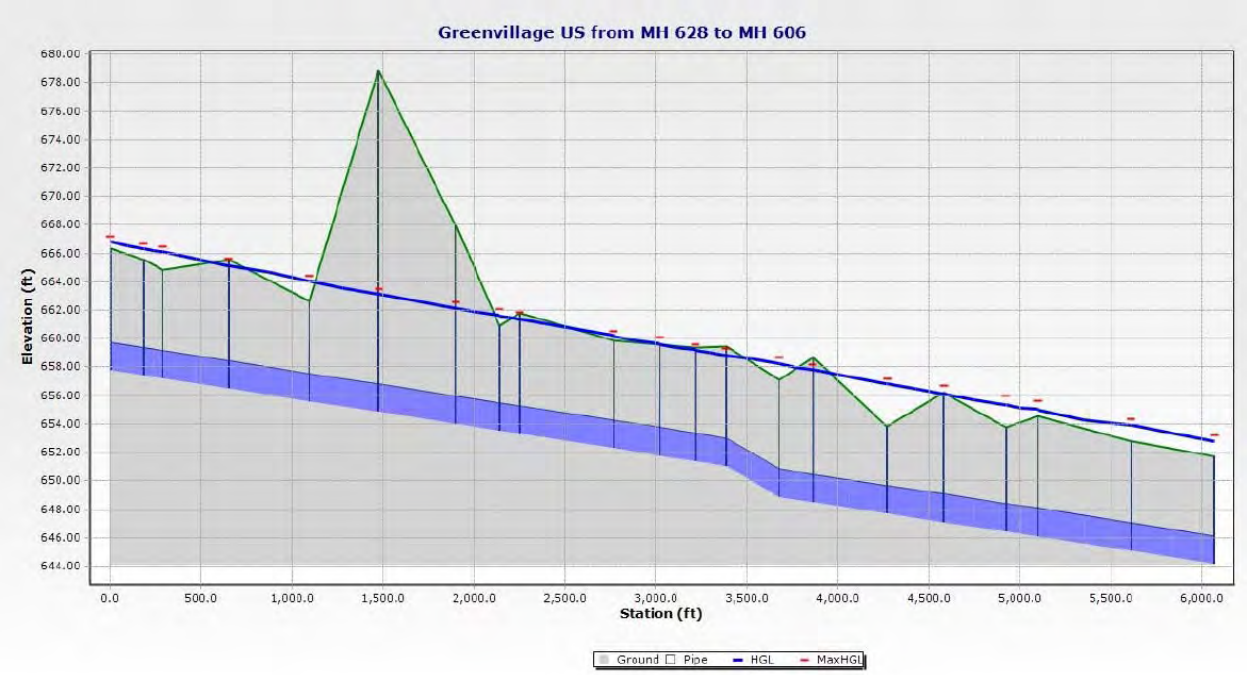

South Scotland US from MH 673 to MH 664
Elevation (ft)
715.00
714.00
713.00
712.00
711.00
710.00
709.00
708.00
707.00
706.00
705.00
704.00
703.00
702.00
701.00
700.00
699.00
698.00
697.00
696.00
695.00
694.00
693.00
692.00
691.00
690.00
689.00
688.00
0.0
200.0
400.0
600.0
800.0
1,000.0
1,200.0
1,400.0
1,600.0
1,800.0
2,000.0
2,200.0
2,400.0
2,600.0
2,800.0
3,000.0
3,200.0
3,400.0
Station (ft)
Ground
Pipe
HGL
MaxHGL

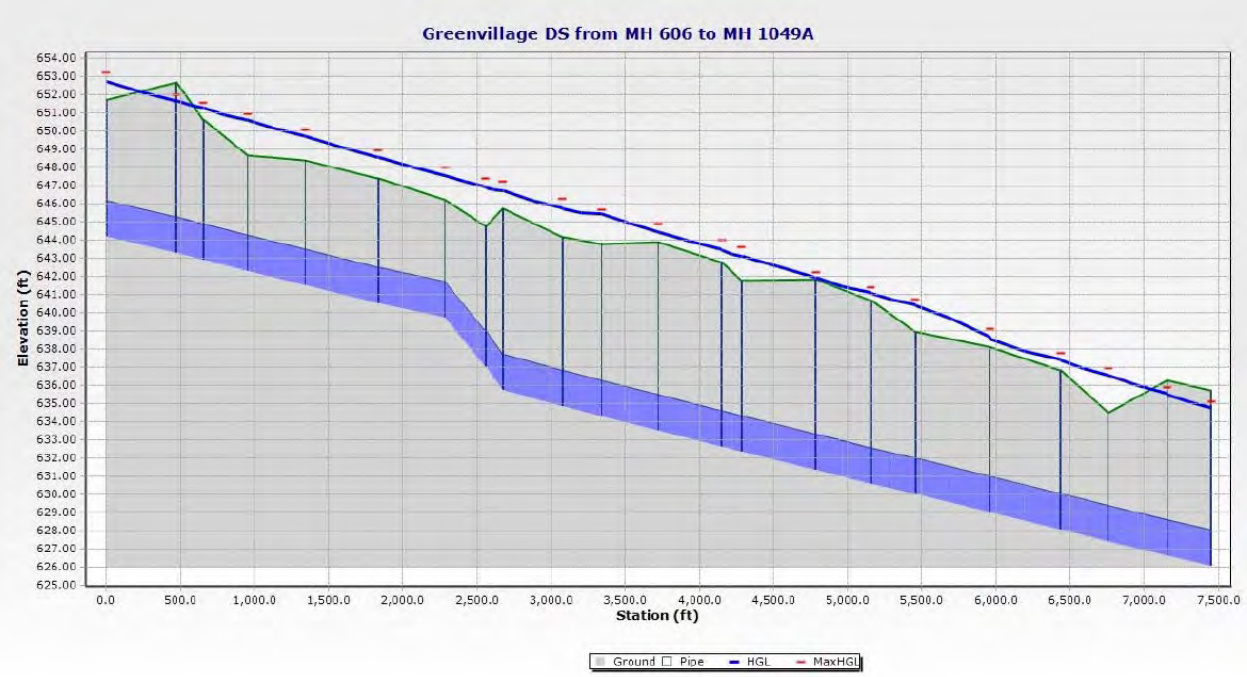
Appendix C


South Scotland DS from MH 664 to MH 640
Elevation (ft)
700.00
698.00
696.00
694.00
692.00
690.00
688.00
686.00
684.00
682.00
680.00
678.00
676.00
674.00
672.00
670.00
668.00
666.00
0.0
500.0
1,000.0
1,500.0
2,000.0
2,500.0
3,000.0
3,500.0
4,000.0
4,500.0
5,000.0
5,500.0
6,000.0
6,500.0
7,000.0
Station (ft)
Ground
Pipe
HGL
MaxHGL

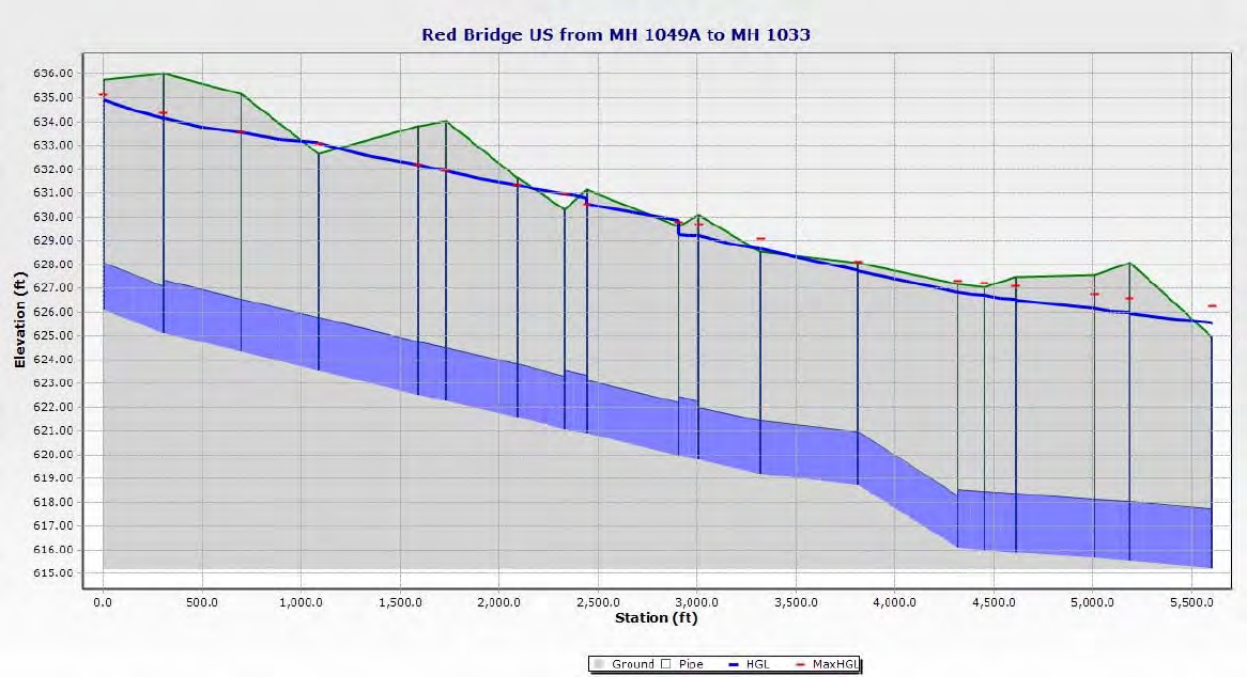

North Scotland Basin
Elevation (ft)
677.00
676.00
675.00
674.00
673.00
672.00
671.00
670.00
669.00
668.00
667.00
666.00
665.00
664.00
663.00
662.00
661.00
660.00
659.00
658.00
657.00
0.0
200.0
400.0
600.0
800.0
1,000.0
1,200.0
1,400.0
1,600.0
1,800.0
2,000.0
2,200.0
2,400.0
2,600.0
2,800.0
3,000.0
3,200.0
3,400.0
Station (ft)
Ground
Pipe
HGL
MaxHGL

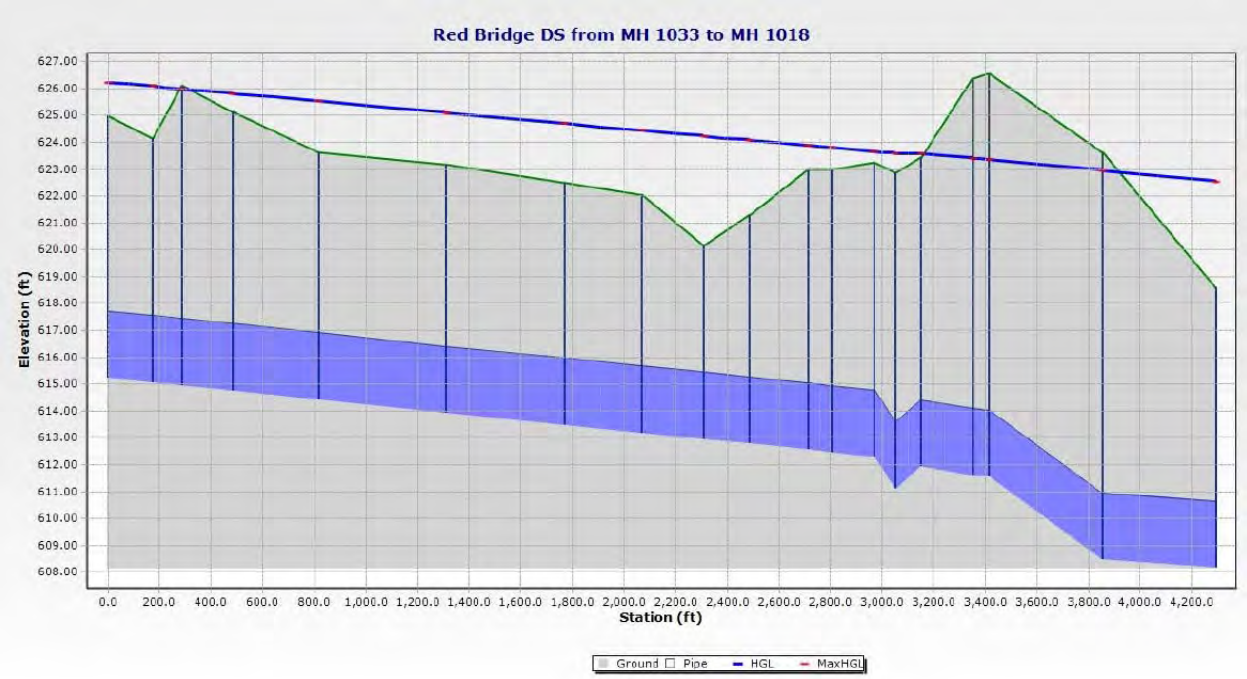
Appendix C


Greenvillage US from MH 628 to MH 606
Elevation (ft)
680.00
678.00
676.00
674.00
672.00
670.00
668.00
666.00
664.00
662.00
660.00
658.00
656.00
654.00
652.00
650.00
648.00
646.00
644.00
0.0
500.0
1,000.0
1,500.0
2,000.0
2,500.0
3,000.0
3,500.0
4,000.0
4,500.0
5,000.0
5,500.0
6,000.0
Station (ft)
Ground
Pipe
HGL
MaxHGL

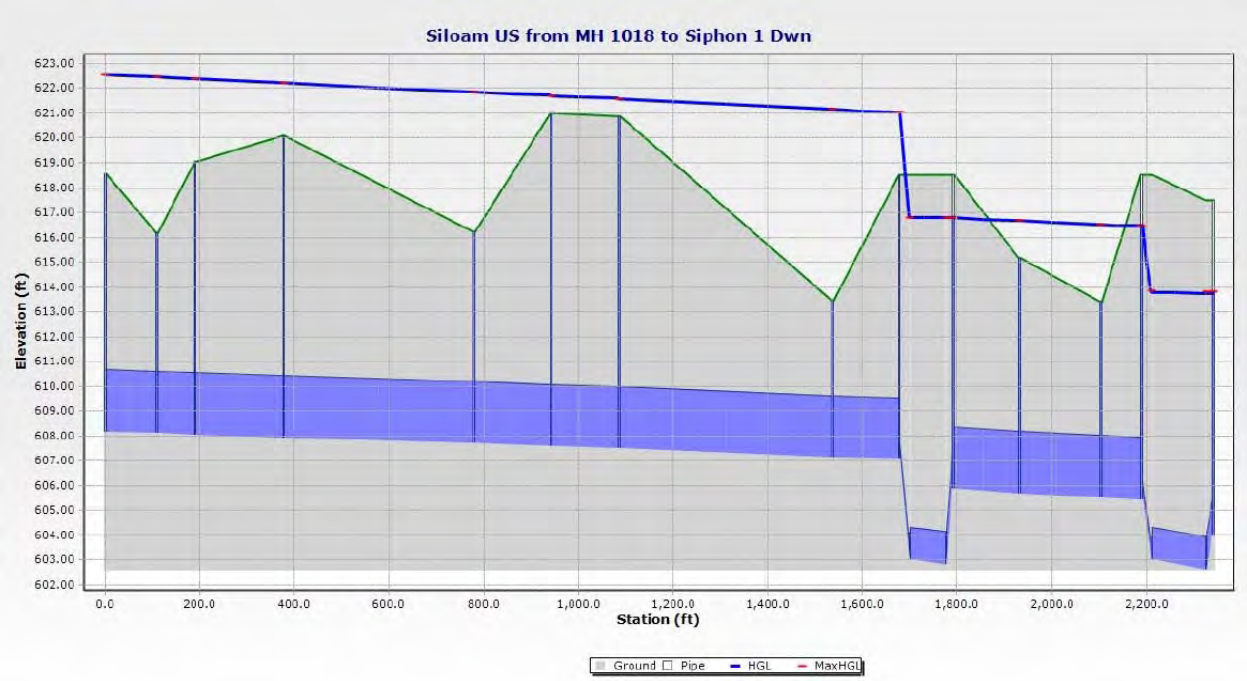

Greenvillage DS from MH 606 to MH 1049A
Elevation (ft)
654.00
653.00
652.00
651.00
650.00
649.00
648.00
647.00
646.00
645.00
644.00
643.00
642.00
641.00
640.00
639.00
638.00
637.00
636.00
635.00
634.00
633.00
632.00
631.00
630.00
629.00
628.00
627.00
626.00
625.00
0.0
500.0
1,000.0
1,500.0
2,000.0
2,500.0
3,000.0
3,500.0
4,000.0
4,500.0
5,000.0
5,500.0
6,000.0
6,500.0
7,000.0
7,500.0
Station (ft)
Ground
Pipe
HGL
MaxHGL

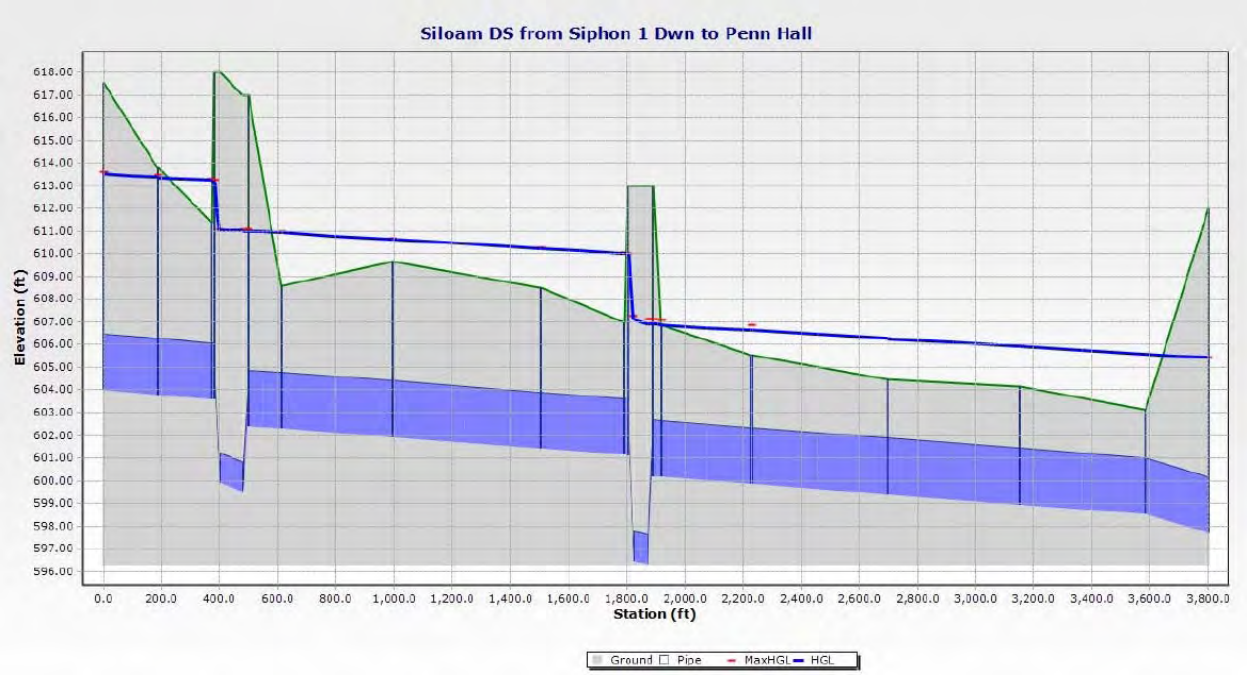
Appendix C


Red Bridge US from MH 1049A to MH 1033
Elevation (ft)
636.00
635.00
634.00
633.00
632.00
631.00
630.00
629.00
628.00
627.00
626.00
625.00
624.00
623.00
622.00
621.00
620.00
619.00
618.00
617.00
616.00
615.00
0.0
500.0
1,000.0
1,500.0
2,000.0
2,500.0
3,000.0
3,500.0
4,000.0
4,500.0
5,000.0
5,500.0
Station (ft)
Ground
Pipe
HGL
MaxHGL

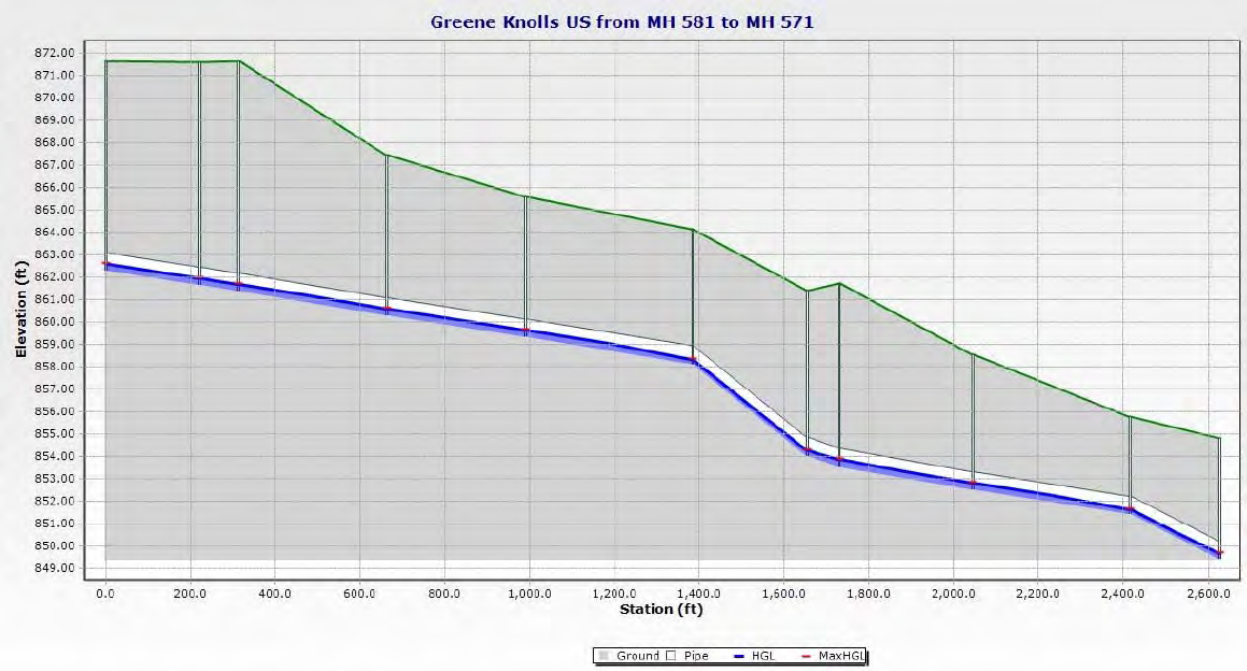

Red Bridge DS from MH 1033 to MH 1018
Elevation (ft)
627.00
626.00
625.00
624.00
623.00
622.00
621.00
620.00
619.00
618.00
617.00
616.00
615.00
614.00
613.00
612.00
611.00
610.00
609.00
608.00
0.0
200.0
400.0
600.0
800.0
1,000.0
1,200.0
1,400.0
1,600.0
1,800.0
2,000.0
2,200.0
2,400.0
2,600.0
2,800.0
3,000.0
3,200.0
3,400.0
3,600.0
3,800.0
4,000.0
4,200.0
Station (ft)
Ground
Pipe
HGL
MaxHGL

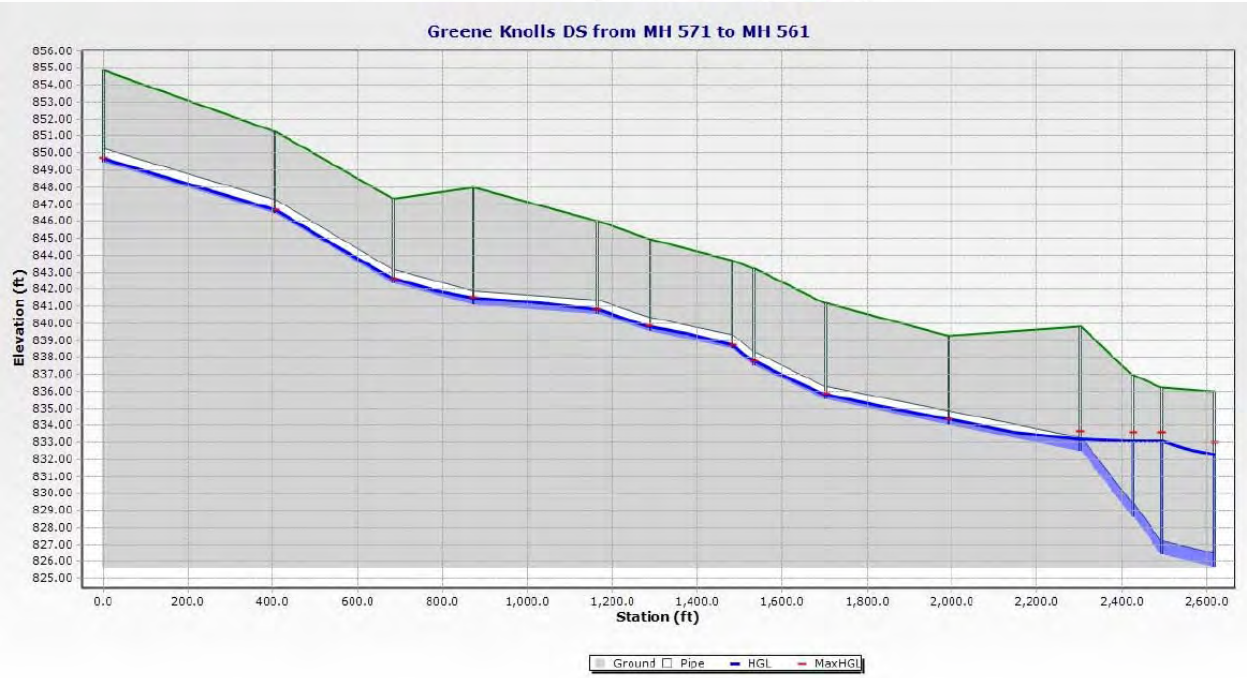
Appendix C


Siloam US from MH 1018 to Siphon 1 Dwn
Elevation (ft)
623.00
622.00
621.00
620.00
619.00
618.00
617.00
616.00
615.00
614.00
613.00
612.00
611.00
610.00
609.00
608.00
607.00
606.00
605.00
604.00
603.00
602.00
0.0
200.0
400.0
600.0
800.0
1,000.0
1,200.0
1,400.0
1,600.0
1,800.0
2,000.0
2,200.0
Station (ft)
Ground
Pipe
HGL
MaxHGL

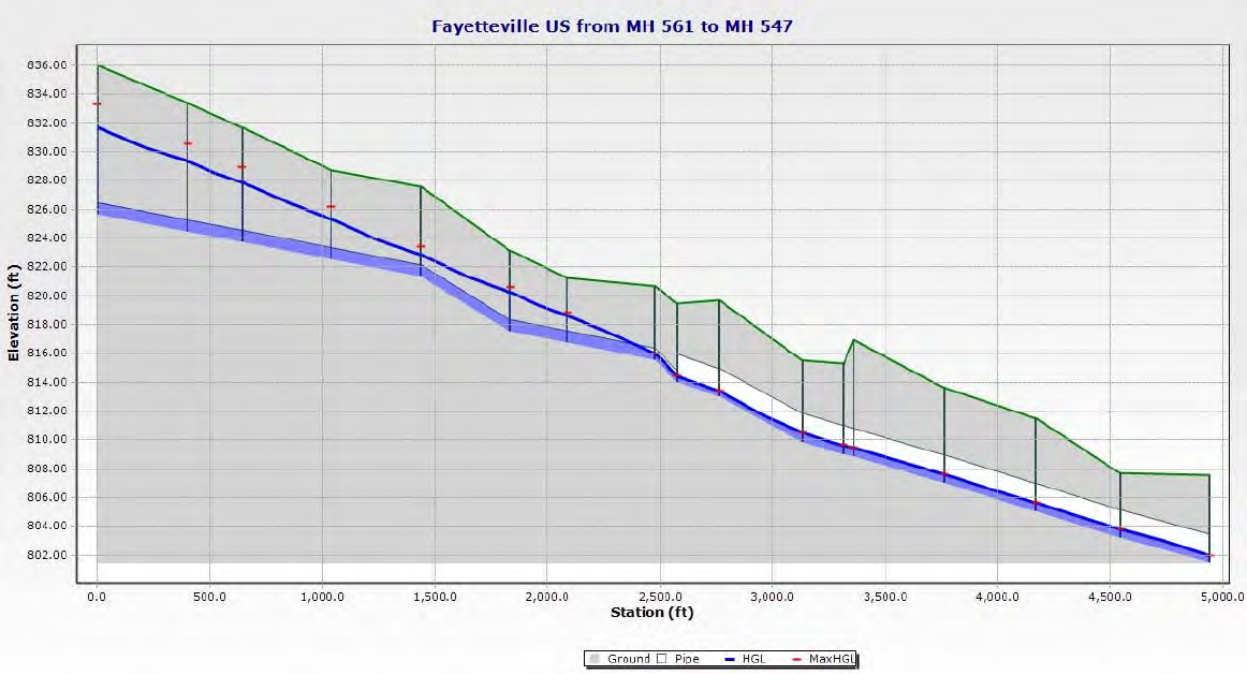

Siloam DS from Siphon 1 Dwn to Penn Hall
Elevation (ft)
618.00
617.00
616.00
615.00
614.00
613.00
612.00
611.00
610.00
609.00
608.00
607.00
606.00
605.00
604.00
603.00
602.00
601.00
600.00
599.00
598.00
597.00
596.00
0.0
200.0
400.0
600.0
800.0
1,000.0
1,200.0
1,400.0
1,600.0
1,800.0
2,000.0
2,200.0
2,400.0
2,600.0
2,800.0
3,000.0
3,200.0
3,400.0
3,600.0
3,800.0
Station (ft)
Ground
Pipe
MaxHGL
HGL

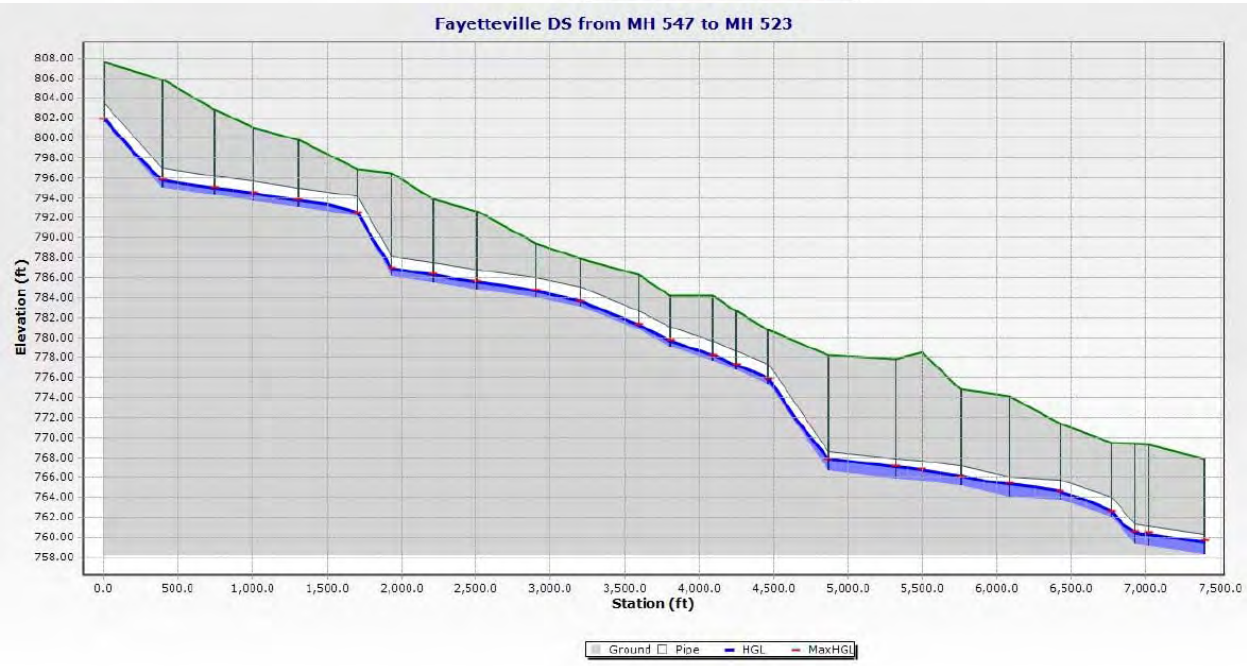
Appendix D
Modeled Sewer Profiles for November 22 Storm After Completion of Phase I Improvements


Greene Knolls US from MH 581 to MH 571
Elevation (ft)
872.00
871.00
870.00
869.00
868.00
867.00
866.00
865.00
864.00
863.00
862.00
861.00
860.00
859.00
858.00
857.00
856.00
855.00
854.00
853.00
852.00
851.00
850.00
849.00
0.0
200.0
400.0
600.0
800.0
1,000.0
1,200.0
1,400.0
1,600.0
1,800.0
2,000.0
2,200.0
2,400.0
2,600.0
Station (ft)
Ground
Pipe
HGL
MaxHGL

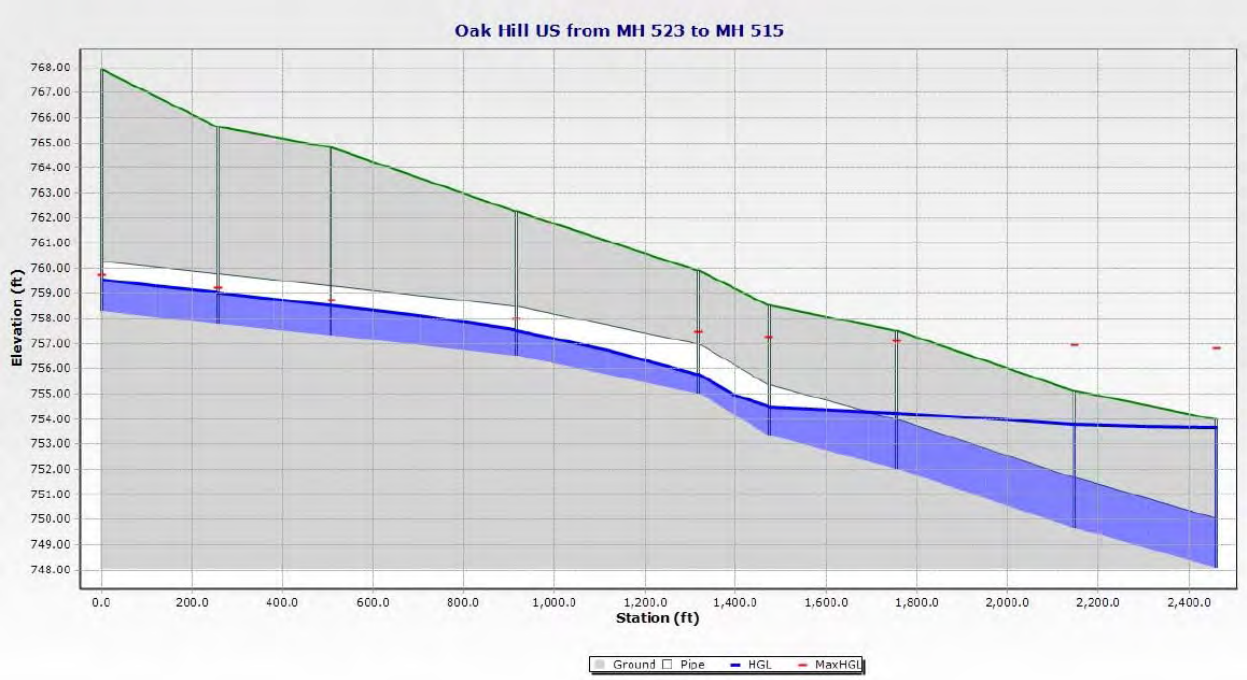

Greene Knolls DS from MH 571 to MH 561
Elevation (ft)
856.00
855.00
854.00
853.00
852.00
851.00
850.00
849.00
848.00
847.00
846.00
845.00
844.00
843.00
842.00
841.00
840.00
839.00
838.00
837.00
836.00
835.00
834.00
833.00
832.00
831.00
830.00
829.00
828.00
827.00
826.00
825.00
0.0
200.0
400.0
600.0
800.0
1,000.0
1,200.0
1,400.0
1,600.0
1,800.0
2,000.0
2,200.0
2,400.0
2,600.0
Station (ft)
Ground
Pipe
HGL
MaxHGL

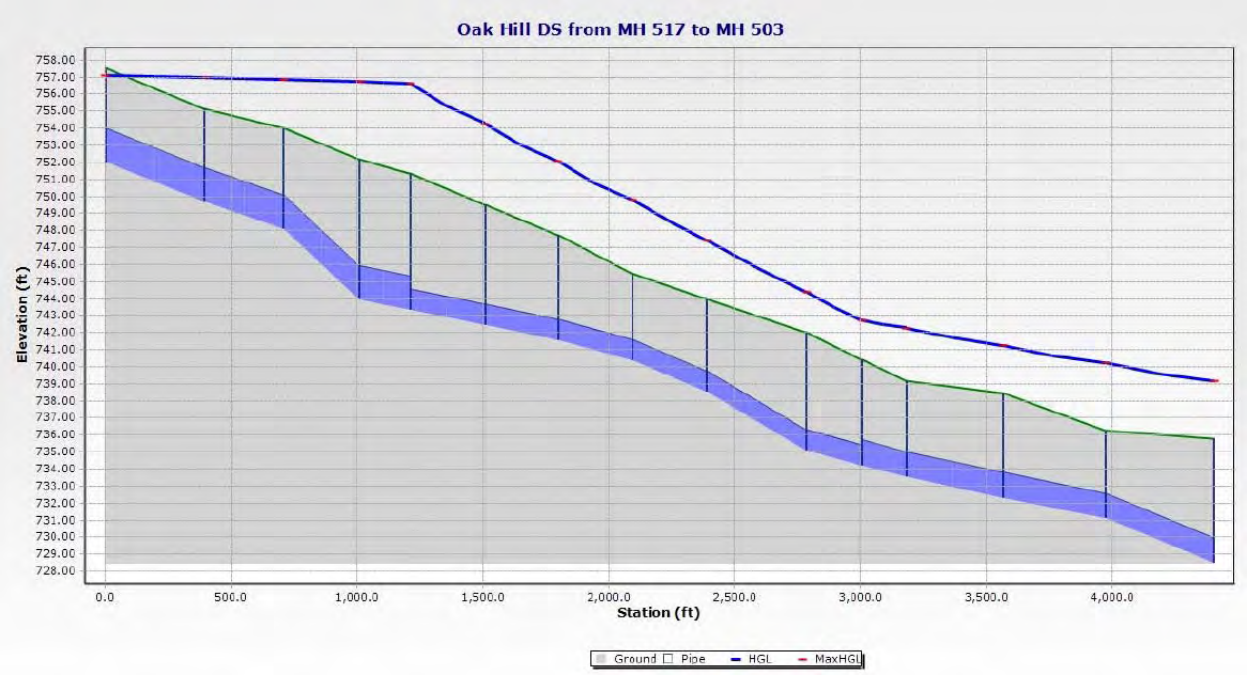
Appendix D


Fayetteville US from MH 561 to MH 547
Elevation (ft)
836.00
834.00
832.00
830.00
828.00
826.00
824.00
822.00
820.00
818.00
816.00
814.00
812.00
810.00
808.00
806.00
804.00
802.00
0.0
500.0
1,000.0
1,500.0
2,000.0
2,500.0
3,000.0
3,500.0
4,000.0
4,500.0
5,000.0
Station (ft)
Ground
Pipe
HGL
MaxHGL

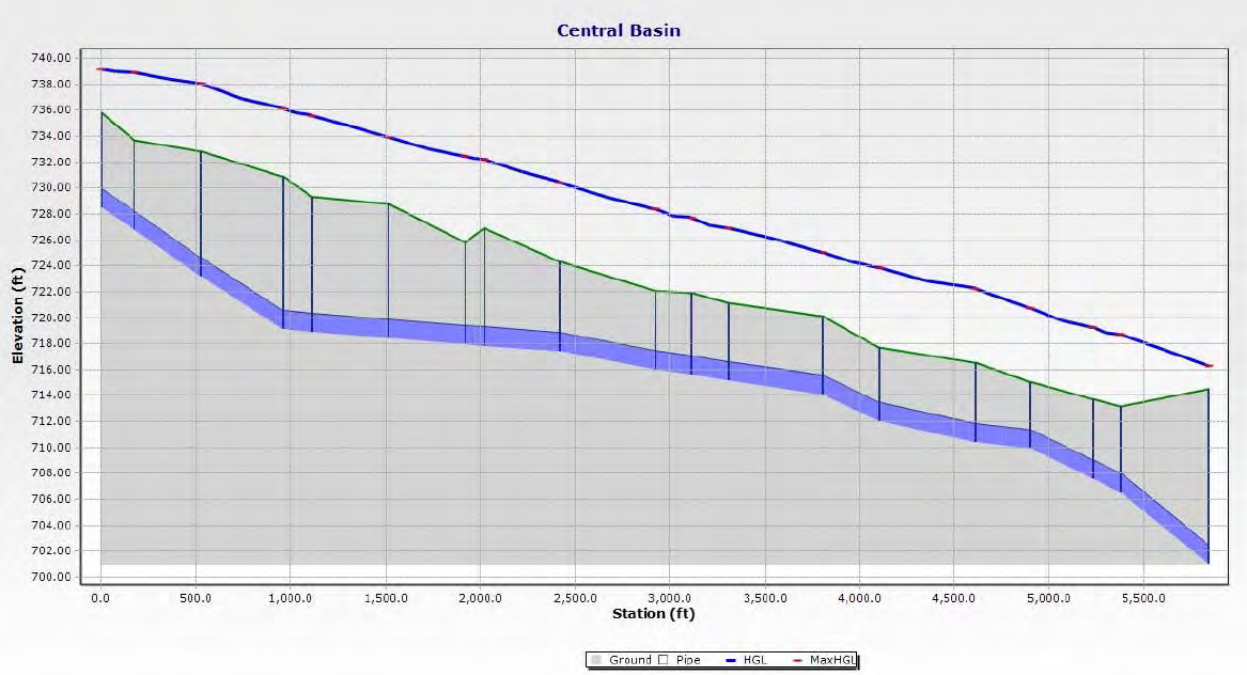

Fayetteville DS from MH 547 to MH 523
Elevation (ft)
808.00
806.00
804.00
802.00
800.00
798.00
796.00
794.00
792.00
790.00
788.00
786.00
784.00
782.00
780.00
778.00
776.00
774.00
772.00
770.00
768.00
766.00
764.00
762.00
760.00
758.00
0.0
500.0
1,000.0
1,500.0
2,000.0
2,500.0
3,000.0
3,500.0
4,000.0
4,500.0
5,000.0
5,500.0
6,000.0
6,500.0
7,000.0
7,500.0
Station (ft)
Ground
Pipe
HGL
MaxHGL

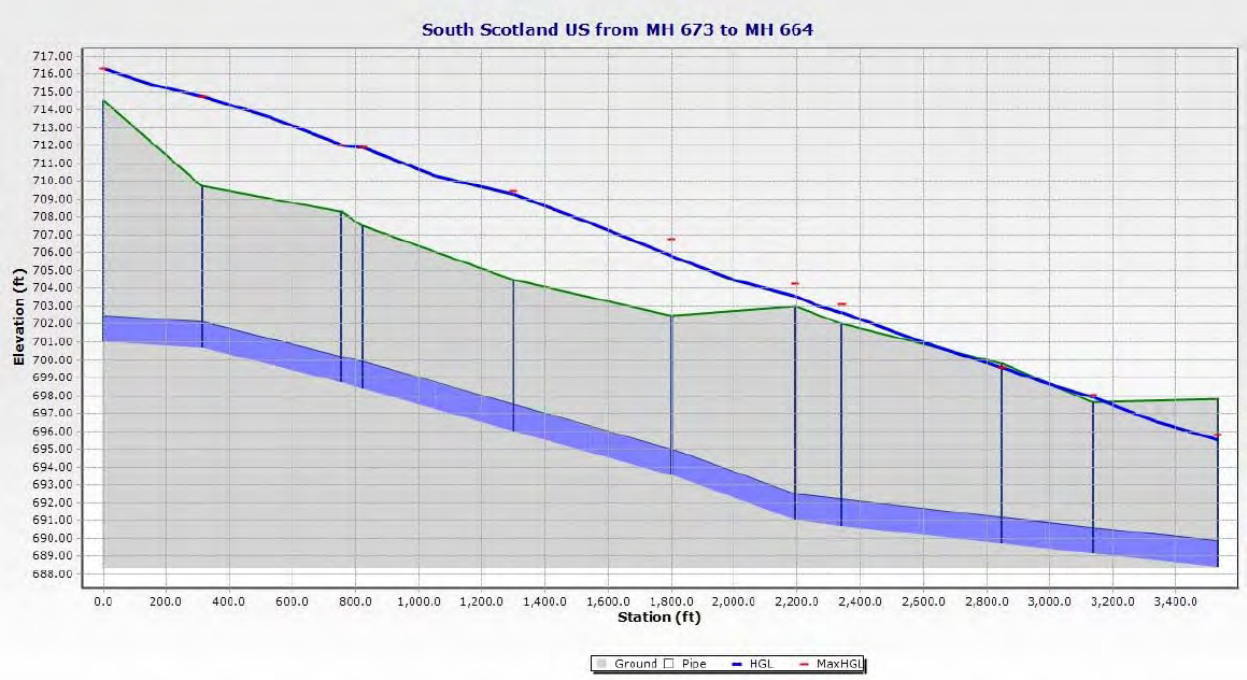
Appendix D

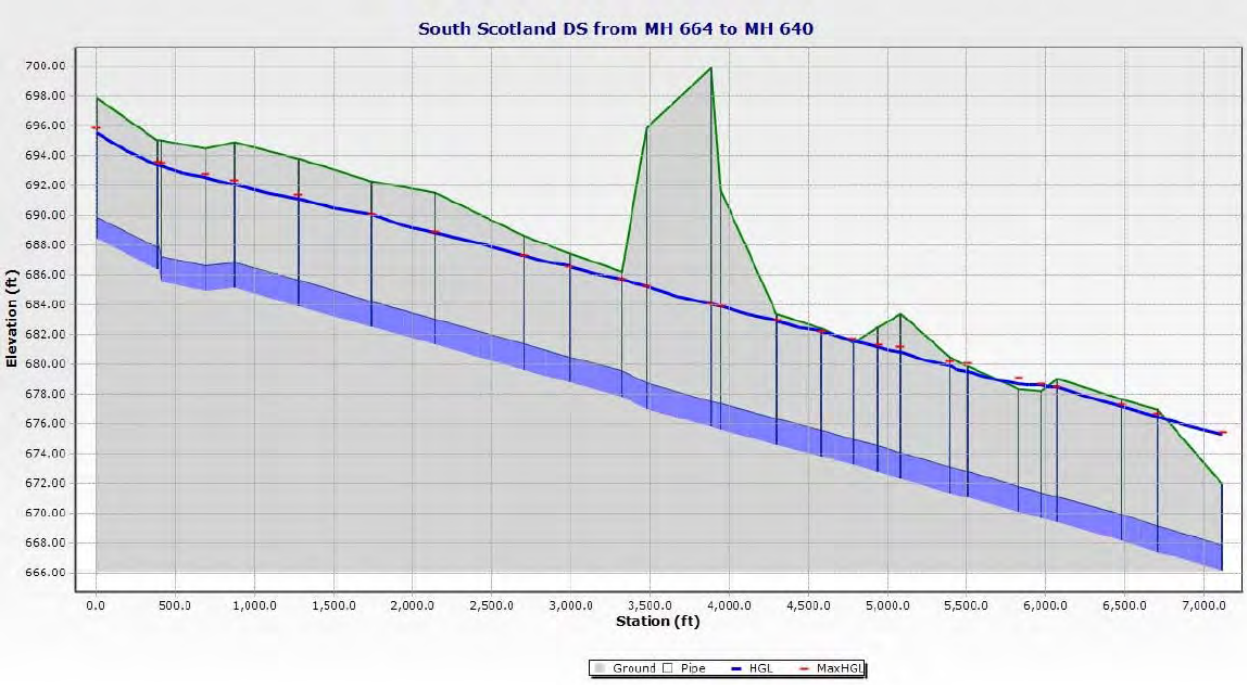

Oak Hill US from MH 523 to MH 515
Elevation (ft)
768.00
767.00
766.00
765.00
764.00
763.00
762.00
761.00
760.00
759.00
758.00
757.00
756.00
755.00
754.00
753.00
752.00
751.00
750.00
749.00
748.00
0.0
200.0
400.0
600.0
800.0
1,000.0
1,200.0
1,400.0
1,600.0
1,800.0
2,000.0
2,200.0
2,400.0
Station (ft)
Ground
Pipe
HGL
MaxHGL

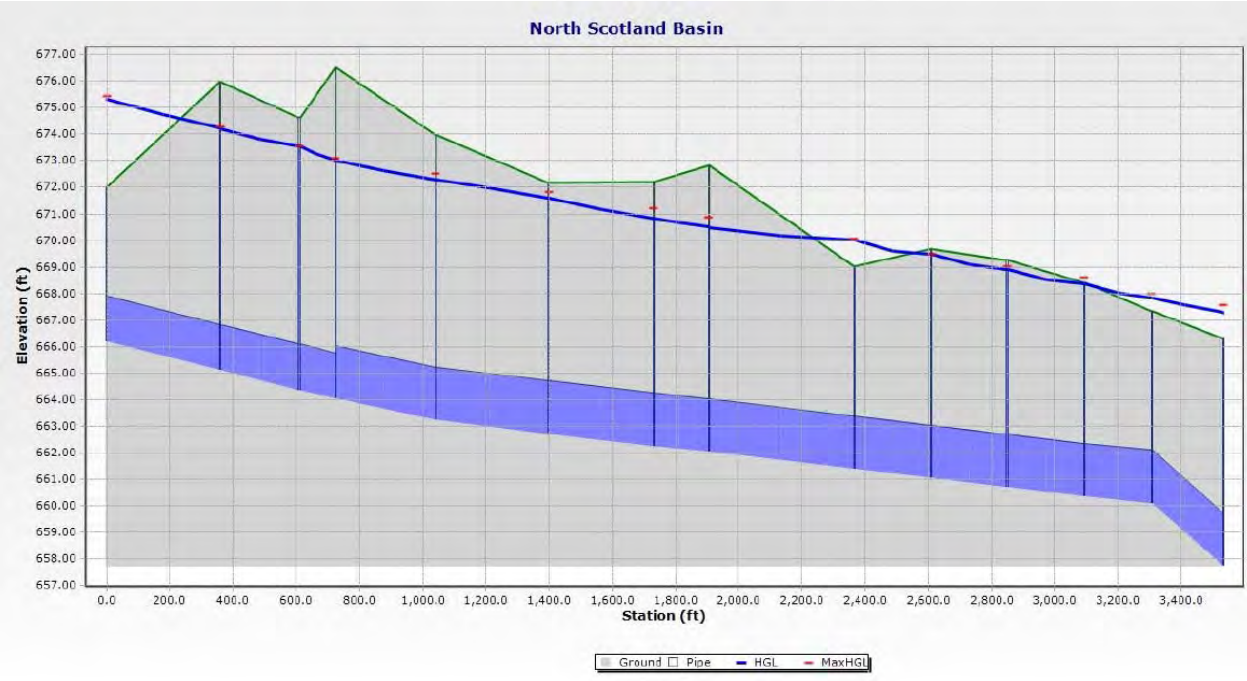

Oak Hill DS from MH 517 to MH 503
Elevation (ft)
758.00
757.00
756.00
755.00
754.00
753.00
752.00
751.00
750.00
749.00
748.00
747.00
746.00
745.00
744.00
743.00
742.00
741.00
740.00
739.00
738.00
737.00
736.00
735.00
734.00
733.00
732.00
731.00
730.00
729.00
728.00
0.0
500.0
1,000.0
1,500.0
2,000.0
2,500.0
3,000.0
3,500.0
4,000.0
Station (ft)
Ground
Pipe
HGL
MaxHGL

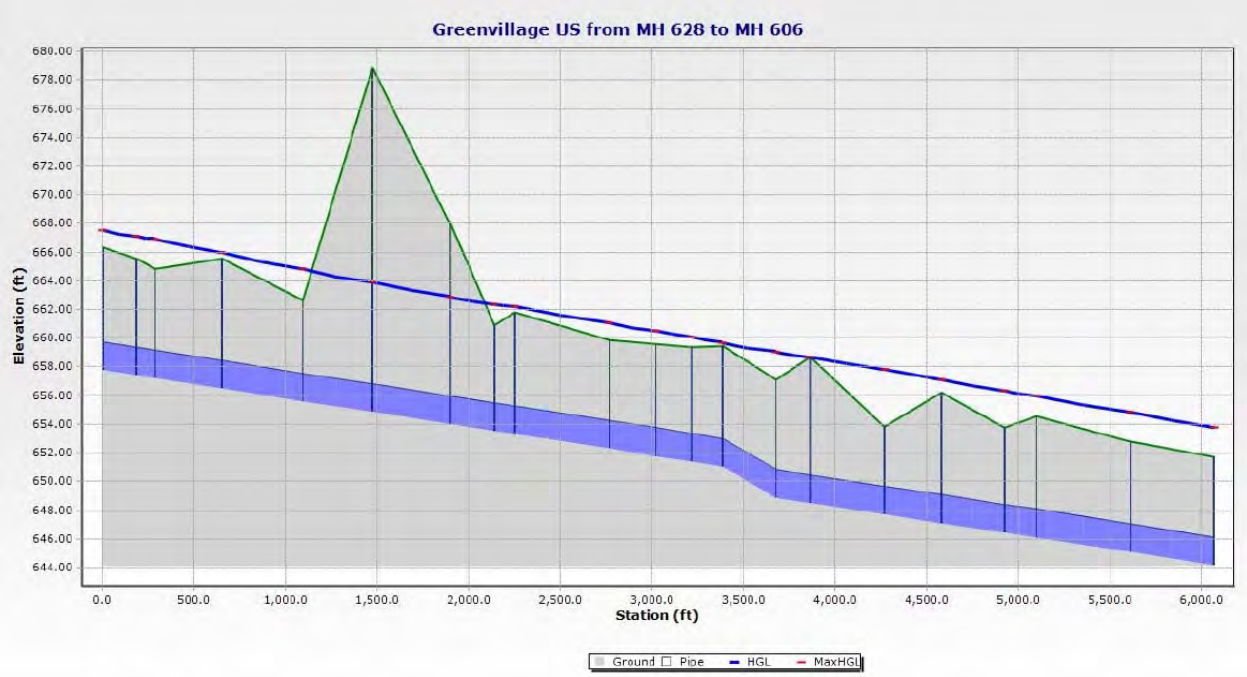
Appendix D

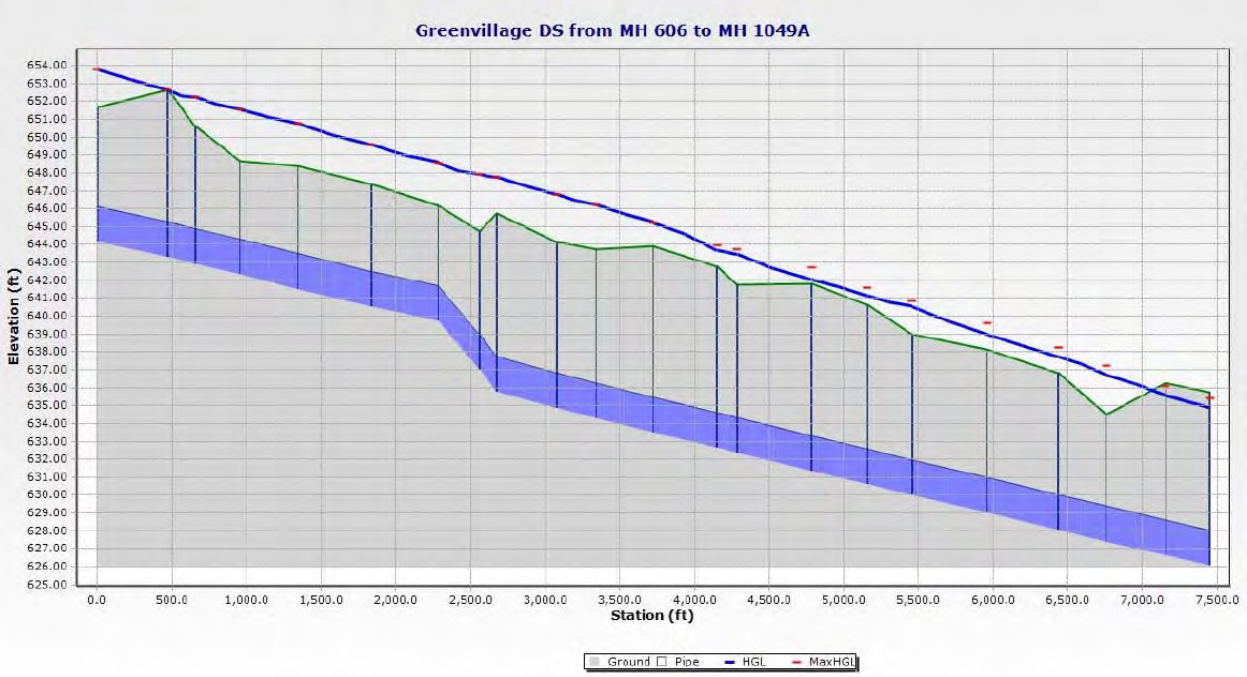

Central Basin
Elevation (ft)
740.00
738.00
736.00
734.00
732.00
730.00
728.00
726.00
724.00
722.00
720.00
718.00
716.00
714.00
712.00
710.00
708.00
706.00
704.00
702.00
700.00
0.0
500.0
1,000.0
1,500.0
2,000.0
2,500.0
3,000.0
3,500.0
4,000.0
4,500.0
5,000.0
5,500.0
Station (ft)
Ground
Pipe
HGL
MaxHGL

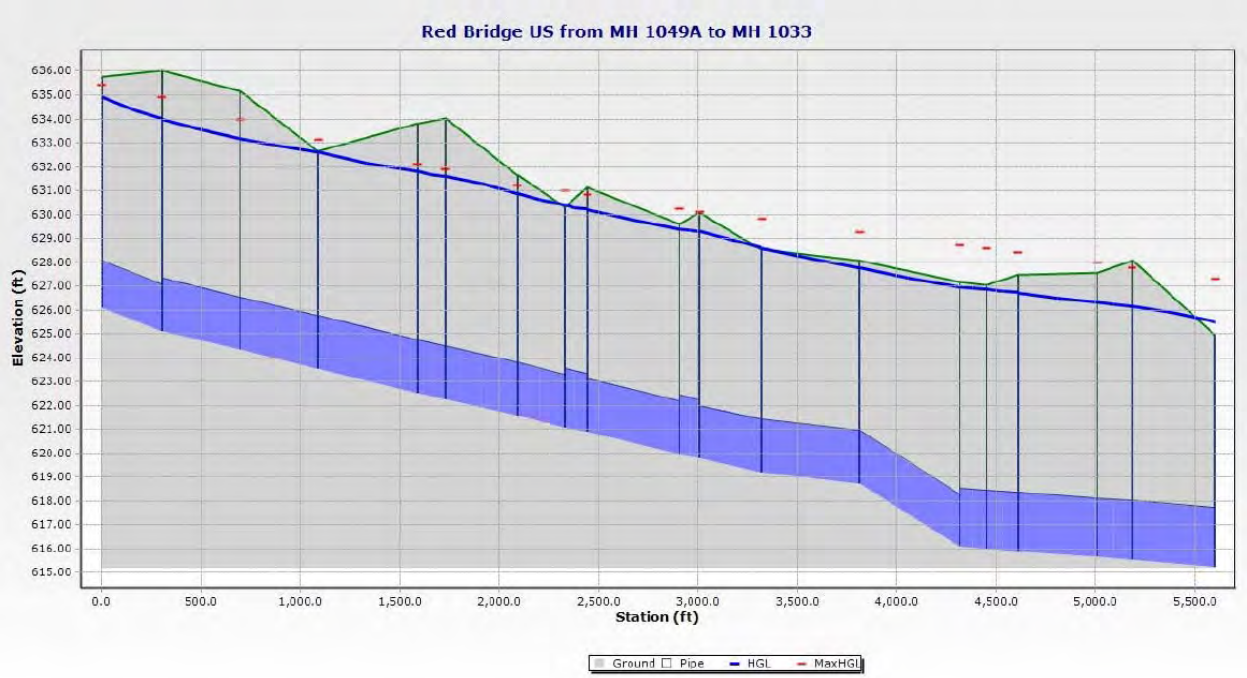

South Scotland US from MH 673 to MH 664
Elevation (ft)
717.00
716.00
715.00
714.00
713.00
712.00
711.00
710.00
709.00
708.00
707.00
706.00
705.00
704.00
703.00
702.00
701.00
700.00
699.00
698.00
697.00
696.00
695.00
694.00
693.00
692.00
691.00
690.00
689.00
688.00
0.0
200.0
400.0
600.0
800.0
1,000.0
1,200.0
1,400.0
1,600.0
1,800.0
2,000.0
2,200.0
2,400.0
2,600.0
2,800.0
3,000.0
3,200.0
3,400.0
Station (ft)
Ground
Pipe
HGL
MaxHGL

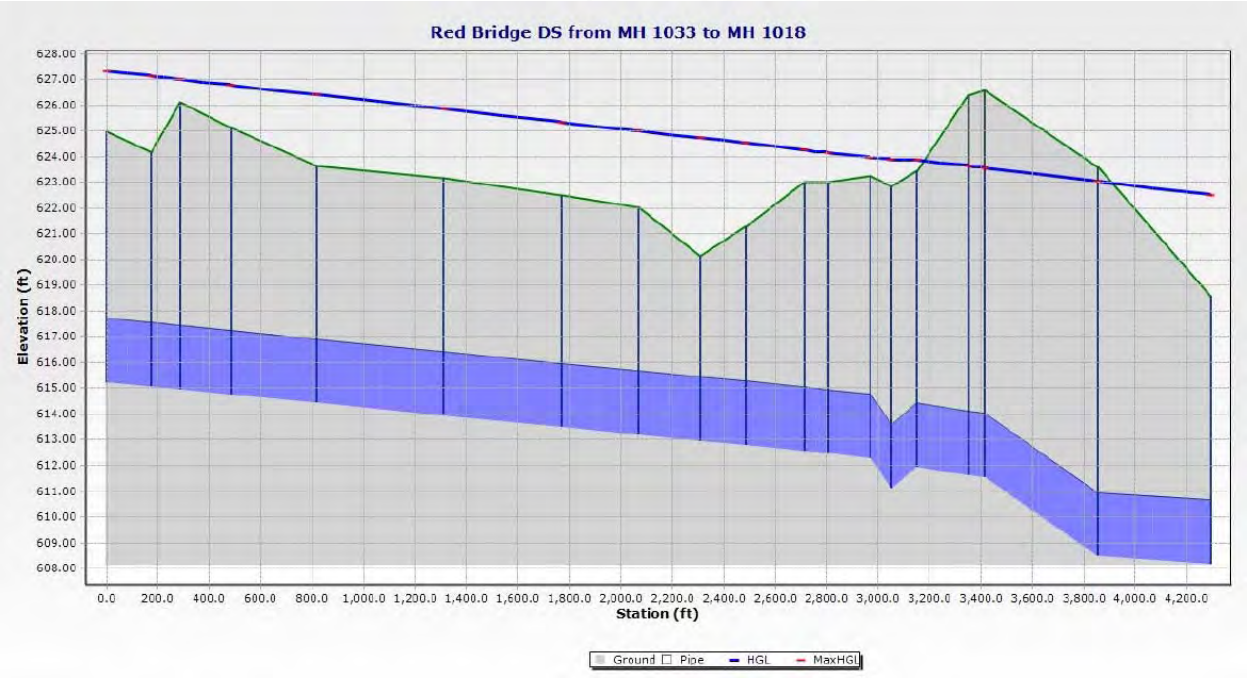

South Scotland DS from MH 664 to MH 640
Elevation (ft)
700.00
698.00
696.00
694.00
692.00
690.00
688.00
686.00
684.00
682.00
680.00
678.00
676.00
674.00
672.00
670.00
668.00
666.00
0.0
500.0
1,000.0
1,500.0
2,000.0
2,500.0
3,000.0
3,500.0
4,000.0
4,500.0
5,000.0
5,500.0
6,000.0
6,500.0
7,000.0
Station (ft)
Ground
Pipe
HGL
MaxHGL


North Scotland Basin
Elevation (ft)
677.00
676.00
675.00
674.00
673.00
672.00
671.00
670.00
669.00
668.00
667.00
666.00
665.00
664.00
663.00
662.00
661.00
660.00
659.00
658.00
657.00
0.0
200.0
400.0
600.0
800.0
1,000.0
1,200.0
1,400.0
1,600.0
1,800.0
2,000.0
2,200.0
2,400.0
2,600.0
2,800.0
3,000.0
3,200.0
3,400.0
Station (ft)
Ground
Pipe
HGL
MaxHGL

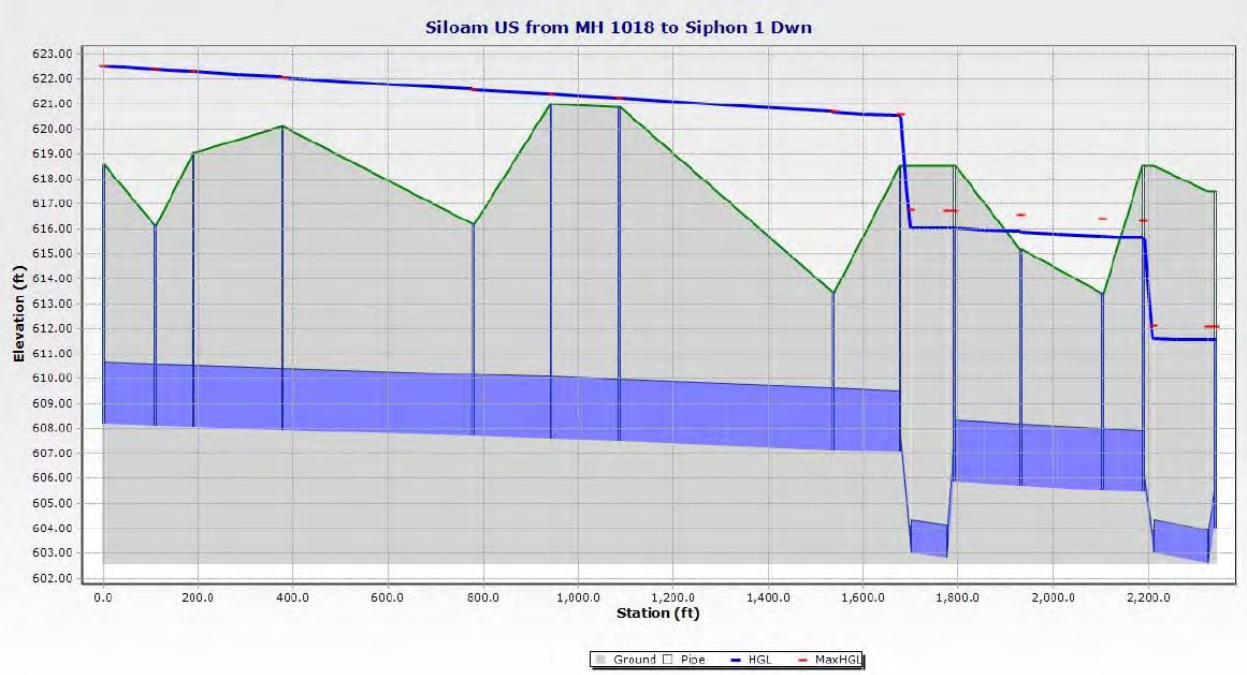

Greenvillage US from MH 628 to MH 606
Elevation (ft)
680.00
678.00
676.00
674.00
672.00
670.00
668.00
666.00
664.00
662.00
660.00
658.00
656.00
654.00
652.00
650.00
648.00
646.00
644.00
0.0
500.0
1,000.0
1,500.0
2,000.0
2,500.0
3,000.0
3,500.0
4,000.0
4,500.0
5,000.0
5,500.0
6,000.0
Station (ft)
Ground
Pipe
HGL
MaxHGL

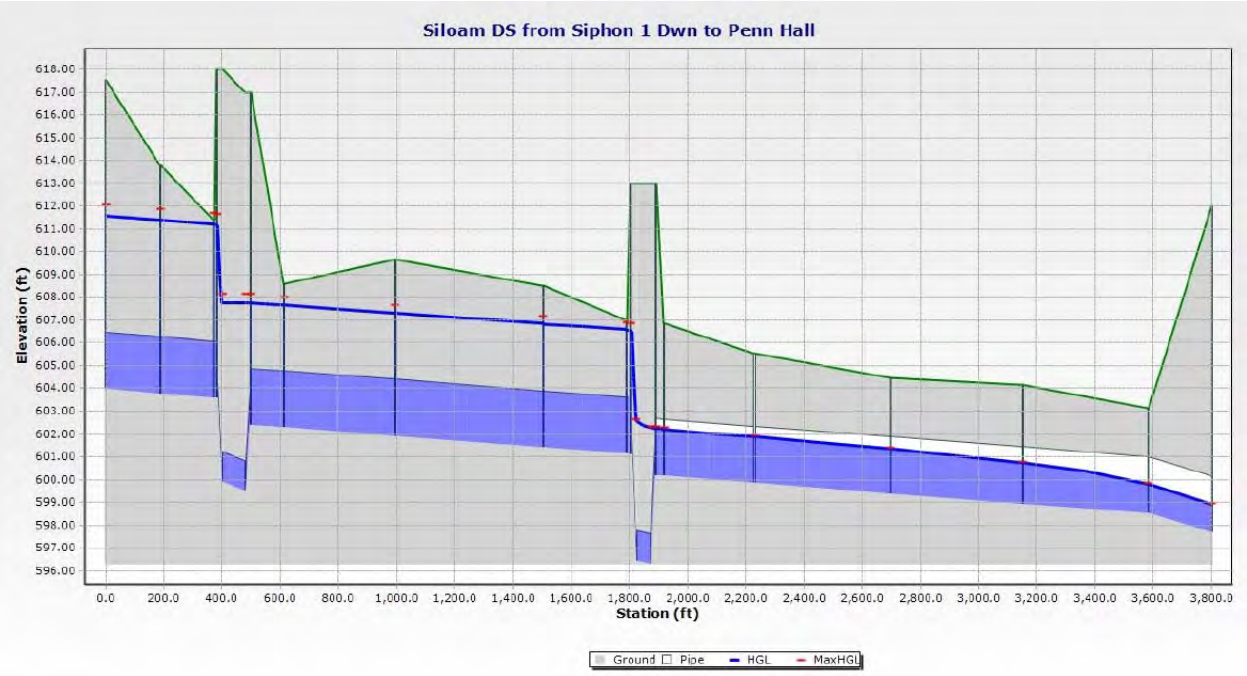

Greenvillage DS from MH 606 to MH 1049A
Elevation (ft)
654.00
653.00
652.00
651.00
650.00
649.00
648.00
647.00
646.00
645.00
644.00
643.00
642.00
641.00
640.00
639.00
638.00
637.00
636.00
635.00
634.00
633.00
632.00
631.00
630.00
629.00
628.00
627.00
626.00
625.00
0.0
500.0
1,000.0
1,500.0
2,000.0
2,500.0
3,000.0
3,500.0
4,000.0
4,500.0
5,000.0
5,500.0
6,000.0
6,500.0
7,000.0
7,500.0
Station (ft)
Ground
Pipe
HGL
MaxHGL


Red Bridge US from MH 1049A to MH 1033
Elevation (ft)
636.00
635.00
634.00
633.00
632.00
631.00
630.00
629.00
628.00
627.00
626.00
625.00
624.00
623.00
622.00
621.00
620.00
619.00
618.00
617.00
616.00
615.00
0.0
500.0
1,000.0
1,500.0
2,000.0
2,500.0
3,000.0
3,500.0
4,000.0
4,500.0
5,000.0
5,500.0
Station (ft)
Ground
Pipe
HGL
MaxHGL


Red Bridge DS from MH 1033 to MH 1018
Elevation (ft)
628.00
627.00
626.00
625.00
624.00
623.00
622.00
621.00
620.00
619.00
618.00
617.00
616.00
615.00
614.00
613.00
612.00
611.00
610.00
609.00
608.00
0.0
200.0
400.0
600.0
800.0
1,000.0
1,200.0
1,400.0
1,600.0
1,800.0
2,000.0
2,200.0
2,400.0
2,600.0
2,800.0
3,000.0
3,200.0
3,400.0
3,600.0
3,800.0
4,000.0
4,200.0
Station (ft)
Ground
Pipe
HGL
MaxHGL

Appendix D


Siloam US from MH 1018 to Siphon 1 Dwn
Elevation (ft)
623.00
622.00
621.00
620.00
619.00
618.00
617.00
616.00
615.00
614.00
613.00
612.00
611.00
610.00
609.00
608.00
607.00
606.00
605.00
604.00
603.00
602.00
0.0
200.0
400.0
600.0
800.0
1,000.0
1,200.0
1,400.0
1,600.0
1,800.0
2,000.0
2,200.0
Station (ft)
Ground
Pipe
HGL
MaxHGL


Siloam DS from Siphon 1 Dwn to Penn Hall
Elevation (ft)
618.00
617.00
616.00
615.00
614.00
613.00
612.00
611.00
610.00
609.00
608.00
607.00
606.00
605.00
604.00
603.00
602.00
601.00
600.00
599.00
598.00
597.00
596.00
0.0
200.0
400.0
600.0
800.0
1,000.0
1,200.0
1,400.0
1,600.0
1,800.0
2,000.0
2,200.0
2,400.0
2,600.0
2,800.0
3,000.0
3,200.0
3,400.0
3,600.0
3,800.0
Station (ft)
Ground
Pipe
HGL
MaxHGL



*Excellence Delivered **As Promised***

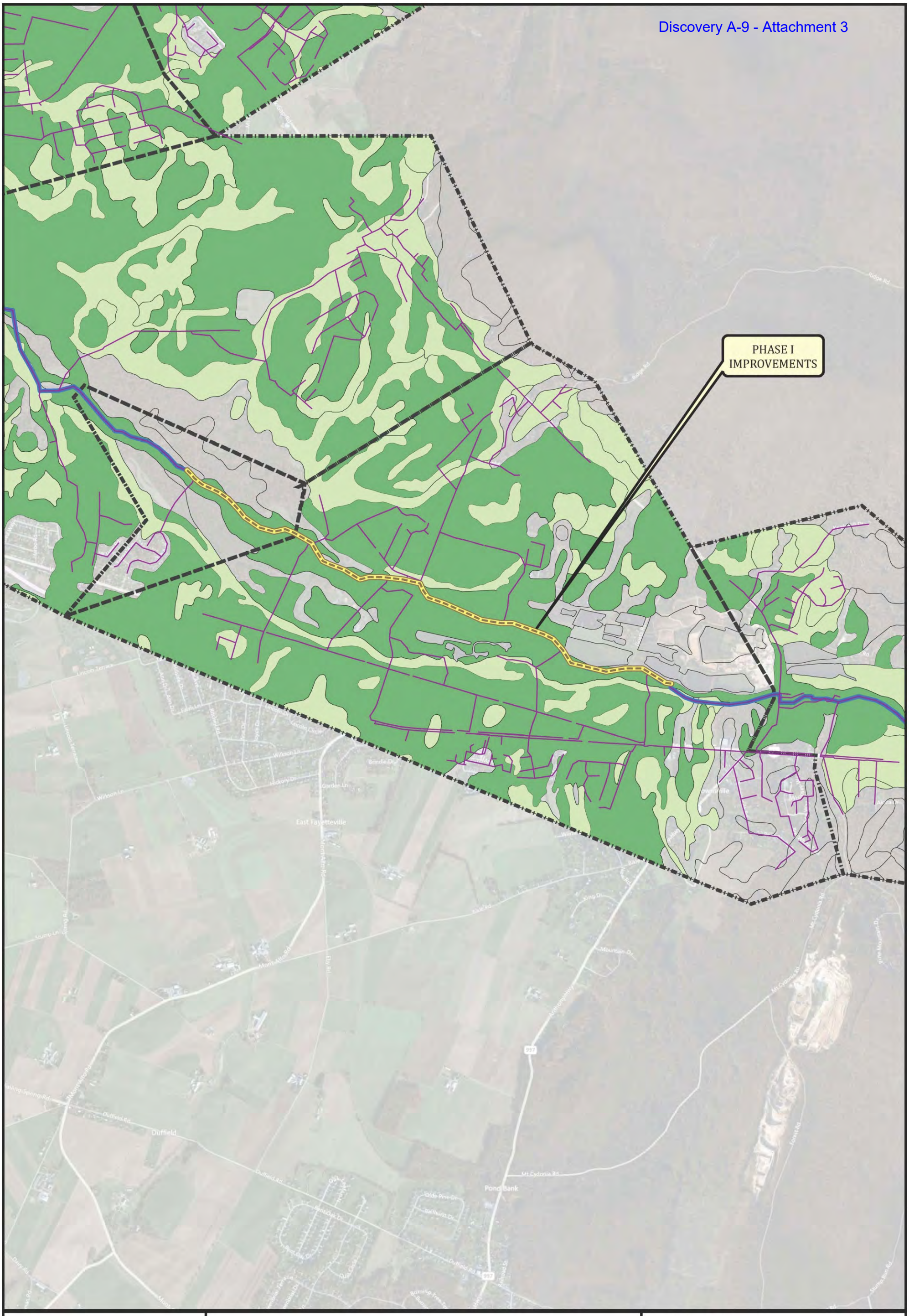
Appendix B

Exhibits

Gannett Fleming

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Discovery A-9 - Attachment 3



Discovery A-9 - Attachment 3

PHASE I
IMPROVEMENTS

Legend

- BASIN BOUNDARY
- WETLAND
- IMPROVEMENT
- INTERCEPTOR
- SEWER

WETLANDS

PHASE I - INTERCEPTOR IMPROVEMENT

N
W E
S

EXHIBIT 2
MARCH 2013

2,000 1,000 0 2,000
Feet

1 Inch = 2,000 Feet

GREENE TOWNSHIP MUNICIPAL AUTHORITY

Gannett Fleming

Appendix C

Gannett Fleming

*Excellence Delivered **As Promised***

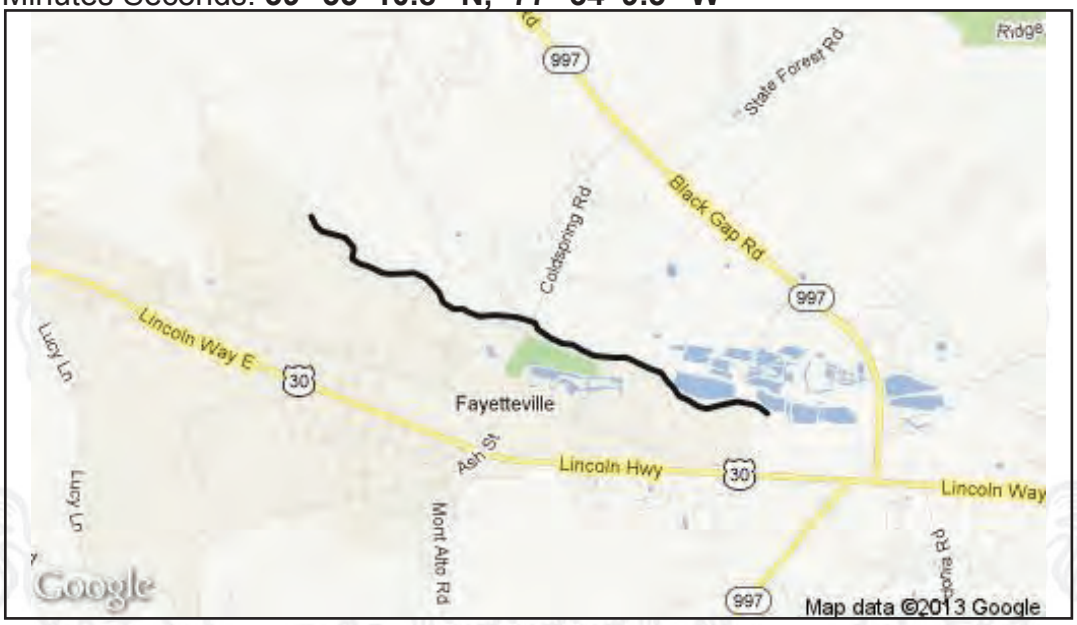
Pennsylvania Natural Diversity Index
Project Environmental Review

Gannett Fleming

*Excellence Delivered **As Promised***

1. PROJECT INFORMATION

Project Name: **Greene Township Municipal Authority - Interceptor Improvements**
Date of review: **2/5/2013 8:23:57 AM**
Project Category: **Waste Transfer, Treatment, and Disposal,Liquid waste/Effluent,Sewage module/Act 537 plan**
Project Length: **12741.4** feet
County: **Franklin** Township/Municipality: **Greene**
Quadrangle Name: **SCOTLAND** ~ ZIP Code: **17222**
Decimal Degrees: **39.919676 N, -77.569313 W**
Degrees Minutes Seconds: **39° 55' 10.8" N, -77° 34' 9.5" W**



2. SEARCH RESULTS

Agency	Results	Response
PA Game Commission	**Potential Impact**	**FURTHER REVIEW IS REQUIRED, See Agency Response**
PA Department of Conservation and Natural Resources	**Potential Impact**	**FURTHER REVIEW IS REQUIRED, See Agency Response**
PA Fish and Boat Commission	**Potential Impact**	**FURTHER REVIEW IS REQUIRED, See Agency Response**
U.S. Fish and Wildlife Service	No Known Impact	No Further Review Required

As summarized above, Pennsylvania Natural Diversity Inventory (PNDI) records indicate there may be potential impacts to threatened and endangered and/or special concern species and resources within the project area. If the response above indicates "No Further Review Required" no additional communication with the respective agency is required. If the response is "Further Review Required" or "See Agency Response," refer to the appropriate agency comments below. Please see the DEP Information Section of this receipt if a PA Department of Environmental Protection Permit is required.

RESPONSE TO QUESTION(S) ASKED

Q1: Accurately describe what is known about wetland presence in the project area or on the land parcel. "Project" includes all features of the project (including buildings, roads, utility lines, outfall and intake structures, wells, stormwater retention/detention basins, parking lots, driveways, lawns, etc.), as well as all associated impacts (e.g., temporary staging areas, work areas, temporary road crossings, areas subject to grading or clearing, etc.). Include all areas that will be permanently or temporarily affected -- either directly or indirectly -- by any type of disturbance (e.g., land clearing, grading, tree removal, flooding, etc.). Land parcel = the lot(s) on which some type of project(s) or activity(s) are proposed to occur .
Your answer is: **2. The project area (or land parcel) has not been investigated by someone qualified to identify and delineate wetlands, or it is currently unknown if the project or project activities will affect wetlands.**

Q2: Aquatic habitat (stream, river, lake, pond, etc.) is located on or adjacent to the subject property and project activities (including discharge) may occur within 300 feet of these habitats
Your answer is: **3. Unknown**

3. AGENCY COMMENTS

Regardless of whether a DEP permit is necessary for this proposed project, any potential impacts to threatened and endangered species and/or special concern species and resources must be resolved with the appropriate jurisdictional agency. In some cases, a permit or authorization from the jurisdictional agency may be needed if adverse impacts to these species and habitats cannot be avoided.

These agency determinations and responses are **valid for two years** (from the date of the review), and are based on the project information that was provided, including the exact project location; the project type, description, and features; and any responses to questions that were generated during this search. If any of the following change: 1) project location, 2) project size or configuration, 3) project type, or 4) responses to the questions that were asked during the online review, the results of this review are not valid, and the review must be searched again via the PNDI Environmental Review Tool and resubmitted to the jurisdictional agencies. The PNDI tool is a primary screening tool, and a desktop review may reveal more or fewer impacts than what is listed on this PNDI receipt. The jursidictional agencies **strongly advise against** conducting surveys for the species listed on the receipt prior to consultation with the agencies.

PA Game Commission

RESPONSE: Further review of this project is necessary to resolve the potential impacts(s). Please send project information to this agency for review (see WHAT TO SEND).

PGC Species: (Note: The PNDI tool is a primary screening tool, and a desktop review may reveal more or fewer species than what is listed below.)
Scientific Name: Myotis septentrionalis
Common Name: Northern Myotis
Current Status: Special Concern Species*
Proposed Status: Special Concern Species*

PA Department of Conservation and Natural Resources

RESPONSE: Further review of this project is necessary to resolve the potential impacts(s). Please send

project information to this agency for review (see WHAT TO SEND).

DCNR Species: (Note: The PNDI tool is a primary screening tool, and a desktop review may reveal more or fewer species than what is listed below. After desktop review, if a botanical survey is required by DCNR, we recommend the DCNR Botanical Survey Protocols, available here: http://www.gis.dcnr.state.pa.us/hgis-er/PNDI_DCNR.aspx.)
Scientific Name: Carex prairea
Common Name: Prairie Sedge
Current Status: Threatened
Proposed Status: Threatened

Scientific Name: Juncus arcticus var. littoralis
Common Name: Baltic Rush
Current Status: Threatened
Proposed Status: Threatened

Scientific Name: Lathyrus palustris
Common Name: Vetchling
Current Status: Special Concern Species*
Proposed Status: Endangered

Scientific Name: Salix myricoides
Common Name: Broad-leaved Willow
Current Status: Special Concern Species*
Proposed Status: Endangered

PA Fish and Boat Commission

RESPONSE: Further review of this project is necessary to resolve the potential impacts(s). Please send project information to this agency for review (see WHAT TO SEND).

PFBC Species: (Note: The PNDI tool is a primary screening tool, and a desktop review may reveal more or fewer species than what is listed below.)
Scientific Name: Sensitive Species**
Common Name:
Current Status: Endangered
Proposed Status: Endangered

Scientific Name: Sensitive Species**
Common Name:
Current Status: Threatened
Proposed Status: Special Concern Species*

Scientific Name: Sensitive Species**
Common Name:
Current Status: Endangered
Proposed Status: Special Concern Species*

U.S. Fish and Wildlife Service

RESPONSE: No impacts to **federally** listed or proposed species are anticipated. Therefore, no further consultation/coordination under the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.* is required. Because no take of federally listed species is anticipated, none is authorized. This response does not reflect potential Fish and Wildlife Service concerns under the Fish and Wildlife Coordination Act or other authorities.

* Special Concern Species or Resource - Plant or animal species classified as rare, tentatively undetermined or candidate as well as other taxa of conservation concern, significant natural communities, special concern populations (plants or animals) and unique geologic features.
** Sensitive Species - Species identified by the jurisdictinal agency as collectible, having economic value, or being susceptible to decline as a result of visitation.

WHAT TO SEND TO JURISDICTIONAL AGENCIES

If project information was requested by one or more of the agencies above, send the following information to the agency(s) seeking this information (see AGENCY CONTACT INFORMATION).

Check-list of *Minimum* Materials to be submitted:

____**SIGNED** copy of this Project Environmental Review Receipt
____Project narrative with a description of the overall project, the work to be performed, current physical characteristics of the site and acreage to be impacted.
____Project location information (name of USGS Quadrangle, Township/Municipality, and County)
____USGS 7.5-minute Quadrangle with project boundary clearly indicated, and quad name on the map

The inclusion of the following information may expedite the review process.
____A basic site plan(particularly showing the relationship of the project to the physical features such as wetlands, streams, ponds, rock outcrops, etc.)
____Color photos keyed to the basic site plan (i.e. showing on the site plan where and in what direction each photo was taken and the date of the photos)
____Information about the presence and location of wetlands in the project area, and how this was determined (e.g., by a qualified wetlands biologist), if wetlands are present in the project area, provide project plans showing the location of all project features, as well as wetlands and streams

4. DEP INFORMATION

The Pa Department of Environmental Protection (DEP) requires that a signed copy of this receipt, along with any required documentation from jurisdictional agencies concerning resolution of potential impacts, be submitted with applications for permits requiring PNDI review. For cases where a "Potential Impact" to threatened and

endangered species has been identified before the application has been submitted to DEP, the application should not be submitted until the impact has been resolved. For cases where "Potential Impact" to special concern species and resources has been identified before the application has been submitted, the application should be submitted to DEP along with the PNDI receipt. The PNDI Receipt should also be submitted to the appropriate agency according to directions on the PNDI Receipt. DEP and the jurisdictional agency will work together to resolve the potential impact(s). See the DEP PNDI policy at http://www.naturalheritage.state.pa.us.

5. ADDITIONAL INFORMATION

The PNDI environmental review website is a **preliminary** screening tool. There are often delays in updating species status classifications. Because the proposed status represents the best available information regarding the conservation status of the species, state jurisdictional agency staff give the proposed statuses at least the same consideration as the current legal status. If surveys or further information reveal that a threatened and endangered and/or special concern species and resources exist in your project area, contact the appropriate jurisdictional agency/agencies immediately to identify and resolve any impacts.

For a list of species known to occur in the county where your project is located, please see the species lists by county found on the PA Natural Heritage Program (PNHP) home page (www.naturalheritage.state.pa.us). Also note that the PNDI Environmental Review Tool only contains information about species occurrences that have actually been reported to the PNHP.

6. AGENCY CONTACT INFORMATION

PA Department of Conservation and Natural Resources
Bureau of Forestry, Ecological Services Section
400 Market Street, PO Box 8552, Harrisburg, PA. 17105-8552
Fax:(717) 772-0271

U.S. Fish and Wildlife Service
Endangered Species Section
315 South Allen Street, Suite 322, State College, PA. 16801-4851
NO Faxes Please.

PA Fish and Boat Commission
Division of Environmental Services
450 Robinson Lane, Bellefonte, PA. 16823-7437
NO Faxes Please

PA Game Commission
Bureau of Wildlife Habitat Management
Division of Environmental Planning and Habitat Protection
2001 Elmerton Avenue, Harrisburg, PA. 17110-9797
Fax:(717) 787-6957

7. PROJECT CONTACT INFORMATION

Name: HEATHER RIPLEY
Company/Business Name: GANNETT FLEMING
Address: PO BOX 67100
City, State, Zip: HARRISBURG, PA, 17106-7100
Phone:(717) 763-7211 Fax:(717) 763-1808
Email: hripley@gfnet.com

8. CERTIFICATION

I certify that ALL of the project information contained in this receipt (including project location, project size/configuration, project type, answers to questions) is true, accurate and complete. In addition, if the project type, location, size or configuration changes, or if the answers to any questions that were asked during this online review change, I agree to re-do the online environmental review.

Heather M Ripley
applicant/project proponent signature

2/12/13
date

Appendix D

Gannett Fleming

*Excellence Delivered **As Promised***

Pennsylvania Natural Diversity Index Inquiries

Gannett Fleming

*Excellence Delivered **As Promised***

Pennsylvania Department of Conservation and Natural Resources

Gannett Fleming

*Excellence Delivered **As Promised***

Gannett Fleming

Excellence Delivered As Promised

February 14, 2013

CERTIFIED MAIL: 7010 3090 0001 8677 7642
RETURN RECEIPT REQUESTED

PA Department of Conservation and Natural Resources
Bureau of Forestry, Ecological Services Section
400 Market Street
P.O. Box 8552
Harrisburg, PA 17105-8552

RE: Project Environmental Review Receipt
Potential Impact of Proposed Activity
Greene Township Municipal Authority, Franklin County

Ladies and Gentlemen:

Gannett Fleming is currently assisting Greene Township Municipal Authority (Authority) with planning under the Pennsylvania Sewage Facilities Act (Act 537). The planning has progressed to the point where alternatives have been developed specifically for conveyance of wastewater generated in Greene Township. A Pennsylvania Natural Diversity Inventory (PNDI) Project Environmental Review was performed. The PNDI review determined that additional review is necessary by the Pennsylvania Department of Conservation and Natural Resources to resolve potential impacts from implementation of the alternatives. A signed copy of the Project Environmental Review is enclosed.

Wastewater generated in Greene Township, in portions of Guilford Township, and from the Chambersburg Water Treatment Plant is conveyed to the Chambersburg Wastewater Treatment Plant (WWTP) via sewage facilities owned by the Authority. The wastewater is conveyed by approximately 14 miles of Authority interceptor sewer from Greene Township to the Chambersburg Sewer System. As part of the Act 537 planning process, the Authority considered a number of wastewater management alternatives to adequately provide for its present and projected needs. The most cost effective wastewater management approach at this time for the Authority is to increase the capacity of the Authority's existing interceptor in the Fayetteville area of Greene Township.

There are two (2) alternatives that are being considered; (1) is to replace the existing interceptor sewer with a new larger sewer in the same location as the existing interceptor, and (2) is to rehabilitate the existing interceptor with new manholes and run a parallel sewer along the existing interceptor. Either alternative will be constructed within the Authority's existing sewer right-of-way.

P.O. Box 67100 • Harrisburg, PA 17106-7100 | 207 Senate Avenue • Camp Hill, PA 17011-2316
t: 717.763.7211 • f: 717.763.8150
www.gannettfleming.com

Discovery A-9 - Attachment 3

The first alternative will require the Authority to replace approximately 2.5 miles of existing sewer along Conococheague Creek, beginning north of New Lane and U.S. Route 30, and ending west of Mount Pleasant Road (State Route 1001) and north of 5th Avenue. The work will be conducted within the Authority's existing sewer right-of-way. The second alternative will add a sewer parallel to the existing sewer along the same route as Alternative 1 within the Authority's sewer right-of-way. The Greene Township's existing interceptor sewer is between 5 and 13 feet deep along the bank of the creek. The Authority's replacement or parallel interceptor will be placed at approximately the same depth in the same trench as the existing interceptor sewer, but offset to one side to provide future access to the line. This construction method should minimize the amount of new disturbance as most of the excavation will be in areas previously disturbed by Greene Township during the installation of its existing interceptor sewer.

Please find the enclosed documents demonstrating the extent of the project:

1. PNDI Project Environmental Review – Greene Township Municipal Authority – Interceptor Improvements (#20130205389416).
2. Project narrative including an estimate of earth disturbance.
3. 7.5' U.S.G.S. Map with defined boundary of the proposed activity.

This submission is intended to notify the Department of the potential impact and request the appropriate action by the Department to help resolve the potential impact. While a commitment has not been made to undertake the project shown in the mapping and explained in the project narrative, this information will be incorporated in planning assessments under the Pennsylvania Sewage Facility Act and in specific alternative proposals.

Please do not hesitate to call me at (717) 763-7212, Ext. 2393 if you have any questions regarding the Act 537 Plan. We look forward to your prompt response to this letter so that we can properly address any anticipated impacts in the sewage facilities planning.

Very truly yours,

GANNETT FLEMING, INC.
Environmental Resources Division

Heather M Ripley

HEATHER M. RIPLEY, E.I.T.
Planning Specialist
Water Practice

Enclosures

cc: W. Dwayne DelGrande, P.E. Authority Engineer

PNDI Project Environmental Review Receipt Project Search ID: 20130205389416

1. PROJECT INFORMATION

Project Name: **Greene Township Municipal Authority - Interceptor Improvements**
Date of review: **2/5/2013 8:23:57 AM**
Project Category: **Waste Transfer, Treatment, and Disposal,Liquid waste/Effluent,Sewage module/Act 537 plan**
Project Length: **12741.4** feet
County: **Franklin** Township/Municipality: **Greene**
Quadrangle Name: **SCOTLAND** ~ ZIP Code: **17222**
Decimal Degrees: **39.919676 N, -77.569313 W**
Degrees Minutes Seconds: **39° 55' 10.8" N, -77° 34' 9.5" W**



2. SEARCH RESULTS

Agency	Results	Response
PA Game Commission	**Potential Impact**	**FURTHER REVIEW IS REQUIRED, See Agency Response**
PA Department of Conservation and Natural Resources	**Potential Impact**	**FURTHER REVIEW IS REQUIRED, See Agency Response**
PA Fish and Boat Commission	**Potential Impact**	**FURTHER REVIEW IS REQUIRED, See Agency Response**
U.S. Fish and Wildlife Service	No Known Impact	No Further Review Required

As summarized above, Pennsylvania Natural Diversity Inventory (PNDI) records indicate there may be potential impacts to threatened and endangered and/or special concern species and resources within the project area. If the response above indicates "No Further Review Required" no additional communication with the respective agency is required. If the response is "Further Review Required" or "See Agency Response," refer to the appropriate agency comments below. Please see the DEP Information Section of this receipt if a PA Department of Environmental Protection Permit is required.

RESPONSE TO QUESTION(S) ASKED

Q1: Accurately describe what is known about wetland presence in the project area or on the land parcel. "Project" includes all features of the project (including buildings, roads, utility lines, outfall and intake structures, wells, stormwater retention/detention basins, parking lots, driveways, lawns, etc.), as well as all associated impacts (e.g., temporary staging areas, work areas, temporary road crossings, areas subject to grading or clearing, etc.). Include all areas that will be permanently or temporarily affected -- either directly or indirectly -- by any type of disturbance (e.g., land clearing, grading, tree removal, flooding, etc.). Land parcel = the lot(s) on which some type of project(s) or activity(s) are proposed to occur .
Your answer is: **2. The project area (or land parcel) has not been investigated by someone qualified to identify and delineate wetlands, or it is currently unknown if the project or project activities will affect wetlands.**

Q2: Aquatic habitat (stream, river, lake, pond, etc.) is located on or adjacent to the subject property and project activities (including discharge) may occur within 300 feet of these habitats
Your answer is: **3. Unknown**

3. AGENCY COMMENTS

Regardless of whether a DEP permit is necessary for this proposed project, any potential impacts to threatened and endangered species and/or special concern species and resources must be resolved with the appropriate jurisdictional agency. In some cases, a permit or authorization from the jurisdictional agency may be needed if adverse impacts to these species and habitats cannot be avoided.

These agency determinations and responses are **valid for two years** (from the date of the review), and are based on the project information that was provided, including the exact project location; the project type, description, and features; and any responses to questions that were generated during this search. If any of the following change: 1) project location, 2) project size or configuration, 3) project type, or 4) responses to the questions that were asked during the online review, the results of this review are not valid, and the review must be searched again via the PNDI Environmental Review Tool and resubmitted to the jurisdictional agencies. The PNDI tool is a primary screening tool, and a desktop review may reveal more or fewer impacts than what is listed on this PNDI receipt. The jursidictional agencies **strongly advise against** conducting surveys for the species listed on the receipt prior to consultation with the agencies.

PA Game Commission

RESPONSE: Further review of this project is necessary to resolve the potential impacts(s). Please send project information to this agency for review (see WHAT TO SEND).

PGC Species: (Note: The PNDI tool is a primary screening tool, and a desktop review may reveal more or fewer species than what is listed below.)
Scientific Name: Myotis septentrionalis
Common Name: Northern Myotis
Current Status: Special Concern Species*
Proposed Status: Special Concern Species*

PA Department of Conservation and Natural Resources

RESPONSE: Further review of this project is necessary to resolve the potential impacts(s). Please send

project information to this agency for review (see WHAT TO SEND).

DCNR Species: (Note: The PNDI tool is a primary screening tool, and a desktop review may reveal more or fewer species than what is listed below. After desktop review, if a botanical survey is required by DCNR, we recommend the DCNR Botanical Survey Protocols, available here: http://www.gis.dcnr.state.pa.us/hgis-er/PNDI_DCNR.aspx.)
Scientific Name: Carex prairea
Common Name: Prairie Sedge
Current Status: Threatened
Proposed Status: Threatened

Scientific Name: Juncus arcticus var. littoralis
Common Name: Baltic Rush
Current Status: Threatened
Proposed Status: Threatened

Scientific Name: Lathyrus palustris
Common Name: Vetchling
Current Status: Special Concern Species*
Proposed Status: Endangered

Scientific Name: Salix myricoides
Common Name: Broad-leaved Willow
Current Status: Special Concern Species*
Proposed Status: Endangered

PA Fish and Boat Commission

RESPONSE: Further review of this project is necessary to resolve the potential impacts(s). Please send project information to this agency for review (see WHAT TO SEND).

PFBC Species: (Note: The PNDI tool is a primary screening tool, and a desktop review may reveal more or fewer species than what is listed below.)
Scientific Name: Sensitive Species**
Common Name:
Current Status: Endangered
Proposed Status: Endangered

Scientific Name: Sensitive Species**
Common Name:
Current Status: Threatened
Proposed Status: Special Concern Species*

Scientific Name: Sensitive Species**
Common Name:
Current Status: Endangered
Proposed Status: Special Concern Species*

U.S. Fish and Wildlife Service

RESPONSE: No impacts to **federally** listed or proposed species are anticipated. Therefore, no further consultation/coordination under the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.* is required. Because no take of federally listed species is anticipated, none is authorized. This response does not reflect potential Fish and Wildlife Service concerns under the Fish and Wildlife Coordination Act or other authorities.

* Special Concern Species or Resource - Plant or animal species classified as rare, tentatively undetermined or candidate as well as other taxa of conservation concern, significant natural communities, special concern populations (plants or animals) and unique geologic features.
** Sensitive Species - Species identified by the jurisdictinal agency as collectible, having economic value, or being susceptible to decline as a result of visitation.

WHAT TO SEND TO JURISDICTIONAL AGENCIES

If project information was requested by one or more of the agencies above, send the following information to the agency(s) seeking this information (see AGENCY CONTACT INFORMATION).

Check-list of *Minimum* Materials to be submitted:

✓ **SIGNED** copy of this Project Environmental Review Receipt
✓ Project narrative with a description of the overall project, the work to be performed, current physical characteristics of the site and acreage to be impacted.
✓ Project location information (name of USGS Quadrangle, Township/Municipality, and County)
✓ USGS 7.5-minute Quadrangle with project boundary clearly indicated, and quad name on the map

The inclusion of the following information may expedite the review process.
____A basic site plan(particularly showing the relationship of the project to the physical features such as wetlands, streams, ponds, rock outcrops, etc.)
____Color photos keyed to the basic site plan (i.e. showing on the site plan where and in what direction each photo was taken and the date of the photos)
____Information about the presence and location of wetlands in the project area, and how this was determined (e.g., by a qualified wetlands biologist), if wetlands are present in the project area, provide project plans showing the location of all project features, as well as wetlands and streams

4. DEP INFORMATION

The Pa Department of Environmental Protection (DEP) requires that a signed copy of this receipt, along with any required documentation from jurisdictional agencies concerning resolution of potential impacts, be submitted with applications for permits requiring PNDI review. For cases where a "Potential Impact" to threatened and

endangered species has been identified before the application has been submitted to DEP, the application should not be submitted until the impact has been resolved. For cases where "Potential Impact" to special concern species and resources has been identified before the application has been submitted, the application should be submitted to DEP along with the PNDI receipt. The PNDI Receipt should also be submitted to the appropriate agency according to directions on the PNDI Receipt. DEP and the jurisdictional agency will work together to resolve the potential impact(s). See the DEP PNDI policy at http://www.naturalheritage.state.pa.us.

5. ADDITIONAL INFORMATION

The PNDI environmental review website is a **preliminary** screening tool. There are often delays in updating species status classifications. Because the proposed status represents the best available information regarding the conservation status of the species, state jurisdictional agency staff give the proposed statuses at least the same consideration as the current legal status. If surveys or further information reveal that a threatened and endangered and/or special concern species and resources exist in your project area, contact the appropriate jurisdictional agency/agencies immediately to identify and resolve any impacts.

For a list of species known to occur in the county where your project is located, please see the species lists by county found on the PA Natural Heritage Program (PNHP) home page (www.naturalheritage.state.pa.us). Also note that the PNDI Environmental Review Tool only contains information about species occurrences that have actually been reported to the PNHP.

6. AGENCY CONTACT INFORMATION

PA Department of Conservation and Natural Resources
Bureau of Forestry, Ecological Services Section
400 Market Street, PO Box 8552, Harrisburg, PA. 17105-8552
Fax:(717) 772-0271

U.S. Fish and Wildlife Service
Endangered Species Section
315 South Allen Street, Suite 322, State College, PA. 16801-4851
NO Faxes Please.

PA Fish and Boat Commission
Division of Environmental Services
450 Robinson Lane, Bellefonte, PA. 16823-7437
NO Faxes Please

PA Game Commission
Bureau of Wildlife Habitat Management
Division of Environmental Planning and Habitat Protection
2001 Elmerton Avenue, Harrisburg, PA. 17110-9797
Fax:(717) 787-6957

7. PROJECT CONTACT INFORMATION

Name: HEATHER RIPLEY
Company/Business Name: GANNETT FLEMING
Address: PO BOX 67100
City, State, Zip: HARRISBURG, PA, 17106-7100
Phone:(717) 763-7211 Fax:(717) 763-1808
Email: hripley@gfnet.com

8. CERTIFICATION

I certify that ALL of the project information contained in this receipt (including project location, project size/configuration, project type, answers to questions) is true, accurate and complete. In addition, if the project type, location, size or configuration changes, or if the answers to any questions that were asked during this online review change, I agree to re-do the online environmental review.

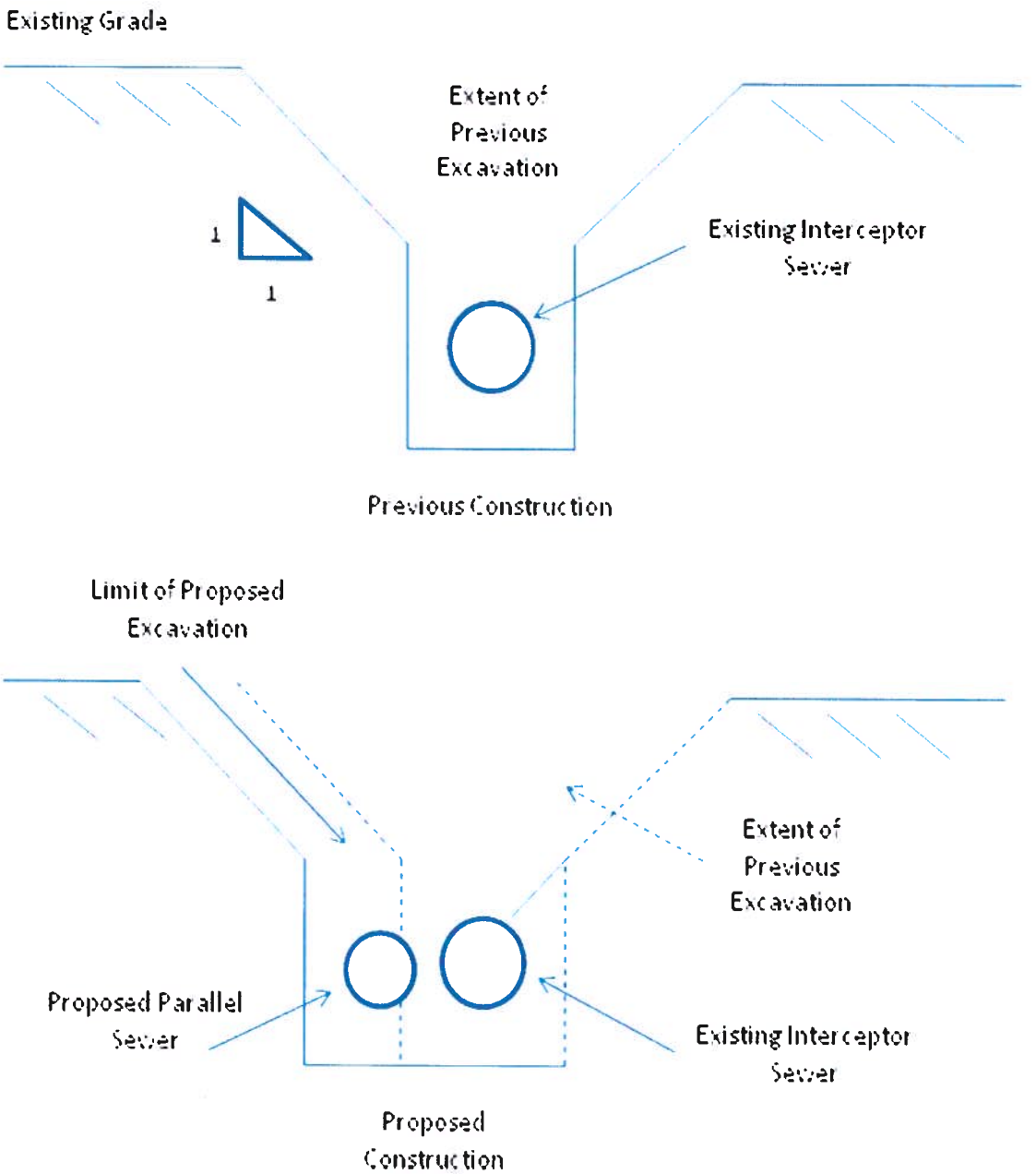
Heather M Ripley — applicant/project proponent signature
2/14/13 — date

PROJECT NARRATIVE

The proposed project will occur in Greene Township, located in Franklin County, Pennsylvania. Greene Township sewage, wastewater from the Chambersburg Water Treatment Plant and a portion of sewage from Guilford Township is conveyed to the Chambersburg Wastewater Treatment Plant (WWTP) by approximately 14 miles of existing interceptor sewers. As part of the Act 537 Planning process, Green Township Municipal Authority (Authority) considered a number of wastewater management alternatives to adequately provide for the existing and projected needs of Greene Township and the surrounding contributors. The most cost effective wastewater management alternative for the Authority was to increase capacity of an existing interceptor sewer in the Fayetteville and Oak Hill areas of Greene Township.

Two (2) alternatives are being considered for the proposed project. The first alternative will replace the existing interceptor sewer with a larger capacity sewer. This alternative will replace approximately 2.5 miles of existing sewer along Conococheague Creek, beginning north of New Lane and U.S. Route 30 and ending west of Mount Pleasant Road (State Route 1001) and north of 5th Avenue. The construction will be completed within the Authority's existing sewer right-of-way. The second alternative will add a parallel sewer to the existing interceptor to handle peak wet weather events. Approximately 2.5 miles of new sewer will be added along the same path as the first alternative. The construction associated with this alternative will be completed within the Authority's existing sewer right-of-way. The added sewer capacity will convey sewage generated in Fayetteville, Greene Knolls Basin including Caledonia State Park, Borough of Chambersburg WTP and Oak Hill. Figure 1 depicts the proposed construction technique for the parallel sewer.

FIGURE 1: ALTERNATIVE 2 PROPOSED CONSTRUCTION TECHNIQUE



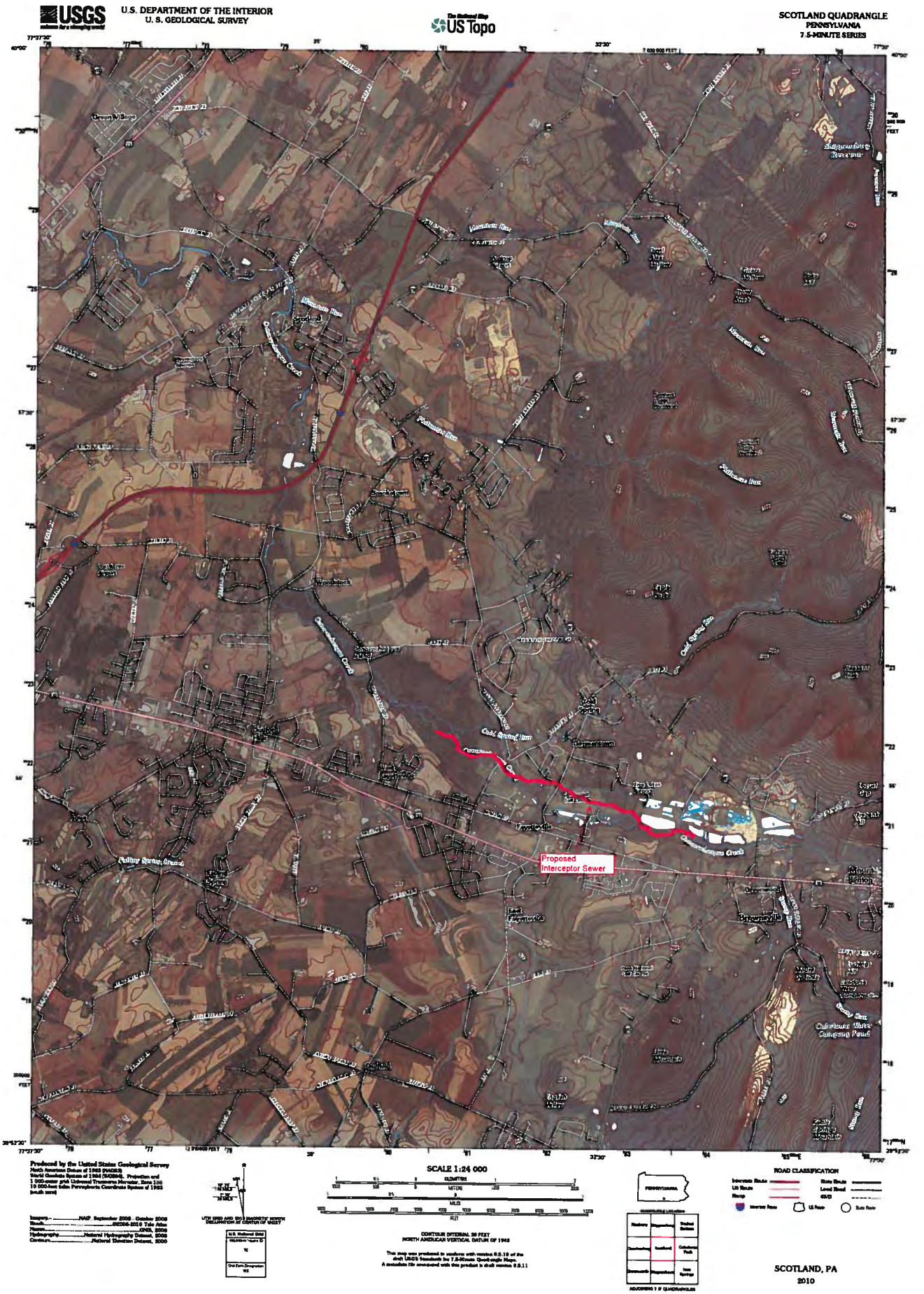
An estimate of the amount of land disturbance for the proposed interceptor sewers is included in Table 1. This estimate is based on the length of sewer with six-foot trenching. The proposed project does not include any modifications to existing buildings or disturbance of soils not previously disturbed by sanitary sewer construction.

TABLE 1: Estimated Amount of Earth Disturbance

Sewer Alternative	Description	Length of Sewer	Estimated Amount of Earth Disturbance (1)
1	Replace Existing Interceptor	12,800	5.9 acres
2	Parallel Sewer	12,560	5.8 acres

Notes:

(1) The majority of earth disturbance for Alternative 1 was previously disturbed during construction of the existing sewer. Alternative 2 will make use of the existing trench for the Greene Township Interceptor Sewer, as shown in Figure 1.


USGS
U.S. DEPARTMENT OF THE INTERIOR
U. S. GEOLOGICAL SURVEY
The National Map
US Topo
SCOTLAND QUADRANGLE
PENNSYLVANIA
7.5-MINUTE SERIES
Proposed
Interceptor Sewer
SCALE 1:24 000
ROAD CLASSIFICATION
SCOTLAND, PA
2010

Pennsylvania Department of Fish and Boat Commission

Gannett Fleming

*Excellence Delivered **As Promised***

Gannett Fleming

Excellence Delivered As Promised

February 14, 2013

CERTIFIED MAIL: 7010 3090 0001 8677 7635
RETURN RECEIPT REQUESTED

PA Fish and Boat Commission
Division of Environmental Services
450 Robinson Lane
Bellefonte, PA 16823

RE: Project Environmental Review Receipt
Potential Impact of Proposed Activity
Greene Township Municipal Authority, Franklin County

Ladies and Gentlemen:

Gannett Fleming is currently assisting Greene Township Municipal Authority (Authority) with planning under the Pennsylvania Sewage Facilities Act (Act 537). The planning has progressed to the point where alternatives have been developed specifically for conveyance of wastewater generated in Greene Township. A Pennsylvania Natural Diversity Inventory (PNDI) Project Environmental Review was performed. The PNDI review determined that additional review is necessary by the Pennsylvania Fish and Boat Commission to resolve potential impacts from implementation of the alternatives. A signed copy of the Project Environmental Review is enclosed.

Wastewater generated in Greene Township, in portions of Guilford Township, and from the Chambersburg Water Treatment Plant is conveyed to the Chambersburg Wastewater Treatment Plant (WWTP) via sewage facilities owned by the Authority. The wastewater is conveyed by approximately 14 miles of Authority interceptor sewer from Greene Township to the Chambersburg Sewer System. As part of the Act 537 planning process, the Authority considered a number of wastewater management alternatives to adequately provide for its present and projected needs. The most cost effective wastewater management approach at this time for the Authority is to increase the capacity of the Authority's existing interceptor in the Fayetteville area of Greene Township.

There are two (2) alternatives that are being considered; (1) is to replace the existing interceptor sewer with a new larger sewer in the same location as the existing interceptor, and (2) is to rehabilitate the existing interceptor with new manholes and run a parallel sewer along the existing interceptor. Either alternative will be constructed within the Authority's existing sewer right-of-way.

Gannett Fleming, Inc.

P.O. Box 67100 • Harrisburg, PA 17106-7100 | 207 Senate Avenue • Camp Hill, PA 17011-2316
t: 717.763.7211 • f: 717.763.8150
www.gannettfleming.com

Discovery A-9 - Attachment 3

The first alternative will require the Authority to replace approximately 2.5 miles of existing sewer along Conococheague Creek, beginning north of New Lane and U.S. Route 30, and ending west of Mount Pleasant Road (State Route 1001) and north of 5th Avenue. The work will be conducted within the Authority's existing sewer right-of-way. The second alternative will add a sewer parallel to the existing sewer along the same route as Alternative 1 within the Authority's sewer right-of-way. The Greene Township's existing interceptor sewer is between 5 and 13 feet deep along the bank of the creek. The Authority's replacement or parallel interceptor will be placed at approximately the same depth in the same trench as the existing interceptor sewer, but offset to one side to provide future access to the line. This construction method should minimize the amount of new disturbance as most of the excavation will be in areas previously disturbed by Greene Township during the installation of its existing interceptor sewer.

Please find the enclosed documents demonstrating the extent of the project:

1. PNDI Project Environmental Review - Greene Township Municipal Authority Interceptor Improvements (#20130205389416).
2. Project narrative including an estimate of earth disturbance.
3. 7.5' U.S.G.S. Map with defined boundary of the proposed activity.

This submission is intended to notify the Commission of the potential impact and request the appropriate action by the Commission to help resolve the potential impact. While a commitment has not been made to undertake the project shown in the mapping and explained in the project narrative, this information will be incorporated in planning assessments under the Pennsylvania Sewage Facility Act and in specific alternative proposals.

Please do not hesitate to call me at (717) 763-7212, Ext. 2393 if you have any questions regarding the Act 537 Plan. We look forward to your prompt response to this letter so that we can properly address any anticipated impacts in the sewage facilities planning.

Very truly yours,

GANNETT FLEMING, INC.
Environmental Resources Division

Heather M Ripley

HEATHER M. RIPLEY, E.I.T.
Planning Specialist
Water Practice

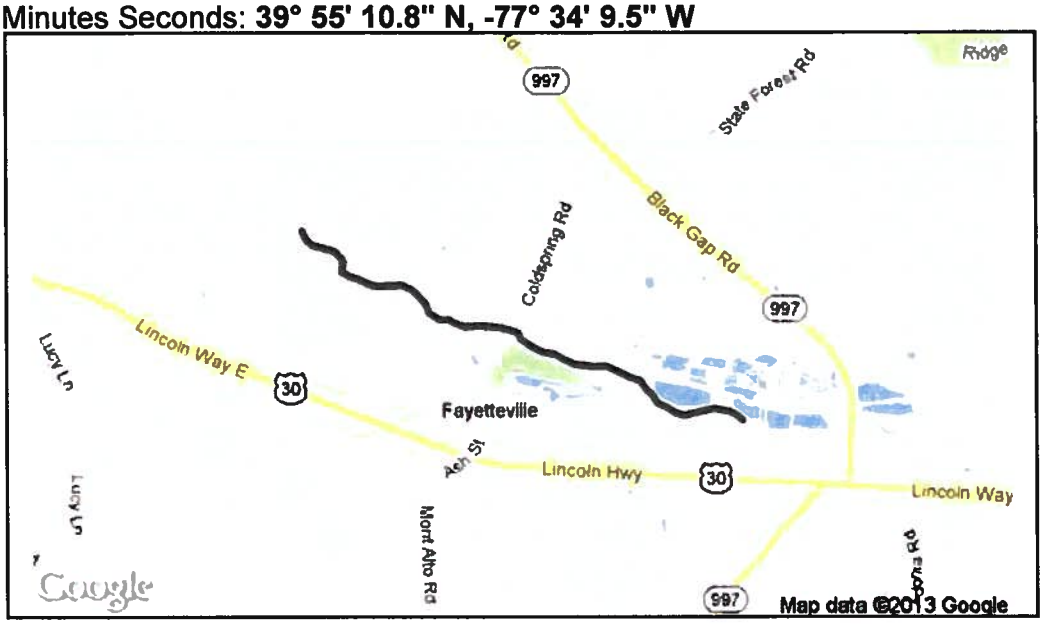
Enclosures

cc: W. Dwayne DelGrande, P.E. Authority Engineer

PNDI Project Environmental Review Receipt Project Search ID: 20130205389416

1. PROJECT INFORMATION

Project Name: **Greene Township Municipal Authority - Interceptor Improvements**
Date of review: **2/5/2013 8:23:57 AM**
Project Category: **Waste Transfer, Treatment, and Disposal,Liquid waste/Effluent,Sewage module/Act 537 plan**
Project Length: **12741.4** feet
County: **Franklin** Township/Municipality: **Greene**
Quadrangle Name: **SCOTLAND** ~ ZIP Code: **17222**
Decimal Degrees: **39.919676 N, -77.569313 W**
Degrees Minutes Seconds: **39° 55' 10.8" N, -77° 34' 9.5" W**



2. SEARCH RESULTS

Agency	Results	Response
PA Game Commission	**Potential Impact**	**FURTHER REVIEW IS REQUIRED, See Agency Response**
PA Department of Conservation and Natural Resources	**Potential Impact**	**FURTHER REVIEW IS REQUIRED, See Agency Response**
PA Fish and Boat Commission	**Potential Impact**	**FURTHER REVIEW IS REQUIRED, See Agency Response**
U.S. Fish and Wildlife Service	No Known Impact	No Further Review Required

As summarized above, Pennsylvania Natural Diversity Inventory (PNDI) records indicate there may be potential impacts to threatened and endangered and/or special concern species and resources within the project area. If the response above indicates "No Further Review Required" no additional communication with the respective agency is required. If the response is "Further Review Required" or "See Agency Response," refer to the appropriate agency comments below. Please see the DEP Information Section of this receipt if a PA Department of Environmental Protection Permit is required.

RESPONSE TO QUESTION(S) ASKED

Q1: Accurately describe what is known about wetland presence in the project area or on the land parcel. "Project" includes all features of the project (including buildings, roads, utility lines, outfall and intake structures, wells, stormwater retention/detention basins, parking lots, driveways, lawns, etc.), as well as all associated impacts (e.g., temporary staging areas, work areas, temporary road crossings, areas subject to grading or clearing, etc.). Include all areas that will be permanently or temporarily affected -- either directly or indirectly -- by any type of disturbance (e.g., land clearing, grading, tree removal, flooding, etc.). Land parcel = the lot(s) on which some type of project(s) or activity(s) are proposed to occur .
Your answer is: **2. The project area (or land parcel) has not been investigated by someone qualified to identify and delineate wetlands, or it is currently unknown if the project or project activities will affect wetlands.**

Q2: Aquatic habitat (stream, river, lake, pond, etc.) is located on or adjacent to the subject property and project activities (including discharge) may occur within 300 feet of these habitats
Your answer is: **3. Unknown**

3. AGENCY COMMENTS

Regardless of whether a DEP permit is necessary for this proposed project, any potential impacts to threatened and endangered species and/or special concern species and resources must be resolved with the appropriate jurisdictional agency. In some cases, a permit or authorization from the jurisdictional agency may be needed if adverse impacts to these species and habitats cannot be avoided.

These agency determinations and responses are **valid for two years** (from the date of the review), and are based on the project information that was provided, including the exact project location; the project type, description, and features; and any responses to questions that were generated during this search. If any of the following change: 1) project location, 2) project size or configuration, 3) project type, or 4) responses to the questions that were asked during the online review, the results of this review are not valid, and the review must be searched again via the PNDI Environmental Review Tool and resubmitted to the jurisdictional agencies. The PNDI tool is a primary screening tool, and a desktop review may reveal more or fewer impacts than what is listed on this PNDI receipt. The jursidictional agencies **strongly advise against** conducting surveys for the species listed on the receipt prior to consultation with the agencies.

PA Game Commission

RESPONSE: Further review of this project is necessary to resolve the potential impacts(s). Please send project information to this agency for review (see WHAT TO SEND).

PGC Species: (Note: The PNDI tool is a primary screening tool, and a desktop review may reveal more or fewer species than what is listed below.)
Scientific Name: Myotis septentrionalis
Common Name: Northern Myotis
Current Status: Special Concern Species*
Proposed Status: Special Concern Species*

PA Department of Conservation and Natural Resources

RESPONSE: Further review of this project is necessary to resolve the potential impacts(s). Please send

project information to this agency for review (see WHAT TO SEND).

DCNR Species: (Note: The PNDI tool is a primary screening tool, and a desktop review may reveal more or fewer species than what is listed below. After desktop review, if a botanical survey is required by DCNR, we recommend the DCNR Botanical Survey Protocols, available here: http://www.gis.dcnr.state.pa.us/hgis-er/PNDI_DCNR.aspx.)
Scientific Name: Carex prairea
Common Name: Prairie Sedge
Current Status: Threatened
Proposed Status: Threatened

Scientific Name: Juncus arcticus var. littoralis
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Common Name: Vetchling
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Scientific Name: Salix myricoides
Common Name: Broad-leaved Willow
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PA Fish and Boat Commission

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PFBC Species: (Note: The PNDI tool is a primary screening tool, and a desktop review may reveal more or fewer species than what is listed below.)
Scientific Name: Sensitive Species**
Common Name:
Current Status: Endangered
Proposed Status: Endangered

Scientific Name: Sensitive Species**
Common Name:
Current Status: Threatened
Proposed Status: Special Concern Species*

Scientific Name: Sensitive Species**
Common Name:
Current Status: Endangered
Proposed Status: Special Concern Species*

U.S. Fish and Wildlife Service

RESPONSE: No impacts to **federally** listed or proposed species are anticipated. Therefore, no further consultation/coordination under the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.* is required. Because no take of federally listed species is anticipated, none is authorized. This response does not reflect potential Fish and Wildlife Service concerns under the Fish and Wildlife Coordination Act or other authorities.

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WHAT TO SEND TO JURISDICTIONAL AGENCIES

If project information was requested by one or more of the agencies above, send the following information to the agency(s) seeking this information (see AGENCY CONTACT INFORMATION).

Check-list of *Minimum* Materials to be submitted:

____**SIGNED** copy of this Project Environmental Review Receipt
____Project narrative with a description of the overall project, the work to be performed, current physical characteristics of the site and acreage to be impacted.
____Project location information (name of USGS Quadrangle, Township/Municipality, and County)
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The inclusion of the following information may expedite the review process.
____A basic site plan(particularly showing the relationship of the project to the physical features such as wetlands, streams, ponds, rock outcrops, etc.)
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____Information about the presence and location of wetlands in the project area, and how this was determined (e.g., by a qualified wetlands biologist), if wetlands are present in the project area, provide project plans showing the location of all project features, as well as wetlands and streams

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PA Game Commission
Bureau of Wildlife Habitat Management
Division of Environmental Planning and Habitat Protection
2001 Elmerton Avenue, Harrisburg, PA. 17110-9797
Fax:(717) 787-6957

7. PROJECT CONTACT INFORMATION

Name: HEATHER RIPLEY
Company/Business Name: GANNETT FLEMING
Address: PO BOX 67100
City, State, Zip: HARRISBURG, PA, 17106-7100
Phone:(717) 763-7211 Fax:(717) 763-1808
Email: hripley@gfnet.com

8. CERTIFICATION

I certify that ALL of the project information contained in this receipt (including project location, project size/configuration, project type, answers to questions) is true, accurate and complete. In addition, if the project type, location, size or configuration changes, or if the answers to any questions that were asked during this online review change, I agree to re-do the online environmental review.

Heather M Ripley — applicant/project proponent signature

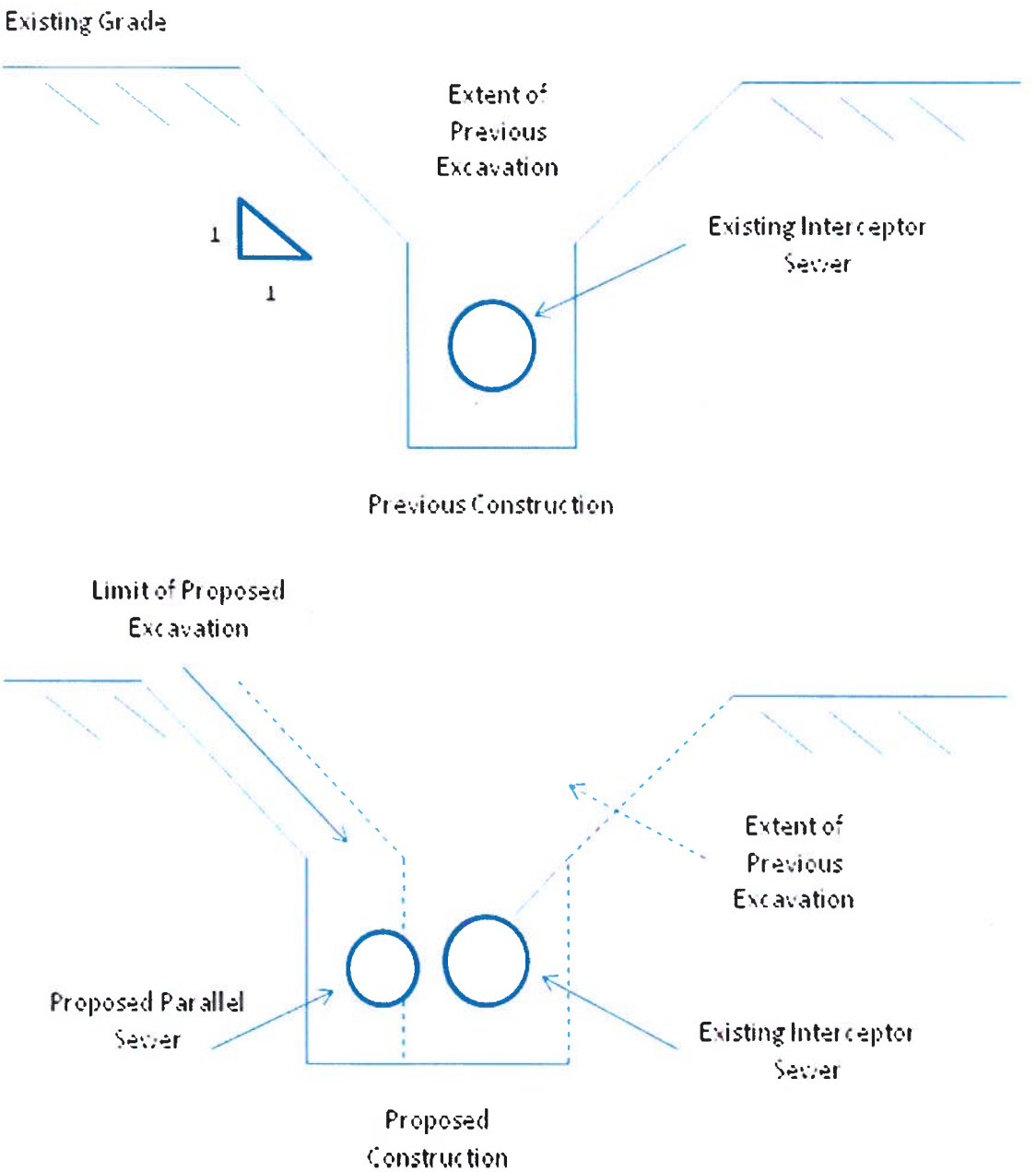
2/12/13 — date

PROJECT NARRATIVE

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FIGURE 1: ALTERNATIVE 2 PROPOSED CONSTRUCTION TECHNIQUE



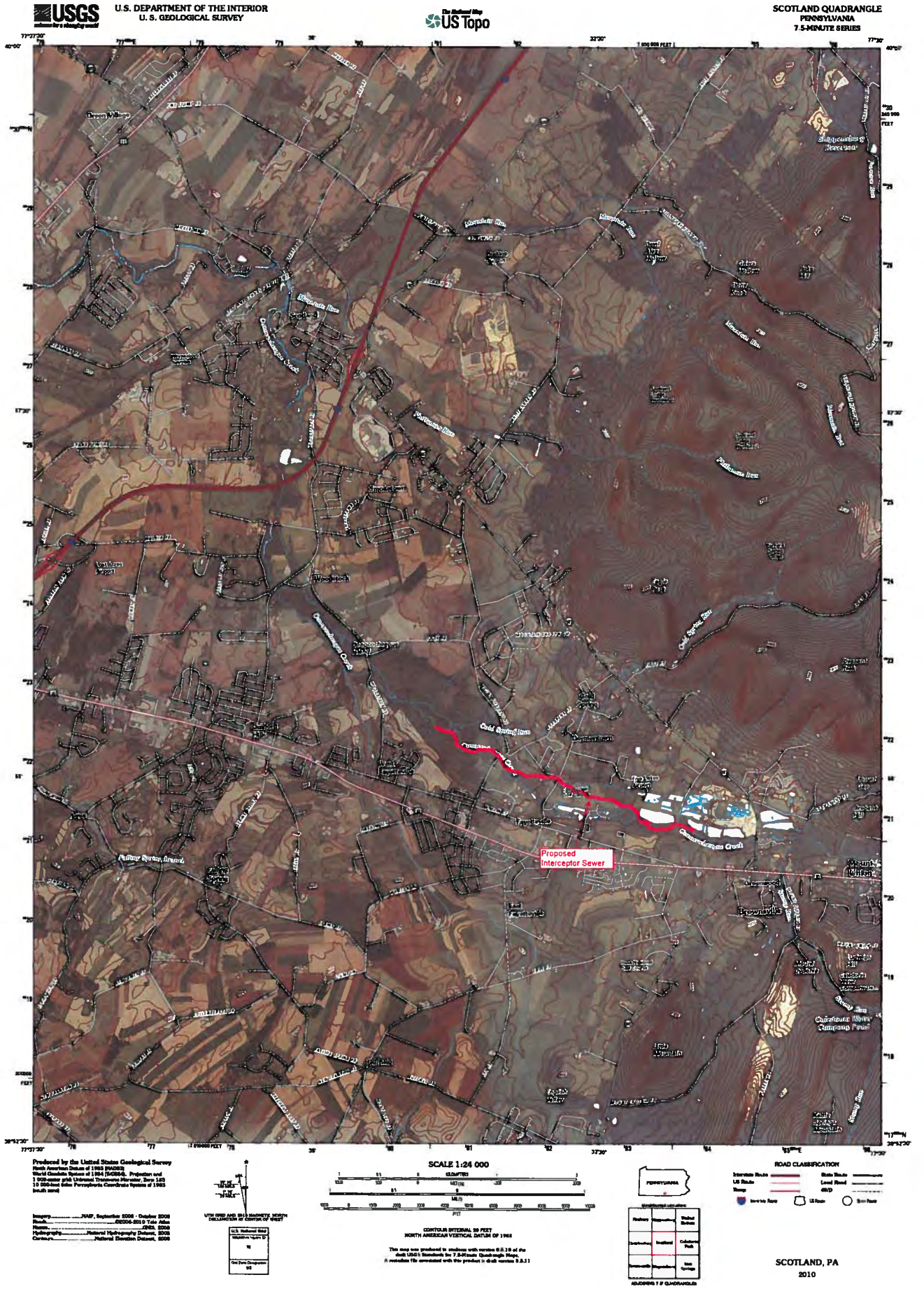
An estimate of the amount of land disturbance for the proposed interceptor sewers is included in Table 1. This estimate is based on the length of sewer with six-foot trenching. The proposed project does not include any modifications to existing buildings or disturbance of soils not previously disturbed by sanitary sewer construction.

TABLE 1: Estimated Amount of Earth Disturbance

Sewer Alternative	Description	Length of Sewer	Estimated Amount of Earth Disturbance (1)
1	Replace Existing Interceptor	12,800	5.9 acres
2	Parallel Sewer	12,560	5.8 acres

Notes:

(1) The majority of earth disturbance for Alternative 1 was previously disturbed during construction of the existing sewer. Alternative 2 will make use of the existing trench for the Greene Township Interceptor Sewer, as shown in Figure 1.


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U.S. DEPARTMENT OF THE INTERIOR
U. S. GEOLOGICAL SURVEY
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PENNSYLVANIA
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Pennsylvania Game Commission

Gannett Fleming

*Excellence Delivered **As Promised***

Gannett Fleming

Excellence Delivered As Promised

February 14, 2013

CERTIFIED MAIL: 7010 3090 0001 8677 7659
RETURN RECEIPT REQUESTED

PA Game Commission
Bureau of Wildlife Habitat Management
Division of Environmental Planning and Habitat Protection
2001 Elmerton Avenue
Harrisburg, PA 17110-9797

RE: Project Environmental Review Receipt
Potential Impact of Proposed Activity
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Ladies and Gentlemen:

Gannett Fleming is currently assisting Greene Township Municipal Authority (Authority) with planning under the Pennsylvania Sewage Facilities Act (Act 537). The planning has progressed to the point where alternatives have been developed specifically for conveyance of wastewater generated in Greene Township. A Pennsylvania Natural Diversity Inventory (PNDI) Project Environmental Review was performed. The PNDI review determined that additional review is necessary by the Pennsylvania Game Commission to resolve potential impacts from implementation of the alternatives. A signed copy of the Project Environmental Review is enclosed.

Wastewater generated in Greene Township, in portions of Guilford Township, and from the Chambersburg Water Treatment Plant is conveyed to the Chambersburg Wastewater Treatment Plant (WWTP) via sewage facilities owned by the Authority. The wastewater is conveyed by approximately 14 miles of Authority interceptor sewer from Greene Township to the Chambersburg Sewer System. As part of the Act 537 planning process, the Authority considered a number of wastewater management alternatives to adequately provide for its present and projected needs. The most cost effective wastewater management approach at this time for the Authority is to increase the capacity of the Authority's existing interceptor in the Fayetteville area of Greene Township.

There are two (2) alternatives that are being considered; (1) is to replace the existing interceptor sewer with a new larger sewer in the same location as the existing interceptor, and (2) is to rehabilitate the existing interceptor with new manholes and run a parallel sewer along the existing interceptor. Either alternative will be constructed within the Authority's existing sewer right-of-way.

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t: 717.763.7211 • f: 717.763.8150
www.gannettfleming.com

Discovery A-9 - Attachment 3

The first alternative will require the Authority to replace approximately 2.5 miles of existing sewer along Conococheague Creek, beginning north of New Lane and U.S. Route 30, and ending west of Mount Pleasant Road (State Route 1001) and north of 5th Avenue. The work will be conducted within the Authority's existing sewer right-of-way. The second alternative will add a sewer parallel to the existing sewer along the same route as Alternative 1 within the Authority's sewer right-of-way. The Greene Township's existing interceptor sewer is between 5 and 13 feet deep along the bank of the creek. The Authority's replacement or parallel interceptor will be placed at approximately the same depth in the same trench as the existing interceptor sewer, but offset to one side to provide future access to the line. This construction method should minimize the amount of new disturbance as most of the excavation will be in areas previously disturbed by Greene Township during the installation of its existing interceptor sewer.

Please find the enclosed documents demonstrating the extent of the project:

1. PNDI Project Environmental Review – Greene Township Municipal Authority – Interceptor Improvements (#20130205389416).
2. Project narrative including an estimate of earth disturbance.
3. 7.5' U.S.G.S. Map with defined boundary of the proposed activity.

This submission is intended to notify the Commission of the potential impact and request the appropriate action by the Commission to help resolve the potential impact. While a commitment has not been made to undertake the project shown in the mapping and explained in the project narrative, this information will be incorporated in planning assessments under the Pennsylvania Sewage Facility Act and in specific alternative proposals.

Please do not hesitate to call me at (717) 763-7212, Ext. 2393 if you have any questions regarding the Act 537 Plan. We look forward to your prompt response to this letter so that we can properly address any anticipated impacts in the sewage facilities planning.

Very truly yours,

GANNETT FLEMING, INC.
Environmental Resources Division

Heather M Ripley

HEATHER M. RIPLEY, E.I.T.
Planning Specialist
Water Practice

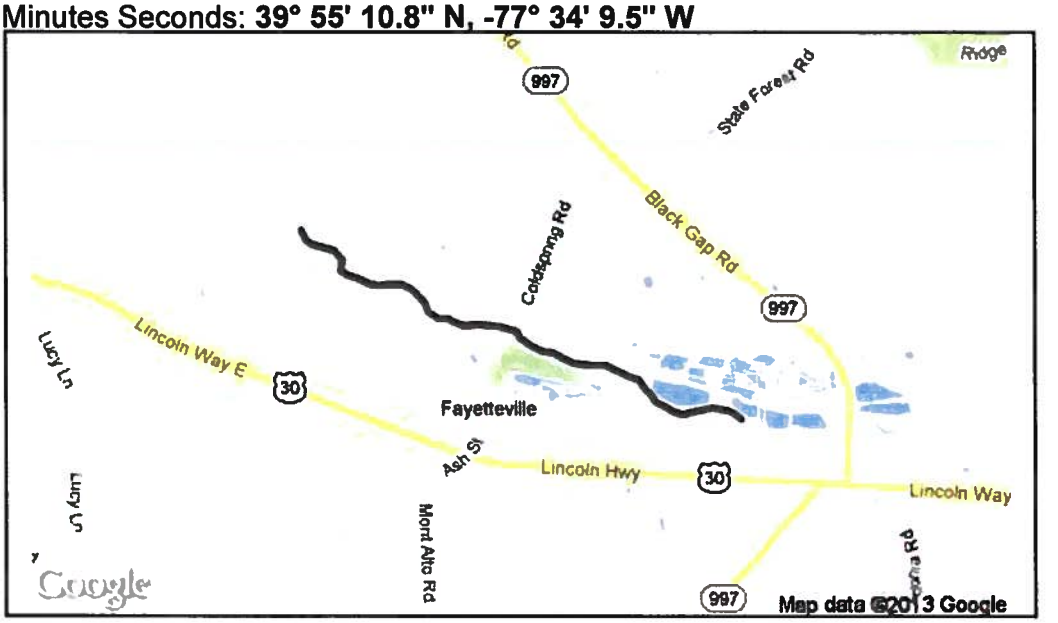
Enclosures

cc: W. Dwayne DelGrande, P.E. Authority Engineer

PNDI Project Environmental Review Receipt Project Search ID: 20130205389416

1. PROJECT INFORMATION

Project Name: **Greene Township Municipal Authority - Interceptor Improvements**
Date of review: **2/5/2013 8:23:57 AM**
Project Category: **Waste Transfer, Treatment, and Disposal,Liquid waste/Effluent,Sewage module/Act 537 plan**
Project Length: **12741.4** feet
County: **Franklin** Township/Municipality: **Greene**
Quadrangle Name: **SCOTLAND** ~ ZIP Code: **17222**
Decimal Degrees: **39.919676 N, -77.569313 W**
Degrees Minutes Seconds: **39° 55' 10.8" N, -77° 34' 9.5" W**



2. SEARCH RESULTS

Agency	Results	Response
PA Game Commission	**Potential Impact**	**FURTHER REVIEW IS REQUIRED, See Agency Response**
PA Department of Conservation and Natural Resources	**Potential Impact**	**FURTHER REVIEW IS REQUIRED, See Agency Response**
PA Fish and Boat Commission	**Potential Impact**	**FURTHER REVIEW IS REQUIRED, See Agency Response**
U.S. Fish and Wildlife Service	No Known Impact	No Further Review Required

As summarized above, Pennsylvania Natural Diversity Inventory (PNDI) records indicate there may be potential impacts to threatened and endangered and/or special concern species and resources within the project area. If the response above indicates "No Further Review Required" no additional communication with the respective agency is required. If the response is "Further Review Required" or "See Agency Response," refer to the appropriate agency comments below. Please see the DEP Information Section of this receipt if a PA Department of Environmental Protection Permit is required.

RESPONSE TO QUESTION(S) ASKED

Q1: Accurately describe what is known about wetland presence in the project area or on the land parcel. "Project" includes all features of the project (including buildings, roads, utility lines, outfall and intake structures, wells, stormwater retention/detention basins, parking lots, driveways, lawns, etc.), as well as all associated impacts (e.g., temporary staging areas, work areas, temporary road crossings, areas subject to grading or clearing, etc.). Include all areas that will be permanently or temporarily affected -- either directly or indirectly -- by any type of disturbance (e.g., land clearing, grading, tree removal, flooding, etc.). Land parcel = the lot(s) on which some type of project(s) or activity(s) are proposed to occur .
Your answer is: **2. The project area (or land parcel) has not been investigated by someone qualified to identify and delineate wetlands, or it is currently unknown if the project or project activities will affect wetlands.**

Q2: Aquatic habitat (stream, river, lake, pond, etc.) is located on or adjacent to the subject property and project activities (including discharge) may occur within 300 feet of these habitats
Your answer is: **3. Unknown**

3. AGENCY COMMENTS

Regardless of whether a DEP permit is necessary for this proposed project, any potential impacts to threatened and endangered species and/or special concern species and resources must be resolved with the appropriate jurisdictional agency. In some cases, a permit or authorization from the jurisdictional agency may be needed if adverse impacts to these species and habitats cannot be avoided.

These agency determinations and responses are **valid for two years** (from the date of the review), and are based on the project information that was provided, including the exact project location; the project type, description, and features; and any responses to questions that were generated during this search. If any of the following change: 1) project location, 2) project size or configuration, 3) project type, or 4) responses to the questions that were asked during the online review, the results of this review are not valid, and the review must be searched again via the PNDI Environmental Review Tool and resubmitted to the jurisdictional agencies. The PNDI tool is a primary screening tool, and a desktop review may reveal more or fewer impacts than what is listed on this PNDI receipt. The jursidictional agencies **strongly advise against** conducting surveys for the species listed on the receipt prior to consultation with the agencies.

PA Game Commission

RESPONSE: Further review of this project is necessary to resolve the potential impacts(s). Please send project information to this agency for review (see WHAT TO SEND).

PGC Species: (Note: The PNDI tool is a primary screening tool, and a desktop review may reveal more or fewer species than what is listed below.)
Scientific Name: Myotis septentrionalis
Common Name: Northern Myotis
Current Status: Special Concern Species*
Proposed Status: Special Concern Species*

PA Department of Conservation and Natural Resources

RESPONSE: Further review of this project is necessary to resolve the potential impacts(s). Please send

project information to this agency for review (see WHAT TO SEND).

DCNR Species: (Note: The PNDI tool is a primary screening tool, and a desktop review may reveal more or fewer species than what is listed below. After desktop review, if a botanical survey is required by DCNR, we recommend the DCNR Botanical Survey Protocols, available here: http://www.gis.dcnr.state.pa.us/hgis-er/PNDI_DCNR.aspx.)
Scientific Name: Carex prairea
Common Name: Prairie Sedge
Current Status: Threatened
Proposed Status: Threatened

Scientific Name: Juncus arcticus var. littoralis
Common Name: Baltic Rush
Current Status: Threatened
Proposed Status: Threatened

Scientific Name: Lathyrus palustris
Common Name: Vetchling
Current Status: Special Concern Species*
Proposed Status: Endangered

Scientific Name: Salix myricoides
Common Name: Broad-leaved Willow
Current Status: Special Concern Species*
Proposed Status: Endangered

PA Fish and Boat Commission

RESPONSE: Further review of this project is necessary to resolve the potential impacts(s). Please send project information to this agency for review (see WHAT TO SEND).

PFBC Species: (Note: The PNDI tool is a primary screening tool, and a desktop review may reveal more or fewer species than what is listed below.)
Scientific Name: Sensitive Species**
Common Name:
Current Status: Endangered
Proposed Status: Endangered

Scientific Name: Sensitive Species**
Common Name:
Current Status: Threatened
Proposed Status: Special Concern Species*

Scientific Name: Sensitive Species**
Common Name:
Current Status: Endangered
Proposed Status: Special Concern Species*

U.S. Fish and Wildlife Service

RESPONSE: No impacts to **federally** listed or proposed species are anticipated. Therefore, no further consultation/coordination under the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.* is required. Because no take of federally listed species is anticipated, none is authorized. This response does not reflect potential Fish and Wildlife Service concerns under the Fish and Wildlife Coordination Act or other authorities.

* Special Concern Species or Resource - Plant or animal species classified as rare, tentatively undetermined or candidate as well as other taxa of conservation concern, significant natural communities, special concern populations (plants or animals) and unique geologic features.
** Sensitive Species - Species identified by the jurisdictinal agency as collectible, having economic value, or being susceptible to decline as a result of visitation.

WHAT TO SEND TO JURISDICTIONAL AGENCIES

If **project information was requested by one or more of the agencies above,** send the following information to the agency(s) seeking this information (see AGENCY CONTACT INFORMATION).

Check-list of *Minimum* Materials to be submitted:

__✓__ **SIGNED** copy of this Project Environmental Review Receipt
__✓__ Project narrative with a description of the overall project, the work to be performed, current physical characteristics of the site and acreage to be impacted.
__✓__ Project location information (name of USGS Quadrangle, Township/Municipality, and County)
__✓__ USGS 7.5-minute Quadrangle with project boundary clearly indicated, and quad name on the map

The inclusion of the following information may expedite the review process.
____ A basic site plan(particularly showing the relationship of the project to the physical features such as wetlands, streams, ponds, rock outcrops, etc.)
____ Color photos keyed to the basic site plan (i.e. showing on the site plan where and in what direction each photo was taken and the date of the photos)
____ Information about the presence and location of wetlands in the project area, and how this was determined (e.g., by a qualified wetlands biologist), if wetlands are present in the project area, provide project plans showing the location of all project features, as well as wetlands and streams

4. DEP INFORMATION

The Pa Department of Environmental Protection (DEP) requires that a signed copy of this receipt, along with any required documentation from jurisdictional agencies concerning resolution of potential impacts, be submitted with applications for permits requiring PNDI review. For cases where a "Potential Impact" to threatened and

endangered species has been identified before the application has been submitted to DEP, the application should not be submitted until the impact has been resolved. For cases where "Potential Impact" to special concern species and resources has been identified before the application has been submitted, the application should be submitted to DEP along with the PNDI receipt. The PNDI Receipt should also be submitted to the appropriate agency according to directions on the PNDI Receipt. DEP and the jurisdictional agency will work together to resolve the potential impact(s). See the DEP PNDI policy at http://www.naturalheritage.state.pa.us.

5. ADDITIONAL INFORMATION

The PNDI environmental review website is a **preliminary** screening tool. There are often delays in updating species status classifications. Because the proposed status represents the best available information regarding the conservation status of the species, state jurisdictional agency staff give the proposed statuses at least the same consideration as the current legal status. If surveys or further information reveal that a threatened and endangered and/or special concern species and resources exist in your project area, contact the appropriate jurisdictional agency/agencies immediately to identify and resolve any impacts.

For a list of species known to occur in the county where your project is located, please see the species lists by county found on the PA Natural Heritage Program (PNHP) home page (www.naturalheritage.state.pa.us). Also note that the PNDI Environmental Review Tool only contains information about species occurrences that have actually been reported to the PNHP.

6. AGENCY CONTACT INFORMATION

PA Department of Conservation and Natural Resources
Bureau of Forestry, Ecological Services Section
400 Market Street, PO Box 8552, Harrisburg, PA. 17105-8552
Fax:(717) 772-0271

U.S. Fish and Wildlife Service
Endangered Species Section
315 South Allen Street, Suite 322, State College, PA. 16801-4851
NO Faxes Please.

PA Fish and Boat Commission
Division of Environmental Services
450 Robinson Lane, Bellefonte, PA. 16823-7437
NO Faxes Please

PA Game Commission
Bureau of Wildlife Habitat Management
Division of Environmental Planning and Habitat Protection
2001 Elmerton Avenue, Harrisburg, PA. 17110-9797
Fax:(717) 787-6957

7. PROJECT CONTACT INFORMATION

Name: HEATHER RIPLEY
Company/Business Name: GANNETT FLEMING
Address: PO BOX 67100
City, State, Zip: HARRISBURG, PA, 17106-7100
Phone: (717) 763-7211 Fax: (717) 763-1808
Email: hripley@gfnet.com

8. CERTIFICATION

I certify that ALL of the project information contained in this receipt (including project location, project size/configuration, project type, answers to questions) is true, accurate and complete. In addition, if the project type, location, size or configuration changes, or if the answers to any questions that were asked during this online review change, I agree to re-do the online environmental review.

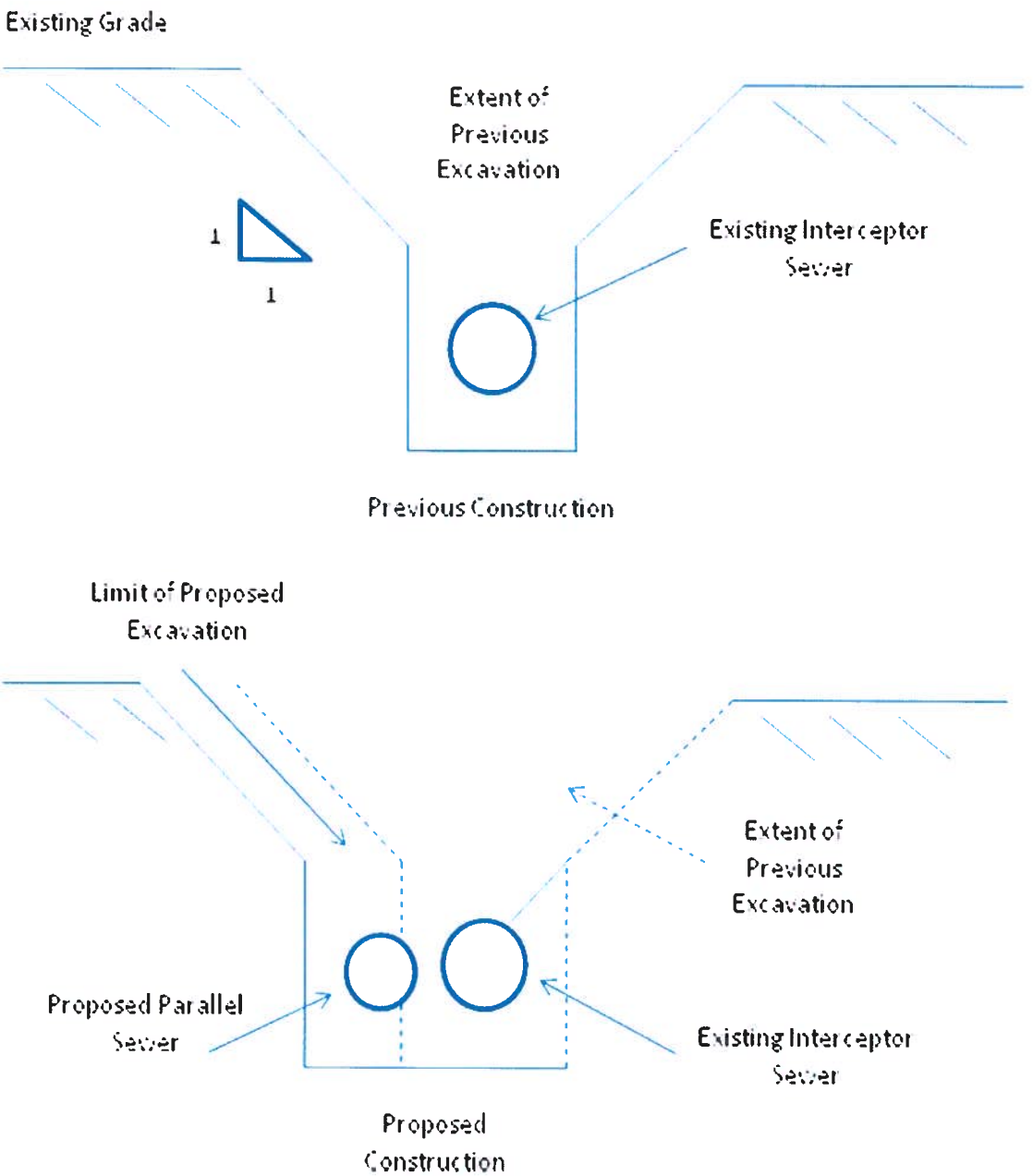
Heather M Ripley — applicant/project proponent signature
2/14/13 — date

PROJECT NARRATIVE

The proposed project will occur in Greene Township, located in Franklin County, Pennsylvania. Greene Township sewage, wastewater from the Chambersburg Water Treatment Plant and a portion of sewage from Guilford Township is conveyed to the Chambersburg Wastewater Treatment Plant (WWTP) by approximately 14 miles of existing interceptor sewers. As part of the Act 537 Planning process, Green Township Municipal Authority (Authority) considered a number of wastewater management alternatives to adequately provide for the existing and projected needs of Greene Township and the surrounding contributors. The most cost effective wastewater management alternative for the Authority was to increase capacity of an existing interceptor sewer in the Fayetteville and Oak Hill areas of Greene Township.

Two (2) alternatives are being considered for the proposed project. The first alternative will replace the existing interceptor sewer with a larger capacity sewer. This alternative will replace approximately 2.5 miles of existing sewer along Conococheague Creek, beginning north of New Lane and U.S. Route 30 and ending west of Mount Pleasant Road (State Route 1001) and north of 5th Avenue. The construction will be completed within the Authority's existing sewer right-of-way. The second alternative will add a parallel sewer to the existing interceptor to handle peak wet weather events. Approximately 2.5 miles of new sewer will be added along the same path as the first alternative. The construction associated with this alternative will be completed within the Authority's existing sewer right-of-way. The added sewer capacity will convey sewage generated in Fayetteville, Greene Knolls Basin including Caledonia State Park, Borough of Chambersburg WTP and Oak Hill. Figure 1 depicts the proposed construction technique for the parallel sewer.

FIGURE 1: ALTERNATIVE 2 PROPOSED CONSTRUCTION TECHNIQUE



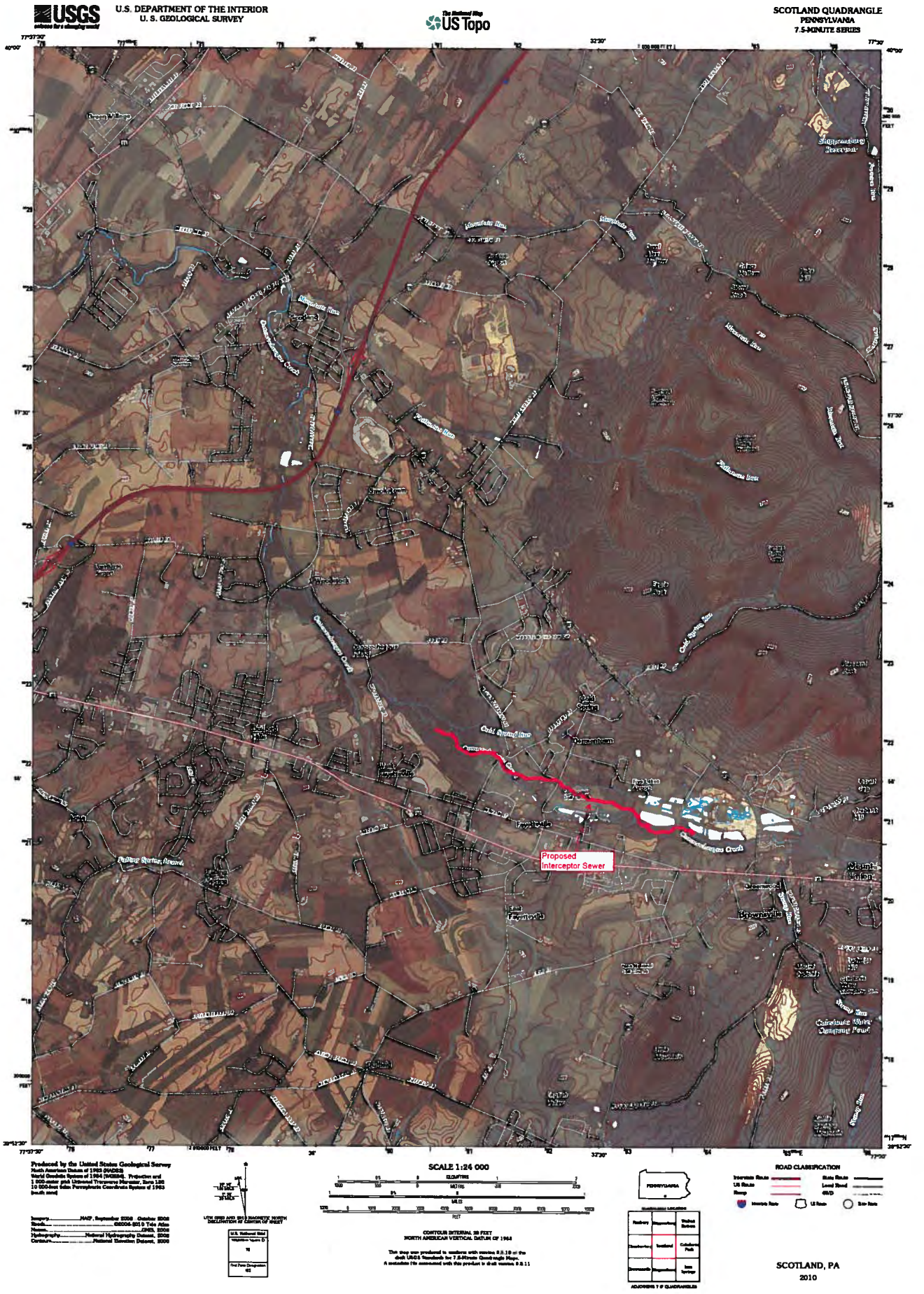
An estimate of the amount of land disturbance for the proposed interceptor sewers is included in Table 1. This estimate is based on the length of sewer with six-foot trenching. The proposed project does not include any modifications to existing buildings or disturbance of soils not previously disturbed by sanitary sewer construction.

TABLE 1: Estimated Amount of Earth Disturbance

Sewer Alternative	Description	Length of Sewer	Estimated Amount of Earth Disturbance (1)
1	Replace Existing Interceptor	12,800	5.9 acres
2	Parallel Sewer	12,560	5.8 acres

Notes:

(1) The majority of earth disturbance for Alternative 1 was previously disturbed during construction of the existing sewer. Alternative 2 will make use of the existing trench for the Greene Township Interceptor Sewer, as shown in Figure 1.


USGS
U.S. DEPARTMENT OF THE INTERIOR
U. S. GEOLOGICAL SURVEY
The National Map
US Topo
SCOTLAND QUADRANGLE
PENNSYLVANIA
7.5-MINUTE SERIES
Proposed
Interceptor Sewer
SCALE 1:24 000
CONTOUR INTERVAL 20 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988
ROAD CLASSIFICATION
SCOTLAND, PA
2010

Appendix E

Gannett Fleming

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Pennsylvania Natural Diversity Index Responses

Gannett Fleming

*Excellence Delivered **As Promised***

pennsylvania
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

BUREAU OF FORESTRY

February 26, 2013 **PNDI Number: 20130205389416**

Heather Ripley
Gannett Fleming, Inc.
P.O. Box 67100
Harrisburg, PA 17106
Email: hripley@gfnet.com (hard copy will not follow)

Re: Greene Township Municipal Authority – Interceptor Improvements
Greene Township, Franklin County, PA

Dear Ms. Ripley,

Thank you for the submission of the Pennsylvania Natural Diversity Inventory (PNDI) Environmental Review Receipt Number 20130205389416 for review. PA Department of Conservation and Natural Resources screened this project for potential impacts to species and resources under DCNR's responsibility, which includes plants, terrestrial invertebrates, natural communities, and geologic features only.

Potential Impact Anticipated

PNDI records indicate species or resources under DCNR's jurisdiction are located in the project vicinity. Based on a detailed PNDI review, DCNR determined potential impacts to the following threatened or endangered species or species of special concern.

Scientific Name	Common Name	PA Current Status	PA Proposed Status
Carex prairea	Prairie Sedge	Threatened	Threatened
Juncus arcticus var. *littoralis*	Baltic Rush	Threatened	Threatened
Lathyrus palustris	Marsh Vetchling	Undetermined	Endangered
Salix myricoides	Broad-leaved Willow	Not Listed	Endangered

Survey Request
DCNR requests a survey for the following species:

- ***Carex prairea* (Prairie Sedge):** prefers wet calcareous marshes and fens; fruits June – July
- ***Juncus arcticus var. littoralis* (Baltic Rush):** prefers calcareous swamps and shores; flowers/fruits late May – September
- ***Lathyrus palustris* (Marsh Vetchling):** prefers shores, moist meadows, sand plains, swamps, and thickets; flowers June – August
- ***Salix myricoides* (Broad-leaved Willow):** prefers stream banks and swamps; flowers in May

✓ A survey for the above species should be conducted by a qualified botanist *at the appropriate time of year and then submitted to our office for review*. **Your botanist should carefully review the new DCNR Botanical Survey Protocols available at http://www.gis.dcnr.state.pa.us/hgis-er/Login.aspx. These protocols are recommended to ensure that the all necessary information is collected and that survey reports are prepared properly. It is the expectation of DCNR that these protocols will be followed when conducting surveys for species under our jurisdiction.**

✓ Your botanist should *fill out the field survey form while performing their survey*: http://www.gis.dcnr.state.pa.us/hgis-er/hgis/Internet%20Field%20Survey%20Form_2007.pdf. Contact our office prior to the survey for detailed information about the species, or for a list of qualified surveyors.

- ✓ Any target and non-target state-listed species found during the site visit should be reported to our office. Mitigation measures and monitoring may be requested if species or communities of special concern are found on or adjacent to site.
- ✓ If the land type(s) does not exist on site, a survey may not be necessary; please submit a habitat assessment report which describes the current land cover, habitat types, and species found on site.

This response represents the most up-to-date review of the PNDI data files and is valid for two (2) years only. If project plans change or more information on listed or proposed species becomes available, our determination may be reconsidered. For PNDI project updates, please see the PNHP website at www.naturalheritage.state.pa.us for guidance. As a reminder, this finding applies to potential impacts under DCNR's jurisdiction only. Visit the PNHP website for directions on contacting the Commonwealth's other resource agencies for environmental review. Should you have any questions or concerns, please don't hesitate to contact me by phone (717-705-2822) or via email (c-jryndock@pa.gov).

Sincerely,

Jason Ryndock, Ecological Information Specialist
Bureau of Forestry, Ecological Services Section
Pennsylvania Natural Heritage Program

Rebecca H. Bowen, Section Chief
Bureau of Forestry, Ecological Services Section
Pennsylvania Natural Heritage Program

Appendix F

Gannett Fleming

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Pennsylvania Historical Museum Commission
Cultural Response Inquiry

Gannett Fleming

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Gannett Fleming

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February 12, 2013

CERTIFIED MAIL: 7010 3090 0001 8677 7628
RETURN RECEIPT REQUESTED

Pennsylvania Historical and Museum Commission
Bureau of Historic Preservation
Commonwealth Keystone Building
400 North Street, Second Floor
Harrisburg, PA 17120-0093

RE: Notification of Potential Effect of Proposed Action
On Archaeological and Historical Resources
Greene Township Municipal Authority, Franklin County

Ladies and Gentlemen:

Gannett Fleming is currently assisting Greene Township Municipal Authority (Authority) with planning under the Pennsylvania Sewage Facilities Act (Act 537). The planning has progressed to the point where alternatives have been developed specifically for conveyance of wastewater generated in Greene Township. The Act 537 planning regulations require the Authority to determine if the alternatives will have an impact on archaeological or historical resources.

Wastewater generated in Greene Township, in portions of Guilford Township, and from the Chambersburg Water Treatment Plant is conveyed to the Chambersburg Wastewater Treatment Plant (WWTP) via sewage facilities owned by the Authority. The wastewater is conveyed by approximately 14 miles of Authority interceptor sewer from Greene Township to the Chambersburg Sewer System. As part of the Act 537 planning process, the Authority considered a number of wastewater management alternatives to adequately provide for its present and projected needs. The most cost effective wastewater management approach at this time for the Authority is to increase the capacity of the Authority's existing interceptor in the Fayetteville area of Greene Township.

There are two (2) alternatives that are being considered; (1) is to replace the existing interceptor sewer with a new larger sewer in the same location as the existing interceptor, and (2) is to rehabilitate the existing interceptor with new manholes and run a parallel sewer along the existing interceptor. Either alternative will be constructed within the Authority's existing sewer right-of-way.

The first alternative will require the Authority to replace approximately 2.5 miles of existing sewer along Conococheague Creek, beginning north of New Lane and U.S. Route 30, and ending west of Mount Pleasant Road (State Route 1001) and north of 5th Avenue. The work will be conducted within the Authority's existing sewer right-of-way. The second alternative will add a sewer parallel to the existing sewer along the same route as Alternative 1 within the

Gannett Fleming, Inc.

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www.gannettfleming.com

Discovery A-9 - Attachment 3

Authority's sewer right-of-way. The Greene Township's existing interceptor sewer is between 5 and 13 feet deep along the bank of the creek. The Authority's replacement or parallel interceptor will be placed at approximately the same depth in the same trench as the existing interceptor sewer, but offset to one side to provide future access to the line. This construction method should minimize the amount of new disturbance as most of the excavation will be in areas previously disturbed by Greene Township during the installation of its existing interceptor sewer.

Please find the enclosed documents demonstrating the extent of the project:

1. Completed Cultural Resource Notice.
2. Project narrative including an estimate of earth disturbance.
3. 7.5' U.S.G.S. Map with defined boundary of the proposed activity.

This submission is intended to notify the Commission of the potential effect of a proposed action on an archaeological or historical resource in accordance with the Pennsylvania Historic Preservation Act, 37 PA, CSA, Section 501-502. We understand the Commission will advise the Authority within 15 days of the receipt of this notice if the proposed projects will not affect a known archaeological or historical resource or, if a significant known archaeological or historical resource, as determine by the Commission using Secretary of Interior criteria for determining resource significant, required protection or if a "high probability archaeological area" could be affected by the proposed sewage facilities. While a commitment has not been made to undertake either of the two alternatives both in the same location as shown on the map and explained in the project narrative, this information will be incorporated in the planning assessments under the Pennsylvania Sewage Facility Act and in specific alternative proposals.

Please do not hesitate to call me at (717) 763-7212, Ext. 2393 if you have any questions regarding the Act 537 Plan. We look forward to your prompt response to this letter so that we can properly address any anticipated impacts in the sewage facilities planning.

Very truly yours,

GANNETT FLEMING, INC.
Environmental Resources Division

Heather M Ripley

HEATHER M. RIPLEY, E.I.T.
Planning Specialist
Water Practice

Enclosures

cc: W. Dwayne DelGrande, P.E. Authority Engineer

Discovery A-9 - Attachment 3

0120-PM-PY0003 Rev. 5/2006
NOTICE

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

CULTURAL RESOURCE NOTICE

DEP USE ONLY
Date Received

Read the instructions before completing this form.

SECTION A. APPLICANT IDENTIFIER

Applicant Name: Greene Township Municipal Authority

Street Address: 4182 Sunset Pike

City: Chambersburg State: PA Zip: 17202

Telephone Number: 717-263-5324

Project Title: Interceptor Improvements

SECTION B. LOCATION OF PROJECT

Municipality: Greene Township County Name: Franklin DEP County Code: 28

SECTION C. PERMITS OR APPROVALS

Name of Specific DEP Permit or Approval Requested:

Anticipated federal permits:

- ☐ Surface Mining
- ☒ Army Corps of Engineers
- ☐ 401 Water Quality Certification
- ☐ 404 Water Quality Permit
- ☐ Federal Energy Regulatory Commission
- ☒ Other: Act 537 Plan Approval, WQM Part II Permit, NPDES Permit

SECTION D. GOVERNMENT FUNDING SOURCES

- ☐ State: (Name)
- ☒ Local: (Name) Existing Authority Funds
- ☐ Federal: (Name)
- ☐ Other: (Name)

SECTION E. RESPONSIBLE DEP REGIONAL, CENTRAL, DISTRICT MINING or OIL & GAS MGMT OFFICE

DEP Regional Office Responsible for Review of Permit Application

- ☐ Central Office (Harrisburg)
- ☐ Southeast Regional Office (Norristown)
- ☐ Northeast Regional Office (Wilkes-Barre)
- ☒ Southcentral Regional Office (Harrisburg)
- ☐ Northcentral Regional Office (Williamsport)
- ☐ Southwest Regional Office (Pittsburgh)
- ☐ Northwest Regional Office (Meadville)
- ☐ District Mining Office:
- ☐ Oil & Gas Office:

SECTION F. RESPONSIBLE COUNTY CONSERVATION DISTRICT, if applicable.

County Conservation District	Telephone Number, if known
Franklin County Conservation District	717-264-5499

SECTION G. CONSULTANT

Consultant, if applicable: Gannett Fleming, Inc.

Street Address: P.O. Box 67100

City: Harrisburg State: PA Zip: 17106-7100

Telephone Number: 717-763-7212 ext. 2393

SECTION H. PROJECT BOUNDARIES AND DESCRIPTION

REQUIRED

Indicate the total acres in the property under review. Of this acreage, indicate the total acres of earth disturbance for the proposed activity.

Attach a 7.5' U.S.G.S. Map indicating the defined boundary of the proposed activity.

Attach photographs of any building over 50 years old. Indicate what is to be done to all buildings in the project area. N/A

Attach a narrative description of the proposed activity.

Attach the return receipt of delivery of this notice to the Pennsylvania Historical and Museum Commission.

REQUESTED

Attach photographs of any building over 40 years old.

Attach site map, if available.

SECTION I. SIGNATURE BLOCK

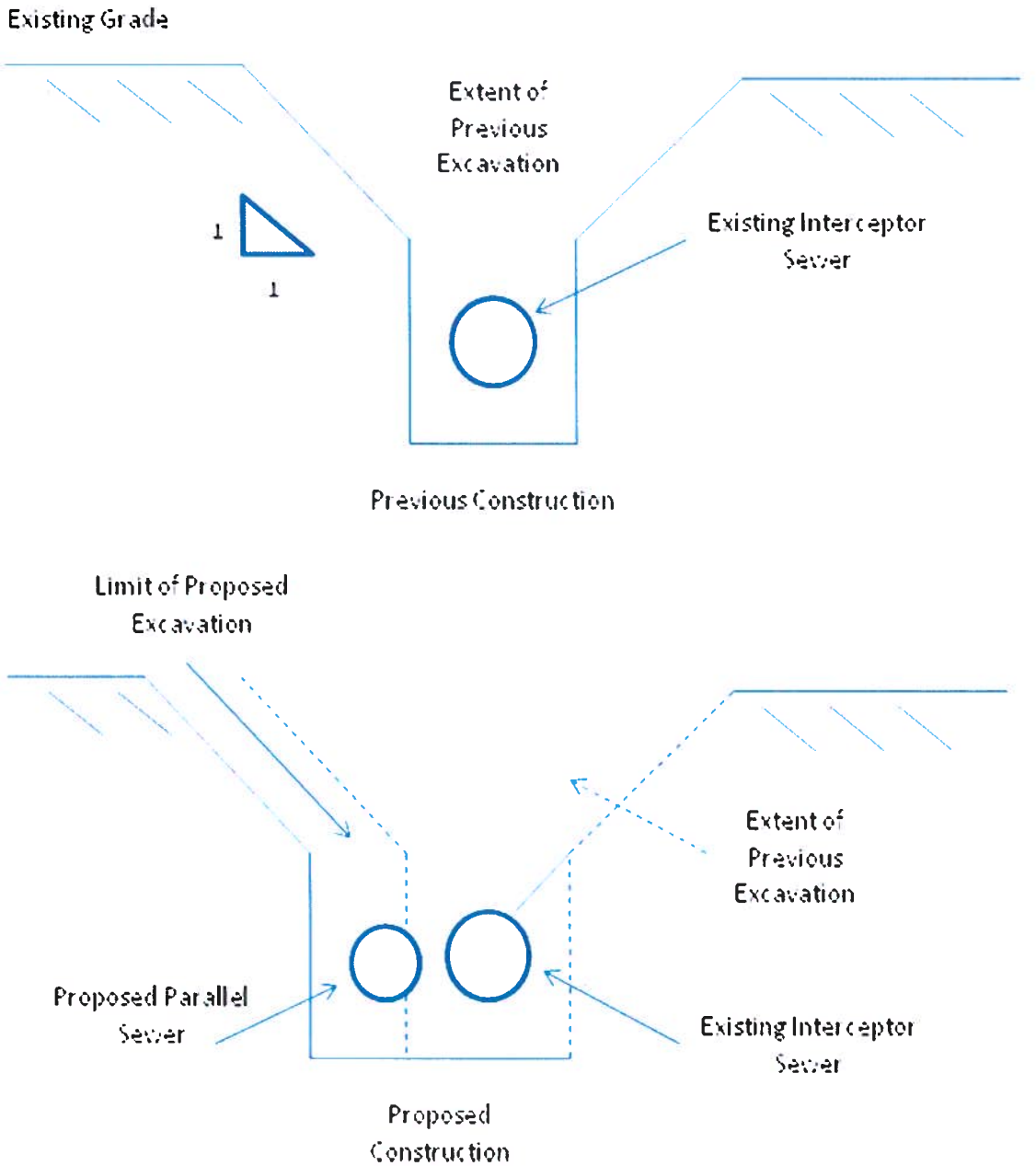
Applicant's Signature	Date of Submission of Notice to PHMC
Heather M Ripley	2/12/2013

PROJECT NARRATIVE

The proposed project will occur in Greene Township, located in Franklin County, Pennsylvania. Greene Township sewage, wastewater from the Chambersburg Water Treatment Plant and a portion of sewage from Guilford Township is conveyed to the Chambersburg Wastewater Treatment Plant (WWTP) by approximately 14 miles of existing interceptor sewers. As part of the Act 537 Planning process, Green Township Municipal Authority (Authority) considered a number of wastewater management alternatives to adequately provide for the existing and projected needs of Greene Township and the surrounding contributors. The most cost effective wastewater management alternative for the Authority was to increase capacity of an existing interceptor sewer in the Fayetteville and Oak Hill areas of Greene Township.

Two (2) alternatives are being considered for the proposed project. The first alternative will replace the existing interceptor sewer with a larger capacity sewer. This alternative will replace approximately 2.5 miles of existing sewer along Conococheague Creek, beginning north of New Lane and U.S. Route 30 and ending west of Mount Pleasant Road (State Route 1001) and north of 5th Avenue. The construction will be completed within the Authority's existing sewer right-of-way. The second alternative will add a parallel sewer to the existing interceptor to handle peak wet weather events. Approximately 2.5 miles of new sewer will be added along the same path as the first alternative. The construction associated with this alternative will be completed within the Authority's existing sewer right-of-way. The added sewer capacity will convey sewage generated in Fayetteville, Greene Knolls Basin including Caledonia State Park, Borough of Chambersburg WTP and Oak Hill. Figure 1 depicts the proposed construction technique for the parallel sewer.

FIGURE 1: ALTERNATIVE 2 PROPOSED CONSTRUCTION TECHNIQUE



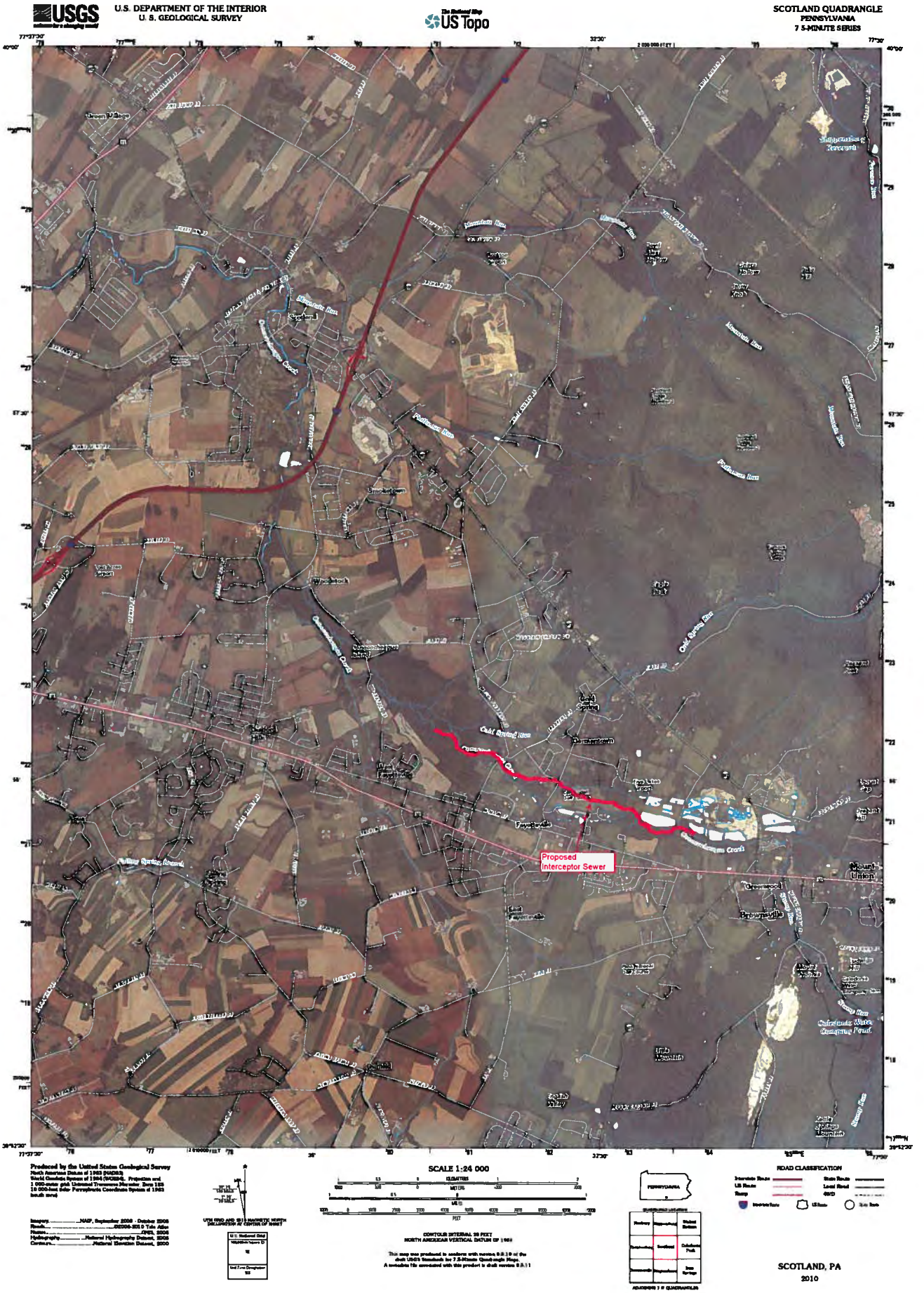
An estimate of the amount of land disturbance for the proposed interceptor sewers is included in Table 1. This estimate is based on the length of sewer with six-foot trenching. The proposed project does not include any modifications to existing buildings. Photographs of buildings over 50-years old are therefore not applicable.

TABLE 1: Estimated Amount of Earth Disturbance

Sewer Alternative	Description	Length of Sewer	Estimated Amount of Earth Disturbance (1)
1	Replace Existing Interceptor	12,800	5.9 acres
2	Parallel Sewer	12,560	5.8 acres

Notes:

(1) The majority of earth disturbance for Alternative 1 was previously disturbed during construction of the existing sewer. Alternative 2 will make use of the existing trench for the Greene Township Interceptor Sewer, as shown in Figure 1.


U.S. DEPARTMENT OF THE INTERIOR
U. S. GEOLOGICAL SURVEY
USGS
US Topo
SCOTLAND QUADRANGLE
PENNSYLVANIA
7.5-MINUTE SERIES
Proposed
Interceptor Sewer
SCALE 1:24 000
CONTOUR INTERVAL 20 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988
ROAD CLASSIFICATION
SCOTLAND, PA
2010

Appendix G

Gannett Fleming

*Excellence Delivered **As Promised***

Pennsylvania Historical Museum Commission Response

Gannett Fleming

*Excellence Delivered **As Promised***

Discovery A-9 - Attachment 3

Commonwealth of Pennsylvania
Pennsylvania Historical and Museum Commission
Bureau for Historic Preservation
Commonwealth Keystone Building, 2nd Floor
400 North Street
Harrisburg, PA 17120-0093
www.phmc.state.pa.us

February 21, 2013

Heather M. Ripley, E.I.T.
Gannett Fleming, Inc.
P.O. Box 67100
Harrisburg, PA 17106-7100

TO EXPEDITE REVIEW USE
BHP REFERENCE NUMBER

Re: File No. ER 2013-0907-055-A
COE Act 537 Plan Approval, WQM Part II
Permit, NPDES Permit: Greene Township
Municipal Authority Interceptor Improvements
Greene Twp., Franklin Co.

Dear Ms. Ripley:

Thank you for submitting information concerning the above referenced project. The Bureau for Historic Preservation (the State Historic Preservation Office) reviews projects in accordance with state and federal laws. Section 106 of the National Historic Preservation Act of 1966, and the implementing regulations (36 CFR Part 800) of the Advisory Council on Historic Preservation, is the primary federal legislation. The Environmental Rights amendment, Article 1, Section 27 of the Pennsylvania Constitution and the Pennsylvania History Code, 37 Pa. Cons. Stat. Section 500 et seq. (1988) is the primary state legislation. These laws include consideration of the project's potential effects on both historic and archaeological resources.

Archaeology

Alternative No. 1

There is a high probability that archaeological resources are located in this project area. In our opinion, the activity described in your proposal should have no effect on such resources. Should the scope of the project be amended to include additional ground disturbing activity this office should be contacted immediately and a Phase I Archaeological Survey may be necessary to locate all potentially significant archaeological resources.

Alternative No. 2

Based on an evaluation by our staff, there is a high probability that significant archaeological sites are located in this project area and could be adversely affected by project activities. Although there are no recorded archaeological sites within the project boundaries, the soil type, topographic setting, slope direction, and distance to water of the project area are similar to the settings of known archaeological sites in the vicinity. A Phase I archaeological survey of the project area is required to locate potentially significant archaeological resources. Guidelines and instructions for conducting Phase I surveys are available on our web site or from our office upon request.

Historic Structures

There may be historic buildings, structures, districts, and/or objects eligible for the National Register of Historic Places located in the project area. However, in our opinion, the activity described in your proposal should have no effect on such resources. Should the scope and/or nature of the project activities change, the Bureau for Historic Preservation should be contacted immediately.

If you need further information in this matter please consult Doug McLearen at (717) 772-0925.

Sincerely,

Douglas C. McLearen, Chief
Division of Archaeology &
Protection

cc: Greene Township Municipal Authority, 4182 Sunset Pike, Chambersburg, PA 17202
COE, Baltimore District
DEP, Southcentral Regional Office

DCM/tmw

Appendix H

Gannett Fleming

*Excellence Delivered **As Promised***

Planning Level Opinion of Probable Costs

Gannett Fleming

*Excellence Delivered **As Promised***

TABLE H-1

PLANNING LEVEL ESTIMATED PROJECT COSTS

ALTERNATIVE NO. 1[(1)]

Item Description	Estimated Quantities	Unit	Cost/Unit	Cost
Mobilization and Demobilation	1	LS	$ 50,000	$ 50,000
24-inch DIP Sewer	12,374	LF	$ 200	$ 2,474,800
Reconnect 8-inch Existing Sewer [(2)]	6	Each	$ 2,000	$ 12,000
Reconnect 10-inch Existing Sewer	2	Each	$ 2,200	$ 4,400
Reconnect 12-inch Existing Sewer	1	Each	$ 2,400	$ 2,400
Reconnect 15-inch Existing Sewer	1	Each	$ 2,600	$ 2,600
Connect 24-inch New Sewer	42	Each	$ 3,200	$ 134,400
4 foot Manhole (new)	44	Each	$ 4,000	$ 176,000
Manhole Frame and Cover	44	Each	$ 450	$ 19,800
Abandon Manhole (existing)	44	Each	$ 3,000	$ 132,000
Grading and Seeding	1	LS	$ 5,400	$ 5,400
By-pass Pumping	6	Month	$ 45,000	$ 270,000
Stream Crossing	526	LF	$ 680	$ 357,680
Concrete Encasement	526	LF	$ 350	$ 184,100
Contingency			20%	$ 770,000
		Estimated Construction Cost		$ 4,600,000
Engineering, Legal, Financial, and Administration			25%	$ 1,100,000
		ESTIMATED PROJECT COST		$ 5,700,000

Notes:

(1) Unit costs include excavation, bedding, and initial backfill materials.

(2) Assume forcemain connection is 8-inches in diameter.

TABLE H-2

PLANNING LEVEL ESTIMATED PROJECT COSTS

ALTERNATIVE NO. 2[(1)(2)]

Item Description	Estimated Quantities	Unit	Cost/Unit	Cost
Mobilization and Demobilation	1	LS	$ 50,000	$ 50,000
12-inch DIP Sewer	6,697	LF	$ 120	$ 803,640
12-inch pipe lay (0-12 feet deep)	6,697	LF	$ 60	$ 401,820
Reconnect 10-inch Existing Sewer	1	Each	$ 2,200	$ 2,200
Reconnect 12-inch Existing Sewer	9	Each	$ 2,400	$ 21,600
18-inch DIP Sewer	5,949	LF	$ 170	$ 1,011,330
18-inch pipe lay (0-12 feet deep)	5,949	LF	$ 40	$ 237,960
4 foot Manhole (new)	43	Each	$ 4,000	$ 172,000
Manhole Frame and Cover	43	Set	$ 450	$ 19,350
Rehabilitate Manhole (existing)	330	Vertical LF	$ 230	$ 75,900
Grading and Seeding	1	LS	$ 5,400	$ 5,400
Stream Crossing	526	LF	$ 680	$ 357,680
Concrete Encasement	526	LF	$ 350	$ 184,100
Contingency			20%	$ 670,000
			Estimated Construction Cost	$ 4,000,000
Engineering, Legal, Financial, and Administration			25%	$ 1,000,000
			ESTIMATED PROJECT COST	$ 5,000,000

Notes:

(1) Unit costs include excavation, bedding, and initial backfill materials.

(2) Land acquisition and ROWs not included in costs.

Discovery A-9 - Attachment 4

TABLE OF CONTENTS

VOLUME 1 OF 2

ADMINISTRATIVE COMPLETENESS CHECKLIST

EXECUTIVE SUMMARY

1.0 PREVIOUS WASTEWATER PLANNING

1.1 INTRODUCTION
1.2 IDENTIFICATION AND ANALYSIS OF EXISTING WASTEWATER PLANNING
1.3 PLANNING MODULES
1.4 PLANNING BY APPLICABLE MUNICIPAL AUTHORITY
1.5 IDENTIFICATION AND ANALYSIS OF EXISTING MUNICIPAL AND COUNTY PLANNING DOCUMENTS ADOPTED PURSUANT ACT 247

2.0 PHYSICAL AND DEMOGRAPHIC ANALYSES

2.1 IDENTIFICATION OF PLANNING AREA
2.2 TOPOGRAPHY AND SLOPES ANALYSIS
2.3 GEOLOGY/HYDROLOGY
2.4 SOILS
2.5 PRIME AGRICULTURAL LANDS
2.6 POTABLE WATER SUPPLIES
2.7 WETLANDS
2.8 FLOODPLAINS
2.9 SOLID WASTE MANAGEMENT
2.10 STORMWATER MANAGEMENT
2.11 HISTORICAL AND ARCHAEOLOGICAL AREAS
2.12 POPULATION

3.0 EXISTING SEWAGE FACILITIES

3.1 IDENTIFICATION AND EVALUATION OF EXISTING WASTEWATER TREATMENT AND CONVEYANCE SYSTEMS
3.2 CHAMBERSBURG REGIONAL WASTEWATER TREATMENT PLANT
3.3 EXISTING SMALL FLOW TREATMENT FACILITIES OPERATIONS AND MAINTENANCE REQUIREMENTS
3.4 INDIVIDUAL WATER SUPPLY SURVEY

4.0 FUTURE GROWTH AND LAND DEVELOPMENT

4.1 SUMMARY OF MUNICIPAL AND COUNTY PLANNING DOCUMENTS

Discovery A-9 - Attachment 4

TABLE OF CONTENTS

VOLUME 1 OF 2

ADMINISTRATIVE COMPLETENESS CHECKLIST

EXECUTIVE SUMMARY

1.0 PREVIOUS WASTEWATER PLANNING

1.1 INTRODUCTION
1.2 IDENTIFICATION AND ANALYSIS OF EXISTING WASTEWATER PLANNING
1.3 PLANNING MODULES
1.4 PLANNING BY APPLICABLE MUNICIPAL AUTHORITY
1.5 IDENTIFICATION AND ANALYSIS OF EXISTING MUNICIPAL AND COUNTY PLANNING DOCUMENTS ADOPTED PURSUANT ACT 247

2.0 PHYSICAL AND DEMOGRAPHIC ANALYSES

2.1 IDENTIFICATION OF PLANNING AREA
2.2 TOPOGRAPHY AND SLOPES ANALYSIS
2.3 GEOLOGY/HYDROLOGY
2.4 SOILS
2.5 PRIME AGRICULTURAL LANDS
2.6 POTABLE WATER SUPPLIES
2.7 WETLANDS
2.8 FLOODPLAINS
2.9 SOLID WASTE MANAGEMENT
2.10 STORMWATER MANAGEMENT
2.11 HISTORICAL AND ARCHAEOLOGICAL AREAS
2.12 POPULATION

3.0 EXISTING SEWAGE FACILITIES

3.1 IDENTIFICATION AND EVALUATION OF EXISTING WASTEWATER TREATMENT AND CONVEYANCE SYSTEMS
3.2 CHAMBERSBURG REGIONAL WASTEWATER TREATMENT PLANT
3.3 EXISTING SMALL FLOW TREATMENT FACILITIES OPERATIONS AND MAINTENANCE REQUIREMENTS
3.4 INDIVIDUAL WATER SUPPLY SURVEY

4.0 FUTURE GROWTH AND LAND DEVELOPMENT

4.1 SUMMARY OF MUNICIPAL AND COUNTY PLANNING DOCUMENTS

4.2 DELINEATION AND ANALYSIS OF DEVELOPMENT, LAND USE, AND FUTURE GROWTH AREAS
4.3 LAND USE DESIGNATION UNDER 53 P.S. 10101-11201

5.0 ALTERNATIVES TO PROVIDE NEW OR IMPROVED WASTEWATER DISPOSAL FACILITIES

5.1 CONVENTIONAL COLLECTION, CONVEYANCE, TREATMENT, AND DISCHARGE ALTERNATIVES
5.2 NEED FOR CONSTRUCTION OF NEW COMMUNITY SEWAGE SYSTEMS
5.3 USE OF COMMUNITY LAND DEVELOENT ALTERNATIVES
5.4 NEEDS ASSESSMENT

6.0 EVALUATION OF ALTERNATIVES

6.1 RESOLUTION OF INCONSISTENCIES
6.2 EVALUATION OF ALTERNATIVES
6.3 COST ESTIMATES USING PERSENT WORTH ANALYSIS FOR CONSTRUCTION AND FINANCEING
6.4 ANALYSIS OF FUNDING METHODS
6.5 ABILITY TO IMPLEMENT PROPOSED EXPANSIONS

7.0 INSTITUTIONAL EVALUATION

7.1 ANALYSIS OF EXISTING SEWAGE TREATMENT AUTHORITIES
7.2 DESCRIPTIONS AND ANALYSIS OF VARIOUS INSTITUTIONAL ALTERNATIVES
7.3 ADMINISTRATIVE AND LEGAL ACTIVITIES NECESSARY TO IMPLEMENT ALTERNATIVE
7.4 HAMILTON TOWNSHIP/LETTERKENNY TOWNSHIP RELATIONSHIP

8.0 IMPLEMENTATION SCHEDULE AND JUSTIFICATION FOR SELECTED TECHNICAL AND INSTITUTIONAL ALTERNATIVES

8.1 DESIGNATION AND DESCRIPTION OF CAPITAL FINANCIAL PLAN
8.2 IMPLEMENTATION SCHEDULE

Discovery A-9 - Attachment 4

MAPS

Map 2.1 Hamilton Township, Franklin County and Surrounding Region

Map 2.2.A. Topography of Hamilton Township

Map 2.2.B. Topographic Slopes of Hamilton Township

Map 2.3 Geology of Hamilton Township

Map 2.4 Soil Classifications of Hamilton Township

Map 2.5 Prime Agricultural Land of Hamilton Township

Map 2.6 Areas Serviced by Public Water Supply, Hamilton Township

Map 2.7 Wetlands, Hamilton Township

Map 2.8 Floodplains, Hamilton Township

Map 3.1.1. Sanitary Sewer Collection and Conveyance System, Hamilton Township

Map 3.3.4. On-lot Wastewater Management System Locations, Hamilton Township

Map 3.3.5.A. On-lot Wastewater Management Systems and Soil Types, Hamilton Township

Map 3.3.5.A.1. On-lot Wastewater Management Systems and Soil Types, Old Kensington Heights, Letterkenny Township

Map 3.3.5.B. On-lot Wastewater Management Systems and Topographic Slope, Hamilton Township

Map 3.3.5.B.1. On-lot Wastewater Management Systems and Topographic Slope, Old Kensington Heights, Letterkenny Township

Map 3.3.5.C. On-lot Wastewater Management Systems and Floodplain/Wetlands, Hamilton Township

Map 3.3.5.D. On-lot Wastewater Management Systems and Groundwater Samples, Hamilton Township

Map 3.4.1 Residential Well Water Sample Locations and Analytical Data Summary, Hamilton Township

Map 4.3.1.1. Designated Growth and Development Areas, Hamilton Township, Franklin County

EXECUTIVE SUMMARY

This Pennsylvania Act 537 Plan dated December 2006 was prepared by Hamilton Township in order to define and respond to Township wastewater collection and disposal needs during the planning period, 2006 through 2017.

The goals of this plan are to protect the health of residents and the environment within the service area of the Hamilton Township Municipal Authority (HTMA). In order to accomplish these goals this plan defines the current and anticipated service area conditions with respect to population, growth and development, wastewater infrastructure, water supply, and solid waste management for a ten year planning period. This plan also provides technical and financial mechanisms that will allow the Township to address current and anticipated future wastewater needs.

A. PUBLIC WASTEWATER FACILITIES

It is anticipated that the HTMA service area will experience continued population growth and land development during the next ten year period, 2007 to 2017. This growth will occur primarily in residential development with corresponding proportional growth in the commercial and retail sectors.

Existing wastewater management infrastructure is generally capable of accommodating the anticipated growth with respect to hydraulic capacity. Completion or construction of extensions of the existing collection and conveyance system will be required in order to address all geographic areas of development. These areas primarily include the southern portion of the Township at Housum and Cashtown and the northern portion of the Township at the Kensington Heights area in Letterkenny Township. Once this infrastructure is provided, growth will be restricted by available wastewater treatment capacity as defined by the service agreement between Hamilton Township and the Borough of Chambersburg (Chambersburg Regional Wastewater Treatment Plant) and by the nutrient removal efficiency of the Chambersburg Regional Wastewater Treatment Plant.

Public wastewater management infrastructure is supplemented throughout the Township by use of individual on-lot wastewater disposal systems. These systems, both existing and as part of approved residential developments, will continue to play a significant role in the management of Township wastewater for the foreseeable future. Use of individual on-lot disposal systems will be limited, however, to existing on-lot systems for which there is no feasible alternative and to new on-lot systems in areas where land use, soil types, slopes, siting, and percolation rates meet regulatory requirements.

B. SEWER SERVICE AREA

The existing sewer service area includes portions of northeast, central, and south central Hamilton Township. The service area also includes the Kensington Heights development in both Hamilton Township and Letterkenny Township, based on an inter-municipality service agreement. The agreement provides for planned collection and conveyance of

sewage from the old and new Kensington Heights developments to the Chambersburg Regional Wastewater Treatment Plant using the HTMA collection and conveyance system.

C. ALTERNATIVES OF CHOICE

An extension of the sanitary collection and conveyance system in the Housum area of the Township has been constructed and is anticipated to be complete within the next two years. A preliminary evaluation of the need for design, financing, and construction of a sanitary sewer service connection between old Kensington Heights and the existing Hamilton Township Municipal Authority (HTMA) collection and conveyance system was conducted in 2006 as part of this update. The evaluation concluded that it would be beneficial to the residents of this neighborhood to be connected to the HTMA system due to low permeability of soils and topographic slopes present in the area. However, responses by residents to a survey of the on-lot systems in the area did not identify a significant number of malfunctioning on-lot systems. Similarly, there were no malfunctioning systems on record with the sewage compliance officer. Lastly, all of the residents in the old Kensington Heights development are supplied with potable public water. As a result, it is recommended that existing resources be directed to completion of the Housum area extension with the proposed Kensington Heights extension being addressed as resources become available after completion of the Housum area extension. No other significant extension of the existing collection and conveyance system is anticipated by HTMA during this planning period.

The current growth and development rate within Hamilton Township is anticipated to continue for the next ten year planning period. The HTMA is currently discharging to Chambersburg Regional Wastewater Treatment Plant at a slightly higher wastewater flow rate than was projected in the 1995 Act 537 Plan Update. A preliminary review of capacity of HTMA pump stations indicates that significant hydraulic capacity remains available to accommodate the current growth rate in the HTMA system as a whole. An analysis of the HTMA collection and conveyance system as a network should be conducted to evaluate the potential for "bottle-neck" conditions to exist in specific portions of the system. This analysis would be completed within the upcoming five year period.

The capacity of the current HTMA system is limited by negotiated agreement between HTMA and the Borough of Chambersburg. This agreement allocates a portion of the total permitted capacity of Chambersburg Regional Wastewater Treatment Plant to HTMA and three other municipalities. Accommodation of the current growth rate within Hamilton Township will be contingent on the ability of CRWTP to accept discharge based on hydraulic capacity and nutrient removal efficiency. Any modifications to the CRWTP must comply with the operating requirements of the National Pollution Discharge Elimination System (NPDES) operating permit issued to the plant by the Pennsylvania Department of Environmental Protection (PADEP). The CRWTP was designed to accommodate up to 17.0-MGD of total flow. Current allocated capacity to all municipalities served by the plant is approximately 6.80-MGD. The current hydraulic utilization rate for the facility based on design capacity is approximately 41%.

As growth within the Township continues, residents not connected to the HTMA system will continue to utilize individual on-lot wastewater management systems. In order to provide for the secure health of residents and to protect the environment, the Township will increase focus in the areas of operation and maintenance of on-lot systems. This will include technical, administrative, and enforcement efforts as a continued expansion of the recommendations provided for in the 1996 Act 537 Plan Update. Simultaneously, the HTMA will continue it's efforts to efficiently operate and maintain existing infrastructure.

D. COST OF IMPLEMENTATION

The Guitner Road/Coontown Road extension is funded and in the process of completion. No further action is required for this project.

The estimated construction cost of the proposed old Kensington Heights extension is estimated at $975,000, in 2006 dollars. An additional estimated cost of $750,000 would be incurred in the event that a pump station would be required to service the northern portion of the neighborhood. Approximately $120,000 will be needed to address overhead costs associated with design, easement and legal negotiation, and research and acquisition of outside funding sources. Total project cost is estimated at $1.95 M, including a pump station and overhead costs.

A low interest PENNVEST type loan would be a cost effective means of financing that is available to implement significant portions of this plan. A PENNVEST type loan could be supplemented by private financing or user fees as a secondary alternative. Total financing of the plan by private loans or private financing supplemented by user fees would be a third financing alternative. Lastly, the option to construct this extension in two or more stages could be evaluated in detail from a technical and financial perspective. A substantial backlog currently exists for PENNVEST loans.

Efforts to optimize the efficiency and effectiveness of existing on-lot wastewater management systems are not anticipated to require substantial funding. Existing resources and personnel from Hamilton Township Board of Supervisors and Hamilton Township Municipal Authority would be utilized in support of this effort, supplemented on an as needed basis by private vendors or contracted agents.

E. MUNICIPAL ADOPTION

The Hamilton Township Supervisors have committed to adoption and implementation of the revisions of the 2006 Update of the Act 537 Official Comprehensive Sewage Facilities Plan through its Resolution of Adoption, dated January 2007.

F. IMPLEMENTATION SCHEDULE

The schedule for implementing the recommendations of this plan update and projection of related events and activities is provided in Section 8.0.

G. CONSISTENCY DOCUMENTATION

There are no known inconsistencies in this 2006 Act 537 Plan Update that require resolution.

SECTION 1.0

PREVIOUS WASTEWATER PLANNING

SECTION 1.0
PREVIOUS WASTEWATER PLANNING

1.1 INTRODUCTION

The most recent preceding Act 537 Official Comprehensive Sewage Facilities Plan Update was completed in July of 1996. This 2006 Plan Update has considered the previous plan and made modifications that reflect current conditions and the needs, objectives, costs, and regulations that were not present during the previous update.

1.1.1 Planning Objectives and Needs

This plan has been developed for Hamilton Township, Franklin County, in response to the requirements of the Pennsylvania Sewage Facilities Act, P.L. 1535, No. 537 (PA Act 537).

PA Act 537, as enacted by the Pennsylvania Legislature in 1996, requires that every municipality in the Commonwealth develop and maintain an up-to-date sewage facilities plan. The primary purpose of the municipality's sewage facilities plan is to protect the health, safety, and welfare of the citizens living in the municipality. This is achieved by correcting malfunctioning on-lot septic systems, overloaded treatment plants or sewer lines, and "wildcat" sewers. Additionally, two important and critical goals of the sewage facilities plan are to prevent future sewage disposal problems from occurring and to provide protection of both the groundwater and surface waters of the Commonwealth of Pennsylvania.

The information contained in the Hamilton Township PA Act 537 Plan, 2006 Update, will assist and guide the Township in the planning, regulation, and management of sewage facilities within its' municipal and service area boundaries, as well as coordination of sewage disposal through cooperating Authorities and other municipalities.

1.2 IDENTIFICATION AND ANALYSIS OF EXISTING WASTEWATER PLANNING

1.2.1 Act 537 Official Comprehensive Sewage Facilities plan Update, July 1996

The following recommendations were made:

1. Upgrading and Enlarging the Chambersburg Regional Wastewater Treatment Plant
2. Provide sanitary collection sewer extensions to Edenville Road and Fischer Road within 5-years, and to Guitner Road and Crottlestown Road within 10-years.

3. Expand the existing Sewage Management Program to more closely manage on-lot subsurface sewage disposal facilities by making areas not serviced by sanitary sewer collection lines a separate and distinct Sewage Management District.

1.3 PLANNING MODULES

Wastewater management planning includes the on-going review of planning modules for proposed sewage connections to existing facilities and for the placement of on-lot disposal systems. The scope of planning is further defined in the Hamilton Township Subdivision and Land Development Ordinance.

Twenty-six major subdivisions have submitted planning modules and have been approved by Hamilton Township since 1977. These approved planning modules account for 2,577 equivalent domestic units (EDU's) of capacity. Seven major subdivision planning modules have been approved by the Township since 1996. These seven modules account for 375 EDU's. Three subdivisions started between 1980 and 1988 utilize privately owned and operated wastewater systems and account for 398 individual units primarily servicing prefabricated homes.

1.4 PLANNING BY APLICABLE MUNICIPAL AUTHORITY

1.4.1 Hamilton Township Municipal Authority (HTMA) will initiate for the 5 to 10 year planning period, design and evaluate proposed sewer lines that will service the older portion of Kensington Heights including the portion of the development formerly serviced by and located within Letterkenny Township. This area is located approximately two and one half miles northeast of Chambersburg Borough within the Hamilton Township Municipal Authority's current service area. The portion of the development situated in Letterkenny Township will utilize HTMA facilities to convey sewage to CRWTP within existing and proposed sewer main.

The intent of this sanitary sewer collection system extension is to provide public sewer service consistent with the 1996 Hamilton Township Act 537 Sewage Facilities Plan to multiple existing single family residences which are located along Lawyer Road, Sheffield Drive, Kensington Drive, and Funk Road. Service will be provided by extension of sanitary sewer collection system pipe from Edenville Road to the older portion of the Kensington Heights development.

It is projected that a total of 40equivalent domestic units (EDU's) will be served by an 8-inch diameter sanitary sewer extension, approximately 2.6-miles in length. 40 EDU's will generate approximately 9,400 GPD of additional flow as calculated using the HTMA 2005 Chapter 94 Report generation rate of 235 GPD per EDU.

Preliminary planning indicates that the proposed sanitary sewer main will be gravity flow to a manhole located at Canterbury Road, manhole No. 32, near the intersection of Canterbury Road and Lawyer Road.

It is estimated that planning and construction associated with this infrastructure project will cost approximately $1.1 million.

1.5 IDENTIFICATION AND ANALYSIS OF EXISTING MUNICIPAL AND COUNTY PLANNING DOCUMENTS ADOPTED PURSUANT THE PAMPC (ACT 247)

1.5.1 Municipal Planning Activities

A Comprehensive Plan was prepared for Hamilton Township Planning Commission in 1975. Included in this comprehensive plan was an Existing Land Use Study, a Future Land Use Plan, and a Community Facilities Plan. These component plans did not address nor make recommendations regarding future sewage facilities within the Township, according to the Act 537 Official Comprehensive Sewage Facilities Plan Update, July 19, 1996.

1.5.2 Municipal Zoning and Subdivision Ordinances

Hamilton Township development is managed and administered under two ordinances, the Hamilton Township Subdivision and Land Development Ordinance, effective April 1, 2002, as amended in 2002, 2004, and 2005. This Ordinance provides administrative and technical guidance for proposed subdivision and development of land. It also is administered, in part, under Ordinance No. 82, Hamilton Township Land Use Ordinance. This Ordinance requires a property owner to obtain a land use permit prior to constructing any improvement to real property.

1.5.3 Floodplain Ordinance

Hamilton Township adopted Ordinance No. 85 on May 15, 1990. This ordinance updates and repeals the Hamilton Township Flood Hazard Ordinance of 1986, Ordinance No. 78. The purpose of Ordinance No. 85 is to promote appropriate building practice, to protect water supply and natural drainage, limit development in flood prone areas, and to comply with Federal and Commonwealth regulations addressing floodplain management. As such, it establishes the boundaries and area of a 100-year flood plain in all sections of the Township. It also establishes administrative procedures and technical requirements for proposed construction within the floodplain. This ordinance requires compliance with various Federal and Commonwealth regulations and their amendments, including the Federal Clean Water Act (Section 404, 33, U.S.C. 1344), Pennsylvania Floodplain Management Act, Pennsylvania Sewage Facilities Act, Pennsylvania Dam Safety and Encroachments Act, and the Pennsylvania Clean Streams Act. The National Flood Insurance Program is incorporated as a reference standard.

1.5.4 Stormwater Management Regulations

Hamilton Township Subdivision and Land Development Ordinance, Section 605 and Section 606 address requirements for a review and approval of stormwater runoff design(s) by the County Conservation District and site specific stormwater management/recharge criteria. Hamilton Township adopted Ordinance No. 92, Establishing An Industrial

Pretreatment Program And Other Regulations Controlling Discharges To The Sewer System, effective January 14, 1993. This ordinance provides for the separation of stormwater and sanitary sewage. It prohibits discharge of sanitary sewage to any stormwater sewer of the Township and it prohibits any discharge of stormwater to sanitary sewers. Lastly, it requires all industrial users of the sanitary sewer collection system to comply with Federal requirements for obtaining an approved Spill Prevention, Control, and Countermeasure Plan.

1.5.5 Public Groundwater/Surface Water Supply

Hamilton Township Subdivision and Land Development Ordinance addresses protection of potable water supplies by requiring that percolation tests be completed and approved by the Sewage Enforcement Officer prior to construction of an on-lot disposal system. Protection of water supply and groundwater quality is also addressed in part under the stormwater management regulations.

1.5.6 Groundwater Recharge

No known studies have evaluated the role of Hamilton Township in recharge of local or regional groundwater. Hamilton Township Ordinance No. 85, requiring that a building permit is obtained prior to construction, is intended to minimize danger to public health by protecting water supply and natural drainage. It also addresses construction in flood prone areas. Hamilton Township Subdivision and Land Development Ordinance, Section 605 and Section 606 address requirements for a review and approval of stormwater runoff design(s) by the County Conservation District and site specific stormwater management/recharge criteria. Section 609 of Hamilton Township Subdivision and Land Development Ordinance contains provisions for aquifer recharge and groundwater removal.

1.5.7 Recreational Water Use Areas

Recreational water use areas are managed under the jurisdiction of the Commonwealth of Pennsylvania. Areas where recreational use may occur are along the Conococheague Creek, Dennis Creek, and Back Creek. These areas are also governed by Pennsylvania regulations. Recreational water use areas in Hamilton Township are largely limited to areas where camping related activities and fishing are the primary recreational water uses. There are no areas in the Township where boating would be practical.

1.5.8 Industrial Water Use

There is currently one known user in the Township that is classified as an industrial user. The industrial user is a poultry farm egg processing facility that discharges egg wash water. The source of water for this user is both public water and an on-site well.

Hamilton Township Ordinance No. 92, Establishing An Industrial Pretreatment Program And Other Regulations Controlling Discharges To The Sewer System, effective January 14, 1993, provides administrative and technical pretreatment requirements for industrial

user of the sewer collection system. This ordinance was amended in 1995 as Ordinance No. 100, and again on March 21, 2002 as Ordinance 124. This Ordinance, as amended, provides for establishing local discharge limits but also defers to Commonwealth and Federal regulations in the event that those regulations are more stringent.

1.5.9 Wetlands

Federal and Commonwealth regulations governing wetlands apply based on the absence of specific Township regulations.

SECTION 2.0

PHYSICAL AND DEMOGRAPHIC ANALYSES

SECTION 2.0 PHYSICAL AND DEMOGRAPHIC ANALYSES

2.1 IDENTIFICATION OF PLANNING AREA

Hamilton Township is located in the south central portion of Pennsylvania in Franklin County. It is centrally situated within Franklin County. Hamilton Township is bordered to the north by Letterkenny Township, to the South by Antrim Township, to the west by Saint Thomas Township, and to the east by Greene Township, the Borough of Chambersburg, and Guilford Township. Back Creek and Conococheague Creek form Township boundaries to the southwest and east. The Township boundaries are man-made lines in the north. The planning area also includes the older portion of Kensington Heights development located in the southeastern portion of Letterkenny Township.

The regional location of the HTMA service area is provided as Map 2.1., Hamilton Township, Franklin County, Pennsylvania and Surrounding Region. The planning area includes all of Hamilton Township and a small portion of Letterkenny Township. Hamilton Township encompasses approximately 35.4 square miles of area, slightly less than five percent of the total area of Franklin County. The area is composed of agricultural lands to the north and southwest and residential tracts in the northeast, east and south. Commercial parcels occupy strips or clusters of parcels primarily bordering the main highways traversing the Township.

The most developed areas of the Township are the result of residential development including light commercial facilities situated in areas such as Kensington Heights, Barclay Village, Laurich Estates, and Warm Spring Estates.

The main roads traversing the Township include U.S. Route 30 which bisects the Township northeast to southwest, State Route 995 which is a primary north/south corridor in the southern half of the Township, and State Routes 4008, 4010, 4013, and 4015 that service the northern portion of the Township with primarily east/west traffic flow.

2.2 TOPOGRAPHY AND SLOPES ANALYSIS

The western portion of the Township is characterized by steep wooded mountain foothills, sloping down from west to east, to a mixture of flat to moderate and steep areas in the central and eastern portions of the Township. The elevations vary from 2000 feet MSL to the west to approximately 700 feet MSL in the eastern and southern areas. Land to the south is of approximately 600 feet MSL. Map 2.2.A., Topography of Hamilton Township, provides details of the topography present in the Township.

Approximately 35% of the land is characterized by slopes of 5% or less. Moderate slopes of 5% to 10% dominate the creek areas. Areas with slopes of 10% or more comprise approximately 40% of the Township. Map 2.2.B., Topographic Slopes of Hamilton Township, provides details of the topographic slopes present in the Township.

Surface drainage in the Township is channeled to the three major streams or their tributaries, Dennis Creek, Back Creek and Conococheague Creek. Water flow in the southern half of the Township drains east and west away from a raised north/south divide, the top of which is largely defined by State Route 995. Water in this area flows west to Back Creek and East to Conococheague Creek. The remaining northern portions of the Township are drained almost exclusively by Back Creek. Dennis Creek drains the western portion of the Township and joins with Back Creek at Twin Bridges Road and Crottlestown Road. The headwaters of Dennis Creek are formed by springs discharging from the slopes of the mountains that define the western border of the Township.

2.3 GEOLOGY/HYDROLOGY

Hamilton Township is located in the southwestern portion of the Great Valley Section of the Valley and Ridge Physiographic Province. The Township is characterized by a Karst type topography which has formed over various limestone and dolomite dominated geologic formations. The geologic formations underlying the Township include the Martinsburg Formation, the Chambersburg Formation, the Saint Paul Group, and the Pinesburg Station Formation. Map 2.3., Geology of Hamilton Township, provides details of the Township geology.

2.3.1 Martinsburg Formation

The Martinsburg Formation dominates approximately 90% geology of the Township and is interspersed with smaller striations and pockets of the remaining formations exclusively to the west and east. This formation is 12,800 feet thick at it's thickest point.(1) Rock and groundwater conditions include buff-weathering, dark gray shale and silt limestone, interbeds of siltstone and sandstone grading into limy shale and silty limestone.(1) The median groundwater yield is 29 gallons per minute with a maximum yield of 100 gallons per minute. Yield zones are typically less than 150 feet in depth.(2) Water is moderately hard and of poor quality due to concentrations of hydrogen sulfide and iron.(2)

2.3.2 Chambersburg Formation

The Chambersburg Formation forms thin north–south striations in the western and extreme eastern portions of the Township comprising approximately 3% of the underlying geology. This formation is approximately 700 feet thick at it's thickest point.(1) It is characterized by dark gray limestone a the top, gray argillaceous limestone in the middle, and dark gray cobbly limestone at the base.(1) The median groundwater yield in this group is 11 gallons per minute with a maximum yield of 35 gallons per minute.(2) Water character is relatively hard.(2)

2.3.3 Pinesburg Station Formation

Pinesburg Station Formation is present in a single area in the western portion of the Township. It comprises approximately 1% of the geology of the Township. This formation is characterized by light to medium gray, laminated to banded dolomite containing black chert nodules and white quartz rosettes and interbeds of medium-gray

limestone.(1) The median groundwater yield of this formation is 46 gallons per minute with a maximum yield of 150 gallons per minute.(2) Water is characteristically very hard.(2)

2.3.4 Saint Paul Group

The Saint Paul Group forms broad north-south striations almost exclusively in the western portion of the Township with one small area in the extreme east southeastern border of Hamilton Township and Guilford Township. This group comprises approximately 5% of the geology of the Township. This group is approximately 580 feet thick at it's thickest point.(1) It is characterized by buff-colored magnesium limestone containing numerous layers of chert.(1) It is in part highly calcareous.(1) The median groundwater yield is 25 gallons per minute with a maximum yield of 225 gallons per minute.(2) Water is characteristically very hard.(2)

(1) Source: Engineering Characteristics of the Rocks of Pennsylvania. Alan Gayer and J. Peter Wilshusen, 1982.

(2) Source: Groundwater Resources in the Cumberland and Contiguous Valleys of Franklin County Pennsylvania. Albert Becher and Larry Taylor, 1982.

2.4 SOILS

There are three soil associations located in Hamilton Township. A summary of these associations relative to the Township is provided in Table 2.4 – Soil Association Summary, Hamilton Township, below.

TABLE 2.4.A. – SOIL ASSOCIATION SUMMARY, HAMILTON TOWNSHIP *

Association	Description	Location	Approximate % of Township
Laidig-very stony land-Buchanan	Deep, well drained to somewhat poorly drained, nearly level to very steep soils formed in colluvium from sandstone and Very stony land, on tops and sides of mountains	Northwest portion	10
Murrill-Laidig	Deep, well drained, gently sloping to moderately steep soils formed in colluvium; on mountain foot slopes	Western and Extreme Eastern	30
Weikert-Berks-Bedington	Shallow to deep, well drained nearly level to very steep soils formed in materials weathered from shale and interbedded shale, siltstone, and sandstone; in valleys	Central	60

Source: Soil Survey of Franklin County, Pennsylvania, United States Department of Agriculture, August 1975

There are thirty-eight different soil series located in the Township. Map 2.4., Soils Classifications of Hamilton Township provides details of the soils of the Township. A description of the soils and soil characteristics is provided in Table 2.4, Hamilton Township Soils Characteristics.

TABLE 2.4.B. –SOILS CHARACTERISTICS OF HAMILTON TOWNSHIP *

Soil Designation	Description	% Slope	Characteristics
AgB	Allegheny loam	3-8	
AnB	Andover gravelly loam	3-8	Wetness & percs slowly
AoB	Andover gravelly loam, very stony	0-8	Wetness & percs slowly
As	Atkins silt loam		Flooding, wetness & percs slowly
BhB	Bedington channery silt loam	3-8	
BhC	Bedington channery silt loam	8-15	
BkB	Berks channery silt loam	3-8	Slope and shallow depth
BkC	Berks channery silt loam	8-15	Slope and shallow depth
BlA	Blairton channery silt loam	0-3	Wetness & percs slowly, shallow depth
BlB	Blairton channery silt loam	3-8	Wetness & percs slowly, shallow depth
BrA	Brinkerton silt loam	0-3	Wetness & percs slowly
BrB	Brinkerton silt loam	3-8	Wetness & percs slowly
BuB	Buchanan gravelly loam, extremely stony	3-8	Wetness & percs slowly
BxB	Buchanan cobbly loam, extremely stony	0-8	Wetness & percs slowly
CoB	Carbo silty clay loam	8-25	
CsA	Clarksburg silt loam	0-3	
CtB	Clearbrook channery silt loam	0-8	
CvB	Covegap cobbly sandy loam	3-8	
DED	Dekalb and Hazelton soils, rubbly	3-25	
DEF	Dekalb and Hazelton soils, rubbly	25-75	
DoB	Downsville gravelly loam	3-8	
DoD	Downsville gravelly loam	8-25	
DrB	Dryrun gravelly loam	3-8	
EeB	Edom-Carbo silty clay loams	3-8	Slope and percs slowly
EeC	Edom-Carbo silty clay loams	8-15	Slope and percs slowly
ErB	Ernest silt loam	3-8	Wetness & percs slowly
Fu	Funkstown silt loam		
HaA	Hagerstown silt loam	0-3	
HaB	Hagerstown silt loam	3-8	
HaC	Hagerstown silt loam	8-15	
HbB	Hagerstown-Carbo silty clay loams	3-8	Wetness & percs slowly
HaC	Hagerstown-Carbo silty clay loams	8-15	Wetness & percs slowly
HcB	Hagerstown-Carbo silty clay loams	3-8	Wetness & percs slowly

HcC	Hagerstown-Carbo silty clay loams	8-15	Wetness & percs slowly
HkB	Hagerstown – Rock Outcrop complex	3-8	Slope
HkD	Hagerstown – Rock Outcrop complex	8-35	Slope
Hm	Hatboro silt loam		
HRB	Hazleton and Dekalb soils, extremely stony	0-8	Slope and poor filter
HRD	Hazleton and Dekalb soils, extremely stony	8-25	Slope and poor filter
HRF	Hazleton and Dekalb soils, extremely stony	25-75	Slope and poor filter
Jg	Jugtown silt loam		
LaC	Laidig gravelly loam	8-15	Slope
LbB	Laidig gravelly loam, extremely stony	0-8	Poor Filter
LbD	Laidig gravelly loam , extremely stony	8-25	Slope and poor filter
LCE	Laidig gravelly loam, extremely stony	25-60	Slope and poor filter
LgB	Leetonia gravelly loamy sand	0-15	
Ma	Markes channery sit loam	0-8	
Mb	Maurertown silt loam		
Me	Melvin silt loam		Flooding and wetness
MoB	Monongahela silt loam	3-8	Wetness & percs slowly
MrB	Murrill gravelly loam	3-8	
Mrc	Murrill gravelly loam	8-15	
MuB	Murrill cobbly sandy loam	3-8	
MuC	Murrill cobbly sandy loam	8-15	
MvB	Murrill gravelly loam, extremely stony	3-8	
MvD	Murrill gravelly loam, extremely stony	8-25	
Pg	Penlaw silt loam	0-3	Wetness & percs slowly
Ph	Philo silt loam		
Po	Pope silt loam		
Pu	Purdy silty clay loam		Wetness & percs slowly
Q	Quarries		
ScB	Sideling gravelly loam	3-8	
SeC	Sideling gravelly loam	8-15	Slope and poor filter
SrB	Sideling gravelly loam, extremely stony	0-8	Poor filter
SrD	Sideling gravelly loam, extremely stony	8-25	Slope and poor filter
SSF	Sideling and Hazleton soils, extremely stony	25-60	Slope and poor filter
SwB	Swampond-Edom complex	0-8	
Ty	Tyler silt loam	0-3	Wetness & percs slowly
UbB	Urban land – Berks Complex	0-8	
UbC	Urban land – Berks Complex	8-15	

Uu	Urban land – Udorthents complex	0-25	
WeB	Weikert channery silt loam	3-8	Shallow Depth to rock
WeC	Weikert channery silt loam	8-15	Shallow Depth to rock
WeD	Weikert channery silt loam	15-25	Slope and Shallow Depth to rock
WkB	Weikert very channery silt loam	3-8	Slope and Shallow Depth to rock
WkC	Weikert very channery silt loam	8-15	Slope and Shallow Depth to rock
WkD	Weikert very channery silt loam	15-25	Slope and Shallow Depth to rock
WkF	Weikert very channery silt loam	25-60	Slope and Shallow Depth to rock

*** Source: Soil Survey of Franklin County, Pennsylvania, U. S. Department of Agriculture, August 1975**

Concerns exist with respect to use of on-lot wastewater disposal systems and soil characteristics. These concerns focus on the ability of the soil to filter, percolate, and to effectively accommodate hydraulic and nutrient loadings. Similarly, systems located on slopes are difficult to effectively operate and maintain. In areas where a combination of soil type, slope, and shallow depth to groundwater exist, it is likely that groundwater and/or surface water impact can or will occur.

2.5 PRIME AGRICULTURAL LANDS

Prime agricultural land, as defined by the U.S. Department of Agricultural, Natural Resource Conservation Service (NRCS), includes land of "prime", "unique", or "of State or local importance", as well as land "characterized by active agricultural use", or soils within the bounds of an agricultural preservation area established under Section 604(3) of the Pennsylvania Municipalities Planning Code. Prime agricultural lands soils are typically those listed as belonging to NRCS Soil Capability Classes I, II, III, or IV. Prime agricultural areas of the Township are delineated on Map 2.5, Prime Agricultural Lands of Hamilton Township.

Currently the Township's policy regarding prime Agricultural Lands is one of preservation. One tool available to municipalities for preserving Prime Agricultural lands is the establishment of Agricultural Security Areas. Hamilton Township adopted (in 1983) a Township Agricultural Security Area Designation Ordinance pursuant to the rules and regulations of the Pennsylvania Agricultural Security Act, as amended (Act 43 of 1981).

The Township's Zoning and Subdivision and Land Development Ordinance currently does not restrict use of Prime Agricultural Lands areas.

2.6 POTABLE WATER SUPPLIES

There are two sources of potable water for public use. The eastern and southern portions of the Township are serviced by Bear Valley Water Authority. The Bear Valley Water

Authority is a potable water supplier with treatment and distribution infrastructure that services several townships in Franklin County. The northwest portion of the Township is supplied by Silver Spring Water Association. Silver Spring Water Association is a privately owned and operated source of potable water with and estimated 30 residential customers. Private potable water wells co-exist in areas serviced by water supply utilities, predominantly in the western and southern portions of the Township. Map 2.6 – Areas Serviced by Public Water Supply, Hamilton Township, indicates the areas serviced by public water supply.

The source of public water for the Township is through Bear Valley Water Authority. The source of Bear Valley Water Authority supply is Broad Run, located in Fort Loudon, Pennsylvania. Bear Valley Water Authority treats water from Broad Run using particulate removal, chlorination, and the addition of fluoride and lime. The treated water is pumped to several elevated potable water storage tanks located throughout the Township for storage and distribution. Storage capacity of the tanks is approximately 1.1 million gallons (South Hamilton Township, 575,000 gallons; Kensington, 500,000 gallons). Bear Valley Water Authority provides approximately 175,358,490 gallons of water to Hamilton Township in 2005.

Table 2.6.A., provides a summary of potable water connections by Bear Valley Water Authority to Hamilton Township by user type. "Tap Connections" listed in the table represents the number of physical connections between a structure and the water main. "Units" listed in the table represents the number of users of the water from the tap. Note that a single tap may service more than one end user, as would be the case where multiple users occupy a single structure serviced by a single tap such as a commercial building with multiple tenants. "Gallons" represents the quantity of water utilized by category.

TABLE 2.6.A
BEAR VALLEY WATER AUTHORITY CONNECTIONS IN HAMILTON TOWNSHIP AS OF DECEMBER 2005 *

Category:	Domestic	Commercial	Schools	Industrial	Totals
Tap Connections:	2686	99	2	0	2787
Units:	3190	140	2	0	3332
Gallons:	163,491,390	11,090,500	776,600	0	175,358,490

*** Source: Bear Valley Water Authority, 4/5/06**

The Bear Valley Water Authority water supply is augmented by water from the Borough of Chambersburg. The Borough has allocated approximately 800,000 gallons per day of potable water for use and distribution by Bear Valley Water Authority. This allocation is not exclusively dedicated to use by the Township.

A smaller potable water distribution area located in the northwest portion of the Township is serviced by the Silver Spring Water Association. This association serves approximately thirty residences on or near Gilbert Road. The source of water for the Association is

natural springs flowing from the mountains. Treatment process for the water is unknown, however, sheds from which the water is collected and distributed appear to have at least rudimentary particulate filtration augmented by chlorination/disinfection capabilities. There appears to be little or no storage capacity for this system. Water is conducted from the springs/treatment sheds to the residents via metal pipe. System pressure is dependent on gravity as all of the homes served are down gradient of the source springs. The president of the Association was unavailable and could not be contacted to discuss details of the Association or its' operation at the time of preparation of this Plan.

The remainder of the potable water supply needs of the HTMA service area are served by private wells. These wells are located in all areas not serviced by the Bear Valley Water Authority, Borough of Chambersburg, or the Silver Spring Water Association. Wells vary greatly in age, construction, and water quality.

2.7 WETLANDS

The National Wetlands Inventory (NWI) mapping prepared by the U.S. Fish and Wildlife Service, identifies several wetland areas in Hamilton Township. These areas provide wildlife habitat, flood protection, surface water quality improvements, and a variety of other significant functions. They frequently overlap areas designated as floodplain areas. Wetlands within the Township are presented in Map 2.7, Wetlands, Hamilton Township.

Wetlands are located throughout the Township, primarily associated with drainage courses. Wetlands comprise approximately 45 acres of land within the Township. A majority of wetlands are located in the western and southwestern portion of the Township in association with Back Creek and, to a lesser degree, Dennis Creek, and their smaller tributaries. Other areas where wetlands are prevalent include the southeastern portion of the Township along Conococheague Creek. Relatively few wetlands areas are found in the northwestern portion of the Township due to steep slopes and rocky terrain. Wetlands are found throughout the interior of the Township as smaller isolated pockets. Approximately 37 acres of land is designated as both wetlands and floodplain.

2.8 FLOODPLAINS

Floodplains in the Township are delineated as shown Map 2.8, Floodplains, Hamilton Township. Data from this map is derived from the Flood Insurance Rate Map developed by the National Flood Insurance Program. Floodplains comprise approximately 445 acres of land in the Township. Floodplains areas are shown primarily bordering Dennis Creek, Back Creek, and Conococheague Creek and portions of larger tributaries. These areas are expected to be inundated when a combination of abundant surface water, ample soil moisture, and high water table supplies more runoff than can be accommodated in the normal stream channel. Approximately 37 acres of land is designated as wetlands and floodplain.

2.8 SOLID WASTE MANAGEMENT

Two streams of waste materials are generated and managed in the Township, refuse and recyclables. Both streams are regulated under Commonwealth law. Recycling is optional in the Township and includes paper goods, aluminum, bi-metal cans, glass, and plastic, according to Waste Management, Incorporated. Solid waste management in Hamilton Township is managed through contract by individual residents or property owner(s)/lessee(s). The two largest haulers that service the Township are Waste Management, Incorporated, with office in Greencastle, Pennsylvania and IESI Pennsylvania, Chambersburg Hauling, Chambersburg, Pennsylvania. Waste Management, Incorporated (WMI) services approximately 80% of the residences in the Township for both recycling and refuse disposal, according to Mr. Pat Heraty, WMI Manager of Hauling Operations. All materials collected by WMI are hauled to the WMI Greencastle facility for either landfill disposal or recycling. The majority of the remaining residences and business are serviced by IESI Pennsylvania (IESI). Those residences not services by WMI or IESI manage waste by on-site disposal, out of Township disposal, or other similar method.

2.10 STORMWATER MANAGEMENT

Hamilton Township Subdivision and Land Development Ordinance, effective April 1, 2002, as amended by Ordinance No. 2002-125, Ordinance No. 2004-130, Ordinance No. 2005-134, and Ordinance No. 2005-138, requires stormwater management plans for new developments be prepared in accordance with Commonwealth and Franklin County stormwater management standards and soil erosion and sediment control standards. Township ordinances specifically require that the rate of runoff after development does not exceed the rate of runoff prior to development. Further, it is required that groundwater recharge occur on developed properties such that during drought conditions anticipated water usage will not lower the groundwater table to such an extent that available water supply capacity is decreased by greater than 10% of predevelopment capacity.

2.11 HISTORICAL AND ARCHAEOLOGICAL AREAS

The site of the former Fort McCord, an early settlement and privately operated fort is located in the Sandy Hook area of the Township near the intersection of Fort McCord Road and Wenger Road. A monument near the site of the former fort commemorates the capture or killing of settlers by Indians in April, 1756, during the French and Indian war, according to McCord Family Association and the bronze placard on the monument. No formal delineation of the site was observed beyond the monument itself.

2.12 POPULATION

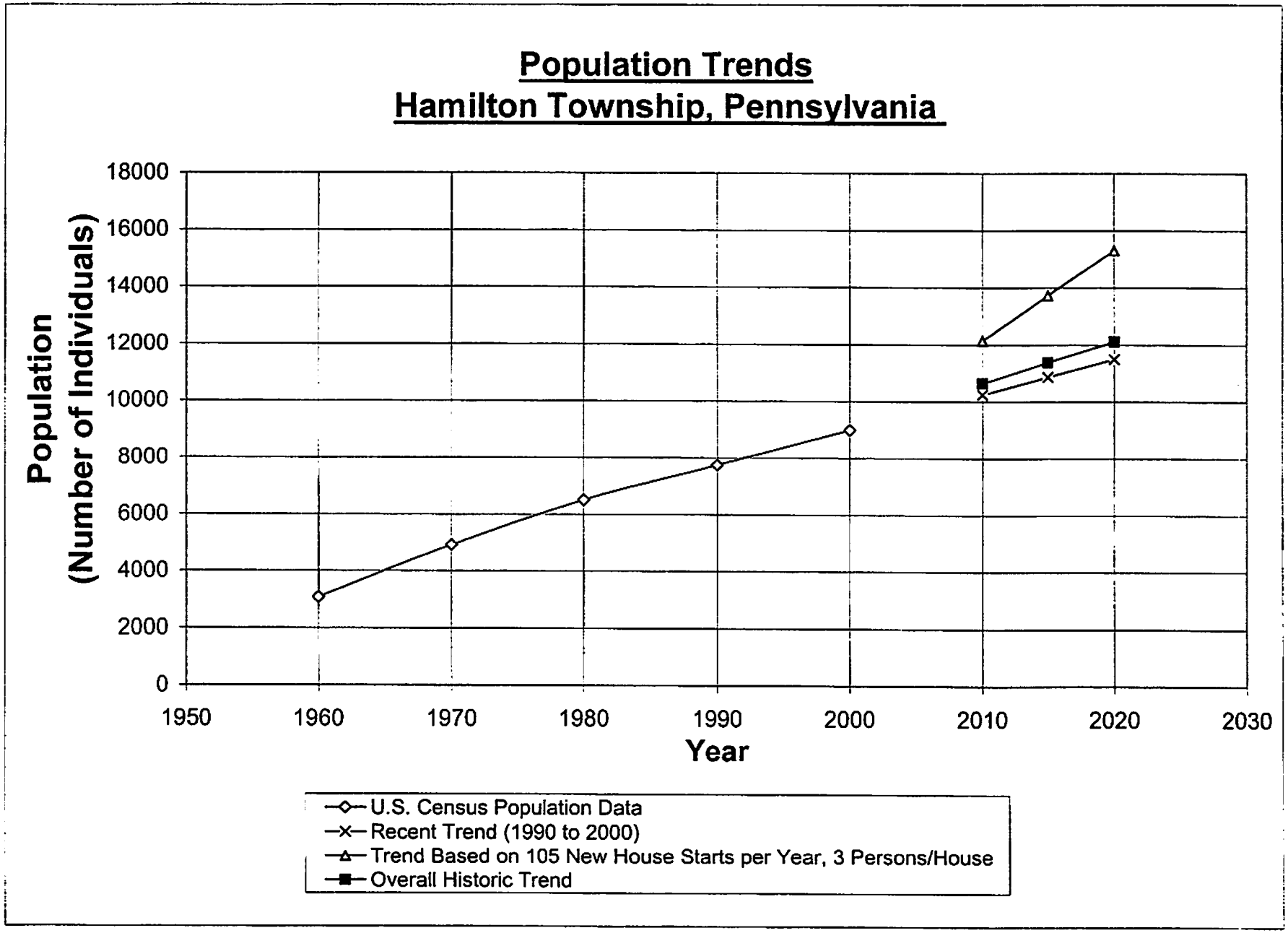
Historic and recent population and housing data for Hamilton Township was obtained from the U.S. Census Bureau, Census 2000. This data is provided in tabular format as Table 2.12 – Population Data Summary, Hamilton Township. Figure 2.12, Population Trends, Hamilton Township, Pennsylvania provides a graphic presentation of population trend information.

TABLE 2.12 – POPULATION DATA SUMMARY, HAMILTON TOWNSHIP

Parameter	Year 1960*	Year 1970*	Year 1980*	Year 1990*	Year 2000+	Year 2010++	Year 2015++	Year 2020++
Documented Population, 1960 - 2000	3,077	4,921	6,504	7,745	8,949	-	-	-
Overall Population Growth Trend using Least Squares Methodology	-	-	-	-	-	10,646	11,379	12,116
% Population Growth Since Previous Year	-	59	32	19	16	18.9 ++	7 ++	6 ++
Population Growth by Individuals Since Previous Planning Year	-	1844	1583	1241	1204	1661	728	728
Township Households	-	-	-	2980	3476	4526++	5051++	5576++
Unit Increase in the Number of Households Since Previous Planning Year	-	-	-	-	496	1050++	525++	525++

* **Source: Hamilton Township Supervisors, 4/13/06**
\+ **Source: U.S. Census Bureau, Census 2000**
++ **Source: Remington Vernick & Beach Engineers, 2006, Trend Projections Based on Approved Planning Modules**

Figure 2.12 - Population Trends, Hamilton Township, Pennsylvania



NOTES: 1. Projected population data derived from known population data using least squares analysis method.
2. Source: Average new Housing Starts, Hamilton Township Records, 2001 to 2005

SECTION 3.0

EXISTING SEWAGE FACILITIES

3.0 EXISTING SEWAGE FACILITIES

3.1 IDENTIFICATION AND EVALUATION OF EXISTING WASTEWATER TREATMENT AND CONVEYANCE SYSTEMS

Hamilton Township Municipal Authority (HTMA) serves the majority of public wastewater management needs of the Township. The HTMA operates a collection and conveyance system only. The HTMA system discharges to the Chambersburg Regional Wastewater Treatment Plant (CRWTP). The HTMA collection and conveyance system consists of pipe, pump stations, manholes, metering points, and related appurtenances. There are no waste water treatment facilities within the Township operated by HTMA. Sewage collected by HTMA system is discharged to the CRWTP for treatment prior to discharge. The CRWTP discharges treated water to the Conococheague Creek.

The HTMA collection and conveyance system was designed and constructed in multiple phases between the late-1960's and the present. Addition of smaller sub-systems related to approved planning module private developments or small branch collection systems connected to mains were also added to the system but are not considered major phases of construction. A description of each phase is provided below:

TABLE 3.1 –COLLECTION AND CONVEYANCE SYSTEM HISTORY *

Phase	Location	Date Initiated	Date Complete
I	Bordering Chambersburg	1971	1980
II	Dedication of Three Community Systems	1970	1981
III	Southern Hamilton Township	1994	1996
IV	Southern Hamilton Township	1998	1999
V	Edenville Road	1999	2001
-	Coontown Road & Kensington Heights sanitary sewer extension, addition of private development subsystems	1970	2007

*** Source: Hamilton Township Municipal Authority, 2005/6**

3.1.1 COLLECTION AND CONVEYANCE PIPE

HTMA operates approximately 25-miles of sanitary sewer collection and conveyance pipe and associated pump stations. Map 3.1.1., Sanitary Sewer Collection and Conveyance System, Hamilton Township, presents the pipe system location, pump stations, metering stations, and general areas serviced by the system within Hamilton Township. Note that a portion of Letterkenny Township discharges to the Hamilton Township system at the northeastern corner of Hamilton Township, as shown on Map 3.1.1. Pipe for gravity and force mains vary in size from 6-inch in diameter to 12-inches in diameter. In addition to gravity and force mains, many residential developments operate low pressure force main system that discharges to a central collection point or pump station prior to discharging to

the gravity flow collection system. These low pressure system pipes vary in size from 1.5-inches in diameter to 6-inches in diameter.

Total pump station hydraulic design capacity is approximately 4.95 million gallons per day (MGD). This does not consider network or bottleneck design constraints at individual pump stations. Actual flows for 2005 show that 0.582 MGD was utilized in the system as a whole. In general, each existing pump station is utilizing approximately 11.6% of its rated capacity. There is substantial potential for additional utilization of each individual pump station.

3.1.2 PUMP STATIONS

Currently there are 14 pump stations located throughout the Township, with the majority of these stations located in the eastern and southern portion of the Township. The locations of pump stations in the Township are presented on Map 3.1.1., Sanitary Sewer Collection and Conveyance System, Hamilton Township. Details of the pump stations are provided in Table 3.1.2 – Pump Station Capacity and Flow Details, below.

TABLE 3.1.2 – PUMP STATIONS CAPACITY AND FLOW DETAILS

Station Number	Location	Pump Design Capacity (GPM)*	Pump Design Capacity (MGD)*	2005 Actual Daily EDU's**	2005 Average Flow (GPM) +	2005 Average Flow (MGD)
1	Keefer Road south of Boundary Road	600	0.86	340	55	0.08
2	Echo Springs Road at Sherry Drive	560	0.81	472	69	0.10
3	Crottlestown Road at Tapeworm Road	160	0.23	30	5	0.01
4	743 Fern Lane	900	1.30	1,078	173	0.25
5	Hamilton Drive	260	0.37	174	28	0.04
6	Topaz Drive at Opal Drive	240	0.35	181	29	0.04
7	Camelian Drive (cul-de-sac)	21	0.03	6	1	0.001
8	Warm Spring Road north of Lehman Road	180	0.26	98	16	0.02
9	Jack's Mill Road west of Warm Springs Road	32	0.05	6	5	0.01
10	Wren Court and Mallard Drive	29	0.04	42	7	0.01
11	Fisher Road	60	0.09	24	4	0.01
12	Fisher Road	47	0.07	6	1	0.001
13	Edenville Road west of Fort McCord-Edenville Road	200	0.29	36	6	0.01
14	Hamilton Hills Drive north of Jesse Drive	100	0.14	34	5	0.01
	TOTAL	3,389	4.89	2,491	404	0.582

*** Source: Act 537 Official Comprehensive Sewage Facilities Plan Update, July 19, 1996**
**** Source: Municipal Waste Load Management Report for Hamilton Township Municipal Authority, December 2005**
+ Conversion: Utilize 235 gallons per EDU

The design capacity of all pump stations is approximately 4.89 MGD. The flow from all pump stations in year 2005 was measured at 0.582 MGD. The maximum utilized capacity of each individual pump station is typically less than 20% under current operating conditions.

3.1.3 METERING STATIONS

The HTMA System converges at two metering locations prior to discharging into the CRWTP collection main at the boundary of Chambersburg Borough. The metering stations are located at Commerce Street and West Washington Street, respectively, at the boundary of Hamilton Township and Chambersburg Borough. The locations of metering stations in the Township are presented on Map 3.1.1., Sanitary Sewer Collection and Conveyance System, Hamilton Township. Details of the metering system measured flow and flow projections are provided in Table 3.1.3. Projected flows and flow allocation for HTMA were provided by the Borough of Chambersburg in correspondence to HTMA dated July 20, 1995. A copy of this correspondence is provided in Appendix 3.1.3, Correspondence from Borough of Chambersburg to Hamilton Township Municipal Authority, July 20, 1995.

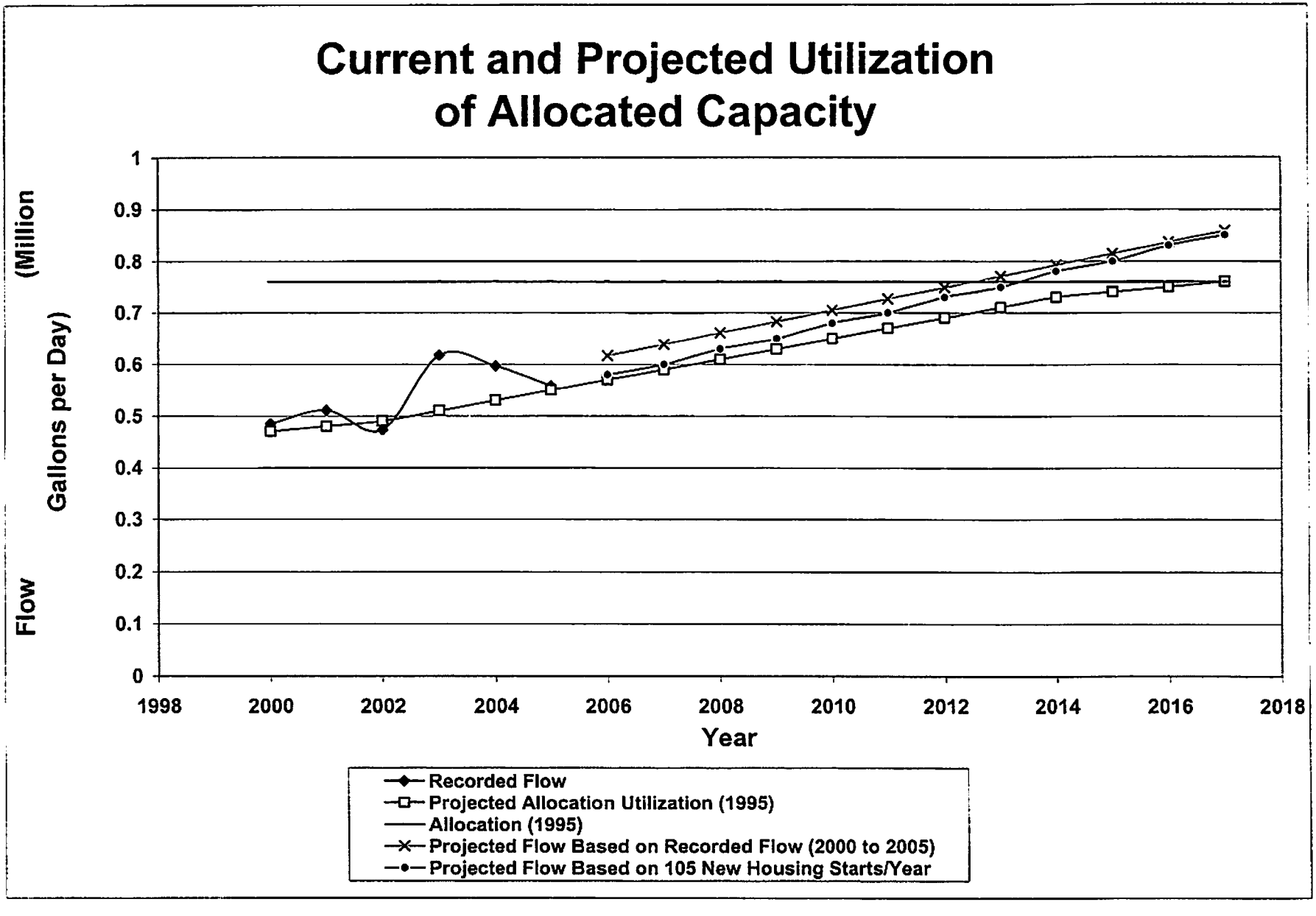
TABLE 3.1.3 – METER STATION ACTUAL FLOWS 2000 TO 2005*

Meter Location	Average Daily Metered Flow 2000 (MGD)	Average Daily Metered Flow 2001 (MGD)	Average Daily Metered Flow 2002 (MGD)	Average Daily Metered Flow 2003 (MGD)	Average Daily Metered Flow 2004 (MGD)	Average Daily Metered Flow 2005 (MGD)
Commerce Street	0.155	0.132	0.157	0.234	0.202	0.193
West Washington Street	0.330	0.379	0.316	0.384	0.392	0.365
TOTAL FLOW:	0.485	0.511	0.473	0.618	0.597	0.558
Projected Utilization of Allocated Capacity +	0.470	0.480	0.490	0.510	0.530	0.550

*** Source: Hamilton Township Municipal Authority Records, 2000 to 2005**
+ Source: Borough of Chambersburg correspondence to HTMA, dated July 20, 1995.

HTMA is currently utilizing a slightly higher than projected discharge rate to CRWTP. However, this discharge rate does not exceed allocated hydraulic capacity of 0.76 MGD agreed to by Borough of Chambersburg and HTMA. Based on current metered utilization rate, HTMA will reach it's allocated hydraulic capacity in approximately year 2012. Allocated capacity utilization data is graphically presented in Figure 3.1.3, Current and Projected Utilization of Allocated Capacity.

Figure 3.1.3. - Current and Projected Utilization of Allocated Capacity, Hamilton Township, Pennsylvania



3.2 CHAMBERSBURG REGIONAL WASTEWATER TREATMENT PLANT

The Hamilton Township Municipal Authority collection and conveyance system discharges wastewater to the CRWTP. CRWTP operates under NPDES Permit Number 0026051, a copy of which is provided herein as Appendix 3.2, Chambersburg Regional Wastewater Treatment Plant, NPDES Permit No. 0026051. This facility accepts flow from Borough of Chambersburg, a portion of Letterkenny Township, and Guilford Township, in addition to the Hamilton Township flow. The flow from Letterkenny Township is conveyed to the CRWTP using the Hamilton Township collection and conveyance system as of 1998. Table 3.2, Wastewater Flow Allocation by Municipality provides details of flow quantities from each municipality.

TABLE 3.2 – WASTEWATER FLOW ALLOCATION BY MUNICIPALITY*

Municipality	Flow Allocation (MGD)	Percent of Allocation
Chambersburg Borough	2.73	40.1
Greene Township	1.84	27.1
Guilford Township	1.47	21.6
Hamilton Township (HTMA Service Area)	0.76	11.2
TOTAL	6.80	100.0

Source: Borough of Chambersburg correspondence to HTMA, dated July 20, 1995.

The original CRWTP was constructed in 1911 and has been subsequently expanded and upgraded. These expansions and upgrades occurred in 1939, 1959, 1982, 1998/2000, with the most recent upgrades proposed to be finalized in 2006. The recent expansion of 1998/2000 increased the hydraulic capacity of the plant to 6.8 MGD (17 MGD Maximum Monthly Average) from the previous 4.60 MGD (5.89 MGD Maximum Monthly Average), according to PADEP. In 2003, the NPDES Permit (Permit Number 0026051) was renewed and reflects plant improvements and capacity increases from the 1998/2000 improvements. Similarly, CRWTP manages biosolids under PADEP Permit Number PAG083587. This permit also reflects the modifications to the treatment plant of 1998/200.

3.2.1. CHAMBERSBURG REGIONAL WASTEWATER TREATMENT PLANT TREATMENT PROCESS

The CRWTP is comprised of five treatment stages based on the 1998/2000 improvements and permit requirements:

1. Pretreatment: Grit Removal
2. Primary Treatment: Clarification and Acration
3. Secondary Treatment: Clarification
4. Disinfection and Aeration
5. Biosolids Management: Primary Clarifier Sludge and Secondary Clarifier Sludge with sludge thickener, digester systems, and dewatering.

Figure 3.2.1. Treatment Process Diagram, Chambersburg Regional Wastewater Treatment Plant, provides details of the wastewater process.

3.2.1.1 DESCRIPTION OF PRETREATMENT

Pretreatment consists of influent headworks (for flow sampling and return of recycled flow), a pump station, grit removal facilities, and a cominuter . A Parshall flume is positioned prior to the primary clarifier, immediately downstream of pretreatment equipment.

3.2.1.2. DESCRIPTION OF PRIMARY TREATMENT

Primary treatment consists of primary clarification/settling and scum removal. Settled sludge and scum is discharged to a gravity thickener and clarified liquids are discharged to a vertical loop reactor (VLR) aeration tank. The VLR tank receives return activated sludge from the secondary clarifier.

3.2.1.3. DESCRIPTION OF SECONDARY TREATMENT

Secondary treatment consists of three individual clarifiers where settled sludge is collected at a pump station and pumped to aerated sludge holding tanks. A portion of the secondary clarifier sludge is returned to the primary aeration tank for recycling. Clarified effluent is discharged to a disinfection unit.

3.2.1.4 DESCRIPTION OF DISINFECTION AND AERATION

Disinfection is accomplished using ultraviolet light technology. Halogen oxidation is not used in the disinfection process. Disinfected water flows to cascade aeration system prior to discharge. A sampling point is located immediately prior to the cascade aeration unit.

3.2.1.5. DESCRIPTION OF BIOSOLIDS MANAGEMENT

Sludge and scum from the primary clarifiers are collected in the waste activated sludge (WAS) holding tank. Sludge stored in the holding tank is pumped to rotary drum thickeners. Thickened sludge is sent to a holding tank where it is stored until being pumped to a belt filter press. Discharge from the filter press is mixed with lime prior to discharge to a disposal transport truck.

Sludge and scum from the secondary clarifiers is collected in a gravity thickener. The thickened sludge from the gravity thickener is pumped to a primary anaerobic digester. Following primary anaerobic digestion, the sludge is sent to a secondary anaerobic digester. Sludge from the secondary anaerobic digester is discharged to a belt filter press, is treated with lime, and discharged to a disposal transport truck.

Treatment of primary clarifier sludge and secondary clarifier sludge includes thickening, anaerobic digestion, polymer conditioning, belt filtration, and lime stabilization (as required).

Additionally, a bio-filter is used for odor control.

3.2.2 CHAMBERSBURG REGIONAL WASTEWATER TREATMENT PLANT OPERATIONAL LIMITATIONS

The CRWTP operates under the requirements of NPDES Permit 0026051, most recently renewed in 2003 and scheduled to be renewed again in 2008. A summary of discharge limitations for the plant NPDES permit are provided in Table 3.2.2.

Based on verbal discussions with PADEP in April 2006, it was also noted that the facility has restricted or curtailed acceptance of septage from commercial septic tank service firms.

A nutrient removal/operating efficiency of greater than 99% will be necessary in order to accommodate a hydraulic loading of 17.0 MGD. The current operating efficiency is approximately 97% based on available 2005 discharge monitoring reports. Additional information and review is necessary in order to determine the point at which it becomes cost prohibitive or technically impractical to increase flow while continuing to meet discharge effluent loading requirements. This condition is a critical consideration in the event that a regional approach to nutrient loading in the Chesapeake Bay watershed becomes a promulgated requirement under USEPA requirements.

TABLE 3.2.2
CHAMBERSBURG REGIONAL WASTEWATER TREATMENT PLANT
EFFLUENT DISCHARGE REQUIREMENTS
NPDES PERMIT 0026051 *

Parameter	Monthly Average	Weekly Average	Monthly Average Mass Loading #/day	Weekly Average Mass Loading #/day
Total Suspended Solids	30 mg/l	45 mg/l	1701	2552
CBOD (Summer)	15 mg/l	22 mg/l	851	1248
CBOD (Winter)	25 mg/l	40 mg/l	1418	2268
Ammonia (N) (Summer	3.5 mg/l	-	198	-
Ammonia (N) (Winter)	10 mg/l	-	567	-
Fecal Coliform (Summer)	200 colonies /100 ml	-	-	-
Fecal Coliform (Winter)	4500 colonies /100 ml	-	-	-
pH (S.U.)	6 to 9	-	-	-
Dissolved Oxygen	>5.0	-	-	-
One 24-hour composite sample per day is required for compliance monitoring.				

* Source: PADEP records, NPDES Permit Number 0026051

3.2.3 CHAMBERSBURG REGIONAL WASTEWATER TREATMENT PLANT UPGRADE AND EXPANSION PLANS

CRWTP added or replaced the following equipment as part of the 1998/2000 plant improvement program *:

- Comminuter
- Bar Screen
- Paddle Grit Remover
- Screw Grit Remover
- (4) Primary Settling Tanks
- (4) VLR Units
- (3) Secondary Clarifiers
- UV Disinfection
- Sludge Thickener
- Primary Anaerobic Digester
- Secondary Anaerobic Digester
- Sludge Holding Tank
- (2) Belt Filter Presses
- Sludge Storage Tank
- (2) Rotary Screen Thickeners
- (2) WAS Holding Tank
- Bio-filter for Odor Control

*** Source: Hamilton Township Records, 4/11/06**

3.3 EXISTING SMALL FLOW TREATMENT FACILITIES OPERATIONS AND MAINTENANCE REQUIREMENTS

A substantial portion of the Township utilizes on-lot disposal systems as the primary means of managing wastewater. These systems are limited to residential use as individual systems.

3.3.1 EXISTING DISPOSAL/DISCHARGE AREAS AND GROUNDWATER

PADEP permit number PAG083587 allows CRWTP to dispose of biosolids by landfill or by land application. Biosolids from CRWTP can be accepted by Mountain View Landfill, Greencastle, York County, Pennsylvania, operated by Waste Management, Incorporated. However, according to PADEP, the majority of biosolids generated by CRWTP are currently managed by land application. CRWTP is permitted to land apply biosolids at the John Yeager Farm, Hamilton Township (PADEP Permit Number PAG083578). Application of the biosolids at this facility is limited by the nutrient uptake requirements/capacity of the crops, according to the PADEP permit. Additionally, biosolids cannot be applied within 300 feet of a residential structure, well, or stream.

A limited evaluation of groundwater quality was conducted using data from a survey of Township wells as discussed in Section 3.4, below.

Groundwater quality data generated by public or government sources was not readily available for review at the time of this report. No assessment of overall groundwater quality was conducted in the absence of Federal, Commonwealth, or County data.

3.3.2 EXISTING INDIVIDUAL AND COMMUNITY ON-LOT SEWAGE DISPOSAL SYSTEMS

There are approximately 585 individual on-lot systems listed as operating within the Hamilton Township, according to Township records. These systems are primarily located in the western and southern portions of the Township. There are approximately 40 additional on-lot systems operating within the service area but situated outside of the Township. These systems are primarily located in the old Kensington Heights area situated in Letterkenny Township on the northeast border of Hamilton Township.

Table 3.3.1, below, provides a summary of applications for construction of on-lot sanitary disposal systems. These systems are primarily sand mound systems for individual lots or residential developments.

TABLE 3.3.1.
APPLICATIONS FOR CONSTRUCTION OF ON-LOT SANITARY DISPOSAL SYSTEMS IN HTMA SERVICE AREA

System Type	2003	2004	2005
Sand Mound Construction (Individual Lot)	10	17	13
Sand Mound Construction (Community System)	0	1	0
Sand Mound Repair (Individual Lot)	0	3	0
Sand Mound Repair (Community System)	0		0
Septic Tank Construction	0	0	0
Septic Tank Repair	0	2	0
Alternative A/B System	0	2	0
Commercial Holding Tank Construction	0	1	1

*** Source: Hamilton Township Sewer Enforcement Officer/JWP Environmental, Inc. 4/12/06**

3.3.3 TYPES OF ON-LOT SYSTEMS IN USE

Multiple types of sanitary on-lot disposal systems (OLDS) are present throughout the Township. A summary of the types of OLDS is listed in Table 3.3.1. Some properties/lots site more than one type of system. Types of systems present in the Township include clay pipe/tile distribution systems, septic tank with perforated pipe distribution field systems (individual and community), abandoned or minimal use privy (individual), sand mound systems (individual and community), and alternate above ground systems. Holding tanks are also present in the Township. These tanks are typically associated with small to medium commercial or institutional facilities situated along larger roads where public wastewater disposal infrastructure is not available.

The age of the systems throughout the Township varies substantially. Based on interviews of residents, a significant number of systems have been active over several decades with their construction initiated prior to 1940 and in some limited instances prior to 1900. This situation is especially prevalent on agricultural parcels. The majority of sand mound and septic tank disposal systems were constructed after approximately 1977. There are few if any readily available records of the older systems, constructed pre-1970 that describe construction, location, and/or operation.

3.3.4 SANITARY SURVEY

Township records provide a listing of residences utilizing on-lot sanitary disposal systems. This list is provided as Appendix 3.3.4, Data from Sanitary (OLDS) Survey, 2005 - 2006. The location of Township residences with on-lot sanitary disposal systems is presented on Map 3.3.4., On-Lot Wastewater Management Systems, Hamilton Township.

A survey of on-lot disposal systems within Hamilton Township was conducted by Remington, Vernick, & Beach Engineers between November 2005 and February 2006. Township residences operating on-lot septic systems were contacted to verify information provided by the Township. The residences that confirmed the information were then contacted a second time to establish their willingness to participate in an on-site survey and to set a date for inspection of their septic system as well as a sampling of on-site well(s), if a well was also present.

Septic systems were inspected at each participating residence. This survey included:

- Verbal discussion with the resident to gather information about the septic and well systems locations and operational considerations.
- Visual inspection of the septic and well systems.
- Collection of water samples to determine the presence and concentration of characteristic contaminants.

A similar survey of residents in the old Kensington Heights neighborhood was conducted by Remington Vernick & Beach Engineers in November and December 2006. It was determined that all of the residents in this development were utilizing OLDS and that all of the residents in this development were supplied with potable water by Bear Valley Water Authority.

3.3.5 COMPARISON OF EXISTING AND APPROPRIATE SEWAGE SYSTEMS

Appropriate siting and operation of on-lot wastewater disposal systems (OLDS) is contingent on several factors:

1. Soil Type
2. Topographic Slope
3. Proximity to Surface Water and Groundwater
4. Diligent Operation, Inspection, and Maintenance

The majority of soil types and slopes throughout the Township are not conducive to construction and operation of OLDS. Map 3.3.5.A. On-lot Wastewater Systems and Soil Types, shows the location of residences using on-lot disposal systems throughout the Township relative to various soils types. Map 3.3.5.A.1 On-lot Wastewater Systems and Soil Types, Kensington Heights, Letterkenny Township, shows the location of residences using on-lot disposal systems in the Letterkenny Township portion of the service area. Note that the majority of OLDS are sited in areas where soil type and/or slopes are not optimum for this type of system. 585 documented OLDS exist in Hamilton Township and 40 OLDS exist in old Kensington Heights, Letterkenny Township. Map 3.3.5.B. On-lot Wastewater Systems and Topographic Slope, shows the location of on-lot disposal systems throughout the Township relative to topographic slope of the land. Map 3.3.5.B.1. On-lot Wastewater Systems and Topographic Slope, Kensington Heights, Letterkenny Township, shows the location of on-lot disposal systems throughout the Township relative to topographic slope of the land in old Kensington Heights.

The proximity of OLDS, both horizontally and vertically, to surface water or groundwater can also impact operation of the systems. Map 3.3.5.C On-lot Wastewater Systems and Floodplain/Wetlands, shows the location of on-lot disposal systems throughout Hamilton Township relative to areas within the designated floodplain. Floodplain areas are usually situated close to existing surface water and subject to inundation during periods of precipitation or snowmelt. Because of this, it is likely that the soils in these areas are regularly saturated with runoff water. Similarly, during periods of flooding or runoff, groundwater elevation in these areas is likely to be elevated. Saturated soils and elevated groundwater limit the effective and normal operation of OLDS and could result in adverse impact to the construction and operation of the system. There were no floodplains or wetlands identified in the old Kensington Heights neighborhood.

Map 3.3.5.D On-lot Wastewater Systems and Groundwater Sample Locations, shows the location of on-lot disposal systems throughout the Township relative to areas where groundwater samples were collected. No groundwater samples were collected in the old Kensington Heights neighborhood.

3.3.6 OPERATIONS AND MAINTENANCE REQUIREMENTS OF SMALL VOLUME ON-LOT SYSTEMS

Operation and maintenance of on-lot disposal systems are governed by Ordinance 2000-119, An Ordinance Governing Municipal management of On-Lot Subsurface Sewage Disposal Facilities for the Township of Hamilton, Franklin County, Pennsylvania. This ordinance establishes operation, maintenance, and inspection requirement for on-lot disposal systems. Specifically, it requires inspection of each system by the Township during construction, pumping of the system every three years unless a waiver is granted, and administrative and enforcement protocol for implementing the ordinance. It further provides for Sanitation Districts used to designate specific portions of the Township for maintenance of on-lot systems on a rotating annual basis.

Ordinances related to the operation and management of small volume on-lot disposal systems include, Ordinance 97 of 1993 and Ordinance 2000-117, and Hamilton Township Subdivision and Land Development Ordinance of April 2002, each as amended.

3.3.7 DESCRIPTION OF DOCUMENTED AND POTENTIAL PROBLEMS

A limited record of documented problems exists for Hamilton Township. Table 3.3.7, Summary of Documented Malfunctions of On-Lot Disposal Systems, provides a list of documented malfunctions for the period 2003 to 2005. Records prior to 2003 were not reviewed or not readily available for review.

TABLE 3.3.7
SUMMARY OF DOCUMENTED MALFUNCTION OF ON-LOT DISPOSAL SYSTEMS IN HAMILTON TOWNSHIP, 2003 TO 2005

Date	Location	System Type	Description of Malfunction	Results of Investigation by Sewer Enforcement Officer
7/17/06	1056 Papermill Road	Individual Septic Tank and Infiltration Field	Soap Suds discharging from backyard pipe	Required homeowner to connect pipe to septic tank
9/3/06	5361 Bricker Road	Septic Tank and Infiltration Field	Complaint by neighbor of surface discharge	No discharge identified by inspection officer
10/16/03	826, 828, 830 Lincoln Way	Community Septic Tank and Distribution Field	System back-up and overflow	Pump system frequently and regularly due to poor infiltration

*** Source: Hamilton Township Sewage Enforcement Officer/JPW Environmental, Inc. 4/12/06**

These documented system malfunctions are located in various area of the Township. Due to the small number of reported malfunctions no specific trend(s) in causal relationships can be identified. However, the Lincoln Way malfunction is significant because it is a system that serves a multiple resident community of prefabricated homes, each of which is in close proximity to the other residents of the community. This system has recently been redesigned and rebuilt in 2005. There have been no reported malfunctions since reconstruction.

3.4 INDIVIDUAL WATER SUPPLY SURVEY

The majority of the needs for potable water of Hamilton Township and the old Kensington Heights area of Letterkenny Township are served by Bear Valley Water Authority. This is the major source of public water supply and is provided to individual users through a pipe distribution system. A secondary source of potable water supplied through a piped distribution system is the Silver Spring Water Association. The Silver Spring Water Association supplies potable water to a limited number of residences in the western portion of the Township. The remainder of the Hamilton Township service area is serviced by individual on-lot wells. Approximately 231 residences are known to possess an on-lot water supply well for potable water use.

A survey of residences possessing on-lot water supply wells was conducted by Remington Vernick and Beach Engineers between January and March of 2006. The survey consisted of telephone and/or written correspondence contacts with approximately 231 residents. Of the 231 residents contacted, fifty-one were willing and able to provide samples of water from their on-site well. Well water samples were collected and analyzed for total Coliform, fecal Coliform, and nitrate. All residents of old Kensington Heights are served by public water supply with the exception of one agricultural parcel.

Since the majority of residences sampled for well water also possessed an on-lot septic system, a survey of on-lot septic systems was conducted concurrently with sampling of well water. Discussion of the on-lot septic system survey is addressed in Section 3.3.4, above.

3.4.1 SAMPLING REQUIREMENTS AND ANALYTICAL STANDARDS

Protocol for the sampling program was based on the guidance document, "ACT 527 Sewage Disposal Needs Identification", as provided by the Commonwealth of Pennsylvania, Department of Environmental Protection, 3800-BK-DEP1949, Rev. 2002.

Fifteen percent or more of the potential 231 individual residential wells were required to be sampled for total Coliform, fecal Coliform, and nitrate in order to meet PADER requirements. Samples that showed the presence of any parameter exceeding the recommended limits were resampled and reanalyzed to confirm the results of the initial analysis. Sample locations and a summary of sample data are presented on a Map 3.3.5.D., On-lot Wastewater Systems and Groundwater Sample Locations, Hamilton Township.

Water supply wells were sampled at all residences willing to participate in the study resulting in fifty one samples (22% of residences with on-lot well(s) were sampled). Samples were collected using sterile collection techniques from sample locations situated prior to (upstream

of) any treatment equipment. Attempts were made to collect water from sample locations as close to groundwater well as possible, and to allow standing water to be displaced from the pipe and well system prior to sample collection. Purging was conducted in order to obtain representative samples of actual groundwater. Sample locations were purged of standing water by allowing the tap, drain valve, or hose bib to flow for several minutes prior to sample collection. Samples were collected allowing water to fill sample bottles without touching the point of discharge. The water supply system was then returned to previous operating settings. Residents were also verbally interviewed about the well system details. Interview notes were recorded for inclusion in this report as Appendix 3.3.4, Data from Sanitary (OLDS) Survey, 2005 - 2006.

None of the residents in the old Kensington Heights neighborhood utilize private wells as a source of potable water.

3.4.2 DATA SUMMARY AND INTERPRETATION

A summary of all analytical data collected during the sampling of individual wells is provided as Table 3.4.2.A., Summary of Residential Well Water Analytical Data, below. A summary of analytical data showing the presence of total Coliform, fecal Coliform, or nitrate in samples that exceed acceptable limits is provided as Table 3.4.2.B., Residential Well Water Analytical Data Showing Detected Contaminants, below. Note that the Map ID number in these tables corresponds to the sample location as shown on Map 3.4.1., Residential Well Water Sample Locations and Analytical Data Summary, Hamilton Township.

TABLE 3.4.2.A. – SUMMARY OF RESIDENTIAL WELL WATER ANALYTICAL DATA *

Map Location ID Number	Street Address	Sample Date	Total Coliform (CFU/100mL)	Fecal Coliform (Present / Absent)	Nitrate - N Concentration (mg/l)	Depth to Groundwater from Surface Elevation
1	5893 Mountain Road	2/21/2006	3	A	1.7	<25 Feet
		3/22/2006	4	A	1.4	<25 Feet
2	5871 Mountain Road	1/16/2006	31	P	4.4	<25 Feet
3	5849 Mountain Road	1/16/2006	15	A	2.9	<25 Feet
		2/22/2006	5	P	3.1	<25 Feet
4	5805 Mountain Road	2/21/2006	7	P	2	<25 Feet
		3/22/2006	5	A	1.7	<25 Feet
5	5753 Mountain Road	1/17/2006	0	A	<1.0	<25 Feet
6	5712 Mountain Road	2/21/2006	11	A	1.5	<25 Feet
7	5827 Mountain Road	2/21/2006	18	P	2.3	<25 Feet
8	2113 Twin Bridge Rd.	2/22/2006	1	A	1.3	<25 Feet
		3/22/2006	0	A	<1.0	<25 Feet
9	4427 Rumler Road	1/17/2006	0	A	1.1	–
10	8820 Mt. Olivet Road	1/16/2006	0	A	<1.0	–
11	8865 Mt. Olivet Road	1/16/2006	28	P	6.3	–
		2/22/2006	88	A	5.6	–
12	3746 Wenger Road	1/17/2006	0	A	<1.0	–
13	8797 Edenville-Cheesetown Road	1/16/2006	0	A	<1.0	–
14	3728 Wenger Road	1/16/2006	0	A	<1.0	–
15	6937 Edenville-Cheesetown Road	1/16/2006	0	A	<1.0	–
16	2375 Twin Bridge Road	1/17/2006	0	A	8.5	<25 Feet
17	1918 Twin Bridge Road	1/17/2006	0	A	<1.0	<25 Feet

18	1629 Twin Bridge Road	1/16/2006	0	A	<1.0	<25 Feet
19	1679 Twin Bridge Road	1/17/2006	0	A	<1.0	<25 Feet
20	5361 Bricker Road	1/16/2006	8	P	1.2	–
		2/22/2006	P	A	1.5	–
21	4084 Burkett Road (home)	2/22/2006	0	A	2.2	–
22	4084 Burkett Road (farm)	1/17/2006	4	P	5.6	–
23	3279 Portico Road	1/16/2006	0	A	<1.0	–
24	2975 Portico Rd.	1/17/2006	0	A	<1.0	–
25	2944 Portico Road	1/16/2006	1	A	<1.0	–
26	3945 Crottlestown Road	1/17/2006	0	A	<1.0	–
27	3815 Crottlestown Road	1/16/2006	0	A	1.1	–
28	3489 Crottlestown Road	1/16/2006	0	A	<1.0	–
29	3733 Crottlestown Road	2/22/2006	2	P	2.7	–
		3/22/2006	0	A	3.1	–
30	2610 Jack Road	1/17/2006	0	A	<1.0	–
31	3369 Warm Spring Road	1/17/2006	0	A	<1.0	–
32	671 Boyer Mill Road	1/17/2006	0	A	<1.0	–
33	5753 Fort McCord Rd.	2/22/2006	0	A	1.1	–
34	5222 Fort McCord Rd.	2/21/2006	0	A	<1.0	–
35	7735 Edenville Rd.	2/21/2006	P	A	<1.0	–
		3/22/2006	0	A	<1.0	–
36	2025 Crottlestown Rd.	2/22/2006	0	A	<1.0	–
37	2235 Crottlestown Rd.	2/21/2006	0	A	<1.0	–
38	1369 Warm Springs Rd.	2/22/2006	0	A	<1.0	–
39	4821 Rumler Rd.	2/22/2006	0	A	<1.0	–
40	2300 Edenville Rd.	2/22/2006	0	A	<1.0	–

41	6248 Edenville Rd.	2/22/2006	2	A	3.5	–
		3/22/2006	2	P	1.5	–
42	2899 Leafmore Rd.	2/22/2006	0	A	<1.0	–
43	4923 Fort McCord Rd.	2/22/2006	0	A	<1.0	–
44	1686 Twin Bridge Rd.	2/22/2006	0	A	<1.0	–
45	9466 Gilbert Rd.	2/21/2006	0	A	<1.0	–
46	Gilbert Rd.	2/21/2006	0	A	<1.0	–
47	3250 Edenville Rd.	2/21/2006	1	A	<1.0	–
		3/22/2006	0	A	<1.0	–
48	6364 Fort McCord Rd.	2/22/2006	0	A	<1.0	–
49	7519 Fort McCord Rd.	2/22/2006	17	P	1.5	–
50	2213 Crottlestown Rd.	2/22/2006	1	A	<1.0	–
51	3850 Wenger Rd.	3/22/2006	0	A	<1.0	–
52	4562 Edenville Rd.	3/22/2006	0	A	<1.0	–

*** Source: Remington Vernick & Beach/Suburban Water Testing Labs, 2005/2006**

TABLE 3.4.2.B. - RESIDENTIAL WELL WATER ANALYTICAL DATA SHOWING DETECTED CONTAMINANTS *

Table Line #	Map ID #	Street Address	Sample Date	Total Coliform (CFU/100mL)	Fecal Coliform (Absent/Present)	Nitrate - N Concentration (mg/l)
1	1	5893 Mountain Road	2/21/2006	3	A	1.7
2	1		3/22/2006	4	A	1.4
3	1	5871 Mountain Road	1/16/2006	31	P	4.4
4	3	5849 Mountain Road	1/16/2006	15	A	2.9
5	3		2/22/2006	5	P	3.1
6	4	5805 Mountain Road	2/21/2006	7	P	2.0
7	4		3/22/2006	5	A	1.7
8	6	5712 Mountain Road	2/21/2006	11	A	1.5
9	7	5827 Mountain Road	2/21/2006	18	P	2.3
10	8	2113 Twin Bridge Rd.	2/22/2006	1	A	1.3
11	8		3/22/2006	0	A	<1.0
12	9	4427 Rumler Road	1/17/2006	0	A	1.1
13	11	8865 Mt. Olivet Road	1/16/2006	28	P	6.3
14	11		2/22/2006	88	A	5.6
15	16	2375 Twin Bridge Road	1/17/2006	0	A	8.5
16	20	5361 Bricker Road	1/16/2006	8	P	1.2
17	20		2/22/2006	>1	A	1.5
18	21	4084 Burkett Road (home)	2/22/2006	0	A	2.2

19	22	4084 Burkett Road (farm)	1/17/2006	4	P	5.6
20	25	2944 Portico Road	1/16/2006	1	A	<1.0
21	27	3815 Crottlestown Road	1/16/2006	0	A	1.1
22	29	3733 Crottlestown Road	2/22/2006	2	P	2.7
23	29		3/22/2006	0	A	3.1
24	33	5753 Fort McCord Rd.	2/22/2006	0	A	1.1
25	35	7735 Edenville Rd.	2/21/2006	>1	A	<1.0
26	35		3/22/2006	0	A	<1.0
27	41	6248 Edenville Rd.	2/22/2006	2	A	3.5
28	41		3/22/2006	2	P	1.5
29	47	3250 Edenville Rd.	2/21/2006	1	A	<1.0
30	47		3/22/2006	0	A	<1.0
31	49	7519 Fort McCord Rd.	2/22/2006	17	P	1.5
33	50	2213 Crottlestown Rd.	2/22/2006	1	A	<1.0

*** Source: Remington Vernick & Beach/Suburban Water Testing Labs, 2005/2006**

The data presented in Table 4.3.2.B., indicates a good correlation between initial sample data and confirmation sample data. Identification of contaminants during the initial sampling corresponds well with second round sample results. Based on correlation of data, the following observations are provided:

Twenty-two of the fifty-one samples collected (43%) showed contamination at levels exceeding recommended limits. Exceedences of limits includes (1) contamination from total Coliform, four sites (7.8%); (2) contamination from nitrate, five sites (9.8%); (3) contamination from total Coliform and nitrate, five sites (9.8%); and (4) contamination from fecal Coliform, total Coliform, and nitrate, eight sites (15.6%). Total Coliform analysis includes fecal streptococcus bacteria.

Sites exhibiting a concentration of exceedences can be grouped by geographic location as follows:

Area 1. – Mountain Road: six sites in close proximity to each other, all exhibiting contamination from total Coliform and nitrate. Four of the six sites showed the presence of fecal Coliform in addition to total Coliform. Typical depth to groundwater from surface was approximately 25-feet.

Area 2. – Twin Bridge Road: two sites characterized by the absence of biological contamination but the presence of nitrate. Agricultural activities appear to be the source of the nitrate.

Area 3. – Edenville Road: three sites characterized by low concentrations of total Coliform and very low or no nitrate or fecal Coliform. The presence of livestock appears to be the source of contamination from total Coliform.

Other locations where samples were identified as exceeding acceptable levels of contamination did not show grouping or clusters based on geographic location, or the proximity of sample locations was dispersed and did not allow for groupings or clusters to be readily apparent due to geographical separation. In this latter situation, the physical separation of sample locations was significantly influenced by the size of the land parcels and/or the topographic/soil characteristics of the land surrounding the sample locations.

All of the sites sampled utilized an on-site will as a water supply source. All of the sites that showed the presence of contamination had filtration and/or sterilization mechanisms present prior to faucets or taps. However, not all filtration/sterilization systems were fully operational.

3.4.3 WASTEWATER SLUDGE AND SEPTAGE: GENERATION, TRANSPORT, AND DISPOSAL METHODS

Septage is generated by the Township through the use, operation, and management of on-lot septic disposal systems. Septage is managed by commercial septic service providers with locations throughout Franklin, York, and Derry Counties as well as in the Hagerstown, Maryland area. It is disposed of at permitted receiving facilities such as wastewater treatment plants and land application facilities. The disposal facilities are located throughout the same counties where the commercial service providers are located. Septage is land applied at one known permitted located in Hamilton Township.

3.4.4 LOCATION OF WASTEWATER SLUDGE AND SEPTAGE

No wastewater sludge is generated by the sanitary sewer collection and conveyance system operated by Hamilton Township Municipal Authority. This is because the system is a collection and conveyance system only, and has no direct treatment component. However, the Township does receive biosolids generated by the CRWTP for land application within the Township. CRWTP is located in the Borough of Chambersburg. On-lot septic disposal systems are located and utilized throughout Hamilton Township.

3.4.5 QUANTITIES OF BIOSOLIDS AND SEPTAGE GENERATED

Quantities of biosolids generated by the CRWTP are determined utilizing reported quantities disposed of at the land application facility located in Hamilton Township. PADEP records indicate that 45-tons of dewatered biosolids were applied at the Dice Farm property in 2005 and 4-tons of dewatered biosolids were applied at the Dice Farm in 2004.

The quantity of septage anticipated to be generated is calculated based on the presence of 585 known on-lot disposal systems within the Township, each possessing a septic tank with an estimated average capacity of 900 gallons, and the presumption that 33% of the systems will be serviced each year, in accordance with Ordinance 2000-119. The result is a potential septage generation rate of up to 173,745 gallons per year.

3.4.6 CURRENT DISPOSAL METHODS, LOCATIONS, CAPACITIES, AND TRANSPORTATION

The Chambersburg Regional Wastewater Treatment Plant disposes of biosolids through land application at various locations throughout the county including Hamilton Township. The treated biosolids are applied to agricultural land known as John Yeager Farm located in Hamilton Township. The biosolids are also permitted for landfill disposal at Mountain View Landfill, Greencastle, Pennsylvania. Approximately 45 dry tons of biosolids were land applied in Hamilton Township in 2005.

TABLE 3.8.1A – SUMMARY OF BIOSOLIDS DISPOSAL QUANTITIES AND LOCATIONS BY CRWTP IN HAMILTON TOWNSHIP*

Disposal Facility	Material Received	Quantity Year 2004	Quantity Year 2005
Dice Farm, Hamilton Township (Permit # PAG093524, Septage; Permit # PAG083560, Biosolids)	Septage (gallons)	743,100	742,000
	Biosolids from St. Thomas Township(dry tons)	4	9
John Yeager Farm (Permit # PAG083578)	Biosolids from CRWTP (dry tons)	0	36

* **Source: PADEP, 4/18/06**

The quantities of biosolids received by the John Yeager Farm reflect modifications to the CRWTP and its ability to accommodate the sanitary needs of the communities that it serves. It is anticipated that additional quantities of biosolids will be directed to the Yeager Farm facility in the future.

3.8.2 ON-LOT SEPTIC DISPOSAL SYSTEMS AND SEPTAGE MANAGEMENT

Septage in Hamilton Township is managed under the following Township Ordinances:

- Hamilton Township Ordinance 97 of 1993, an ordinance restricting and regulating the use of holding tanks for collecting and retaining sewage on property located in Hamilton Township, Franklin County, Pennsylvania.
- Ordinance No. 2000-117, an ordinance governing the pumping collection, transport, storage, and disposal of septic tank waste in the Township of Hamilton, Franklin County, Pennsylvania.
- Ordinance No. 2000-119, an ordinance governing municipal management of on-lot subsurface sewage disposal facilities for the Township of Hamilton, Franklin County, Pennsylvania

A copy of these ordinances is provided in Appendix 3.8.2, Hamilton Township Ordinances.

There are numerous companies based throughout Franklin County, York County, and the Hagerstown, Maryland areas that provide septic system management services. A list of septic system service providers that are permitted and currently operating in the Township is provided in Table 3.8.2.A., Septic System Service Providers, Franklin County Pennsylvania.

TABLE 3.8.2.A –SEPTIC SYSTEM SERVICE PROVIDERS FRANKLIN COUNTY, PENNSYLVANIA 2006 *

PADEP Permit #	Company	Location			
28001	Merle E. Wingert Co.	5103 Mountain Rd.	Chambersburg	PA	17201
28002	Wadel's Septic Cleaning Service	8907 Rowe Run Road	Shippensburg	PA	17257
28003	Rosenberry's Septic Tank Service	8885 Pineville Road	Shippensburg	PA	17257
28004	Roger A. Wingert Septic Service	2946 Black Gap Rd.	Chambersburg	PA	17201
28005	Chamberlin's Septic and Portable Toilet Service	7703 Upper Horsevalley Rd.	Upper Strasburg	PA	17265
28006	Antrim Septic Service	3119 Barr Road	Greencastle	PA	17225
28007	Gordon Septic	P.O. Box 32	Mercersburg	PA	17236
28008	Rosy's Septic Tank Pumping	1781 Hade Rd.	Chambersburg	PA	17201
28009	S.R. Daley & Son	4103 W. Weaver Rd.	Greencastle	PA	17225
28010	Art's Portable Toilets	P.O. Box 145	Fannettsburg	PA	17221
28011	May and Company, Inc.	197 Pioneer Dr.	St. Thomas	PA	17252
28012	Gipe's Septic Tank Pumping	4534 Warm Springs Road	Greencastle	PA	17225

*** Source: PADER, 4/7/06**

Additional service providers may conduct business in Hamilton Township, however, these vendors are likely to have a Maryland address or they do not hold a PADEP permit.

Additional service providers are not anticipated to be significant contributors to septage management of the Township.

Septic system service providers are required to dispose of septage at facilities specifically permitted to accept septage by PADEP. The Dice Farm is the only facility within Hamilton Township permitted to accept, treat, and land apply septage. The CRWTP has restricted acceptance of septage for disposal. Other disposal alternatives include out of county facilities. Disposal of septage in York County and Derry County require haulers to manifest their material, register their vehicles, and discharge to county approved disposal facilities such as the York County Municipal Authority Waste Water Treatment Plant.

PADEP records show that approximately 742,550 gallons of septage are accepted for land application at the Dice Farm location between 2004 and 2005. This quantity exceeds the calculated generation rate for septage generated within Hamilton Township of 173,745 gallons per year. Other septage is presumed to be managed at out-of-Township facilities.

3.4.7 SCHEDULED OR IN-PROGRESS SYSTEM IMPROVEMENTS

Two system expansion projects are pending or proposed. The first is an extension of the collection and conveyance system involving construction of gravity and force main on Guitner Road and Coontown Road, connecting to existing main on Warm Spring Road. This extension is located in the southern most portion of the Township. This extension has been completed with final acceptance anticipated in late 2006. Connections to the Guitner Road/Coontown Road extension shall be limited to properties within 150-feet of the public right-of-way in which the sanitary wastewater main is located. The second proposed extension involves the old Kensington Heights development located in the southeastern portion of Letterkenny Township. This development is proposed to be connected to the existing HTMA system at some time in the future. However, this is a second tier priority pending availability of funding and resources. There is no completion date proposed for this second expansion.

The Township is in the process of returning individual residence grinder pump systems to individual property owners. Approximately 60 of these units remain the responsibility of the HTMA. As property is sold or changes ownership, the responsibility of operation and maintenance of these systems will become the responsibility of the new property owner. These efforts are intended to streamline labor and cost loads at the HTMA.

Miscellaneous studies, maintenance activities, and administrative activities will be conducted by HTMA over the coming years including but not limited to continued evaluation of the collection and conveyance system for infiltration and non-wastewater flows, review of need to conduct network analysis of system flows, review of flow monitoring equipment and methods, and amendments to the Act 537 Plan to accommodate future plan revisions during the upcoming 10-year planning period.

SECTION 4.0

FUTURE GROWTH AND LAND DEVELOPMENT

4.0 FUTURE GROWTH AND LAND DEVELOPMENT

4.1 SUMMARY OF MUNICIPAL AND COUNTY PLANNING DOCUMENTS

In 1975, an existing land use study was completed as part of Hamilton Township's 1975 Act 537 Comprehensive Sewage Facilities Plan. In 1993, an existing land use inventory was conducted including an on-lot visual survey with identification of actual land use and review of tax designation. Parcels are designated as residential, commercial, agricultural, or public use, based on this inventory.

4.1.1 LAND USE AND ZONING MAPS

All lots in Hamilton Township that are platted and registered with the Franklin County Recorder of Deeds office have been inventoried and are illustrated in Map 2.1., Hamilton Township, Franklin County, Pennsylvania and Surrounding Region. There are no zoning designations or restrictions on the land of the Township except for floodplain construction.

4.1.2. ZONING AND SUBDIVISION REGULATIONS

There are no zoning requirements for land parcels in Hamilton Township. Hamilton Township Subdivision and Land Development Ordinance does address minimum size requirements for lots based on the availability and type of water and sewer service. Requirements are found in Section 603. Table 4.1.2 provides a summary of the lot requirements based on water and sewer service utilization. Note that lots without public sewer service must meet percolation requirements for on-lot sanitary disposal systems, as well as comply with Federal, Commonwealth, and Township requirements addressing wetlands, floodplains, and special use land designations. Additionally, all lots are required to provide a 10-foot strip of land on each side of structure reserved for open space and the structure must be situated at least 35-feet from the right-of-way (ROW).

TABLE 4.1.2
SUMMARY OF LOT SIZE REQUIREMENTS
AND AVAILABILITY OF PUBLIC UTILITIES *

Utility Service Utilized	Dwelling Type	Minimum Lot Width (Feet)	Minimum Lot Area per Dwelling Unit (Square Feet)
Public Water Only	Single Family Detached	100	43,560
Public Sewer Only	(not specifically identified)	100	20,000
Public Water and Sewer	Single Family Detached	80	12,000
Public Water and Sewer	Two Family Detached, two story structure, one unit above the other	80	6000
Public Water and Sewer	Two Family Semi-Detached, two single story units side-by-side	50	6000
Public Water and Sewer Mandatory	Single Family Attached	20	2,400
Public Water and Sewer Mandatory	Multi-Family Dwelling	100	2400
No Public Water and Sewer	Two Family Detached and Semi-Detached	100	43,560
No Public Water and Sewer	Recreational Vehicle Park or Campgrounds	50	5000
No Public Water and Sewer	Non-Residential Use	Adequate to accommodate needs of specific end user per Township regulations.	Adequate to accommodate needs of specific end user per Township regulations.
	Telecommunication Facilities	60-feet to all property lines, minimum	80,000

*** Source: Hamilton Township Municipal Ordinances**

4.1.3 LIMITATIONS AND PLANS RELATED TO FLOODPLAIN AND STORMWATER MANAGEMENT OR SPECIAL PROTECTION

Growth and development in areas designated as floodplain, stormwater management, or special protection shall be restricted based on Commonwealth and Federal laws and regulations.

4.2 DELINEATION AND ANALYSIS OF DEVELOPMENT, LAND USE DESIGNATION, AND FUTURE GROWTH AREAS

Hamilton Township Subdivision and Land Development Ordinance regulates development and ultimately characterizes the potential for land to be developed beyond its current level of occupation and/or use. This ordinance directly or implicitly characterizes the requirements necessary for cost effective develop based on the following:

1. Restricting development in areas that are considered floodplains, wetlands, public use, or reserved for use by governmental organizations (special use designation).
2. Lot size and geometry by type of end use and location.
3. Availability or use of public water and sewer service.
4. Availability or use of public and private sanitary sewer service.
5. Impact of post development end use on groundwater elevation.
6. Impact of post development end use on groundwater quality.
7. Impact of post development end use on lot water recharge characteristics based on stormwater management practice.
8. Availability of waste disposal facilities in proximity to future growth areas, including public sewer, septage, biosolids, and municipal solid waste.

4.2.1. AREAS OF EXISTING DEVELOPMENT

Table 4.2.1, Named Residential Developments, Hamilton Township provides a summary of larger developments within the Township.

TABLE 4.2.1
NAMED RESIDENTIAL DEVELOPMENTS, HAMILTON TOWNSHIP *

No.	Developer	Name of Development	Units	Land Area (Acres)	Start Date
1	Laurich Company	Laurich Hills	183	77	1977
2	Laurich Company	Laurich Gems	374	149	1977
3	Black Brothers	Crestwood Acres	9	9	1979
4	Carson's MHP Associates **		150	62	1980
5		Kensington Heights	225	192	1983
6	Glenn Shoemaker	Hamilton Woods Estates	105	102	1983
7	Laurich Company	Laurich Ridge	180	98	1986
8		Woodbourne Estates **	182	31	1986
9	Billie Bard		22	20	1986
10	Norm Eyer	Penn Aire Grants	71	22	1987
11	Myron Young	Shale Manor	32	29	1987
12	Stanley Johnson	Meadow Green Heights	85	47	1987
13		Warm Spring Estates **	66	22	1988
14	Laurich Company	Laurich Town Hill Estates	48	147	1988
15	J.E.D. Associates	Liberty Estates	54	46	1988
16	Majestic Ridge Associates	Majestic Ridge	100	145	1991
17	Valley Properties	Warm Spring Ridge	224	58	1993
18	Whiskey Run Associates	Whiskey Run	51	54	1994
19	Bricker Brothers		13	6	1994
20	P.C. Homes	Brookdale	85	27	1996
21	R.A. Hill, Inc.	Hamilton Hills	105	64	1996
22	Billie Bard	Westview	38	34	1999
23		Rose Hills	17	10	2002
24		Hunter's Chase	81	42	2003
25		Westview Woods	32	21	2004
26		Warm Spring Road Estates	34	74	2006

*** Source: Hamilton Township Records and Bear Valley Water Authority**
**** Indicates wastewater infrastructure operated and maintained privately.**

TABLE 4.2.1. – APPROVED SUBDIVISION PLANS BY TYPE, 1996 TO 2005, HAMILTON TOWNSHIP *

Year:	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Totals 1996 to 2005
Number of Approved Subdivision Plans	38	25	41	35	38	29	24	29	40	34	333
Subdivision Residential Units (Public Sanitary):	240	41	108	20	231	126	108	13	185	41	1113
Subdivision Residential Units (On-lot Sanitary):	15	2	2	2	7	7	3	26	19	8	91
Subdivision Commercial or Public Units (Public Sanitary):	1	0	9	3	8	0	1	0	2	0	24
Subdivision Commercial or Public Units (On-lot Sanitary):	0	0	0	0	0	0	0	1	0	0	1
Total Units Approved Requiring Sanitary Service:	256	43	119	25	246	133	112	40	226	49	1029
New Residential Homes Constructed by Year *	n/a	n/a	n/a	56	50	79	90	105	148	105	633

* **Source: Hamilton Township Records, 3/06**

Note: Each "unit" identified in Table 4.2.1 is considered a quantity of real estate.

In addition to these areas of residential development, corridors along larger roads and highways have also been subject to development. These corridors include Lincoln Way, Warm Spring Road, Sollenberger Road, Leafmore Road, and Edenville Road.

4.3 LAND USE DESIGNATIONS UNDER 53 P.S. 10101-11202

4.3.1 FUTURE GROWTH AREAS

Future growth areas are characterized by ease of growth and development based on:

- Availability of land for development
- Ability to obtain an approved planning module.
- Proximity of public utility(s) infrastructure to development parcels
- Ability to construct private utility infrastructure in development parcels
- Willingness of potential purchasers to acquire and maintain development units

Specific areas where these characteristics represent growth potential from strongest to weakest include:

Primary growth areas are largely restricted to areas proximal to existing wastewater and water infrastructure. These areas include:

- North and South sides of Lincoln Way between Pleasant View and Saint Thomas Township
- South of Edenville Road (S.R. 4010) between Rocky Spring Branch and Back Creek
- Cheesetown, north and south of Edenville Road
- Hamilton Heights, north and south of Edenville Road and south of
- Sunbeam and Pleasant View
- Both sides of Warm Spring Road (S.R. 995), Guitner Road (S.R. 3015) and Coontown Road within 150-feet of the right-of-way, south of Turkeyfoot
- Select portions of Jack's Mill Road, both sides, within 150-feet of the right-of-way.

Secondary growth areas are largely restricted to areas proximal to existing wastewater and water infrastructure but are located farther from commercial or higher population density areas. These are:

- The area north of Fisher Road, west of Sunbeam, and south of Lincoln Way
- The area north of Edenville Road (S.R. 4010), east of Portico and Boundary Roads, and west of Keefer Road
- The area south of Edenville Road, adjoining Stone Bridge Road, Crottletown Road, and Shatzer Orchard Road, east of Dennis Creek

Tertiary growth areas include those areas where service by wastewater or water infrastructure is limited or does not exist. This type of growth area is largely limited to the western portion of the Township. This growth area(s) includes:

- Sandy Hook.
- The area south of Letterkenny Arm Depot, west of Portico Road, north of Edenville-Cheesetown Road, and east of Sandy Hook and State Game Lands #235
- Turkeyfoot

- Cashtown
- Housum

These areas are currently the least developed areas in the Township. Absent is significant and/or extensive public sewer and water supply infrastructure. These areas are also characterized by more limited size roadways and fewer roads connecting between areas of growth or commerce. These areas are least influenced by primary growth areas as they are buffered by secondary growth areas or restricted growth designations (connection to wastewater infrastructure within 150-feet of ROW only) for portions of primary growth areas.

Growth in these areas is anticipated to be primarily residential development with light commercial facilities reflecting growth in service oriented businesses that will support or e supported by residential development. Growth will likely occur as a gradual spectrum of development initially focusing in the primary growth areas. The tertiary areas of growth will see the smallest rate of growth or no growth at all. This is largely due to the absence of sanitary sewers.

As primary growth areas become saturated, secondary areas will see growth. This growth is premised on stable regional and national economic conditions characterized by relatively low interest rates, stable energy supply, and continued migration of population from urban and suburban areas to more rural portions of the central Pennsylvania/Maryland/West Virginia region.

A second qualifier is the availability of support services such as waste management systems to accommodate sanitary and solid waste. This second qualifier will have little impact on the ability of the land to be developed but rather will impact the ability and willingness of purchasers to acquire developed or developable parcels.

4.3.1.1. AVAILABILITY OF LAND

Approximately 98% of the land (20,626 acres) in the Township is privately held. The remainder of the land in the Township is utilized and/or controlled by local, Commonwealth, or Federal organizations or is of restricted use in accordance with government regulations. These areas include municipal facilities, public recreational areas, wetlands, floodplains, gamelands, and federal reserves. Agricultural lands are considered privately held.

Wetlands are regulated by Commonwealth and Federal laws. Special use or restricted lands include state game lands and Commonwealth or Federal facilities. Public use lands include parks, sports and recreational facilities, pump stations, administrative facilities, and public works facilities. Private land includes all land not accounted for in other categories. Private land includes all parcels regardless of size or state of development. Table 4.1.1, Land Use Designation, Hamilton Township summarizes the land area designated for each category.

TABLE 4.3.1.1. - LAND USE DESIGNATION, HAMILTON TOWNSHIP

Land Use Designation	Acres	Percentage of Total Township Land
Floodplain and Wetlands	453	<1
Special Use/Restricted	989	<1
Municipal Use	100 (estimated)	<1
Private Use	20,218	98
TOTAL	21,760	100

A significant portion of available private land within the Township is currently developed or is designated for development based on approved planning modules or permit applications. This developed land accounts for approximately 4500 acres of private use land. Growth within these areas has reached current optimum utilization for residential or light commercial development. It is unlikely that significant additional development would occur in these areas for the foreseeable future. However, it is possible that portions of these developed lands could utilize additional public sewage or potable water resources.

The remainder of the land in the Township that is not under Commonwealth or Federal jurisdiction, is not a wetlands or floodplain, and is not utilized for municipal applications, and is not currently developed, is therefore available for development and future growth. Land available for growth accounts for approximately 65% (14,180 acres) of the land in the Township.

Limited by:

- Availability of public sewage and water
- Suitable soil for on-lot sanitary disposal where public sewer is not available,
- Desirability by topographic slope (greater slope equates to higher development costs)
- Willingness to commit to development of private land by current land owner(s)

With respect to growth and development within the Township, Township land is designated as primary, secondary, or tertiary growth areas. Map 4.3.1.1, Designated Growth and Development Areas, shows the delineation of each of these growth and development areas as well as the extent of public sanitary sewer service. Primary growth areas are designated for development during the current planning period. Secondary growth areas are designated for development in the event that wastewater treatment capacity is made available and infrastructure is capable of accommodating additional development after the primary growth areas have reached saturation. Tertiary growth areas are areas where development is restricted or where infrastructure is not likely to available to support development until well after the secondary growth areas are saturated. Approximately 6,553.1 acres are designated as primary growth areas. Approximately 4,036.1 acres are designated as secondary growth areas. Tertiary growth areas account for approximately 12,153.8 acres.

4.3.1.2 AVAILABILITY OF WATER SUPPLY

Water supply sources currently available within the Township:

- Public
  Bear Valley Water Commission (under Consent Decree with PADEP)
  Silver Spring Water Association
- Private
  On-site wells

The Bear Valley Water Commission is currently operating with restrictions due to a consent decree issued by PADEP. The consent decree restricts or prevents new connections to the existing potable water infrastructure. As a result, potable water supply and infrastructure within the Township will be limited until the consent decree issues are resolved. The Silver Spring Water Association services a limited area and is not anticipated to extend service significantly beyond the existing service area. On-site wells are anticipated to be the primary source of potable water for the designated areas of development during this planning period.

Map 2.6., Areas Serviced by Public Water Supply, Hamilton Township, shows the existing service area of Bear Valley Water Authority and Silver Spring Water Association.

4.3.1.3 AVAILABILITY OF SANITARY SEWER DISPOSAL FACILITIES

Four levels of development can be used to identify the level of public infrastructure available to accommodate current and future sanitary disposal management needs of the Township. These levels are:

1. Primarily Private Sanitary Management Infrastructure present is characterized by: reliance on on-site sanitary disposal systems to accommodate all current and anticipated future needs. There is little presence or availability of public infrastructure.
2. Limited Public Sewage Management Infrastructure characterized by: existing public infrastructure capable of accommodating a limited amount anticipated future needs of specific select areas only, while all other areas must rely on on-site sanitary disposal systems to accommodate all anticipated future needs.
3. Moderate Public Sewage Management Infrastructure characterized by: existing public infrastructure capable of accommodating the majority of anticipated future needs while relying on on-lot sanitary disposal systems to accommodate other areas.
4. Primarily Public Sewer Infrastructure characterized by: Infrastructure capable of accommodating all of areas of the Township. Few if any on-site sanitary disposal systems present.

These four scenarios also represent the spectrum of expansion alternatives available to accommodate current and anticipated future sanitary disposal needs of the Township.

The CRWTP is the only facility currently available that can accommodate sanitary sewage flow from Hamilton Township. It is anticipated that existing and future flow public sanitary

sewer flow will be directed to this facility for the foreseeable future. Three factors limit the ability of this facility to meet projected future demand: hydraulic capacity and capacity allocation, nutrient removal efficiency, and available disposal area for biosolids.

The CRWTP currently utilizes approximately 41% of potential hydraulic capacity. This capacity is allocated based on negotiated inter-municipality service agreement(s).

Wastewater treatment plants in the Franklin County/south-central Pennsylvania area are limiting the quantity of septage accepted due to the need to accommodate sewage from public collection systems. CRWTP has restricted or stopped acceptance of septage from private haulers. Saint Thomas Township wastewater treatment plant is anticipated to follow the same path due to development in that township. This issue is apparently related to nutrient loading and the removal efficiency of the wastewater treatment plants.

Landfills in south central Pennsylvania are restricted in their ability to accept septage for disposal. An alternative to landfill disposal of septage and biosolids is land application. It is anticipated that the Dice Farm biosolids management facility will install additional tanks to accommodate higher flow and application rates. Although the farm is limited by nutrient uptake from crops such as soy beans, hay, corn, and alfalfa, the application rate is currently lower than uptake potential. As a result, additional capacity remains available to accommodate on-site septage and biosolids.

4.3.1.4. ZONING AND SUBDIVISION REGULATIONS

Development in the Township is governed under Hamilton Township Subdivision and Land Development Ordinance of Aril 2002, as amended. A copy of this ordinance is provided in Appendix 3.8.2., Hamilton Township Ordinances.

SECTION 5.0

ALTERNATIVES TO PROVIDE NEW OR IMPROVED WASTEWATER DISPOSAL FACILITIES

5.0. ALTERNATIVES TO PROVIDE NEW OR IMPROVED WASTEWATER DISPOSAL FACILITIES

Three scenarios characterize the range of alternatives available to improve the existing sewage and septage management infrastructure and methods. These scenarios are:

1. Reliance on the existing collection and conveyance system only, with treatment provided by a regional WWTP. This would include extension of the existing system components until they reach maximum capacity with the construction of additional similar infrastructure to accommodate future growth. This scenario is contingent on expansion of the regional WWTP to accommodate future growth and flow.
2. Reliance on the existing collection and conveyance system for the Township to accommodate existing and future growth until the existing system reaches maximum allocated capacity. New infrastructure including local WWTP or advanced technology systems would be evaluated in order to plan for future anticipated growth in areas not accommodated by existing infrastructure. This scenario is contingent on the ability of the regional WWTP to accommodate anticipated future growth and flow.
3. Construction of new local WWTP or advanced technology systems with partial or complete transition of the existing collection and conveyance system to the new treatment system(s). Once implemented, this scenario would be largely independent of the ability of the regional WWTP to accommodate future growth and flow.

In order to evaluate these potential alternatives, previous wastewater management planning and policy must be considered:

- The Potomac Region Comprehensive Water Quality Management Plan (COAMP) recommends that future wastewater from the Township be sent to the CRWTP for treatment in lieu of constructing Township facilities. The existing system as well as service agreement with CRWTP has been designed and incorporated in accordance with this recommendation

- The State Water Plan of the Commonwealth of Pennsylvania notes that a significant portion of the Township is dependent on private wells and/or springs as a drinking water source. Hamilton Township recognizes that aging on-lot disposal systems are a potential threat to private wells and groundwater supplies.

- Approval of new or pending planning modules will be contingent on utilization of negotiated capacity currently provided by CRWTP. Planning modules do not guarantee access to wastewater management infrastructure. However, they are used to project future needs with respect to both the collection and conveyance system of HTMA and utilization of capacity allocation by CRWTP.

- Current and anticipate future planning by Commonwealth and Federal agencies are focusing on regional approach to wastewater management. It should be anticipated

that future planning requirements will increasingly rely on a regional planning approach based on data being collected and evaluated by USEPA with respect to pollution management in the Chesapeake Bay drainage basin. The current use of a regional wastewater treatment plant to accommodate the needs of Hamilton Township, portions of Letterkenny Township, Green Township, Guilford Township, and the Borough of Chambersburg is consistent with this anticipated approach.

5.1 CONVENTIONAL COLLECTION, CONVEYANCE, TREATMENT, AND DISCHARGE ALTERNATIVES

A conventional collection and conveyance system is currently being utilized to accommodate the needs of the Township. The system discharges to a regional wastewater treatment plant.

5.1.1 POTENTIAL FOR REGIONAL WASTEWATER TREATMENT

A regional wastewater treatment facility (Chambersburg Regional Waste Water Treatment Facility) currently exists and is in use. It accommodates the needs of Hamilton Township as well as Chambersburg Borough and other surrounding adjacent townships. It has recently been expanded to accommodate the needs of the service areas discharging to the facility. This expansion is based on planning activities that utilized data from 1995 and earlier. Following expansion, and based on more recent data generated after 1996, the facility may soon approach or reach the limit of its operating efficiency sooner than originally anticipated. Therefore, the treatment facility will likely again require expansion and/or modification as projected growth and development continue throughout the service area. Conversely, without expansion and/or modification, growth and development within the service area will be limited or the service areas must limit flow and loading sent to the regional treatment facility.

5.1.2 POTENTIAL FOR EXTENSION OF EXISTING FACILITIES

Existing facilities in the Township include only a collection and conveyance system for wastewater. Based on the anticipated long-term future growth rate of the Township and technical requirements, the need for future extension of existing facilities is strong. The current system has sufficient capacity to accommodate extension, including much of the anticipated growth situated in the central and southern areas of the Township. However, areas where force main are present may require upgrade or enlargement to accommodate additional flow from proposed extension(s). Currently, the existing collection and conveyance system is capable of accommodating planned growth for at least the next five to seven years. The current system is restricted, however, by flow limits negotiated with CRWTP. Extension of the collection and conveyance system will be necessary to direct additional flow to CRWTP, as well as to direct flow to local pretreatment or treatment facilities, should the Township elect to develop such facilities. It is anticipated that extension of collection and conveyance infrastructure based on future development will be funded primarily by the developers.

5.1.3 POTENTIAL FOR CONTINUED USE OF EXISTING FACILITIES

The capacity of the existing collection and conveyance is significantly greater than is currently being utilized. The existing system is therefore able to accommodate a substantial additional flow without increasing or replacing substantial portions existing facilities. However, some portions of the exiting collection and conveyance system may require upgrade or expansion depending on the location and rate of growth and development.

5.1.4 REPAIR OR REPLACEMENT OF EXISTING COLLECTION AND CONVEYANCE SYSTEM COMPONENTS

The Township is currently in the process of divesting maintenance requirements for all individual residential grinder pump force main units. Approximately 60-units of this type remain in service. All future force main systems will become the responsibility of individual home owners.

5.2 NEED FOR CONSTRUCTION OF NEW COMMUNITY SEWAGE SYSTEMS

New collection and conveyance systems will be constructed by developers of each approved planning module tract. However, community operated sewage system are not encouraged under the current Act 537 Plan. Currently, development is encouraged in areas where sanitary sewer collection and conveyance infrastructure exists. In areas where this infrastructure does not currently exist, developers are encouraged to provide such infrastructure as a condition of gaining approval for a development. New community sewage systems are not encouraged.

5.2.1 USE OF INNOVATIVE/ALTERNATIVE METHODS

Because the HTMA system is a collection and conveyance system only, opportunities for use of innovative and/or alternative methods are limited.

5.2.2 USE OF INDIVIDUAL SEWAGE DISPOSAL SYSEMS

Individual sewage disposal systems are limited for use in areas of the Township where access to wastewater infrastructure is restricted or unavailable. It is not anticipated that use of individual sewage disposal systems is a viable alternative to the existing public collection and conveyance at this time.

5.2.3 USE OF SMALL FLOW SEWAGE TREATMENT FACILITIES OR PACKAGE TREATMENT FACILITIES

There are no plans to utilize small flow sewage treatment or package treatment facilities for the foreseeable future. However, use of a small "package" type treatment or pretreatment plant used to accommodate sanitation needs of the extreme southern or western portion of the Township is an option that HTMA may elect to evaluate.

5.3 USE OF COMMUNITY LAND DEVELOPMENT ALTERNATIVES

There are no plans to utilize community land development alternatives for the foreseeable future.

5.4 NEEDS ASSESSMENT

The following factors are considered when evaluating the current and future needs of the Township with respect to wastewater management:

- Malfunctioning on-lot disposal systems
- Availability of public water supply
- Physical limitations to effectiveness of on-lot disposal systems (soil type, slope, depth to groundwater, land restrictions)
- Age of on-lot system
- Current use of land

These factors were addressed in Section 2.0 and Section 3.0 of this Plan, including an HTMA service area wide survey of potential sources of groundwater impacts. That survey identified specific sources of impact including:

- Poor, outdated, or failing well structures or construction techniques.
- Land use (agricultural or livestock impact)
- Naturally occurring contamination such as hardness (mineral content).
- Failure or malfunction of on-lot disposal systems.
- Construction of on-lot disposal systems in soil or on slopes not suited for on-lot systems.

The most prevalent impact to groundwater quality was the presence of bacteria and nitrates. Fecal Coliform, although present in some locations, occurred at a lower frequency than total Coliform and nitrate. This appears to indicate a more significant impact to groundwater quality is land use and well construction. However, impact by all three parameters proved significant based on a contamination rate of slightly less than 50%.

Impacted areas include Mountain Road, Crottlestown Road, and Edenville Road.

Mountain Road is identified as a high priority wastewater management and potable drinking water needs area based on public health considerations. This area is situated in the far northwest portion of the Township between Letterkenny Township and Bricker Road in the Sandy Hook area. This area is characterized by high groundwater elevation, sloping topography, older on-lot disposal systems, older groundwater wells, and consistent and significant groundwater impact based on sampling and analysis of groundwater at individual residences. This area is also characterized by soil types and topography generally unsuitable for use of on-lot wastewater disposal systems. Related areas in close proximity to Mountain showing similar but somewhat reduced levels of groundwater contamination include Bricker Road and Fort McCord Road.

Because of the remote location of these residences, land topography, soil types, groundwater elevation, and land use, it is not likely that construction of a public wastewater collection and conveyance system for these residences would be a viable means for remediating this condition. It is recommended public water supply be made available to residents in this area, however. The Bear Valley Water Authority is the primary service provider for potable water in this portion of the Township. Bear Valley Water Authority is currently restricted by administrative consent decree issued by PADEP. This decree prevents additional connections from being made to the Bear Valley Water Authority system. In order to provide potable water supply to this area, PADEP must become more actively involved.

Crottlestown Road is identified as a wastewater management and potable drinking water needs area of future concern based on public health and potential growth and development considerations in the area. This area is located south of Edenville Road and north of Lincoln Highway. The area of concern is situated east of Twin Bridge Road and west of Brechbill Road. This area is characterized by agricultural use, soil types and slopes generally not recommended for on-lot wastewater disposal systems, and documented presence of groundwater impact. Relatively low level groundwater impact by bacteria and nitrate was identified in residences sampled in this area. This area has previously been identified as Area 1A, a medium priority sewage collection system alternative during the 1996 Act 537 Plan Update. This area is also an area where future development is likely based on the presence of approved planning modules for areas along Lincoln Highway, Sollenberger Road, and Edenville Road as well as the presence of public collection and conveyance immediately adjacent to this area.

Edenville Road is identified as a wastewater management and potable drinking water needs area of future concern based on public health and potential growth and development considerations in the area. The area of interest is situated south of Fort McCord-Edenville Road and east of Crider's Church Road along Edenville Road. This area is characterized by agricultural use, soil types and slopes generally not recommended for on-lot wastewater disposal systems, and documented presence of groundwater impact. Relatively low level groundwater impact by bacteria and nitrate was identified in residences sampled in this area. This area has previously been identified as the border between Area 1 and Area 1A, a medium priority sewage collection system alternative during the 1996 Act 537 Plan Update. This area is also an area where future development is likely based on the presence of approved planning modules for areas along Edenville Road, immediately east of Fort McCord-Edenville Road, as well as the presence of public collection and conveyance immediately adjacent to this area.

Old Kensington Heights is identified as a waste water management needs area of concern based on soil types and topographic slopes. The area of interest is situated in the down-slope portion of Funk Road, Kensington Drive, and Sheffield Drive. Map 3.3.5.B.1., On-lot Wastewater Systems and Topographic Slopes, Old Kensington Heights, Letterkenny Township, shows the location of streets and buildings, and slope of the land. This neighborhood was previously identified during the 1996 Act 537 Plan Update as an area that would be serviced by the HTMA as the Letterkenny Municipal Authority was not able to provide service.

The sanitary service needs of this area were further evaluated by conducting telephone interviews with residents that use OLDS as their primary sanitary disposal system. Twenty one of the forty total residents of the development were interviewed with respect to operation and maintenance of their septic system. Of the twenty one residents interviewed, three residents replaced their septic system within the past twenty five years, two residents reported minor repairs or upgrades, and two residents reported percolation issues. Replacement systems included two in-kind replacements and one raised "sand mound" type system. Minor repairs or upgrades included modifications to septic tanks by enlarging the access port. The restricted percolation issues reported by two residents are characterized by location, soil, and slope. Both residents are located adjacent to the north side of the intersection of Lawyer Road and Kensington Drive. The soil type in this location is Bedington channery silt loam on a 5% to 15% slope.

Old Kensington Heights is an older development served by public water, power, and telecommunications. The majority of the available land is developed and is not likely to experience significant additional growth. It is bordered by the newer Kensington Heights development that is served by public sewer in addition to other public utilities.

Discovery A-9 - Attachment 4

SECTION 6.0

EVALUATION OF ALTERNATIVES

6.0 EVALUATION OF ALTERNATIVES

The alternatives discussed in this plan are all technically feasible. Each technically feasible alternative has been evaluated for consistency with the objectives and policies of the following:

- Comprehensive Water Quality Management Plans (COWAMP)

COWAMP Plans have been developed under Section 4 and Section 5 of the Clean Streams Law for all areas of the Commonwealth of Pennsylvania. These plans are considered a valuable planning resource that can serve as a basis for incorporation of the Commonwealth's water quality goals and objectives in Official Sewage Facility Plan Updates. A goal of the COWAMP that includes Hamilton Township is to abate ground and surface water contamination from improperly treated domestic wastes. Extension of the wastewater collection and conveyance system with an overall reduction in on-lot disposal system sis consistent with the COWAMP objectives.

- State Water Plan (SWP)

The SWP is prepared by PADEP as a comprehensive management tool to guide the conservation, development, and administration of the Commonwealth's water and related land resources. Hamilton Township is included in SWP Sub-basin 13 Report. The Township's Act 537 Plan Update has been developed to further the goals and objectives contained in the SWP. One objective of the SWP is to abate groundwater pollution that originates from malfunctioning on-lot wastewater treatment systems. One of the recommendations of the SWP is to enact floodplain management regulations. This recommendation is accommodated by the Township through specific requirements found in the Township Subdivision Development Ordinance.

- Pennsylvania Anti-degradation Requirements

Authority for these Chapters is found in the Pennsylvania Clean Streams Law, Federal Clean Water Act, 40 CFR Part 122, and 25 PA Chapters 91, 92, 93, 95, 96, 102, and 105. These regulations govern the discharge of "pollutants" to bodies of water. The broad legislation requires multiple government agencies ranging from USEPA, PADEP, Pennsylvania Farm Bureau, Pennsylvania Department of Forestry, County Soil Conservation Service, and others to develop standards and requirements that prevent the degradation of water quality from erosion, septic systems, stormwater run-off, and a variety of NPDES type discharges. These requirements are typically accommodated through the various agencies that are charged with managing specific types of industry, natural resources, and human activities. A copy of the PADEP Water Quality Anti-degradation Implementation Guidance is provided in Appendix 6.0A.

- Comprehensive Plans of PAMPC

Although inter-municipality agreements exist among the townships served by the CRWTP, a single comprehensive plan addressing zoning, development, environmental management for all parties is not yet developed.

- Pennsylvania Prime Agricultural Land Policy

This policy identified five levels of priority for farmland preservation, Preserved farmland (land restricted to agricultural use by deed or easement), Farmland in agricultural secured areas (land restricted to agricultural use by local government), Farmland enrolled in the Pennsylvania Farmland and Forest Land Assessment Act of 1974 (land designated for preferential tax assessment as land in "agriculture use" or "farmland", farmland planned for agricultural use and subject to effective agricultural zoning (farmland designated under 53 P.S. §§ 10101-70105), and land capability Classes I, II, III, IV farmland and unique farmland (designated and mapped farmland by United States Department of Agriculture, Natural Resources Conservation Service (land used for production of specific high value food and fiber crops as identified in county soil conservation maps).

A relatively small amount of farmland may exist as restricted by deed or easement in Hamilton Township. A comprehensive policy for designation of agricultural secured areas by local government does not exit in the Township as of 2006. A substantial portion of the agricultural land in the Township is provided with tax assessment based on agricultural use. Specific agricultural zoning is not present in the Township. All land designated as prime farmland in the Township comprises 3,939 acres, farmland of statewide importance comprises 7,467 acres, and 11,301 acres are considered non-prime farmland, according to DNRCS.

- Pennsylvania Stormwater Management Act and County Stormwater Management

The Pennsylvania Department of Environmental Protection (DEP) is responsible for administering the state's stormwater management program. Pennsylvania's stormwater program requires stormwater be treated to the maximum extent practicable. Pennsylvania's NPDES stormwater program establishes permitting requirements for construction sites disturbing more than one acre, industrial sites, and Municipal Separate Storm Sewer Systems (MS4s). All MS4s should currently be permitted or in the permit process. Each permitted MS4 will be responsible for establishing a Stormwater Management Program (SMP).

Numeric treatment requirements specific to stormwater have not been established at the state level, but stormwater is regulated at the county and watershed level. It should also be noted that Pennsylvania is currently drafting a comprehensive stormwater management manual that will likely include mandated stormwater treatment requirements. Once in place, all communities will be required to meet the new regulations or impose more stringent local requirements. Currently, local regulations addressing stormwater management defer to county requirements for design and implementation standards and review.

- Pennsylvania Chapter 105 (Wetlands Protection)

Wetlands identification and protection is administered and enforced at the state level through the Pennsylvania Department of Environmental Protection.

6.1 RESOLUTION OF INCONSISTENCIES IN SECTION VI.A. OF THE CHECKLIST

No known inconsistencies have been identified between this Act 537 Plan Update and Federal, Commonwealth, and County requirements.

6.2 EVALUATION OF ALTERNATIVES

There are no proposed alternatives for wastewater treatment within Hamilton Township. The Township operates only a collection and conveyance system. The collection and conveyance system discharges to Chambersburg Regional Wastewater Treatment Plant. Expansion of the existing collection and conveyance system is discussed within this updated plan. With the exception of completing expansion projects previously initiated, future expansion will be dependent on allocation of hydraulic capacity by CRWTP and the ability of the wastewater treatment plant to meet permit requirements. The existing collection and conveyance system is technically capable of accommodating current and projected hydraulic loading until such time as flow reaches allocated capacity limits agreed to by the Borough of Chambersburg and the municipalities that it serves.

6.3 COST ESTIMATES USING PRESENT WORTH ANALYSIS FOR CONSTRUCTION, FINANCE, AND ADMINISTRATION

Appendix 6.3.A. provides a summary of the costs associated with completion of conveyance and collection infrastructure that will service Kensington Heights.

Appendix 6.3.B, Design and Construction Costs, Guitner Road/Coontown Road Force Main Extension, provides a summary of the remaining costs associated with completion of the Guitner Road/Coontown Road wastewater collection and conveyance infrastructure extension.

6.4 ANALYSIS OF FUNDING METHODS

Identification of viable funding is essential to the successful implementation of the proposed extension of collection and conveyance infrastructure to the Kensington Heights area, should it be initiated. The following is a listing of funding sources for construction of public infrastructure in Pennsylvania:

- Farmers Home Administration Program

This is a program of loans and grants to rural communities for construction of improved sewage infrastructure (wastewater collection, conveyance, and treatment). If eligible, a municipality may receive between 55% and 75% of project cost in grant-in-aid toward

construction costs. Interest rates are determined for loans through this program on a county specific basis.

- PennVEST

This is a program of loans and grants to communities constructing new or improved wastewater management infrastructure from the Commonwealth Water Pollution Control Revolving Fund. Grants are available as well as loans at interest rates of 1.0% to 6.0% over a time period of up to 30-years. A project's readiness to proceed and reasonable availability of the funds are utilized in the selection process for this type of loan. The PENNVEST website is extensive and provides a detailed explanation of most program details. The site can be accessed via the internet at www.pennvest.state.pa.us. The PENNVEST project coordinator/loan officer for Hamilton Township would be Vicki Johnson, (717) 783-8618. A scheduled consultation with PENNVEST, Community Development Block Grant (commonwealth), PADEP, and Rural Utility Service (federal) representatives is required in order to initiate the application process. A very substantial backlog exists for the 2007 program year.

- Small Community Development Block Grant Program

This program is administered by Pennsylvania Department of Community Affairs. It provides up to $350,000 per municipality for wastewater infrastructure improvement projects. However, it is directed to communities meeting low to moderate income criteria on a competitive basis. A survey of income in the applicant community may be required. Details of the program are available on the internet at: www.hud.gov.

- Community Facilities Program

The Pennsylvania Department of Commerce administers a grants program that provides a maximum of $75,000 in grant-in-aid for construction of public wastewater collection and conveyance systems where project costs are less than $1 million. This is a limited program where most applicants are not readily approved.

- Site Development Grants

The Pennsylvania Department of Commerce administers a grants program that provides up to $100,000 per municipality for improvement of public facilities essential for industrial growth and expansion.

- Economic Development Administration

This is a federally administered program of grants and loans for sanitary sewer systems that stimulate economic growth. Details of the program can be reviewed at www.eda.gov.

- Issuance of Municipal Bonds

Local municipal bonds may be issued to cover the cost of the construction ad provided for and developed by the Township or HTMA.

6.5 ABILITY TO IMPLEMENT PROPOSED EXPANSIONS

The Kensington Heights collection and conveyance system extension project is recommended for future implementation, pending availability of funding. It is estimated that the gravity flow collection and conveyance portion of this project would cost between $950,000 and $1,250,000, in 2006 dollars. Construction of a pump station and force main to service the northern portion of the development would require additional funding. Further evaluation of this project based on extent of need, technical feasibility, available funding, and timing of available funding, should be pursued during the upcoming five year planning period, in order to determine final feasibility.

Current expansion projects to which the Township has committed resources will be completed within the next two years. Proposed future projects focus largely on planning and evaluation, including the Kensington Heights extension.

SECTION 7.0

INSTITUTIONAL EVALUATION

7.0 INSTITUTIONAL EVALUATION

Current and future use of existing public wastewater management infrastructure in support of growth and development as well as compliance with Federal, Commonwealth, and County regulations is restrained by available capacity and allocation of available capacity of the regional wastewater treatment facility. This restrained condition results in need for the Township to pursue three courses of action. First existing allocated capacity of the CRWTP will be utilized in support of community growth and development in areas that are close to existing wastewater collection and conveyance infrastructure. Second, the Township in coordination with the Borough of Chambersburg and other users of the CRWTP must develop a plan to increase utilization of a larger portion of the treatment plant design capacity. Third reliance on existing on-lot systems to service residents unable to connect to the collection and conveyance infrastructure will become a more significant consideration and require increased attention by the Township. This is due to the increasing age of these systems and the use of many on-lot systems in areas where soil or topography slope is less than necessary for optimum system efficiency. In order to protect public health and the environment it will be necessary to implement more efficient administration of ordinances and regulations governing the operation and maintenance of on-lot disposal systems.

7.1 ANALYSIS OF EXISTING WASTEWATER TREATMENT AUTHORITIES

The Hamilton Township collection and conveyance system is operated and maintained by the Hamilton Township Municipal Authority. Connection to this system by residences and land owners is managed under the Hamilton Township Subdivision and Land Use Ordinance. Construction of new on-lot wastewater disposal systems is also managed under this ordinance.

Approximately 40% of the land area of the Township is served by the public wastewater system. Approximately 65% of the population of the Township is served by the public wastewater system. Areas that are not served by public sewers rely on individual on-lot systems consisting of conventional subsurface and above ground sand mound system. In the areas of the Township where public sewer service is not available and on-lot systems are the primary means of wastewater disposal, the owner of the system is responsible for use of the system. However, it remains the responsibility of the Township to administer the overall use of on-lot systems for the benefit of the Township as a whole. A sewage enforcement officer has been contracted by the Township to inspect on-lot systems and administer enforcement of ordinances governing on-lot systems.

The focus of the sewage enforcement officer has been largely the inspection of new or proposed on-lot systems and malfunctions in existing systems. Within the past three years the Township has begun to shift this focus from construction and malfunction as high priority issues to effective maintenance and operation of existing systems. This shift in focus is being implemented in accordance with Pennsylvania Code, Title 25, Chapter 71.73.

7.2 ANALYSIS AND DESCRIPTION OF INSTITUTIONAL ALTERNATIVES

As part of an expanded on-lot wastewater disposal system management program, it is currently mandatory that existing on-lot wastewater management systems be pumped a minimum of once every three years.

In addition to this requirement, it is recommended that the existing on-lot wastewater disposal system management program be further expanded to include:

- Establishment of a municipality/authority administered record keeping system that tracks construction, operation, maintenance, and decommissioning details for each on-lot wastewater management system in the Township. Construction details would include location of the system, location of on-site well(s), size, layout, soil type, topographic slope and contouring, construction details, date of commissioning, and responsible owner. Operation and maintenance records would include pumping dates, inspection dates, condition of system components, and recorded malfunctions. Decommissioning records would include date of decommissioning, removal or closure procedures, and confirmation of system location.
- Required inspection and certification of performance efficiency of each on-lot system by a Township representative qualified to conduct such work. Recommended inspection schedule would be every five to six years or whenever a property changes ownership.
- Implementation of mandatory schedules and time limits for remediation of malfunctioning on-lot systems.

In implementing these recommendations, a municipality has the option of selecting the option of periodic inspection by a municipal representative or maintenance of records by on-lot system owners.

Under the inspection by a municipal representative option, a municipal employee or a sewage enforcement officer conducts periodic inspections of septic systems to ensure that they are properly maintained and functioning. Authority for accessing the systems would be provided by municipal ordinance, easements, or other regulatory mechanisms.

Under the maintenance permit program, the system owner is issued a permit that requires maintenance and inspection activities. Proof of compliance with permit requirements would be based on submission by the owner of documentation showing pumping and inspection by a qualified septic system service professional. Alternately, the septic system service professional would submit the documentation directly to the Township using standardized forms. The sewage enforcement officer would selective inspect a representative number of systems annually to confirm effective operation and maintenance.

The plan recommends that due to potential impacts to human health and the environment, on-lot wastewater management systems within the Township be managed under a comprehensive system. That comprehensive system must incorporate permitting, inspection, administration, and enforcement components.

7.3 ADMINISTRATIVE AND LEGAL ACTIVITIES NECESSARY TO IMPLEMENT ALTERNATIVE

The Hamilton Township Board of Supervisors is considered the most appropriate agency and necessary authority for fiscal, regulatory, technical, and administrative oversight of on-lot wastewater management systems. The Board of Supervisors and its existing administrative staff is capable of undertaking the additional responsibilities identified in an expanded sewage management program.

The Hamilton Township Municipal Authority has satisfactorily managed and operated the existing collection and conveyance system. They will also be responsible for management and administration of extensions and improvements to the existing collection and conveyance system.

The Hamilton Township Municipal Authority in concert with the Hamilton Township Board of Supervisors will be responsible for administering and negotiating rates and allocation of flow to the Chambersburg Regional Wastewater Treatment Plant.

7.4 HAMILTON TOWNSHIP/LETTERKENNY TOWNSHIP RELATIONSHIP

Hamilton Township Municipal Authority provides sanitary sewer services to a portion of Letterkenny Township identified as Kensington Heights. The Kensington Heights area utilizes 81 EDU's of HTMA capacity, according to the 1996 Act 537 Plan Update. It is estimated that 80 additional EDU's have been added between 1996 and 2006. 40 new EDU's will be added from Kensington Heights to the HTMA system within the next three years. Sewage from this area is transported through the HTMA system to CRWTP. Costs for this service are billed by Chambersburg to the HTMA.

Letterkenny Township operates its own municipal authority to manage wastewater disposal needs. This authority has proven to be financially insolvent due to the limited number of users of the Letterkenny system. HTMA has, by written agreement with Letterkenny Township, absorbed responsibility for providing wastewater disposal service to the Kensington Heights portion of Letterkenny Township.

Discovery A-9 - Attachment 4

SECTION 8.0

SELECTED WASTEWATER TREATMENT AND INSTITUTIONAL ALTERNATIVES

8.0 SELECTED WASTEWATER TREATMENT AND INSTITUTIONAL ALTERNATIVES

Hamilton Township has resolved that the optimum alternative for managing wastewater collection and disposal needs is the continued use of the Chambersburg Regional Wastewater Treatment Plan and the continued use of an Inter-district Wastewater Flow Allocation Agreement with the Borough of Chambersburg. The existing agreement will require renegotiation prior to the year 2012 if it is to accommodate projected growth and development anticipated in the Township. An additional 0.20 MGD of flow capacity will be required by the Township prior to the year 2013. Depending on the ability of the CRWTP to accommodate requested flow allocation increases, modifications of the CRWTP may need to considered, especially with respect to accommodation of nutrient loading and nutrient removal efficiency.

All other areas of the Township currently utilizing on-lot disposal systems will continue to utilize on-lot systems to meet wastewater management needs. An expanded On-lot Wastewater Management System oversight program is recommended with specific increased focus on operation and maintenance of individual system, in addition to the existing requirements for regular service and permit approval prior to construction. In order to more efficiently manage on-lot disposal systems in the Township, septic system service providers should be licensed and required to provide to the Township documentation of locations serviced and locations of septage disposal on a monthly or quarterly basis.

Since the proposed alternative remains consistent with previous planning, resolution of inconsistencies is not anticipated to be needed at this time.

8.1 DESIGNATION AND DESCRIPTION OF CAPITAL FINANCIAL PLAN

Capital financing is required in order to support the proposed and required construction in the Kensington Heights area. It is anticipated that the Kensington Heights sewer extension project will be a publicly bid scope of work. The remainder of the costs will be financed through available public and private sources, with the emphasis on low interest loans from the public sector. It is anticipated that user fees will off-set a small portion of the overall costs. Letterkenny Township is not contributing directly to the cost of construction of this project

It is anticipated that the recommended expansion of administrative and inspection activities associated with on-lot wastewater management systems will largely be absorbed by existing staff and resources through the Hamilton Township Board of Supervisors and the Hamilton Township Municipal Authority. There would be little if any additional costs generated as a result of implementing this program.

8.2 IMPLEMENTATION SCHEDULE

2007

- **Continued addition of users based on approved planning modules, Hamilton Township.**
- **Anticipated Submission of CRWTP Act 537 Plan for public comment.**
- **Initiate negotiations with Chambersburg Regional Wastewater Treatment Facility regarding projected future use needs. Minimum required increase in capacity: 0.25 MGD (0.76 MGD up to 0.95 MGD) based on average of 125 homes constructed per year for 5-years between year 2012 and year 2016.**

February

- **Advertise Act 537 Plan and Submit to Planning Agencies for Review.**
- **Begin Negotiations with Chambersburg Borough for increase in discharge limit to CRWTP.**
- **Final commissioning of Housum Area Pumping System, Guitner Road/Coontown Road.**

April

- **Receive and Respond to Public Comments, HTMA Act 537 Plan.**

June

- **Receive Approval of Plan from Pennsylvania Department of Environmental Protection.**

September

- **Initiate Evaluation of Feasibility and Finance Options for old Kensington Heights Infrastructure construction.**

2008

- **Continued addition of users based on approved planning modules, Hamilton Township.**

2009

- **Initiate network flow and capacity analysis of existing collection system.**
- **Continued addition of users based on approved planning modules, Hamilton Township.**

2010

- **Continued addition of users based on approved planning modules, Hamilton Township.**

2011

- **Anticipated approval of request for additional flow capacity by CRWTP and PADEP.**
- **Continued addition of users based on approved planning modules and utilizing increase of discharge capacity allocation to CRWTP, 2011 service agreement, Hamilton Township.**

2012

- **Estimated year existing conveyance system reaches administrative maximum capacity based on 1995 service agreement discharge capacity allocation and projected allocation utilization.**

2013

- **No new construction anticipated unless service agreement is modified.**

2014

- **No new construction anticipated unless service agreement is modified.**

2015

- **No new construction anticipated unless service agreement is modified.**
- **Initiate revisions to Act 537 Plan for 2016, Hamilton Township.**

2016

- **No new construction anticipated unless service agreement is modified.**

LETTERKENNY TOWNSHIP

Buchanan State Forest

State Game Lands #235

LETTERKENNY TOWNSHIP

Sandy Hook

State Game Lands #235

Letterkenny Army Depot

MAGNETIC

0 3000' 6000' 9000'

SCALE 1' = 3000'

GREENE TOWNSHIP

DENNIS CREEK

BACK CREEK

ROCKY SPRING BRANCH

Cheesetown

Hamilton Heights

CSX TRANSPORTATION

CONOCOCHEAGUE CREEK

NORFOLK SOUTHERN

FALLING SPRING BRANCH

BOROUGH OF CHAMBERSBURG

WILSON RUN

SAINT THOMAS TOWNSHIP

Pleasant View

Sunbeam

Guilford Springs

Turkeyfoot

Cashtown

Housum

Marion

Stone Bridge

ANTRIM TOWNSHIP

MAP 2.1

HAMILTON TOWNSHIP
FRANKLIN COUNTY, PENNSYLVANIA
HAMILTON TOWNSHIP AND SURROUNDING REGION

Remington, Vernick & Beach Engineers
102 West Allen Street, Mechanicsburg, Pennsylvania 17055-6203
Phone: (717) 766-1775 · Fax: (717) 766-0232 · Website: www.RVE.com

RV&B

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Discovery A-9 - Attachment 4

LETTERKENNY TOWNSHIP

LETTERKENNY TOWNSHIP

Sandy Hook

Letterkenny Army Depot

GREENE TOWNSHIP

Cheesetown

Hamilton Heights

SAINT THOMAS TOWNSHIP

BOROUGH OF CHAMBERSBURG

Pleasant View

Sunbeam

Guilford Springs

Turkeyfoot

Cashtown

Housum

Marion

Stone Bridge

ANTRIM TOWNSHIP

DONNS CREEK

BACK CREEK

ROCKY SPRING BRANCH

WILSON RUN

CONOCOCHEAGUE CREEK

NORFOLK - SOUTHERN

CSX TRANSPORTATION

MAGNETIC

0 3000' 6000' 9000'

SCALE 1' = 3000'

AREAS SERVICED BY BEAR VALLEY WATER AUTHORITIES

AREAS SERVICED BY SILVER SPRING WATER ASSOSIATION, PUBLIC WATER SUPPLY

MAP 2.6

HAMILTON TOWNSHIP

FRANKLIN COUNTY, PENNSYLVANIA

AREAS SERVISED BY PUBLIC WATER SUPPLY

Remington, Vernick & Beach Engineers
102 West Allen Street, Mechanicsburg, Pennsylvania 17055-6203
Phone: (717) 766-1775 · Fax: (717) 766-0232 · Website: www.RVE.com

RV&B

P:\DRAFTING\PENNSYLVANNIA\HAMILTON\PFHTM006\HAMILTONPUBLIC-WATER-SUPPLY.DWG

LETTERKENNY TOWNSHIP

Buchanan State Forest

LETTERKENNY TOWNSHIP

State Game Lands #235

Sandy Hook

State Game Lands #285

Letterkenny Army Depot

GREENE TOWNSHIP

Cheesetown

Hamilton Heights

BOROUGH OF CHAMBERSBURG

SAINT THOMAS TOWNSHIP

Pleasant View

Sunbeam

Guilford Springs

Turkeyfoot

Cashtown

Housum

Marion

Stone Bridge

ANTRIM TOWNSHIP

GRAPHIC SCALE

3000 0 1500 3000 6000 12000

(IN FEET)
1 inch = 3000 ft.

LEGEND

- S.R. 0030 — STATE ROAD AND NUMBER
- Crottlestown Road — TOWNSHIP ROAD AND NAME
- PRIVATE ROAD
- TOWNSHIP BOUNDARY
- Stream
- 8 — GRAVITY SEWER
- FM 8 — FORCE MAIN
- LPS 2 — LOW PRESSURE SEWER
- MANHOLE
- P.S. #4 — METER/PUMP STATION

MAP 3.1.1.

HAMILTON TOWNSHIP

FRANKLIN COUNTY, PENNSYLVANIA

SANITARY SEWER COLLECTION AND CONVEYANCE SYSTEM

Remington, Vernick & Beach Engineers
102 West Allen Street, Mechanicsburg, Pennsylvania 17055-6203
Phone: (717) 766-1775 · Fax: (717) 766-0232 · Website: www.RVE.com

RV&B

P:\DRAFTING\Pennsylvania\HAMILTON\PFHTM006\HamiltonBase-San-sew-collectin.dwg

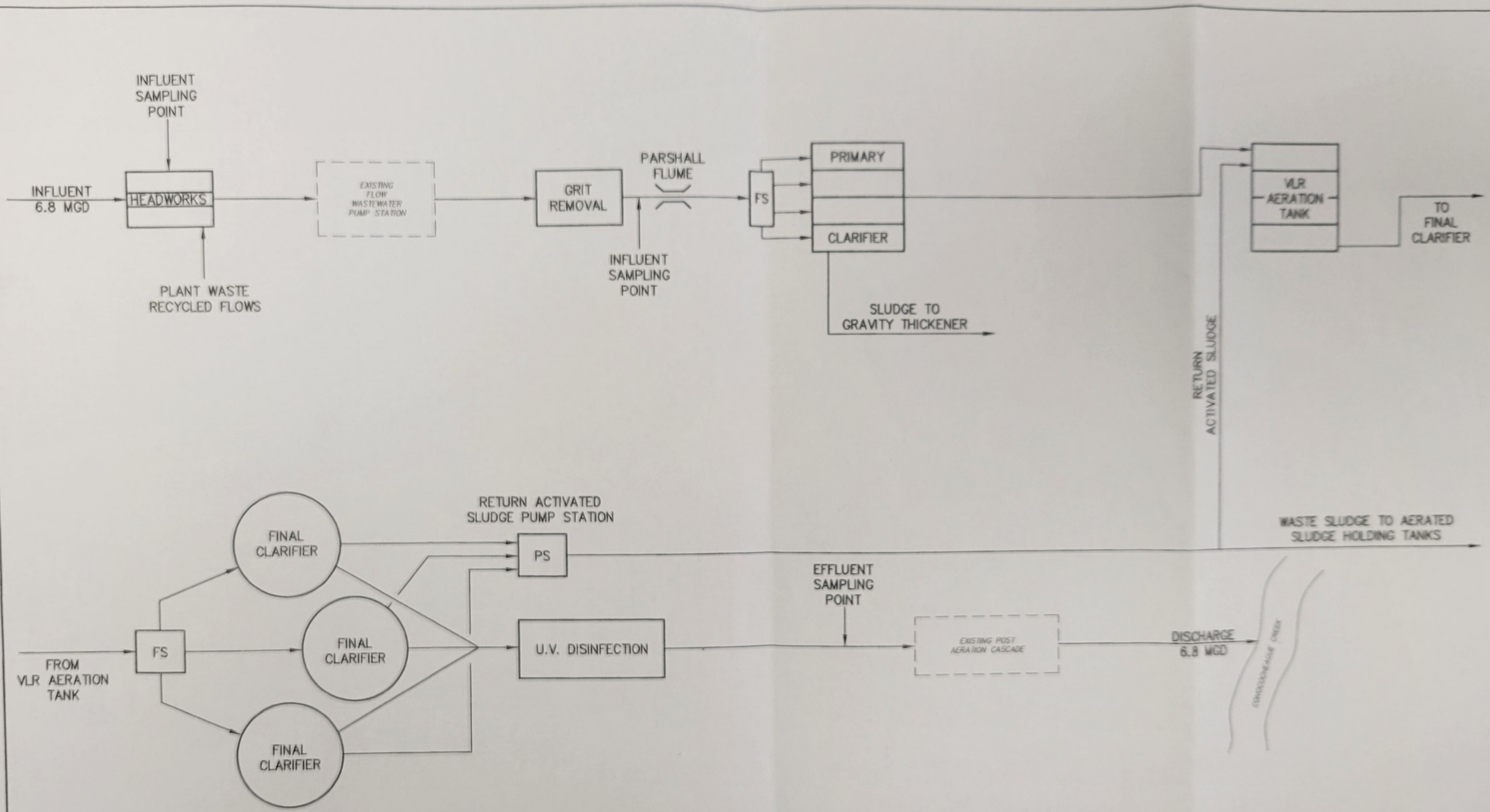


FIGURE 3.2.1 TREATMENT PROCESS DIAGRAM, CHAMBERSBURG REGIONAL WASTEWATER TREATMENT PLANT

N.T.S.

SOURCES: 1. PADEP RECORDS, 2005 NPDES PERMIT RENEWAL APPLICATION
2. BUCHART HORN, INC., PROJECT DRAWING 71745, 3/97



Legend

- Septic System Sites
- Hamilton Roads
- Municipal Boundary

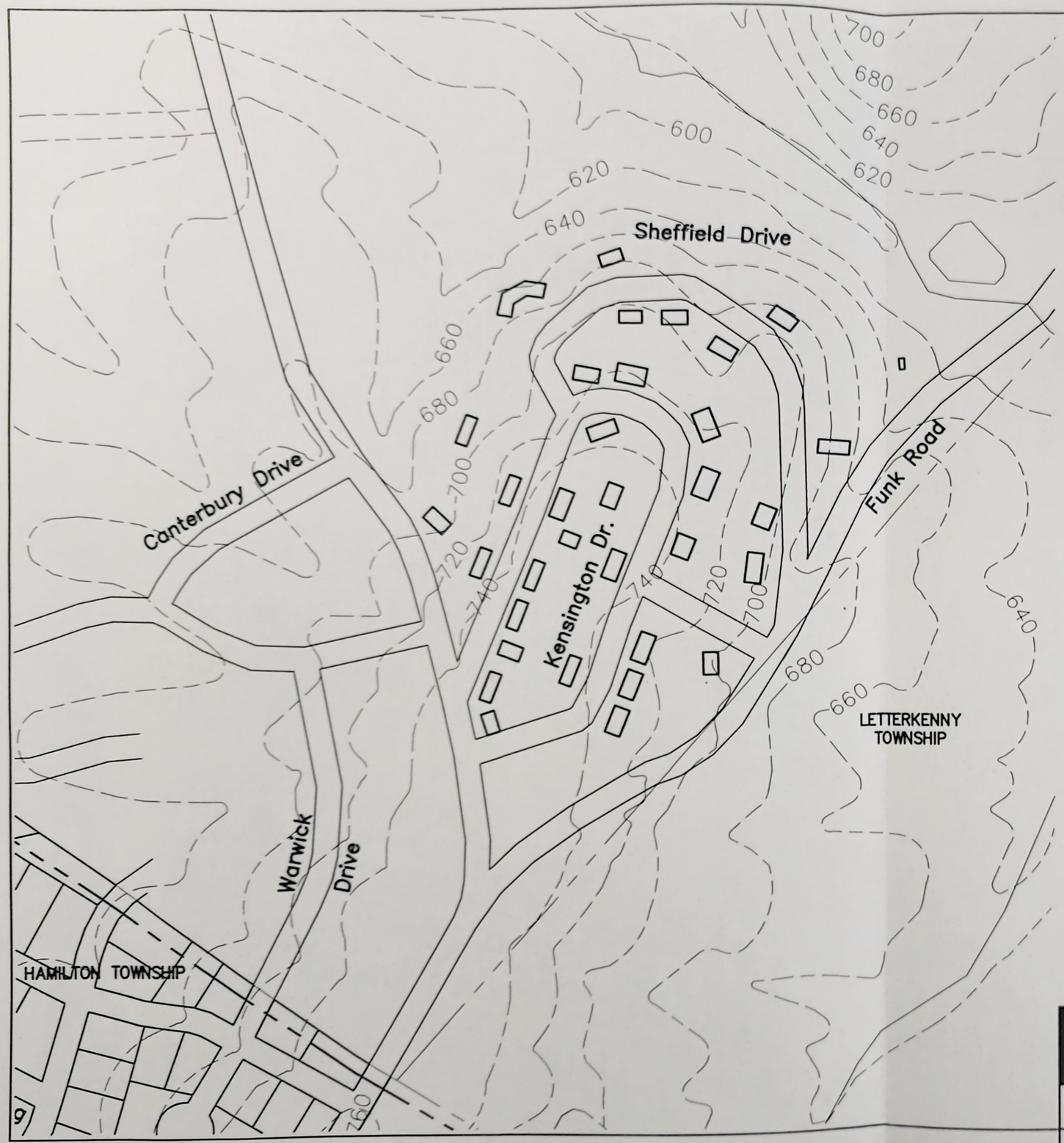
MAP 3.3.4.

HAMILTON TOWNSHIP
FRANKLIN COUNTY, PENNSYLVANIA

ON-LOT WASTEWATER SYSTEM LOCATIONS

Remington, Vernick & Beach Engineers
102 West Allen Street, Mechanicsburg, Pennsylvania 17055-6203
Phone: (717) 766-1775 * Fax: (717) 766-0232 * Website: www.RVE.com

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LEGEND

- ELEVATIONS CONTOURS
- RESIDENTIAL STRUCTURES
- STREET
- MUNICIPAL BOUNDARY

MAP 3.3.5.B.1 ON-LOT WASTEWATER SYSTEM AND TOPOGRAPHIC SLOPE, OLD KENSINGTON HEIGHTS, LETTERKENNY TOWNSHIP.

24 GA 28003800
REMINGTON & VERNICK ENGINEERS
232 KING'S HIGHWAY EAST HADDONFIELD, N.J. 08033
(856) 795-9595, FAX (856) 795-1882, WEB SITE ADDRESS: WWW.RVE.COM

SCALE	DATE	DRAWN BY	DSGN. BY	CHK'D. BY	DWG. NO.	SHEET NO.
1"=300'	12/06	N.K.	R.M.	R.C.	PFHM006	OF

DWG FILE PATH/NAME

P:\DRAFTING\PENNSYLVANNIA\HAMILTON\PFHTM006\OLD KENSINGTON HEIGHTSDEVELOPMENTS_GIS_DATA.DWG

Discovery A-9 - Attachment 4

LETTERKENNY TOWNSHIP

Buchanan State Forest

LETTERKENNY TOWNSHIP

State Game Lands #235

Sandy Hook

State Game Lands #285

Letterkenny Army Depot

GREENE TOWNSHIP

Cheesetown

Hamilton Heights

BOROUGH OF CHAMBERSBURG

SAINT THOMAS TOWNSHIP

Pleasant View

Sunbeam

Guilford Springs

Turkeyfoot

Cashtown

Housum

Marion

Stone Bridge

ANTRIM TOWNSHIP

BACK CREEK

ROCKY SPRING BRANCH

DENNIS CREEK

WILSON RUN

COPPOCHEAGUE CREEK

NORFOLK SOUTHERN

CSX TRANSPORTATION

MAGNETIC

GRAPHIC SCALE

3000 0 1500 3000 6000 12000

(IN FEET)

1 inch = 3000 ft.

ADDITIONAL SERVICE AREA LOCATED IN LETTERKENNY TOWNSHIP TO BE INCORPORATED INTO HTMA COLLECTION AND CONVEYANCE SYSTEM

LEGEND

- S.R. 0030 — STATE ROAD AND NUMBER
- Crottlestown Road — TOWNSHIP ROAD AND NAME
- PRIVATE ROAD
- TOWNSHIP BOUNDARY
- Stream
- 8 — GRAVITY SEWER
- FM 8 — FORCE MAIN
- LPS 2 — LOW PRESSURE SEWER
- MANHOLE
- P.S. #4 — METER/PUMP STATION
- PRIMARY DEVELOPMENT AREA
- SECONDARY DEVELOPMENT AREA
- PUBLIC SEWER EXTENSION AREAS

RESIDENCES WITHIN 150' OF GUITNER ROAD–COONTOWN ROAD SANITARY SEWER EXTENSION ARE TO BE SERVICED BY THIS EXTENSION, ONLY

TERTIARY DEVELOPMENT

MAP 4.3.1.1.

HAMILTON TOWNSHIP

FRANKLIN COUNTY, PENNSYLVANIA

DESIGNATED GROWTH AND DEVELOPMENT AREAS,

Remington, Vernick & Beach Engineers
102 West Allen Street, Mechanicsburg, Pennsylvania 17055-6203
Phone: (717) 766-1775 · Fax: (717) 766-0232 · Website: www.RVE.com

RV&B

VERIFICATION

I, Mark A. Wheeler, being Chief Operating Officer at The York Water Company, hereby state that the facts above set forth are true and correct to the best of my knowledge, information and belief, and that I expect to be able to prove the same at a hearing held in this matter.

I understand that the statements herein are made subject to the penalties of 18 Pa. C.S. § 4904 (relating to unsworn falsification to authorities).

Date: April 12, 2022

Mark A. Wheeler