

# **ACT 537 PLAN REVISION**

**FOR**

**UPPER MILFORD TOWNSHIP  
OLD ZIONSVILLE, PA**

**July 2005**

**SEA PROJECT NO. 0050-001**

**PREPARED BY**

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**KARL E. SCHREITER, JR., PE, DEE  
PRESIDENT**



**SCHREITER ENGINEERING ASSOCIATES, Inc.  
7 RALEIGH DRIVE  
DOWNTOWN, PA 19335**

**In Conjunction with**



**SCHOOR DEPALMA**  
Engineers and Consultants

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## 1.0 PLAN SUMMARY

### 1.1 FINAL PLAN RECOMMENDATION

#### 1.1.1 Service Areas Evaluated

This Act 537 Plan Revision addresses the entire area of Upper Milford Township. In addition, Upper Milford Township (UMiT) coordinated with both the Lehigh County Authority (LCA) and Emmaus Borough to determine if any of the municipal facilities have available capacity for transport and/or treatment of Upper Milford Township's wastewater.

The sewage needs of the entire Township were evaluated as part of this Act 537 Plan Revision. As part of this needs evaluation, the Township Sewage Enforcement Officer (SEO) performed site visitations to observe the actual operating conditions of onsite treatment systems in suspected areas with failing systems.

The results of the analysis segregated the Township into three types of sewage service areas:

**Existing Sewer Service Areas** – These areas of Upper Milford Township are currently serviced by sanitary sewers.

**Proposed Sewer Service Areas** - These areas of Upper Milford Township are currently serviced by onsite treatment systems. However, they have shown a need to be serviced by sanitary sewer either through an existing need resulting from failing onsite treatment systems or requests from developers for sewage service to proposed subdivisions.

**Sewage Management District** – These areas of Upper Milford Township are currently serviced by onsite treatment systems and will continue to be serviced in kind in the future.

The existing and proposed sewer service areas are illustrated on Figure 1-1.



Figure 1-1



## 1.1.2 Summary of Alternatives

The Act 537 Plan Revision examined alternatives that focused on both sewage collection and transport to the Township's existing wastewater treatment plant along with improving the Township management of onsite treatment systems.

### No Action Alternative

Under this alternative, the Township would only provide sewage service to those areas currently serviced by sanitary sewers. The remaining portions of the Township would remain utilizing onsite treatment systems.

#### 1.1.2.2 Sewer System Alternatives

**Alternative #1 – Provide Sewer Service to the Leibert Creek Basin through Borough of Emmaus using a Gravity Interceptor** - Under this alternative, the areas within the Leibert Creek drainage basin including the Village of Vera Cruz will be provided sewage service. A gravity collection system and interceptor network would be constructed to provide sewer service to this area. The gravity interceptor would be connect to an existing Borough MH #C-231 located adjacent to Leibert Creek.

**Alternative #2 – Provide Sewer Service to the Leibert Creek Basin through Borough of Emmaus using pumping stations**- Under this alternative, the areas within the Leibert Creek drainage basin including the Village of Vera Cruz will be provided sewage service. A combination gravity collection system and pumping station network would be constructed to provide sewer service to this area. The collection system would be connected to an existing Borough MH #C-231 located adjacent to Leibert Creek.

**Alternative #3 – Provide Sewer Service to the Leibert Creek Basin through Lehigh County Authority Route 29 Facilities using a Central Pumping Station and Gravity Interceptor** - Under this alternative, the areas within the Leibert Creek drainage basin including the Village of Vera Cruz will be provided sewage service. A gravity collection system and interceptor network would be constructed to provide sewer service to this area. A proposed pumping station would be located near the intersection of Vera Cruz and Mill Roads. The force main would extend from the pumping station along Mill Road to Shimerville Road, to Salem Drive. The force main would terminate on Salem Drive at the LCA MH #JS-1.



**Alternative #4 – Provide Sewer Service to the Leibert Creek Basin through Lehigh County Authority Route 29 Facilities using Pumping Stations** - Under this alternative, the areas within the Leibert Creek drainage basin including the Village of Vera Cruz will be provided sewage service. A combination of gravity collection systems, low-pressure systems and pumping station network would be constructed to provide sewer service to this area. A proposed pumping station would be located near the intersection of Vera Cruz and Mill Roads. The force main would extend from the pumping station along Mill Road to Shimerville Road, to Salem Drive. The force main would terminate on Salem Drive at the LCA MH #JS-1.

**Alternative #5 – Provide Sewer Service to the Leibert Creek Basin through new WWTP with stream discharge to Leibert Creek** – Under this alternative, the areas within the Leibert Creek drainage basin including the Village of Vera Cruz. A combination of gravity collection system and pumping station network would be constructed to provide sewer service to this area. A central treatment plant would be constructed in the Vera Cruz area. Treated effluent from the treatment facility would be discharged directly to Leibert Creek in the vicinity of the WWTP.

**Alternative #6 – Provide Sewer Service to the Leibert Creek Basin through new WWTP with land application discharge** – Under this alternative, sewer service would be provided to areas of the Leibert Creek drainage basin. A central treatment plant would be constructed in the Vera Cruz area. Treated effluent from the treatment facility would be disposed of using either spray irrigation or drip irrigation distribution systems.

**Alternative #7 – Provide Sewer Service to the Leibert Creek Basin through Lehigh County Authority Route 29 Facilities using Low Pressure Collection Sewers**- Under this alternative, the areas within the Leibert Creek drainage basin including the Village of Vera Cruz will be provided sewage service. A low-pressure system would be constructed to provide sewer service to this area. The low-pressure system would terminate on Salem Drive at the LCA MH #JS-1.

**Alternative #8 – Extending Sewer Service to the South Fifth St. Area** - Under this alternative, gravity sewers would be extended along South 5th Street. Sewers would also be extended to provide sewer service to Plain View Rd, Columbus Drive, Knoll Wood Drive and Hillary Drive. The sewers would connect to the Borough of Emmaus collection system at Borough MH #C-1 located on South 5<sup>th</sup> St.





**Alternative #9 – Extending Sewer Service to Indian Creek Drainage Basin** - Under the alternative, this area would be serviced by a gravity collection system and a community septic disposal system. The community disposal system designed to process sewage from the St. Peters Road and the Schantz Road areas (PSA-7) would have a capacity of 36,000 gpd. Two central pumping stations, one located on St Peters Road and the second located on Schantz Road, would transfer the sewage to the community system. The treatment system and absorption bed would be located adjacent to St. Peters Road in a vacant field.

**Alternative #10 – Extending Sewer Service to the Hosensack Creek Drainage Basin -**

Under this alternative, each of the three sub-drainage basins within this area would be serviced by a gravity collection system, central pumping station, and a community septic disposal system.

**Churchview Road Area (PSA-8)** - The community disposal system would be designed to process sewage from the Church View Road Area (PSA-8). A central pumping station located along Church View Road would transfer the sewage to a community system located adjacent to Church View Road in a vacant field.

**Old Zionsville Area (PSA-9)** - The community disposal system would be designed to process sewage from Old Zionsville (PSA-9). A central pumping station located adjacent to Kings Highway would transfer the sewage to a community system located adjacent to Kings Highway in a vacant field.

**Zionsville Area (PSA-10)** - The community disposal system would be designed to process sewage from Zionsville (PSA-10). A central pumping station located on Kings Highway south of the former Reading Railroad right of way would transfer the sewage to the community on-site septic system located adjacent to Kings Highway in a vacant field.

**Alternative #11 – Extending Sewer Service in the Swabia Creek Drainage Basin -**

Under this alternative, the gravity collection system servicing ESA-8 would be extended to provide sewer service to this area. The majority of the area would be serviced by gravity sanitary sewers that connect to existing LCA MH #B-8. The gravity sewer would be extended from MH #B-8 along the unnamed tributary to Swabia Creek to Mill Road. Sewers would then extend along Mill Road and provide sewer service to Homestead Circle and Flora Drive. Gravity sanitary sewers that also provide service to the Ford Drive area would service the area along Tank Farm Road north of Mill Road. A small portion of Tank farm Road would be serviced through existing MH #B-12. The sanitary sewers servicing the Chestnut Street area would extend along both sides of the highway and connect to existing LCA MH #R-20.



### **1.1.2.3 Onsite System Treatment Alternatives**

**Formation of Sewage Management District** - Under this Alternative, Upper Milford Township would form a sewage management district within the Township to manage all on-site treatment systems. The management district would encompass the entire Township and include all homes or other facilities serviced by on-site treatment systems.

**Incorporation Into County System** - Under this Alternative, the Township would turn over all responsibility for management of on-site systems to a county level health department. Although Lehigh County does not currently have a health department, such an agency may be planned in the future. Until this agency would be formed and operational, the Township would be required to continue to implement its own management program.

## **1.1.3 Recommended Plan**

### **1.1.3.1 Sewer System Alternatives**

The results of the current needs study indicated that the need for sanitary sewers in the proposed sewer service areas was not as great as found during previous Needs Surveys. This difference in findings can be attributed to several factors including the ongoing drought conditions that impacted the entire Lehigh Valley area during 2002 and previous years.

Therefore, it is recommended that the Township proceed as follows:

**Construction of the collection system to service the Village of Vera Cruz** –The Township should proceed with construction of collector sewers to service portions of the Leibert Creek drainage basin as outlined in Alternative #4. The specific areas to be serviced at this time should include a majority of the areas within PSA–1 through PSA-4. The remaining areas of this basin should be serviced at a future date. Based on the results of the needs survey, there is no immediate requirement for the installation of sanitary sewers in these remaining areas. However, the remaining areas identified in the Needs Survey had potential needs due to area restrictions such as bad soils, high groundwater table, or other limiting factors impacting the satisfactory operation of an onsite treatment system. The Township should assure that it has sufficient capacity in both any proposed interceptors and LCA facilities to provide sewage service in the future when required.



The sanitary sewer system to be constructed under this recommended plan “The Vera Cruz Project Area” is illustrated on Figure 1-2. Fringe areas of the sewer service area that did not demonstrate any wastewater need were not provided sewage service at this time. If these properties exhibit a need in the future, sewage service can be extended when required.

**Remaining Areas of the Township** - The remaining areas of the Township within the Proposed Sewer Service Areas will be serviced on an as needed basis. Based on the results of the needs survey, there is no immediate requirement for the installation of sanitary sewers. However, the remaining areas identified in the Needs Survey had potential needs due to area restrictions such as bad soils, high groundwater table, or other limiting factors impacting the satisfactory operation of an onsite treatment system. These areas should be reexamined in the future if conditions determine that sewage service may be required due to malfunctioning on-site systems.

In addition, several of the proposed sewer service areas may be subject to sewer construction due to subdivision and subsequent development. Consideration should be given at that time to extending any proposed sewers to existing homes and other users to address any wastewater needs in those areas.

### **1.1.3.2 Onsite System Treatment Alternatives**

It is recommended that the Township create a sewage management district to manage all onsite treatment systems within the Township. This management district would encompass the entire township and include those areas not serviced by sanitary sewers. In addition, any potential malfunctions of on-site systems identified during the needs survey would be addressed as part of the implementation of this management district.

## **1.1.4 Institution Arrangements**

### **1.1.4.1 Sewer System Related Arrangements**

The Agreement between UMiT and Lehigh County Authority (LCA) is in place that allows LCA assume the responsibility for designing, constructing, owning and operating all proposed public sewer systems set forth in this plan. The Township will be responsible for adopting all appropriate ordinances requiring abutting property owners to connect to said sewer and pay any charges levied by LCA.



Figure 1-2



#### **1.1.4.2 Sewage Management District Arrangements**

The Upper Milford Township Board of Supervisors will be required to adopt an ordinance establishing the sewage management district. A copy of the proposed ordinance is contained in Appendix I. This ordinance is scheduled for adoption within one year after approval of the Act 537 Plan Revision by PADEP.

The Township has a holding tank ordinance currently in effect. The Township Board of Supervisors adopted Ordinance No. 76 on March 19, 1988. A copy of the ordinance is contained in Appendix H.

### **1.2 IMPLEMENTATION**

#### **1.2.1 Summary of Project Costs**

The project costs for each of the eleven sewer alternatives is presented in detail Section 3.2.3 of the study and summarized on Table 1-1.

#### **1.2.2 Method of Funding Projects**

The project will be funded by a combination of grant(s), municipal contributions, property assessment, capacity tapping fees and financing. The Township has received a Federal allocation to be used for UMiT sewer projects. The actual estimated capital contribution from an individual Township user will vary.

The Township will investigate the use of alternative funding sources such as Lehigh County Community Block Grants or other Federal or state grant and/or loan programs if they are available when a particular project is ready to be implemented by the Township.

#### **1.2.3 User Charges**

The users within the proposed sewer service areas scheduled for sewage service under this Act 537 Plan Revision will pay LCA sewer rates for sewer service within the Township. The sewer rate will vary within the Township based on those LCA facilities required to provide the service. Reference Section 4.4 for the estimated Vera Cruz Area Project user charges.

Homeowner costs associated with installation, operation, and maintenance of on-site treatment systems are not anticipated to change with the implementation of a septic management district.



Table 1-1



#### **1.2.4 Schedule of Actions Required**

The full implementation schedule for all phases of this project is contained in Section 4.0 of this document. Based on the schedule presented, the Township will be proceeding on the following items upon receipt of approval of the Act 537 Plan Revision:

- Construction of the sanitary sewers to the Vera Cruz Area including portions of Shimerville Road, Mill Road, Acorn Drive and Moyer 1 and 2 Subdivisions.

Sanitary sewer service in the South 7<sup>th</sup> St. Extension area will be addressed through a PADEP *Sewage Planning Module for a Minor Act 537 Plan Revision*. A private developer through a PADEP Planning Module will address the Golf Circle area.

The remaining items addressed in this Act 537 Plan will be implemented over the length of the planning period as outlined in Section 4.0 of the study.

#### **1.2.5 Commitments to Implement Plan**

A copy of the resolution adopted by the Upper Milford Township Board of Supervisors is included in Appendix A. The implementation schedule to be followed is outlined in Section 4.0 of this document.

#### **1.2.6 Supporting References**

All supporting reference letters and other correspondence is contained in Appendixes B and C of this document. The correspondence includes letters to the following agencies or municipal bodies:

Pennsylvania Department of Environmental Resources  
Pennsylvania Historical and Museum Commission  
Pennsylvania Department of Conservation and Natural Resources  
Lehigh Valley Planning Commission

Correspondence to these various agencies or municipal government bodies have been referenced in the Act 537 Plan Revision as required. In addition, the public notice and its proof of publication are also included in Appendix D.



## **2.0 BACKGROUND**

### **2.1 PLANNING OBJECTIVES AND NEEDS**

#### **2.1.1 Introduction**

Upper Milford Township has initiated planning activities to meet the growing sewage needs of the Township. Several wastewater issues have arisen that the Township wishes to address. The specific wastewater issues to be addressed by this Plan revision include:

##### **Evaluation of Sewage Needs of the Village of Vera Cruz**

As a result of past sewage studies conducted by the Township, it has been determined that the Village of Vera Cruz has some problems associated with failing on-site septic systems. The previous studies have recommended providing sewage service to this area.

##### **Evaluation of Sewage Needs in Old Zionsville Area**

As a result of past sewage studies conducted by the Township, it has been determined that the Old Zionsville Area has some problems associated with failing on-site septic systems. These studies have proposed providing sewage service to this area.

##### **Evaluation of Sewage Needs in Other Areas of Township**

As a result of requests from area residents, it has been determined that the area in and around South 7<sup>th</sup> Street Extension and Golf Circle have problems associated with failing on-site septic systems. Both of these areas will be addressed in separate studies. The South 7<sup>th</sup> St Extension area will be addressed through a PADEP *Sewage Planning Module for a Minor Act 537 Plan Revision*. The Golf Circle area will be addressed by a private developer through a PADEP Planning Module.





### **2.1.2 Purpose of Study**

The purpose of the study was to determine the wastewater treatment needs of Upper Milford Township through the year 2020. Using the guidelines set forth by the PADEP for Act 537 Planning, the extent of the proposed sanitary sewer collection system servicing portions of Upper Milford Township was determined.

The scope of work for the revision to Act 537 Official Plan consisted of three major work phases:

- Phase I - Needs Analysis
- Phase II - Development of Septic Management District
- Phase III - Sanitary Sewer System Analysis

A copy of the approved scope of work for this project has been included in Appendix B.

### **2.1.3 Past Wastewater Planning**

#### **COWAMP/208 Comprehensive Water Quality Management Plan**

The COWAMP plan delineates 20-year needs for wastewater treatment works and sets forth procedures and methods for controlling non-point sources of pollution for a given regional area. Lehigh County is included with Northampton, Carbon, Monroe, Wayne, and Pike counties in the PADER Study Area 2.

#### **Water Supply and Sewage Facilities Plan**

The Lehigh Valley Planning Commission (LVPC) updated the Water Supply and Sewage Facilities Plan (WSSFP) in December 1995. This document was intended to serve as a guide to growth and development in Lehigh and Northampton counties through the year 2010. The WSSFP will be used in conjunction with the zoning districts adopted in July of 1985 to determine the areas of design population growth based on projected future land use. Also, the WSSFP includes references to potential on-site sewage disposal problem areas within the Township. These areas will be addressed as part of the On-site System Needs Survey.



## **Water Supply and Sewage Facilities Plan Supplement**

The Lehigh Valley Planning Commission (LVPC) updated the Water Supply and Sewage Facilities Plan (WSSFP) in January 2000. This document was intended to serve as an update to the WSSFP 1995 Plan. This supplement did not propose any revisions to the sewer and water policies contained in the 1995 WSSFP Plan.

## **Upper Milford Township Act 537 Plan Update**

Schoor DePalma prepared an Act 537 Plan Revision in the Year 2000. The Township completed this draft Act 537 Plan Revision in 2000 to evaluate various sewage needs within the Township. This plan recommended providing sewer service to the Village of Vera Cruz and connecting the proposed collection system to the LCA interceptor system.

## **Vera Cruz Area Sanitary Sewer Service Feasibility Study**

In 1999, the Upper Milford Township Engineer prepared a Vera Cruz Sewer Service Feasibility Study. The new study focused specifically on the Vera Cruz area, due to the continuing on-lot system malfunctions, and included several new sewage treatment and disposal alternatives to address system malfunctions. Specifically, the study evaluated spray irrigation and drip irrigation treatment systems as additional alternatives. The 1999 study evaluated alternatives to serve the following Township areas in and around Vera Cruz: Vera Cruz Village, Spruce Road, Main Road east and west of Vera Cruz Village, the Moyer Subdivision (area adjacent to Sickle, Bow Lane, and Chock Roads, Jarvis Drive, an Sickle Circle) , Main Road north and south of Vera Cruz Village, and the intersection of Mill Road and Vera Cruz Road North. The study concluded that extension of the existing Lehigh County Authority collection system through construction of new gravity sewers, low-pressure sewers, and two new pumping stations was the most feasible and cost effective alternative. The Township Supervisors held a public meeting in Vera Cruz to discuss the study alternatives and subsequently voted to move ahead with the implementation of this recommendation.

The only portion of the past planning recommendations that have been implemented is the extension of sanitary sewers to serve the Route 29 Corridor. Sewer extensions to serve Vera Cruz, Old Zionsville, and Powder Valley Village areas as identified in this study have yet to implemented. Lehigh County Authority is not currently planning any new sewer extensions into Upper Milford Township that could serve any of the three study areas included in this Act 537 Plan Update.



## **Draft Act 537 Sewage Facilities Plan Update**

On March 8, 1994, PADEP recommended that the Township develop an update for its Official Sewage Facilities Plan that would address documented sewage problems in various areas of the Township. On May 6, 1994, the Department wrote to the Township to order an update to the Official Sewage Facilities Plan. A failure by the Township to revise the plan could have jeopardized future Department approval of planning modules for new land developments. A draft version of the Part I Act 537 Plan Update was completed during January 1996; however, this plan was never formally adopted by the Township or reviewed by PADEP due to resident concerns over alternative user costs.

## **On-Lot Sewage Disposal Management Demonstration Project (JPC. 1993)**

The Joint Planning Commission of Lehigh and Northampton Counties (JPC) prepared this study for portions of Upper Milford and North Whitehall Townships. In Upper Milford Township, three study areas were considered. These were the village of Vera Cruz, with a slightly smaller study area than that considered in this study; Old Zionsville, again with a study area smaller than the study area considered in this report; and a small group of homes along or near a private alley northwest of Vera Cruz, which is a part of the Vera Cruz Road study area considered in this report. For the JPC study, a house-to-house sanitary survey was conducted to obtain information regarding septic system problems. Some limited surface and well water samples were taken as well. Thirty-eight percent of the homes in Vera Cruz were found to have problems with their on-lot sewage disposal systems. Two of three well water samples taken indicated the presence of fecal coliform bacteria. Surface water quality in Leibert Creek and local drainage ditches indicated fecal coliform levels well above that expected of such waterways. The plan evaluated several different configurations for a wastewater collection system for the village. A community subsurface sewage disposal system, on property to the north, was recommended for disposal of the collected sewage from the village. The annual cost per Equivalent Dwelling Unit (EDU) for such a system was expected to be \$585, assuming that no grants were available, and the connection fee was \$1,000 per EDU. For purposes of comparison, these annual costs were compared to updated costs for a conventional gravity system from the 1982 LCA study. For a conventional sewer system with connection to the regional sewer system through Emmaus, the annual cost per EDU was estimated at \$711, assuming a \$1,200 connection fee.

The area northwest of Vera Cruz contained 15 lots. Only two of the property owners indicated that they had problems with their sewage disposal systems. Neither of the two wells tested showed contamination with fecal coliform bacteria; as a result, the study did not recommend any community-wide wastewater disposal system for this area.



The Old Zionsville study area consisted of 37 lots. Twenty-three percent of these lots had problems with their sewage disposal systems. Two of the three well water samples showed the presence of fecal coliform bacteria. Due to the relatively small number of lots with problems, the study did not recommend any community wastewater disposal systems at that time. For future consideration, an alternative to a sewage collection system and a subsurface sewage disposal system in the vicinity of Lenape Park was evaluated. The annual cost per EDU for such a system was expected to be about \$940, assuming a \$1,000 connection fee and no grants. For purposes of comparison, the annual cost of a conventional sewage collection system and pumping the sewage to the proposed sewer system in Vera Cruz was estimated to be about \$1,160 per EDU, assuming no grants and a \$1,200 connection fee.

A number of public meetings were held regarding this study. After receiving input from residents, the Township decided not to pursue community on-lot disposal systems or conventional public sewer systems for any of these study areas due to the high costs involved. Concerns were also expressed about the new, unproved nature of a community on-lot sewage disposal system, its long-term effectiveness, and the possibility of additional maintenance or repair costs. Some favored connection to the LCA sewer system since it would use proven technology.

### **Miscellaneous Evaluations - Vera Cruz Road Corridor**

In response to a request for service by the owner of the Grist Mill along Vera Cruz Road North, the Township had LCA estimate the cost of providing service to the mill and a few other homes. This work was completed in 1989-90 and 1994-95. The analysis estimated a total project cost of approximately \$78,000. Since the standard sewer rates for the three EDU's would have supported a capital cost of only \$9,300, a very large capital cost would have been required from the three units to be served. For this reason, the project was not implemented. In 1994, Emmaus Borough was deliberating over the extension of public sewer service to the last few homes in the Borough along Vera Cruz Road. Although a pumping station was the cheapest option for the Borough, a more costly gravity sewer would facilitate a later connection of flows from Upper Milford Township along Vera Cruz Road. Emmaus Borough asked the Township to consider paying the additional cost of approximately \$50,000 in order to have this potential future benefit. The Township had the Township Engineer prepare cost estimates for a sewer along Vera Cruz Road. The total cost to serve approximately 40 EDU's was estimated at \$260,000. The Borough granted approval to the Township to connect up to 45 EDU's to the Emmaus system at Vera Cruz Road. That offer was effective through August 1, 1997, and project prior to those dates, Upper Milford Township would have had to notify Emmaus Borough so that a new study could be undertaken, at that time, to guarantee that there was enough capacity in the Borough sanitary sewer lines. Due to the high cost, the Township did not participate in the Emmaus project, nor did it take any further steps, at that time, to implement the Vera Cruz Road project.



## **The Sewage Facilities Plan Update for the Route 29 Corridor**

The Lehigh County Authority (LCA) prepared this study in 1987. This report summarized all of the prior sewer plans from 1973 to 1987, except for the Joint Planning Commission (JPC) study that was prepared in 1983.

The following is a summary of the LCA studies:

### **Upper Milford Township Update of Sanitary Sewage Study Area VI (1973):**

Due to increased development in Area VI, an update of the 1969 Wisenberger Associates study was undertaken. In this report, collector and interceptor systems were investigated and a two-phase system was recommended. The conclusions of the report indicated that this area could support a sanitary sewage system. Negotiations for treatment and transportation capacity, grant applications, and the formation of a municipal authority were all included in the recommendations.

### **Sewer Service Feasibility Study - Step I - Upper Milford Township (1982):**

This report was undertaken to determine the preliminary feasibility of a sanitary sewer system in two areas of the Township: the Vera Cruz Corridor and the Route 29 Corridor. The study and report were in response to numerous complaints and on-lot system failures. In this report, Borough Heights, previously a part of Area II (1969 report), was included in the Route 29 Corridor Service Area. This was due primarily to its close proximity and similar need for sewerage. Prepared by the Lehigh County Authority, this plan updated the building count in the areas studied to determine a current flow estimate. Customer costs were estimated by utilizing comparable costs for the then-recent Phase II Wescosville Project. Investigation of available financing revealed that Federal regulations would terminate all grants for collection systems as of October 1, 1984, thus putting the burden of financing any system upon the Township and the customers to be served. The conclusions of this report suggested that more comprehensive studies of both the Vera Cruz Corridor and the Route 29 Corridor were needed.

**Sewer Service Feasibility Study - Step 2 (1984):** This study focused upon the Route 29 Corridor service area and investigated various sewerage facility options and their costs. The JPC removed the Vera Cruz Corridor from the study area due to ongoing lot investigations. Financing options and grant availability for the Route 29 Corridor were incorporated into determining the conclusions and recommending the course of action. Although conclusions indicated that upgrading of on-lot systems would be more economical, the report suggested inspection, lot-by-lot, of these systems prior to making a final decision.



**Borough Heights Project - Phase 1(1987):** The purpose of this report was to summarize information acquired through detailed investigations of on-lot systems in the Borough Heights section of the Route 29 Corridor. An investigation was made for each lot in the area. Lot size, sewer system type and size, and a record of problems and well location were among the items researched and tabulated. From this information, the overall health and safety of the neighborhood was evaluated. The conclusions of this report showed that the area contained numerous substandard systems with 70% of them in need of rehabilitation. To upgrade these systems to meet current Pennsylvania Department of Environmental Protection (PADEP) regulations would have required encroachment beyond individual property lines and possible compromise of individual water supplies. The costs for this type of work would have nearly equaled public sewage costs and would not have served as a permanent solution.

**Sewage Facilities Plan Update for the Route 29 Corridor (December 1987):** This report, which was prepared by LCA, is the most recent update to the Township's official Sewage Facilities Plan. The update incorporates all of the previous reports and feasibility studies and presents the recommended alternative for sewerage the Route 29 Corridor. This project has since been constructed; further details of this study have not been included in this report.

### **Feasibility Study and Report for a Sanitary Sewage System**

A. L. Wiesenberger Associates prepared this study in May 1969. This study divided the Township into the following six areas:

- I. Southeastern Area, which drains into the Saucon Creek, and consists of approximately 714 acres;
- II. Vera Cruz-Shimerville Area, which is drained by the Leibert Creek, and consists of approximately 2,900 acres;
- III. Old Zionsville/Zionsville Area, which is drained by the Hosensack Creek, and contains approximately 1,900 acres;
- IV. West Central Area, which is drained by the Indian Creek, and consists of 2,480 acres;
- V. Western Area, which is drained by the Perkiomen Creek, and consists of 1,590 acres;
- VI. The section west of Emmaus that drains into the Little Lehigh Creek, and which contains approximately 800 acres.



The Weisenberger report, which studied the feasibility of sewerage Areas II, III, and VI, concluded that the population was not sufficiently concentrated in any area of the Township, at that time, to support the cost of a sewerage system. The report did indicate, however, that the rapid rate of population expansion would eventually necessitate construction of a sewerage system in these three areas during the 1975-1980 time period.

### **Upper Milford Township Comprehensive Plan**

The Upper Milford Township Comprehensive Plan, dated December 1971, was adopted in 1972. The plan recommends that the highest density residential areas should be in the Route 29 Corridor, and around the Village of Old Zionsville. Moderate density residential development is recommended in a rural residential zone on the fringes of the Route 29 Corridor area, as well as around Vera Cruz, Zionsville, Powder Valley, Main Road East and the Moyer Subdivision, and the Fifth Street Road Extension from the Borough of Emmaus. The plan recommends that public sewers be extended during the 1976-80 period to Borough Heights and Ramer Heights (in the Route 29 Corridor), Vera Cruz and the Main Road East Corridor, including the Moyer Subdivision Area and Brunner Road. The plan also recommends public sewer service to the existing cluster of homes along Shimerville Road in the vicinity of Mill Road.

## **2.2 PHYSICAL DESCRIPTION OF PLANNING AREA**

### **2.2.1 General Area Description**

Upper Milford Township is located in Lehigh County in the southwestern corner bordered on the south by Berks County. The Township is located in eastern Pennsylvania, occupies approximately 17.91 square miles, and is classified as a second-class township. Upper Milford is mainly a bedroom community for the Allentown, Bethlehem, and Easton Metropolitan Area. Pennsylvania Routes 100 and 29 run through the center of the Township. The Township boundaries are illustrated on Figure 2-1.

Three major watersheds divide the Township. The Little Lehigh Creek drains a significant portion of Upper Milford Township in the north central area. A significant portion of the Township in the south and west drains to the Perkiomen Creek and a small area on the eastern corner of the Township drains to the North Branch of the Saucon Creek. The Little Lehigh Creek Watershed can be further subdivided into three minor watersheds. Most of this area is drained by Leibert Creek. Several of the study areas for this report are within the Leibert Creek Watershed. Other portions of the Township in the Little Lehigh Creek Watershed drain to the Swabia Creek or directly to the Little Lehigh Creek Main Branch. The portion of the Township, which drains to the Perkiomen Creek, is further subdivided into three minor watersheds; Hosensack Creek Watershed, the Indian Creek Watershed, and the Main Branch of the Perkiomen Creek.



Figure 2-1





The watershed associated with the Little Lehigh Creek including the Leibert and Swabia Creeks is classified as High Quality – Cold Water Fisheries (HQ-CWF) under current PADEP regulations contained in Chapter 94.9d. The Perkiomen Creek, Hosensack Creek, Indian Creek and the Saucon Creek drainage basins within the Township are classified as Cold Water Fisheries (CWF).

This Act 537 Plan Revision Study Area will include the entire Township as shown on Figure 2-1. The watershed areas are illustrated on Figure 2-2.

## **2.2.2 Adjacent Municipalities**

The following municipalities bound Upper Milford Township:

Upper Saucon Township, Lehigh County  
Lower Milford Township, Lehigh County  
Emmaus Borough, Lehigh County  
Salisbury Township, Lehigh County  
Lower Macungie Township, Lehigh County  
Hereford Township, Berks County  
Macungie Borough, Lehigh County

In addition, the area is serviced by the Lehigh County Authority who owns and operates sewage collection and interceptor facilities in this portion of Lehigh County. Currently, none of the boundary municipalities will require any sewage capacity in Upper Milford Township facilities.

## **2.2.3 Review of Consistency Issues**

### **2.2.3.1 Flood Plain**

The current flood plain mapping is illustrated on Figure 2-3. The impact of flood plains on each proposed alternative will be discussed as part of the environmental impact assessment of that alternative.



Figure 2-2



Figure 2-3



### **2.2.3.2 Soils**

The updated soils map in digitized format for Lehigh County was obtained from the NRCS Map Compilation and Digitizing Center Internet Site (<http://mcdc.cas.psu.edu/>). The soils information was obtained from the USDA-NRCS NASIS Pangaea Reports Internet site (<http://www.statlab.iastate.edu/soils/reportest/>). Since the final published version of the updated soils survey was not available at the time of this report preparation, there were no descriptions available regarding soil associations in Lehigh County. This soils information supersedes the data that was presented in the previous soils survey *Lehigh County Soil Survey Series 1959, No. 31*. The updated soils information is summarized on Table 2-1. An updated soils map is found on Figure 2-4.

### **2.2.3.3 Prime Agricultural Lands**

The prime agricultural farmlands were identified using updated information obtained from the USDA - NRCS NASIS Internet site (<http://www.statlab.iastate.edu/soils/reportest/>). It should be noted that prime agricultural soils information available from the Lehigh County Conservation District (LCCD) is only applicable to soils data contained in the 1962 SCS Soils Survey for Lehigh County and does not apply to the updated digitized information used for this document.

There are several designated prime agricultural lands within the Study Area. The prime agricultural soils found within the Township are summarized on Table 2-2. The location of these soils is illustrated in Figure 2-5.

As part of the Township's Zoning Ordinance adopted in 1985, an area of the Township was designated Rural Agricultural District to encourage the continuation of farming and other agricultural uses. Furthermore, Upper Milford Township property owners, regardless of where their properties are located within the Township, can participate in the Agricultural Security Zone enacted pursuant to Act 165 to preserve that property for agricultural use.

The impact of prime agricultural soils on each proposed alternative will be discussed as part of the environmental impact assessment of that alternative.

### **2.2.3.4 Wetlands**

The documented wetland areas within the Study Area as shown on National Wetland Inventory Maps are illustrated on Figure 2-6. The impact of wetlands on each proposed alternative will be discussed as part of the environmental impact assessment of that alternative



Table 2-1



Figure 2-4



Table 2-2



Figure 2-5





Figure 2-6



## Hydrology and Geologic Features

Upper Milford Township is underlain by the following four geologic formations that are shown on Figure 2-7: Leithsville Formation (Limestone), Hardyston Formation (Quartzite and quartz-pebble conglomerate) Granite Gneiss and Granite Hornblende Gneiss.

The Leithsville Formation occurs on or near the flanks of South Mountain and is composed predominantly of dolomites. Virtually all wells in the Leithsville Formation provide adequate water for domestic supplies. Some industrial and public supply wells have yields exceeding 1,000 gallons per minute. Eight wells in the Leithsville Formation that were tested in the 1950's and 60's showed nitrate concentrations in the range of 5.3 - 14 mg/L with a median value of 8.6 mg/l. Twenty of 68 wells tested positive for total coliforms.

The Hardyston Formation consists of quartzite and quartz-pebble conglomerate and is a fairly dependable source of domestic supplies. However, industrial and public water supplies usually cannot be economically developed. Seven wells tested for nitrates showed a range of 0.2-9.7 mg/l with a median value of 3.4 mg/l. Only three of 22 wells tested for the presence of total coliform bacteria in the Hardyston Formation and related geologic formations tested positive.

Granite and Granite Gneiss Formations usually yield adequate supplies of groundwater for domestic use: however, hilltop wells normally have very low yields. Some public supply wells have been developed in this formation with median yields of about 50 gpm. Six wells in this formation tested for nitrates had a range of 0.4-8.0 mg/l with a median value of 5.5 mg/L. The Hornblende Gneiss is among the poorest yielding rocks in Lehigh County. It is nearly impossible to obtain yields in sufficient quantity for other than household use. In fact, 20-30 percent of wells drilled will not even yield enough water for domestic use. Seven wells tested for nitrates showed a range of values from 3.9-30 mg/l with a median value of 1.4 mg/l.

As required in PADEP's letter of October 29, 2004, a qualitative evaluation of the project area to develop a preliminary understanding of the effect the proposed replacement of individual onsite wastewater treatment systems (i.e. septic systems) will have on Leibert Creek needs to be addressed. In evaluating the effects the aforementioned replacement of individual onsite wastewater treatment systems with a new wastewater treatment facility, the following reviewed materials including:

Soils Map and Summary of Major Soil Components;  
Geologic Mapping of Upper Milford Township; and  
Township records regarding the number of individual onsite waste water treatment systems proposed for replacement.



Figure 2-7



Previous evaluation of the proposed project area indicates that the project area covers approximately 592 acres of the Leibert Creek Watershed. Review of the 2002 PENNDOT General Highway Map for Lehigh County indicates that Leibert Creek and two unnamed upstream tributaries flow to the northwest through the project area. Geologic mapping for the project limits indicates that a majority of the project area is underlain by bedrock deposits of the Allentown Dolomite with minor portion of the project area underlain by bedrock deposits identified as the Hardystone Quartzite.

Review of the soils mapping for the project area indicates that the project area is dominated by a series of soil units that are characterized by typical soil depths ranging from 3.7 feet to 7 feet with typically high water tables for several of the units. As indicated in the USDA-NRCS NASIS Pangaea Report, the majority of the soil units within the project area are characterized as having limited septic suitability for in-ground systems resulting from restricted permeability, shallow depth to bedrock, and locally high water tables.

Reviews of septic systems located in the project area identified approximately 160 septic systems are in use by existing residential and commercial users. Further evaluation indicated that of 146 septic systems that were surveyed approximately 32 percent (47 septic systems) of these systems are suspected or confirmed as having operational problems. Additionally, another 12 septic systems have been constructed using elevated sand mounds to likely compensate for unsuitable conditions for conventional in-ground system construction.

Given the shallow depth to bedrock for conventional in-ground systems and elevated seasonal water table levels in the project area, continued operation following the replacement or repair of the systems that have been identified as having operational problems is unlikely to result in significant improved operation. Although mounded systems or soil replacement systems can be installed, the native soil limitations will continue to exist in the vicinity of the systems. Discharges from mounded systems, installed to increase the separation distance from seasonal high water table conditions or shallow bedrock surfaces, will continue to migrate from the septic systems into the underlying native soils along the top of bedrock or seasonal high water table. Replacing soils within and below the septic systems will also serve little purposes since the wastewater discharged to the replaced soil will eventually migrate through the replaced soil and backup in the onsite systems resulting in continued operational and treatment problems.

The removal of wastewater from the Leibert Creek Basin will have negligible impact on the groundwater levels in the Village of Vera Cruz area. The projected service area within the basin has an approximate area of approximately 592 acres. The area receives an annual average precipitation of approximately 42 inches of per year. Based on an estimated wastewater flow of 72,000 gpd from this area, the wastewater will transfer an equivalent of 1.6 inches of precipitation from the basin. This amounts to 3.87 % of the total annual average precipitation rate.



Based on the existing onsite wastewater treatment system operational problems that have been identified and a review of the existing hydrogeologic conditions it is unlikely that the planned project will have an adverse effect on the Leibert Creek hydrologic system. Based on a review of the existing soil, bedrock, and high water table conditions, removal of the septic system effluent, which likely receives inadequate treatment, will improve the surface water quality in the area with the implementation of the proposed sewer service expansion to this area.

#### **2.2.3.6 Historical Commission Notification**

The Pennsylvania Historical Commission was initially notified of this study on July 6, 2002. Based on subsequent conversations and correspondence with the PHMC, several alternatives will have historical and/ or archeological impacts. The impact on these resources will be discussed as part of the alternative analysis in section 3.2.3. Copies of the various correspondences have been attached in Appendix B.

#### **2.2.3.7 Pennsylvania Natural Diversity Inventory Review**

Letter dated July 6, 2002 requested an initial Pennsylvania Natural Diversity Inventory (PANDI) review. By letter dated July 16, 2002, DCNR indicated that there are two occurrences of specific concern within the overall project area:

<i>Cyperus retrorsus</i>	Retorse flatsedge
<i>Erythronium albidum</i>	White trout-lily

DCNR has requested that their office be contacted when the scope and boundaries of a specific project have been more clearly defined. At the request of PADEP, additional detailed information was provided to DCNR, Pennsylvania Fish and Boat Commission, and US Fish and Wildlife Service by letter dated November 20, 2003 to allow a more comprehensive review associated with each of the proposed alternatives.

It was determined that the selected alternatives will not have any impact on endangered species based on the current proposed alignment of the sanitary sewers. In those areas where wetlands border the roadway, construction of sewers will be limited to the area within the roadway itself as to not impact surrounding wetland areas. These areas will still require the Township to obtain General Purpose permits at each of these areas.

Copies of the correspondences from DCNR, PA Fish and Boat Commission, and US Fish and Wildlife Service have been attached in Appendix B.



### 2.2.3.8 Zoning

The current zoning map for the Study Area is illustrated on Figure 2-8. This zoning map was developed as part of the Township's overall zoning ordinance. The last update to the current zoning ordinance was adopted in 1985, revised in 1992, and last amended on February 21, 2002. The current zoning criteria is summarized on Table 2-3.

The current zoning ordinance includes the following designated uses:

#### **Residential**

**RS-R – Rural Suburban Residential District** - The purpose of this District is to retain the existing low to medium density residential areas, which are protected from incompatible land uses, as so to maintain these areas as attractive rural- suburban living environments. As a result, minimum lot sizes for a single-family dwelling unit connected to a public sewer and water in this area are 12,000 sq. ft. or 0.28 acres.

**S-R – Suburban Residential District** - The purpose of this district is to provide opportunities for housing types in moderate densities in areas near existing urban centers and in close proximity to centralized water and sewer networks. As a result, minimum lot sizes for a single-family detached dwelling unit connected to a public sewer and water system in this area are 7,500 sq. ft. or 0.17 acres.

#### **Commercial**

The purpose of this district is to provide for a variety of commercial uses acceptable and convenient locations and promote well-planned and designed commercial areas. Depending on the specific uses, minimum lots sizes in this zoning category that are connected to a public sewer and water system is 10,000 sq. ft. or 0.23 acres. Also, maximum building coverage is 35 percent in those areas serviced by both water and sewer services.

#### **Industrial**

The purpose of the industrial district is to provide opportunities for industrial uses at appropriate locations and to prevent conflicts between these industrial uses and adjacent land uses. Minimum lots sizes in this zoning category are 40,000 sq. ft. or 0.92 acres. Also, maximum building coverage is 30 percent.



Table 2-3



Figure 2-8





## Specialized Zoning Districts

**R-A Rural Agricultural District**- As part of the Township's Zoning Ordinance adopted in 1985, an area of the Township was designated a Rural Agricultural District for encouragement of farming and other agricultural uses. As a result, minimum lot sizes for a single-family dwelling unit in this area is 1 acre. Furthermore, Upper Milford Township property owners, regardless of where their properties are located within the Township, can participate in the Agricultural Security Zone enacted pursuant to Act 165 to preserve that property for agricultural use.

**South Mountain Conservation** - The purpose of this district is to protect the scenic, recreational, and environmental resources of South Mountain and allow for the continuation of limited, large lot single family residential uses on the Mountain. Minimum lots sizes in this zoning category are 2 acres. Also, maximum building coverage is 10 percent.

### 2.2.3.9 Potable Water Supply

#### Existing Water Distribution Systems

Portions of the Township are currently serviced by four potable water distribution systems:

**Emmaus Borough Distribution System** - The Borough of Emmaus provides public water directly to the 198 users within Upper Milford Township. These users are located in the southern section of the Township.

**Philip M. Buss Water Company Distribution System** – The Philip M. Buss Water Company is a private water utility serving Buss Acres and Deer Run subdivisions, which lie between Route 100 and St. Peter's Road. This system serves 89 customers with two wells. Tests of nitrate concentrations in the water in showed nitrate concentrations of 4.79 – 7.51 mg/L NO<sub>3</sub>-N.

**Lehigh County Authority Distribution System** - The LCA serves Mink Estates and Far View Farms subdivisions. This system serves approximately 57 residential units with three wells.

**Red Hill Water Authority** – The Red Hill water Authority has limited water service in the western area of the Township along Chestnut Street and Yeakel's Mill Road. The Authority services approximately 15 customers in this area.

Areas serviced by public water are illustrated on Figure 2-9.



Figure 2-9



## Current Water Consumption

Based on Township records, the total annual water consumption for 2001 is summarized on Table 2-4.

Based on this 2001 consumption data, the water use average residential water consumption in the Township was 179 gpd / EDU (equivalent dwelling unit). Based on a 2000 average family of 3.07 people/ family within the Township, the average per capita water consumption was 58 gallons per capita.

## 2.3 EXISTING WASTEWATER TREATMENT FACILITIES

### 2.3.1 Collection/ Interceptor Systems

#### 2.3.1.1 Lehigh County Authority

The LCA currently provides sewage service to a portion of the Upper Milford Township. The service area is located in the northwestern section of the Township adjacent to the boundary with Lower Macungie Township. The LCA has approximately 377 residential units and 45 commercial customers currently allocated within the Township. LCA’s Western Lehigh Interceptor ultimately services the sewage flows from the Township and transports sewage to the City of Allentown for treatment and disposal. The areas serviced by LCA are illustrated on Figure 2-10.

The service areas within the Township and their associated connection points to adjacent downstream collection/ interceptor systems are as follows:

#### Transport via Salisbury Township

Keystone Ave	4 Residential Units
Woods Hollow Lane	4 Residential Units

#### Transport via Borough of Emmaus

South Second St	2 Residential Units
David Drive/Shimerville Rd	26 Residential Units
Little Lehigh Acres West (MH #E66)	30 Residential Units
(MH #C302A)	45 Residential Units
	1 Commercial Connection
Borough Heights	67 Residential Units
	10 Commercial Connections



Table 2-4



Figure 2-10



Transport via LCA Western Lehigh Interceptor

Connection at LCA MH #L-83	199 Residential Units 32 Commercial Connections
----------------------------	--

Transport via Borough of Macungie

Connection at Borough MH #118A	1 Residential Units
Connection at Borough MH # 46-13	1 Residential Units

Based on the current agreement with LCA dated August 5, 1987, Upper Milford Township has a flow allocation of 225,000 gpd for new development in the LCA interceptor system. A copy of this agreement is included in Appendix G.

**2.3.1.2 Borough of Emmaus**

Currently, there are three properties within the Township that are connected directly to the Borough of Emmaus collection system:

- Corner of David Drive and Shimerville Rd.
- Corner of Keystone Drive and Biery St.
- 173 Biery St.

**2.3.2 Existing Wastewater Treatment Plants**

There are no existing wastewater treatment plants located within the Township. All existing sewage generated within the Township and discharged to the Lehigh County Authority is transported and treated at the City of Allentown WWTP.



## **2.4 EVALUATION OF WASTEWATER TREATMENT NEEDS**

### **2.4.1 General**

As part of the 1996 Act 537 Plan Revision, the Township conducted a needs survey to determine the operational status of the existing on-site treatment systems. As part of the Act 537 Plan Revision, the Township was required to reexamine on-site treatment systems and update their operational status. The Needs Survey was conducted in two phases:

- Phase 1 Initial Needs Survey
- Phase 2 Follow-up Survey of the Vera Cruz Area.

An initial needs survey was conducted by the Township based on a limited survey area of the Township. These areas were surveyed based on past data indicating potential operational problems with existing on-site treatment systems. This survey was limited due to the ongoing drought conditions that were present during the 2000-2002 time period. The result of this Needs Survey has been included as Appendix G of this document.

The results of the initial survey documented a high potential need in the Village of Vera Cruz area. As result of comments received from PADEP, the Township preformed a more detailed survey of the Vera Cruz area to better define the extent of the need. The results of this work have been included in Appendix M.

### **2.4.2. Review of On Site Treatment System Needs**

#### **2.4.2.1 Previous Wastewater Needs Assessments**

##### **Water Supply and Sewage Facilities Plan**

The *Water Supply and Sewage Facilities Plan* (Lehigh Valley Planning Commission, December 1995) references potential on-site sewage disposal problem areas within Upper Milford Township.

The four areas noted in the WSSFP are as follows:



<b>Map No. 14 – Old Zionsville</b>	Surrounding the intersections of Chestnut Street, Kings Highway, and Church View Road
<b>Map No. 15 – Vera Cruz Area</b>	Along Main Road and Vera Cruz Road
<b>Map No. 16 – Zionsville</b>	Along Kings Highway south, adjacent to Lower Milford Township
<b>Map No. 17 – Knollwood Subdivision</b>	East of 5 <sup>th</sup> Street adjacent to Emmaus Borough
<b>Map No. 18 – Robert Moyer Subdivision</b>	Intersection of Main Road and Limeport Road

The current needs survey has addressed all area of concern outlined in the WSSFP.

### **1996 Act 537 Plan Revision**

As part of the 1996 Act 537 Plan Revision, an onsite treatment system needs survey of the Township was completed. Based on the results of this survey, seven areas within the Township were identified for potential sewage service.

Based on the results of the needs survey conducted as part of this study, the following areas were identified for further evaluation:

- Vera Cruz Road from Emmaus to Quarry Drive
- The Village of Vera Cruz
- An extended portion of Vera Cruz along Spruce Road
- Moyer Subdivision
- Main Road East from Vera Cruz to Moyer Subdivision
- Village of Old Zionsville
- Village of Powder Valley
- Mill Road west of Shimerville Road

The on-site survey results from this 1996 Study are summarized on Table 2-5.

The results of this 1996 needs survey demonstrated that the Vera Cruz and Moyer Subdivision areas had documented wastewater needs. In these areas, total reported system failures (both major and minor problems) accounted for 30 – 40% of the total lots surveyed. In addition, the Main Road East area had in excess of 20% reported failures.





Table 2-5



The Mill Road area percentages are misleading due to the low number of lots surveyed. Other areas surveyed all had less than 20 % failures. In all cases, the areas included in these surveyed areas were to be reexamined as part of any future needs analysis.

This study also obtained a limited number of well water samples as summarized on Table 2-6. These samples included both samples obtained during the study period and results of samples obtained by homeowners in the area in the time period just prior to the 1996 study. Only 18% of the lots in the Study area were sampled. Of those sampled only 24% of the samples had contamination. The highest percentage of contaminated samples occurred in the Vera Cruz Road and Main Road areas. These results correspond to the results of the on-site system survey and indicate that failing on-site system may have some impact on contaminated well samples.

#### **2.4.2.2 2003 Needs Analysis**

##### **Delineation of Needs Areas**

As part of the scope of work submission to PADEP, the Township was required to delineate areas of the Township for study as part of the needs analysis. These areas have been illustrated on Figure 2-11.

The areas to be evaluated as part of this analysis have been delineated by drainage basins and include the following:

##### **Saucon Creek Drainage Basin**

Area #SC-1 This area is located on the eastern end of the Township and is bounded by Brunner and Limeport Roads.

##### **Leibert Creek Drainage Basin**

Area #LC-1 This area is located adjacent to the Borough of Emmaus along Shimerville and Mill Roads.

Area #LC-2 This area includes the Village of Vera Cruz and is bounded by the Northeast Extension of the Pennsylvania Turnpike and the former Reading Railroad.

Area #LC-3 This area is located adjacent to Main Road East between the former Reading Railroad right of way and Limeport Road. This area includes the Moyer subdivision.



Table 2-6



Figure 2-11



Area #LC-4 This area is located adjacent to Jasper Road between Main Road East and Shimerville Road.

Area #LC-5 This area is located adjacent to Main Road East and Shimerville Roads between Chestnut St. (PA Route 29), Milford Road, and Beck Road.

#### Indian Creek Drainage Basin

Area #IC-6 This area is located adjacent to St. Peters Road west of Chestnut Street (PA Route 29).

#### Hosensack Creek Drainage Basin

Area #HC-1 This area is located adjacent the Church View Road and includes Sun Valley Run, Deer Drive, Wendi Drive (East and West), Gwen Circle.

Area #HC-2 This area consists of the overall Village of Old Zionsville.

Area #HC-3 This area consists of the overall Village of Zionsville.

#### Swabia Creek Drainage Basin

Area #SWC-1 This area is in the northern section of the Township and adjacent to Chestnut St., Mill Road, Tank Farm Road, and Rose Drive.

#### Little Lehigh Drainage Basin

Area #LL-1 This area is located adjacent the Borough of Emmaus along South 5<sup>th</sup> St., Columbus Drive.

Area #LL-2 This area is located adjacent the Borough of Emmaus along South 7<sup>th</sup> St.

### **Review of On site System Repair Records**

This analysis consisted of a review of Township records for repair of onsite systems. A summary of the results of this survey has been illustrated on Figure 2-12. The results of the survey have been tabulated on Table 2-7.



Figure 2-12



Table 2-7



Systems using “Best Technical Guidance” (BTG) for past repairs are summarized on Table 2-8. In each of these cases, the site restricts prevented on-site system repairs from fully meeting criteria required under Title 25 PaCode Chapter 73. Restrictions may have included isolation distances from potable water supplies, existing housing units or other isolation distance requirements.

An analysis of factors impacting future on-site system repairs was also completed. These factors included:

- Limited Isolation distances
- Floodplain Restrictions

Properties with limited isolation distances for future repairs are summarized on Table 2-8. These properties have limited space to properly locate any future repairs that will be required if the existing on-site system malfunctions. At best, these systems will have to be repaired following BTG requirements. The primary cause for these limiting isolation distances was related to small lot sizes in each impacted area. In most cases, there is not enough space available for any system repair.

Properties located in a FEMA designated floodplain area are also summarized on Table 2-8. The properties will also encounter problems with future repairs due to the location in a designated 100-year floodplain.

### **Review of Other Factors**

Other factors that were examined as part of the needs survey included the following:

- Area geology
- Existing densities
- Use of elevated sand mounds

The details of each of these areas are detailed in Appendix G of this document.

### **On Site System Visitations**

As part of the evaluation of onsite systems, the Township SEO completed a site visit to each onsite system that was located in the designated areas illustrated on Figure 2-11. The site visitations were initiated in June 2002 and were completed by August 2002. As part of this visit, an inspection was completed of the onsite systems and included a visual observation of the septic tank and associated drainfield. When possible, the resident or owner of the building serviced by the onsite system was interviewed.

The results of these site visits are summarized on Table 2-9.





Table 2-8



Table 2-9



## **Private Requests**

The Township has not received any private requests for actions regarding Act 537 Planning issues. However, the Township has received requests for two properties to be serviced by individual wastewater treatment facilities. These homes are at the following locations:

4926 Main Road  
6558 St. Peters Road

The following residents have requested the Township to provide sewage service:

3235 S. 6<sup>th</sup> St.  
3201 S. 7<sup>th</sup> St. Extension  
3320 S. 7<sup>th</sup> St. Extension  
3001 N. 2<sup>nd</sup> St.

In addition, the residents in the area of Golf Circle have requested sewer service in the past. Therefore, this area will be included as a potential sewer service area within the Township.

## **Summary of Results of the Needs Survey**

Based on the data compiled in this study, each delineated study area was evaluated to determine if the extension of central collection sewers should be considered. To assist in this evaluation, a matrix was developed for each of the following categories:

- Soils
- Geology
- Density
- Historical Repair Records
- Confirmed Malfunctions
- Suspected/ Confirmed Malfunctions
- Use of Elevated Sand Mounds
- Suspected/ Confirmed Cesspools



Each category was rated as follows:

- High Risk – These factors were evaluated to have a significant impact on the wastewater needs in the area.
- Moderate Risk - These factors were evaluated to have some impact on the wastewater needs in the area.
- Slight Risk - These factors were evaluated to have little to no impact on the wastewater needs in the area.

Averaging the risk factors from each category for each needs survey made the overall risk factor. The following numeric weight was given to each risk factor:

- Slight Risk                    1
- Moderate Risk                2
- High Risk                        3

The results of this analysis are presented on Table 2-10. Details regarding this analysis have been included in Appendix G.

The most significant factor impacting the results of the survey was the ongoing drought conditions that have plagued the entire Lehigh Valley area. During the summer of 1999, the entire area was subject to severe water restrictions. As a result, typical water consumption was significantly reduced. In addition, area water table levels were lower than normal. Therefore, it is very important that the Township SEO continue to monitor the on-site systems in these needs areas. If future problems occur due to changes in water table or other physical conditions in each area, a reassessment should be made at that time to determine if sanitary sewer service is warranted. Details of the entire needs survey have been documented in Appendix H of this document.

### **2.4.2.3            2005 Vera Cruz Area Needs Assessment**

Based on comments received from PADEP, the Township conducted a more detailed analysis of the needs in the Village of Vera Cruz area. The purpose of this analysis was to update the status of the existing on-site wastewater systems in the area. In addition, the system failures were re-classified to facilitate PADEP and Pennvest funding requirements. The results of this study have been included in Appendix M.

The results of this study have been summarized on Table 2-11.



Table 2-10



Table 2-11



## **2.4.3 Sewer Service Area Delineation**

### **2.4.3.1 General**

The sewer service areas have been divided into two areas:

Existing Sewer Service Areas (ESA) - These areas currently have sanitary sewer service provided by either the Borough of Emmaus or LCA.

Proposed Sewer Service Areas (PSA) – These areas have either a demonstrated need for sanitary sewer service to address existing wastewater needs.

### **2.4.3.2 Existing Sewer Service Areas**

The existing sewer service areas are illustrated on Figure 2-13. The areas ESA-1 through ESA-9 have been identified based on service provider and drainage area constraints.

Table 2-12 summarizes the existing sewer connections and residential service populations in each of the existing sewer service areas. The existing sewer service areas are illustrated on Figure 2-13.

### **2.4.3.3 Proposed Sewer Service Areas**

The proposed sewer service areas of the Township include those areas recommended for central collection sewers. The proposed sewer service areas are illustrated on Figure 2-14.

Table 2-13 summarizes the number of existing housing and commercial units and residential populations in each of the proposed sewer service areas. In addition, Table 2-14 summarizes the reasons for proposing sewer service in each of the areas. These reasons include any of the following:



Table 2-12





Figure 2-13



Figure 2-14



Table 2-13



Table 2-14



**Need For Future Sewage Service** - – These areas were included as part of the Needs Survey completed as part of the Act 537 Plan Revision. The overall risk factor associated with the needs area is an indicator of the likelihood of extending sewers in the future. Those areas with a “high” risk would most likely be sewered in the near future. Those areas with a “moderate” risk factor would be monitored as part of a septic management district with installation of sewers occurring only after on-site treatment is no longer practical in the area. Those areas with “slight” risk factors would only be sewered if circumstances warranted. In some cases, the proposed service areas associated with needs study areas were modified based on survey information obtained on individual properties and their need for future sewer service.

**Request for Development** –These areas have been designated for future development by private developers. Development in these areas would only occur after the private developer completes and submits the necessary supplementary planning documents such as a PADEP or Township planning module including justification for the need for sewage service.

Only those existing units that will be serviced immediately by any sewer system have been included in the existing service area tabulations shown on Table 2-13. Those units that are located in fringe areas or outlying properties without a documented need will be included as part of future connections. These existing properties could be serviced in the future if a need develops for that given property.

## **2.4.4 Review of Population Projections**

### **2.4.4.1 Estimated Occupancy Rate**

The results of the 2000 U. S. Census indicated that the population of the Township was 6889. Furthermore, the U. S. Census data indicated that there were 2576 households in the Township with an average family of 3.07 persons. This average family size will be used to estimate populations within the Study Area.



**2.4.4.2 Estimated Populations**

Population projections were obtained from two sources:

*Lehigh Valley Profile and Trends, 2001 Edition*, Lehigh Valley Planning Commission, June 2001

Upper Milford Township Property Data and Building Permit Records

**Water Supply and Sewage Facilities Plan** – The population projections provided by the Lehigh Valley Planning Commission (formerly the JPC – Lehigh Northampton Counties) are as follows:

**Table 2-15  
LVPC Population Projections**

Year	Population	Population Increase	
		(People)	(%)
1970	3,992		
1980	5,013	1,021	25.58%
1990	6,304	1,291	25.75%
2000	6,889	585	9.28%
2010	8,901 <sup>1</sup>	2,012	29.21%
2020	10,320 <sup>1</sup>	1,419	15.94%

1 – Projected population values

**Upper Milford Township Property Data and Building Permit Records** – For the period of 1991 through 2001, Upper Milford Township issued 464 permits for construction of new residential units. The average issue rate was 38.7 permits per year. This data has been summarized on Table 2-16. Based on a family size of 3.07 persons per unit as outlined in the 2000 US Census data, this shows a potential annual increase in population of 119 persons per year or 1,190 people per decade. This further indicates that the Year 2010 population may only be 8,079 as compared to the LVPC projection of 8,901. This is significantly lower than the projections shown by the LVPC.

**Summary of Population Projections** – Based on a review of the population projection data, the following population projections will be used to estimate wastewater needs in the Township for the planning period through the year 2020:



**Table 2-16**



**Table 2-17  
Population Projections for Period 2000-2020**

<b>Year</b>	<b>Total Population</b>	<b>ESA Sewered Population</b>	<b>10 Year Growth</b>	<b>PSA Sewered Population</b>	<b>10 Year Growth</b>
2000	6,889	1,164 <sup>1</sup>		2,564 <sup>1</sup>	
2005					
2010	8,901	1,980	70.1%	2,788	8.7%
2015					
2020	10,320	2,751	38.9%	3,012	8.0%

1-Based on current residential connections and 3.07 people per connection

These population projections assume that the growth rate used by the LVPC will continue at a rate of 0.93 percent per year throughout the entire planning period. Furthermore, the projections assume that 59.3 percent of the new residential growth will occur in either the existing or proposed sewer service areas of the Township.

The future population growth has been disaggregated as shown on Tables 2-18 for the existing service areas and 2-19 for the proposed service areas. It should be noted that there is a potential for future growth to exceed the population projections if all possible development occurs within these areas. In reality, this maximum growth is not likely to occur. However, the interceptors should be properly sized to accept growth from any of the areas. Therefore, the maximum growth potential will be used to determine potential flows from each of the sewer service areas.

## **2.4.5 Wastewater Flow Projections**

### **2.4.5.1 General**

Wastewater flows are a sum of the following components:

- Residential
- Commercial
- Industrial
- Inflow/ Infiltration





Table 2-18



Table 2-19



#### **2.4.5.2 Residential Flows**

Based on water billing data from within the various Township water distribution systems, residential water consumption was estimated to be approximately 186 gallons per day per equivalent dwelling unit. These estimates are based on the data presented on Table 2-5. Based on an average of 3.07 people per family, the average daily water consumption in the Township was 186 gallons per family.

The total water consumption for each equivalent dwelling unit will be used to project current and future residential sewage flows. Since only 75- 90 percent of the typical water consumption is discharged to a sanitary sewer, the flow projections for residential users will be conservative in nature.

#### **2.4.5.3 Minor Commercial Flows**

Minor commercial flows consist of small businesses that only generate domestic type sewage as a result of their business activities. Currently, these users are billed based on an equivalent dwelling unit basis. Therefore, existing flow projections for minor commercial users will be based on a flow of 186 gpd/ EDU and the respective number of equivalent dwelling units used for billing purposes.

Future growth of the minor commercial flows in the existing sewer service areas will be assumed to increase by 10 percent of the existing minor commercial users over the planning period. Additional future flow will be allocated for major commercial/industrial growth.

Minor commercial growth in the proposed sewer service area will be assumed to be 5 percent of the total projected flows. Growth associated with minor commercial users is the only anticipated non-residential growth anticipated in the proposed sewer service areas.



#### 2.4.5.4 Major Industrial/ Commercial Flows

##### Existing Sewer Service Areas

There are four major industrial commercial users currently located within the Township. These users include:

**Table 2-20**  
**Existing Sewer Service Areas**  
**Major Industrial/ Commercial Users**

<b>Industrial/ Commercial User</b>	<b>Service Area</b>	<b>Allocated EDU's</b>	<b>Allocated Flow<sup>1</sup></b>
		(edu's)	(gpd)
Hatfield Meats	ESA-8	43.62	12,000
Trivet Family Restaurant	ESA-8	10	2,800
Pickles Restaurant (Formerly Gerhart's Restaurant)	ESA-8	8.06	2,200
Lehigh Valley Baptist Church	ESA-8	7.66	2,100

1 - Flows based on an LCA flow rate of 275 gpd/EDU

All other industrial or commercial users have sewage flow allocations of less than 1500 gpd.

Within the existing sewer service area, 10 percent of the total flows for will be allocated for future industrial/ commercial growth. Based on current zoning, all of the future industrial/ commercial growth will be allocated to ESA-8.

##### Proposed Sewer Service Areas

There are no major industrial/ commercial users within the proposed sewer service areas. Future flow allocations for industrial/ commercial users will be included in the 10 percent increase allocated for future minor commercial growth.

#### 2.4.5.5 Inflow/ Infiltration Flows

Inflow/ infiltration (I/I) flows can have an impact on overall capacity requirements. Furthermore, these requirements vary throughout the system. Typical infiltration and inflow flows are illustrated in Figure 2-15.



Figure 2-15



Infiltration flows represent continuous flows from groundwater sources entering the sanitary sewers. These infiltration sources may include broken or cracked sewer pipes, leaking manhole joints, or broken or cracked sewer lateral pipe. These flows are normally highest during periods when groundwater table elevations are at their maximum levels. As the groundwater table elevation drops, the quantities of infiltration measured in the wastewater treatment facilities also are lower. Since this infiltration flow is somewhat continuous, high infiltration flow rates can decrease available capacity both in the sewage collection system and at the wastewater treatment plant.

Inflow occurs during significant wet weather events. Sources of inflow include illegal connections such as downspouts, sump pumps, and floor drains. Normally, inflow occurs during the storm event and decreases once the event has subsided. Instantaneous peak flows that occur during these periods are substantially higher than normal dry weather flows. These high flows have a major impact on available capacity in both gravity interceptor sewers and pumping stations that must process these high flow rates. As a result of high inflow flow rates, reserve capacity in these facilities may be significantly reduced.

Currently, there is no data available on the inflow/infiltration contributions from existing sewers located within Upper Milford Township. All new sewers will be constructed following strict building standards. As a result, infiltration/ inflow contributions from new connections will be minimal. A flow allocation of 50 gpd/ edu will be used to estimate I/I contributions from new sources.

#### **2.4.5.6 Existing Lehigh County Authority Flow Projections**

All flow projections for existing users serviced by the Lehigh County Authority will be estimated using a flow rate of 275 gpd/EDU that includes all I/I contributions.

#### **2.4.5.7 Summary of Adjacent Municipality Flow Projections**

There are no adjacent municipalities that will require capacity in wastewater facilities within Upper Milford Township.



## **2.4.5.8 Summary of Flow Projections**

### **Service Area Flow Projections**

The flow projections for the Township have been further disaggregated to reflect the volume of wastewater projected to be generated by each existing and proposed sewer service area. These projections are required to assure that the Township's collection/interceptor system has sufficient hydraulic capacity to transport the wastewater.

The design flow projections for existing sewer service areas are summarized on Table 2-21. The flow projections for the proposed sewer service areas are summarized on Table 2-22.

### **Drainage Basin Area Flow Projections**

A summary of flow projections for the two major drainage basins is presented on Tables 2-23 and 2-24. The major basins include:

Leibert Creek Basin (including adjacent Saucon Creek drainage basin)  
Hosensack Creek Basin

Each of these basins will include multiple proposed sewer service areas at their anticipated point of connection with other wastewater transports and/ or treatment facilities.

The remaining service areas will be serviced as separate entities to include:

- Little Lehigh Basin to include both the 5<sup>th</sup> St. and 7<sup>th</sup> St. sewer extensions
- Indian Creek Basin
- Swabria Creek Basin

In these cases, the flow projections for each service area will represent projected flows at the anticipated points of connection to other downstream wastewater conveyance facilities.

A summary of flow projections for the existing service areas is presented on Table 2-25.



Table 2-21





Table 2-22



Table 2-23



Table 2-24



Table 2-25



## **3.0 Evaluation of Alternatives**

### **3.1 DESCRIPTION OF ALTERNATIVES**

#### **3.1.1 Sewer System Alternatives**

The sewer system alternatives have been developed to address specific wastewater needs in each of the Township's three major drainage basins. Table 3-1 cross-references each alternative with the areas to be serviced including the proposed sewer service area (PSA) and Needs Area shown in the Needs Survey. In addition, alternatives were developed to address only those wastewater needs within the existing sewer service areas. A no action alternative was also considered.

Alternatives for the South 7<sup>th</sup> Street Extension and Golf Circle areas were not presented as part of this analysis. The South 7<sup>th</sup> St Extension area will be addressed through a PADEP *Sewage Planning Module for a Minor Act 537 Plan Revision*. A private developer through a PADEP Planning Module will address the Golf Circle area. Both planning documents will be presented to PADEP at a later date.

##### **3.1.1.1 No Action Alternative**

Under this alternative, the existing sewer service area within the Township would not be modified to extend and provide sewer service to the Village of Vera Cruz and other areas with documented sewage needs. Those areas currently not serviced by sanitary sewers would continue to be serviced by individual on-lot treatment systems.

##### **3.1.1.2 Alternative #1 – Provide Sewer Service to the Leibert Creek Basin through Borough of Emmaus using a Gravity Interceptor**

Under this alternative, a gravity collection system would be constructed to service the various areas of the drainage basin. A gravity interceptor would be constructed starting at Main Road East and extending north and paralleling Leibert Creek. The interceptor would provide service to the entire Leibert Creek drainage basin. The interceptor would connect to the Borough of Emmaus collection system at existing MH #C-231 located adjacent to Leibert Creek within the Borough limits.



Table 3-1 pg 2



Table 3-1



A portion of the service area located along Shimerville Road between Mill Road and David Drive and Marion Place can be serviced by installation of a gravity sewer that discharges to the Borough's existing MH #C-2334C located on Shimerville Road. This portion of the alternative is dependent on the availability of limited capacity in the Borough's collection system located downstream of Borough MH #C-2334C.

A sanitary sewer collection system would be constructed to provide sewage service to the following proposed serve service areas:

- PSA-1
- PSA-2
- PSA-3
- PSA-4

It must be noted that certain properties within the above referenced proposed serve service areas will not be provided sewage service under the initial proposed project. These properties were eliminated from the initial project area due to lack of demonstrated need and cost to extend service at this time. These properties can be provided sewage service if needs develop in the future.

The remaining two proposed service areas in the Leibert Creek basin did not have a significant need for installation of sanitary sewers at this time. However, any plan developed should include a sewage capacity allocation for these areas in the future. This Alternative is illustrated on Figure 3-1.

The Borough of Emmaus has addressed available sewage capacity within the their collection system. The results of this analysis are included in Appendix J. Based on this analysis, the Borough cannot provide sewage service using their collection system for the entire drainage area. Therefore, this alternative is not feasible and will not be further evaluated.

### **3.1.1.3 Alternative #2 – Provide Sewer Service to the Leibert Creek Basin through Borough of Emmaus using pumping stations**

Under this alternative, a gravity collection system would be constructed to service the various areas of the drainage basin. A pumping station would be constructed to transfer sewage within the Township's collection system. A pumping station would be located in the area of Main Road East would transfer sewage to a gravity line located along Vera Cruz Road North. The sewer would connect to the Borough of Emmaus collection system at existing MH #C-231 located adjacent to Leibert Creek within the Borough limits.





Figure 3-1



A portion of the service area located along Shimerville Road between Mill Road and David Drive and Marion Place can be serviced by installation of a gravity sewer that discharges to the Borough's existing MH #C-2334C located on Shimerville Road. This portion of the alternative is dependent on the availability of limited capacity in the Borough's collection system located downstream of Borough MH #C-2334C.

A sanitary sewer collection system would be constructed to provide sewage service to the following proposed serve service areas:

- PSA-1
- PSA-2
- PSA-3
- PSA-4

It must be noted that certain properties within the above referenced proposed serve service areas will not be provided sewage service under the initial proposed project. These properties were eliminated from the initial project area due to lack of demonstrated need and cost to extend service at this time. These properties can be provided sewage service if needs develop in the future.

The remaining two proposed service areas in the Leibert Creek basin, PSA-5 and PSA-6 did not have a significant need for installation of sanitary sewers at this time. However, any plan developed should include a sewage capacity allocation for these areas in the future. This Alternative is illustrated on Figure 3-2.

The Borough of Emmaus has addressed available sewage capacity within the their collection system. The results of this analysis are included in Appendix J. Based on this analysis, the Borough cannot provide sewage service using their collection system for the entire drainage area. Therefore, this alternative is not feasible and will not be further evaluated.

#### **3.1.1.4 Alternative #3 – Provide Sewer Service to the Leibert Creek Basin through Lehigh County Authority Route 29 Facilities using a Pumping Station and Gravity Interceptor**

Under this alternative, a combination of gravity interceptors and pumping stations would be used to transport wastewater to LCA's Route 29 collection system. The proposed system would connect to the existing LCA collection system at MH # JS-1 located on Salem Drive.



Figure 3-2



The gravity interceptor would extend along Leibert Creek from Main Road East along the creek to the proposed pumping station. The proposed pumping station would be located near the intersection of Vera Cruz and Mill Roads. The force main would extend from the pumping station along Mill Road to Shimerville Road, to Salem Drive. The force main will terminate on Salem Drive at the LCA MH #JS-1. Capacity within the LCA collection and interceptor system was addressed in a letter dated August 28, 2002 from LCA that has been included in Appendix K.

A portion of the service area located along Shimerville Road between Mill Road and David Drive and Marion Place can be serviced by a low-pressure collection system. This low-pressure system will discharge to the proposed gravity manhole located at the intersection of Mill and Shimerville Roads.

A sanitary sewer collection system would be constructed to provide sewage service to the following proposed serve service areas:

- PSA-1
- PSA-2
- PSA-3
- PSA-4

It must be noted that certain properties within the above referenced proposed serve service areas will not be provided sewage service under the initial proposed project. These properties were eliminated from the initial project area due to lack of demonstrated need and cost to extend service at this time. These properties can be provided sewage service if needs develop in the future.

The remaining two proposed service areas in the Leibert Creek basin, PSA-5 and PSA-6 did not have a significant need for installation of sanitary sewers at this time. However, any plan developed should include a sewage capacity allocation for these areas in the future. This Alternative is illustrated on Figure 3-3.

#### **3.1.1.5 Alternative #4 – Provide Sewer Service to the Leibert Creek Basin through Lehigh County Authority Route 29 Facilities using Pumping Stations**

Under this alternative, a combination of pumping stations would be used to transport wastewater to the Lehigh County Authority Route 29 collection system. The proposed system would connect to the existing LCA collection system at MH # JS-1 located on Salem Drive.



Figure 3-3



The first pumping station, located in the area of Main Road East, would transfer sewage to a gravity line located along Vera Cruz Road North. The second proposed pumping station would be located near the intersection of Vera Cruz and Mill Roads. The force main would extend from the pumping station along Mill Road to Shimerville Road, to Salem Drive. The force main would terminate on Salem Drive at the LCA MH #JS-1. Capacity within the LCA collection and interceptor system was addressed in a letter dated August 28, 2002 from LCA that has been included in Appendix K.

A portion of the service area located along Shimerville Road between Mill Road and David Drive and Marion Place can be serviced by a low-pressure collection system. This low-pressure system will discharge to the proposed gravity manhole located at the intersection of Mill and Shimerville Roads.

A sanitary sewer collection system would be constructed to provide sewage service to the following proposed serve service areas:

- PSA-1
- PSA-2
- PSA-3
- PSA-4

It must be noted that certain properties within the above referenced proposed serve service areas will not be provided sewage service under the initial proposed project. These properties were eliminated from the initial project area due to lack of demonstrated need and cost to extend service at this time. These properties can be provided sewage service if needs develop in the future.

The remaining two proposed service areas in the Leibert Creek basin, PSA-5 and PSA-6 did not have a significant need for installation of sanitary sewers at this time. However, any plan developed should include a sewage capacity allocation for these areas in the future. This Alternative is illustrated on Figure 3-4.



Figure 3-4



### 3.1.1.6 Alternative #5 – Provide Sewer Service to the Leibert Creek Basin through new WWTP with Stream Discharge to Leibert Creek

Under this alternative, a 0.110 mgd treatment plant would be constructed along Quarry Drive. The treatment plant would discharge to Leibert Creek in the vicinity of the WWTP. Since Leibert Creek is classified as a HQ-CWF stream, water quality standards for any treatment facility would be very strict. Typical monthly effluent standards for this facility would be as follows:

Biochemical Oxygen Demand (5 day)	15 mg/l
Total Suspended Solids	30 mg/l
Ammonia Nitrogen	
Winter	4.5 mg/l as N
Summer	1.5 mg/l as N
Total Nitrogen	10 mg/l as N
Phosphorus	2.0 mg/l as P
pH	7 - 9
Dissolved Oxygen	Not less than 6.0
Total Chlorine Residual	Not detectable

In order to achieve these effluent stands, the proposed treatment plant would include the following unit processes:

- Influent bar screen
- Grit removal system
- Packaged type activated sludge system
- Ultra-violet disinfection system
- Post aeration
- Aerobic digestion
- Belt filter press

The majority of the collection system would be serviced through a pumping station located on East Main Road. A small pumping station would also be required to service potential users that are located in the lower portion of the Leibert Creek drainage basin. The pumping station would be located near the Township municipal boundary with the Borough of Emmaus.

A portion of the service area located along Shimerville Road between Mill Road and David Drive and Marion Place can be serviced by a low-pressure collection system. This low-pressure system will discharge to the proposed gravity manhole located at the intersection of Mill and Shimerville Roads.

This Alternative is illustrated on Figure 3-5.





Figure 3-5



### **3.1.1.7 Alternative #6 – Provide Sewer Service to the Leibert Creek Basin through New WWTP with Land Application Discharge**

Under this alternative, land application would be used to dispose of the treated effluent from a WWTP located in the area outlined in Alternatives #1-5.

The land application alternatives are similar to those for stream discharge. The major difference is that the treated effluent is disposed of via a spray irrigation system instead of by direct discharge to a receiving water body. Based on the current PADEP regulations, all Act 537 Plans must include land application as one of the wastewater management alternatives.

There are four types of land treatment which are widely used:

- Rapid infiltration
- Spray irrigation
- Drip Irrigation

The PADEP has issued regulations governing the design of spray irrigation facilities, *Manual for Land Application of Treated Sewage and Industrial Wastewater*, (October 15, 1997). The USEPA has published recommended design standards for all three types of systems in the *Process Design Manual, Land Treatment of Municipal Wastewater* (1981). The PADEP standards will be used in the pre preliminary design phase for the cost-effectiveness analysis.

Based on preliminary analysis, rapid infiltration was not considered as a viable method for land application in this area. The soils in the area do not meet minimum percolation requirements necessary for rapid infiltration systems.

There are several advantages associated with land application of municipal effluents:

- Recharge of groundwater supplies
- Reduction of organic loading in surface waters
- Irrigation of vegetation that is not used in the human food chain

Of these advantages, the recharge of existing groundwater supplies is of primary importance. During years of drought, the water table of an area may become depleted by normal water consumption. Proper management of a land application operation could minimize this impact.



The land application treatment process entails three major components:

- Conventional secondary treatment plant
- Spray field or disposal area
- Effluent storage lagoon

Conventional secondary treatment is required prior to land application. The treatment processes usually included are:

- Preliminary treatment consisting of screening and grit removal
- Secondary treatment
- Disinfection with chlorine

Normal treatment levels for this application are 85 percent removal of both BOD<sub>5</sub> and total suspended solids. A chlorine residual of 1.5 mg/l is also required for disinfection and to control odor in the effluent storage lagoons.

The land application portion of the system consists of a large spray field or disposal area and storage lagoon. Normal biological activity of the cover vegetation and chemical and microbial activity in the soil mantle are used for final treatment. Based on the site limitations dictated by the cover crop and soils, the effluent is sprayed onto the field and allowed to percolate through the soil.

Soil limitations for preliminary screening of soils for use with land application were as follows:

Permeability Rate	>0.06 in/hr
High Ground water Table	>4.0 ft
Depth to Bedrock	>4.0 ft
Slope	<12.0%

Based on a compatibility review of the soils found within Upper Milford Township, several soils are potentially usable for spray irrigation:

- Gladstone (Gfb, GfC)
- Udorthents (Ua)
- Washington (WaB, Wac)

In addition, Edgemont, Gladstone (GeA-C), Laidag, Murrill, Neshaminy, and Penn are somewhat limited for use. In most cases, depth to high groundwater table is the limiting factor regarding these soils.



A review of the geology of the area indicates that carbonate rocks underlie a majority of the area. These areas include both Allentown and Rickenbach dolomite. Furthermore, those areas on the fringe of the carbonate rock area may also have layers of carbonate rock interspaced with the other rock formations. Studies conducted in adjacent areas indicated that limestone formations were found in areas mapped for rock formations other than limestone.

Based on the presence of limestone bedrock in the Upper Milford area, land application of treated wastewater would not be feasible as outlined in Title 25 PaCode Chapter 73.12.

### **3.1.1.8 Alternative #7 – Provide Sewer Service to the Leibert Creek Basin through Lehigh County Authority Route 29 Facilities using a Low Pressure System**

Under this alternative, a low-pressure collection system would be used to transport wastewater to LCA’s Route 29 collection system. The proposed system would connect to the existing LCA collection system at MH # JS-1 located on Salem Drive.

A sanitary sewer collection system would be constructed to provide sewage service to the following proposed serve service areas:

- PSA-1
- PSA-2
- PSA-3
- PSA-4

It must be noted that certain properties within the above referenced proposed serve service areas will not be provided sewage service under the initial proposed project. These properties were eliminated from the initial project area due to lack of demonstrated need and cost to extend service at this time. These properties can be provided sewage service if needs develop in the future.

The remaining two proposed service areas in the Leibert Creek basin, PSA-5 and PSA-6 did not have a significant need for installation of sanitary sewers at this time. However, any plan developed should include a sewage capacity allocation for these areas in the future. This Alternative is illustrated on Figure 3-6.



Figure 3-6



### **3.1.1.9 Alternative #8 – Extending Sewer Service to the South Fifth St. Area**

This alternative would provide sewer service to PSA-12. Under this alternative, gravity sewers would be extended along South 5th Street. Sewers would also be extended to provide sewer service to and provide sewer service to Plain View Rd, Columbus Drive, Knoll Wood Drive and Hillary Drive. The sewers would connect to the Borough of Emmaus collection system at Borough MH #C-1 located on South 5<sup>th</sup> St.

This Alternative is illustrated on Figure 3-7.

### **3.1.1.10 Alternative #9 – Extending Sewer Service to Indian Creek Drainage Basin**

Under this alternative, this area would be serviced by a gravity collection system and a community septic disposal system. The community disposal system designed to process sewage from the St. Peters Road and the Schantz Road areas (PSA-7) would have a capacity of 36,000 gpd. The collection system would require approximately 18,300 linear feet of gravity sewer. Two central pumping stations, one located on St Peters Road and the second located on Schantz Road, would transfer the sewage to the community system. A mechanical bar screen would be included with the pumping station to remove rags and other large debris. The treatment system would consist of two sequencing batch reactor tanks followed by an absorption bed with an effective minimum absorption bed area of 36,000 square feet. The proposed site for the absorption bed would be located adjacent to St. Peters Road in a vacant field. A detailed analysis of this system is contained in Appendix L.

This Alternative is illustrated on Figure 3-8.

### **3.1.1.11 Alternative #10 – Extending Sewer Service to the Hosensack Creek Drainage Basin**

Under this alternative, each sub-drainage basin within this area would be serviced by a gravity collection system, central pumping station, and a community septic disposal system. This Alternative is illustrated on Figure 3-9.

**Churchview Road Area (PSA-8)** - The community disposal system designed to process sewage from the Church View Road Area (PSA-8) would have a capacity of 17,000 gpd. The collection system would require approximately 8,000 linear feet of gravity sewer. A central pumping station located Church View Road would transfer the sewage to the community system. A mechanical bar screen would be included with the pumping station to remove rags and other large debris. The treatment system would consist of a sequencing batch reactor treatment plant followed by an absorption bed with an effective minimum absorption bed area of 17,000 square feet. The proposed site for the absorption bed would be located adjacent to Church View in a vacant field. A detailed analysis of this system is contained in Appendix L.



Figure 3-7



Figure 3-8





Figure 3-9



**Old Zionsville Area (PSA-9)** - The community disposal system designed to process sewage from Old Zionsville (PSA-9) would have a capacity of 32,000 gpd. The collection system would require approximately 13,100 linear feet of gravity sewer. A central pumping station located adjacent to Kings Highway would transfer the sewage to the community system. A mechanical bar screen would be included with the pumping station to remove rags and other large debris. The treatment system would consist of sequencing batch reactor tanks followed by an absorption bed with an effective minimum absorption bed area of 32,000 square feet. The proposed site for the absorption bed would be located adjacent to Kings Highway in a vacant field. A detailed analysis of this system is contained in Appendix L.

**Zionsville Area (PSA-10)** - The community disposal system designed to process sewage from Zionsville (PSA-10) would have a capacity of 7,000 gpd. The collection system would require approximately 2000 linear feet of gravity sewer. A central pumping station located on Kings Highway south of the former Reading Railroad right of way would transfer the sewage to the community on-site septic system. A mechanical bar screen would be included with the pumping station to remove rags and other large debris. The treatment system would consist of two 6,000-gallon septic tanks followed by an absorption bed with an estimated effective absorption bed area of 8,800 - 12,800 square feet. The proposed site for the absorption bed would be located adjacent to Kings Highway in a vacant field.

### **3.1.1.12 Alternative #11 – Extending Sewer Service in the Swabia Creek Drainage Basin**

Under this alternative, the gravity collection system servicing ESA-8 would be extended to provide sewer service to this area.

The majority of the area would be serviced by gravity sanitary sewers that connect to existing LCA MH #B-8. The gravity sewer would be extended from MH #B-8 along the unnamed tributary to Swabia Creek to Mill Road. Sewers would then extend along Mill Road and provide sewer service to Homestead Circle and Flora Drive.

Gravity sanitary sewers that also provide service to the Ford Drive area would service the area along Tank Farm Road north of Mill Road. A small portion of Tank farm Road would be serviced through existing MH #B-12.

The sanitary sewers servicing the Chestnut Street area would extend along both sides of the highway and connect to existing LCA MH #R-20.

This Alternative is illustrated on Figure 3-10.



Figure 3-10



### **3.1.2 Onsite System Treatment Alternatives**

#### **3.1.2.1 No Action Alternative**

Under this Alternative, the Township would continue to operate its on-site management program without any modifications. Currently, the Township has a part time Sewage Enforcement Officer (SEO) who is responsible for management of all on-site systems in the Township. As part of his duties, the SEO issues permits for construction of new on-site treatment systems, issues repair permits for failing on-site systems, witnesses soil probes and percolation tests associated with new system construction or repair of old systems, and is responsible for enforcement actions associated with failing existing on-site treatment systems.

#### **3.1.2.2 Formation of Sewage Management District**

Under this Alternative, Upper Milford Township would form a sewage management district within the Township to manage all on-site treatment systems. The management district would encompass the entire Township and include all homes or other facilities serviced by on-site treatment systems.

#### **Using Existing Township Resources to Establish Management Agencies**

As outlined in the no action Alternative, Upper Milford Township is currently involved in a limited on-site system management program. This program, based on state regulations, requires that the Township issue permits for on-site treatment systems. These activities involve site testing, design review and final inspection of on-site sewage systems and require that procedures and fees be established to carry out the program. Some of the activities of the Township extend to resolving system malfunctions as required by local ordinances or state laws. A sewage management program is a natural extension of the existing permitting program. While the existing on-site permitting program stops at the final inspection of the system installation, the sewage management program would extend the Township oversight of these on-site systems through required maintenance or inspection. This assures that the special precautions taken to make sure these systems are designed and installed properly are not wasted because of the lack of owner maintenance. It also assures that all new land developments proposed within the Township will become part of the management program and will have maintained systems. Malfunctions of existing systems will be reduced due to more frequent maintenance.



## **Function of an On-Site Treatment System Management Agency**

The management program will be designed to:

- Actively identify malfunctions;
- Take enforcement action to abate nuisances;
- Provide technical assistance to help correct malfunctions;
- Update old systems to present disposal technology (as applicable);
- Require property owners to pump septage from septic tanks on a predetermined schedule;
- Conduct operation and maintenance inspections.

## **Planning Elements Required Establishing an On-site Treatment System Management Agency**

As part of this Act 537 Plan Revision, the following planning elements were included in order to properly assess a sewage management program:

- Identification of the areas of the municipality in which sewage management activities will be established;
- An evaluation of the types of periodic inspections, operation or maintenance activities needed to assure long term use of onlot systems;
- An identification of the legal authority the municipality intends to use to carry out these activities, including enforcement and restraint of violations of the program;
- Standards for operation, maintenance, repair and replacement of sewage facilities consistent with any state standards;
- Establishment of a fee schedule for the services provided by the municipality or management agency;
- An ordinance that implements the program.

## **Sewage Management Program Requirements**

The basic options available to the Township in establishing their sewage management program are controlled by the minimum maintenance standards contained in Chapter 71 of PADEP's regulations. These standards were established to make sure that each management program established carries out at least the minimum activities necessary to maintain on-site treatment systems. These minimum standards require that the sewage management plan include:

- Removal of septage or other solids from the treatment tanks once every three years or whenever a tank inspection reveals that the tank is filled in excess of 1/3 the liquid depth of the tank with scum or solids;



- Maintenance of surface contouring around the system to divert stormwater away from the system and protect the system from all forms of material damage;
- Water conservation requirements;
- Requirements for maintenance of electrical, mechanical and chemical components of the sewage facility including collection/ conveyance piping, pressure lines, septic or holding tanks, alarm and flow recorders (if necessary), pumps, disinfection equipment and related safety equipment;
- Provisions for septage pumping and disposal; and
- Requirements for holding tank maintenance.

### **Implementation of the Sewage Management Program**

The key to implementation of the sewage management program is establishment of a successful sewage management program is as follows:

- Assure that all systems are constructed in accordance with requirements set forth by PADEP and other regulatory agencies.
- Assure that all systems are pumped on a regularly scheduled basis.
- Assure that all systems are inspected on a regularly scheduled basis to assure that they are operating properly.
- Assure that septage generated in the Township is properly disposed at permitted wastewater treatment facilities.

**System Permitting** – Under this program, permitting of all on-site treatment systems would be processed through the Township’s existing Sewage Enforcement Officer (SEO). The permitting process would follow current PADEP permit requirements.

**System Pumping** – The program would establish a mandatory minimum pumping schedule for all on-site treatment systems in the Township. The Township would issue a notice to each system prior to the date that the system pumping is required. The system owner would then contact an approved contractor to pump the contents of the on-site treatment system including the septic tank and other auxiliary tanks such as a pump tank. The contractor would be responsible for notifying the Township that the system was pumped and the resulting septage was disposed of in an approved manner. Based on current PADEP requirements, each system would be pumped once every three years.



**System Inspection** – As part of the pumping activity, the pumping contractor would be responsible to perform a preliminary inspection of the on-site treatment system. Prior to pumping the system, the access lid of the septic tank would be exposed to allow for inspection of the internal components of the septic tank. These would include items such as the inlet and outlet baffles and inlet and outlet piping. As part of the reporting to the Township, the pumping contractor would be responsible to assess the condition of the system and report any potential deficiencies as part of the septage disposal manifesting system.

If the contractor discovers any deficiencies with a system, the Township SEO will complete a follow-up inspection to determine the severity of the problem and possible corrective actions.

**Permitting of all Contractors** – All approved contractors pumping on-site treatment systems in the Township would be permitted by the Township. The Township ordinance would establish the duration of any permit. As part of the permitting process, the contractors must demonstrate the following:

- Equipment used in the pumping activities must be in serviceable condition and well maintained.
- The Contractor must have proper insurances to include environmental damage, automotive, and liability.
- The Contractor must demonstrate his/ her abilities to properly inspect on-site treatment systems.
- The Contractor must demonstrate an approved method for disposal of all septage.

Contractors would be required to obtain operating permits on an annual basis. All fees and fee schedules would be established in the Township Ordinance.

### **Legal Authority for Implementing Program**

A sample ordinance for implementing the sewage management program is contained in Appendix H. In addition, the Township has a current ordinance for use of holding tanks. This ordinance is contained in Appendix I.

### **3.1.2.3 Incorporation Into County System**

Under this Alternative, the Township would turn over all responsibility for management of on-site systems to a county level health department. Although Lehigh County does not currently have a health department, some local officials are potentially planning to form such an agency in the future. Until this agency would be formed and operational, the Township would be required to continue to implement its own management program.



## **3.2 EVALUATION OF ALTERNATIVES**

### **3.2.1 Facility Capacity Analysis**

This analysis will be used to determine if existing facilities have sufficient capacity to meet the future wastewater needs of their respective sewer service areas. These facilities will include both the existing Lehigh County Authority Interceptor and the existing sewage collection system located in Emmaus Borough.

#### **3.2.1.1 Wastewater Treatment Plant**

The City of Allentown wastewater treatment plant will ultimately service the Township's sewage needs. The treatment plant capacity is allocated through LCA. Therefore, all wastewater needs will be addressed by available capacity from LCA. Based on correspondence from LCA dated August 28, 2003 and July, 27 2005, there is sufficient treatment capacity available to meet all of the Township's projected requirements. A copy of this letter is found in Appendix B.

#### **3.2.1.2 Interceptor Analysis**

##### **Lehigh County Authority Interceptor**

The LCA completed an analysis in July 1999 for acceptance of 259,200 gpd (180 gpm) from a proposed Township pumping station discharging to LCA MH #JS-1. Based on this analysis, the LCA collection/ interceptor required to provide service to the proposed Township pumping station located in the vicinity of Mill and Vera Cruz Roads had sufficient capacity to transport the projected flows. Based on current flow projections for the Leibert Creek drainage basin, the projected peak flows are less than the 259,200 gpd used for this analysis.

In addition, the analysis indicates that the collection system will have sufficient capacity to address all wastewater needs within PSA-13 (South 7<sup>th</sup> St. Extension area), PSA-11 (Swabia Creek Basin), and PSA-14 (Golf Circle Area). The estimated wastewater flow from this area is estimated to be 0.029 mgd daily average flow with an estimated peak flow rate 0.116 mgd.





## **Borough of Emmaus Collection System**

As part of the Act 537 Plan, the Township was requested to evaluate the potential for using the Borough of Emmaus collection system to convey sewage to the LCA interceptors. Based on an analysis completed by the Borough Engineer in a letter dated June 12, 2003, Hanover Engineering, it was determined that the Borough did not have sufficient reserve capacity in their collection system to provide service to Upper Milford Township' proposed collection and interceptor system servicing the entire Leibert Creek drainage basin. This analysis is provided in Appendix J.

### **3.2.2 Financial Analysis**

#### **3.2.2.1 Sewer System Alternatives**

##### **Capital Costs**

**Sewer System Construction Costs** – The construction costs associated installation of sanitary sewers has been summarized on Tables 3-2 and 3-3. Where possible, gravity sanitary sewers were used to provide sewage service. However, in some cases, this was not practical due to topographic constraints. In these cases, the use of low-pressure sewer systems was used to provide sewage service.

For purposes of estimating costs for each alternative, the following types of gravity sewers were used:

- 8 in. diameter gravity sewer located in open terrain (off road areas)
- 8 in. diameter gravity sewer located in Township roads
- 8 in. diameter gravity sewer located in PennDOT roads
- 12 in diameter interceptor sewers
- Low-Pressure Mains

The estimated construction costs for the gravity sewers in each alternative have been summarized on Table 3-2.

In addition, several alternatives included use of a pumping station and force main. In these cases, the pumping station design was assumed to consist of a submersible type pumping system. The associated force mains were assumed to be 6-inch diameter ductile iron pipe.

The low pressure sewers were estimated using single unit grinder pump systems and common low pressure force mains that are 2-5 inches in diameter depending on the number of customers serviced by the low pressure system.



Table 3-2



The estimated construction costs for the low-pressure sewers, pumping stations, and force mains associated with each alternative are summarized on Table 3-3.

**Wastewater Treatment Plant Construction Costs** - The costs associated with construction of a WWTP associated with Alternatives #6, #9, and #10 are summarized on Table 3-4. The treatment plant costs associated with Alternative #6 include a treatment facility including a sequence batch reactor type activated sludge system. The treatment system systems associated with Alternatives #9 and #10 are for community on-lot systems including treatment tanks and absorption beds and necessary appurtenances at the treatment site.

**LCA Non-project Capacity Tapping Fees** – The cost of the tapping fee has been included in alternatives # 3, #4, #7 and #8. In each of these alternatives, the sewer system users will be ultimately serviced by LCA facilities and will be required to pay the minimum connection fee of \$1,606 per equivalent dwelling unit (EDU). These costs have been summarized on Table 3-5.

**Total Capital Costs** - The total estimated capital costs for construction of sewers in each alternative are summarized on Table 3-6. In addition, the costs for engineering, legal assistance, and administrative costs have been included in the analysis. Also, any costs associated with acquisition of right of ways have been included in the analysis.

### **Operation and Maintenance Costs**

**Collection System Operating Costs** – The operating costs associated with each alternative will be most associated with operation of pumping station equipment. These costs would include labor associated with maintaining the station and electrical power to operate the pumping equipment. The operating costs associated with the gravity sewers would be minimal. For purposes of this analysis, 12 - 50 man-hours of maintenance activity were used. The cost for each man-hour of labor is \$150/hr including vehicles and other sewer equipment such as video inspection and vactor equipment. Therefore, the estimated gravity collection system O&M cost varied from \$600 to \$7500 for each of the various alternatives.

The cost for operating a low-pressure collection system was estimated to be \$15, 000 per year. This would include such maintenance tasks as flushing of lines.

The costs associated with operation of grinder pump units would also be minimal. Once constructed, these units would be operated and maintained by the individual homeowner. The homeowner would be required obtain an annual maintenance contract to assure that their pump unit would be maintained. This would also provide an efficient means to repair any potential pump failure in the future.

The estimated operations and maintenance costs associated with the collection system alternatives are summarized on Table 3-7.



Table 3-3



Table 3-4



Table 3-5



Table 3-6



Table 3-7





**Wastewater Treatment Plant Costs** - The costs for operation and maintenance of a wastewater treatment plant are summarized on Table 3-8.

**LCA Annual UMiT Common Rate User Charges** – For purposes of this analysis, an annual unit charge of \$451/EDU was used to account for the base annual user fees paid to LCA for use of their system. These annual costs are summarized on Table 3-9.

### **Present Worth Analysis**

The present worth for each of the alternatives is summarized on Table 3-10. The present worth analysis was calculated for a 20-year period and included:

- Capital cost of the sanitary sewer collection system
- Capital cost of interceptor sewers (if necessary)
- Present worth of collection system operation and maintenance costs
- Present worth of WWTP capital costs
- Present worth of WWTP operation and maintenance costs

The present worth of the operations and maintenance costs was calculated using current WSJ prime interest rate of 4.00%.

### **User Charges**

It is estimated that properties within the Vera Project Area that connect to the sewer system will pay an annual user charge of \$1,378 per Edu. The charge will be composed of two parts, the then current Upper Milford Common Rate charge, currently \$451 plus a Vera Cruz Project charge estimated to be \$ 927.

This user charge does not include any additional costs associated with a capital recovery fee where required to fund the construction of sewer facilities.

### **Septic Management District Costs**

#### **Township Costs**

The Township will be able to implement the septic management district alternative using existing Township staff. The Township currently employs the services of a qualified full time Sewage Enforcement Officer (SEO). The Township also uses the services of a part-time backup SEO when necessary.

The cost for implementation of the septic management district is not anticipated to significantly increase Township's costs.



Table 3-8



Table 3-9



Table 3-10



## **User Costs**

The homeowner will continue to be responsible for all costs associated with operation and maintenance of the on-site treatment systems. These costs would include periodic pumping of the septic tanks and system repairs.

In addition, individual homeowners will continue to be responsible for costs associated with permitting of new on-site systems and repairs to existing onsite systems. Costs include percolation testing costs, engineering fees if applicable, Township permit fees and system installation costs.

### **3.2.3 Environmental Impact Analysis**

#### **3.2.3.1 Sewer System Alternatives**

##### **No Action Alternative**

Under this alternative, limited existing and no future wastewater needs within the Township would be addressed. As a result, both surface and ground water resources could be impacted throughout the planning period.

These impacts would include possible contamination of groundwater resources by failing on-site treatment systems. In some cases, homeowners may be unable to properly repair a failing on-site system. In order to prevent a public health hazard, the homeowner may be forced to use a holding tank. Under some extreme conditions, the homeowner may lose the occupancy permit for the premises and the house would be forced to remain vacant until adequate sewage facilities are provided.

In addition, others problems could be fostered by this alternative:

Inability of homeowners to sell properties due to inability to obtain septic system certification for the mortgage company

The area surrounding failing on-site treatment systems could be subject to odor problems

Based on the negative impacts associated with the no action alternative, some form of action to address wastewater needs must be taken by the Township.



**Alternative #1 – Provide Sewer Service to the Leibert Creek Basin through Borough of Emmaus using a Gravity Interceptor**

Since the Borough of Emmaus cannot provide sufficient capacity in their collection system to provide service to the Township, this alternative was determined to be unfeasible and was not evaluated for environmental impacts.

**Alternative #2 – Provide Sewer Service to the Leibert Creek Basin through Borough of Emmaus using pumping stations**

Since the Borough of Emmaus cannot provide sufficient capacity in their collection system to provide service to the Township, this alternative was determined to be unfeasible and was not evaluated for environmental impacts.

**Alternative #3 – Provide Sewer Service to the Leibert Creek Basin through Lehigh County Authority Route 29 Facilities using a Central Pumping Station and Gravity Interceptor**

**General Environmental Impacts** - Construction of new wastewater conveyance facilities in the Village of Vera Cruz and Moyer subdivision areas of the Township will have a positive impact both surface and ground water quality in the area. This portion of the Township will have a positive environmental impact on the overall area by improving both surface and groundwater quality. These improved conditions will also have a positive impact on the quality of living conditions in this area. The various environmental impacts have been illustrated on Figure 3-11.

The construction of new facilities to service existing homes and other facilities in the Village of Vera Cruz and Moyer subdivision areas of the Township will have a positive impact both surface and ground water quality in the area. The new collection system will service properties with known or suspected problematic existing on-site treatment systems. By removing these on-site systems from service, corresponding waste loadings of BOD<sub>5</sub>, ammonia nitrogen, and phosphorus will be removed from entering both groundwater and surface waters in the area. Since this area is located in the Environmentally Sensitive Zone of the Township, these factors are extremely important to maintain the high quality of the groundwater.

Construction of the sewer facilities will have minimal adverse short-term impacts in this area, such as noise, dirt, and minor traffic disruptions during the construction period. Some of these impacts can be minimized through the use of approved soil erosion control techniques and posted traffic detours. These impacts will be eliminated upon the completion of the construction of the facilities.



Figure 3-11



In addition, several of the collection sanitary sewers will be located adjacent to PennDOT highways. PennDOT construction restrictions may require that sewers be located in the shoulder of the highway wherever possible. Necessary PennDOT permits will be obtained for all sewers located within PennDOT right of ways.

This alternative will require a pumping station to transfer sewage to LCA facilities. Therefore, this alternative will require continual electrical resources to operate the system.

**Wetland Impacts** –This alternative will have minimal long-term impact on wetland areas. As shown on Figure 3-11, most of the mapped wetland areas associated with the area directly adjacent to Leibert Creek in the Vera Cruz area. The gravity interceptor will have to cross these wetland areas. However, the areas can be restored to near existing conditions upon completion of the construction. In addition, the interceptor will pass through wetlands located adjacent to Leibert Creek. Necessary PADEP and US Army Corps of Engineers (ACOE) permits will be obtained for all wetland crossings as part of the design process. These permit applications are anticipated to be for PADEP GP-5 permits and ACOE permits associated with wetlands.

**Stream Crossings** – The interceptor and collection system sewers will have several stream crossing associated with Leibert Creek as illustrated on Figure 3-11. These crossing include two stream crossing along Main Road East and one crossing along Vera Cruz Road North in the Village of Vera Cruz. Also, the sewers will cross several smaller unnamed tributaries of the Leibert Creek. During the design phase of the project, these areas will be mapped and necessary PADEP permits (PADEP GP-5 Permit) will be obtained where necessary for the sewer pipes crossing the wetland areas. Upon completion of construction, these wetland areas should revert back to conditions present prior to construction.

**Floodplain Impacts** - This alternative will have minor long-term impacts on flood plains in the area. The proposed interceptor will be located outside the designated floodway wherever possible. In those areas where the interceptor is located within the designated 100-year floodplain, all manholes will be equipped with waterproof manhole covers. Where practical, the top of the manhole structure will be above the estimated 100-year flood elevation. The areas that will be impacted by the floodplain are adjacent to the Leibert Creek. This alternative will not involve any permanent structures that will impact flood plain and change floodplain characteristics. The design phase will include obtaining necessary PADEP permits associated with occupancy of any floodplain areas.

**Impact on Prime Agricultural Soils** – As shown on Figure 3-11, this alternative will could have an impact on prime agricultural soils. However, several of the larger land tracts have been placed into the Township’s Agricultural Preservation Program. Therefore, these properties will not be subject to future development as a result of implementation of this alternative.





**Secondary Impacts** – Secondary impacts such as controlling growth in this area should not be a significant problem. Current Township Ordinances will control growth based on the physical topography of the area and the inability to construct new houses.

**Historical Site Impacts** - Based on the results of the needs survey, several older homes were identified. Construction of any sewers required to service these homes or associated structures will not impact the buildings in anyway. In most cases, extension of sewer service to areas with these older structures will enhance the value of the building by replacing older outdated sewage systems.

In addition, a historic Jasper quarry was located along Vera Cruz Road North adjacent to the Village of Vera Cruz. Based on discussions with the PHMC, no additional survey work will be required if the proposed sanitary sewers remain in existing road rights of way that have been previously disturbed.

**Future Development Impacts** - Developers within this area of the Township would be responsible to extend all other sewers to provide sewer service to new developments or other subdivisions. Impacts associated with this construction activity would be addressed as part of the Township's subdivision review process.

#### **Alternative #4 – Provide Sewer Service to the Leibert Creek Basin through Lehigh County Authority Route 29 Facilities using Pumping Stations**

**General Environmental Impacts** - Construction of new wastewater conveyance facilities in the Village of Vera Cruz and Moyer subdivision areas of the Township will have a positive impact both surface and ground water quality in the area. This portion of the Township will have a positive environmental impact on the overall area by improving both surface and groundwater quality. These improved conditions will also have a positive impact on the quality of living conditions in this area. The various environmental impacts have been illustrated on Figure 3-12.

The construction of new facilities to service existing homes and other facilities in the Village of Vera Cruz and Moyer subdivision areas of the Township will have a positive impact both surface and ground water quality in the area. The new collection system will service properties with known or suspected operating problems associated with the existing on-site treatment systems. By removing these onsite systems from service, corresponding waste loadings of BOD<sub>5</sub>, ammonia nitrogen, and phosphorus will be removed from entering both groundwater and surface waters in the area.

Construction of the sewer facilities will also have minimal adverse short-term impacts in this area, such as noise, dirt, and minor traffic disruptions during the construction period. These impacts can be minimized through the use of approved soil erosion control techniques and posted traffic detours. These impacts will be eliminated upon the completion of the construction of the facilities.



Figure 3-12



In addition, several of the collection sanitary sewers will be located adjacent to PennDOT highways. PennDOT construction restrictions may require that sewers be located in the shoulder of the highway wherever possible. Necessary PennDOT permits will be obtained for all sewers that will be located within PennDOT right of ways.

This alternative will require two pumping stations to transfer sewage to LCA facilities. Therefore, this alternative will require continual electrical resources to operate the system.

**Wetland Impacts** - This alternative will have minimal long-term impact on wetland areas. As shown on Figure 3-12, the mapped wetland areas associated with the area directly adjacent to Leibert Creek in the Vera Cruz area and will not be directly impacted by this alternative. The collection sewers will have to cross other unmapped wetland areas. Any wetland areas would be mapped during design phase of the project. Necessary PADEP and US Army Corps of Engineers (ACOE) permits will be obtained for all wetland crossings as part of the design process. These permit applications are anticipated to be for PADEP GP-5 permits and ACOE permits associated with wetlands.

**Stream Crossings** – The interceptor and collection system sewers will have several stream crossing associated with Leibert Creek. These crossing include one stream crossing along Main Road East and one crossing along Vera Cruz Road North. Also, the sewers will cross several smaller unnamed tributaries of the Leibert Creek. During the design phase of the project, these areas will be mapped and necessary PADEP permits (PADEP GP-5 Permit) will be obtained where necessary for the sewer pipes crossing the wetland areas.

**Flood Plain Impacts** - This alternative will have minor impact on flood plains in the area. The proposed interceptor will be located outside the designated floodplain wherever possible. The areas that will be impact the floodplain are associated with the Leibert creek. This alternative will not involve any permanent structures that will impact flood plain and change floodplain characteristics. The design phase will include obtaining necessary PADEP permits associated with occupancy of any floodplain areas.

**Impact on Prime Agricultural Soils** – As shown on Figure 3-12, this alternative will could have an impact on prime agricultural soils. However, several of the larger land tracts have been placed into the Township’s Agricultural Preservation Program. Therefore, these properties will not be subject to future development as a result of implementation of this alternative.

**Secondary Impacts** – Secondary impacts such as controlling growth in this area should not be a significant problem. Current Township Ordinances will control growth based on the physical topography of the area and the inability to construct new houses.



**Historical Site Impacts** - Based on the results of the needs survey, several older homes were identified within this area. Construction of any sewers required to service these homes or associated structures will not impact the buildings in anyway. In most cases, extension of sewer service to areas with these older structures will enhance the value of the building by replacing older outdated sewage systems.

In addition, a historic Jasper quarry was located along Vera Cruz Road North adjacent to the Village of Vera Cruz. Based on discussions with the PHMC, no additional survey work will be required if the proposed sanitary sewers remain in existing road rights of way that have been previously disturbed.

**Future Development Impacts** - Developers within this area of the Township will be responsible to extend all other sewers to provide sewer service the new developments or other subdivisions. Impacts associated with this construction activity will be addressed as part of the Township's subdivision review process.

**Alternative #5 – Provide Sewer Service to the Leibert Creek Basin through new WWTP with stream discharge to Leibert Creek**

**General Environmental Impacts** - Construction of new wastewater conveyance and treatment facilities in the Village of Vera Cruz and Moyer subdivision areas of the Township will have a positive impact both surface and ground water quality in the area. This portion of the Township will have a positive environmental impact on the overall area by improving both surface and groundwater quality. These improved conditions will also have a positive impact on the quality of living conditions in this area. The various environmental impacts have been illustrated on Figure 3-13.

The construction of new facilities to service existing homes and other facilities in the Village of Vera Cruz and Moyer subdivision areas of the Township will have a positive impact both surface and ground water quality in the area. The new collection system will service properties with known or suspected operating problems associated with the existing on-site treatment systems. By removing these onsite systems from service, corresponding waste loadings of BOD<sub>5</sub>, ammonia nitrogen, and phosphorus will be removed from entering both groundwater and surface waters in the area. Since this area is located in the Environmentally Sensitive Zone of the Township, these factors are extremely important to maintain the high quality of the groundwater.

Construction of the sewer facilities will also have minimal adverse short-term impacts in this area, such as noise, dirt, and minor traffic disruptions during the construction period. These impacts can be minimized through the use of approved soil erosion control techniques and posted traffic detours. These impacts will be eliminated upon the completion of the construction of the facilities.



Figure 3-13



In addition, several of the collection sanitary sewers will be located adjacent to PennDOT highways. PennDOT construction restrictions may require that sewers be located in the shoulder of the highway wherever possible. Necessary PennDOT permits will be obtained for all sewers that will be located within PennDOT right of ways.

This alternative will require construction of a new WWTP in the Vera Cruz area. This plant would have minimal impact on the area. Aesthetic impacts such as odor could be minimized through proper operation and maintenance of the facility. Noise could be minimized through use of acoustical enclosures for the various piece of mechanical equipment. The WWTP effluent would be of sufficient quality to meet current water quality standards in the Leibert Creek.

**Wetland Impacts** - This alternative will have minimal long-term impact on wetland areas. As shown on Figure 3-13, the mapped wetland areas associated with the area directly adjacent to Leibert Creek in the Vera Cruz area and will not be directly impacted by this alternative. The collection sewers will have to cross other unmapped wetland areas. Any wetland areas would be mapped during design phase of the project. Necessary PADEP permits would be obtained for all wetland crossings as part of the design process. These permit applications are anticipated to be for PADEP GP-5 permits. These wetland areas can be fully restored to existing conditions upon completion of the construction.

**Stream Crossings** – The interceptor and collection system sewers will have several stream crossing associated with Leibert Creek. These crossing include one stream crossing along Main Road East and one crossing along Vera Cruz Road North. Also, the sewers will cross several smaller unnamed tributaries of the Leibert Creek. During the design phase of the project, these areas will be mapped and necessary PADEP permits (PADEP GP-5 Permit) will be obtained where necessary for the sewer pipes crossing the wetland areas.

**Impact on Prime Agricultural Soils** – As illustrated on Figure 3-13, this alternative will have minimal impact on prime agricultural soils. There are no major active farming sites within the service area associated with this alternative. Areas designated for future sewer service will be addressed either through further planning at the time of the proposed sewer construction or through the Planning Module approval process.

**Historical Site Impacts** - Based on the results of the needs survey, several older homes constructed in the earlier 1800's were identified. Construction of any sewers required to service these homes or associated structures will not impact the buildings in anyway. In most cases, extension of sewer service to areas with these older structures will enhance the value of the building by replacing older outdated sewage systems.

In addition, a historic Jasper quarry was located along Vera Cruz Road North adjacent to the Village of Vera Cruz. Based on discussions with the PHMC, no additional survey



work will be required if the proposed sanitary sewers remain in existing road rights of way that have been previously disturbed.

**Secondary Impacts** – Secondary impacts associated with the implementation of this alternative will be controlled using existing Township Ordinances and oversight by Township advisory organizations such as the Township Planning Commission.

**Future Development Impacts** - Developers within this area of the Township will be responsible to extend all other sewers to provide sewer service new developments or other subdivisions. Impacts associated with this construction activity will be addressed as part of the Township’s subdivision review process.

**Alternative #6 – Provide Sewer Service to the Leibert Creek Basin through new WWTP with Land Application Discharge**

Construction of new wastewater treatment facilities in this portion of the Township will have a positive environmental impact on the overall area by improving both surface and groundwater quality. These improved conditions will also have a positive impact on the quality of living conditions in this area.

However, the area has significant amounts of carbonate bedrock. As a result, use of land application methods for disposal of treated effluent could have a negative impact on groundwater quality due to the potential of sinkholes and underground streams and other caverns.

**Alternative #7 – Provide Sewer Service to the Leibert Creek Basin through Lehigh County Authority Route 29 Facilities using a Low Pressure Collection System**

**General Environmental Impacts** - Construction of new wastewater conveyance facilities in the Village of Vera Cruz and Moyer subdivision areas of the Township will have a positive impact both surface and ground water quality in the area. This portion of the Township will have a positive environmental impact on the overall area by improving both surface and groundwater quality. These improved conditions will also have a positive impact on the quality of living conditions in this area. The various environmental impacts have been illustrated on Figure 3-14.

The construction of new facilities to service existing homes and other facilities in the Village of Vera Cruz and Moyer subdivision areas of the Township will have a positive impact both surface and ground water quality in the area. The new collection system will service properties with known or suspected operating problems associated with the existing on-site treatment systems. By removing these onsite systems from service, corresponding waste loadings of BOD<sub>5</sub>, ammonia nitrogen, and phosphorus will be removed from entering both groundwater and surface waters in the area.



Figure 3-14





Construction of the sewer facilities will also have minimal adverse short-term impacts in this area, such as noise, dirt, and minor traffic disruptions during the construction period. These impacts can be minimized through the use of approved soil erosion control techniques and posted traffic detours. These impacts will be eliminated upon the completion of the construction of the facilities.

In addition, several of the collection sanitary sewers will be located adjacent to PennDOT highways. PennDOT construction restrictions may require that sewers be located in the shoulder of the highway wherever possible. Necessary PennDOT permits will be obtained for all sewers that will be located within PennDOT right of ways.

**Wetland Impacts** - This alternative will have minimal long-term impact on wetland areas. As shown on Figure 3-14, the mapped wetland areas associated with the area directly adjacent to Leibert Creek in the Vera Cruz area and will not be directly impacted by this alternative. The collection sewers will have to cross other unmapped wetland areas. Any wetland areas would be mapped during design phase of the project. Necessary PADEP and US Army Corps of Engineers (ACOE) permits will be obtained for all wetland crossings as part of the design process. These permit applications are anticipated to be for PADEP GP-5 permits and ACOE permits associated with wetlands.

**Stream Crossings** – The interceptor and collection system sewers will have several stream crossing associated with Leibert Creek. These crossing include one stream crossing along Main Road East and one crossing along Vera Cruz Road North. Also, the sewers will cross several smaller unnamed tributaries of the Leibert Creek. During the design phase of the project, these areas will be mapped and necessary PADEP permits (PADEP GP-5 Permit) will be obtained where necessary for the sewer pipes crossing the wetland areas.

**Flood Plain Impacts** - This alternative will have minor impact on flood plains in the area. The proposed interceptor will be located outside the designated floodplain wherever possible. The areas that will be impact the floodplain are associated with the Leibert creek. This alternative will not involve any permanent structures that will impact flood plain and change floodplain characteristics. The design phase will include obtaining necessary PADEP permits associated with occupancy of any floodplain areas.

**Impact on Prime Agricultural Soils** – As shown on Figure 3-14, this alternative will could have an impact on prime agricultural soils. However, several of the larger land tracts have been placed into the Township’s Agricultural Preservation Program. Therefore, these properties will not be subject to future development as a result of implementation of this alternative.

**Secondary Impacts** – Secondary impacts such as controlling growth in this area should not be a significant problem. Current Township Ordinances will control growth based on the physical topography of the area and the inability to construct new houses.



**Historical Site Impacts** - Based on the results of the needs survey, several older homes were identified within this area. Construction of any sewers required to service these homes or associated structures will not impact the buildings in anyway. In most cases, extension of sewer service to areas with these older structures will enhance the value of the building by replacing older outdated sewage systems.

In addition, a historic Jasper quarry was located along Vera Cruz Road North adjacent to the Village of Vera Cruz. Based on discussions with the PHMC, no additional survey work will be required if the proposed sanitary sewers remain in existing road rights of way that have been previously disturbed.

**Future Development Impacts** - Developers within this area of the Township will be responsible to extend all other sewers to provide sewer service the new developments or other subdivisions. Impacts associated with this construction activity will be addressed as part of the Township's subdivision review process.

#### **Alternative #8 – Extending Sewer Service to the South Fifth St. Area**

**General Environmental Impacts** - Construction of new wastewater conveyance facilities in this portion of the Township will have a positive environmental impact on the overall area by improving both surface and groundwater quality. These improved conditions will also have a positive impact on the quality of living conditions in this area. The various environmental impacts are illustrated on Figure 3-15.

The construction of new facilities to service existing homes in this area will have a positive impact both surface and ground water quality in the area. The new collection system will service properties with known operating problems associated with the existing on-site treatment systems. By removing these onsite systems from service, corresponding waste loadings of BOD<sub>5</sub>, ammonia nitrogen, and phosphorus will be removed from entering both groundwater and surface waters in the area.

Construction of the sewer facilities will also have minimal adverse short-term impacts in this area, such as noise, dirt, and minor traffic disruptions during the construction period. These impacts can be minimized through the use of approved soil erosion control techniques and posted traffic detours. These impacts will be eliminated upon the completion of the construction of the facilities.

**Wetland Impacts** – As shown on Figure 3-15, there are no known designated wetlands areas that will be impacted by any sewers associated with this alternative. During the design phase of the project, any wetland areas will be identified and necessary PADEP permits will be obtained for the sewer pipes crossing any wetland areas. Upon completion of construction, any wetland areas should revert back to conditions present prior to construction.



Figure 3-15



**Floodplain Impacts** - This alternative will have no impact on any designated floodplains.

**Impact on Prime Agricultural Soils** – As illustrated on Figure 3-15, this alternative will have minimal impact on prime agricultural soils. There are no active farming sites within the service area associated with this alternative.

**Secondary Impacts** – Secondary impacts associated with the implementation of this alternative will be controlled using existing Township Ordinances and oversight by Township advisory organizations such as the Township Planning Commission.

**Historical Site Impacts** - Based on the results of the needs survey, a few older homes were identified within this area. Construction of any sewers required to service these homes or associated structures will not impact the buildings in anyway. In most cases, extension of sewer service to areas with these older structures will enhance the value of the building by replacing older outdated on-site sewage treatment systems.

**Future Development Impacts** - Developers within this area of the Township will be responsible to extend all other sewers to provide sewer service the new developments or other subdivisions. Impacts associated with this construction activity will be addressed as part of the Township’s subdivision review process.

### **Alternative #9 – Extending Sewer Service to Indian Creek Drainage Basin**

**General Environmental Impacts** - Construction of new wastewater conveyance and treatment facilities in this portion of the Township will have a positive environmental impact on the overall area by improving both surface and groundwater quality. These improved conditions will also have a positive impact on the quality of living conditions in this area. The various environmental impacts are illustrated on Figure 3-16.

Construction of the sewer facilities will also have minimal adverse short-term impacts in this area, such as noise, dirt, and minor traffic disruptions during the construction period. These impacts can be minimized through the use of approved soil erosion control techniques and posted traffic detours. These impacts will be eliminated upon the completion of the construction of the facilities.

**Wetland Impacts** - This impact is illustrated on Figure 3-16. This alternative should have no direct impact on any identified wetland areas. Necessary PADEP permits would be obtained for all wetland crossings identified as part of the design process. These permit applications are anticipated to be for PADEP GP-5 permits. These wetland areas can be fully restored to existing conditions upon completion of the construction.



Figure 3-16



**Floodplain Impacts** - This alternative will have no impact on any designated floodplains. The design phase will include obtaining necessary PADEP permits associated with occupancy of any floodplain area if necessary. Necessary PADEP permits would be obtained for all floodplain crossings identified as part of the design process. These permit applications are anticipated to be for PADEP GP-5 permits.

**Impact on Prime Agricultural Soils** – As shown on Figure 3-16, this alternative will have minimal impact on prime agricultural soils. There are no major active farming sites within the service area associated with this alternative. It is anticipated that the proposed sewer extension would only service existing homes in the area.

**Historical Site Impacts** - Based on the results of the needs survey, there were a few older structures identified in this area. Construction of any sewers required to service these homes or associated structures will not impact the buildings in anyway. In most cases, extension of sewer service to areas with these older structures will enhance the value of the building by replacing older outdated on-site sewage treatment systems. Also, there are no impacts regarding archeological resources associated with this alternative.

**Secondary Impacts** – Secondary impacts associated with the implementation of this alternative will be controlled using existing Township Ordinances and oversight by Township advisory organizations such as the Township Planning Commission.

**Future Development Impacts** - Developers within this area of the Township will be responsible to extend all other sewers to provide sewer service the new developments or other subdivisions. Impacts associated with this construction activity will be addressed as part of the Township’s subdivision review process.

### **Alternative #10 – Extending Sewer Service to the Hosensack Creek Drainage Basin**

**General Environmental Impacts** - Construction of new wastewater conveyance and treatment facilities in this portion of the Township will have a positive environmental impact on the overall area by improving both surface and groundwater quality. These improved conditions will also have a positive impact on the quality of living conditions in this area. The various environmental impacts are illustrated on Figure 3-17.

Construction of the sewer facilities will also have minimal adverse short-term impacts in this area, such as noise, dirt, and minor traffic disruptions during the construction period. These impacts can be minimized through the use of approved soil erosion control techniques and posted traffic detours. These impacts will be eliminated upon the completion of the construction of the facilities.



**Figure 3-17**



**Wetland Impacts** - This impact is illustrated on Figure 3-17. This alternative should have no direct impact on any identified wetland areas. Necessary PADEP permits would be obtained for all wetland crossings identified as part of the design process. These permit applications are anticipated to be for PADEP GP-5 permits. These wetland areas can be fully restored to existing conditions upon completion of the construction.

**Floodplain Impacts** - This alternative will have no impact on any designated floodplains. The design phase will include obtaining necessary PADEP permits associated with occupancy of any floodplain area if necessary. Necessary PADEP permits would be obtained for all floodplain crossings identified as part of the design process. These permit applications are anticipated to be for PADEP GP-5 permits.

**Impact on Prime Agricultural Soils** – As shown on Figure 3-17, this alternative will have minimal impact on prime agricultural soils. There are no major active farming sites within the service area associated with this alternative. It is anticipated that the proposed sewer extension would only service existing homes in the area.

**Historical Site Impacts** - Based on the results of the needs survey, there were a few older structures identified in this area. Construction of any sewers required to service these homes or associated structures will not impact the buildings in anyway. In most cases, extension of sewer service to areas with these older structures will enhance the value of the building by replacing older outdated on-site sewage treatment systems. Also, there are no impacts regarding archeological resources associated with this alternative.

**Secondary Impacts** – Secondary impacts associated with the implementation of this alternative will be controlled using existing Township Ordinances and oversight by Township advisory organizations such as the Township Planning Commission.

**Future Development Impacts** - Developers within this area of the Township will be responsible to extend all other sewers to provide sewer service new developments or other subdivisions. Impacts associated with this construction activity will be addressed as part of the Township’s subdivision review process.

### **Alternative #11 – Extending Sewer Service in the Swabia Creek Drainage Basin**

**General Environmental Impacts** - Construction of new wastewater conveyance facilities in this portion of the Township will have a positive environmental impact on the overall area by improving both surface and groundwater quality. These improved conditions will also have a positive impact on the quality of living conditions in this area. The various environmental impacts are illustrated on Figure 3-18.





Figure 3-18



Construction of the sewer facilities will also have minimal adverse short-term impacts in this area, such as noise, dirt, and minor traffic disruptions during the construction period. These impacts can be minimized through the use of approved soil erosion control techniques and posted traffic detours. These impacts will be eliminated upon the completion of the construction of the facilities.

**Wetland Impacts** - This impact is illustrated on Figure 3-18. This alternative should have minimal direct impact on any identified wetland areas. Necessary PADEP permits would be obtained for all wetland crossings identified as part of the design process. These permit applications are anticipated to be for PADEP GP-5 permits. These wetland areas can be fully restored to existing conditions upon completion of the construction.

**Floodplain Impacts** - This alternative will have minimal impact on any designated floodplains. As shown on Figure 3-18, the collector sewers may occupy the flood plain in the vicinity of the existing LCA sewer connection point along the unnamed tributary to Swabia Creek. The design phase will include obtaining necessary PADEP permits associated with occupancy of any floodplain area if necessary. Necessary PADEP permits would be obtained for all floodplain crossings identified as part of the design process. These permit applications are anticipated to be for PADEP GP-5 permits.

**Stream Crossings** – The interceptor and collection system sewers will have several stream crossing associated with the unnamed tributary to Swabia Creek. These crossing include one stream crossing along Mill Road. Also, the sewers will occupy the stream bank adjacent to the unnamed tributary of Swabia Creek north of Mill Road. During the design phase of the project, these areas will be mapped and necessary PADEP permits (PADEP GP-5 Permit) will be obtained where necessary for the sewer pipes crossing the wetland areas.

**Impact on Prime Agricultural Soils** – As shown on Figure 3-18, this alternative will have minimal impact on prime agricultural soils. There are no major active farming sites within the service area associated with this alternative. It is anticipated that the proposed sewer extension would only service existing homes in the area.

**Historical Site Impacts** - Based on the results of the needs survey, there were no older structures identified in this area. Also, there are no impacts regarding archeological resources associated with this alternative.

**Secondary Impacts** – Secondary impacts associated with the implementation of this alternative will be controlled using existing Township Ordinances and oversight by Township advisory organizations such as the Township Planning Commission.

**Future Development Impacts** - Developers within this area of the Township will be responsible to extend all other sewers to provide sewer service the new developments or other subdivisions. Impacts associated with this construction activity will be addressed as part of the Township's subdivision review process.



## Summary of Sewer Alternative Analysis

**No Action Alternative** - Based on the results of the alternative analysis, implementation the No Action Alternative will not meet the future needs of the Township. Existing wastewater needs in the unsewered areas of the Township will continue to be exist and the Township will not have the necessary resource to address them.

**Leibert Creek Basin Alternatives** – Based on the results of this analysis, both alternatives #3, #4 and #7 were found to be feasible alternatives. Based on the cost analysis, Alternative #7, (Low-pressure sewer collection system) appeared to be the least cost alternative presented. The second least costly alternative was Alternative #4 (Gravity Collection System with pumping stations).

A further comparison of these alternatives was made to evaluate the Alternatives:

The advantages of Alternative #7 versus Alternative #4 are as follows:

- Low-pressure sewer systems have been used extensively throughout the USA and Europe for about 30 years and have provided significant capital cost savings in areas where there is widely varying topography, the need for conventional pumping stations, bedrock close to the surface, high water tables, low density housing, and a variety environmental issues. The capital construction cost of a low-pressure sanitary sewer system (Alternative #7) is estimated to be approximately 1.3 million dollars less when compared to the installation of a gravity sanitary sewer collection system with regional pump stations (Alternative #4).
- Alternative #7 will consist of small diameter force mains (2”-5”) and, because of its shallow installation depth can be installed with fewer disturbances to existing lawns, sidewalks, pavement, and utilities when compared to Alternative #4 that consists of larger pipe diameters and deeper excavations.
- Alternative #7 will consist of low-pressure force mains and therefore, the overall regular maintenance of the low-pressure sanitary sewer system will be less when compared to Alternative #4, which will includes regional pump stations that require daily maintenance.
- Typically in areas that are served exclusively by low-pressure sewers infiltration/inflow is significantly reduced.

The disadvantages of Alternative #7 Versus Alternative #4 are as follows:

The design of a low-pressure sanitary sewer system (Alternative #7) must consider all potential future sanitary sewer connections, since the low-pressure sanitary sewer



system consists mainly of force mains, which have limiting velocities that can preclude future sanitary sewer connections. The gravity sanitary sewer system that is proposed under Alternative #4 will be capable of accepting a larger quantity of future sanitary sewer connections that may have not been anticipated during the initial planning phases. Additionally, the regional pump stations that are proposed under Alternative #4 can also be upgraded, if needed, to accommodate unanticipated future sanitary sewer connections.

Grease in smaller diameter force mains, which are proposed under Alternative #7, may become a problem, which without proper maintenance could result in blockages.

Public education is necessary so the user knows how to deal with emergencies or other maintenance problems.

Property owners typically do not support the ownership, operation, and maintenance responsibilities associated with the individual pump stations that will be installed for the low pressure sanitary sewer system (Alternative #7). However, by township ordinance the owner's will be required to enter in to an annual Maintenance Agreement with a private company that has been given special training by the manufacture of the grinder pump.

Power outages can result in overflows or the inability to discharge wastewater from the home, assuming there is an operating water supply during the the power outage

The main advantages of Alternative #7 are lower capital and potentially lower operating costs. However, the major disadvantage with Alternative #7 is its limited capacity compared to that of a gravity system to accept a larger quantity of long-term future sanitary sewer connections that may have not been anticipated during the initial planning phases.

Therefore, it is recommended that Alternative #4 be selected. However, during the design phase of the project, the use of a low-pressure sewer system for the Project Area in it's entirety or in part will be examined in greater detail.

**Remaining Areas of Township** - The remaining Alternatives should be implemented once a wastewater need in a given area is determined as part of the proposed septic management program. The Township should reserve capacity in the regional LCA interceptors and Allentown WWTP to address any needs in these areas once the systems begin showing signs of failure. The Township will be able to monitor system operational activity and need repairs and/ or replacement through the proposed sewage management district.



### **3.2.3.2 On Site System Treatment Alternatives**

**No Action Alternative** – Under this alternative, the Township would continue to implement a limited management role over on-site treatment systems in the Township.

**Formation of Sewage Management District** – Under this alternative, the Township would have a more active role in the operation and maintenance of on-site treatment systems in the Township. This would improve the overall operation of on-site wastewater treatment systems in the Township and assist the Township in protecting both groundwater and surface water resources.

**Incorporation Into County System** – Since Lehigh County does not have a Department of Health established at this time, this alternative can not be implemented. Based on current reports from the County, such a Department is only in the early planning stages and would not be formed in the near future. Therefore, this alternative cannot be considered.

**Summary of Alternative Analysis** – Based on this analysis, the Township should form its own septic management district to manage on-site treatment systems located within the Township. This will allow the Township to better protect the area from potential environmental impacts associated with failing on-site treatment systems. By managing the existing treatment systems, existing users of the on-site treatment systems can optimize their performance and extend their effective service life.



## 4.0 IMPLEMENTATION EVALUATION

### 4.1 IMPLEMENTATION SCHEDULE

The Act 537 Plan will be implemented in various stages. Prior to implementation of any construction projects, the Township will require approval of the overall Act 537 Plan Revision. Once the Act 537 Plan Revision has been approved, the Township will be able to begin implementation of projects to meet the wastewater needs as outlined in this study.

#### 4.1.1 Act 537 Plan Revision

The following schedule will be used to implement the Act 537 planning phase of the project:

	Months from Start
Submit draft Act 537 Plan Revision to PADEP for Review and Comment	0
Receive initial comments from PADEP	3
Adopt Act 537 Plan Revision by Township	4
Submit Final Act 537 Plan Revision to PADEP	5
Receive PADEP Approval of Act 537 Revision	6

Upon receipt of approval of the Act 537 Plan Revision, the Township will be able to proceed with implementing the various construction projects associated with meeting the wastewater treatment needs of the Township.

#### 4.1.2 Implementation of Sewer Alternatives

##### 4.1.2.1 Construction of Sewers Servicing The Leibert Creek Basin (Alternate #4)

Construction of sewers servicing the Leibert Creek Basin have been divided into two categories: The Vera Cruz Project Area, which will address an identified immediate need for public sewer service, and The Remaining Leibert Creek Basin Areas, which will be implemented in the future if a need is identified.



**Vera Cruz Project Area:** This project will include the construction of gravity collector systems, low-pressure systems in areas where gravity service is not feasible, two pumping stations and associated force mains to provide public sewer service to the ~284 properties within the project area. The sanitary sewer infrastructure will be constructed as necessary to meet the estimated future wastewater needs in their specific service area.

The implementation schedule for construction of the public sanitary sewer infrastructure to provide service to Vera Cruz Project area is as follows:

Phase of Project	Months from Start
Approval of Act 537 Plan Revision	0
Conduct Project Area Resident Surveys	4
Complete Phase I Archaeological Survey	4
Complete Phase II Archaeological Survey	7
Submit Plans and Specifications of the selected collection system	
Submit PADEP GP-5 Permit Application regarding stream crossings and wetland encroachment	11
Obtain PADEP Part II Construction Permits	14
Submit Project for Bids	16
Award Contract	18
Start Construction	20
Complete Construction	32

We have assumed that PADEP, PennDOT and Lehigh County Conservation District will provide a timely review and issuance of necessary permits and that PHMC archaeological survey requirements can be accomplished in a reasonable time frame. Also, construction may be delayed due to unforeseen issues associated with the environmental permitting.

It should be noted, that each of the collection systems within this project area would service less than 250 units. Therefore, PADEP Part II Water Quality permits will not be required for the overall collection system. However, a PADEP Part II permit may be required for certain portion of the collection system that utilizes a low-pressure collection system with more than five (5) grinder pump units.

**The Remaining Leibert Creek Basin Areas:** The following non-collection system service areas in the Leibert Creek Basin will continue utilizing on-site systems for the near future:

- The remaining areas of the PSA-3 and PSA-4 that are not part of the Vera Cruz Project Area.
- Saucon Creek Basin area bounded by Brunner and Limeport Roads (PSA-1)
- The area adjacent to Jasper Road between Main Road East and Shimerville Road (PSA-5)
- The area adjacent to Main St. East and Shimerville road between Chestnut St. (PA Route 29) and Milford and Beck Roads (PSA-6)



The users in these areas will become part of the septic management district. If it is determined that on-site systems are no longer operating properly in a specific area, construction of sanitary sewers will be considered. Since each of these collection system service areas will service less than 250 units, no PADEP Part II permits will be required to install sanitary sewers.

#### **4.1.2.2 Construction of Sewers on 7<sup>th</sup> Street Extension**

Public sewer service to this area will be provided via a “public sewer project” and is currently being addressed separately with the applicable PADEP *Sewage Planning Module for a Minor Act 537 Plan Revision*.

#### **4.1.2.3 Construction of Sewers on Golf Circle**

Public sewer service to this area will be provided in part by developer-installed extensions and/or if a future need is identified by a “public sewer project”, both cases will be addressed with the applicable PADEP *Sewage Planning Modules*.

#### **4.1.2.4 Construction of Future Sewers in the Remaining Areas of Township**

Construction of sanitary sewers in the remaining portions of the Township will be considered on an as needed basis. These areas include portions of the Township associated with the following Alternatives that will not be serviced initially:

- Alternative #8 - Area adjacent to South 5<sup>th</sup> St (PSA-13)
- Alternative #9 - Indian Creek Area adjacent to St. Peters Rd west of Chestnut St. (PA Route 29) (PSA-7)
- Alternative #10 - Hosensack Creek Area including Church View Road area (PSA-8), Old Zionsville area (PSA-9), and Zionsville area (PSA-10)
- Alternative #11 - Swabia Creek basin area adjacent to Chestnut St., Mill Road, Tank Farm Road, and Rose Drive (PSA-11)

Based on the data generated in this study, there are presently no other immediate wastewater needs in the Township requiring installation of sanitary sewers in these areas. It is expected that sewer construction in these areas will be a direct result of either subdivision activity or documented future failures of on-site treatment systems. In these cases, the developers associated with the respective subdivisions will be responsible for installation of necessary collector sewers.





### 4.1.3 Septic Management District

The following schedule will be used to implement the septic management district:

	Months from Start
PADEP Approval of Act 537 Plan Revision	0
Develop permits and other administrative forms and procedures	9
Adopt Septic Management District Ordinance	12
Apply for PADEP Certification	12
PADEP On-site Program Review	14
Prepare Modifications per PADEP Comments	16
Obtain PADEP Approval of District	18

In addition, the results of the needs survey identified several on-site systems that may need repairs to correct potential malfunctions. These systems were located in proposed sewer service areas. However, the number of potential or confirmed malfunctions and their relative severity indicated that sanitary sewer service could not be justified at this time. In most cases, the identified potential and confirmed malfunctions were dispersed throughout the various Study Areas.

Therefore, initiation of repair of any confirmed malfunctioning on-site systems will be addressed on a case-by-case basis within six months of the approval of the Act 537 Plan Revision. This initial step will consist of issuance of a written notice of violation to the effected homeowner. It is anticipated that the implementation process associated with any necessary repairs will be made as part of the management functions associated with the overall septic management district within the Township. Furthermore, it is anticipated that periodic surveys of on-site systems conducted, as part of the implementation of the septic management district will continue to identify potential malfunctions in the future. These potential malfunctions will be addressed in a similar manner. This information will then be used by the Township SEO to determine if other actions may be required in the future to address any on-going problems with potential malfunctioning systems.



## **4.2 INSTITUTIONAL REQUIREMENTS**

### **4.2.1 Sewer Service Areas**

#### **4.2.1.1 Institutional Responsibilities**

The existing wastewater facilities are the responsibility of the following local agencies:

Upper Milford Township –The Township in accordance with their agreement Lehigh County Authority (LCA) has requested that LCA assume the responsibility for designing, constructing, owning and operating all proposed public sewer systems set forth in this plan. The Township will be responsible for adopting all appropriate ordinances requiring abutting property owners to connect to said sewer and pay any charges levied by LCA. The Township is also responsible for ACT 537 Planning.

Lehigh County Authority (LCA) – The LCA is the wastewater service provider in Upper Milford Township. LCA currently owns and operates the existing collection and interceptor sanitary sewers in Upper Milford Township and the Western Lehigh Interceptor and it's associated relief facilities that convey the wastewater to the City of Allentown for treatment. LCA is the permittee for these facilities.

Borough of Emmaus (Borough) – The Borough owns and operates existing collection sanitary sewers that provide conveyance capacity between sewers servicing service a portion in Upper Milford Township and LCA's Western Lehigh Interceptor. They are the permittee for their facilities.

City of Allentown (City) – The City owns and operates existing interceptor sanitary sewers and wastewater treatment facilities utilized by LCA. LCA conveys wastewater to the City's facility for final conveyance, treatment, and disposal. They are the permittee for their facilities.

#### **4.2.1.2 Service Agreements**

All necessary agreements are currently in place with the Township that designates LCA to own and operate all public wastewater facilities within the township. Therefore, implementation of any of the alternatives will not require any action to be taken by the Township at this time.

### **4.2.2 Sewage Management District**



The Township is currently implementing a limited sewage management program under current PADEP regulations. However, several additional institutional actions must be taken by the Township to upgrade the existing program into a full sewage management district. These actions include:

Adoption of a Township Ordinance establishing the sewage management district

Development of permits forms, and other administrative tools required for implementing the program

Once the administrative program is in place, the Township staff will be required to permit all septic haulers wishing to continue to provide services in the Township. Formal permits for these haulers will also have to be developed.

## **VERA CRUZ PROJECT AREA FINANCIAL INFORMATION**

### **4.3.1 Cost Estimate Assumptions**

The information presented in this section are estimates and are subject to change prior to the adoption by the Township of the required ordinances that would authorize the Project and establish the property assessments and tapping fees.

#### **4.3.1.1 Financing**

A conservative interest rate of 5-percent per annum has been assumed for the project costs that will be financed to reduce the property owner's up-front costs for the public facilities. However, it is our intention to pursue the lowest cost financing, such as Penn Vest to further reduce the overall cost impact on property owners.

#### **4.3.1.2 Other**

All other cost estimates were based upon the current construction market; regulatory and PADOT requirements; applicable LCA non-project capacity tapping fees and certain assumptions regarding property assessments; and project tapping fees.



### 4.3.2 Project Cost & Cost Recovery

Public facility project cost for a gravity system, including the purchase of wastewater capacity is estimated at \$7,245,060. The project will be funded by a combination of grant(s), municipal contributions, property assessment, capacity tapping fees and financing.

#### 4.3.2.1 Grant(s) and Municipal Contributions

The Township has secured an EPA grant in the net amount of approximately \$962,000 for Township sewer projects, it is envisioned that approximately \$924,000 of this grant will be applied to the Vera Cruz Project Area. LCA will contribute \$310,000 to the project or \$1,000.00 per Equivalent Dwelling Unit (Edu), based upon an ultimate build-out of 310 Edus. In addition, LCA has waived the standard UMiT capacity tapping fees, an estimated value of \$618,450 that has been excluded from estimated \$7,245,060 project cost.

**Table 4-1  
Project Funding**

Item	Amount
<b>Conceptual Project Costs</b>	
New Public Facility Cost	\$ 6,747,200
Allocation Cost	497,860
<b>Total Conceptual Project Cost</b>	<b>\$ 7,245,060</b>
<b>Less Estimated Credits</b>	
Vera Cruz Share of EPA Grant	\$ (924,136)
LCA Contribution	(310,000)
Property Assessments	(310,843)
Project Capacity Tapping Fees	(509,640)
Non-project Capacity Tapping Fees	(497,600)
<b>Total Estimated Credits</b>	<b>\$ (2,552,219)</b>
<b>Net to be Financed</b>	<b>\$ 4,692,841</b>
<b>Financing Apportionment</b>	
Amount apportioned to UMiT Common Rate Charge	\$ 1,240,000
Amount apportioned to Vera Cruz Project Charge	3,452,841
<b>Total Financing</b>	<b>\$ 4,692,841</b>



### 4.3.2.2 Mandatory Connection Requirement

In accordance with the §67502(a) of the Second Class Township Code all properties that are adjoining or adjacent to or whose principal building is within one hundred and fifty feet (150’) from the sanitary sewer will be required to connect.

### 4.3.2.3 Property Owner One-time Up-front Costs

All properties within the project area will pay all or some portion of the one-time up-front costs. Typically, they will incur two separate types of one-time up-front costs; Public Facility Fees to pay for their share the public sewer facilities; and Private Plumbing Costs, to pay the plumbing contractor they hire to connect their property to the public facilities and abandon existing facilities.

### 4.3.2.4 Public Facility Fees

Public facility fees are composed of three parts:

1. Benefit Property Assessment: Reflects the amount of benefit that the property received because of the availability of public sewer. The estimated assessment amount for each property will vary, ranging from a low of approximately \$40 to a high of \$18,000. All properties within the project area, except those exempted by law will pay this fee.

**Table 4-2  
Property Assessment Estimates**

<b>Example</b>	<b>Approximate Assessment</b>
Median Cost	\$ 430
Average Cost	\$ 1,110
1/4 Acre Lot	\$ 195
1 Acre Lot	\$ 770
2 Acre Lot	\$ 1,535
4.5 Acre Lot	\$ 3,450
10 Acre Lot	\$ 7,670

2. Project Tapping Fee: Purchases capacity in the Project Area facilities. This fee is estimated at \$1,644 per Edu. Only properties that are required to connect to the public sewer will pay this fee.



3. Non-project Capacity Tapping Fees: Purchases capacity in sewer facilities outside the Project Area that convey and treat the sewage from a project area property. These fees are as follows:

**Table 4-3  
Components of the  
Non-project Capacity Tapping Fee**

Component	Cost per/Edu
Wastewater Treatment Capacity	\$ 884
Western Lehigh Interceptor Capacity	\$ 603
Little Lehigh Relief Interceptor Capacity	\$ 119
<b>Total Non-project Capacity Tapping Fee</b>	<b>\$ 1,606</b>

The total of these fees are estimated at \$1,606 per Edu. Only properties that are required to connect to the public sewer will pay this fee.

**Table 4-4  
Tapping Fees Examples**

Example	# of Edus	Tapping Fee		
		Project \$	Non-Project \$	Total for Example \$
Single family residence	1	\$ 1,644	\$ 1,606	\$ 3,250
Apartment building with four units	4	\$ 6,576	\$ 6,424	\$ 13,000
Duplex / Twin on one property	2	\$ 3,288	\$ 3,212	\$ 6,500
Single family residence with one apartment unit on the property	2	\$ 3,288	\$ 3,212	\$ 6,500
Commercial building assigned 2 Edus.	2	\$ 3,288	\$ 3,212	\$ 6,500

*Note: Commercial establishments will vary dependent upon the number of Edu's that are assigned to the property.*



### 4.3.2.5 Private Plumbing Costs

Property owners will be required to hire a plumbing contractor to physically connect their structure to the public sewer system lateral, modify interior plumbing as necessary, pump out and fill in the existing septic tank and abandon any existing sewage facilities. Commercial property owners will be required to install a water meter on their well water supply and if applicable, grease trap. These costs will vary depending upon the distance from the public facilities and the complexity of the installation, estimates range from \$3,000 to \$5,000, the typical property being approximately \$3,500.

### 4.3.2.6 Examples of Property Owner One-time Up-front Costs

**Table 4-5  
Estimated One-time Up-front Costs**

Example			Public Facility Fees		Private Plumbing (Typical)	Total
Description	Lot Size (acre)	# of Edus	Property Assessment	Tapping Fees		
Single family residence	0.25	1	\$ 195	\$ 3,250	\$ 3,500	\$ 6,945
Single family residence	2.00	1	\$ 1,535	\$ 3,250	\$ 3,500	\$ 8,285
Single family residence	10.00	1	\$ 7,670	\$ 3,250	\$ 3,500	\$ 14,420
Apartment building with four units	4.50	4	\$ 3,450	\$ 13,000	\$ 3,500	\$ 19,950
Duplex / Twin on one property	1.50	2	\$ 1,150	\$ 6,500	\$ 3,500	\$ 11,150
Single family residence with one apartment unit on the property	1.00	2	\$ 770	\$ 6,500	\$ 3,500	\$ 10,770
Commercial building assigned 2 Edus	3.50	2	\$ 2,700	\$ 6,500	\$ 3,500	\$ 12,700
Vacant Lot	5.00	0	\$ 3,835	\$ -	\$ -	\$ 3,835

(1) Private Plumbing costs are estimated between \$3,000 and \$5,000, with the typical property being approximately \$3,500 in the calculation of the Table 4.4 estimates.



#### 4.4 User Charges

The residents of the Vera Cruz Project Area will be paying the majority of the costs associated with the project, avoiding subsidization by other existing township customers that have been paying their share of the existing sewer system costs for many years.

It is estimated that properties within the Vera Project Area that connect to the sewer system will pay an annual user charge of \$1,378 per Edu. The charge will be composed of two parts, the then current Upper Milford Common Rate charge, currently \$451 plus a Vera Cruz Project surcharge estimated to be \$ 927.

**Table 4-6  
Estimated Annual User Charges**

Example	# of Edus	Component		Estimated Annual User Charge
		UMiT Common	Project Surcharge	
Single family residence	1	451	927	\$ 1,378
Apartment building with four units	4	1804	3708	\$ 5,512
Duplex / Twin on one property	2	902	1854	\$ 2,756
Single family residence with one apartment unit on the property	2	902	1854	\$ 2,756
Commercial building assigned 2 Edus	2	902	1854	\$ 2,756

#### On-Lot Grinder Pump Units

Because of the project area topography some properties may require an on-lot sewage grinder pump unit to pump sewage from the home or business establishment upgrade into the public system. At this time, it is envisioned that grinder pump units will be incorporated into the project cost, and when required, will be provided to the property owner for installation by their plumbing contractor.





#### **4.5.1 Ownership, Owners Responsibilities and Associated Costs**

The on-lot sewage grinder pump unit will be owned and maintained by the property owner. The property owner, by township ordinance will be required to enter in to an annual Maintenance Agreement with a private company that has been given special training by the manufacture of the grinder pump unit. The cost of the annual maintenance agreement is estimated to be approximately \$125. In addition, property owners can expect to pay approximately \$30 annually in electrical power costs to operate the grinder pump unit.

#### **4.6 Additional Funding**

Various types of additional funding are being sought to reduce the overall financial impact on the property owners and include Lehigh County Community Block Grants (CDBG), and other Federal and/or state funding sources that are available.

In addition, the Township will provide information to the residents and/or coordinate a meeting place where representatives from the United States Department of Agriculture (USDA) can discuss their individual grant and loan programs with the property owners

##### **4.6.1 Property Owner Surveys**

Within 4 months after ACT 537 approval by DEP, the applicable survey(s) will be conducted to determine the eligibility and/or terms for any grants and/or special financing that may be available from Penn Vest and CDBG. The residents of the project area will be encouraged to respond to these survey(s).

**APPENDIX A  
RESOLUTION FOR ADOPTION**

**RESOLUTION FOR ADOPTION  
ACT 537 OFFICIAL SEWAGE PLAN**

**RESOLUTION OF THE BOARD OF SUPERVISORS OF UPPER MILFORD  
TOWNSHIP  
LEHIGH COUNTY, PENNSYLVANIA**

WHEREAS, Section 5 of the Act of January 24, 1966, P.L. 1535, No. 537, known as the Pennsylvania Sewage Facilities Act, as amended, and the Rules and Regulations of the Pennsylvania Department of Environmental Resources adopted thereunder, Chapter 71 of Title 25 of the Pennsylvania Code, require the municipality to adopt an Official Sewage Facilities Plan entitled "Act 537 Plan Revision " dated January 2004 providing for sewage services adequate to prevent contamination of waters and/or environmental health hazards with sewage wastes, and to revise said plan whenever it is necessary to determine whether a proposed method of sewage disposal for a new land development conforms to a comprehensive program of pollution control and water quality management, and

WHEREAS, Upper Milford Township finds that the attached Official Sewage Plan dated January 2004 conforms to applicable zoning and other municipal ordinances and plans, and to a comprehensive program of pollution control and water quality management.

NOW, THEREFORE, BE IT RESOLVED that the Board of Supervisors of Upper Milford Township hereby adopt and submit to the Pennsylvania Department of Environmental Resources for its approval the Official Sewage Facilities Plan of the Township which includes implementation the following Alternatives:

Alternative #4 - Provide Sewer Service to the Leibert Creek Basin through Lehigh County Authority Route 29 Facilities using Pumping Stations.

Alternative #8 – Extending Sewer Service to the Seventh St. Extension Area

Alternative #12 – Extending Sewer Service to the Golf Circle Area

Each alternative is summarized in Section 1.0 of the Plan Revision and attached hereto. In addition, the Township will establish a septic management district to oversee the operation and maintenance of onsite treatment systems located in the areas of the Township not serviced by sanitary sewers. The Township further resolves that the schedules of implementation for each alternative to be followed and implementation of the septic management district are listed in Section 4.0 of the Plan Revision.

ADOPTED this \_\_\_ day of March, 2004.

SEAL

ATTEST:

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Secretary

**APPENDIX B**

**PROJECT CORESPONDANCE**

**APPENDIX C**

**PLANNING AGENCY REVIEW AND MUNICIPAL COMMENTS**

**APPENDIX D**  
**PROOF OF PUBLICATION**

**To be included in final Report**



**APPENDIX E**

**LIST OF PRIME AGRICULTURAL SOILS IN LEHIGH COUNTY**

**APPENDIX F**  
**LCA AGREEMENT**

**APPENDIX G**

**ONSITE SYSTEM NEEDS SURVEY**

**APPENDIX H**

**ONLOT MANAGEMENT DISTRICT ORDINANCE**

To be inserted in final document

**APPENDIX I**

**UPPER MILFORD TOWNSHIP  
HOLDING TANK ORDINANCE**

**APPENDIX J**

**BOROUGH OF EMMAUS CAPACITY ANALYSIS**

**APPENDIX K**

**LCA CAPACITY ANALYSIS**



**APPENDIX L**  
**COMMUNITY STSTEM ANALYSIS**

**APPENDIX M**

**2005 NEEDS ANALYSIS**

**APPENDIX N**  
**PADEP CHECKLIST**