5.1 POTENTIAL WASTEWATER TREATMENT ALTERNATIVES

Rules and regulations pertaining to the content of Act 537 plans are contained in Title 25 Pennsylvania Code Chapter 71. These rules and regulations require that each Act 537 plan present and evaluate alternatives for sewage service within the project area. The following sections present several alternatives available to the Region for meeting the wastewater planning needs identified in Chapter 4. The topics covered in this chapter include the following:

1. No Action.
2. Increased OLDS/Decentralized System Management.
3. Community On-lot Disposal Systems (COLDS).
4. Extension of new public sewers with connection to Authority's system.
5. Potential Land-Based Alternatives such as spray irrigation.

For planning areas outside of the proposed sewer extension areas, alternatives to be evaluated during the plan preparation for these areas include:

1. No Action
2. Increased OLDS/Decentralized System Management

The above referenced wastewater alternatives have been considered for areas within the planning area currently served by OLDS. Initially, many alternatives such as sewering the entire planning area were considered, however some were dismissed immediately and eliminated from further consideration in the Plan due to cost and technical infeasibility. 23 sewer extension alternatives to provide public sewer service to these areas of the planning area currently served by OLDS have been evaluated to identify whether they are cost-effective, environmentally sound, and structurally feasible. These alternatives are listed below:

Alternative No. 1A provides public sewer service to Matamoras Borough along Pennsylvania Avenue and Westfall Township Northeast along Route 6/209. For this alternative, the entire extension is a conventional gravity system. Due to the topographical features of this extension, no additional pump stations will be required with this alternative. All flows would be conveyed via gravity to MATW's WWTP through MATW Pump Station #1 on Route 6/209. For Alternatives 1A-1C., there are 84 projected connections with this alternative.

Alternative No. 1B provides public sewer service to Matamoras Borough and Westfall Township Northeast along Pennsylvania Avenue. For this alternative, the entire extension is a low pressure system, and it is anticipated that 80 properties will require a grinder pump and low pressure sewer laterals. The low pressure main will tie into the existing force main where Pennsylvania Avenue and Route 6/209 merge with this alternative.

Alternative No. 1C provides public sewer service to Matamoras Borough along Pennsylvania Avenue and Westfall Township Northeast along Route 6/209. For this alternative, the system is largely a conventional gravity system but with a pump station located approximately 500 feet from the existing force main. The remainder of the system is a force main that will tie directly into the existing system, which is located where Route 6/209 and Pennsylvania Avenue merge. The capacity for the proposed pump station would be over 35,200 GPD with this alternative

Alternative No. 2A provides public sewer service to Matamoras Borough and Westfall Township Northeast along Pennsylvania Avenue as well as the municipal roads in Matamoras Borough. The

municipal roads included in this alternative were determined based on the needs identification surveys described in Chapter 3. Conventional gravity sewer is proposed to collect the wastewater and convey it to Westfall Authority Pump Station #1 along Route 6/209. No additional pump stations are assumed to be required for this alternative. For Alternatives 2A-2C, there are 222 projected connections.

Alternative No. 2B provides public sewer service to Matamoras Borough along Pennsylvania Avenue as well as the municipal roads in Matamoras and also in Westfall Township Northeast along Route 6/209. The municipal roads included in this alternative were determined based on the Tier 2 Survey Results described in Chapter 3. Low pressure sewer is proposed to collect the wastewater and convey it to the existing force main where Pennsylvania Avenue and Route 6/209 merge.

Alternative No. 2C provides public sewer service to Matamoras Borough and Westfall Township Northeast along Pennsylvania Avenue as well as the municipal roads in Matamoras Borough. The municipal roads included in this alternative were determined based on the Tier 2 Surveys described in Chapter 3. Conventional gravity sewer is proposed to collect most of the wastewater and convey it to a proposed pump station near 10th Street. A force main from the proposed pump station would be used out of the pump station to convey flow to the existing force main where Pennsylvania Avenue and Route 6/209 merge for this alternative. The capacity for the proposed pump station would be over 63,400 GPD.

Alternative No. 3A provides public sewer service to the Westfall Township Southwest planning area along Route 6/209 to the Milford/Westfall Township border. A combination of gravity collection lines and a pump station, proposed to be located on Route 6/209 near Kittatinny Canoes, are proposed to collect the wastewater and convey it to the existing system, which currently terminates near the McDonalds on Route 6/209. Properties will directly connect to the force main via lower pressure sewer with grinder pumps following the proposed pump station with this alternative. For Alternative 3A-3B, there are 14 probable connections (382 EDUs). The pump station capacity should be rated at over 43,000 GPD.

Alternative No. 3B provides public sewer service to the Westfall Township Southwest planning area along Route 6/209 to the Milford/Westfall Township border. Low pressure sewer is proposed to collect the wastewater and convey it to the existing system, which currently terminates by the McDonald's on Route 6/209.

Alternative No. 4A provides public sewer service to the Westfall Township Southwest, Milford Township, and Milford Borough planning areas. In Westfall Township Southwest and Milford Township East, the area proposed is along Route 6/209, and in Milford Borough, it is along Broad Street. Low pressure sewer is proposed along Broad Street through Milford Borough for this alternative. The system's low pressure line transitions into a gravity line in Milford Township before it enters a proposed pump station and force main that eventually ties into the MATW system at its new proposed termination in Alternatives 3A and 3B. Properties along the low pressure system and force main would require grinder pumps and low pressure lateral connections. For Alternatives 4A-4C, there are 49 projected connections. The pump station capacity to tie into new proposed improvements would be rated at over 21,200 GPD.

Alternative No. 4B modifies Alternative No. 4A by replacing the pump stations, gravity collection systems, and force main with a low pressure system and grinder pumps. It would connect to the

proposed force main in Alternatives 3A and 3B, which is located along Route 6/209 at the Westfall Township/ Milford Township Line.

Alternative No. 4C modifies Alternative No.4B by replacing the proposed low pressure system with a combination of gravity lines and pump stations. From Harford Street to George Street, there are proposed gravity lines with a proposed pump station located near the intersection of Broad Street and East George Street.. Downstream of the proposed pump station, the remainder of the system would bel force main with properties requiring grinder pumps to tie into the proposed improvements. The proposed force main would tie into the existing MATW force main located near McDonald's in Westfall Township. The proposed pump station would be rated for over 21,200 GPD.

Alternative No. 4D modifies Alternative No. 4B by replacing the proposed low pressure system along Broad Street with two low pressure lines along Gooseberry Alley and Blackberry Alley before converging at Broad Street and Route 6/209. The proposed low pressure system will connect to the proposed force main termination in Alternatives 3A and 3B. Alternatives No. 4D and 4E are projected to have 68 connections.

Alternative No. 4E modifies Alternative No. 4D by replacing the proposed low pressure system with a combination of gravity sewer and a pump station. Gravity collection lines would be along Blackberry Alley and Gooseberry Alley until the two lines converge on Broad Street, where a pump station is proposed. The proposed force main would convey the wastewater along the remainder of Broad Street and Route 6/209 before connecting to the proposed termination point in the MATW system on the border of Westfall Township and Milford Township. The proposed pump station would have a capacity of 26,600 GPD.

Alternative No. 5A modifies Alternative No. 4C by adding a proposed extension of the gravity collection line along West Harford Street. No additional pump stations are assumed to be required to Alternative 4A. The proposed pump station would have a capacity of 35,800 GPD for this alternative. Alternatives 5A and 5C are projected to have 87 connections.

Alternative No. 5B modifies Alternative by No. 5A by replacing the proposed gravity collection lines along Broad Street and West Harford Street with proposed gravity lines along West Pearl Alley, Blackberry Alley, and Gooseberry Alley. The proposed pump station would have a capacity of 37,000 GPD for this alternative. Alternatives 5B and 5D are projected to have 102 connections.

Alternative No. 5C modifies Alternative No. 5A by replacing the proposed gravity mains and proposed pump station with a low pressure system. There are no proposed pump stations, and properties will be required to have grinder pumps In this alternative.

Alternative No. 5D modifies Alternative No. 5C by replacing the proposed low pressure mains along Broad Street and West Harford Street with low pressure lines along West Pear Alley, Blackberry Alley, and Gooseberry Alley for this alternative.

Alternative No. 6A modifies Alternative No. 5A by adding a proposed extension of the low pressure line along East Harford Street. For Alternatives 6A-6C, approximately 114 commercial, 9 government, 3 Institutional, and 5 residential connections are proposed. The proposed pump station would have a capacity of 65,000 GPD in this alternative.

Alternative No. 6B modifies Alternative No. 6A by replacing the low pressure lines and one pumps station with gravity collection. There is a pump station at the end of East Harford Street with a proposed force main that connects to the proposed main gravity line on Broad Street. Thie proposed pump station would have a capacity of 54,200 GPD. There is a second pump station proposed near the in Milford Borough near the intersection of Broad Street and East George Street in this alternative. The second proposed pump station would have a capacity of 11,200 GPD in this alternative

Alternative No. 6C modifies Alternative No. 6B by replacing all proposed conveyance lines with low pressure lines. No pump stations are assumed to be required, but properties will need grinder pumps in this alterantive

Alternative No. 6D modifies Alternative No. 6B by replacing the proposed gravity collection lines along Broad Street and Harford Street with lines along Gooseberry Alley, Blackberry Alley, and Pear Alley. The conveyance line splits at East and West George Street before entering the alleys. The pump station, gravity, and force main lines on East Harford Street are to be replaced with low pressure conveyance lines and grinder pumps East Pear Alley. This pump station would have a capacity of 54,200 GPD. Alternatives 6D-6E have 78 commercial, 11 government, 5 Institutional, and 28 Residential connections.

Alternative No. 6E modifies Alternative No. 6D by replacing the proposed gravity lines as well as the pump station with low pressure conveyance lines and grinders pumps.

Alternative No. 6F modifies Alternative No. 6D by replacing the proposed conveyance lines along Pear Alley with proposed low pressure conveyance line along East and West Harford Street. Alternative 6F has 123 commercial, 12 government, 5 institutional, and 9 residential connections.

Alternative No. 7 modifies Alternative No. 6B by including low pressure lines in municipal roads in Milford Borough based on the Tier 2 Survey Results described in Chapter 3. There are 140 commercial, 9 government, 7 institutional, and 71 residential connections.

All of the alternative extensions presented above are proposed to be conveyed to the Municipal Authority of Westfall Township wastewater treatment plant and system as described in Chapter 3.

A hydraulic analysis was performed to confirm if the plant, pump stations, and conveyance system have sufficient capacity to accept flows from the proposed extensions. Using the 2019 Westfall Township Chapter 94 Report data as well as SewerCAD models for the MATW Plant, there is sufficient hydraulic and organic capacity for the plant. Figures 5.1 and 5.2 show the projected hydraulic and organic demands of the selected alternatives (2B, 3B, and 6F) based on immediate and probable connections

Figure 5.1: Projected Hydraulic Loads

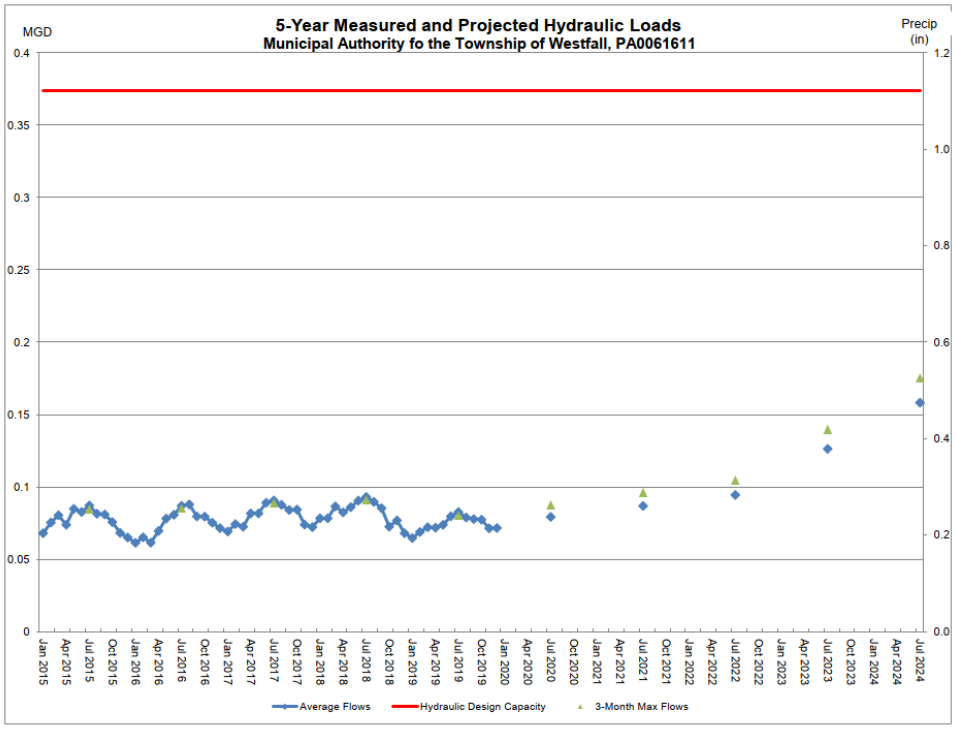
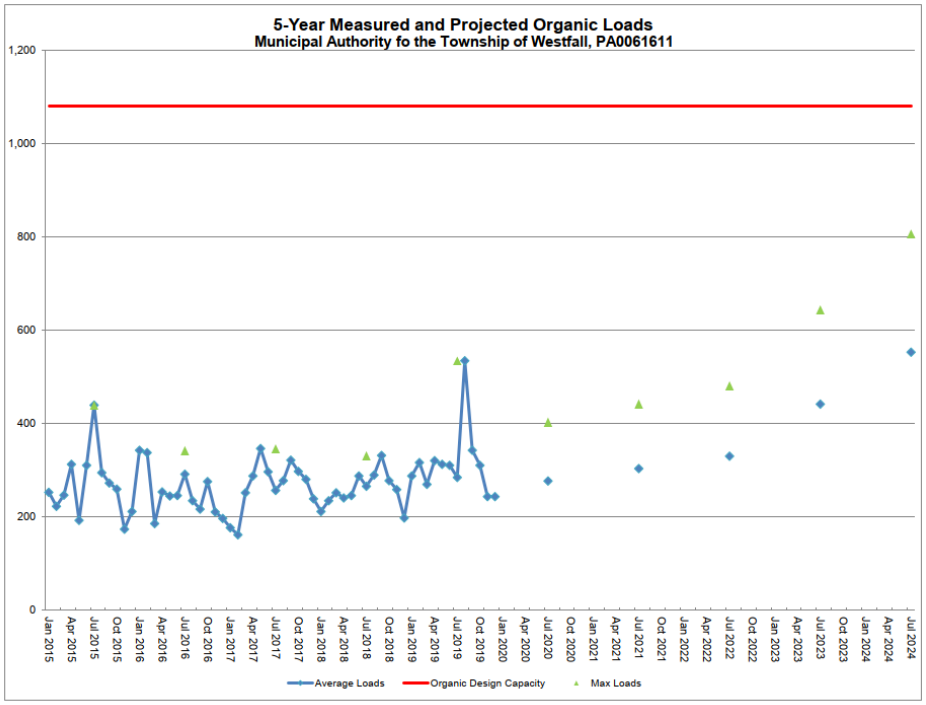


Figure 5.2: Projected Organic Loads



5.2 NEW COLLECTION AND CONVEYANCE FACILITIES

Presently, public sewer only exists within part of Westfall Township along Route 6/209, which merges into Pennsylvania Avenue. The Westfall Township Municipal Authority's system begins at the McDonald's Restaurant on Route 6/209 and extends northeast to the Price Chopper located on Pennsylvania Avenue. The remaining portions of the planning area are served by OLDS.

5.2.1 Conveyance Alternatives

New collection and conveyance facilities were evaluated to extend public sewer and are required to serve the sewer service areas identified by this Act 537 Plan. The apparent needs areas are the major roads and commercial zoning areas which are along Route 6/209, Broad Street and Harford Street in Milford Borough, and Pennsylvania Avenue in Matamoras Borough. The needs areas in Matamoras Borough are addressed in Alternatives 1A-1C and Alternatives 2A-2C. The needs areas in Westfall Township Southwest, Milford Township, and Milford Borough are addressed in Alternatives 3-7. The plant can handle significantly more flow than projected. Therefore, no upgrades are proposed at the time of the Plan. The extensions are proposed for the 5-10 year planning window; depending on available funding. Far Future connections are projected beyond the 10-year planning window and may require upgrades to the conveyance system and/or the plant (see Appendix E).

Conventional Gravity Sewers-

Conventional gravity sewers convey wastewater by using gravity. The sewers must be set deep enough to receive flows from individual buildings. The building sewer or lateral is typically comprised of 4-inch or 6-inch diameter pipe laid at a minimum slope of 1%. Building sewers connect directly to the collecting sewers. Where financially feasible, the collecting sewer is set at a depth that is capable of receiving basement flows. Conventional gravity sewers are constructed to meet minimum state and local requirements. Generally, they are constructed of 8-inch diameter or larger pipe with access manholes spaced a maximum of 400 feet apart and at each change of direction. Conventional systems are connected directly to existing or proposed conveyance and treatment systems. The feasibility of conventional gravity sewers is dependent on factors such as topography, presence of rock, high groundwater tables, and density of homes. The costs of a conventional gravity system can vary dramatically depending on the above noted factors.

Low-pressure Systems-

Low-pressure systems which rely on Grinder Pumps (GP) are an alternative to conventional gravity systems. The GP systems shred or reduce the size of raw wastewater solids, producing a pumpable slurry which is conveyed to the treatment plant through low-pressure sewer lines. Pressure sewers are most cost-effective in areas where the terrain is rolling, or the line needs to be close to the surface due to low depth to bedrock or a high water table. Pressure sewers have disadvantages such that the sewage may be septic and odor problems may arise depending on the length of the system. The homeowner would be responsible for the maintenance of their grinder pump.

When discussing GP systems, it is necessary to consider both the on-lot element as well as the collection system elements. The on-lot elements of a GP system consist of a 4-inch or 6-inch building sewer that conveys business / household sewage to the GP. On existing homes, either a new connection is made to the existing plumbing system or the existing building sewer is intercepted by the new building sewer and directed to the GP. The GP typically consists of a fiberglass basin with a minimum capacity of 50 gallons. The pumps are either centrifugal or semi-

positive displacement units with 1-2 HP motors. The basin includes appropriate valves for isolation of the pump. Each basin package is provided with a pump control panel, which can either be located remotely at the business / house or locally at the GP. For single-family homes, there is only one pump. The homeowner would be responsible for extending the power out to the control panel, and if a new electrical service would be required, it would be the homeowner's responsibility.

The second component of any GP system is the collection system. A typical low-pressure sewer system consists of small diameter, less than 4 inches in diameter, high-density polyethylene (HDPE) pressure piping. All piping downstream of the grinder pump is under low pressure, usually 60 psi or less. The low-pressure collection system is arranged as a branch network with no loops in the system. Appurtenances of a low-pressure system consist of in-line and terminal clean-outs located at 400'-600' intervals, at changes in direction or at changes in pipe size. Air release valves are located within the system at all high points. Isolation valves are installed strategically throughout the system to facilitate maintenance. GP systems have been most applicable in areas where the topography is very flat, has rolling hills, significant rock may be present, high groundwater table is present, or where the system outfall is at a higher elevation than the service area. In this planning area, the elevation changes suddenly at multiple points along the proposed alternatives, so the utilization of the GP system would eliminate the need for multiple pump stations.

The purchase and installation of grinder pumps is included in the project cost. Once the project is complete, the grinder pumps become the homeowner's property, and they are responsible for the O&M. The homeowner would be responsible for extending power out to the control panel, and in some instances, a new service is required as well, which would be the homeowner's responsibility.

Collection System Construction Costs

Typically, an authority or municipality would be responsible for the construction and funding of an extension of public facilities to a previously developed area. In the case of a new development, sewage facilities are generally extended by the developer at their cost and dedicated to the authority or municipality under a written agreement. Estimates of construction cost and overall project costs are included in the focused assessment of the needs areas in Section 5.10.

5.2.2 Repair or Replacement of Existing Collection and Conveyance System Components

No alternatives are anticipated which would facilitate the need for repair or replacement of existing collection or conveyance system mains or interceptors. As none of the four municipalities directly own or operate a collection and conveyance system, it is owned and operated by MATW.

5.3 UPGRADE OF EXISTING WASTEWATER TREATMENT

Westfall Township Authority currently has a hydraulic capacity of 0.374 MGD, and its 2021 average flow was 0.0806 MGD. Based on the chosen alternatives, the WWTP has sufficient hydraulic and organic capacity to implement the alternatives.

The wastewater flow projections developed for this Act 537 Plan were based on the following conditions and assumptions:

- Wastewater flows generated for all Structural Alternatives are based on 200 gallons per day (gpd) per equivalent dwelling unit (EDU).
- Delaware Valley High School connection is based on an annual average flow of 15,000 gpd from existing flow records.
- Milford Senior Care Rehabilitation Center connection is based on annual average flow of 15,000 gpd from existing flow records.
- In Milford Borough and Milford Township, the existing water meter usage was used to project wastewater flow for commercial buildings.
- In Westfall Township, PA Title 25 Chapter 73 was used to project wastewater flow for non-residential buildings.
- In Matamoras Borough, water meter usage data was used to project wastewater flow for non-residential buildings.
- The Katz Development Reserve discussed in Chapter 4 was taken in account when evaluating capacity.
- Each residential building was assumed to be one EDU.

5.4 CONTINUED USE OF ON-LOT DISPOSAL SYSTEMS

Additional On-lot disposal systems (OLDS) were not considered as an option in this Act 537. It was not being considered further since OLDS would be done on an individual basis. It is anticipated that the existing OLDS will remain in use when they are non-failing and permissible in Areas where sewer extensions are not proposed.

5.4.1 – Repair, Replacement or Upgrade of Existing Malfunctioning Systems

Each municipality's SEO is authorized to require the repair of any on-lot malfunction by the following methods approved by Title 25, Chapter 73 of the Pennsylvania Code: cleaning, repair or replacement of components of the existing system, adding capacity or otherwise altering or replacing the system's treatment tank, expanding the existing disposal area, replacing the existing disposal area, replacing the gravity distribution system with a pressurized system, replacing the system with a holding tank, or other alternatives as appropriate for the specific site.

It is recommended that the confirmed malfunctions be rehabilitated and/or repaired by providing a suitably sized drainage bed or replaced. The suspected and potential malfunctions are recommended to be further investigated by the SEO to determine the needs for rehabilitation, replacement, or upgrades.

5.5 COMMUNITY ON-LOT, SMALL FLOW OR PACKAGE TREATMENT

According to the Tier 2 surveys, Green Acres Community on Roberts Lane, Milford PA has two Community On-lot Disposal Systems, or COLDS, for the mobile-home park community, which consists of 55 mobile-homes. There are also two COLDS in the Milford Town Green complex. COLDS are essentially small, centralized collection systems that serve isolated developed areas and involve the discharge of treated effluent to the subsurface. Many COLDS simply consist of a large septic tank followed by an absorption bed, while others consist of a conventional treatment plant with effluent discharged into the subsurface. COLDS commonly service relatively small, isolated communities (i.e. less than 50 EDU's); however, there are some large COLDS that service larger communities of several hundred households. Since the majority of the planning areas already have individual on-lot systems, this alternative would be too expensive and lack funding sources. As a result, additional COLDS are not recommended. Therefore, no further evaluations were completed and no COLDS are proposed.

There are two (2) non-municipal package or small flow treatment facilities located within Westfall Township as described in Chapter 3. Milford Senior Care and Rehabilitation Center (NPDES Permit #PA0060020) and Delaware Valley School District (NPDES Permit #PA0032166) own and operate the two Wastewater Treatment Facilities. Milford Senior Care and Rehabilitation Center is permitted for 18,000 GPD, and Delaware Valley School District is permitted for 20,000 GPD. Both facilities intend to connect to the MATW WWTP, and furthermore, both facilities' actual flows are significantly lower than the capacity. The two package facilities intend to connect once public sewer is available. As a result, upgrades to these facilities were not considered as part of this planning effort.

No costs associated with the abandonment and acceptance of flows from existing wastewater treatment facilities are included in the cost opinions because each of the NPDES permits for these respective facilities indicates the following within Paragraph D, under "Other Requirements," "*If, after the issuance of this permit, DEP approves a municipal sewage facilities official plan or an amendment to an official plan under Act537 (Pennsylvania Sewage Facilities Act, the Act of January 24, 1966, P.L. 1535 as amended) in which sewage from the herein approved facilities will be treated and disposed of at other planned facilities, the permittee shall, upon notification from the municipality or DEP, provide for the conveyance of its sewage to the planned facilities, abandon use and decommission the herein approved facilities including the proper disposal of solids, and notify DEP accordingly.*"

5.6 SPRAY IRRIGATION SYSTEM

On-lot drip irrigation systems appear to be a viable alternative based on the soil survey data for replacement of existing OLDs. However, the expense would solely be on the homeowner. Drip irrigation takes excessive space, is expensive, and can cause issues in the winter. As a result, this alternative is not recommended due to the cost to residents and the need to establish system requirements when there are cheaper and more viable alternatives for individuals that are outside of the recommended structural alternatives.

A spray irrigation system was briefly considered to serve Milford Borough as a means of wastewater treatment discharge. It was proposed that the treatment facility could be located in an empty lot owned by Pike County in Milford Township (Tax Parcel ID: 113.00-01-05.010). Since the same conveyance lines as a conventional sewage system would still need to be built, it is not cost

effective to build a separate facility, when the flows could be conveyed to a regional WWTP that has excess capacity. Therefore, no further evaluations were completed and no spray irrigation systems are proposed.

5.7 HOLDING TANKS

Holding tanks are vessels designed and constructed to store sewage prior to ultimate disposal at another site. Pumper trucks are the preferred method of conveyance of holding tank wastes. Due to the high maintenance costs resulting from frequent pumping, holding tanks are not considered to be a viable long-term alternative for typical residential demands. However, they may be viable solutions for transient residential, commercial or industrial sites with minimal wastewater flow.

Installation of a holding tank may be required by the municipality's SEO as a rehabilitative measure to repair an OLDS. In the event that rehabilitative or replacement measures are not feasible or do not prove effective, the municipality may require the owner to apply for a permit to construct a holding tank. It is recommended that the municipality should issue holding tank permits only as required for the temporary repair of malfunctioning OLDS. The issuance of holding tank permits shall continue in accordance with DEP regulations and requirements of Westfall Township's Ordinances. Westfall Township's existing Holding Tank Ordinance is provided in Appendix B. Matamoras Borough, Milford Borough, and Milford Township do not have holding tank ordinances but should adopt a similar one to Westfall Township's existing ordinance.

5.8 SEWAGE MANAGEMENT PROGRAMS

The OLDS management Ordinance would intend to provide requirements for the permitting, inspection, operation, maintenance, and rehabilitation of OLDS within the study area and throughout each Municipality. A draft Ordinance Template is included in Appendix D. Select items from the Ordinance may include the following:

- No person shall install, construct, or request bid proposals for construction, or alter an individual sewage system or community sewage system or construct or request bid proposals for construction or install or occupy any building or structure for which an individual sewage system or community sewage system is to be installed without first obtaining a permit from the Municipality's Sewage Enforcement Office. The permit shall indicate that the site and the plans and specifications of such system are in compliance with the provisions of the Clean Streams Law and the Pennsylvania Sewage Facilities Act and the regulations adopted pursuant to those Acts.
- Applicants for sewage permits will be required to notify the Sewage Enforcement Officer of the schedule for construction of the permitted OLDS so that inspection(s) in addition to the final inspection required by the Sewage Facilities Act may be scheduled and performed by the Sewage Enforcement Officer.
- Any On-lot Sewage System may be inspected by an authorized agent at any reasonable time as of the effective date of the Ordinance. Such inspection may include a physical tour of the property, the taking of samples from surface water, wells and /or, other groundwater sources, the sampling of the contents of the sewage disposal system itself and/or the introduction of a traceable substance into the interior plumbing of the structure served to ascertain the path and ultimate destination of wastewater generated in the structure.

- An authorized agent shall inspect systems known to be, or alleged to be, malfunctioning. Should said inspections reveal that the system is indeed malfunctioning; the authorized agent shall order action to be taken to correct the malfunction.
- Each person owning a building served by an On-lot Sewage Disposal System which contains a septic tank shall have the septic tank pumped by an authorized pumper/hauler within three years of the effective date of the Ordinance. Thereafter that person shall have the tank pumped at least once every five years or whenever an inspection reveals that the septic tank is filled with solids or scum in excess of 1/3 of the liquid depth of the tank. Justification, including sufficient evidence that the septic tank does not require pumping every five years, may be submitted to the SEO for review and approval. Receipts from the authorized pumper/hauler shall be submitted to the Township within the prescribed one and five year pumping periods.
- The required pumping frequency may be increased or decreased at the discretion of the municipality if the septic tank is undersized, if solids buildup in the tank is above average, if the hydraulic load on the system increases significantly above average, if a garbage disposal r is used in the building, if the system malfunctions or for other good cause shown.
- Within seven (7) days of notification by the municipality that a malfunction has been identified, the property owner shall make application to the Sewage Enforcement Officer for a permit to repair or replace the malfunctioning system. Within 30 days of initial notification by the municipality, construction of the permitted repair or replacement shall commence.

5.8.1 Public Education

Each municipality will publicly educate residents on the requirements of a proposed OLDS Management Ordinance and provide resources to the municipality's residents as necessary.

5.9 NON-STRUCTURAL/PLANNING ACTIVITIES

There will be mandatory connection ordinances in Matamoras and Milford Boroughs. Westfall Township currently has a mandatory connection ordinance but exempts Residential users as long the existing OLDS is in good working condition. Milford Township will not have a mandatory connection ordnance, and as of now, there are no planned connections as part of this plan. Instead, any proposed sewer line that goes through Milford Township will be considered to be a transmission line. The existing rules, regulations and planning activities in each Municipality appear sufficient to sustain the anticipated level of development in the municipalities as long as sufficient public sewage facilities are provided to handle anticipated growth and development as described in Chapter 4. Each Municipality's development and adoption of the On-lot Sewage Management Program will recommend regular maintenance of on-lot systems in each planning area thereby reducing the frequency of malfunctioning systems. It does not appear that new non-structural planning activities are needed at this time.

5.10 NO ACTION ALTERNATIVE

The no action alternative is the continued use of residential on-lot systems. The impacts of no action to address existing, short-term, and long-term sewage facilities include several considerations. Most of the discussion within this Plan has focused on the environmental and public health and safety concerns associated with the functioning of the existing on-lot sewage systems. The impacts of no action include possible degradation of ground water, possible loss of recreational use of waterways and environmental hazards. Economically, the no action

alternative could result in substantial fines and/or penalties and restrict or prohibit growth to the planning area's potential growth and development areas. Several businesses have informed the municipalities that it is not financially feasible to stay in the area without central sewage, and other businesses have expressed concerns that the cost of being part of a central system would hamper their economic viability. Assessing the economic viability of businesses is outside the scope of this study. The No Action Alternative was briefly considered and rejected.

5.11 STRUCTURAL ALTERNATIVES FOR UN-SEWERED AREAS

Alternatives to provide public sewer service to Matamoras Borough, Westfall Southwest, and Milford Borough Planning Areas are provided in the sections below. These Areas are all needs Areas due to the density of potential, suspected, and confirmed OLDS malfunctions, zoning classifications, and potential growth. The Planning Areas are shown on Map 11 in Appendix C.

The 24 focused alternatives for providing public sewer service to the areas defined above are presented below and are evaluated on the basis of cost-effectiveness, environmental soundness, and structural feasibility. Cost estimates for the alternatives are provided in the tables provided below. Maps of each of the structural alternatives which identified proposed facilities are presented in Appendix I. Cost estimates are presented for comparative purposes when applicable and are detailed in the tables provided. Present worth, annual debt service, annual O&M and total annual cost per EDU for each alternative are also presented in the tables provided. O&M costs include the O&M costs associated with gravity sewer mains, low pressure system mains, force mains, and pump stations. Annual debt service is estimated based on a 20-year, 1.000% term as provided by PENNVEST cap rate funding for Pike County, a 40-year, 1.875% term as provided by USDA, and a 30-year, 4.5% term as assumed by tax exempt (Bond) financing. Actual debt service will depend on the financing scheme chosen and the actual finances of the project when completed. Present worth is estimated based on a 20-year, 4.25% term.

Chapter 6 provides an analysis of the proposed funding methods available to finance the alternatives evaluated in this section. The preparation of detailed funding scenarios, analyses of financial service charges, cash flow analyses based on anticipated revenues, a user service charge system, administrative costs, and personnel costs would require additional information beyond the scope of this Plan. Please refer to Chapter 6 for the funding analysis.

5.11.1 Alternatives for the Matamoras Borough Planning Area

As mentioned in this Plan, Matamoras Borough is considered a needs area, especially along Pennsylvania Avenue. This area is considered to be of the highest need with the largest concentration of OLDS issues observed where there is also concentrated commercial demand for central sewage. Some residential streets were also included in some of the alternatives based on the Needs Identification Study in Chapter 3. All alternatives evaluated for inclusion in this Plan have the flexibility for a future extension to serve this area if the need arise or additional funding becomes available. Alternatives 1A-2C are the proposed alternatives in this planning area and are described in Section 5.1 of this chapter.

5.11.2 Alternatives for Westfall Township Southwest

Westfall Township Southwest is also a needs area along Route 6/209. There are a number of businesses and commercial buildings with high sewage demand with needs and desires to connect to MATW's system. Alternatives 3A-3B are the proposed alternatives in this planning area

and are described in Section 5.1 of this chapter.

5.11.3 Alternatives for Milford Borough

Milford Borough is another needs area, especially along Broad Street and East and West Harford Street. Milford Borough is one of the larger needs areas in the Study due to commercial zoning and demands as well as needs areas identified in the Tier 2 Surveys. In Alternatives 5 and 6, the alleys behind East and West Harford Streets are proposed rather than East and West Harford Streets because it would allow for a lower cost for property owners to connect to the system as most building's existing on-lot systems are located in the back of the property. In addition, there would be lower restoration costs as these alleys are not PennDOT roads. The conveyance line would through along Route 6/209 in Milford Township until it converged with the conveyance line in Westfall Township. However, there are no planned connections in Milford Township at this time. Alternatives 4A-7 are the proposed alternatives in this planning area and are described in Section 5.1 of this chapter.

5.11.4 Alternatives for Milford Township

No structural alternatives for Milford Township have been contemplated at the time of this Study. The study areas of Milford Township East and Milford Township West are not significant needs areas based on the OLDS surveys, the well water sampling data, and the good drainage In Milford Township East and West. Due to the lack of a mandatory connection ordinance, the Study anticipates no immediate connections in the next five years and does not account for any financial contribution from these future connections. The properties along Rt. 6/209 are projected as future connections and would have the option to voluntarily connect to the proposed sewer collection system.

5.11.5 Alternative for Future Flow Capacity

The proposed systems outlined in the alternatives address current needs and provide for only minimal growth in the planning area. While there is still a large amount of capacity available at the MATW WWTP, the flow projections do not consider future developments. Both Milford Borough and Matamoras Borough are limited in terms of available lots to be developed, and any public sewer connections in Milford Township would be done through a planning module. As shown in Figure 5.1, the MATW WWTP would still only be at approximately half of the hydraulic capacity if the three selected alternatives were implemented.

5.11.6 No Action Alternative

The No Action structural alternative represents the status quo. It proposes the continued repair and construction of on-lot sewage disposal systems in compliance with Chapter 72 Standards and under the guidance and permitting of the Municipal SEO. In some cases, these systems will not be feasible based on the site limitations, including unsuitable soil, slope, and space restrictions.

This option is the least disruptive to the community, however, it does not address the issues raised in the Tier 2 survey – malfunctioning systems and business economic viability in the Plan Areas.

Costs for repair and replacement of individual on lot sewage disposal systems vary greatly from property to property; therefore, a realistic cost estimate for comparison purposes could not be prepared for this alternative.

5.11.7 Comparative Cost Estimates of Study Area Structural Alternatives

The following assumptions were used to develop the cost estimates presented in this Plan:

1. Based on 2022 Dollars
2. The proposed extensions and cost estimate are conceptual and subject to change.
3. It is assumed that all proposed utility work will be completed as one project.
4. Length of HDD Laterals: 25' per connection
5. Inline cleanout required every 500 feet.
6. Assume 1 Air Release Valve and vault per 5,280 feet.
7. Gravity, Force Main, and LPS Main - assume 75% suitable backfill, 25% aggregate backfill.
8. Depth of Manholes: 10 feet.
9. Manhole is required every 350 lineal feet.
10. Length of gravity lateral connections: 20' per connection; Aggregate Backfill 50% of total length and Suitable Backfill 50% of total length.
11. Temporary Paving is assumed to be 2" of 19.5mm HMA.
12. Municipal Paving is assumed to be 3" 25mm base and 1.5" 9.5mm wearing.
13. PennDOT Paving is assumed to be 5" 37.5mm base and 2" 12.5mm wearing mill and overlay wearing (approximately one-lane width).
14. Assume one Clay Dike between every manhole
15. It was assumed that an Equivalent Dwelling Unit is equal to 200 GPD.
16. Flows were calculated using PA Code 25 Chapter 73 for dwellings in Westfall Township and Matamoras Borough. A single family home was classified as 1 EDU. In Milford Township and Milford Borough, water usage data from the Milford Water Authority was used to calculate the flow of businesses.
17. Every residential dwelling had one simplex grinder pump. Every non-residential dwelling had one duplex grinder pump.
18. For Gravity Sewer alternatives, assume one cleanout for each lateral connection.
19. Borings should be 10 feet deep with standard penetration resistance testing.
20. Test pits every 400 feet and at every pump station.
21. Assume Low Pressure Sewer and Force Main are HDD and vegetative restoration included in costs.
22. Assume all grinder pumps are outside of 100-year floodplain and will not require risers.

Using the assumptions outlined above, several cost opinions were prepared to use as a basis to compare the cost effectiveness of each structural alternative. Where applicable, a direct cost comparison of alternatives has been provided. Annual costs per EDU are based on these project costs and an assumed loan on the full project cost. It should be noted that the cost estimates prepared in this Act 537 Plan are first level cost estimates appropriate for planning level detail and should not be considered as final costs for financing purposes. The estimated tapping fees of $1,600.00(current MATW tapping fees) and a wholesale rate of $25/EDU have been used for the financial alternative comparisons.

Tables No. 5-1 through 5-24 present the cost estimates for the structural alternatives and Table No. 5-25 provide a summarization and comparison of the estimates. Table No. 5-26 includes the estimated annual cost and payment of annual debt service for several funding scenarios of the recommended alternatives. As a means of comparison, the Westfall Township Municipal Authority

currently charges residential users $60 per month (per EDU).

TABLE 5-1 COST OPINION FOR MATAMORAS BOROUGH ALTERNATIVE 1A

OPINION OF PROBABLE PROJECT COST
FOR
EASTERN PIKE COUNTY REGIONAL ACT 537 SEWAGE FACILITIES PLAN
MATAMORAS EXTENSION MAIN ROAD GRAVITY
ALTERNATIVE 1A: GRAVITY SEWER
SEWER EXTENSION

ITEM NO.	DESCRIPTION	EST. QUANTITY	UNIT	UNIT PRICE	EXTENSION
GENERAL					
1	MOBILIZATION @ 10%	1	L.S.	$ 298,400.00	$ 298,400.00
2	TRAFFIC MAINTENANCE & PROTECTION @ 5%	1	L.S.	$ 149,200.00	$ 149,200.00
3	EROSION AND SEDIMENTATION CONTROL @ 3%	1	L.S.	$ 89,500.00	$ 89,500.00
GRAVITY SEWER					
4	8" PVC MAIN - AGGREGATE BACKFILL	2,100	L.F.	$ 230.00	$ 483,000.00
5	8" PVC MAIN - SUITABLE BACKFILL	6,505	L.F.	$ 175.00	$ 1,138,375.00
6	8" X 6" WYE	81	EA.	$ 435.00	$ 35,235.00
7	6" SERVICE LATERAL - AGGREGATE BACKFILL	810	L.F.	$ 140.00	$ 113,400.00
8	6" SERVICE LATERAL - SUITABLE BACKFILL	810	L.F.	$ 125.00	$ 101,250.00
9	6" SERVICE LATERAL CLEANOUT - SUITABLE BACKFILL	81	L.F.	$ 1,500.00	$ 121,500.00
10	CONNECTION TO EXISTING PUMP STATION	1	EA.	$ 11,000.00	$ 11,000.00
11	CLAY DIKE	35	EA.	$ 600.00	$ 21,000.00
MANHOLE					
12	MANHOLE - 4 FT DIAMETER	36	EA.	$ 8,000.00	$ 288,000.00
13	MANHOLE FRAME AND COVER	36	EA.	$ 1,000.00	$ 36,000.00
14	MANHOLE PROTECTIVE LINING	1	EA.	$ 5,000.00	$ 5,000.00
CROSSING					
15	PENNDOT CROSSING	1	L.S.	$ 35,000.00	$ 35,000.00
16	STREAM CROSSING	4	L.S.	$ 15,000.00	$ 60,000.00
SURFACING					
15	TEMPORARY PAVING	2,910	L.F.	$ 15.00	$ 43,650.00
16	PENNDOT PAVING RESTORATION (BASE)	2,910	L.F.	$ 90.00	$ 261,900.00
17	PENNDOT PAVING RESTORATION (MILL AND OVERLAY)	3,300	S.Y.	$ 25.00	$ 82,500.00
18	MUNICIPAL PAVING RESTORATION	0	L.F.	$ 65.00	$ -
19	VEGETATIVE RESTORATION	7,315	L.F.	$ 20.00	$ 146,300.00
				ESTIMATED CONSTRUCTION COSTS	$ 3,521,000.00
				CONSTRUCTION CONTINGENCY @ 20%	$ 705,000.00
				ENGINEERING, ADMIN, & LEGAL FEES @ 25%	$ 1,057,000.00
				TOTAL ESTIMATED PROJECT COSTS	$ 5,283,000.00
				ESTIMATED NUMBER OF EDUs TO BE SERVED	140
				ESTIMATED CAPITAL COST PER EDU	$ 38,000.00

TABLE 5-2 COST OPINION FOR MATAMORAS BOROUGH ALTERNATIVE 1B

OPINION OF PROBABLE PROJECT COST
FOR
EASTERN PIKE COUNTY REGIONAL ACT 537 SEWAGE FACILITIES PLAN
MATAMORAS EXTENSION MAIN ROAD LOW PRESSURE
ALTERNATIVE 1B: LOW PRESSURE SEWER
SEWER EXTENSION

ITEM NO.	DESCRIPTION	EST. QUANTITY	UNIT	UNIT PRICE	EXTENSION
GENERAL					
1	MOBILIZATION @ 10%	1	L.S.	$ 183,100.00	$ 183,100.00
2	TRAFFIC MAINTENANCE & PROTECTION @ 5%	1	L.S.	$ 91,600.00	$ 91,600.00
3	EROSION AND SEDIMENTATION CONTROL @ 3%	1	L.S.	$ 55,000.00	$ 55,000.00
LOW PRESSURE SEWER					
4	2" HDPE LOW PRESSURE SEWER - AGGREGATE BACKFILL	1,058	L.F.	$ 70.00	$ 74,025.00
5	2" HDPE LOW PRESSURE SEWER - SUITABLE BACKFILL	3,173	L.F.	$ 65.00	$ 206,212.50
6	1.25" HDPE LOW PRESSURE SEWER LATERAL	2,025	L.F.	$ 65.00	$ 131,625.00
7	AIR/VACUUM RELEASE VALVES	4	EA.	$ 12,000.00	$ 50,760.00
8	INLINE CLEANOUT	9	EA.	$ 4,500.00	$ 40,500.00
9	TERMINAL CLEANOUT	2	EA.	$ 3,000.00	$ 6,000.00
10	GRINDER PUMP - SIMPLEX	43	EA.	$ 9,000.00	$ 387,000.00
11	GRINDER PUMP - DUPLEX	38	EA.	$ 15,000.00	$ 570,000.00
12	LOW PRESSURE LATERAL CONNECTION	81	EA.	$ 900.00	$ 72,900.00
13	CURBSTOP AND CHECK VALVE ASSEMBLY	81	EA.	$ 850.00	$ 68,850.00
14	TEST PITS	11	EA.	$ 950.00	$ 10,450.00
15	CONNECTION TO EXISTING FORCE MAIN	1	EA.	$ 12,000.00	$ 12,000.00
CROSSING					
16	PENNDOT CROSSING	0	L.S.	$ 35,000.00	$ -
17	STREAM CROSSING	4	L.S.	$ 15,000.00	$ 60,000.00
SURFACING					
18	TEMPORARY PAVING	1,058	L.F.	$ 15.00	$ 15,862.50
19	PENNDOT PAVING RESTORATION (BASE)	1,058	L.F.	$ 90.00	$ 95,175.00
20	PENNDOT PAVING RESTORATION (MILL AND OVERLAY)	1,175	S.Y.	$ 25.00	$ 29,375.00
21	MUNICIPAL PAVING RESTORATION	0	L.F.	$ 65.00	$ -
22	VEGETATIVE RESTORATION	0	L.F.	$ 20.00	$ -
				ESTIMATED CONSTRUCTION COSTS	$ 2,161,000.00
				CONSTRUCTION CONTINGENCY @ 20%	$ 433,000.00
				ENGINEERING, ADMIN, & LEGAL FEES @ 25%	$ 648,500.00
				TOTAL ESTIMATED PROJECT COSTS	$ 3,242,500.00
				ESTIMATED NUMBER OF EDUs TO BE SERVED	140
				ESTIMATED CAPITAL COST PER EDU	$ 24,000.00

TABLE 5-3 COST OPINION FOR MATAMORAS BOROUGH ALTERNATIVE 1C

OPINION OF PROBABLE PROJECT COST
FOR
EASTERN PIKE COUNTY REGIONAL ACT 537 SEWAGE FACILITIES PLAN
MATAMORAS EXTENSION MAIN ROAD GRAVITY
ALTERNATIVE 1C: GRAVITY SEWER
GRAVITY AND PUMP STATION SEWER EXTENSION

ITEM NO.	DESCRIPTION	EST. QUANTITY	UNIT	UNIT PRICE	EXTENSION
GENERAL					
1	MOBILIZATION @ 10%	1	L.S.	$ 206,200.00	$ 206,200.00
2	TRAFFIC MAINTENANCE & PROTECTION @ 5%	1	L.S.	$ 103,100.00	$ 103,100.00
3	EROSION AND SEDIMENTATION CONTROL @ 3%	1	L.S.	$ 61,900.00	$ 61,900.00
GRAVITY SEWER					
4	8" PVC MAIN - AGGREGATE BACKFILL	933	L.F.	$ 230.00	$ 214,475.00
5	8" PVC MAIN - SUITABLE BACKFILL	2,798	L.F.	$ 175.00	$ 489,562.50
6	8" X 6" WYE	81	EA.	$ 435.00	$ 35,235.00
7	6" SERVICE LATERAL - AGGREGATE BACKFILL	810	L.F.	$ 140.00	$ 113,400.00
8	6" SERVICE LATERAL - SUITABLE BACKFILL	810	L.F.	$ 125.00	$ 101,250.00
9	6" SERVICE LATERAL CLEANOUT - SUITABLE BACKFILL	81	L.F.	$ 1,500.00	$ 121,500.00
10	CONNECTION TO EXISTING FORCE MAIN	1	EA.	$ 11,000.00	$ 11,000.00
11	CLAY DIKE	15	EA.	$ 600.00	$ 9,000.00
MANHOLE					
12	MANHOLE - 4 FT DIAMETER	16	EA.	$ 8,000.00	$ 128,000.00
13	MANHOLE FRAME AND COVER	16	EA.	$ 1,000.00	$ 16,000.00
14	MANHOLE PROTECTIVE LINING	1	EA.	$ 5,000.00	$ 5,000.00
FORCE MAIN					
15	4" HDPE FORCE MAIN - AGGREGATE BACKFILL	125	L.F.	$ 110.00	$ 13,750.00
16	4" HDPE FORCE MAIN - SUITABLE BACKFILL	375	L.F.	$ 100.00	$ 37,500.00
17	TEST PITS	1	EA.	$ 950.00	$ 950.00
PUMP STATION					
18	PUMP STATION	1	L.S.	$ 400,000.00	$ 400,000.00
CROSSING					
19	PENNDOT CROSSING	0	L.S.	$ 35,000.00	$ -
20	STREAM CROSSING	4	L.S.	$ 15,000.00	$ 60,000.00
SURFACING					
21	TEMPORARY PAVING	1,743	L.F.	$ 15.00	$ 26,137.50
22	PENNDOT PAVING RESTORATION (BASE)	1,743	L.F.	$ 90.00	$ 156,825.00
23	PENNDOT PAVING RESTORATION (MILL AND OVERLAY)	2,000	S.Y.	$ 25.00	$ 50,000.00
24	MUNICIPAL PAVING RESTORATION	0	L.F.	$ 65.00	$ -
25	VEGETATIVE RESTORATION	3,608	L.F.	$ 20.00	$ 72,150.00
				ESTIMATED CONSTRUCTION COSTS	$ 2,433,000.00
				CONSTRUCTION CONTINGENCY @ 20%	$ 487,000.00
				ENGINEERING, ADMIN, & LEGAL FEES @ 25%	$ 730,000.00
				TOTAL ESTIMATED PROJECT COSTS	$ 3,650,000.00
				ESTIMATED NUMBER OF EDUs TO BE SERVED	140
				ESTIMATED CAPITAL COST PER EDU	$ 27,000.00

TABLE 5-4 COST OPINION FOR MATAMORAS BOROUGH ALTERNATIVE 2A

OPINION OF PROBABLE PROJECT COST
FOR
EASTERN PIKE COUNTY REGIONAL ACT 537 SEWAGE FACILITIES PLAN
MATAMORAS RESIDENTIAL GRAVITY
ALTERNATIVE 2A: GRAVITY SEWER
SEWER EXTENSION

ITEM NO.	DESCRIPTION		UNIT	UNIT PRICE	EXTENSION
GENERAL					
1	MOBILIZATION @ 10%	1	L.S.	$ 502,800.00	$ 502,800.00
2	TRAFFIC MAINTENANCE & PROTECTION @ 5%	1	L.S.	$ 251,400.00	$ 251,400.00
3	EROSION AND SEDIMENTATION CONTROL @ 3%	1	L.S.	$ 150,900.00	$ 150,900.00
GRAVITY SEWER					
4	8" PVC MAIN - AGGREGATE BACKFILL	3,550	L.F.	$ 230.00	$ 816,500.00
5	8" PVC MAIN - SUITABLE BACKFILL	10,855	L.F.	$ 175.00	$ 1,899,625.00
6	8" X 6" WYE	202	EA.	$ 435.00	$ 87,870.00
7	6" SERVICE LATERAL - AGGREGATE BACKFILL	2,020	L.F.	$ 140.00	$ 282,800.00
8	6" SERVICE LATERAL - SUITABLE BACKFILL	2,020	L.F.	$ 125.00	$ 252,500.00
9	6" SERVICE LATERAL CLEANOUT - SUITABLE BACKFILL	202	L.F.	$ 1,500.00	$ 303,000.00
10	CONNECTION TO EXISTING PUMP STATION	1	EA.	$ 11,000.00	$ 11,000.00
11	CLAY DIKE	17	EA.	$ 600.00	$ 10,200.00
MANHOLE					
12	MANHOLE - 4 FT DIAMETER	43	EA.	$ 8,000.00	$ 344,000.00
13	MANHOLE FRAME AND COVER	43	EA.	$ 1,000.00	$ 43,000.00
14	MANHOLE PROTECTIVE LINING	1	EA.	$ 5,000.00	$ 5,000.00
CROSSING					
15	PENNDOT CROSSING	1	L.S.	$ 35,000.00	$ 35,000.00
16	STREAM CROSSING	4	L.S.	$ 15,000.00	$ 60,000.00
SURFACING					
17	TEMPORARY PAVING	5,570	L.F.	$ 15.00	$ 83,550.00
18	PENNDOT PAVING RESTORATION (BASE)	3,295	L.F.	$ 90.00	$ 296,543.66
19	PENNDOT PAVING RESTORATION (MILL AND OVERLAY)	3,661	S.Y.	$ 25.00	$ 91,525.82
20	MUNICIPAL PAVING RESTORATION	2,275	L.F.	$ 65.00	$ 147,879.58
21	VEGETATIVE RESTORATION	12,875	L.F.	$ 20.00	$ 257,500.00
				ESTIMATED CONSTRUCTION COSTS	$ 5,933,000.00
				CONSTRUCTION CONTINGENCY @ 20%	$ 1,187,000.00
				ENGINEERING, ADMIN, & LEGAL FEES @ 25%	$ 1,780,000.00
				TOTAL ESTIMATED PROJECT COSTS	$ 8,900,000.00
				ESTIMATED NUMBER OF EDUs TO BE SERVED	276
				ESTIMATED CAPITAL COST PER EDU	$ 33,000.00

TABLE 5-5 COST OPINION FOR MATAMORAS BOROUGH ALTERNATIVE 2B

OPINION OF PROBABLE PROJECT COST
FOR
EASTERN PIKE COUNTY REGIONAL ACT 537 SEWAGE FACILITIES PLAN
MATAMORAS RESIDENTIAL LOW PRESSURE
ALTERNATIVE 2B
LOW PRESSURE SEWER
SEWER EXTENSION

ITEM NO.	DESCRIPTION		UNIT	UNIT PRICE	EXTENSION
GENERAL					
1	MOBILIZATION @ 10%	1	L.S.	$ 397,700.00	$ 397,700.00
2	TRAFFIC MAINTENANCE & PROTECTION @ 5%	1	L.S.	$ 198,900.00	$ 198,900.00
3	EROSION AND SEDIMENTATION CONTROL @ 3%	1	L.S.	$ 119,400.00	$ 119,400.00
LOW PRESSURE SEWER					
4	2" HDPE LOW PRESSURE SEWER - AGGREGATE BACKFILL	2,508	L.F.	$ 70.00	$ 175,525.00
5	2" HDPE LOW PRESSURE SEWER - SUITABLE BACKFILL	7,523	L.F.	$ 65.00	$ 488,962.50
6	1.25" HDPE LOW PRESSURE SEWER LATERAL	5,050	L.F.	$ 65.00	$ 328,250.00
7	AIR/VACUUM RELEASE VALVES	11	EA.	$ 12,000.00	$ 132,000.00
8	INLINE CLEANOUT	21	EA.	$ 4,500.00	$ 94,500.00
9	TERMINAL CLEANOUT	2	EA.	$ 3,000.00	$ 6,000.00
10	GRINDER PUMP- SIMPLEX	163	EA.	$ 9,000.00	$ 1,467,000.00
11	GRINDER PUMP- DUPLEX	39	EA.	$ 15,000.00	$ 585,000.00
12	LOW PRESSURE LATERAL CONNECTION	202	EA.	$ 900.00	$ 181,800.00
13	CURBSTOP AND CHECK VALVE ASSEMBLY	202	EA.	$ 850.00	$ 171,700.00
14	TEST PITS	26	EA.	$ 950.00	$ 24,700.00
15	CONNECTION TO EXISTING FORCE MAIN	1	EA.	$ 5,000.00	$ 5,000.00
CROSSING					
16	PENNDOT CROSSING	0	L.S.	$ 35,000.00	$ -
17	STREAM CROSSING	4	L.S.	$ 15,000.00	$ 60,000.00
SURFACING					
18	TEMPORARY PAVING	2,508	L.F.	$ 15.00	$ 37,612.50
19	PENNDOT PAVING RESTORATION (BASE)	1,058	L.F.	$ 90.00	$ 95,175.00
20	PENNDOT PAVING RESTORATION (MILL AND OVERLAY)	1,175	S.Y.	$ 25.00	$ 29,375.00
21	MUNICIPAL PAVING RESTORATION	1,450	L.F.	$ 65.00	$ 94,250.00
22	VEGETATIVE RESTORATION	0	L.F.	$ 20.00	$ -
				ESTIMATED CONSTRUCTION COSTS	$ 4,693,000.00
				CONSTRUCTION CONTINGENCY @ 20%	$ 939,000.00
				ENGINEERING, ADMIN, & LEGAL FEES @ 25%	$ 1,408,000.00
				TOTAL ESTIMATED PROJECT COSTS	$ 7,040,000.00
				ESTIMATED NUMBER OF EDUs TO BE SERVED	276
				ESTIMATED CAPITAL COST PER EDU	$ 26,000.00

TABLE 5-6 COST OPINION FOR MATAMORAS BOROUGH ALTERNATIVE 2C

OPINION OF PROBABLE PROJECT COST
FOR
EASTERN PIKE COUNTY REGIONAL ACT 537 SEWAGE FACILITIES PLAN
MATAMORAS RESIDENTIAL GRAVITY
ALTERNATIVE 2C: GRAVITY SEWER
GRAVITY, PUMP STATION SEWER EXTENSION

ITEM NO.	DESCRIPTION		UNIT	UNIT PRICE	EXTENSION
GENERAL					
1	MOBILIZATION @ 10%	1	L.S.	$ 415,200.00	$ 415,200.00
2	TRAFFIC MAINTENANCE & PROTECTION @ 5%	1	L.S.	$ 207,600.00	$ 207,600.00
3	EROSION AND SEDIMENTATION CONTROL @ 3%	1	L.S.	$ 124,600.00	$ 124,600.00
GRAVITY SEWER					
4	8" PVC MAIN - AGGREGATE BACKFILL	2,383	L.F.	$ 230.00	$ 547,975.00
5	8" PVC MAIN - SUITABLE BACKFILL	7,148	L.F.	$ 175.00	$ 1,250,812.50
6	8" X 6" WYE	202	L.F.	$ 435.00	$ 87,870.00
7	6" SERVICE LATERAL - AGGREGATE BACKFILL	2,020	L.F.	$ 140.00	$ 282,800.00
8	6" SERVICE LATERAL - SUITABLE BACKFILL	2,020	L.F.	$ 125.00	$ 252,500.00
9	6" SERVICE LATERAL CLEANOUT - SUITABLE BACKFILL	202	L.F.	$ 1,500.00	$ 303,000.00
10	CONNECTION TO EXISTING FORCE MAIN	1	EA.	$ 12,000.00	$ 12,000.00
11	CLAY DIKE	17	EA.	$ 600.00	$ 10,200.00
MANHOLE					
12	MANHOLE - 4 FT DIAMETER	29	EA.	$ 8,000.00	$ 232,000.00
13	MANHOLE FRAME AND COVER	29	EA.	$ 1,000.00	$ 29,000.00
14	MANHOLE PROTECTIVE LINING	1	EA.	$ 5,000.00	$ 5,000.00
FORCE MAIN					
15	4" HDPE FORCE MAIN - AGGREGATE BACKFILL	125	L.F.	$ 110.00	$ 13,750.00
16	4" HDPE FORCE MAIN - SUITABLE BACKFILL	375	L.F.	$ 100.00	$ 37,500.00
17	TEST PITS	1	EA.	$ 950.00	$ 950.00
PUMP STATION					
18	PUMP STATION	1	L.S.	$ 400,000.00	$ 400,000.00
CROSSING					
19	PENNDOT CROSSING	0	L.S.	$ 35,000.00	$ -
20	STREAM CROSSING	4	L.S.	$ 15,000.00	$ 60,000.00
SURFACING					
21	TEMPORARY PAVING	4,403	L.F.	$ 15.00	$ 66,037.50
22	PENNDOT PAVING RESTORATION (BASE)	1,723	L.F.	$ 90.00	$ 155,080.72
23	PENNDOT PAVING RESTORATION (MILL AND OVERLAY)	1,915	S.Y.	$ 25.00	$ 47,864.42
24	MUNICIPAL PAVING RESTORATION	2,679	L.F.	$ 65.00	$ 174,159.76
25	VEGETATIVE RESTORATION	9,168	L.F.	$ 20.00	$ 183,350.00
				ESTIMATED CONSTRUCTION COSTS	$ 4,900,000.00
				CONSTRUCTION CONTINGENCY @ 20%	$ 980,000.00
				ENGINEERING, ADMIN, & LEGAL FEES @ 25%	$ 1,470,000.00
				TOTAL ESTIMATED PROJECT COSTS	$ 7,350,000.00
				ESTIMATED NUMBER OF EDUs TO BE SERVED	276
				ESTIMATED CAPITAL COST PER EDU	$ 27,000.00

TABLE 5-7 COST OPINION FOR WESTFALL TOWNSHIP SOUTHWEST ALTERNATIVE 3A

OPINION OF PROBABLE PROJECT COST
FOR
EASTERN PIKE COUNTY REGIONAL ACT 537 SEWAGE FACILITIES PLAN
WESTFALL TOWNSHIP EXTENSION GRAVITY/FORCE MAIN
ALTERNATIVE 3A: COMBINATION OF PUMP STATION, GRAVITY SEWER
SEWER EXTENSION

ITEM NO.	DESCRIPTION		UNIT	UNIT PRICE	EXTENSION
GENERAL					
1	MOBILIZATION @ 10%	1	L.S.	$ 351,400.00	$ 351,400.00
2	TRAFFIC MAINTENANCE & PROTECTION @ 5%	1	L.S.	$ 175,700.00	$ 175,700.00
3	EROSION AND SEDIMENTATION CONTROL @ 3%	1	L.S.	$ 105,500.00	$ 105,500.00
GRAVITY SEWER					
4	8" PVC MAIN - AGGREGATE BACKFILL	1,588	L.F.	$ 230.00	$ 365,125.00
5	8" PVC MAIN - SUITABLE BACKFILL	4,763	L.F.	$ 175.00	$ 833,437.50
6	8" X 6" WYE	1	EA.	$ 435.00	$ 435.00
7	6" SERVICE LATERAL - AGGREGATE BACKFILL	90	L.F.	$ 140.00	$ 12,600.00
8	6" SERVICE LATERAL - SUITABLE BACKFILL	90	L.F.	$ 125.00	$ 11,250.00
9	6" SERVICE LATERAL CLEANOUT - SUITABLE BACKFILL	9	L.F.	$ 1,500.00	$ 13,500.00
10	1.25" HDPE LOW PRESSURE LATERAL - SUITABLE BACKFILL	50	L.F.	$ 65.00	$ 3,250.00
11	GRINDER PUMP - DUPLEX	2	EA.	$ 15,000.00	$ 30,000.00
12	LOW PRESSURE LATERAL CONNECTION	2	EA.	$ 900.00	$ 1,800.00
13	CURBSTOP AND CHECK VALVE ASSEMBLY	2	EA.	$ 850.00	$ 1,700.00
14	CONNECTION TO EXISTING FORCE MAIN	1	EA.	$ 11,000.00	$ 11,000.00
15	CLAY DIKE	26	EA.	$ 600.00	$ 15,600.00
MANHOLE					
16	MANHOLE - 4 FT DIAMETER	27	EA.	$ 8,000.00	$ 216,000.00
17	MANHOLE FRAME AND COVER	27	EA.	$ 1,000.00	$ 27,000.00
18	MANHOLE PROTECTIVE LINING	1	EA.	$ 5,000.00	$ 5,000.00
CROSSING					
19	PENNDOT CROSSING	0	L.S.	$ 35,000.00	$ -
20	STREAM CROSSING	10	L.S.	$ 15,000.00	$ 150,000.00
PUMP STATION					
21	PUMP STATION	1	L.S.	$ 400,000.00	$ 400,000.00
FORCE MAIN					
22	4" HDPE FORCE MAIN - AGGREGATE BACKFILL	1,625	L.F.	$ 110.00	$ 178,750.00
23	4" HDPE FORCE MAIN - SUITABLE BACKFILL	4,875	L.F.	$ 100.00	$ 487,500.00
24	1.25" HDPE LOW PRESSURE SEWER LATERAL	275	L.F.	$ 65.00	$ 17,875.00
25	GRINDER PUMP - SIMPLEX	0	EA.	$ 9,000.00	$ -
26	GRINDER PUMP - DUPLEX	11	EA.	$ 15,000.00	$ 165,000.00
27	LATERAL CONNECTION	11	EA.	$ 500.00	$ 5,500.00
28	CURBSTOP AND CHECK VALVE ASSEMBLY	11	EA.	$ 850.00	$ 9,350.00
29	TEST PITS	17	EA.	$ 950.00	$ 16,150.00
SURFACING					
30	TEMPORARY PAVING	3,303	L.F.	$ 15.00	$ 49,537.50
31	PENNDOT PAVING RESTORATION (BASE)	3,303	L.F.	$ 90.00	$ 297,225.00
32	PENNDOT PAVING RESTORATION (MILL AND OVERLAY)	3,669	S.Y.	$ 25.00	$ 91,736.11
33	MUNICIPAL PAVING RESTORATION	0	L.F.	$ 65.00	$ -
34	VEGETATIVE RESTORATION	4,853	L.F.	$ 20.00	$ 97,050.00
				ESTIMATED CONSTRUCTION COSTS	$ 4,146,000.00
				CONSTRUCTION CONTINGENCY @ 20%	$ 622,000.00
				ENGINEERING, ADMIN, & LEGAL FEES @ 25%	$ 1,192,000.00
				TOTAL ESTIMATED PROJECT COSTS	$ 5,960,000.00
				ESTIMATED NUMBER OF EDUs TO BE SERVED	128
				ESTIMATED CAPITAL COST PER EDU	$ 47,000.00

TABLE 5-8 COST OPINION FOR WESTFALL TOWNSHIP SOUTHWEST ALTERNATIVE 3B

OPINION OF PROBABLE PROJECT COST
FOR
EASTERN PIKE COUNTY REGIONAL ACT 537 SEWAGE FACILITIES PLAN
WESTFALL TOWNSHIP EXTENSION LOW PRESSURE
ALTERNATIVE 3B
LOW PRESSURE SEWER
SEWER EXTENSION

ITEM NO.	DESCRIPTION	EST. QUANTITY	UNIT	UNIT PRICE	EXTENSION
GENERAL					
1	MOBILIZATION @ 10%	1	L.S.	$ 93,300.00	$ 93,300.00
2	TRAFFIC MAINTENANCE & PROTECTION @ 5%	1	L.S.	$ 46,700.00	$ 46,700.00
3	EROSION AND SEDIMENTATION CONTROL @ 3%	1	L.S.	$ 46,700.00	$ 46,700.00
LOW PRESSURE SEWER					
4	2" HDPE LOW PRESSURE SEWER - AGGREGATE BACKFILL	3,213	L.F.	$ 70.00	$ 224,875.00
5	2" HDPE LOW PRESSURE SEWER - SUITABLE BACKFILL	9,638	L.F.	$ 65.00	$ 626,437.50
6	1.25" HDPE LOW PRESSURE SEWER LATERAL	350	L.F.	$ 65.00	$ 22,750.00
7	AIR/VACUUM RELEASE VALVES	13	EA.	$ 12,000.00	$ 156,000.00
8	INLINE CLEANOUT	26	EA.	$ 4,500.00	$ 117,000.00
9	TERMINAL CLEANOUT	2	EA.	$ 3,000.00	$ 6,000.00
10	GRINDER PUMP - SIMPLEX	1	EA.	$ 9,000.00	$ 9,000.00
11	GRINDER PUMP - DUPLEX	13	EA.	$ 5,000.00	$ 65,000.00
12	LOW PRESSURE LATERAL CONNECTION	14	EA.	$ 900.00	$ 12,600.00
13	CURBSTOP AND CHECK VALVE ASSEMBLY	14	EA.	$ 850.00	$ 11,900.00
14	TEST PITS	33	EA.	$ 950.00	$ 31,350.00
15	CONNECTION TO EXISTING FORCE MAIN	1	EA.	$ 5,000.00	$ 5,000.00
CROSSING					
16	PENNDOT CROSSING	0	L.S.	$ 35,000.00	$ -
17	STREAM CROSSING	10	L.S.	$ 15,000.00	$ 150,000.00
SURFACING					
18	TEMPORARY PAVING	3,213	L.F.	$ 15.00	$ 48,187.50
19	PENNDOT PAVING RESTORATION (BASE)	3,213	L.F.	$ 90.00	$ 289,125.00
20	PENNDOT PAVING RESTORATION (MILL AND OVERLAY)	3,569	S.Y.	$ 25.00	$ 89,236.11
21	MUNICIPAL PAVING RESTORATION	0	L.F.	$ 65.00	$ -
22	VEGETATIVE RESTORATION	0	L.F.	$ 20.00	$ -
				ESTIMATED CONSTRUCTION COSTS	$ 2,052,000.00
				CONSTRUCTION CONTINGENCY @ 20%	$ 411,000.00
				ENGINEERING, ADMIN, & LEGAL FEES @ 25%	$ 616,000.00
				TOTAL ESTIMATED PROJECT COSTS	$ 3,079,000.00
				ESTIMATED NUMBER OF EDUs TO BE SERVED	128
				ESTIMATED CAPITAL COST PER EDU	$ 25,000.00

TABLE 5-9 COST OPINION FOR MILFORD BOROUGH ALTERNATIVE 4A

OPINION OF PROBABLE PROJECT COST
FOR
EASTERN PIKE COUNTY REGIONAL ACT 537 SEWAGE FACILITIES PLAN
MILFORD BOROUGH- BROAD ST ONLY LOW PRESSURE, FORCE MAIN, GRAVITY
ALTERNATIVE 4A
COMBINATION OF LOW PRESSURE, GRAVITY, PUMP STATION
SEWER EXTENSION

ITEM NO.	DESCRIPTION		UNIT	UNIT PRICE	EXTENSION
GENERAL					
1	MOBILIZATION @ 10%	1	L.S.	$ 303,600.00	$ 303,600.00
2	TRAFFIC MAINTENANCE & PROTECTION @ 5%	1	L.S.	$ 151,800.00	$ 151,800.00
3	EROSION AND SEDIMENTATION CONTROL @ 3%	1	L.S.	$ 151,800.00	$ 151,800.00
LOW PRESSURE SEWER					
4	2" HDPE LOW PRESSURE SEWER - AGGREGATE BACKFILL	683	L.F.	$ 70.00	$ 47,775.00
5	2" HDPE LOW PRESSURE SEWER - SUITABLE BACKFILL	2,048	L.F.	$ 65.00	$ 133,087.50
6	1.25" HDPE LOW PRESSURE SEWER LATERAL	1,200	L.F.	$ 65.00	$ 78,000.00
7	LOW PRESSURE LATERAL CONNECTION	48	EA.	$ 900.00	$ 43,200.00
8	AIR/VACUUM RELEASE VALVES	1	EA.	$ 12,000.00	$ 12,000.00
9	INLINE CLEANOUT	6	EA.	$ 4,500.00	$ 27,000.00
10	TERMINAL CLEANOUT	1	EA.	$ 3,000.00	$ 3,000.00
11	GRINDER PUMP - SIMPLEX	27	EA.	$ 9,000.00	$ 243,000.00
12	GRINDER PUMP - DUPLEX	21	EA.	$ 15,000.00	$ 315,000.00
13	CURBSTOP AND CHECK VALVE ASSEMBLY	48	EA.	$ 850.00	$ 40,800.00
14	TEST PITS	8	EA.	$ 950.00	$ 7,600.00
15	CONNECTION TO EXISTING MANHOLE	1	EA.	$ 5,000.00	$ 5,000.00
GRAVITY SEWER					
16	8" PVC MAIN - AGGREGATE BACKFILL	443	L.F.	$ 230.00	$ 101,775.00
17	8" PVC MAIN - SUITABLE BACKFILL	1,328	L.F.	$ 175.00	$ 232,312.50
18	8" X 6" WYE	0	EA.	$ 435.00	$ -
19	6" SERVICE LATERAL - AGGREGATE BACKFILL	0	L.F.	$ 140.00	$ -
20	6" SERVICE LATERAL - SUITABLE BACKFILL	0	L.F.	$ 125.00	$ -
21	6" SERVICE LATERAL CLEANOUT - SUITABLE BACKFILL	0	EA.	$ 1,500.00	$ -
22	CONNECTION TO EXISTING FORCE MAIN	1	EA.	$ 11,000.00	$ 11,000.00
23	LATERAL CONNECTION	0	EA.	$ 500.00	$ -
24	CURBSTOP AND CHECK VALVE ASSEMBLY	0	EA.	$ 850.00	$ -
25	CLAY DIKE	6	EA.	$ 600.00	$ 3,600.00
MANHOLE					
26	MANHOLE - 4 FT DIAMETER	7	EA.	$ 8,000.00	$ 56,000.00
27	MANHOLE FRAME AND COVER	7	EA.	$ 1,000.00	$ 7,000.00
28	MANHOLE PROTECTIVE LINING	2	EA.	$ 5,000.00	$ 10,000.00
CROSSING					
29	PENNDOT CROSSING	0	L.S.	$ 35,000.00	$ -
30	STREAM CROSSING	14	L.S.	$ 15,000.00	$ 210,000.00
PUMP STATION					
31	PUMP STATION	1	L.S.	$ 400,000.00	$ 400,000.00
FORCE MAIN					
32	4" HDPE FORCE MAIN - AGGREGATE BACKFILL	12,983	L.F.	$ 110.00	$ 1,428,075.00
33	4" HDPE FORCE MAIN - SUITABLE BACKFILL	4,328	L.F.	$ 100.00	$ 432,750.00
34	1.25" HDPE LOW PRESSURE SEWER LATERAL	425	L.F.	$ 65.00	$ 27,625.00
35	GRINDER PUMP - SIMPLEX	5	EA.	$ 9,000.00	$ 45,000.00
36	GRINDER PUMP - DUPLEX	12	EA.	$ 15,000.00	$ 180,000.00
37	LOW PRESSURE LATERAL CONNECTION	17	EA.	$ 900.00	$ 15,300.00
38	CURBSTOP AND CHECK VALVE ASSEMBLY	17	EA.	$ 850.00	$ 14,450.00
37	TEST PITS	44	EA.	$ 950.00	$ 41,800.00
SURFACING					
38	TEMPORARY PAVING	14,108	L.F.	$ 15.00	$ 211,612.50
39	PENNDOT PAVING RESTORATION (BASE)	14,108	L.F.	$ 90.00	$ 1,269,675.00
40	PENNDOT PAVING RESTORATION (MILL AND OVERLAY)	15,675	S.Y.	$ 25.00	$ 391,875.00
41	MUNICIPAL PAVING RESTORATION	0	L.F.	$ 65.00	$ -
42	VEGETATIVE RESTORATION	1,328	L.F.	$ 20.00	$ 26,550.00
				ESTIMATED CONSTRUCTION COSTS	$ 6,680,000.00
				CONSTRUCTION CONTINGENCY @ 20%	$ 1,336,000.00
				ENGINEERING, ADMIN, & LEGAL FEES @ 25%	$ 2,004,000.00
				TOTAL ESTIMATED PROJECT COSTS	$ 10,020,000.00
				ESTIMATED NUMBER OF EDUs TO BE SERVED	106
				ESTIMATED CAPITAL COST PER EDU	$ 95,000.00

TABLE 5-10 COST OPINION FOR MILFORD BOROUGH ALTERNATIVE 4B

OPINION OF PROBABLE PROJECT COST
FOR
EASTERN PIKE COUNTY REGIONAL ACT 537 SEWAGE FACILITIES PLAN
MILFORD BOROUGH- BROAD ST ONLY LOW PRESSURE
ALTERNATIVE 4B
LOW PRESSURE, GRAVITY SEWER
SEWER EXTENSION

ITEM NO.	DESCRIPTION		UNIT	UNIT PRICE	EXTENSION
GENERAL					
1	MOBILIZATION @ 10%	1	L.S.	$ 396,600.00	$ 396,600.00
2	TRAFFIC MAINTENANCE & PROTECTION @ 5%	1	L.S.	$ 198,300.00	$ 198,300.00
3	EROSION AND SEDIMENTATION CONTROL @ 3%	1	L.S.	$ 119,000.00	$ 119,000.00
LOW PRESSURE SEWER					
4	2" HDPE LOW PRESSURE SEWER - AGGREGATE BACKFILL	5,453	L.F.	$ 70.00	$ 381,675.00
5	2" HDPE LOW PRESSURE SEWER - SUITABLE BACKFILL	16,358	L.F.	$ 65.00	$ 1,063,237.50
6	1.25" HDPE LOW PRESSURE SEWER LATERAL	1,725	L.F.	$ 65.00	$ 112,125.00
7	AIR/VACUUM RELEASE VALVES	22	EA.	$ 12,000.00	$ 264,000.00
8	INLINE CLEANOUT	44	EA.	$ 4,500.00	$ 198,000.00
9	TERMINAL CLEANOUT	1	EA.	$ 3,000.00	$ 3,000.00
10	GRINDER PUMP - SIMPLEX	34	EA.	$ 9,000.00	$ 306,000.00
11	GRINDER PUMP - DUPLEX	35	EA.	$ 15,000.00	$ 525,000.00
12	LOW PRESSURE LATERAL CONNECTION	69	EA.	$ 900.00	$ 62,100.00
13	CURBSTOP AND CHECK VALVE ASSEMBLY	69	EA.	$ 850.00	$ 58,650.00
14	TEST PITS	55	EA.	$ 950.00	$ 52,250.00
15	CONNECTION TO EXISTING FORCE MAIN	1	EA.	$ 5,000.00	$ 5,000.00
CROSSING					
16	PENNDOT CROSSING	0	L.S.	$ 35,000.00	$ -
17	STREAM CROSSING	14	L.S.	$ 15,000.00	$ 210,000.00
SURFACING					
18	TEMPORARY PAVING	5,453	L.F.	$ 15.00	$ 81,787.50
19	PENNDOT PAVING RESTORATION (BASE)	5,453	L.F.	$ 90.00	$ 490,725.00
20	PENNDOT PAVING RESTORATION (MILL AND OVERLAY)	6,058	S.Y.	$ 25.00	$ 151,458.33
21	MUNICIPAL PAVING RESTORATION	0	L.F.	$ 65.00	$ -
22	VEGETATIVE RESTORATION	0	L.F.	$ 20.00	$ -
				ESTIMATED CONSTRUCTION COSTS	$ 4,679,000.00
				CONSTRUCTION CONTINGENCY @ 20%	$ 936,000.00
				ENGINEERING, ADMIN, & LEGAL FEES @ 25%	$ 1,404,000.00
				TOTAL ESTIMATED PROJECT COSTS	$ 7,019,000.00
				ESTIMATED NUMBER OF EDUs TO BE SERVED	106
				ESTIMATED CAPITAL COST PER EDU	$ 67,000.00

TABLE 5-11 COST OPINION FOR MILFORD BOROUGH ALTERNATIVE 4C

OPINION OF PROBABLE PROJECT COST
FOR
EASTERN PIKE COUNTY REGIONAL ACT 537 SEWAGE FACILITIES PLAN
MILFORD BOROUGH- BROAD ST ONLY FORCE MAIN
ALTERNATIVE 4C
COMBINATION OF GRAVITY, PUMP STATION
SEWER EXTENSION

ITEM NO.	DESCRIPTION		UNIT	UNIT PRICE	EXTENSION
GENERAL					
1	MOBILIZATION @ 10%	1	L.S.	$ 455,300.00	$ 455,300.00
2	TRAFFIC MAINTENANCE & PROTECTION @ 5%	1	L.S.	$ 227,700.00	$ 227,700.00
3	EROSION AND SEDIMENTATION CONTROL @ 3%	1	L.S.	$ 136,600.00	$ 136,600.00
GRAVITY SEWER					
4	8" PVC MAIN - AGGREGATE BACKFILL	398	L.F.	$ 230.00	$ 91,425.00
5	8" PVC MAIN - SUITABLE BACKFILL	1,193	L.F.	$ 175.00	$ 208,687.50
6	8" X 6" WYE	38	EA.	$ 435.00	$ 16,530.00
7	6" SERVICE LATERAL - AGGREGATE BACKFILL	380	L.F.	$ 140.00	$ 53,200.00
8	6" SERVICE LATERAL - SUITABLE BACKFILL	380	L.F.	$ 125.00	$ 47,500.00
9	6" SERVICE LATERAL CLEANOUT - SUITABLE BACKFILL	38	EA.	$ 1,500.00	$ 57,000.00
10	CONNECTION TO EXISTING FORCE MAIN	1	EA.	$ 11,000.00	$ 11,000.00
11	CLAY DIKE	5	EA.	$ 600.00	$ 3,000.00
MANHOLE					
12	MANHOLE - 4 FT DIAMETER	6	EA.	$ 8,000.00	$ 48,000.00
13	MANHOLE FRAME AND COVER	6	EA.	$ 1,000.00	$ 6,000.00
14	MANHOLE PROTECTIVE LINING	1	EA.	$ 5,000.00	$ 5,000.00
CROSSING					
15	PENNDOT CROSSING	0	L.S.	$ 35,000.00	$ -
16	STREAM CROSSING	14	L.S.	$ 15,000.00	$ 210,000.00
PUMP STATION					
17	PUMP STATION	1	L.S.	$ 400,000.00	$ 400,000.00
FORCE MAIN					
18	4" HDPE FORCE MAIN - AGGREGATE BACKFILL	5,058	L.F.	$ 110.00	$ 556,325.00
19	4" HDPE FORCE MAIN - SUITABLE BACKFILL	15,173	L.F.	$ 100.00	$ 1,517,250.00
20	1.25" HDPE LOW PRESSURE SEWER LATERAL	750	L.F.	$ 65.00	$ 48,750.00
21	GRINDER PUMP - SIMPLEX	14	EA.	$ 9,000.00	$ 126,000.00
22	GRINDER PUMP - DUPLEX	16	EA.	$ 15,000.00	$ 240,000.00
23	LOW PRESSURE LATERAL CONNECTION	30	EA.	$ 900.00	$ 27,000.00
24	CURBSTOP AND CHECK VALVE ASSEMBLY	30	EA.	$ 850.00	$ 25,500.00
25	TEST PITS	51	EA.	$ 950.00	$ 48,450.00
SURFACING					
26	TEMPORARY PAVING	5,835	L.F.	$ 15.00	$ 87,525.00
27	PENNDOT PAVING RESTORATION (BASE)	5,835	L.F.	$ 90.00	$ 525,150.00
28	PENNDOT PAVING RESTORATION (MILL AND OVERLAY)	6,483	S.Y.	$ 25.00	$ 162,083.33
29	MUNICIPAL PAVING RESTORATION	0	L.F.	$ 65.00	$ -
30	VEGETATIVE RESTORATION	1,573	L.F.	$ 20.00	$ 31,450.00
				ESTIMATED CONSTRUCTION COSTS	$ 5,373,000.00
				CONSTRUCTION CONTINGENCY @ 20%	$ 1,075,000.00
				ENGINEERING, ADMIN, & LEGAL FEES @ 25%	$ 1,612,000.00
				TOTAL ESTIMATED PROJECT COSTS	$ 8,060,000.00
				ESTIMATED NUMBER OF EDUs TO BE SERVED	106
				ESTIMATED CAPITAL COST PER EDU	$ 77,000.00

TABLE 5-12 COST OPINION FOR MILFORD BOROUGH ALTERNATIVE 4D

OPINION OF PROBABLE PROJECT COST
FOR
EASTERN PIKE COUNTY REGIONAL ACT 537 SEWAGE FACILITIES PLAN
MILFORD BOROUGH- BROAD ST ALLEYS LOW PRESSURE
ALTERNATIVE 4D
LOW PRESSURE SEWER
SEWER EXTENSION

ITEM NO.	DESCRIPTION		UNIT	UNIT PRICE	EXTENSION
GENERAL					
1	MOBILIZATION @ 10%	1	L.S.	$ 371,600.00	$ 371,600.00
2	TRAFFIC MAINTENANCE & PROTECTION @ 5%	1	L.S.	$ 185,800.00	$ 185,800.00
3	EROSION AND SEDIMENTATION CONTROL @ 3%	1	L.S.	$ 111,500.00	$ 111,500.00
LOW PRESSURE SEWER					
4	2" HDPE LOW PRESSURE SEWER - AGGREGATE BACKFILL	5,753	L.F.	$ 70.00	$ 402,675.00
5	2" HDPE LOW PRESSURE SEWER - SUITABLE BACKFILL	17,258	L.F.	$ 65.00	$ 1,121,737.50
6	1.25" HDPE LOW PRESSURE SEWER LATERAL	1,675	L.F.	$ 65.00	$ 108,875.00
7	AIR/VACUUM RELEASE VALVES	1	EA.	$ 12,000.00	$ 12,000.00
8	INLINE CLEANOUT	47	EA.	$ 4,500.00	$ 211,500.00
9	TERMINAL CLEANOUT	1	EA.	$ 3,000.00	$ 3,000.00
10	GRINDER PUMP - SIMPLEX	44	EA.	$ 9,000.00	$ 396,000.00
11	GRINDER PUMP - DUPLEX	23	EA.	$ 15,000.00	$ 345,000.00
12	LOW PRESSURE LATERAL CONNECTION	67	EA.	$ 900.00	$ 60,300.00
13	CURBSTOP AND CHECK VALVE ASSEMBLY	67	EA.	$ 850.00	$ 56,950.00
14	TEST PITS	58	EA.	$ 950.00	$ 55,100.00
15	CONNECTION TO EXISTING FORCE MAIN	1	EA.	$ 5,000.00	$ 5,000.00
CROSSING					
16	PENNDOT CROSSING	0	L.S.	$ 35,000.00	$ -
17	STREAM CROSSING	14	L.S.	$ 15,000.00	$ 210,000.00
SURFACING					
18	TEMPORARY PAVING	5,753	L.F.	$ 15.00	$ 86,287.50
19	PENNDOT PAVING RESTORATION (BASE)	5,058	L.F.	$ 90.00	$ 455,175.00
20	PENNDOT PAVING RESTORATION (MILL AND OVERLAY)	5,619	S.Y.	$ 25.00	$ 140,486.11
21	MUNICIPAL PAVING RESTORATION	695	L.F.	$ 65.00	$ 45,175.00
22	VEGETATIVE RESTORATION	0	L.F.	$ 20.00	$ -
				ESTIMATED CONSTRUCTION COSTS	$ 4,385,000.00
				CONSTRUCTION CONTINGENCY @ 20%	$ 877,000.00
				ENGINEERING, ADMIN, & LEGAL FEES @ 25%	$ 1,316,000.00
				TOTAL ESTIMATED PROJECT COSTS	$ 6,578,000.00
				ESTIMATED NUMBER OF EDUs TO BE SERVED	126
				ESTIMATED CAPITAL COST PER EDU	$ 53,000.00

TABLE 5-13 COST OPINION FOR MILFORD BOROUGH ALTERNATIVE 4E

OPINION OF PROBABLE PROJECT COST
FOR
EASTERN PIKE COUNTY REGIONAL ACT 537 SEWAGE FACILITIES PLAN
MILFORD BOROUGH- BROAD ST ALLEYS ONLY FORCE MAIN
ALTERNATIVE 4E
COMBINATION OF GRAVITY, PUMP STATION, FORCE MAIN SEWER
SEWER EXTENSION

ITEM NO.	DESCRIPTION		UNIT	UNIT PRICE	EXTENSION
GENERAL					
1	MOBILIZATION @ 10%	1	L.S.	$ 481,100.00	$ 481,100.00
2	TRAFFIC MAINTENANCE & PROTECTION @ 5%	1	L.S.	$ 240,600.00	$ 240,600.00
3	EROSION AND SEDIMENTATION CONTROL @ 3%	1	L.S.	$ 144,400.00	$ 144,400.00
GRAVITY SEWER					
4	8" PVC MAIN - AGGREGATE BACKFILL	695	L.F.	$ 230.00	$ 159,850.00
5	8" PVC MAIN - SUITABLE BACKFILL	2,085	L.F.	$ 175.00	$ 364,875.00
6	8" X 6" WYE	37	EA.	$ 435.00	$ 16,095.00
7	6" SERVICE LATERAL - AGGREGATE BACKFILL	370	L.F.	$ 140.00	$ 51,800.00
8	6" SERVICE LATERAL - SUITABLE BACKFILL	370	L.F.	$ 125.00	$ 46,250.00
9	6" SERVICE LATERAL CLEANOUT - SUITABLE BACKFILL	37	EA.	$ 1,500.00	$ 55,500.00
10	CONNECTION TO EXISTING FORCE MAIN	1	EA.	$ 12,000.00	$ 12,000.00
11	CLAY DIKE	8	EA.	$ 600.00	$ 4,800.00
MANHOLE					
12	MANHOLE - 4 FT DIAMETER	9	EA.	$ 8,000.00	$ 72,000.00
13	MANHOLE FRAME AND COVER	9	EA.	$ 1,000.00	$ 9,000.00
14	MANHOLE PROTECTIVE LINING	1	EA.	$ 5,000.00	$ 5,000.00
CROSSING					
15	PENNDOT CROSSING	0	L.S.	$ 35,000.00	$ -
16	STREAM CROSSING	14	L.S.	$ 15,000.00	$ 210,000.00
PUMP STATION					
17	PUMP STATION	1	L.S.	$ 400,000.00	$ 400,000.00
FORCE MAIN					
18	4" HDPE FORCE MAIN - AGGREGATE BACKFILL	5,058	L.F.	$ 110.00	$ 556,325.00
19	4" HDPE FORCE MAIN - SUITABLE BACKFILL	15,173	L.F.	$ 100.00	$ 1,517,250.00
20	1.25" HDPE LOW PRESSURE SEWER LATERAL	750	L.F.	$ 65.00	$ 48,750.00
21	GRINDER PUMP - SIMPLEX	14	EA.	$ 9,000.00	$ 126,000.00
22	GRINDER PUMP - DUPLEX	16	EA.	$ 15,000.00	$ 240,000.00
23	LOW PRESSURE LATERAL CONNECTION	30	EA.	$ 900.00	$ 27,000.00
24	CURBSTOP AND CHECK VALVE ASSEMBLY	30	EA.	$ 850.00	$ 25,500.00
25	TEST PITS	42	EA.	$ 950.00	$ 39,900.00
SURFACING					
26	TEMPORARY PAVING	6,123	L.F.	$ 15.00	$ 91,837.50
27	PENNDOT PAVING RESTORATION (BASE)	5,383	L.F.	$ 90.00	$ 484,451.79
28	PENNDOT PAVING RESTORATION (MILL AND OVERLAY)	5,981	S.Y.	$ 25.00	$ 149,522.16
29	MUNICIPAL PAVING RESTORATION	740	L.F.	$ 65.00	$ 48,080.65
30	VEGETATIVE RESTORATION	2,455	L.F.	$ 20.00	$ 49,100.00
				ESTIMATED CONSTRUCTION COSTS	$ 5,677,000.00
				CONSTRUCTION CONTINGENCY @ 20%	$ 1,136,000.00
				ENGINEERING, ADMIN, & LEGAL FEES @ 25%	$ 1,704,000.00
				TOTAL ESTIMATED PROJECT COSTS	$ 8,517,000.00
				ESTIMATED NUMBER OF EDUs TO BE SERVED	126
				ESTIMATED CAPITAL COST PER EDU	$ 68,000.00

TABLE 5-14 COST OPINION FOR MILFORD BOROUGH ALTERNATIVE 5A

OPINION OF PROBABLE PROJECT COST
FOR
EASTERN PIKE COUNTY REGIONAL ACT 537 SEWAGE FACILITIES PLAN
MILFORD BOROUGH- BROAD ST+ W HARFORD ST GRAVITY FORCE MAIN
ALTERNATIVE 5A
COMBINATION OF LOW PRESSURE, GRAVITY, PUMP STATION, FORCE MAIN SEWER
SEWER EXTENSION

ITEM NO.	DESCRIPTION		UNIT	UNIT PRICE	EXTENSION
GENERAL					
1	MOBILIZATION @ 10%	1	L.S.	$ 515,800.00	$ 515,800.00
2	TRAFFIC MAINTENANCE & PROTECTION @ 5%	1	L.S.	$ 257,900.00	$ 257,900.00
3	EROSION AND SEDIMENTATION CONTROL @ 3%	1	L.S.	$ 154,800.00	$ 154,800.00
GRAVITY SEWER					
4	8" PVC MAIN - AGGREGATE BACKFILL	880	L.F.	$ 230.00	$ 202,400.00
5	8" PVC MAIN - SUITABLE BACKFILL	2,640	L.F.	$ 175.00	$ 462,000.00
6	8" X 6" WYE	56	EA.	$ 435.00	$ 24,360.00
7	6" SERVICE LATERAL - AGGREGATE BACKFILL	560	L.F.	$ 140.00	$ 78,400.00
8	6" SERVICE LATERAL - SUITABLE BACKFILL	560	L.F.	$ 125.00	$ 70,000.00
9	6" SERVICE LATERAL CLEANOUT - SUITABLE BACKFILL	56	EA.	$ 1,500.00	$ 84,000.00
10	CONNECTION TO EXISTING FORCE MAIN	1	EA.	$ 11,000.00	$ 11,000.00
11	CLAY DIKE	11	EA.	$ 600.00	$ 6,600.00
MANHOLE					
12	MANHOLE - 4 FT DIAMETER	12	EA.	$ 8,000.00	$ 96,000.00
13	MANHOLE FRAME AND COVER	12	EA.	$ 1,000.00	$ 12,000.00
14	MANHOLE PROTECTIVE LINING	1	EA.	$ 5,000.00	$ 5,000.00
CROSSING					
15	PENNDOT CROSSING	0	L.S.	$ 35,000.00	$ -
16	STREAM CROSSING	14	L.S.	$ 15,000.00	$ 210,000.00
PUMP STATION					
17	PUMP STATION	1	L.S.	$ 400,000.00	$ 400,000.00
FORCE MAIN					
18	4" HDPE FORCE MAIN - AGGREGATE BACKFILL	5,058	L.F.	$ 110.00	$ 556,325.00
19	4" HDPE FORCE MAIN - SUITABLE BACKFILL	15,173	L.F.	$ 100.00	$ 1,517,250.00
20	1.25" HDPE LOW PRESSURE SEWER LATERAL	750	L.F.	$ 65.00	$ 48,750.00
21	GRINDER PUMP - SIMPLEX	14	EA.	$ 9,000.00	$ 126,000.00
22	GRINDER PUMP - DUPLEX	16	EA.	$ 15,000.00	$ 240,000.00
23	LATERAL CONNECTION	30	EA.	$ 500.00	$ 15,000.00
24	CURBSTOP AND CHECK VALVE ASSEMBLY	30	EA.	$ 850.00	$ 25,500.00
25	TEST PITS	42	EA.	$ 950.00	$ 39,900.00
SURFACING					
26	TEMPORARY PAVING	6,498	L.F.	$ 15.00	$ 97,462.50
27	PENNDOT PAVING RESTORATION (BASE)	6,498	L.F.	$ 90.00	$ 584,775.00
28	PENNDOT PAVING RESTORATION (MILL AND OVERLAY)	7,219	S.Y.	$ 25.00	$ 180,486.11
29	MUNICIPAL PAVING RESTORATION	0	L.F.	$ 65.00	$ -
30	VEGETATIVE RESTORATION	3,200	L.F.	$ 20.00	$ 64,000.00
				ESTIMATED CONSTRUCTION COSTS	$ 6,086,000.00
				CONSTRUCTION CONTINGENCY @ 20%	$ 1,218,000.00
				ENGINEERING, ADMIN, & LEGAL FEES @ 25%	$ 1,826,000.00
				TOTAL ESTIMATED PROJECT COSTS	$ 9,130,000.00
				ESTIMATED NUMBER OF EDUs TO BE SERVED	172
				ESTIMATED CAPITAL COST PER EDU	$ 54,000.00

TABLE 5-15 COST OPINION FOR MILFORD BOROUGH ALTERNATIVE 5B

OPINION OF PROBABLE PROJECT COST
FOR
EASTERN PIKE COUNTY REGIONAL ACT 537 SEWAGE FACILITIES PLAN
MILFORD BOROUGH- BROAD ST+ W HARFORD ST ALLEYS FORCE MAIN
ALTERNATIVE 5B
COMBINATION OF LOW PRESSURE, GRAVITY, PUMP STATION, FORCE MAIN SEWER
SEWER EXTENSION

ITEM NO.	DESCRIPTION		UNIT	UNIT PRICE	EXTENSION
GENERAL					
1	MOBILIZATION @ 10%	1	L.S.	$ 578,700.00	$ 578,700.00
2	TRAFFIC MAINTENANCE & PROTECTION @ 5%	1	L.S.	$ 289,400.00	$ 289,400.00
3	EROSION AND SEDIMENTATION CONTROL @ 3%	1	L.S.	$ 173,700.00	$ 173,700.00
GRAVITY SEWER					
4	8" PVC MAIN - AGGREGATE BACKFILL	3,360	L.F.	$ 230.00	$ 772,800.00
5	8" PVC MAIN - SUITABLE BACKFILL	1,120	L.F.	$ 175.00	$ 196,000.00
6	8" X 6" WYE	71	EA.	$ 435.00	$ 30,885.00
7	6" SERVICE LATERAL - AGGREGATE BACKFILL	710	L.F.	$ 140.00	$ 99,400.00
8	6" SERVICE LATERAL - SUITABLE BACKFILL	710	L.F.	$ 125.00	$ 88,750.00
9	6" SERVICE LATERAL CLEANOUT - SUITABLE BACKFILL	71	EA.	$ 1,500.00	$ 106,500.00
10	CONNECTION TO EXISTING FORCE MAIN	1	EA.	$ 11,000.00	$ 11,000.00
11	CLAY DIKE	13	EA.	$ 600.00	$ 7,800.00
MANHOLE					
12	MANHOLE - 4 FT DIAMETER	14	EA.	$ 8,000.00	$ 112,000.00
13	MANHOLE FRAME AND COVER	14	EA.	$ 1,000.00	$ 14,000.00
14	MANHOLE PROTECTIVE LINING	1	EA.	$ 5,000.00	$ 5,000.00
CROSSING					
15	PENNDOT CROSSING	0	L.S.	$ 35,000.00	$ -
16	STREAM CROSSING	14	L.S.	$ 15,000.00	$ 210,000.00
PUMP STATION					
17	PUMP STATION	1	L.S.	$ 400,000.00	$ 400,000.00
FORCE MAIN					
18	4" HDPE FORCE MAIN - AGGREGATE BACKFILL	5,058	L.F.	$ 110.00	$ 556,325.00
19	4" HDPE FORCE MAIN - SUITABLE BACKFILL	15,173	L.F.	$ 100.00	$ 1,517,250.00
20	1.25" HDPE LOW PRESSURE SEWER LATERAL	750	L.F.	$ 40.00	$ 30,000.00
21	GRINDER PUMP - SIMPLEX	14	EA.	$ 9,000.00	$ 126,000.00
22	GRINDER PUMP - DUPLEX	16	EA.	$ 15,000.00	$ 240,000.00
23	LOW PRESSURE LATERAL CONNECTION	30	EA.	$ 900.00	$ 27,000.00
24	CURBSTOP AND CHECK VALVE ASSEMBLY	30	EA.	$ 850.00	$ 25,500.00
25	TEST PITS	52	EA.	$ 950.00	$ 49,400.00
SURFACING					
26	TEMPORARY PAVING	9,128	L.F.	$ 15.00	$ 136,912.50
27	PENNDOT PAVING RESTORATION (BASE)	7,473	L.F.	$ 90.00	$ 672,539.02
28	PENNDOT PAVING RESTORATION (MILL AND OVERLAY)	8,303	S.Y.	$ 25.00	$ 207,573.77
29	MUNICIPAL PAVING RESTORATION	1,655	L.F.	$ 65.00	$ 107,564.87
30	VEGETATIVE RESTORATION	1,830	L.F.	$ 20.00	$ 36,600.00
				ESTIMATED CONSTRUCTION COSTS	$ 6,829,000.00
				CONSTRUCTION CONTINGENCY @ 20%	$ 1,366,000.00
				ENGINEERING, ADMIN, & LEGAL FEES @ 25%	$ 2,049,000.00
				TOTAL ESTIMATED PROJECT COSTS	$ 10,244,000.00
				ESTIMATED NUMBER OF EDUs TO BE SERVED	178
				ESTIMATED CAPITAL COST PER EDU	$ 58,000.00

TABLE 5-16 COST OPINION FOR MILFORD BOROUGH ALTERNATIVE 5C

OPINION OF PROBABLE PROJECT COST
FOR
EASTERN PIKE COUNTY REGIONAL ACT 537 SEWAGE FACILITIES PLAN
MILFORD BOROUGH- BROAD ST+ W HARFORD ST LOW PRESSURE
ALTERNATIVE 5C
LOW PRESSURE SEWER
SEWER EXTENSION

ITEM NO.	DESCRIPTION		UNIT	UNIT PRICE	EXTENSION
GENERAL					
1	MOBILIZATION @ 10%	1	L.S.	$ 409,000.00	$ 409,000.00
2	TRAFFIC MAINTENANCE & PROTECTION @ 5%	1	L.S.	$ 204,500.00	$ 204,500.00
3	EROSION AND SEDIMENTATION CONTROL @ 3%	1	L.S.	$ 122,700.00	$ 122,700.00
LOW PRESSURE SEWER					
4	2" HDPE LOW PRESSURE SEWER - AGGREGATE BACKFILL	5,938	L.F.	$ 70.00	$ 415,625.00
5	2" HDPE LOW PRESSURE SEWER - SUITABLE BACKFILL	17,813	L.F.	$ 65.00	$ 1,157,812.50
6	1.25" HDPE LOW PRESSURE SEWER LATERAL	2,150	L.F.	$ 65.00	$ 139,750.00
7	AIR/VACUUM RELEASE VALVES	5	EA.	$ 12,000.00	$ 60,000.00
8	INLINE CLEANOUT	48	EA.	$ 4,500.00	$ 216,000.00
9	TERMINAL CLEANOUT	1	EA.	$ 3,000.00	$ 3,000.00
10	GRINDER PUMP - SIMPLEX	54	EA.	$ 9,000.00	$ 486,000.00
11	GRINDER PUMP - DUPLEX	32	EA.	$ 12,500.00	$ 400,000.00
12	TEST PITS	60	EA.	$ 950.00	$ 57,000.00
13	LOW PRESSURE LATERAL CONNECTION	86	EA.	$ 900.00	$ 77,400.00
14	CURBSTOP AND CHECK VALVE ASSEMBLY	86	EA.	$ 850.00	$ 73,100.00
15	CONNECTION TO EXISTING FORCE MAIN	1	EA.	$ 5,000.00	$ 5,000.00
CROSSING					
16	PENNDOT CROSSING	0	L.S.	$ 35,000.00	$ -
17	STREAM CROSSING	14	L.S.	$ 15,000.00	$ 210,000.00
SURFACING					
18	TEMPORARY PAVING	5,938	L.F.	$ 15.00	$ 89,062.50
19	PENNDOT PAVING RESTORATION (BASE)	5,938	L.F.	$ 90.00	$ 534,375.00
20	PENNDOT PAVING RESTORATION (MILL AND OVERLAY)	6,597	S.Y.	$ 25.00	$ 164,930.56
21	MUNICIPAL PAVING RESTORATION	0	L.F.	$ 65.00	$ -
22	VEGETATIVE RESTORATION	0	L.F.	$ 20.00	$ -
				ESTIMATED CONSTRUCTION COSTS	$ 4,826,000.00
				CONSTRUCTION CONTINGENCY @ 20%	$ 966,000.00
				ENGINEERING, ADMIN, & LEGAL FEES @ 25%	$ 1,448,000.00
				TOTAL ESTIMATED PROJECT COSTS	$ 7,240,000.00
				ESTIMATED NUMBER OF EDUs TO BE SERVED	172
				ESTIMATED CAPITAL COST PER EDU	$ 43,000.00

TABLE 5-17 COST OPINION FOR MILFORD BOROUGH ALTERNATIVE 5D

OPINION OF PROBABLE PROJECT COST
FOR
WESTFALL TOWNSHIP ACT 537 SEWAGE FACILITIES PLAN
MILFORD BOROUGH- BROAD ST+ W HARFORD ST ALLEY LOW PRESSURE
ALTERNATIVE 5D
LOW PRESSURE SEWER
SEWER EXTENSION

ITEM NO.	DESCRIPTION		UNIT	UNIT PRICE	EXTENSION
GENERAL					
1	MOBILIZATION @ 10%	1	L.S.	$190,500.00	$ 190,500.00
2	TRAFFIC MAINTENANCE & PROTECTION @ 5%	1	L.S.	$ 95,300.00	$ 95,300.00
3	EROSION AND SEDIMENTATION CONTROL @ 3%	1	L.S.	$ 95,300.00	$ 95,300.00
LOW PRESSURE SEWER					
4	2" HDPE LOW PRESSURE SEWER - AGGREGATE BACKFILL	6,178	L.F.	$ 60.00	$ 370,650.00
5	2" HDPE LOW PRESSURE SEWER - SUITABLE BACKFILL	18,533	L.F.	$ 55.00	$ 1,019,287.50
6	1.25" HDPE LOW PRESSURE SEWER LATERAL	2,900	L.F.	$ 40.00	$ 116,000.00
7	AIR/VACUUM RELEASE VALVES	5	EA.	$ 7,800.00	$ 39,000.00
8	INLINE CLEANOUT	50	EA.	$ 2,700.00	$ 135,000.00
9	TERMINAL CLEANOUT	1	EA.	$ 2,500.00	$ 2,500.00
10	GRINDER PUMP - SIMPLEX	78	EA.	$ 8,000.00	$ 624,000.00
11	GRINDER PUMP - DUPLEX	38	EA.	$ 12,500.00	$ 475,000.00
12	TEST PITS	62	EA.	$ 550.00	$ 34,100.00
13	LATERAL CONNECTION	116	EA.	$ 500.00	$ 58,000.00
14	CURBSTOP AND CHECK VALVE ASSEMBLY	116	EA.	$ 650.00	$ 75,400.00
15	CONNECTION TO EXISTING FORCE MAIN	1	EA.	$ 12,000.00	$ 12,000.00
CROSSING					
16	PENNDOT CROSSING	0	L.S.	$ 30,000.00	$ -
17	STREAM CROSSING	14	L.S.	$ 10,000.00	$ 140,000.00
SURFACING					
18	TEMPORARY PAVING	6,178	L.F.	$ 20.00	$ 123,550.00
19	PENNDOT PAVING RESTORATION (BASE)	5,058	L.F.	$ 80.00	$ 404,600.00
20	PENNDOT PAVING RESTORATION (MILL AND OVERLAY)	5,619	S.Y.	$ 20.00	$ 112,388.89
21	MUNICIPAL PAVING RESTORATION	1,120	L.F.	$ 60.00	$ 67,200.00
22	VEGETATIVE RESTORATION	0	L.F.	$ 15.00	$ -
				ESTIMATED CONSTRUCTION COSTS	$ 4,190,000.00
				CONSTRUCTION CONTINGENCY @ 20%	$ 838,000.00
				ENGINEERING, ADMIN, & LEGAL FEES @ 25%	$ 1,257,000.00
				TOTAL ESTIMATED PROJECT COSTS	$ 6,285,000.00
				ESTIMATED NUMBER OF EDUs TO BE SERVED	178
				ESTIMATED CAPITAL COST PER EDU	$ 36,000.00

TABLE 5-18 COST OPINION FOR MILFORD BOROUGH ALTERNATIVE 6A

OPINION OF PROBABLE PROJECT COST
FOR
EASTERN PIKE COUNTY REGIONAL ACT 537 SEWAGE FACILITIES PLAN
MILFORD BOROUGH EXTENSION W/ HARFORD AND BROAD ST LOW PRESSURE GRAVITY
ALTERNATIVE 6A
COMBINATION OF GRAVITY SEWER, LOW PRESSURE, FORCE MAIN, PUMP STATION
SEWER EXTENSION

ITEM NO.	DESCRIPTION		UNIT	UNIT PRICE	EXTENSION
GENERAL					
1	MOBILIZATION @ 10%	1	L.S.	$ 607,900.00	$ 607,900.00
2	TRAFFIC MAINTENANCE & PROTECTION @ 5%	1	L.S.	$ 304,000.00	$ 304,000.00
3	EROSION AND SEDIMENTATION CONTROL @ 3%	1	L.S.	$ 182,400.00	$ 182,400.00
LOW PRESSURE SEWER					
4	2" HDPE LOW PRESSURE SEWER - AGGREGATE BACKFILL	1,590	L.F.	$ 70.00	$ 111,300.00
5	2" HDPE LOW PRESSURE SEWER - SUITABLE BACKFILL	4,770	L.F.	$ 65.00	$ 310,050.00
6	1.25" HDPE LOW PRESSURE SEWER LATERAL	2,825	L.F.	$ 65.00	$ 183,625.00
7	AIR/VACUUM RELEASE VALVES	7	EA.	$ 12,000.00	$ 84,000.00
8	INLINE CLEANOUT	13	EA.	$ 4,500.00	$ 58,500.00
9	TERMINAL CLEANOUT	4	EA.	$ 3,000.00	$ 12,000.00
10	GRINDER PUMP - SIMPLEX	77	EA.	$ 9,000.00	$ 693,000.00
11	GRINDER PUMP - DUPLEX	36	EA.	$ 12,500.00	$ 450,000.00
12	TEST PITS	16	EA.	$ 950.00	$ 15,200.00
13	LATERAL CONNECTION	113	EA.	$ 500.00	$ 56,500.00
14	CURBSTOP AND CHECK VALVE ASSEMBLY	113	EA.	$ 850.00	$ 96,050.00
15	CONNECTION TO EXISTING FORCE MAIN	1	EA.	$ 5,000.00	$ 5,000.00
GRAVITY SEWER					
16	8" PVC MAIN - AGGREGATE BACKFILL	443	L.F.	$ 230.00	$ 101,775.00
17	8" PVC MAIN - SUITABLE BACKFILL	1,328	L.F.	$ 175.00	$ 232,312.50
18	8" X 6" WYE	0	EA.	$ 435.00	$ -
19	6" SERVICE LATERAL - AGGREGATE BACKFILL	0	L.F.	$ 140.00	$ -
20	6" SERVICE LATERAL - SUITABLE BACKFILL	0	L.F.	$ 125.00	$ -
21	6" SERVICE LATERAL CLEANOUT - SUITABLE BACKFILL	0	EA.	$ 1,500.00	$ -
22	CONNECTION TO EXISTING FORCE MAIN	1	EA.	$ 12,000.00	$ 12,000.00
23	1.25" HDPE LOW PRESSURE SEWER LATERAL	0	L.F.	$ 65.00	$ -
24	GRINDER PUMP - SIMPLEX	0	EA.	$ 9,000.00	$ -
25	GRINDER PUMP - DUPLEX	0	EA.	$ 15,000.00	$ -
26	LATERAL CONNECTION	0	EA.	$ 500.00	$ -
27	CURBSTOP AND CHECK VALVE ASSEMBLY	0	EA.	$ 850.00	$ -
28	CLAY DIKE	6	EA.	$ 600.00	$ 3,600.00
MANHOLE					
29	MANHOLE - 4 FT DIAMETER	7	EA.	$ 8,000.00	$ 56,000.00
30	MANHOLE FRAME AND COVER	7	EA.	$ 1,000.00	$ 7,000.00
31	MANHOLE PROTECTIVE LINING	2	EA.	$ 5,000.00	$ 10,000.00
CROSSING					
32	PENNDOT CROSSING	0	L.S.	$ 35,000.00	$ -
33	STREAM CROSSING	14	L.S.	$ 15,000.00	$ 210,000.00
PUMP STATION					
34	PUMP STATION	1	L.S.	$ 400,000.00	$ 400,000.00
FORCE MAIN					
35	4" HDPE FORCE MAIN - AGGREGATE BACKFILL	4,328	L.F.	$ 110.00	$ 476,025.00
36	4" HDPE FORCE MAIN - SUITABLE BACKFILL	12,983	L.F.	$ 100.00	$ 1,298,250.00
37	1.25" HDPE LOW PRESSURE SEWER LATERAL	425	L.F.	$ 65.00	$ 27,625.00
38	GRINDER PUMP - SIMPLEX	5	EA.	$ 9,000.00	$ 45,000.00
39	GRINDER PUMP - DUPLEX	12	EA.	$ 15,000.00	$ 180,000.00
40	TEST PITS	45	EA.	$ 950.00	$ 42,750.00
41	LOW PRESSURE LATERAL CONNECTION	17	EA.	$ 900.00	$ 15,300.00
42	CURBSTOP AND CHECK VALVE ASSEMBLY	17	EA.	$ 850.00	$ 14,450.00
SURFACING					
43	TEMPORARY PAVING	6,360	L.F.	$ 15.00	$ 95,400.00
44	PENNDOT PAVING RESTORATION (BASE)	6,360	L.F.	$ 90.00	$ 572,400.00
45	PENNDOT PAVING RESTORATION (MILL AND OVERLAY)	7,067	S.Y.	$ 25.00	$ 176,666.67
46	MUNICIPAL PAVING RESTORATION	0	L.F.	$ 65.00	$ -
47	VEGETATIVE RESTORATION	1,328	L.F.	$ 20.00	$ 26,550.00
				ESTIMATED CONSTRUCTION COSTS	$ 7,173,000.00
				CONSTRUCTION CONTINGENCY @ 20%	$ 1,435,000.00
				ENGINEERING, ADMIN, & LEGAL FEES @ 25%	$ 2,152,000.00
				TOTAL ESTIMATED PROJECT COSTS	$ 10,760,000.00
				ESTIMATED NUMBER OF EDUs TO BE SERVED	264
				ESTIMATED CAPITAL COST PER EDU	$ 41,000.00

TABLE 5-19 COST OPINION FOR MILFORD BOROUGH ALTERNATIVE 6B

OPINION OF PROBABLE PROJECT COST
FOR
EASTERN PIKE COUNTY REGIONAL ACT 537 SEWAGE FACILITIES PLAN
MILFORD BOROUGH EXTENSION W/ HARFORD AND BROAD ST GRAVITY FORCE MAIN
ALTERNATIVE 6B
GRAVITY, FORCE MAIN, PUMP STATION SEWER
SEWER EXTENSION

ITEM NO.	DESCRIPTION		UNIT	UNIT PRICE	EXTENSION
GENERAL					
1	MOBILIZATION @ 10%	1	L.S.	$ 640,300.00	$ 640,300.00
2	TRAFFIC MAINTENANCE & PROTECTION @ 5%	1	L.S.	$ 320,200.00	$ 320,200.00
3	EROSION AND SEDIMENTATION CONTROL @ 3%	1	L.S.	$ 192,100.00	$ 192,100.00
GRAVITY SEWER					
4	8" PVC MAIN - AGGREGATE BACKFILL	1,305	L.F.	$ 230.00	$ 300,150.00
5	8" PVC MAIN - SUITABLE BACKFILL	3,915	L.F.	$ 175.00	$ 685,125.00
6	8" X 6" WYE	114	EA.	$ 435.00	$ 49,590.00
7	6" SERVICE LATERAL - AGGREGATE BACKFILL	1,140	L.F.	$ 140.00	$ 159,600.00
8	6" SERVICE LATERAL - SUITABLE BACKFILL	1,140	L.F.	$ 125.00	$ 142,500.00
9	6" SERVICE LATERAL CLEANOUT - SUITABLE BACKFILL	114	EA.	$ 1,500.00	$ 171,000.00
10	CONNECTION TO EXISTING FORCE MAIN	1	EA.	$ 11,000.00	$ 11,000.00
11	CLAY DIKE	15	EA.	$ 600.00	$ 9,000.00
MANHOLE					
12	MANHOLE - 4 FT DIAMETER	16	EA.	$ 8,000.00	$ 128,000.00
13	MANHOLE FRAME AND COVER	16	EA.	$ 1,000.00	$ 16,000.00
14	MANHOLE PROTECTIVE LINING	1	EA.	$ 5,000.00	$ 5,000.00
CROSSING					
15	PENNDOT CROSSING	0	L.S.	$ 35,000.00	$ -
16	STREAM CROSSING	14	L.S.	$ 15,000.00	$ 210,000.00
PUMP STATION					
17	PUMP STATION	2	L.S.	$ 400,000.00	$ 800,000.00
18	TEST PITS	53	L.S.	$ 550.00	$ 29,150.00
FORCE MAIN					
19	4" HDPE FORCE MAIN - AGGREGATE BACKFILL	5,058	L.F.	$ 110.00	$ 556,325.00
20	4" HDPE FORCE MAIN - SUITABLE BACKFILL	15,173	L.F.	$ 100.00	$ 1,517,250.00
21	1.25" HDPE LOW PRESSURE SEWER LATERAL	750	L.F.	$ 65.00	$ 48,750.00
22	GRINDER PUMP - SIMPLEX	14	EA.	$ 9,000.00	$ 126,000.00
23	GRINDER PUMP - DUPLEX	16	EA.	$ 15,000.00	$ 240,000.00
24	TEST PITS	51	EA.	$ 950.00	$ 48,450.00
25	LOW PRESSURE LATERAL CONNECTION	30	EA.	$ 900.00	$ 27,000.00
26	CURBSTOP AND CHECK VALVE ASSEMBLY	30	EA.	$ 850.00	$ 25,500.00
SURFACING					
27	TEMPORARY PAVING	7,503	L.F.	$ 15.00	$ 112,537.50
28	PENNDOT PAVING RESTORATION (BASE)	7,503	L.F.	$ 90.00	$ 675,225.00
29	PENNDOT PAVING RESTORATION (MILL AND OVERLAY)	8,336	S.Y.	$ 25.00	$ 208,402.78
30	MUNICIPAL PAVING RESTORATION	0	L.F.	$ 65.00	$ -
31	VEGETATIVE RESTORATION	5,055	L.F.	$ 20.00	$ 101,100.00
				ESTIMATED CONSTRUCTION COSTS	$ 7,556,000.00
				CONSTRUCTION CONTINGENCY @ 20%	$ 1,512,000.00
				ENGINEERING, ADMIN, & LEGAL FEES @ 25%	$ 2,267,000.00
				TOTAL ESTIMATED PROJECT COSTS	$ 11,335,000.00
				ESTIMATED NUMBER OF EDUs TO BE SERVED	264
				ESTIMATED CAPITAL COST PER EDU	$ 43,000.00

TABLE 5-20 COST OPINION FOR MILFORD BOROUGH ALTERNATIVE 6C

OPINION OF PROBABLE PROJECT COST
FOR
EASTERN PIKE COUNTY REGIONAL ACT 537 SEWAGE FACILITIES PLAN
MILFORD BOROUGH EXTENSION W/ HARFORD AND BROAD ST LOW PRESSURE
ALTERNATIVE 6C
LOW PRESSURE SEWER
SEWER EXTENSION

ITEM NO.	DESCRIPTION		UNIT	UNIT PRICE	EXTENSION
GENERAL					
1	MOBILIZATION @ 10%	1	L.S.	$ 522,800.00	$ 522,800.00
2	TRAFFIC MAINTENANCE & PROTECTION @ 5%	1	L.S.	$ 261,400.00	$ 261,400.00
3	EROSION AND SEDIMENTATION CONTROL @ 3%	1	L.S.	$ 156,900.00	$ 156,900.00
LOW PRESSURE SEWER					
4	2" HDPE LOW PRESSURE SEWER - AGGREGATE BACKFILL	6,363	L.F.	$ 70.00	$ 445,375.00
5	2" HDPE LOW PRESSURE SEWER - SUITABLE BACKFILL	19,088	L.F.	$ 65.00	$ 1,240,687.50
6	1.25" HDPE LOW PRESSURE SEWER LATERAL	3,275	L.F.	$ 65.00	$ 212,875.00
7	AIR/VACUUM RELEASE VALVES	26	EA.	$ 12,000.00	$ 312,000.00
8	INLINE CLEANOUT	51	EA.	$ 4,500.00	$ 229,500.00
9	TERMINAL CLEANOUT	4	EA.	$ 3,000.00	$ 12,000.00
10	GRINDER PUMP - SIMPLEX	90	EA.	$ 9,000.00	$ 810,000.00
11	GRINDER PUMP - DUPLEX	41	EA.	$ 15,000.00	$ 615,000.00
12	TEST PITS	64	EA.	$ 950.00	$ 60,800.00
13	LOW PRESSURE LATERAL CONNECTION	131	EA.	$ 900.00	$ 117,900.00
14	CURBSTOP AND CHECK VALVE ASSEMBLY	131	EA.	$ 850.00	$ 111,350.00
15	CONNECTION TO EXISTING FORCE MAIN	1	EA.	$ 5,000.00	$ 5,000.00
CROSSING					
16	PENNDOT CROSSING	0	L.S.	$ 35,000.00	$ -
17	STREAM CROSSING	14	L.S.	$ 15,000.00	$ 210,000.00
SURFACING					
18	TEMPORARY PAVING	6,363	L.F.	$ 15.00	$ 95,437.50
19	PENNDOT PAVING RESTORATION (BASE)	6,363	L.F.	$ 90.00	$ 572,625.00
20	PENNDOT PAVING RESTORATION (MILL AND OVERLAY)	7,069	S.Y.	$ 25.00	$ 176,736.11
21	MUNICIPAL PAVING RESTORATION	0	L.F.	$ 65.00	$ -
22	VEGETATIVE RESTORATION	0	L.F.	$ 20.00	$ -
				ESTIMATED CONSTRUCTION COSTS	$ 6,169,000.00
				CONSTRUCTION CONTINGENCY @ 20%	$ 1,234,000.00
				ENGINEERING, ADMIN, & LEGAL FEES @ 25%	$ 1,851,000.00
				TOTAL ESTIMATED PROJECT COSTS	$ 9,254,000.00
				ESTIMATED NUMBER OF EDUs TO BE SERVED	264
				ESTIMATED CAPITAL COST PER EDU	$ 36,000.00

TABLE 5-21 COST OPINION FOR MILFORD BOROUGH ALTERNATIVE 6D

OPINION OF PROBABLE PROJECT COST
FOR
EASTERN PIKE COUNTY REGIONAL ACT 537 SEWAGE FACILITIES PLAN
MILFORD BOROUGH EXTENSION W/ HARFORD AND BROAD ST ALLEYS LOW PRESSURE, GRAVITY, FORCE MAIN
ALTERNATIVE 6D
LOW PRESSURE SEWER, GRAVITY, FORCE MAIN, PUMP STATION
SEWER EXTENSION

ITEM NO.	DESCRIPTION		UNIT	UNIT PRICE	EXTENSION
GENERAL					
1	MOBILIZATION @ 10%	1	L.S.	$ 588,300.00	$ 588,300.00
2	TRAFFIC MAINTENANCE & PROTECTION @ 5%	1	L.S.	$ 294,200.00	$ 294,200.00
3	EROSION AND SEDIMENTATION CONTROL @ 3%	1	L.S.	$ 176,500.00	$ 176,500.00
LOW PRESSURE SEWER					
4	2" HDPE LOW PRESSURE SEWER - AGGREGATE BACKFILL	348	L.F.	$ 70.00	$ 24,325.00
5	2" HDPE LOW PRESSURE SEWER - SUITABLE BACKFILL	1,043	L.F.	$ 65.00	$ 67,762.50
6	1.25" HDPE LOW PRESSURE SEWER LATERAL	825	L.F.	$ 65.00	$ 53,625.00
7	AIR/VACUUM RELEASE VALVES	1	EA.	$ 12,000.00	$ 12,000.00
8	INLINE CLEANOUT	3	EA.	$ 4,500.00	$ 13,500.00
9	TERMINAL CLEANOUT	1	EA.	$ 3,000.00	$ 3,000.00
10	GRINDER PUMP - SIMPLEX	26	EA.	$ 9,000.00	$ 234,000.00
11	GRINDER PUMP - DUPLEX	7	EA.	$ 15,000.00	$ 105,000.00
12	TEST PITS	56	EA.	$ 950.00	$ 53,200.00
13	LATERAL CONNECTION	33	EA.	$ 500.00	$ 16,500.00
14	CURBSTOP AND CHECK VALVE ASSEMBLY	33	EA.	$ 850.00	$ 28,050.00
15	CONNECTION TO EXISTING FORCE MAIN	1	EA.	$ 5,000.00	$ 5,000.00
GRAVITY SEWER					
16	8" PVC MAIN - AGGREGATE BACKFILL	1,058	L.F.	$ 230.00	$ 243,225.00
17	8" PVC MAIN - SUITABLE BACKFILL	3,173	L.F.	$ 175.00	$ 555,187.50
18	8" X 6" WYE	64	EA.	$ 435.00	$ 27,840.00
19	6" SERVICE LATERAL - AGGREGATE BACKFILL	640	L.F.	$ 140.00	$ 89,600.00
20	6" SERVICE LATERAL - SUITABLE BACKFILL	640	L.F.	$ 125.00	$ 80,000.00
21	6" SERVICE LATERAL CLEANOUT - SUITABLE BACKFILL	64	EA.	$ 1,500.00	$ 96,000.00
22	CONNECTION TO EXISTING FORCE MAIN	1	EA.	$ 12,000.00	$ 12,000.00
23	CLAY DIKE	13	EA.	$ 600.00	$ 7,800.00
MANHOLE					
24	MANHOLE - 4 FT DIAMETER	14	EA.	$ 8,000.00	$ 112,000.00
25	MANHOLE FRAME AND COVER	14	EA.	$ 1,000.00	$ 14,000.00
26	MANHOLE PROTECTIVE LINING	1	EA.	$ 5,000.00	$ 5,000.00
CROSSING					
27	PENNDOT CROSSING	0	L.S.	$ 35,000.00	$ -
28	STREAM CROSSING	14	L.S.	$ 15,000.00	$ 210,000.00
PUMP STATION					
29	PUMP STATION	1	L.S.	$ 400,000.00	$ 400,000.00
FORCE MAIN					
30	4" HDPE FORCE MAIN - AGGREGATE BACKFILL	5,058	L.F.	$ 110.00	$ 556,325.00
31	4" HDPE FORCE MAIN - SUITABLE BACKFILL	15,173	L.F.	$ 100.00	$ 1,517,250.00
32	1.25" HDPE LOW PRESSURE SEWER LATERAL	750	L.F.	$ 40.00	$ 30,000.00
33	GRINDER PUMP - SIMPLEX	14	EA.	$ 8,000.00	$ 112,000.00
34	GRINDER PUMP - DUPLEX	16	EA.	$ 12,500.00	$ 200,000.00
35	LOW PRESSURE LATERAL CONNECTION	30	EA.	$ 900.00	$ 27,000.00
36	CURBSTOP AND CHECK VALVE ASSEMBLY	30	EA.	$ 850.00	$ 25,500.00
SURFACING					
37	TEMPORARY PAVING	7,103	L.F.	$ 15.00	$ 106,537.50
38	PENNDOT PAVING RESTORATION (BASE)	5,558	L.F.	$ 90.00	$ 500,252.29
39	PENNDOT PAVING RESTORATION (MILL AND OVERLAY)	6,176	S.Y.	$ 25.00	$ 154,398.86
40	MUNICIPAL PAVING RESTORATION	1,544	L.F.	$ 65.00	$ 100,369.18
41	VEGETATIVE RESTORATION	4,215	L.F.	$ 20.00	$ 84,300.00
				ESTIMATED CONSTRUCTION COSTS	$ 6,942,000.00
				CONSTRUCTION CONTINGENCY @ 15%	$ 1,389,000.00
				ENGINEERING, ADMIN, & LEGAL FEES @ 25%	$ 2,083,000.00
				TOTAL ESTIMATED PROJECT COSTS	$ 10,414,000.00
				ESTIMATED NUMBER OF EDUs TO BE SERVED	235
				ESTIMATED CAPITAL COST PER EDU	$ 45,000.00

TABLE 5-22 COST OPINION FOR MILFORD BOROUGH ALTERNATIVE 6E

OPINION OF PROBABLE PROJECT COST
FOR
EASTERN PIKE COUNTY REGIONAL ACT 537 SEWAGE FACILITIES PLAN
MILFORD BOROUGH EXTENSION W/ HARFORD AND BROAD ST ALLEYS LOW PRESSURE
ALTERNATIVE 6E
LOW PRESSURE SEWER
SEWER EXTENSION

ITEM NO.	DESCRIPTION		UNIT	UNIT PRICE	EXTENSION
GENERAL					
1	MOBILIZATION @ 10%	1	L.S.	$ 481,300.00	$ 481,300.00
2	TRAFFIC MAINTENANCE & PROTECTION @ 5%	1	L.S.	$ 240,700.00	$ 240,700.00
3	EROSION AND SEDIMENTATION CONTROL @ 3%	1	L.S.	$ 144,400.00	$ 144,400.00
LOW PRESSURE SEWER					
4	2" HDPE LOW PRESSURE SEWER - AGGREGATE BACKFILL	6,540	L.F.	$ 70.00	$ 457,800.00
5	2" HDPE LOW PRESSURE SEWER - SUITABLE BACKFILL	19,620	L.F.	$ 65.00	$ 1,275,300.00
6	1.25" HDPE LOW PRESSURE SEWER LATERAL	3,175	L.F.	$ 65.00	$ 206,375.00
7	AIR/VACUUM RELEASE VALVES	2	EA.	$ 12,000.00	$ 24,000.00
8	INLINE CLEANOUT	53	EA.	$ 4,500.00	$ 238,500.00
9	TERMINAL CLEANOUT	1	EA.	$ 3,000.00	$ 3,000.00
10	GRINDER PUMP - SIMPLEX	98	EA.	$ 9,000.00	$ 882,000.00
11	GRINDER PUMP - DUPLEX	29	EA.	$ 15,000.00	$ 435,000.00
12	TEST PITS	66	EA.	$ 950.00	$ 62,700.00
13	LOW PRESSURE LATERAL CONNECTION	127	EA.	$ 900.00	$ 114,300.00
14	CURBSTOP AND CHECK VALVE ASSEMBLY	127	EA.	$ 850.00	$ 107,950.00
15	CONNECTION TO EXISTING FORCE MAIN	1	EA.	$ 5,000.00	$ 5,000.00
CROSSING					
16	PENNDOT CROSSING	0	L.S.	$ 35,000.00	$ -
17	STREAM CROSSING	14	L.S.	$ 15,000.00	$ 210,000.00
SURFACING					
18	TEMPORARY PAVING	6,540	L.F.	$ 15.00	$ 98,100.00
19	PENNDOT PAVING RESTORATION (BASE)	5,058	L.F.	$ 90.00	$ 455,175.00
20	PENNDOT PAVING RESTORATION (MILL AND OVERLAY)	5,619	S.Y.	$ 25.00	$ 140,486.11
21	MUNICIPAL PAVING RESTORATION	1,483	L.F.	$ 65.00	$ 96,362.50
22	VEGETATIVE RESTORATION	0	L.F.	$ 20.00	$ -
				ESTIMATED CONSTRUCTION COSTS	$ 5,679,000.00
				CONSTRUCTION CONTINGENCY @ 20%	$ 1,136,000.00
				ENGINEERING, ADMIN, & LEGAL FEES @ 25%	$ 1,704,000.00
				TOTAL ESTIMATED PROJECT COSTS	$ 8,519,000.00
				ESTIMATED NUMBER OF EDUs TO BE SERVED	235
				ESTIMATED CAPITAL COST PER EDU	$ 37,000.00

TABLE 5-23 COST OPINION FOR MILFORD BOROUGH ALTERNATIVE 6F

OPINION OF PROBABLE PROJECT COST
FOR
EASTERN PIKE COUNTY REGIONAL ACT 537 SEWAGE FACILITIES PLAN
MILFORD BOROUGH EXTENSION W/ HARFORD AND BROAD ST ALLEYS LOW PRESSURE
ALTERNATIVE 6F
LOW PRESSURE SEWER
SEWER EXTENSION

ITEM NO.	DESCRIPTION		UNIT	UNIT PRICE	EXTENSION
GENERAL					
1	MOBILIZATION @ 10%	1	L.S.	$ 518,600.00	$ 518,600.00
2	TRAFFIC MAINTENANCE & PROTECTION @ 5%	1	L.S.	$ 259,300.00	$ 259,300.00
3	EROSION AND SEDIMENTATION CONTROL @ 3%	1	L.S.	$ 155,600.00	$ 155,600.00
LOW PRESSURE SEWER					
4	2" HDPE LOW PRESSURE SEWER - AGGREGATE BACKFILL	6,660	L.F.	$ 70.00	$ 466,200.00
5	2" HDPE LOW PRESSURE SEWER - SUITABLE BACKFILL	19,980	L.F.	$ 65.00	$ 1,298,700.00
6	1.25" HDPE LOW PRESSURE SEWER LATERAL	3,725	L.F.	$ 65.00	$ 242,125.00
7	AIR/VACUUM RELEASE VALVES	1	EA.	$ 12,000.00	$ 12,000.00
8	INLINE CLEANOUT	54	EA.	$ 4,500.00	$ 243,000.00
9	TERMINAL CLEANOUT	1	EA.	$ 3,000.00	$ 3,000.00
10	GRINDER PUMP - SIMPLEX	107	EA.	$ 9,000.00	$ 963,000.00
11	GRINDER PUMP - DUPLEX	42	EA.	$ 15,000.00	$ 630,000.00
12	TEST PITS	67	EA.	$ 950.00	$ 63,650.00
13	LATERAL CONNECTION	149	EA.	$ 500.00	$ 74,500.00
14	CURBSTOP AND CHECK VALVE ASSEMBLY	149	EA.	$ 850.00	$ 126,650.00
15	CONNECTION TO EXISTING FORCE MAIN	1	EA.	$ 5,000.00	$ 5,000.00
CROSSING					
16	PENNDOT CROSSING	0	L.S.	$ 35,000.00	$ -
17	STREAM CROSSING	14	L.S.	$ 15,000.00	$ 210,000.00
SURFACING					
18	TEMPORARY PAVING	6,660	L.F.	$ 15.00	$ 99,900.00
19	PENNDOT PAVING RESTORATION (BASE)	5,965	L.F.	$ 90.00	$ 536,850.00
20	PENNDOT PAVING RESTORATION (MILL AND OVERLAY)	6,628	S.Y.	$ 25.00	$ 165,694.44
21	MUNICIPAL PAVING RESTORATION	695	L.F.	$ 65.00	$ 45,175.00
22	VEGETATIVE RESTORATION	0	L.F.	$ 20.00	$ -
				ESTIMATED CONSTRUCTION COSTS	$ 6,119,000.00
				CONSTRUCTION CONTINGENCY @ 20%	$ 1,224,000.00
				ENGINEERING, ADMIN, & LEGAL FEES @ 25%	$ 1,836,000.00
				TOTAL ESTIMATED PROJECT COSTS	$ 9,179,000.00
				ESTIMATED NUMBER OF EDUs TO BE SERVED	284
				ESTIMATED CAPITAL COST PER EDU	$ 33,000.00

TABLE 5-24 COST OPINION FOR MILFORD BOROUGH ALTERNATIVE 7

OPINION OF PROBABLE PROJECT COST
FOR
EASTERN PIKE COUNTY REGIONAL ACT 537 SEWAGE FACILITIES PLAN
MILFORD BOROUGH EXTENSION W/ RESIDENTIAL LOW PRESSURE
ALTERNATIVE 7
LOW PRESSURE SEWER
SEWER EXTENSION

ITEM NO.	DESCRIPTION		UNIT	UNIT PRICE	EXTENSION
GENERAL					
1	MOBILIZATION @ 10%	1	L.S.	$ 577,600.00	$ 577,600.00
2	TRAFFIC MAINTENANCE & PROTECTION @ 5%	1	L.S.	$ 288,800.00	$ 288,800.00
3	EROSION AND SEDIMENTATION CONTROL @ 3%	1	L.S.	$ 173,300.00	$ 173,300.00
LOW PRESSURE SEWER					
4	2" HDPE LOW PRESSURE SEWER - AGGREGATE BACKFILL	7,445	L.F.	$ 70.00	$ 521,150.00
5	2" HDPE LOW PRESSURE SEWER - SUITABLE BACKFILL	22,335	L.F.	$ 65.00	$ 1,451,775.00
6	1.25" HDPE LOW PRESSURE SEWER LATERAL	5,375	L.F.	$ 65.00	$ 349,375.00
7	AIR/VACUUM RELEASE VALVES	26	EA.	$ 12,000.00	$ 312,000.00
8	INLINE CLEANOUT	60	EA.	$ 4,500.00	$ 270,000.00
9	TERMINAL CLEANOUT	4	EA.	$ 3,000.00	$ 12,000.00
10	GRINDER PUMP - SIMPLEX	169	EA.	$ 9,000.00	$ 1,521,000.00
11	GRINDER PUMP - DUPLEX	46	EA.	$ 15,000.00	$ 690,000.00
12	TEST PITS	60	EA.	$ 950.00	$ 57,000.00
13	LOW PRESSURE LATERAL CONNECTION	215	EA.	$ 900.00	$ 193,500.00
14	CURBSTOP AND CHECK VALVE ASSEMBLY	215	EA.	$ 850.00	$ 182,750.00
15	CONNECTION TO EXISTING FORCE MAIN	1	EA.	$ 5,000.00	$ 5,000.00
CROSSING					
16	PENNDOT CROSSING	0	L.S.	$ 35,000.00	$ -
17	STREAM CROSSING	14	L.S.	$ 15,000.00	$ 210,000.00
SURFACING					
18	TEMPORARY PAVING	7,445	L.F.	$ 15.00	$ 111,675.00
19	PENNDOT PAVING RESTORATION (BASE)	6,363	L.F.	$ 90.00	$ 572,625.00
20	PENNDOT PAVING RESTORATION (MILL AND OVERLAY)	7,069	S.Y.	$ 25.00	$ 176,736.11
21	MUNICIPAL PAVING RESTORATION	1,083	L.F.	$ 65.00	$ 70,362.50
22	VEGETATIVE RESTORATION	0	L.F.	$ 20.00	$ -
				ESTIMATED CONSTRUCTION COSTS	$ 7,747,000.00
				CONSTRUCTION CONTINGENCY @ 20%	$ 1,550,000.00
				ENGINEERING, ADMIN, & LEGAL FEES @ 25%	$ 2,325,000.00
				TOTAL ESTIMATED PROJECT COSTS	$ 11,622,000.00
				ESTIMATED NUMBER OF EDUs TO BE SERVED	363
				ESTIMATED CAPITAL COST PER EDU	$ 33,000.00

Table 5-25 Summary of Costs

Summary of Cost Opinions for Structural Alternatives													
Study Area	Alternative	Estimated Project Cost	Tapping Fee Towards Project	Estimated Project Cost Less Tapping Fee	Estimated Annual Debt Service	Estimated Annual O&M Cost	Estimated Annual Cost	Present Worth of Annual O&M	Total Present Worth	Number of EDUs	Estimated Present Worth Per EDU	Estimated Annual Cost Per EDU	Cost per EDU without Assistance
Matamoras Main Road	Alternative 1A	$5,300,000	$0	$5,300,000	$293,000	$7,000	$300,000	$93,061	$5,393,061	140	$38,521.86	$2,142.86	$204
	Alternative 1B	$3,300,000	$0	$3,300,000	$183,000	$3,000	$186,000	$39,883	$3,339,883	140	$23,856	$1,329	$136
	Alternative 1C	$3,700,000	$0	$3,700,000	$205,000	$9,000	$214,000	$119,649	$3,819,649	140	$27,283	$1,529	$152
Matamoras Residential	Alternative 2A	$8,900,000	$0	$8,900,000	$492,000	$12,000	$504,000	$159,532	$9,059,532	276	$32,824	$1,826	$177
	Alternative 2B	$7,100,000	$0	$7,100,000	$392,000	$7,000	$399,000	$93,061	$7,193,061	276	$26,062	$1,445.65	$145
	Alternative 2C	$7,400,000	$0	$7,400,000	$409,000	$13,000	$422,000	$172,827	$7,572,827	276	$27,438	$1,528.99	$152
Westfall Southwest	Alternative 3A	$6,000,000	$300,000	$5,700,000	$332,000	$15,000	$347,000	$199,415	$6,199,415	128	$48,433	$2,711	$225.91
	Alternative 3B	$3,100,000	$300,000	$2,800,000	$171,000	$8,000	$179,000	$106,355	$3,206,355	128	$25,050	$1,398.44	$116.54
Milford Broad St Only	Alternative 4A	$7,000,000	$0	$7,000,000	$428,000	$21,000	$449,000	$279,182	$7,279,182	106	$68,672	$4,236	$378
	Alternative 4B	$4,000,000	$0	$4,000,000	$245,000	$14,000	$259,000	$186,121	$4,186,121	106	$39,492	$2,443	$229
	Alternative 4C	$5,000,000	$0	$5,000,000	$306,000	$21,000	$327,000	$279,182	$5,279,182	106	$49,804	$3,085	$282
	Alternative 4D	$3,500,000	$0	$3,500,000	$214,000	$14,000	$228,000	$186,121	$3,686,121	126	$29,255	$1,810	$176
	Altternative 4E	$5,500,000	$0	$5,500,000	$336,000	$22,000	$358,000	$292,476	$5,792,476	126	$45,972	$2,841	$262
Milford Broad+W Harford	Alternative 5A	$6,100,000	$0	$6,100,000	$373,000	$22,000	$395,000	$292,476	$6,392,476	172	$37,166	$2,297	$216
	Alternative 5B	$7,200,000	$0	$7,200,000	$440,000	$23,000	$463,000	$305,770	$7,505,770	178	$42,167	$2,601	$242
	Alternative 5C	$4,200,000	$0	$4,200,000	$257,000	$15,000	$272,000	$199,415	$4,399,415	172	$25,578	$1,581	$157
	Alternative 5D	$4,200,000	$0	$4,200,000	$257,000	$15,000	$272,000	$199,415	$4,399,415	178	$24,716	$1,528	$152
Milford Harford+Broad	Alternative 6A	$7,700,000	$0	$7,700,000	$471,000	$23,000	$494,000	$305,770	$8,005,770	264	$30,325	$1,871	$181
	Alternative 6B	$8,300,000	$0	$8,300,000	$507,000	$29,000	$536,000	$385,537	$8,685,537	264	$32,900	$2,030	$194
	Alternative 6C	$6,200,000	$0	$6,200,000	$379,000	$16,000	$395,000	$212,710	$6,412,710	264	$24,291	$1,496	$150
	Alternative 6D	$7,400,000	$0	$7,400,000	$452,000	$24,000	$476,000	$319,065	$7,719,065	235	$32,847	$2,026	$194
	Alternative 6E	$5,500,000	$0	$5,500,000	$336,000	$16,000	$352,000	$212,710	$5,712,710	235	$24,309	$1,498	$150
	Alternative 6F	$6,100,000	$0	$6,100,000	$373,000	$16,000	$389,000	$212,710	$6,312,710	284	$22,228	$1,369.72	$139
Milford Residential	Alternative 7	$8,600,000	$0	$8,600,000	$526,000	$18,000	$544,000	$239,299	$8,839,299	363	$24,351	$1,499	$150

Notes:

1. Annual Debt Service Calculations Assuming 1% for 20 Years
2. Tapping Fees are based on the existing MATW tapping fee of $1600/EDU and the number of EDUs
3. Present Worth Calculations Assume 4.25% for 20 Years
4. Annual O&M Estimated based on typical common usage
5. Wholesale rate of $25/edu.

Table 5-26 Summary of Financing Options for Chosen Alternatives (Each Municipality applying separately)

Milford - Selected Alternative 6F Project Cost: $ 6,100,000 Annual O&M Cost: $ 101,200 No. of EDUs 284

Option	Description	Tapping Fee Towards Pjt	Grant	Loan	Interest Rate	Term (Yrs)	Annual DS Cost	Resulting Annual User Rate/EDU*	Resulting Monthly User Rate/EDU*	Total Interest over Term of Loan
6F - 1a	PENNVEST - w/ Anticipated Grant	$ -	$ 1,785,000	$ 4,315,000	1.000%	20	$239,117	$ 1,410	$ 117	$467,342
6F- 1b	PENNVEST - w/ Max Grant	$ -	$ 4,250,000	$ 1,850,000	1.000%	20	$102,518	$ 844	$ 70	$200,367
6F- 2	USDA - w/ 45% Grant	$ -	$ 2,745,000	$ 3,355,000	1.875%	40	$119,972	$ 916	$ 76	$1,443,875
6F- 3	Bank Loan	$ -	$ -	$ 6,100,000	4.250%	20	$458,841	$ 2,320	$ 193	$3,076,820
6F- 4	Bond Issue	$ -	$ -	$ 6,100,000	4.500%	30	$374,488	$ 1,971	$ 164	$5,134,652

Matamoras - Selected Alternative 2B Project Cost: $ 7,100,000 Annual O&M Cost: $ 89,800 No. of EDUs 276

Option	Description	Tapping Fee Towards Pjt	Grant	Loan	Interest Rate	Term (Yrs)	Annual DS Cost	Resulting Annual User Rate/EDU*	Resulting Monthly User Rate/EDU*	Total Interest over Term of Loan
2B - 1a	PENNVEST - w/ Anticipated Grant	$ -	$ 819,000	$ 6,281,000	1.000%	20	$348,064	$ 1,866	$ 156	$680,272
2B - 1b	PENNVEST - w/ Max Grant	$ -	$ 1,950,000	$ 5,150,000	1.000%	20	$285,389	$ 1,599	$ 133	$557,777
2B - 2	USDA - w/ 45% Grant	$ -	$ 3,195,000	$ 3,905,000	1.875%	40	$139,639	$ 978	$ 82	$1,680,576
2B - 3	Bank Loan	$ -	$ -	$ 7,100,000	4.250%	20	$534,061	$ 2,659	$ 222	$3,581,217
2B - 4	Bond Issue	$ -	$ -	$ 7,100,000	4.500%	30	$435,880	$ 2,241	$ 187	$5,976,399

Westfall - Selected Alternative 3B Project Cost: $ 3,100,000 Annual O&M Cost: $ 672,600 No. of Total EDUs 1121

No. of New EDUs 128

Option	Description	Reserve Funds & Tapping Fee Towards Pjt	Grant	Loan	Interest Rate	Term (Yrs)	Annual DS Cost	Resulting Annual User Rate/EDU*	Resulting Monthly User Rate/EDU*	Total Interest over Term of Loan
3B - 1a	PENNVEST - w/ Anticipated Grant	$ 880,640	$ -	$ 2,219,360	1.000%	20	$122,987	$ 767	$ 64	$240,371
3B - 1b	PENNVEST - w/ Max Grant	$ 880,640	$ -	$ 2,219,360	1.000%	20	$122,987	$ 767	$ 64	$240,371
3B - 2	USDA	$ 880,640	$ -	$ 2,219,360	1.875%	40	$79,362	$ 725	$ 60	$955,135
3B - 3	Bank Loan	$ 880,640	$ -	$ 2,219,360	4.250%	20	$166,940	$ 810	$ 67	$1,119,438
3B - 4	Bond Issue	$ 880,640	$ -	$ 2,219,360	4.500%	30	$136,250	$ 780	$ 65	$1,868,138

Notes:

1. Rate projections assumes 7.25% delinquency rate for retail customers and 15% for wholesale.
2. Assumes existing Westfall Authority reserve funds put towards capital project costs and used to lower amount financed by debt.
3. Assumes tapping fee revenue received by Westfall from new connections will be set aside in a reserve account for future capital improvement needs
4. Assumes annual retail and wholesale user charges from Westfall Authority are reduced by $20/month and $10/month respectively to eliminate budgeted depreciation expense for the initial years of service.
5. Assumes initial wholesale rate of $25/EDU/month.

5.12 CONCLUSIONS

Based on the discussion above, the following are recommendations for the wastewater planning needs enumerated in Chapter No. 4. All of the selected alternatives make it feasible for future growth and collection of future flows. These alternatives are environmentally favorable, resulting in the abandonment of malfunctioning OLDS in the study area as well as two package facilities that the DEP requires to connect if public sewer is available. These alternatives also provide proper planning for potential future growth in the planning areas. The four Municipalities may consider providing public sewer service in different areas if more funding becomes available through developers or private entities. However, without a finalized inter-municipal agreement, development agreements, and favorable funding (public and private), neither alternative is feasible. Once the user sewage rates are set and agreed upon, it is not anticipated that there will be any other complications regarding the inter-municipal agreement.

1. Public sewer service shall be provided for Matamoras Borough (Alternative No. 2B) along Pennsylvania Avenue and select municipal roads.

As shown in the cost analyses, the provision of public sewer service to Matamoras Borough along Pennsylvania Avenue (Alternative No. 2B) with an assumed 45% grant and USDA financing would be an estimated monthly cost of $82/EDU. Matamoras Borough will identify additional grants and funding to make it financially feasible upon implementation of the Plan.

The structural alternatives evaluated in this Act 537 Plan to provide public sewer service to Matamoras Borough, represent technically feasible solutions for wastewater management in these areas, but not all of the solutions are cost effective as presented. Of the structural alternatives evaluated for Matamoras Borough, it is recommended that Matamoras Borough pursue Alternative No. 2B. Alternative No. 2B utilizes a low-pressure system that has the lowest estimated cost per user among the alternatives that serve all the needs areas within the Borough.

2. Public sewer service shall be provided for Westfall Township (Alternative 3B) along Route 6/209

As shown in the cost analyses, the provision of public sewer service to Westfall Township along Route 6/209 (Alternative No. 3B) with USDA financing would be an estimated monthly cost of $60/EDU, which matches the existing MATW user rate. For the Structural Alternatives Financial Estimates, the Westfall Authority reserve funds would be utilized for the project costs to lower the amount financed by debt.

The structural alternatives evaluated in this Act 537 Plan to extend public sewer service in Westfall Township, represent technically feasible solutions for wastewater management in Westfall Township, but not all of the solutions are cost effective as presented. Of the structural alternatives evaluated for Westfall Township, it is recommended that Westfall Township pursue Alternative No. 3B. Alternative No. 3B utilizes a low-pressure system that has the lowest estimated cost per user

among the alternatives that serve all of the needs areas within Westfall Township, specifically the remainder of the commercial district.

3. Public sewer service shall be provided for Milford Borough along Broad and Harford Street (Alternative No. 6F).

As shown in the cost analyses, the provision of public sewer service to Milford Borough along Broad Street and Harford Street (Alternative No. 6F) with an assumed 45% grant and USDA financing would be an estimated monthly cost of $76/EDU. Milford Borough will identify additional grants and funding to make it financially feasible upon implementation of the Plan.

The structural alternatives evaluated in this Act 537 Plan to provide public sewer service to Milford Borough, represent technically feasible solutions for wastewater management in these areas, but not all of the solutions are cost effective as presented. Of the structural alternatives evaluated for Milford Borough, Milford Borough has selected Alternative No. 6F. Alternative No. 6F utilizes a low-pressure system that has the lowest estimated cost per user among the alternatives that serve all of the needs areas within the Borough, in particular, the commercial district. Prior to connections for Alternative No. 6F, Alternative No. 3B would need to be completed.

4. No Structural Alternative selected for Milford Township.

No Structural Alternative has been selected for Milford Township. There is a proposed transmission line that runs through Route 6/209 in Milford Township, conveying flow from Milford Borough into Westfall Township. At the time of this Study, Milford Township has not expressed interest in requiring residents to connect or to assist with funding the sewer extension from Milford Borough to Westfall Township in the immediate future. Capacity has been reserved and planned for future from Milford Township as noted in Chapter 4. As a result, there are no immediate connections. Based on the OLDS surveys, Well Water Sampling, and good drainage based on the soil data, Milford Township will focus on maintaining the existing OLDS and COLDS in the Township and pass an OLDS Management Ordinance.

5. Milford Borough, Westfall Township, Milford Township, and Matamoras Borough shall implement an OLDS Management Ordinance.

As mentioned above, Milford Borough, Westfall Township, Milford Township, and Matamoras Borough shall each implement their own OLDS management ordinance. The Ordinance would provide requirements for the permitting, inspection, operation, maintenance, and rehabilitation of OLDS within the Study Areas and throughout the municipalities. Recommended periodic pumping of OLDS would be included within the Ordinance. Successful implementation of such an Ordinance would be expected to have a positive impact on surface water and drinking water supplies in areas of the four Municipalities where OLDS systems are utilized. Periodic pumping of the tanks will provide for improved operation of the systems and will help to eliminate the occurrence of OLDS malfunctions. Currently, none of the municipalities have any ordinances or regulations requiring mandatory OLDS pumping. The implementation of an OLDS Management Ordinance would allow the Municipalities to further evaluate the need for improved sewage facilities after tank pumping activities have commenced for some period of time.