

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 municipality. The following sections present several alternatives available to the Township for meeting the wastewater planning needs identified in Chapter 4. The alternatives considered in this chapter include the following:

1. Conventional collection, conveyance, and treatment systems.
2. Community On-lot Disposal Systems (COLDS).
3. Continued use of on-lot disposal systems (OLDS).
4. Small flow or package treatment facilities.
5. Holding tanks.
6. Sewage management programs.
7. Non-structural/Planning activities.
8. No action alternative.

These broad alternatives are then applied to the Study Areas to alleviate environmental and health impacts resulting from malfunctioning OLDS in the areas, and to plan for future projected growth. Initially, many alternatives were considered; however, some were dismissed immediately and eliminated from further consideration in the Plan due to cost and technical feasibility. Fourteen (14) focused alternatives to provide public sewer service to the Study Areas and the S.R. 896 DGA is presented and evaluated to determine whether they are cost-effective, environmentally sound, and structurally feasible:

- 1A. Low pressure collection system with treatment at proposed recirculating sand filter type treatment facility to serve the Refton Study Area;
- 1B. Low pressure collection system with treatment at proposed conventional packaged wastewater treatment facility to serve the Refton Study Area;
- 1C. STEP system with treatment at proposed recirculating sand filter type treatment facility to serve the Refton Study Area;
- 1D. Low pressure collection system with conveyance to Suburban Lancaster Sewer Authority (SLSA) system to serve the Refton Study Area;
- 1E. Combination gravity and low pressure collection system with treatment at proposed recirculating sand filter type treatment facility to serve the Refton Study Area;

- 1F. Combination gravity and low pressure collection system with treatment at proposed conventional packaged wastewater treatment facility to serve the Refton Study Area;
- 1G. Combination gravity and low pressure collection system with conveyance to Suburban Lancaster Sewer Authority (SLSA) system to serve the Refton Study Area;
- 1H. Combination gravity, force main, and low pressure collection system with treatment at proposed recirculating sand filter treatment facility to serve the Refton Study Area;
- 1I. Combination gravity, force main, and low pressure collection system with treatment at proposed conventional packaged wastewater treatment facility to serve the Refton Study Area;
- 1J. Combination gravity, force main, and low pressure collection with conveyance to Suburban Lancaster Sewer Authority (SLSA) system to serve the Refton Study Area;
- 2A. Connection of existing gravity sewer collection system to Strasburg Borough Authority (SBA) system to serve the Creekview Study Area;
- 3A. Low pressure collection system and conveyance to SBA system to serve the S.R. 896 DGA;
- 3B. Combination gravity, force main, and low pressure collection and conveyance to SBA system to serve the S.R. 896 DGA;
- 3C. Combination gravity and low pressure collection system with treatment at existing packaged wastewater treatment facility to serve the S.R. 896 DGA.

5.2 CONVENTIONAL COLLECTION, CONVEYANCE AND TREATMENT SYSTEMS

The Study Areas identified in this Act 537 Plan currently are not served by public sewers. The Refton Study Area could be connected to a new treatment facility located adjacent to the Village of Refton via new interconnecting public sewage collection and conveyance facilities consisting of low pressure sewers or alternative collection systems. The Creekview Study Area could be connected to the existing SBA system via existing collection and conveyance facilities. Treatment would occur at the City of Lancaster AWWTF. The S.R. 896 DGA could be connected to the existing Hershey Farm PWWTF via new interconnecting public sewage collection and conveyance facilities consisting of gravity sewers, pumping stations and force mains or alternative collection systems; however, other treatment options including connection to SBA system were evaluated.

5.2.1 Conveyance Alternatives

Conveyance alternatives available include conventional type gravity sewers and innovative/alternative solutions such as low-pressure sewers and grinder pump or STEP systems. The September 1992 EPA Manual “Wastewater Treatment/Disposal for Small Communities” examines the advantages and disadvantages of these systems.

Conventional Gravity Sewers

Conventional gravity sewers convey wastewater by using gravity or the differential elevations between the upstream and downstream points in the system. The sewers must be set deep enough to receive flow 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 these factors.

Low-pressure Systems

Low-pressure systems including Septic Tank Effluent Pump (STEP) systems and Grinder Pump (GP) systems are an alternative to conventional gravity systems. STEP systems convey septic tank effluent to the treatment plant by way of low-pressure sewer lines. GP systems shred or reduce the size of raw wastewater solids, producing pumpable slurry which is conveyed to the treatment plant through low-pressure sewer lines. Pressure sewers (STEP and GP) 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 the disadvantage that the material is highly septic and odor problems may arise. STEP systems have the further disadvantage that the tanks need to be regularly maintained, otherwise solids may work their way into the lines causing blockages.

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 4-inch or 6-inch building sewer that conveys household sewage to an on-lot pump station. 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 pump station. The on-lot pump station 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 pumps. Each basin package is provided with a pump control panel, which can either be located remotely at the house or locally at the pump station.

The second component of any GP system is the collection system. A typical low-pressure sewer system consists of small diameter, plastic, 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. Discharge from the low-pressure system can be directly routed to a treatment plant provided the difference in elevation is not significant, or to a conventional collection or conveyance system. 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.

When discussing STEP systems, it is also necessary to consider both the on-lot element as well as the collection system element. The on-lot element consists of a 4-inch or 6-inch building sewer that conveys household sewage to a watertight septic tank with a typical capacity of 1,000 gallons and integral pump vault depending on the size of the building being served. Effluent water from the septic tank is then passed through a filter and into an integral fiberglass or high-density polyethylene pump vault. The pump vault typically has a capacity of 40-60 gallons. Effluent pumps are generally 1/3 to 1/2 horsepower centrifugal or turbine pumps; however, pumps can be as large as 5 horsepower. The pump vault includes valves for isolation of the pumps and is provided with a control panel that can be remotely mounted or located at the pump vault.

The second component of a STEP system is much like a GP collection system. A typical low-pressure sewer system consists of small diameter, plastic, pressure piping. All piping downstream of the effluent 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. A service connection higher than the hydraulic grade line of the pressure system may be served by gravity, avoiding the need for a pump. Discharge from the low-pressure system can be directly routed to a treatment plant provided the difference in elevation is not significant, or to a conventional collection or conveyance system. STEP systems have been most applicable in areas that currently utilize OLDS, 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.

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, overall project cost and present worth of annual operating costs are included in the focused assessment of the Study Areas in Section 5.10.

5.2.2 Repair and/or Replacement of Collection and Conveyance System Components

Strasburg Township does not currently have a collection and conveyance system in operation.

5.3 COMMUNITY ON-LOT DISPOSAL SYSTEMS (COLDS)

Community On-lot Disposal Systems, or 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. Title 25 Pennsylvania Code Chapter 71 provides regulations for Act 537 Plan revisions that propose the use of COLDS or large volume COLDS. Chapter 73 of Title 25 of the Pennsylvania Code presents design criteria and limitations for on-lot and COLDS systems. A general site suitability assessment must be completed for areas where COLDS

are proposed to establish their use as a feasible alternative. The site suitability assessment must include a characterization of the anticipated raw waste characteristics of the sewage and documentation that the soils and geology of the proposed site are generally suitable for installation of the system, including the performance of soil profiles, water mounding analysis, and percolation tests, among others.

As shown in Map 5 in Appendix H, areas of the Township near the Refton Study Area contain soils rated suitable and marginally suitable for COLDS utilizing conventional in-ground systems and sand mound absorption systems. A site suitability assessment was completed by Whitehill Consulting Engineers for the Refton Study Area to evaluate the subsurface conditions for use of drainage beds for treated wastewater disposal. Refer to Appendix M for site suitability assessment.

As shown in Map 5 in Appendix H, areas of the Township near the Creekview Study Area contain soils rated suitable and marginally suitable for sand mound absorption systems but unsuitable for conventional in-ground systems, with some areas surrounding the Study Area unsuitable for any system; therefore, no further evaluations were completed. Additionally, due to the existing gravity sewers located along Creekview Lane with close proximity to the SBA system and limited availability of land, the construction of COLDS systems to serve the Creekview Study Area has been eliminated from consideration.

As shown in Map 5 in Appendix H, areas of the Township near the S.R. 896 DGA contain soils rated suitable and marginally suitable for COLDS utilizing conventional in-ground systems and sand mound absorption systems. However, due to the location of the existing Hershey Farm PWWTF and the close proximity of the SBA system to the S.R. 896 DGA, the construction of COLDS systems to serve the S.R. 896 DGA has been eliminated from consideration. Further study and fieldwork would be required to determine whether COLDS are feasible in the Township on a case-by-case basis.

5.4 CONTINUED USE OF ON-LOT DISPOSAL SYSTEMS

Based on the sanitary survey completed by HRG, conducted as part of this Plan and outlined in Chapter 3, there appears to be a need to provide improved wastewater collection, conveyance, and treatment systems in the Refton Study Area and the Creekview Study Area. Due to the projected commercial and residential growth, public sewer service should be considered along the S.R. 896 DGA as a needs basis in conformity with the Strasburg Region Comprehensive Plan.

Continued use of OLDS within the Township should be monitored for protection against system malfunction, and careful evaluation of proposed building sites and continued implementation of the Township's On-lot Management Ordinance will be necessary to prevent OLDS problems. The Township encourages use of OLDS whenever feasible and economical outside of the public sewer service area as identified within the Designated Growth Areas.

5.4.1 Repair, Replacement or Upgrading of Existing Malfunctioning Systems

The Township's certified 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 a gravity distribution

system with a pressurized system, replacing the system with a holding tank, or other alternatives as appropriate for the specific site. All new lots constructed within Strasburg Township which propose OLDS for sewage treatment require testing to identify both an original site and a replacement site available for future malfunctions of the original on-lot system.

The expansion or replacement of malfunctioning OLDS is suggested in areas of the Township where lot sizes are large enough to allow for the expansion or replacement of the system without impacting nearby drinking water supplies or causing other environmental hazards. In areas of the Township where lot sizes are small, such as in the Study Areas, the expansion or replacement of malfunctioning systems may not be feasible.

5.4.2 Water Conservation

The Township requires the installation and use of water saving devices for all new construction and the replacement of any components of existing structures. Requirements are identified in Section 12 of the Township's On-Lot Management Ordinance. Examples of water saving devices are tank inserts for toilets, low-flow faucets and showerheads, and reduced flow washing machines. These devices can reduce the wastewater flows in existing structures by 25% to 50% and can greatly extend the service life of OLDS. Should the occurrence of on-lot malfunctions continue to increase in frequency, the Township may consider enacting water conservation measures in these areas.

5.5 SMALL FLOW OR PACKAGED TREATMENT FACILITIES

As detailed in Section 3.2, one (1) package wastewater treatment plant exists within the Township. There are currently no Township regulations for the operation or maintenance of small flow or package treatment facilities.

5.5.1 Small Flow Treatment Facilities

As defined by DEP, small flow treatment facilities (SFTFs) serve from one to five single-family residences, small commercial establishments, or other sources that generate 2,000 gallons per day or less of domestic-strength wastewater. These facilities can reduce BOD, TSS, and nitrates through the use of a septic tank on each lot, an optional aerobic treatment tank, a biochemical filter, a disinfection system and tank, and an outfall sewer. They discharge to a stream, dry stream channel, or other land application (with appropriate safeguards). If a SFTF will use land disposal or a dry stream channel discharge for final disposal, a hydrogeologic evaluation must be completed to ensure drinking water sources will be protected and that effluent will not create a public health hazard or nuisance. SFTFs can be used as an alternative replacement for malfunctioning systems or as an alternative for new construction when soils are not suitable for other systems.

The location and type of system installed will dictate the level of permitting required. Certain systems have been approved by DEP for coverage under General Water Quality Management (WQM) and National Pollutant Discharge Elimination System (NPDES) Permits. Systems not meeting the DEP requirements, or that propose discharge to High Quality (HQ) or Exceptional Value (EV) water, must obtain Individual WQM and NPDES Permits. The Individual permitting process has additional requirements and complexities beyond the General permitting process.

SFTFs may not be located in soils that are unsuitable for conventional systems, floodways, wetlands, or areas mapped as floodplain soils or as a flood-prone area when completed FEMA mapping is not available. DEP-approved SFTF filtration systems use various configurations, including subsurface or accessible filters and single-pass (intermittent) or recirculating flow regimes. Each configuration has advantages or disadvantages for individual applications. Site and wastewater characteristics, as well as treatment goals should be examined in the choice of configuration and filter media for each individual application.

5.5.2 Packaged Wastewater Treatment Systems

Packaged treatment plants are prefabricated and pre-engineered systems that have been used primarily to treat sewage generated by mobile home parks, institutions, commercial facilities, and small communities. The plants that are on the market today are capable of meeting stringent discharge requirements, including suspended solids, biochemical oxygen demand (BOD), and nitrate-nitrogen limits. The packaged system generally arrives at the plant construction site as one or more modular units, which can be readily assembled by the contractor. The system usually includes a flow equalization tank, screen or comminutor, aeration tank, aeration system (diffused air or mechanical), final clarifier, disinfection, and sludge handling/disposal components. There are many advantages and disadvantages associated with package treatment systems. The following advantages should be considered:

- Minimal size requirements and site preparation.
- Relatively easy to install/short construction times.
- Lower capital cost than most mechanical systems.
- Capability to achieve high effluent quality.
- Low sludge production compared to other similar activated sludge processes.

Some disadvantages of the packaged system include:

- Requires more highly trained operator.
- Higher O&M costs than other mechanical systems.
- Limited operational flexibility.
- Susceptible to poor settling characteristics due to nitrification or formation of pin floc in the final clarifier.
- May require additional components or equipment to meet special effluent limits, such as phosphorus removal.
- Generates a sludge stream.

5.5.3 Operation and Maintenance of SFTFs and Packaged Wastewater Treatment Facilities

The complexity of these systems requires increased operation and maintenance on the part of the owner. If not cared for properly, these systems can result in health nuisances or pollution problems. To ensure the proper operation and maintenance of the facility, the permit will require a level of inspection, operation, monitoring, maintenance, and reporting to be conducted by a qualified person. In the case of individual ownership, the Township may require specific operation and maintenance requirements based upon one or more of the methods acceptable to the DEP.

5.6 HOLDING TANKS

As shown in Map 10 Appendix H, Strasburg Township has issued sewage holding tank permits for properties with malfunctioning OLDS systems. 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 commercial or industrial sites with minimal wastewater flow.

The Township's Privy Ordinance No. 29 states that installation of a holding tank may be required by the Township's certified 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 Township may require the owner to apply for a permit to construct a holding tank. It is recommended that the Township continue to issue holding tank permits 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 the Township's On-lot Management Ordinance.

5.7 SEWAGE MANAGEMENT PROGRAMS

Strasburg Township adopted the current On-lot Management Ordinance on October 2, 2000. A copy of the ordinance is included in Appendix F. The On-lot Management Ordinance provides for the permitting, inspections, maintenance and rehabilitation of the Township's on-lot systems. It is estimated that there are approximately 1,200 properties served by individual on-lot disposal systems in Strasburg Township. A majority of these properties contain private drinking water wells.

To ensure the proper operation and maintenance of OLDS within the Township, requirements are identified in Section 16 of the Township's On-lot Management Ordinance (Ordinance No. 43). A copy of the Ordinance is included in Appendix F. Select items from the Ordinance for the requirements of proper operation and maintenance of existing OLDS include the following:

- Each person owning a building served by an OLDS which contains a septic tank shall have the septic tank inspected by a qualified pumper/hauler on a regular basis, and, if the inspection demonstrates that the septic tank is filled with solids or scum in excess of 25% of the liquid depth of the tank, then the tank shall be pumped at that time.

- It is recommended that all OLDS on lots in excess of one (1) acre be pumped not less than once every five (5) years and that all OLDS on lots of one (1) acre or less be pumped every three (3) years.

For continued implementation of the Township's On-lot Management Ordinance, it is recommended that the Township consider amending the ordinance to include OLDS maintenance districts to establish a pumping and inspection schedule to assure the long-term operation of the existing and proposed on-lot disposal systems in the Township and to preserve the water quality of the private wells. It is suggested that the Township be divided into three (3) districts, designated as OLDS Management District 1, 2, and 3 as shown on the OLDS Management District Map (see Map in Appendix F). By dividing the Township into districts, the Township's certified SEO will have a more manageable number of systems to inspect on an annual rotating basis. The Township may consider amending the current On-lot Management Ordinance after adoption of this Plan.

Please refer to Appendix F for a complete description of Strasburg Township's On-Lot Management Ordinance.

5.7.1 Public Education

The Township will publically advertise and make the Plan available at the Strasburg-Heisler Public Library, Refton Brethren in Christ Church, and the Township Office, where the public will have an opportunity to review and comment on the Plan during a 30-day public comment period. Following adoption of the Plan by the Township, a copy will remain on file at the Township Office. A flyer will be made available to the public prior to amending the On-lot Management Ordinance briefly describing the OLDS maintenance districts including how the inspections and the annual rotation will be conducted.

5.8 NON-STRUCTURAL/PLANNING ACTIVITIES

The Strasburg Region Comprehensive Plan was adopted in 2006 as noted in Chapters 1 and 4. The Township's Zoning and the County's Subdivision and Land Development Ordinances have been enacted to protect the public health while accommodating controlled community growth. Map 11 in Appendix H presents the Township's approved zoning map. The Township retains a Zoning Officer to oversee implementation and enforcement of its Zoning and Land Development Ordinances. The Township's SEO is charged with enforcing compliance with the Township's On-lot Management Ordinance for protection of groundwater resources.

Existing zoning and minimum lot sizes discussed in Chapter 4 provide for low-density land uses in areas where public water and sewer service are not scheduled for installation. It is the intent of the Township that on-lot sewage disposal systems continue to serve the Township to the extent practical, based on individual site limitations, with the exceptions of designated areas.

The existing Township rules, regulations and planning activities appear sufficient to sustain the anticipated level of development in the Township as long as sufficient public sewage facilities are provided to handle anticipated growth rates within the DGAs as described in Chapter 4. In addition, the Township's On-lot Management Ordinance requires regular maintenance of on-lot systems in the Township thereby reducing the frequency of malfunctioning systems. It does not appear that new non-structural planning activities are necessary at this time.

5.9 NO ACTION ALTERNATIVE

The no action alternative is the continued use of residential on-lot systems and packaged wastewater treatment facilities in the Township. 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 existing on-lot sewage systems in Strasburg Township. The obvious impacts of no action to improve any adverse conditions encountered include degradation of public water supplies, disease, loss of recreational use of waterways, environmental hazards, such as fish kills, and other tragedies. Economically, the no action alternative could restrict or prohibit growth to the Township's DGAs or reduce property values in the Village of Refton. Due to the potential negative impacts of the no action alternative, alternatives to provide improved sewage facilities to the Refton Study Area, Creekview Study Area, and S.R. 896 DGA have been identified and are presented below.

5.10 STRUCTURAL ALTERNATIVES FOR STUDY AREAS

Alternatives to provide public sewer service to the Refton Study Area, Creekview Study Area, and S.R. 896 DGA are provided in the sections below. Although the S.R. 896 DGA is not currently considered an immediate needs area, projected commercial and residential development have lead the Township to seek alternatives to provide public sewer service to this area in conformity with the Strasburg Region Comprehensive Plan. Therefore, alternatives for providing public sanitary sewer service to this area are also evaluated in the sections below to determine whether they are cost-effective.

Fourteen (14) 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 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. Annual debt service is estimated based on a 30-year, 1.0% term as provided by PENNVEST for Lancaster County, a 40-year, 3.45% term as provided by USDA, a 25-year, 5.0% term as provided by tax exempt financing, and a 20-year, 6.0% term as provided by a municipal bank. 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. Maps of each of the structural alternatives which identified proposed facilities are presented in Appendix G.

Chapter 6 provides an analysis of the funding methods available to finance the alternatives evaluated in this section. It is important to note that 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.

5.10.1 Alternatives for the Refton Study Area

As detailed throughout this Plan, the Refton Study Area was immediately identified as a Tier 2 Study Area due to previous planning efforts, small lot sizes in the area, and facilities nearing 50 years in age and beyond. The Refton Study Area includes approximately 95 properties with the highest number and density of OLDS malfunctions and well contamination in the Township. In the past, a number of homeowners have inquired

about the future availability of sanitary sewers in this area. Therefore, alternatives for providing public sewer service were evaluated.

Alternative 1A includes the conveyance of wastewater flows from the Refton Study Area to the proposed recirculating sand filter (RSF) type treatment facility with discharge to proposed disposal beds via low pressure sewers. As discussed in Section 5.2.1, low pressure sewers are a favored alternative to gravity sewers in areas of undulating topography or in areas that require minimum excavation such as state roads lowering construction costs due to shallow line depth. 95 properties would require a grinder pump and low pressure sewer lateral to connect to the proposed low-pressure sewer.

The RSF type treatment facility utilizes a fixed-film process in series to achieve biological treatment of wastewater to meet nutrient discharge requirements. The process consists of six (6) primary tanks or septic tanks for solids removal, three (3) equalization tanks, four (4) recirculating tanks with fine gravel, two (2) final effluent tanks, one (1) dosing tank, and a methanol feed system for supplemental carbon source. After raw wastewater enters the treatment facility via the primary tanks, the settled wastewater is then dosed intermittently onto the gravel beds of the recirculating tanks for nutrient removal. Based upon the organic strength of the wastewater, flow is continuously recirculated through a series of tanks by a determined recirculation ratio in order to achieve the desired effluent quality. Treated wastewater is then discharged to the drainage beds via the dosing tank.

Alternative 1B modifies Alternative 1A by replacing the proposed RSF type treatment facility with a biologically nutrient removal (BNR) packaged wastewater treatment facility (PWWTF) to serve the Refton Study Area.

The BNR PWWTF is a pre-engineered type system capable of meeting stringent discharge requirements, including suspended solids, biochemical oxygen demand (BOD), and nitrate-nitrogen limits. The system generally includes one (1) flow equalization tank with a bar screen, one (1) anoxic tank, four (4) aeration tanks, aeration equipment, one (1) clarifier tank, one (1) sludge holding tank, a tertiary filter, and instrumentation and controls. The raw wastewater influent enters the treatment facility by passing through the bar screen to the equalization tank. Nutrient removal occurs in the aeration and anoxic tanks by recirculating the nitrate-rich contents in the aeration tank to the anoxic tank for denitrification. Additionally, a phosphorus precipitation chemical is fed into the system to enhance phosphorus removal, as necessary. After aeration, the wastewater flows to the clarifier tank to allow solids to settle. Solids are either pumped to the head of the plant or wasted to the sludge holding tank. Treated wastewater is then sent through the tertiary filter prior to discharging to the drainage beds.

Alternative 1C provides public sewer service to the Refton Study Area via a septic tank effluent pump (STEP) system with initial treatment occurring in watertight septic tanks at each property and final treatment at the proposed recirculating sand filter wastewater treatment facility with discharge to proposed disposal beds via low pressure sewers. Septic tank effluent wastewater is pumped from each septic tank through small diameter sewers to the final treatment site. It is anticipated that new waterproof septic tanks, filters, and effluent pumps would be required for all 95 properties.

Alternative 1D modifies 1A by replacing the proposed wastewater treatment facility and the proposed disposal beds with a pump station and associated force main located along Route 222 to convey all wastewater flow from the Refton Study Area to the SLSA system located along Penn Grant Road, with final treatment at the City of Lancaster's Advanced Wastewater Treatment Facility (AWWTF).

Alternative 1E modifies 1A by replacing the low pressure sewers with a combination gravity sewer and low pressure sewer to serve the Refton Study Area. It is anticipated that 72 properties would require grinder pump and low pressure sewer lateral to connect to the proposed low pressure sewer; however, a final determination of the number of grinder pumps needed requires additional topographical survey and design-level efforts beyond the scope of this Plan.

Alternative 1F modifies 1B by replacing the low pressure sewers with a combination gravity sewer and low pressure sewer to serve the Refton Study Area. It is anticipated that 72 properties would require grinder pump and low pressure sewer lateral to connect to the proposed low pressure sewer.

Alternative 1G modifies 1D by replacing the low pressure sewers with a combination gravity sewer and low pressure sewer to serve the Refton Study Area. It is anticipated that 72 properties would require grinder pump and low pressure sewer lateral to connect to the proposed low pressure sewer.

Alternative 1H modifies 1A by replacing the low pressure sewers with a combination gravity sewer and low pressure sewer, and two (2) proposed pump stations and associated force mains to serve the Refton Study Area. It is anticipated that 6 properties would require grinder pump and low pressure sewer lateral to connect to the proposed low pressure sewer; however, a final determination of the number of grinder pumps needed requires additional topographical survey and design-level efforts beyond the scope of this Plan.

Alternative 1I modifies 1B by replacing the low pressure sewers with a combination gravity sewer and low pressure sewer, and two (2) proposed pump stations and associated force mains to serve the Refton Study Area. It is anticipated that 6 properties would require grinder pump and low pressure sewer lateral to connect to the proposed low pressure sewer.

Alternative 1J modifies 1D by replacing the low pressure sewers with a combination gravity sewer and low pressure sewer, and two (2) proposed pump stations and associated force mains to serve the Refton Study Area. It is anticipated that 6 properties would require grinder pump and low pressure sewer lateral to connect to the proposed low pressure sewer.

Alternative 1A is recommended for providing public sewer service to the Refton Study Area due to the undulating topography and the lower estimated total project costs for this structural alternative despite the fact that grinder pumps and low pressure sewers result in higher operation and maintenance costs and require frequent maintenance to function properly. Additionally, the Refton Sewer Committee has approved of the low pressure sewer system and RSF type treatment facility and supports this alternative for the Refton community (see approval letter in Appendix E).

5.10.2 Alternatives for the Creekview Study Area

The Creekview Study Area was identified as a Tier 2 Study Area due to small lot sizes and relatively dense residential development. In addition, this area is located in close proximity to existing sanitary sewer systems owned by the Strasburg Borough Authority and by the Suburban Lancaster Sewer Authority. In the past, a number of homeowners have inquired about the future availability of sanitary sewers in this area. As previously identified in this Plan, sanitary sewer facilities currently exist along Creekview Lane. Therefore, alternatives for providing public sewer service were evaluated based on connection to the existing sanitary sewer facilities in this area.

Alternative 2A includes the connection of the existing gravity sewer located along Creekview Lane to convey all wastewater flow from the Creekview Study Area to Strasburg Borough Authority (SBA) system, and ultimately to the City of Lancaster AWWTF for treatment via SLSA collection and conveyance system.

A letter from the Strasburg Borough Authority indicating their willingness to provide sanitary sewer service in the Creekview Study Area is provided in Appendix E.

It should be noted that the existing sewer facilities should be inspected and evaluated prior to connection.

5.10.3 Alternatives for the S.R. 896 Designated Growth Area

As previously stated, alternatives for the S.R. 896 DGA have been evaluated due to the projected commercial and residential growth in conjunction with current usage and density. It is suggested that the Township implement the selected alternative when a combination of public funding and developer contributions become available to make the alternative feasible.

Alternative 3A provides public sewer service to the S.R. 896 DGA. Wastewater flow from the S.R. 896 DGA is proposed to be collected via a low-pressure sewer and conveyed to the existing SBA's collection and conveyance system located along Hartman Bridge Road (S.R. 896) with treatment at the City of Lancaster's AWWTF via SLSA's collection and conveyance system. Alternative 3A anticipates that the existing Hershey Farm PWWTF will remain in operation and all existing sewer connections will continue to be served by Hershey Farm. It is anticipated that approximately 38 properties would require a grinder pump and low-pressure sewer lateral to connect to the proposed low-pressure sewer along S.R. 896; however, a final determination of the number of grinder pumps needed requires additional topographical survey and design-level efforts beyond the scope of this Plan.

Alternative 3B modifies Alternative 3A by replacing the low-pressure sewers with a combination gravity sewer and low pressure sewer, and one (1) proposed pump station and associated force main to serve the S.R. 896 DGA and convey wastewater flow to SBA system. Alternative 3B anticipates that the existing Hershey Farm PWWTF would be abandoned and all wastewater flow is proposed to be conveyed to SBA system. The proposed pump station should be sized to handle projected future flow from sewer connections currently served by the Hershey Farm PWWTF, any additional planned and projected flow from the S.R. 896 DGA, and for any future sewer extensions along S.R. 896. It is anticipated that approximately 12 properties would require a grinder pump and low-pressure sewer lateral to connect to the proposed low-pressure sewer along S.R. 896; however, a final determination of the number of grinder pumps needed requires additional topographical survey and design-level efforts beyond the scope of this Plan.

Alternative 3C conveys all wastewater flow from residential and commercial properties located within the S.R. 896 DGA via a combination gravity sewer and low pressure sewer with conveyance to the existing Hershey Farm PWWTF. Currently, Hershey Farm PWWTF has capacity to handle the additional wastewater flow from the S.R. 896 DGA and any future sewer extensions along S.R. 896. It is anticipated that approximately 9 properties would require a grinder pump and low-pressure sewer lateral to connect to the proposed low-pressure sewer along S.R. 896; however, a final determination of the number of grinder pumps needed requires additional topographical survey and design-level efforts beyond the scope of this Plan.

Continued negotiations with Hershey Farm as well as the Strasburg Borough Authority is recommended to ensure a favorable agreement can be reached prior to selecting and implementing an alternative for public sewer facilities to serve the S.R. 896 DGA. A letter from Hershey Farm and the Strasburg Borough Authority indicating their willingness to provide sanitary sewer service as conditions and/or development warrants are provided in Appendix E.

Developer's agreements for new development in the S.R. 896 DGA shall incorporate and provide for connections of existing properties when determined by the Township to be technically feasible. The Township, or authority of the Township, shall be consulted as a third party to any developer's agreement with the Strasburg Borough Authority or Hershey Farm in the S.R. 896 DGA to ensure that the proper planning and implementation of sewage facilities/service is provided for.

5.10.4 No Action Alternative

The No Action structural alternative represents the status quo. It proposes the continued repair and construction of on-lot facilities in compliance with Chapter 72 Standards and under the guidance and permitting of the Township's SEO. In some cases these systems will not be feasible based on the site limitations, including soil, slope, and space restrictions. In these instances Best Technical Guidance (BTG) permits will be the only option and should be installed under close scrutiny by the SEO. These BTG repairs do not assure the proper function of an on-lot system, they represent the best solution available for a limited site. As such, systems with BTG repairs are still considered to be "confirmed malfunctions" in the sanitary survey procedure.

This option represents the least upset to the community and status quo; however, it does not address the issues raised in the sanitary survey – those of greywater discharges, malfunctioning systems and fecal contamination of wells in the Study Areas. Greywater discharge malfunctions could be alleviated by connecting them to existing on-lot treatment systems; however, it is likely that the systems will fail under the increased loading.

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

5.10.5 Comparative Cost Estimates of Study Area Structural Alternatives

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 Plan are first level cost estimates appropriate for planning level detail and should not be considered as final costs for financing purposes.

Tables 5-1 through 5-14 present the cost estimates for the structural alternatives and Tables 5-15 through 5-24 summarize them. Tables 5-15 through 5-24 include the estimated annual cost and payment of annual debt service for each alternative. As a means of comparison, the Strasburg Borough Authority currently has a user rate of \$44.00 per 5,000 gal water use per quarter and \$5.75 per additional 1,000 gal per quarter or \$176 per residential or commercial EDU per year. In addition, Suburban Lancaster Sewer Authority currently has a flat user rate of \$33.33 per residential EDU per month or \$400 per residential EDU per year.

The structural alternatives providing public sewer service to the Refton Study Area were found to be the most costly of all the structural alternatives evaluated in this Plan and resulted in the greatest annual cost per user based on projected EDU. Alternative 1A was found to be the least expensive structural alternative serving the Refton Study Area. Estimated annual cost per user for construction of Alternative 1A is approximately \$163/month. As previously stated, cost associated with the Creekview Study Area is contingent upon completion of an inspection and evaluation of the existing sewer facilities prior to connection to SBA's system. Estimated annual cost per existing user for implementation of Alternative 2A is approximately \$39/month. All monthly costs shown here for comparison purposes do not include any grant money or financial contributions from developers. Without public funding in the form of grants and low-interest loans or financial contributions from developers; Alternative 1A is not economically feasible.

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

1. Depth of sewer is 10 - 12-feet.
2. Depth of manholes are 11-feet.
3. Manhole is required every 250-feet.
4. Force main cleanout required every 2000-feet.
5. LPS cleanout required every 500-feet.
6. Service lateral connection includes 20-feet of 6" PVC pipe, wye, and cleanout per connection.
7. Paving restoration based on 2" (12.5mm) wearing course and 6" base course (25mm).
8. Length of low pressure sewer lateral connections is 20' per connection.
9. Pump and motor size evaluated for planning purposes only.
10. Pump station estimates do not include control building, acquisition of land, or emergency generator.
11. WWTP site work includes cost for all yard piping three (3) linear feet beyond proposed structures.

Table 5-1 Cost Opinion for Refton Study Area Alternative 1A

OPINION OF PROBABLE COST FOR STRASBURG TOWNSHIP ACT 537 PLAN REFTON STUDY AREA ALTERNATIVE 1A LOW PRESSURE COLLECTION SYSTEM W/ RECIRCULATING SAND FILTER AND DISPOSAL BED					
ITEM NO.	DESCRIPTION	EST. QUANTITY	UNIT	UNIT PRICE	EXTENSION
GENERAL					
1	MOBILIZATION @ 5%	1	L.S.	\$97,400.00	\$97,400.00
2	TRAFFIC MAINTENANCE & PROTECTION @2.5%	1	L.S.	\$48,700.00	\$48,700.00
LOW PRESSURE SEWER					
3	LPS MAIN -DIRECTIONAL DRILL	11,520	L.F.	\$32.00	\$368,640.00
4	LPS LATERAL	95	EA.	\$1,300.00	\$123,500.00
5	AIR/VACUUM RELEASE VALVE & APPURTENANCES	6	EA.	\$3,000.00	\$18,000.00
6	ONLINE FLUSHING STATION	23	EA.	\$4,000.00	\$92,000.00
7	ENDLINE FLUSHING STATION	5	EA.	\$4,000.00	\$20,000.00
8	GRINDER PUMP - SIMPLEX	95	EA.	\$7,500.00	\$712,500.00
SURFACING					
9	PAVING RESTORATION	344	S.Y.	\$66.00	\$22,700.00
10	VEGATATIVE RESTORATION	300	S.Y.	\$12.00	\$3,600.00
WASTEWATER TREATMENT FACILITY					
11	RECIRCULATING SAND FILTER	1	L.S.	\$387,500.00	\$387,500.00
12	DRAINAGE BED	1	L.S.	\$100,000.00	\$100,000.00
MISCELLANEOUS					
13	CONTROL BUILDING	1	L.S.	\$80,000.00	\$80,000.00
14	CHAIN LINK FENCE	1	L.S.	\$10,000.00	\$10,000.00
15	GRAVEL ACCESS DRIVEWAY/SIDEWALKS	1	L.S.	\$8,000.00	\$8,000.00
ESTIMATED CONSTRUCTION COSTS					\$2,092,600.00
CONSTRUCTION CONTINGENCY @ 15%					\$313,900.00
ENGINEERING, ADMIN, & LEGAL FEES					\$421,100.00
TOTAL ESTIMATED PROJECT COSTS					\$2,827,600.00
ESTIMATED NUMBER OF EDUs TO BE SERVED					101
ESTIMATED CAPITAL COST PER EDU					\$28,000.00

Table 5-2 Cost Opinion for Refton Study Area Alternative 1B

OPINION OF PROBABLE COST FOR STRASBURG TOWNSHIP ACT 537 PLAN REFTON STUDY AREA ALTERNATIVE 1B LOW PRESSURE COLLECTION SYSTEM W/ PACKAGED WASTEWATER TREATMENT FACILITY AND DISPOSAL BED					
ITEM NO.	DESCRIPTION	EST. QUANTITY	UNIT	UNIT PRICE	EXTENSION
GENERAL					
1	MOBILIZATION @ 5%	1	L.S.	\$97,700.00	\$97,700.00
2	TRAFFIC MAINTENANCE & PROTECTION @2.5%	1	L.S.	\$48,900.00	\$48,900.00
LOW PRESSURE SEWER					
3	LPS MAIN -DIRECTIONAL DRILL	11,520	L.F.	\$32.00	\$368,640.00
4	LPS LATERAL	95	EA.	\$1,300.00	\$123,500.00
5	AIR/VACUUM RELEASE VALVES & APPURTENANCES	6	EA.	\$3,000.00	\$18,000.00
6	ONLINE FLUSHING STATION	23	EA.	\$4,000.00	\$92,000.00
7	ENDLINE FLUSHING STATION	5	EA.	\$4,000.00	\$20,000.00
8	GRINDER PUMP - SIMPLEX	95	EA.	\$7,500.00	\$712,500.00
SURFACING					
9	PAVING RESTORATION	344	S.Y.	\$66.00	\$22,704.00
10	VEGATATIVE RESTORATION	300	S.Y.	\$12.00	\$3,600.00
WASTEWATER TREATMENT FACILITY					
11	PACKAGED TREATMENT (25,000 GPD)	1	L.S.	\$394,000.00	\$394,000.00
12	DRAINAGE BED	1	L.S.	\$100,000.00	\$100,000.00
MISCELLANEOUS					
13	CONTROL BUILDING	1	L.S.	\$80,000.00	\$80,000.00
14	CHAIN LINK FENCE	1	L.S.	\$10,000.00	\$10,000.00
15	GRAVEL ACCESS DRIVEWAY/SIDEWALKS	1	L.S.	\$8,000.00	\$8,000.00
ESTIMATED CONSTRUCTION COSTS					\$2,099,600.00
CONSTRUCTION CONTINGENCY @ 15%					\$315,000.00
ENGINEERING, ADMIN, & LEGAL FEES					\$422,600.00
TOTAL ESTIMATED PROJECT COSTS					\$2,837,200.00
ESTIMATED NUMBER OF EDUs TO BE SERVED					101
ESTIMATED CAPITAL COST PER EDU					\$28,100.00

Table 5-3 Cost Opinion for Refton Study Area Alternative 1C

OPINION OF PROBABLE COST FOR STRASBURG TOWNSHIP ACT 537 PLAN REFTON STUDY AREA ALTERNATIVE 1C STEP SYSTEM W/ RECIRCULATING SAND FILTER AND DISPOSAL BED					
ITEM NO.	DESCRIPTION	EST. QUANTITY	UNIT	UNIT PRICE	EXTENSION
GENERAL					
1	MOBILIZATION @ 5%	1	L.S.	\$102,000.00	\$102,000.00
2	TRAFFIC MAINTENANCE & PROTECTION @2.5%	1	L.S.	\$51,000.00	\$51,000.00
SURFACING					
3	PAVING RESTORATION	2,235	S.Y.	\$66.00	\$147,500.00
SMALL DIAMETER SEWER					
4	EFFLUENT MAIN	11,520	L.F.	\$32.00	\$368,640.00
5	2" TANK EFFLUENT LATERAL AND WYE	95	EA.	\$1,300.00	\$123,500.00
6	AIR/VACUUM RELEASE VALVES & APPURTENANCES	6	EA.	\$3,000.00	\$18,000.00
7	INLINE CLEANOUT	28	EA.	\$4,000.00	\$112,000.00
ON-LOT SYSTEM					
8	WATERPROOF SEPTIC TANK	95	EA.	\$4,000.00	\$380,000.00
9	FILTER	95	EA.	\$85.00	\$8,075.00
10	EFFLUENT PUMP	95	EA.	\$3,300.00	\$313,500.00
SURFACING					
11	PAVING RESTORATION	344	S.Y.	\$66.00	\$22,704.00
12	VEGATATIVE RESTORATION	300	S.Y.	\$12.00	\$3,600.00
WASTEWATER TREATMENT FACILITY					
13	RECIRCULATING SAND FILTER	1	L.S.	\$339,500.00	\$339,500.00
14	DRAINAGE BED	1	L.S.	\$100,000.00	\$100,000.00
MISCELLANEOUS					
15	CONTROL BUILDING	1	L.S.	\$80,000.00	\$80,000.00
16	CHAIN LINK FENCE	1	L.S.	\$10,000.00	\$10,000.00
17	GRAVEL ACCESS DRIVEWAY/SIDEWALKS	1	L.S.	\$8,000.00	\$8,000.00
ESTIMATED CONSTRUCTION COSTS					\$2,188,000.00
CONSTRUCTION CONTINGENCY @ 15%					\$328,200.00
ENGINEERING, ADMIN, & LEGAL FEES					\$440,300.00
TOTAL ESTIMATED PROJECT COSTS					\$2,956,500.00
ESTIMATED NUMBER OF EDUs TO BE SERVED					101
ESTIMATED CAPITAL COST PER EDU					\$29,300.00

Table 5-4 Cost Opinion for Refton Study Area Alternative 1D

OPINION OF PROBABLE COST FOR STRASBURG TOWNSHIP ACT 537 PLAN REFTON STUDY AREA ALTERNATIVE 1D LOW PRESSURE COLLECTION SYSTEM W/ CONNECTION TO SLSA SYSTEM					
ITEM NO.	DESCRIPTION	EST. QUANTITY	UNIT	UNIT PRICE	EXTENSION
GENERAL					
1	MOBILIZATION @ 5%	1	L.S.	\$111,175.00	\$111,175.00
2	TRAFFIC MAINTENANCE & PROTECTION @2.5%	1	L.S.	\$55,587.50	\$55,587.50
FORCE MAIN					
3	4" DIP FORCE MAIN - DIRECTIONAL DRILL	8,450	L.F.	\$65.00	\$549,300.00
4	AIR/VACUUM RELEASE VALVES & APPURTENANCES	5	EA.	\$3,000.00	\$15,000.00
5	FORCE MAIN CLEANOUTS	17	EA.	\$4,000.00	\$68,000.00
6	CONNECTION TO SLSA SYSTEM	1	L.S.	\$171,200.00	\$171,200.00
LOW PRESSURE SEWER					
7	LPS MAIN - DIRECTIONAL DRILL	11,520	L.F.	\$32.00	\$368,700.00
8	LPS LATERAL	95	EA.	\$1,300.00	\$123,500.00
9	AIR/VACUUM RELEASE VALVES & APPURTENANCES	6	EA.	\$3,000.00	\$18,000.00
10	ONLINE FLUSHING STATION	7	EA.	\$4,000.00	\$28,000.00
11	ENDLINE FLUSHING STATION	5	EA.	\$4,000.00	\$20,000.00
12	GRINDER PUMP - SIMPLEX	95	EA.	\$7,500.00	\$712,500.00
SURFACING					
13	PAVING RESTORATION	450	S.Y.	\$66.00	\$29,700.00
14	VEGATATIVE RESTORATION	300	S.Y.	\$12.00	\$3,600.00
PUMP STATION					
15	PUMP STATION (78 GPM @ 139 FT TDH)	1	L.S.	\$116,000.00	\$116,000.00
ESTIMATED CONSTRUCTION COSTS					\$2,390,300.00
CONSTRUCTION CONTINGENCY @ 15%					\$358,600.00
ENGINEERING, ADMIN, & LEGAL FEES					\$493,940.00
TOTAL ESTIMATED PROJECT COSTS					\$3,242,840.00
ESTIMATED NUMBER OF EDUs TO BE SERVED					101
ESTIMATED CAPITAL COST PER EDU					\$32,200.00

Table 5-5 Cost Opinion for Refton Study Area Alternative 1E

OPINION OF PROBABLE COST FOR STRASBURG TOWNSHIP ACT 537 PLAN REFTON STUDY AREA ALTERNATIVE 1E COMBINATION GRAVITY SEWER/LOW PRESSURE COLLECTION SYSTEM W/ RECIRCULATING SAND FILTER AND DISPOSAL BED					
ITEM NO.	DESCRIPTION	EST. QUANTITY	UNIT	UNIT PRICE	EXTENSION
GENERAL					
1	MOBILIZATION @ 5%	1	L.S.	\$101,900.00	\$101,900.00
2	TRAFFIC MAINTENANCE & PROTECTION @ 2.5%	1	L.S.	\$51,000.00	\$51,000.00
GRAVITY SEWER LINE					
3	8" PVC PIPE -AGGREGATE BACKFILL	2,560	L.F.	\$119.00	\$304,700.00
4	SERVICE LATERAL	23	EA.	\$985.00	\$22,700.00
5	CLAY DIKE	9	EA.	\$385.00	\$3,500.00
LOW PRESSURE SEWER					
6	LPS MAIN -DIRECTIONAL DRILL	8,960	L.F.	\$32.00	\$286,800.00
7	LPS LATERAL	72	EA.	\$1,300.00	\$93,600.00
8	AIR/VACUUM RELEASE VALVES & APPURTENANCES	5	EA.	\$3,000.00	\$15,000.00
9	ONLINE FLUSHING STATION	6	EA.	\$4,000.00	\$24,000.00
10	ENDLINE FLUSHING STATION	5	EA.	\$4,000.00	\$20,000.00
11	GRINDER PUMP - SIMPLEX	72	EA.	\$7,500.00	\$540,000.00
MANHOLES					
12	MANHOLES, 4-FOOT DIAMETER	11	EA.	\$5,000.00	\$55,000.00
13	MANHOLE FRAME AND COVERS	11	EA.	\$650.00	\$7,200.00
SURFACING					
14	PAVING RESTORATION	1,140	S.Y.	\$66.00	\$75,300.00
15	VEGATATIVE RESTORATION	300	S.Y.	\$12.00	\$3,600.00
WASTEWATER TREATMENT FACILITY					
16	RECIRCULATING SAND FILTER	1	L.S.	\$387,500.00	\$387,500.00
17	DRAINAGE BED	1	L.S.	\$100,000.00	\$100,000.00
MISCELLANEOUS					
18	CONTROL BUILDING	1	L.S.	\$80,000.00	\$80,000.00
19	CHAIN LINK FENCE	1	L.S.	\$10,000.00	\$10,000.00
20	GRAVEL ACCESS DRIVEWAY/SIDEWALKS	1	L.S.	\$8,000.00	\$8,000.00
ESTIMATED CONSTRUCTION COSTS					\$2,189,800.00
CONSTRUCTION CONTINGENCY @ 15%					\$328,500.00
ENGINEERING, ADMIN, & LEGAL FEES					\$440,700.00
TOTAL ESTIMATED PROJECT COSTS					\$2,959,000.00
ESTIMATED NUMBER OF EDUs TO BE SERVED					101
ESTIMATED CAPITAL COST PER EDU					\$29,300.00

Table 5-6 Cost Opinion for Refton Study Area Alternative 1F

OPINION OF PROBABLE COST FOR STRASBURG TOWNSHIP ACT 537 PLAN REFTON STUDY AREA ALTERNATIVE 1F COMBINATION GRAVITY SEWER/LOW PRESSURE COLLECTION SYSTEM W/ PACKAGED WASTEWATER TREATMENT FACILITY AND DISPOSAL BED					
ITEM NO.	DESCRIPTION	EST. QUANTITY	UNIT	UNIT PRICE	EXTENSION
GENERAL					
1	MOBILIZATION @ 5%	1	L.S.	\$102,200.00	\$102,200.00
2	TRAFFIC MAINTENANCE & PROTECTION @ 2.5%	1	L.S.	\$51,100.00	\$51,100.00
GRAVITY SEWER LINE					
3	8" PVC PIPE -AGGREGATE BACKFILL	2,560	L.F.	\$119.00	\$304,700.00
4	SERVICE LATERAL	23	EA.	\$985.00	\$22,700.00
5	CLAY DIKE	9	EA.	\$385.00	\$3,500.00
LOW PRESSURE SEWER					
6	LPS MAIN -DIRECTIONAL DRILL	8,960	L.F.	\$32.00	\$286,800.00
7	LPS LATERAL	72	EA.	\$1,300.00	\$93,600.00
8	AIR/VACUUM RELEASE VALVES & APPURTENANCES	5	EA.	\$3,000.00	\$15,000.00
9	ONLINE FLUSHING STATION	6	EA.	\$4,000.00	\$24,000.00
10	ENDLINE FLUSHING STATION	5	EA.	\$4,000.00	\$20,000.00
11	GRINDER PUMP - SIMPLEX	72	EA.	\$7,500.00	\$540,000.00
MANHOLES					
12	MANHOLES, 4-FOOT DIAMETER	11	EA.	\$5,000.00	\$55,000.00
13	MANHOLE FRAME AND COVERS	11	EA.	\$650.00	\$7,200.00
SURFACING					
14	PAVING RESTORATION	1,140	S.Y.	\$66.00	\$75,300.00
15	VEGATATIVE RESTORATION	300	S.Y.	\$12.00	\$3,600.00
WASTEWATER TREATMENT FACILITY					
16	PACKAGED TREATMENT (25,000 GPD)	1	L.S.	\$394,000.00	\$394,000.00
17	DRAINAGE BED	1	L.S.	\$100,000.00	\$100,000.00
MISCELLANEOUS					
18	CONTROL BUILDING	1	L.S.	\$80,000.00	\$80,000.00
19	CHAIN LINK FENCE	1	L.S.	\$10,000.00	\$10,000.00
20	GRAVEL ACCESS DRIVEWAY/SIDEWALKS	1	L.S.	\$8,000.00	\$8,000.00
ESTIMATED CONSTRUCTION COSTS					\$2,196,700.00
CONSTRUCTION CONTINGENCY @ 15%					\$329,600.00
ENGINEERING, ADMIN, & LEGAL FEES					\$442,100.00
TOTAL ESTIMATED PROJECT COSTS					\$2,968,400.00
ESTIMATED NUMBER OF EDUs TO BE SERVED					101
ESTIMATED CAPITAL COST PER EDU					\$29,400.00

Table 5-7 Cost Opinion for Refton Study Area Alternative 1G

OPINION OF PROBABLE COST FOR STRASBURG TOWNSHIP ACT 537 PLAN REFTON STUDY AREA ALTERNATIVE 1G COMBINATION GRAVITY SEWER, FORCE MAIN, AND LOW PRESSURE COLLECTION SYSTEM W/ CONNECTION TO SLSA SYSTEM					
ITEM NO.	DESCRIPTION	EST. QUANTITY	UNIT	UNIT PRICE	EXTENSION
GENERAL					
1	MOBILIZATION @ 5%	1	L.S.	\$117,800.00	\$117,800.00
2	TRAFFIC MAINTENANCE & PROTECTION @ 2.5%	1	L.S.	\$58,900.00	\$58,900.00
FORCE MAIN					
3	4" DIP FORCE MAIN - DIRECTIONAL DRILL	8,450	L.F.	\$65.00	\$549,300.00
4	AIR/VACUUM RELEASE VALVES & APPURTENANCES	5	EA.	\$3,000.00	\$15,000.00
5	FORCE MAIN CLEANOUTS	17	EA.	\$4,000.00	\$68,000.00
6	CONNECTION TO SLSA SYSTEM	1	L.S.	\$171,200.00	\$171,200.00
GRAVITY SEWER LINE					
7	8" PVC PIPE -AGGREGATE BACKFILL	2,560	L.F.	\$119.00	\$304,700.00
8	SERVICE LATERAL	23	EA.	\$985.00	\$22,700.00
9	CLAY DIKE	9	EA.	\$385.00	\$3,500.00
LOW PRESSURE SEWER					
10	LPS MAIN -DIRECTIONAL DRILL	8,960	L.F.	\$32.00	\$286,800.00
11	LPS LATERAL	72	EA.	\$1,300.00	\$93,600.00
12	AIR/VACUUM RELEASE VALVES & APPURTENANCES	5	EA.	\$3,000.00	\$15,000.00
13	ONLINE FLUSHING STATION	6	EA.	\$4,000.00	\$24,000.00
14	ENDLINE FLUSHING STATION	5	EA.	\$4,000.00	\$20,000.00
15	GRINDER PUMP - SIMPLEX	72	EA.	\$7,500.00	\$540,000.00
MANHOLES					
16	MANHOLES, 4-FOOT DIAMETER	11	EA.	\$3,000.00	\$33,000.00
17	MANHOLE FRAME AND COVERS	11	EA.	\$650.00	\$7,200.00
SURFACING					
18	PAVING RESTORATION	1,246	S.Y.	\$66.00	\$82,300.00
19	VEGATATIVE RESTORATION	300	S.Y.	\$12.00	\$3,600.00
PUMP STATION					
20	PUMP STATION (78 GPM @ 139 FT TDH)	1	L.S.	\$116,000.00	\$116,000.00
ESTIMATED CONSTRUCTION COSTS					\$2,532,600.00
CONSTRUCTION CONTINGENCY @ 15%					\$379,900.00
ENGINEERING, ADMIN, & LEGAL FEES					\$509,700.00
TOTAL ESTIMATED PROJECT COSTS					\$3,422,200.00
ESTIMATED NUMBER OF EDUs TO BE SERVED					101
ESTIMATED CAPITAL COST PER EDU					\$33,900.00

Table 5-8 Cost Opinion for Refton Study Area Alternative 1H

OPINION OF PROBABLE COST FOR STRASBURG TOWNSHIP ACT 537 PLAN REFTON STUDY AREA ALTERNATIVE 1H COMBINATION GRAVITY, FORCE MAIN, AND LOW PRESSURE COLLECTION SYSTEM W/ RECIRCULATING SAND FILTER AND DISPOSAL BED					
ITEM NO.	DESCRIPTION	EST. QUANTITY	UNIT	UNIT PRICE	EXTENSION
GENERAL					
1	MOBILIZATION @ 5%	1	L.S.	\$187,000.00	\$187,000.00
2	TRAFFIC MAINTENANCE & PROTECTION @2.5%	1	L.S.	\$93,500.00	\$93,500.00
GRAVITY SEWER LINE					
3	8" PVC PIPE - AGGREGATE BACKFILL	11,040	L.F.	\$119.00	\$1,313,800.00
4	SERVICE LATERAL	89	EA.	\$985.00	\$87,700.00
5	CLAY DIKE	37	EA.	\$385.00	\$14,300.00
FORCE MAIN					
6	4" DIP FORCE MAIN - DIRECTIONAL DRILL	7,360	L.F.	\$65.00	\$478,400.00
7	AIR/VACUUM RELEASE VALVES & APPURTENANCES	4	EA.	\$3,000.00	\$12,000.00
8	FORCE MAIN CLEANOUTS	15	EA.	\$4,000.00	\$60,000.00
LOW PRESSURE SEWER					
9	LPS MAIN - DIRECTIONAL DRILL	880	L.F.	\$32.00	\$28,160.00
10	LPS LATERAL	6	EA.	\$1,300.00	\$7,800.00
11	AIR/VACUUM RELEASE VALVES & APPURTENANCES	2	EA.	\$3,000.00	\$6,000.00
12	ONLINE FLUSHING STATION	2	EA.	\$4,000.00	\$8,000.00
13	ENDLINE FLUSHING STATION	2	EA.	\$4,000.00	\$8,000.00
14	GRINDER PUMP - SIMPLEX	6	EA.	\$7,500.00	\$45,000.00
MANHOLES					
15	MANHOLES, 4-FOOT DIAMETER	48	EA.	\$5,000.00	\$240,000.00
16	MANHOLE FRAME AND COVERS	48	EA.	\$650.00	\$31,200.00
SURFACING					
17	PAVING RESTORATION	9,708	S.Y.	\$66.00	\$640,800.00
18	VEGATATIVE RESTORATION	300	S.Y.	\$12.00	\$3,600.00
HIGHWAY CROSSINGS					
19	8" PVC PIPE	150	L.F.	\$200.00	\$30,000.00
20	4" FORCE MAIN	75	L.F.	\$125.00	\$9,400.00
PUMP STATION					
21	PUMP STATION #1 (78 GPM @ 114 FT TDH)	1	L.S.	\$65,000.00	\$65,000.00
22	PUMP STATION #2 (78 GPM @ 43 FT TDH)	1	L.S.	\$64,000.00	\$64,000.00
WASTEWATER TREATMENT FACILITY					
23	RECIRCULATING SAND FILTER	1	L.S.	\$387,500.00	\$387,500.00
24	DRAINAGE BED	1	L.S.	\$100,000.00	\$100,000.00
MISCELLANEOUS					
25	CONTROL BUILDING	1	L.S.	\$80,000.00	\$80,000.00
26	CHAIN LINK FENCE	1	L.S.	\$10,000.00	\$10,000.00
27	GRAVEL ACCESS DRIVEWAY/SIDEWALKS	1	L.S.	\$8,000.00	\$8,000.00
ESTIMATED CONSTRUCTION COSTS					\$4,019,200.00
CONSTRUCTION CONTINGENCY @ 15%					\$602,900.00
ENGINEERING, ADMIN, & LEGAL FEES					\$808,900.00
TOTAL ESTIMATED PROJECT COSTS					\$5,431,000.00
ESTIMATED NUMBER OF EDUs TO BE SERVED					101
ESTIMATED CAPITAL COST PER EDU					\$53,800.00

Table 5-9 Cost Opinion for Refton Study Area Alternative 1I

OPINION OF PROBABLE COST FOR STRASBURG TOWNSHIP ACT 537 PLAN REFTON STUDY AREA ALTERNATIVE 1I COMBINATION GRAVITY, FORCE MAIN, AND LOW PRESSURE COLLECTION SYSTEM W/ PACKAGED WASTEWATER TREATMENT FACILITY AND DISPOSAL BED					
ITEM NO.	DESCRIPTION	EST. QUANTITY	UNIT	UNIT PRICE	EXTENSION
GENERAL					
1	MOBILIZATION @ 5%	1	L.S.	\$187,300.00	\$187,300.00
2	TRAFFIC MAINTENANCE & PROTECTION @2.5%	1	L.S.	\$93,700.00	\$93,700.00
GRAVITY SEWER LINE					
3	8" PVC PIPE - AGGREGATE BACKFILL	11,040	L.F.	\$119.00	\$1,313,800.00
4	SERVICE LATERAL	89	EA.	\$985.00	\$87,700.00
5	CLAY DIKE	37	EA.	\$385.00	\$14,300.00
FORCE MAIN					
6	4" DIP FORCE MAIN - DIRECTIONAL DRILL	7,360	L.F.	\$65.00	\$478,400.00
7	AIR/VACUUM RELEASE VALVES & APPURTENANCES	4	EA.	\$3,000.00	\$12,000.00
8	FORCE MAIN CLEANOUTS	15	EA.	\$4,000.00	\$60,000.00
LOW PRESSURE SEWER					
9	LPS MAIN - DIRECTIONAL DRILL	880	L.F.	\$32.00	\$28,160.00
10	LPS LATERAL	6	EA.	\$1,300.00	\$7,800.00
11	AIR/VACUUM RELEASE VALVES & APPURTENANCES	2	EA.	\$3,000.00	\$6,000.00
12	ONLINE FLUSHING STATION	2	EA.	\$4,000.00	\$8,000.00
13	ENDLINE FLUSHING STATION	2	EA.	\$4,000.00	\$8,000.00
14	GRINDER PUMP - SIMPLEX	6	EA.	\$7,500.00	\$45,000.00
MANHOLES					
15	MANHOLES, 4-FOOT DIAMETER	48	EA.	\$5,000.00	\$240,000.00
16	MANHOLE FRAME AND COVERS	48	EA.	\$650.00	\$31,200.00
SURFACING					
17	PAVING RESTORATION	9,708	S.Y.	\$66.00	\$640,800.00
18	VEGATATIVE RESTORATION	300	S.Y.	\$12.00	\$3,600.00
HIGHWAY CROSSINGS					
19	8" PVC PIPE	150	L.F.	\$200.00	\$30,000.00
20	4" FORCE MAIN	75	L.F.	\$125.00	\$9,400.00
PUMP STATION					
21	PUMP STATION #1 (78 GPM @ 114 FT TDH)	1	L.S.	\$65,000.00	\$65,000.00
22	PUMP STATION #2 (78 GPM @ 43 FT TDH)	1	L.S.	\$64,000.00	\$64,000.00
WASTEWATER TREATMENT FACILITY					
23	PACKAGED TREATMENT (25,000 GPD)	1	L.S.	\$394,000.00	\$394,000.00
24	DRAINAGE BED	1	L.S.	\$100,000.00	\$100,000.00
MISCELLANEOUS					
25	CONTROL BUILDING	1	L.S.	\$80,000.00	\$80,000.00
26	CHAIN LINK FENCE	1	L.S.	\$10,000.00	\$10,000.00
27	GRAVEL ACCESS DRIVEWAY/SIDEWALKS	1	L.S.	\$8,000.00	\$8,000.00
ESTIMATED CONSTRUCTION COSTS					\$4,026,200.00
CONSTRUCTION CONTINGENCY @ 15%					\$604,000.00
ENGINEERING, ADMIN, & LEGAL FEES					\$810,300.00
TOTAL ESTIMATED PROJECT COSTS					\$5,440,500.00
ESTIMATED NUMBER OF EDUs TO BE SERVED					101
ESTIMATED CAPITAL COST PER EDU					\$53,900.00

Table 5-10 Cost Opinion for Refton Study Area Alternative 1J

OPINION OF PROBABLE COST FOR STRASBURG TOWNSHIP ACT 537 PLAN REFTON STUDY AREA ALTERNATIVE 1J COMBINATION GRAVITY, FORCE MAIN, AND LOW PRESSURE COLLECTION SYSTEM W/ CONNECTION TO SLSA SYSTEM					
ITEM NO.	DESCRIPTION	EST. QUANTITY	UNIT	UNIT PRICE	EXTENSION
GENERAL					
1	MOBILIZATION @ 5%	1	L.S.	\$202,600.00	\$202,600.00
2	TRAFFIC MAINTENANCE & PROTECTION @2.5%	1	L.S.	\$101,300.00	\$101,300.00
GRAVITY SEWER LINE					
3	8" PVC PIPE - AGGREGATE BACKFILL	11,040	L.F.	\$119.00	\$1,313,800.00
4	SERVICE LATERAL	89	EA.	\$0,985.00	\$87,700.00
5	CLAY DIKE	37	EA.	\$385.00	\$14,300.00
FORCE MAIN					
6	4" DIP FORCE MAIN - DIRECTIONAL DRILL	15,810	L.F.	\$65.00	\$1,027,700.00
7	AIR/VACUUM RELEASE VALVES & APPURTENANCES	8	EA.	\$3,000.00	\$24,000.00
8	FORCE MAIN CLEANOUTS	32	EA.	\$4,000.00	\$128,000.00
9	CONNECTION TO SLSA SYSTEM	1	L.S.	\$152,000.00	\$152,000.00
LOW PRESSURE SEWER					
10	LPS MAIN - DIRECTIONAL DRILL	880	L.F.	\$32.00	\$28,200.00
11	LPS LATERAL	6	EA.	\$1,300.00	\$7,800.00
12	AIR/VACUUM RELEASE VALVES & APPURTENANCES	2	EA.	\$3,000.00	\$6,000.00
13	ONLINE FLUSHING STATION	2	EA.	\$4,000.00	\$8,000.00
14	ENDLINE FLUSHING STATION	2	EA.	\$4,000.00	\$8,000.00
15	GRINDER PUMP - SIMPLEX	6	EA.	\$7,500.00	\$45,000.00
MANHOLES					
16	MANHOLES, 4-FOOT DIAMETER	48	EA.	\$5,000.00	\$240,000.00
17	MANHOLE FRAME AND COVERS	48	EA.	\$650.00	\$31,200.00
SURFACING					
18	PAVING RESTORATION	9,708	S.Y.	\$66.00	\$640,800.00
19	VEGATATIVE RESTORATION	300	S.Y.	\$12.00	\$3,600.00
HIGHWAY CROSSINGS					
20	8" PVC PIPE	150	L.F.	\$200.00	\$30,000.00
21	4" FORCE MAIN	75	L.F.	\$125.00	\$9,400.00
PUMP STATION					
22	PUMP STATION #1 (78 GPM @ 114 FT TDH)	1	L.S.	\$65,000.00	\$65,000.00
23	PUMP STATION #2 (78 GPM @ 43 FT TDH)	1	L.S.	\$64,000.00	\$64,000.00
24	PUMP STATION #3 (78 GPM @ 139 FT TDH)	1	L.S.	\$116,000.00	\$116,000.00
ESTIMATED CONSTRUCTION COSTS					\$4,354,400.00
CONSTRUCTION CONTINGENCY @ 15%					\$653,200.00
ENGINEERING, ADMIN, & LEGAL FEES					\$887,700.00
TOTAL ESTIMATED PROJECT COSTS					\$5,895,300.00
ESTIMATED NUMBER OF EDUs TO BE SERVED					101
ESTIMATED CAPITAL COST PER EDU					\$58,400.00

Table 5-11 Cost Opinion for Creekview Study Area Alternative 2A

OPINION OF PROBABLE COST FOR STRASBURG TOWNSHIP ACT 537 PLAN CREEKVIEW STUDY AREA ALTERNATIVE 2A EXISTING GRAVITY SEWER COLLECTION SYSTEM W/ CONNECTION TO STRASBURG BOROUGH AUTHORITY SYSTEM					
ITEM NO.	DESCRIPTION	EST. QUANTITY	UNIT	UNIT PRICE	EXTENSION
CONNECTION TO SBA SYSTEM					
1	TAPPING FEE (3,780 GPD CAPACITY REQUEST)	1	L.S.	\$113,220.00	\$113,220.00
ESTIMATED TOTAL TAPPING FEES					\$113,220.00
ENGINEERING, ADMIN, & LEGAL FEES					\$19,800.00
TOTAL ESTIMATED PROJECT COSTS					\$133,020.00
ESTIMATED NUMBER OF EDUs TO BE SERVED					20
ESTIMATED CAPITAL COST PER EDU					\$6,700.00

Table 5-12 Cost Opinion for S.R. 896 Designated Growth Area Alternative 3A

OPINION OF PROBABLE COST FOR STRASBURG TOWNSHIP ACT 537 PLAN PA ROUTE 896 GROWTH AREA ALTERNATIVE 3A LOW PRESSURE COLLECTION SYSTEM W/ CONNECTION TO STRASBURG BOROUGH AUTHORITY SYSTEM					
ITEM NO.	DESCRIPTION	EST. QUANTITY	UNIT	UNIT PRICE	EXTENSION
GENERAL					
1	MOBILIZATION @ 5%	1	L.S.	\$51,900.00	\$51,900.00
2	TRAFFIC MAINTENANCE & PROTECTION @2.5%	1	L.S.	\$26,000.00	\$26,000.00
LOW PRESSURE SEWER					
3	LPS MAIN -DIRECTIONAL DRILL	9,600	L.F.	\$32.00	\$307,200.00
4	LPS LATERAL	38	EA.	\$1,300.00	\$49,400.00
5	AIR/VACUUM RELEASE VALVES	6	EA.	\$5,000.00	\$30,000.00
6	ONLINE FLUSHING STATION	19	EA.	\$2,500.00	\$47,500.00
7	ENDLINE FLUSHING STATION	5	EA.	\$2,500.00	\$12,500.00
8	GRINDER PUMP - SIMPLEX	38	EA.	\$7,500.00	\$285,000.00
9	CONNECTION TO SBA SYSTEM	1	L.S.	\$257,600.00	\$257,600.00
MANHOLES					
10	MANHOLES, 4-FOOT DIAMETER	6	EA.	\$5,000.00	\$30,000.00
11	MANHOLE FRAME AND COVERS	6	EA.	\$650.00	\$3,900.00
SURFACING					
12	PAVING RESTORATION	200	S.Y.	\$66.00	\$13,200.00
13	VEGATATIVE RESTORATION	100	S.Y.	\$12.00	\$1,200.00
ESTIMATED CONSTRUCTION COSTS					\$1,115,400.00
CONSTRUCTION CONTINGENCY @ 15%					\$167,400.00
ENGINEERING, ADMIN, & LEGAL FEES					\$224,500.00
TOTAL ESTIMATED PROJECT COSTS					\$1,507,300.00
ESTIMATED NUMBER OF EDUs TO BE SERVED					38
ESTIMATED CAPITAL COST PER EDU					\$39,700.00

Table 5-13 Cost Opinion for S.R. 896 Designated Growth Area Alternative 3B

OPINION OF PROBABLE COST FOR STRASBURG TOWNSHIP ACT 537 PLAN PA ROUTE 896 GROWTH AREA ALTERNATIVE 3B COMBINATION GRAVITY/LOW PRESSURE COLLECTION SYSTEM W/ CONNECTION TO STRASBURG BOROUGH AUTHORITY					
ITEM NO.	DESCRIPTION	EST. QUANTITY	UNIT	UNIT PRICE	EXTENSION
GENERAL					
1	MOBILIZATION @ 5%	1	L.S.	\$117,100.00	\$117,100.00
2	TRAFFIC MAINTENANCE & PROTECTION @2.5%	1	L.S.	\$58,600.00	\$58,600.00
GRAVITY SEWER LINE					
3	8" PVC PIPE - AGGREGATE BACKFILL	6,050	L.F.	\$119.00	\$720,000.00
4	SERVICE LATERAL	27	EA.	\$985.00	\$26,600.00
5	CLAY DIKE	20	EA.	\$385.00	\$7,700.00
FORCE MAIN					
6	4" DIP FORCE MAIN - DIRECTIONAL DRILL	5,250	L.F.	\$65.00	\$341,300.00
7	AIR/VACUUM RELEASE VALVES	3	EA.	\$5,000.00	\$15,000.00
8	FORCE MAIN CLEANOUTS	11	EA.	\$3,500.00	\$38,500.00
9	CONNECTION TO SBA SYSTEM	1	L.S.	\$540,700.00	\$540,700.00
LOW PRESSURE SEWER					
10	LPS MAIN - DIRECTIONAL DRILL	2,050	L.F.	\$32.00	\$65,600.00
11	LPS LATERAL	12	EA.	\$1,300.00	\$15,600.00
12	AIR/VACUUM RELEASE VALVES	2	EA.	\$5,000.00	\$10,000.00
13	ONLINE FLUSHING STATION	4	EA.	\$2,500.00	\$10,000.00
14	ENDLINE FLUSHING STATION	2	EA.	\$2,500.00	\$5,000.00
15	GRINDER PUMP - SIMPLEX	12	EA.	\$7,500.00	\$90,000.00
MANHOLES					
16	MANHOLES, 4-FOOT DIAMETER	30	EA.	\$5,000.00	\$150,000.00
17	MANHOLE FRAME AND COVERS	30	EA.	\$650.00	\$19,500.00
SURFACING					
18	PAVING RESTORATION	2,100	S.Y.	\$66.00	\$138,600.00
19	VEGATATIVE RESTORATION	100	S.Y.	\$12.00	\$1,200.00
HIGHWAY CROSSINGS					
20	8" PVC PIPE	150	L.F.	\$200.00	\$30,000.00
PUMP STATION					
21	HARTMAN BRIDGE PUMP STATION (78 GPM @ 138 FT TDH)	1	L.S.	\$116,000.00	\$116,000.00
ESTIMATED CONSTRUCTION COSTS					\$2,517,000.00
CONSTRUCTION CONTINGENCY @ 15%					\$377,600.00
ENGINEERING, ADMIN, & LEGAL FEES					\$547,100.00
TOTAL ESTIMATED PROJECT COSTS					\$3,441,700.00
ESTIMATED NUMBER OF EDUs TO BE SERVED					170
ESTIMATED CAPITAL COST PER EDU					\$20,300.00

Table 5-14 Cost Opinion for S.R. 896 Designated Growth Area Alternative 3C

OPINION OF PROBABLE COST FOR STRASBURG TOWNSHIP ACT 537 PLAN PA ROUTE 896 GROWTH AREA ALTERNATIVE 3C COMBINATION GRAVITY/LOW PRESSURE COLLECTION SYSTEM W/ TREATMENT AT HERSHEY FARM WWTP					
ITEM NO.	DESCRIPTION	EST. QUANTITY	UNIT	UNIT PRICE	EXTENSION
GENERAL					
1	MOBILIZATION @ 5%	1	L.S.	\$65,800.00	\$65,800.00
2	TRAFFIC MAINTENANCE & PROTECTION @2.5%	1	L.S.	\$32,900.00	\$32,900.00
GRAVITY SEWER LINE					
3	8" PVC PIPE - AGGREGATE BACKFILL	5,700	L.F.	\$119.00	\$678,300.00
4	SERVICE LATERAL	29	EA.	\$985.00	\$28,600.00
5	CLAY DIKE	19	EA.	\$385.00	\$7,400.00
6	CONNECTION TO HERSHEY FARM WWTP	1	L.S.	\$102,600.00	\$102,600.00
LOW PRESSURE SEWER					
7	LPS MAIN - DIRECTIONAL DRILL	2,700	L.F.	\$32.00	\$86,400.00
8	LPS LATERAL	9	EA.	\$1,300.00	\$11,700.00
9	AIR/VACUUM RELEASE VALVES	2	EA.	\$5,000.00	\$10,000.00
10	ONLINE FLUSHING STATION	5	EA.	\$2,500.00	\$12,500.00
11	ENDLINE FLUSHING STATION	2	EA.	\$2,500.00	\$5,000.00
12	GRINDER PUMP - SIMPLEX	9	EA.	\$7,500.00	\$67,500.00
MANHOLES					
13	MANHOLES, 4-FOOT DIAMETER	25	EA.	\$5,000.00	\$125,000.00
14	MANHOLE FRAME AND COVERS	25	EA.	\$650.00	\$16,300.00
SURFACING					
15	PAVING RESTORATION	2,000	S.Y.	\$66.00	\$132,000.00
16	VEGATATIVE RESTORATION	100	S.Y.	\$12.00	\$1,200.00
HIGHWAY CROSSINGS					
17	8" PVC PIPE	150	L.F.	\$200.00	\$30,000.00
ESTIMATED CONSTRUCTION COSTS					\$1,413,200.00
CONSTRUCTION CONTINGENCY @ 15%					\$212,000.00
ENGINEERING, ADMIN, & LEGAL FEES					\$284,400.00
TOTAL ESTIMATED PROJECT COSTS					\$1,909,600.00
ESTIMATED NUMBER OF EDUs TO BE SERVED					38
ESTIMATED CAPITAL COST PER EDU					\$50,300.00

Table 5-15 Summary of PENNVEST Financing (1.0%, 30yrs)

Summary of Cost Opinions for Structural Alternatives - PENNVEST Financing (1.0%, 30yrs)														
Study Area	Alternative	Estimated Project Cost	Estimated Annual Debt Service	Estimated Annual O&M Cost	Estimated Annual Cost	Present Worth of Annual O&M	Total Present Worth	Number of EDUs	Number of Projected EDUs	Estimated Present Worth Per EDU	Estimated Annual Cost Per EDU	Estimated Annual Cost Per Projected EDU	Estimated Monthly Cost Per EDU	Estimated Monthly Cost Per Projected EDU
Refton	Alternative 1A	\$2,827,600	\$109,136	\$88,900	\$198,036	\$1,181,869	\$4,009,469	101	101	\$39,698	\$1,961	\$1,961	\$163	\$163
	Alternative 1B	\$2,837,200	\$109,507	\$105,600	\$215,107	\$1,403,885	\$4,241,085	101	101	\$41,991	\$2,130	\$2,130	\$177	\$177
	Alternative 1C	\$2,956,500	\$114,111	\$88,900	\$203,011	\$1,181,869	\$4,138,369	101	101	\$40,974	\$2,010	\$2,010	\$168	\$168
	Alternative 1D	\$3,242,840	\$125,163	\$84,700	\$209,863	\$1,126,033	\$4,368,873	101	101	\$43,256	\$2,078	\$2,078	\$173	\$173
	Alternative 1E	\$2,959,000	\$114,208	\$81,500	\$195,708	\$1,083,491	\$4,042,491	101	101	\$40,025	\$1,938	\$1,938	\$161	\$161
	Alternative 1F	\$2,968,400	\$114,571	\$98,200	\$212,771	\$1,305,507	\$4,273,907	101	101	\$42,316	\$2,107	\$2,107	\$176	\$176
	Alternative 1G	\$3,422,200	\$132,086	\$77,300	\$209,386	\$1,027,654	\$4,449,854	101	101	\$44,058	\$2,073	\$2,073	\$173	\$173
	Alternative 1H	\$5,431,000	\$209,619	\$70,900	\$280,519	\$942,571	\$6,373,571	101	101	\$63,105	\$2,777	\$2,777	\$231	\$231
	Alternative 1I	\$5,440,500	\$209,986	\$87,600	\$297,586	\$1,164,586	\$6,605,086	101	101	\$65,397	\$2,946	\$2,946	\$246	\$246
	Alternative 1J	\$5,895,300	\$227,539	\$66,700	\$294,239	\$886,734	\$6,782,034	101	101	\$67,149	\$2,913	\$2,913	\$243	\$243
Creekview	Alternative 2A	\$133,020	\$5,134	\$4,300	\$9,434	\$57,166	\$190,186	20	20	\$9,509	\$472	\$472	\$39	\$39
S.R. 896 Designated Growth Area	Alternative 3A	\$1,507,300	\$58,177	\$25,000	\$83,177	\$332,359	\$1,839,659	38	144	\$48,412	\$2,189	\$578	\$182	\$48
	Alternative 3B	\$3,441,700	\$132,838	\$45,100	\$177,938	\$599,576	\$4,041,276	170	276	\$23,772	\$1,047	\$645	\$87	\$54
	Alternative 3C	\$1,909,600	\$73,704	\$15,700	\$89,404	\$208,722	\$2,118,322	38	144	\$55,745	\$2,353	\$621	\$196	\$52
Notes:														
1. Annual Debt Service Calculations Assume PENNVEST Financing of 1.0% for 30 Years														
2. Present Worth Calculations Assume 4.25% for 20 Years														
3. Annual O&M Estimated based on typical common usage														

Table 5-16 Summary of PENNVEST Financing (25% Grant, 75% Loan @ 1.0%, 30yrs)

Summary of Cost Opinions for Structural Alternatives - PENNVEST Financing (25% Grant, 75% Loan @ 1.0%, 30yrs)														
Study Area	Alternative	Estimated Project Cost Less Grant	Estimated Annual Debt Service	Estimated Annual O&M Cost	Estimated Annual Cost	Present Worth of Annual O&M	Total Present Worth	Number of EDUs	Number of Projected EDUs	Estimated Present Worth Per EDU	Estimated Annual Cost Per EDU	Estimated Annual Cost Per Projected EDU	Estimated Monthly Cost Per EDU	Estimated Monthly Cost Per Projected EDU
Refton	Alternative 1A	\$2,120,700	\$81,852	\$88,900	\$170,752	\$1,181,869	\$3,302,569	101	101	\$32,699	\$1,691	\$1,691	\$141	\$141
	Alternative 1B	\$2,127,900	\$82,130	\$105,600	\$187,730	\$1,403,885	\$3,531,785	101	101	\$34,968	\$1,859	\$1,859	\$155	\$155
	Alternative 1C	\$2,217,375	\$85,583	\$88,900	\$174,483	\$1,181,869	\$3,399,244	101	101	\$33,656	\$1,728	\$1,728	\$144	\$144
	Alternative 1D	\$2,432,130	\$93,872	\$84,700	\$178,572	\$1,126,033	\$3,558,163	101	101	\$35,229	\$1,768	\$1,768	\$147	\$147
	Alternative 1E	\$2,219,250	\$85,656	\$81,500	\$167,156	\$1,083,491	\$3,302,741	101	101	\$32,700	\$1,655	\$1,655	\$138	\$138
	Alternative 1F	\$2,226,300	\$85,928	\$98,200	\$184,128	\$1,305,507	\$3,531,807	101	101	\$34,968	\$1,823	\$1,823	\$152	\$152
	Alternative 1G	\$2,566,650	\$99,064	\$77,300	\$176,364	\$1,027,654	\$3,594,304	101	101	\$35,587	\$1,746	\$1,746	\$146	\$146
	Alternative 1H	\$4,073,250	\$157,214	\$70,900	\$228,114	\$942,571	\$5,015,821	101	101	\$49,662	\$2,259	\$2,259	\$188	\$188
	Alternative 1I	\$4,080,375	\$157,489	\$87,600	\$245,089	\$1,164,586	\$5,244,961	101	101	\$51,930	\$2,427	\$2,427	\$202	\$202
	Alternative 1J	\$4,421,475	\$170,655	\$66,700	\$237,355	\$886,734	\$5,308,209	101	101	\$52,557	\$2,350	\$2,350	\$196	\$196
Creekview	Alternative 2A	\$99,765	\$3,851	\$4,300	\$8,151	\$57,166	\$156,931	20	20	\$7,847	\$408	\$408	\$34	\$34
S.R. 896 Designated Growth Area	Alternative 3A	\$1,130,475	\$43,633	\$25,000	\$68,633	\$332,359	\$1,462,834	38	144	\$38,496	\$1,806	\$477	\$151	\$40
	Alternative 3B	\$2,581,275	\$99,629	\$45,100	\$144,729	\$599,576	\$3,180,851	170	276	\$18,711	\$851	\$524	\$71	\$44
	Alternative 3C	\$1,432,200	\$55,278	\$15,700	\$70,978	\$208,722	\$1,640,922	38	144	\$43,182	\$1,868	\$493	\$156	\$41
Notes:														
1. Annual Debt Service Calculations Assume PENNVEST Financing of 1.0% for 30 Years														
2. Present Worth Calculations Assume 4.25% for 20 Years														
3. Annual O&M Estimated based on typical common usage														

Table 5-17 Summary of PENNVEST Financing (50% Grant, 50% Loan @ 1.0%, 30yrs)

Summary of Cost Opinions for Structural Alternatives - PENNVEST Financing (50% Grant; 50% Loan @ 1.0%, 30yrs)														
Study Area	Alternative	Estimated Project Cost Less Grant	Estimated Annual Debt Service	Estimated Annual O&M Cost	Estimated Annual Cost	Present Worth of Annual O&M	Total Present Worth	Number of EDUs	Number of Projected EDUs	Estimated Present Worth Per EDU	Estimated Annual Cost Per EDU	Estimated Annual Cost Per Projected EDU	Estimated Monthly Cost Per EDU	Estimated Monthly Cost Per Projected EDU
Refton	Alternative 1A	\$1,413,800	\$54,568	\$88,900	\$143,468	\$1,181,869	\$2,595,669	101	101	\$25,700	\$1,420	\$1,420	\$118	\$118
	Alternative 1B	\$1,418,600	\$54,753	\$105,600	\$160,353	\$1,403,885	\$2,822,485	101	101	\$27,945	\$1,588	\$1,588	\$132	\$132
	Alternative 1C	\$1,478,250	\$57,056	\$88,900	\$145,956	\$1,181,869	\$2,660,119	101	101	\$26,338	\$1,445	\$1,445	\$120	\$120
	Alternative 1D	\$1,621,420	\$62,582	\$84,700	\$147,282	\$1,126,033	\$2,747,453	101	101	\$27,203	\$1,458	\$1,458	\$122	\$122
	Alternative 1E	\$1,479,500	\$57,104	\$81,500	\$138,604	\$1,083,491	\$2,562,991	101	101	\$25,376	\$1,372	\$1,372	\$114	\$114
	Alternative 1F	\$1,484,200	\$57,285	\$98,200	\$155,485	\$1,305,507	\$2,789,707	101	101	\$27,621	\$1,539	\$1,539	\$128	\$128
	Alternative 1G	\$1,711,100	\$66,043	\$77,300	\$143,343	\$1,027,654	\$2,738,754	101	101	\$27,116	\$1,419	\$1,419	\$118	\$118
	Alternative 1H	\$2,715,500	\$104,809	\$70,900	\$175,709	\$942,571	\$3,658,071	101	101	\$36,219	\$1,740	\$1,740	\$145	\$145
	Alternative 1I	\$2,720,250	\$104,993	\$87,600	\$192,593	\$1,164,586	\$3,884,836	101	101	\$38,464	\$1,907	\$1,907	\$159	\$159
	Alternative 1J	\$2,947,650	\$113,770	\$66,700	\$180,470	\$886,734	\$3,834,384	101	101	\$37,964	\$1,787	\$1,787	\$149	\$149
Creekview	Alternative 2A	\$66,510	\$2,567	\$4,300	\$6,867	\$57,166	\$123,676	20	20	\$6,184	\$343	\$343	\$29	\$29
S.R. 896 Designated Growth Area	Alternative 3A	\$753,650	\$29,088	\$25,000	\$54,088	\$332,359	\$1,086,009	38	144	\$28,579	\$1,423	\$376	\$119	\$31
	Alternative 3B	\$1,720,850	\$66,419	\$45,100	\$111,519	\$599,576	\$2,320,426	170	276	\$13,650	\$656	\$404	\$55	\$34
	Alternative 3C	\$954,800	\$36,852	\$15,700	\$52,552	\$208,722	\$1,163,522	38	144	\$30,619	\$1,383	\$365	\$115	\$30
Notes:														
1. Annual Debt Service Calculations Assume PENNVEST Financing of 1.0% for 30 Years														
2. Present Worth Calculations Assume 4.25% for 20 Years														
3. Annual O&M Estimated based on typical common usage														

Table 5-18 Summary of PENNVEST Financing (75% Grant, 25% Loan @ 1.0%, 30yrs)

Summary of Cost Opinions for Structural Alternatives - PENNVEST Financing (75% Grant; 25% Loan @ 1.0%, 30yrs)														
Study Area	Alternative	Estimated Project Cost Less Grant	Estimated Annual Debt Service	Estimated Annual O&M Cost	Estimated Annual Cost	Present Worth of Annual O&M	Total Present Worth	Number of EDUs	Number of Projected EDUs	Estimated Present Worth Per EDU	Estimated Annual Cost Per EDU	Estimated Annual Cost Per Projected EDU	Estimated Monthly Cost Per EDU	Estimated Monthly Cost Per Projected EDU
Refton	Alternative 1A	\$706,900	\$27,284	\$88,900	\$116,184	\$1,181,869	\$1,888,769	101	101	\$18,701	\$1,150	\$1,150	\$96	\$96
	Alternative 1B	\$709,300	\$27,377	\$105,600	\$132,977	\$1,403,885	\$2,113,185	101	101	\$20,923	\$1,317	\$1,317	\$110	\$110
	Alternative 1C	\$739,125	\$28,528	\$88,900	\$117,428	\$1,181,869	\$1,920,994	101	101	\$19,020	\$1,163	\$1,163	\$97	\$97
	Alternative 1D	\$810,710	\$31,291	\$84,700	\$115,991	\$1,126,033	\$1,936,743	101	101	\$19,176	\$1,148	\$1,148	\$96	\$96
	Alternative 1E	\$739,750	\$28,552	\$81,500	\$110,052	\$1,083,491	\$1,823,241	101	101	\$18,052	\$1,090	\$1,090	\$91	\$91
	Alternative 1F	\$742,100	\$28,643	\$98,200	\$126,843	\$1,305,507	\$2,047,607	101	101	\$20,273	\$1,256	\$1,256	\$105	\$105
	Alternative 1G	\$855,550	\$33,021	\$77,300	\$110,321	\$1,027,654	\$1,883,204	101	101	\$18,646	\$1,092	\$1,092	\$91	\$91
	Alternative 1H	\$1,357,750	\$52,405	\$70,900	\$123,305	\$942,571	\$2,300,321	101	101	\$22,775	\$1,221	\$1,221	\$102	\$102
	Alternative 1I	\$1,360,125	\$52,496	\$87,600	\$140,096	\$1,164,586	\$2,524,711	101	101	\$24,997	\$1,387	\$1,387	\$116	\$116
	Alternative 1J	\$1,473,825	\$56,885	\$66,700	\$123,585	\$886,734	\$2,360,559	101	101	\$23,372	\$1,224	\$1,224	\$102	\$102
Creekview	Alternative 2A	\$33,255	\$1,284	\$4,300	\$5,584	\$57,166	\$90,421	20	20	\$4,521	\$279	\$279	\$23	\$23
S.R. 896 Designated Growth Area	Alternative 3A	\$376,825	\$14,544	\$25,000	\$39,544	\$332,359	\$709,184	38	144	\$18,663	\$1,041	\$275	\$87	\$23
	Alternative 3B	\$860,425	\$33,210	\$45,100	\$78,310	\$599,576	\$1,460,001	170	276	\$8,588	\$461	\$284	\$38	\$24
	Alternative 3C	\$477,400	\$18,426	\$15,700	\$34,126	\$208,722	\$686,122	38	144	\$18,056	\$898	\$237	\$75	\$20
Notes:														
1. Annual Debt Service Calculations Assume PENNVEST Financing of 1.0% for 30 Years														
2. Present Worth Calculations Assume 4.25% for 20 Years														
3. Annual O&M Estimated based on typical common usage														

Table 5-19 Summary of PENNVEST Financing (85% Grant, 15% Loan @ 1.0%, 30yrs)

Summary of Cost Opinions for Structural Alternatives - PENNVEST Financing (85% Grant; 15% Loan @ 1.0%, 30yrs)														
Study Area	Alternative	Estimated Project Cost Less Grant	Estimated Annual Debt Service	Estimated Annual O&M Cost	Estimated Annual Cost	Present Worth of Annual O&M	Total Present Worth	Number of EDUs	Number of Projected EDUs	Estimated Present Worth Per EDU	Estimated Annual Cost Per EDU	Estimated Annual Cost Per Projected EDU	Estimated Monthly Cost Per EDU	Estimated Monthly Cost Per Projected EDU
Refton	Alternative 1A	\$424,140	\$16,370	\$88,900	\$105,270	\$1,181,869	\$1,606,009	101	101	\$15,901	\$1,042	\$1,042	\$87	\$87
	Alternative 1B	\$425,580	\$16,426	\$105,600	\$122,026	\$1,403,885	\$1,829,465	101	101	\$18,114	\$1,208	\$1,208	\$101	\$101
	Alternative 1C	\$443,475	\$17,117	\$88,900	\$106,017	\$1,181,869	\$1,625,344	101	101	\$16,093	\$1,050	\$1,050	\$87	\$87
	Alternative 1D	\$486,426	\$18,774	\$84,700	\$103,474	\$1,126,033	\$1,612,459	101	101	\$15,965	\$1,024	\$1,024	\$85	\$85
	Alternative 1E	\$443,850	\$17,131	\$81,500	\$98,631	\$1,083,491	\$1,527,341	101	101	\$15,122	\$977	\$977	\$81	\$81
	Alternative 1F	\$445,260	\$17,186	\$98,200	\$115,386	\$1,305,507	\$1,750,767	101	101	\$17,334	\$1,142	\$1,142	\$95	\$95
	Alternative 1G	\$513,330	\$19,813	\$77,300	\$97,113	\$1,027,654	\$1,540,984	101	101	\$15,257	\$962	\$962	\$80	\$80
	Alternative 1H	\$814,650	\$31,443	\$70,900	\$102,343	\$942,571	\$1,757,221	101	101	\$17,398	\$1,013	\$1,013	\$84	\$84
	Alternative 1I	\$816,075	\$31,498	\$87,600	\$119,098	\$1,164,586	\$1,980,661	101	101	\$19,611	\$1,179	\$1,179	\$98	\$98
	Alternative 1J	\$884,295	\$34,131	\$66,700	\$100,831	\$886,734	\$1,771,029	101	101	\$17,535	\$998	\$998	\$83	\$83
Creekview	Alternative 2A	\$19,953	\$770	\$4,300	\$5,070	\$57,166	\$77,119	20	20	\$3,856	\$254	\$254	\$21	\$21
S.R. 896 Designated Growth Area	Alternative 3A	\$226,095	\$8,727	\$25,000	\$33,727	\$332,359	\$558,454	38	144	\$14,696	\$888	\$234	\$74	\$20
	Alternative 3B	\$516,255	\$19,926	\$45,100	\$65,026	\$599,576	\$1,115,831	170	276	\$6,564	\$383	\$236	\$32	\$20
	Alternative 3C	\$286,440	\$11,056	\$15,700	\$26,756	\$208,722	\$495,162	38	144	\$13,031	\$704	\$186	\$59	\$15
Notes:														
1. Annual Debt Service Calculations Assume PENNVEST Financing of 1.0% for 30 Years														
2. Present Worth Calculations Assume 4.25% for 20 Years														
3. Annual O&M Estimated based on typical common usage														

Table 5-20 Summary of USDA RUS Financing (3.45%, 40yrs)

Summary of Cost Opinions for Structural Alternatives - USDA RUS Financing (3.45%, 40yrs)														
Study Area	Alternative	Estimated Project Cost	Estimated Annual Debt Service	Estimated Annual O&M Cost	Estimated Annual Cost	Present Worth of Annual O&M	Total Present Worth	Number of EDUs	Number of Projected EDUs	Estimated Present Worth Per EDU	Estimated Annual Cost Per EDU	Estimated Annual Cost Per Projected EDU	Estimated Monthly Cost Per EDU	Estimated Monthly Cost Per Projected EDU
Refton	Alternative 1A	\$2,827,600	\$130,431	\$88,900	\$219,331	\$1,181,869	\$4,009,469	101	101	\$39,698	\$2,172	\$2,172	\$181	\$181
	Alternative 1B	\$2,837,200	\$130,874	\$105,600	\$236,474	\$1,403,885	\$4,241,085	101	101	\$41,991	\$2,341	\$2,341	\$195	\$195
	Alternative 1C	\$2,956,500	\$136,377	\$88,900	\$225,277	\$1,181,869	\$4,138,369	101	101	\$40,974	\$2,230	\$2,230	\$186	\$186
	Alternative 1D	\$3,242,840	\$149,585	\$84,700	\$234,285	\$1,126,033	\$4,368,873	101	101	\$43,256	\$2,320	\$2,320	\$193	\$193
	Alternative 1E	\$2,959,000	\$136,492	\$81,500	\$217,992	\$1,083,491	\$4,042,491	101	101	\$40,025	\$2,158	\$2,158	\$180	\$180
	Alternative 1F	\$2,968,400	\$136,926	\$98,200	\$235,126	\$1,305,507	\$4,273,907	101	101	\$42,316	\$2,328	\$2,328	\$194	\$194
	Alternative 1G	\$3,422,200	\$157,858	\$77,300	\$235,158	\$1,027,654	\$4,449,854	101	101	\$44,058	\$2,328	\$2,328	\$194	\$194
	Alternative 1H	\$5,431,000	\$250,520	\$70,900	\$321,420	\$942,571	\$6,373,571	101	101	\$63,105	\$3,182	\$3,182	\$265	\$265
	Alternative 1I	\$5,440,500	\$250,958	\$87,600	\$338,558	\$1,164,586	\$6,605,086	101	101	\$65,397	\$3,352	\$3,352	\$279	\$279
	Alternative 1J	\$5,895,300	\$271,937	\$66,700	\$338,637	\$886,734	\$6,782,034	101	101	\$67,149	\$3,353	\$3,353	\$279	\$279
Creekview	Alternative 2A	\$133,020	\$6,136	\$4,300	\$10,436	\$57,166	\$190,186	20	20	\$9,509	\$522	\$522	\$43	\$43
S.R. 896 Designated Growth Area	Alternative 3A	\$1,507,300	\$69,528	\$25,000	\$94,528	\$332,359	\$1,839,659	38	144	\$48,412	\$2,488	\$656	\$207	\$55
	Alternative 3B	\$3,441,700	\$158,758	\$45,100	\$203,858	\$599,576	\$4,041,276	170	276	\$23,772	\$1,199	\$739	\$100	\$62
	Alternative 3C	\$1,909,600	\$88,086	\$15,700	\$103,786	\$208,722	\$2,118,322	38	144	\$55,745	\$2,731	\$721	\$228	\$60
Notes:														
1. Annual Debt Service Calculations Assume USDA RUS Financing of 3.45% for 40 Years														
2. Present Worth Calculations Assume 4.25% for 20 Years														
3. Annual O&M Estimated based on typical common usage														

Table 5-21 Summary of USDA RUS Financing (25% Grant, 75% Loan @ 3.45%, 40yrs)

Summary of Cost Opinions for Structural Alternatives - USDA RUS Financing (25% Grant; 75% Loan @ 3.45%, 40yrs)														
Study Area	Alternative	Estimated Project Cost Less Grant	Estimated Annual Debt Service	Estimated Annual O&M Cost	Estimated Annual Cost	Present Worth of Annual O&M	Total Present Worth	Number of EDUs	Number of Projected EDUs	Estimated Present Worth Per EDU	Estimated Annual Cost Per EDU	Estimated Annual Cost Per Projected EDU	Estimated Monthly Cost Per EDU	Estimated Monthly Cost Per Projected EDU
Refton	Alternative 1A	\$2,120,700	\$97,823	\$88,900	\$186,723	\$1,181,869	\$3,302,569	101	101	\$32,699	\$1,849	\$1,849	\$154	\$154
	Alternative 1B	\$2,127,900	\$98,155	\$105,600	\$203,755	\$1,403,885	\$3,531,785	101	101	\$34,968	\$2,017	\$2,017	\$168	\$168
	Alternative 1C	\$2,217,375	\$102,283	\$130,874	\$233,156	\$1,739,882	\$3,957,257	101	101	\$39,181	\$2,308	\$2,308	\$192	\$192
	Alternative 1D	\$2,432,130	\$112,189	\$84,700	\$196,889	\$1,126,033	\$3,558,163	101	101	\$35,229	\$1,949	\$1,949	\$162	\$162
	Alternative 1E	\$2,219,250	\$102,369	\$81,500	\$183,869	\$1,083,491	\$3,302,741	101	101	\$32,700	\$1,820	\$1,820	\$152	\$152
	Alternative 1F	\$2,226,300	\$102,694	\$98,200	\$200,894	\$1,305,507	\$3,531,807	101	101	\$34,968	\$1,989	\$1,989	\$166	\$166
	Alternative 1G	\$2,566,650	\$118,394	\$77,300	\$195,694	\$1,027,654	\$3,594,304	101	101	\$35,587	\$1,938	\$1,938	\$161	\$161
	Alternative 1H	\$4,073,250	\$187,890	\$70,900	\$258,790	\$942,571	\$5,015,821	101	101	\$49,662	\$2,562	\$2,562	\$214	\$214
	Alternative 1I	\$4,080,375	\$188,219	\$87,600	\$275,819	\$1,164,586	\$5,244,961	101	101	\$51,930	\$2,731	\$2,731	\$228	\$228
	Alternative 1J	\$4,421,475	\$203,953	\$66,700	\$270,653	\$886,734	\$5,308,209	101	101	\$52,557	\$2,680	\$2,680	\$223	\$223
Creekview	Alternative 2A	\$99,765	\$4,602	\$4,300	\$8,902	\$57,166	\$156,931	20	20	\$7,847	\$445	\$445	\$37	\$37
S.R. 896 Designated Growth Area	Alternative 3A	\$1,130,475	\$52,146	\$25,000	\$77,146	\$332,359	\$1,462,834	38	144	\$38,496	\$2,030	\$536	\$169	\$45
	Alternative 3B	\$2,581,275	\$119,068	\$45,100	\$164,168	\$599,576	\$3,180,851	170	276	\$18,711	\$966	\$595	\$80	\$50
	Alternative 3C	\$1,432,200	\$66,064	\$15,700	\$81,764	\$208,722	\$1,640,922	38	144	\$43,182	\$2,152	\$568	\$179	\$47
Notes:														
1. Annual Debt Service Calculations Assume USDA RUS Financing of 3.45% for 40 Years														
2. Present Worth Calculations Assume 4.25% for 20 Years														
3. Annual O&M Estimated based on typical common usage														

Table 5-22 Summary of USDA RUS Financing (50% Grant, 50% Loan @ 3.45%, 40yrs)

Summary of Cost Opinions for Structural Alternatives - USDA Financing (50% Grant; 50% Loan @3.45%, 40yrs)														
Study Area	Alternative	Estimated Project Cost Less Grant	Estimated Annual Debt Service	Estimated Annual O&M Cost	Estimated Annual Cost	Present Worth of Annual O&M	Total Present Worth	Number of EDUs	Number of Projected EDUs	Estimated Present Worth Per EDU	Estimated Annual Cost Per EDU	Estimated Annual Cost Per Projected EDU	Estimated Monthly Cost Per EDU	Estimated Monthly Cost Per Projected EDU
Refton	Alternative 1A	\$1,413,800	\$65,215	\$88,900	\$154,115	\$1,181,869	\$2,595,669	101	101	\$25,700	\$1,526	\$1,526	\$127	\$127
	Alternative 1B	\$1,418,600	\$65,437	\$105,600	\$171,037	\$1,403,885	\$2,822,485	101	101	\$27,945	\$1,693	\$1,693	\$141	\$141
	Alternative 1C	\$1,478,250	\$68,188	\$88,900	\$157,088	\$1,181,869	\$2,660,119	101	101	\$26,338	\$1,555	\$1,555	\$130	\$130
	Alternative 1D	\$1,621,420	\$74,792	\$84,700	\$159,492	\$1,126,033	\$2,747,453	101	101	\$27,203	\$1,579	\$1,579	\$132	\$132
	Alternative 1E	\$1,479,500	\$68,246	\$81,500	\$149,746	\$1,083,491	\$2,562,991	101	101	\$25,376	\$1,483	\$1,483	\$124	\$124
	Alternative 1F	\$1,484,200	\$68,463	\$98,200	\$166,663	\$1,305,507	\$2,789,707	101	101	\$27,621	\$1,650	\$1,650	\$138	\$138
	Alternative 1G	\$1,711,100	\$78,929	\$77,300	\$156,229	\$1,027,654	\$2,738,754	101	101	\$27,116	\$1,547	\$1,547	\$129	\$129
	Alternative 1H	\$2,715,500	\$125,260	\$70,900	\$196,160	\$942,571	\$3,658,071	101	101	\$36,219	\$1,942	\$1,942	\$162	\$162
	Alternative 1I	\$2,720,250	\$125,479	\$87,600	\$213,079	\$1,164,586	\$3,884,836	101	101	\$38,464	\$2,110	\$2,110	\$176	\$176
	Alternative 1J	\$2,947,650	\$135,968	\$66,700	\$202,668	\$886,734	\$3,834,384	101	101	\$37,964	\$2,007	\$2,007	\$167	\$167
Creekview	Alternative 2A	\$66,510	\$3,068	\$4,300	\$7,368	\$57,166	\$123,676	20	20	\$6,184	\$368	\$368	\$31	\$31
S.R. 896 Designated Growth Area	Alternative 3A	\$753,650	\$34,764	\$25,000	\$59,764	\$332,359	\$1,086,009	38	144	\$28,579	\$1,573	\$415	\$131	\$35
	Alternative 3B	\$1,720,850	\$79,379	\$45,100	\$124,479	\$599,576	\$2,320,426	170	276	\$13,650	\$732	\$451	\$61	\$38
	Alternative 3C	\$954,800	\$44,043	\$15,700	\$59,743	\$208,722	\$1,163,522	38	144	\$30,619	\$1,572	\$415	\$131	\$35
Notes:														
1. Annual Debt Service Calculations Assume USDA RUS Financing of 3.45% for 40 Years														
2. Present Worth Calculations Assume 4.25% for 20 Years														
3. Annual O&M Estimated based on typical common usage														

Table 5-23 Summary of USDA RUS Financing (75% Grant, 25% Loan @ 3.45%, 40yrs)

Summary of Cost Opinions for Structural Alternatives - USDA Financing (75% Grant; 25% Loan @3.45%, 40yrs)														
Study Area	Alternative	Estimated Project Cost Less Grant	Estimated Annual Debt Service	Estimated Annual O&M Cost	Estimated Annual Cost	Present Worth of Annual O&M	Total Present Worth	Number of EDUs	Number of Projected EDUs	Estimated Present Worth Per EDU	Estimated Annual Cost Per EDU	Estimated Annual Cost Per Projected EDU	Estimated Monthly Cost Per EDU	Estimated Monthly Cost Per Projected EDU
Refton	Alternative 1A	\$706,900	\$32,608	\$88,900	\$121,508	\$1,181,869	\$1,888,769	101	101	\$18,701	\$1,203	\$1,203	\$100	\$100
	Alternative 1B	\$709,300	\$32,718	\$105,600	\$138,318	\$1,403,885	\$2,113,185	101	101	\$20,923	\$1,369	\$1,369	\$114	\$114
	Alternative 1C	\$739,125	\$34,094	\$88,900	\$122,994	\$1,181,869	\$1,920,994	101	101	\$19,020	\$1,218	\$1,218	\$101	\$101
	Alternative 1D	\$810,710	\$37,396	\$84,700	\$122,096	\$1,126,033	\$1,936,743	101	101	\$19,176	\$1,209	\$1,209	\$101	\$101
	Alternative 1E	\$739,750	\$34,123	\$81,500	\$115,623	\$1,083,491	\$1,823,241	101	101	\$18,052	\$1,145	\$1,145	\$95	\$95
	Alternative 1F	\$742,100	\$34,231	\$98,200	\$132,431	\$1,305,507	\$2,047,607	101	101	\$20,273	\$1,311	\$1,311	\$109	\$109
	Alternative 1G	\$855,550	\$39,465	\$77,300	\$116,765	\$1,027,654	\$1,883,204	101	101	\$18,646	\$1,156	\$1,156	\$96	\$96
	Alternative 1H	\$1,357,750	\$62,630	\$70,900	\$133,530	\$942,571	\$2,300,321	101	101	\$22,775	\$1,322	\$1,322	\$110	\$110
	Alternative 1I	\$1,360,125	\$62,740	\$87,600	\$150,340	\$1,164,586	\$2,524,711	101	101	\$24,997	\$1,489	\$1,489	\$124	\$124
	Alternative 1J	\$1,473,825	\$67,984	\$66,700	\$134,684	\$886,734	\$2,360,559	101	101	\$23,372	\$1,334	\$1,334	\$111	\$111
Creekview	Alternative 2A	\$33,255	\$1,534	\$4,300	\$5,834	\$57,166	\$90,421	20	20	\$4,521	\$292	\$292	\$24	\$24
S.R. 896 Designated Growth Area	Alternative 3A	\$376,825	\$17,382	\$25,000	\$42,382	\$332,359	\$709,184	38	144	\$18,663	\$1,115	\$294	\$93	\$25
	Alternative 3B	\$860,425	\$39,689	\$45,100	\$84,789	\$599,576	\$1,460,001	170	276	\$8,588	\$499	\$307	\$42	\$26
	Alternative 3C	\$477,400	\$22,021	\$15,700	\$37,721	\$208,722	\$686,122	38	144	\$18,056	\$993	\$262	\$83	\$22
Notes:														
1. Annual Debt Service Calculations Assume USDA RUS Financing of 3.45% for 40 Years														
2. Present Worth Calculations Assume 4.25% for 20 Years														
3. Annual O&M Estimated based on typical common usage														

Table 5-24 Summary of Bond Financing (5.0%, 25yrs)

Summary of Cost Opinions for Structural Alternatives - Bond Financing (5.0%, 25yrs)														
Study Area	Alternative	Estimated Project Cost	Estimated Annual Debt Service	Estimated Annual O&M Cost	Estimated Annual Cost	Present Worth of Annual O&M	Total Present Worth	Number of EDUs	Number of Projected EDUs	Estimated Present Worth Per EDU	Estimated Annual Cost Per EDU	Estimated Annual Cost Per Projected EDU	Estimated Monthly Cost Per EDU	Estimated Monthly Cost Per Projected EDU
Refton	Alternative 1A	\$2,827,600	\$198,358	\$88,900	\$287,258	\$1,181,869	\$4,009,469	101	101	\$39,698	\$2,844	\$2,844	\$237	\$237
	Alternative 1B	\$2,837,200	\$199,032	\$105,600	\$304,632	\$1,403,885	\$4,241,085	101	101	\$41,991	\$3,016	\$3,016	\$251	\$251
	Alternative 1C	\$2,956,500	\$207,401	\$88,900	\$296,301	\$1,181,869	\$4,138,369	101	101	\$40,974	\$2,934	\$2,934	\$244	\$244
	Alternative 1D	\$3,242,840	\$227,488	\$84,700	\$312,188	\$1,126,033	\$4,368,873	101	101	\$43,256	\$3,091	\$3,091	\$258	\$258
	Alternative 1E	\$2,959,000	\$207,576	\$81,500	\$289,076	\$1,083,491	\$4,042,491	101	101	\$40,025	\$2,862	\$2,862	\$239	\$239
	Alternative 1F	\$2,968,400	\$208,236	\$98,200	\$306,436	\$1,305,507	\$4,273,907	101	101	\$42,316	\$3,034	\$3,034	\$253	\$253
	Alternative 1G	\$3,422,200	\$240,070	\$77,300	\$317,370	\$1,027,654	\$4,449,854	101	101	\$44,058	\$3,142	\$3,142	\$262	\$262
	Alternative 1H	\$5,431,000	\$380,989	\$70,900	\$451,889	\$942,571	\$6,373,571	101	101	\$63,105	\$4,474	\$4,474	\$373	\$373
	Alternative 1I	\$5,440,500	\$381,655	\$87,600	\$469,255	\$1,164,586	\$6,605,086	101	101	\$65,397	\$4,646	\$4,646	\$387	\$387
	Alternative 1J	\$5,895,300	\$413,560	\$66,700	\$480,260	\$886,734	\$6,782,034	101	101	\$67,149	\$4,755	\$4,755	\$396	\$396
Creekview	Alternative 2A	\$133,020	\$9,331	\$4,300	\$13,631	\$57,166	\$190,186	20	20	\$9,509	\$682	\$682	\$57	\$57
S.R. 896 Designated Growth Area	Alternative 3A	\$1,507,300	\$105,738	\$25,000	\$130,738	\$332,359	\$1,839,659	38	144	\$48,412	\$3,440	\$908	\$287	\$76
	Alternative 3B	\$3,441,700	\$241,438	\$45,100	\$286,538	\$599,576	\$4,041,276	170	276	\$23,772	\$1,686	\$1,038	\$140	\$87
	Alternative 3C	\$1,909,600	\$133,960	\$15,700	\$149,660	\$208,722	\$2,118,322	38	144	\$55,745	\$3,938	\$1,039	\$328	\$87
Notes:														
1. Annual Debt Service Calculations Assume Bond Financing of 5.0% for 25 Years														
2. Present Worth Calculations Assume 4.25% for 20 Years														
3. Annual O&M Estimated based on typical common usage														

Table 5-25 Summary of Municipal Bank Financing (6.0%, 20yrs)

Summary of Cost Opinions for Structural Alternatives - Municipal Bank Financing (6.0%, 20yrs)														
Study Area	Alternative	Estimated Project Cost	Estimated Annual Debt Service	Estimated Annual O&M Cost	Estimated Annual Cost	Present Worth of Annual O&M	Total Present Worth	Number of EDUs	Number of Projected EDUs	Estimated Present Worth Per EDU	Estimated Annual Cost Per EDU	Estimated Annual Cost Per Projected EDU	Estimated Monthly Cost Per EDU	Estimated Monthly Cost Per Projected EDU
Refton	Alternative 1A	\$2,827,600	\$243,094	\$88,900	\$331,994	\$1,181,869	\$4,009,469	101	101	\$39,698	\$3,287	\$3,287	\$274	\$274
	Alternative 1B	\$2,837,200	\$243,919	\$105,600	\$349,519	\$1,403,885	\$4,241,085	101	101	\$41,991	\$3,461	\$3,461	\$288	\$288
	Alternative 1C	\$2,956,500	\$254,175	\$88,900	\$343,075	\$1,181,869	\$4,138,369	101	101	\$40,974	\$3,397	\$3,397	\$283	\$283
	Alternative 1D	\$3,242,840	\$278,793	\$84,700	\$363,493	\$1,126,033	\$4,368,873	101	101	\$43,256	\$3,599	\$3,599	\$300	\$300
	Alternative 1E	\$2,959,000	\$254,390	\$81,500	\$335,890	\$1,083,491	\$4,042,491	101	101	\$40,025	\$3,326	\$3,326	\$277	\$277
	Alternative 1F	\$2,968,400	\$255,198	\$98,200	\$353,398	\$1,305,507	\$4,273,907	101	101	\$42,316	\$3,499	\$3,499	\$292	\$292
	Alternative 1G	\$3,422,200	\$294,212	\$77,300	\$371,512	\$1,027,654	\$4,449,854	101	101	\$44,058	\$3,678	\$3,678	\$307	\$307
	Alternative 1H	\$5,431,000	\$466,912	\$70,900	\$537,812	\$942,571	\$6,373,571	101	101	\$63,105	\$5,325	\$5,325	\$444	\$444
	Alternative 1I	\$5,440,500	\$467,729	\$87,600	\$555,329	\$1,164,586	\$6,605,086	101	101	\$65,397	\$5,498	\$5,498	\$458	\$458
	Alternative 1J	\$5,895,300	\$506,829	\$66,700	\$573,529	\$886,734	\$6,782,034	101	101	\$67,149	\$5,679	\$5,679	\$473	\$473
Creekview	Alternative 2A	\$133,020	\$11,436	\$4,300	\$15,736	\$57,166	\$190,186	20	20	\$9,509	\$787	\$787	\$66	\$66
S.R. 896 Designated Growth Area	Alternative 3A	\$1,507,300	\$129,585	\$25,000	\$154,585	\$332,359	\$1,839,659	38	144	\$48,412	\$4,068	\$1,074	\$339	\$89
	Alternative 3B	\$3,441,700	\$295,889	\$45,100	\$340,989	\$599,576	\$4,041,276	170	276	\$23,772	\$2,006	\$1,235	\$167	\$103
	Alternative 3C	\$1,909,600	\$164,172	\$15,700	\$179,872	\$208,722	\$2,118,322	38	144	\$55,745	\$4,733	\$1,249	\$394	\$104
Notes:														
1. Annual Debt Service Calculations Assume Municipal Bank Financing of 6.0% for 20 Years														
2. Present Worth Calculations Assume 4.25% for 20 Years														
3. Annual O&M Estimated based on typical common usage														

5.11 INTERMUNICIPAL WASTEWATER TREATMENT ALTERNATIVES

As identified in Alternatives 1D, 1G, and 1J, connection to the SLSA system and as identified in Alternatives 2A, 3A and 3B, connection to SBA system has been evaluated as part of this Plan. It should be noted that the assumptions and cost estimates used to prepare the present worth analyses are preliminary in nature as intermunicipal agreements between Strasburg Township, SLSA, and SBA providing for the conveyance of Strasburg Township wastewater flows to City of Lancaster AWWTF have not been completed at this point.

As identified in Alternative 3C, connection to the Hershey Farm PWWTF has been evaluated as part of this Plan. It should be noted that the assumptions and cost estimates used to prepare the present worth analyses are preliminary in nature as an agreement with the private owner of the PWWTF have not been completed at this point.

It should be noted that the structural alternatives evaluated utilizing the City of Lancaster AWWTF for wastewater treatment does not include an operation and maintenance savings for nutrient offsets (TN and TP) as a result of OLDS retirement and/or package wastewater treatment plant abandonment. It is anticipated that there will be a cost savings; however, the costs cannot be estimated with a high degree of surety at this time.

Continued cooperation and negotiations between Strasburg Township, SLSA, SBA, and/or the private owner of the Hershey Farm PWWTF will be required based on the recommendations of this Plan. It should be noted that capacity is available for connection to SLSA system via SBA system for future development in the S.R. 896 DGA and treatment at the Hershey Farm PWWTF. As previously noted, a letter from Hershey Farm and the Strasburg Borough Authority indicating their willingness to provide sanitary sewer service as conditions and/or development warrants is provided in Appendix E.

5.12 CONCLUSIONS

Based on the discussion above, the following are recommendations for the wastewater planning needs enumerated in Chapter 4.

1. **Strasburg Township shall continue to enforce the On-lot Management Ordinance governing the management of on-lot disposal systems (OLDS) within the Township.**

As discussed in Chapter 3, a low percentage of confirmed on-lot malfunctions were observed during the sanitary survey completed in this Act 537 Plan. The implementation of the Township's On-lot Management Ordinance may be responsible for preventing the malfunction of on-lot systems as the Ordinance provides for the inspection, maintenance, and mandatory pumping of on-lot systems. The Township should continue to implement the Ordinance in areas of the Township served by OLDS to prevent the malfunctioning of the on-lot systems and to preserve the water quality of private well supplies.

For continued implementation of the Township's On-lot Management Ordinance, it is recommended that the Township consider amending the ordinance to include OLDS maintenance districts to establish a pumping and inspection schedule to assure the long-term operation of the existing and proposed on-lot disposal systems in the Township and to preserve the water quality of the private wells. It is suggested that the Township be

divided into three (3) districts, designated as OLDS Management District 1, 2, and 3 as shown on the OLDS Management District Map (see Map in Appendix F). By dividing the Township into districts, the Township's certified SEO will have a more manageable number of systems to inspect on an annual rotating basis. The Township may consider amending the current On-lot Management Ordinance after adoption of this Plan.

2. Public sewer service should be provided in the Refton Study Area and in the Creekview Study Area when public funding becomes available.

As discussed throughout this Plan, the Refton and Creekview Study Areas are the only areas of the Township currently utilizing OLDS which currently require an upgrade of sewage facilities to correct malfunctioning OLDS. The structural alternatives evaluated in this Plan to provide public sewer service to these Study Areas represent technically feasible solutions for wastewater management in these areas. Of the identified alternatives for the Refton Study Area, it is recommended that the Township pursue Alternative 1A. This alternative is environmentally sound, resulting in the abandonment of malfunctioning OLDS in the area, is consistent with all local, regional, and state planning objectives. This alternative provides for a low pressure sewer system to serve the Village of Refton and convey all wastewater to a proposed biological nutrient removal wastewater treatment facility. The wastewater treatment facility will consist of a series of septic tanks, recirculating sand filters, constructed wetland, and final effluent disposal via in-ground drainage beds.

Connection of sewage facilities to the SBA system for the Creekview Study Area is contingent upon a favorable intermunicipal agreement. Completion of an inspection and evaluation of the existing sewer facilities would be required prior to connection to the SBA system. This alternative also results in the abandonment of malfunctioning OLDS in the area where there is high density development with limited lot sizes for replacement OLDS.

3. S.R. 896 Designated Growth Area will utilize developer built sewer extension(s) for all new development, connecting existing properties where appropriate, and will continue to utilize OLDS for sewage disposal until new developer connections are available.

The sanitary sewage surveys and well water sampling conducted as part of this Plan's preparation indicate that the S.R. 896 DGA do not require immediate sewage facilities upgrades. The alternatives evaluated in this Plan for the S.R. 896 DGA are to be considered as needed for correcting malfunctioning OLDS and/or for accommodating projected commercial and residential development in conformity with the Strasburg Region Comprehensive Plan.

In the case of new development in the S.R. 896 DGA, sewage facilities shall be provided by the developer at their cost with laterals/points of connections for existing residential and commercial properties along proposed sewer extensions to connect to either the SBA system or the Hershey Farm PWWTF for treatment. The developer shall negotiate all agreements for connection to the SBA system or the Hershey Farm PWWTF with the participation and approval of the Township. Sewage facilities built for the S.R. 896 DGA shall be adequately sized for the future connection of the existing residents and businesses currently utilizing OLDS as well as planned and projected development in the S.R. 896 DGA. This will be enforced through the Subdivision and Land Development approval process.

The Township's SEO will continue to direct the repair of malfunctioning OLDS in accordance with DEP rules and regulations. Additionally, the continued implementation of the Township's On-lot Management Ordinance is expected to reduce the number of OLDS and well water contamination observed in these areas.

4. Strasburg Township shall adopt an ordinance requiring mandatory connection of commercial and residential structures in the Township to public sewer when available.

In order to improve the quality of water supplies, protect public health, and increase the feasibility of public sewer service for the Township, an Ordinance shall be passed by the Township, mandating commercial and residential structures located within 300-feet of public sewer to connect to the public sewer system.