WEST PIKELAND TOWNSHIP
CHESTER COUNTY, PENNSYLVANIA

ACT 537 OFFICIAL
SEWAGE FACILITIES PLAN

DRAFT

June 2015

Prepared by:

ARRO Consulting, Inc.
108 West Airport Road
Lititz, PA 17543

TABLE OF CONTENTS

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF MAPS

LIST OF APPENDICES

EXECUTIVE SUMMARY

This Act 537 Plan Update has been prepared in accordance with the regulations provided in Act 537, entitled the Pennsylvania Sewage Facilities Act, Title 25, Chapter 71 of the Pennsylvania Code, and the Pennsylvania Department of Environmental Protection Act 537 Plan Content and Environmental Assessment Checklist (included in Appendix 1). This Plan is intended to replace the previous draft Act 537 Plan prepared in 2012 and submitted for public comment. The planning area for this Plan Update is the entire West Pikeland Township.

The Plan is comprised of the following components addressed in the approved Plan of Study (included in Appendix 2):

I. Previous Wastewater Planning

II. Physical and Demographic Characteristics

III. Existing Sewage Facilities in the Planning Area

IV. Future Growth and Land Development

V. Identification of Alternatives for New or Improved Wastewater Disposal Facilities

VI. Evaluation of Alternatives

VII. Institutional Evaluation

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

A. Identification of the Proposed Service Areas and Major Problems Evaluated in the Plan

The evaluation of the West Pikeland Township Act 537 planning area was conducted Township wide, with additional well sampling completed within the Pikering Estates development. The existing needs of the Township's residents and property owners were evaluated through an analysis of the soil properties, topography, geology, historic Sewage Enforcement Officer (SEO) permits, sanitary surveys, well water testing, zoning

regulations, and potential alternatives for collection, conveyance and treatment of wastewater.

B. Selected Alternatives

Based upon the results of Sewerage Needs Surveys, well sampling, and field investigations, no On-Lot Disposal System (OLDS) Needs Areas requiring public sewage were identified within West Pikeland Township. As a result, there are no structural sewer alternatives proposed as part of this Act 537 Plan. The Township has adopted and is in the process of implementing the Sewage Management Program.

West Pikeland Township, through extension agreement with Aqua Pennsylvania, Inc. (AQUA), proposes to extend public water to a portion of the Township to address public safety concerns with existing on-lot wells. The water line extension will serve existing residents within the Pickering Estates Development.

C. Cost Summary of Selected Alternative

The continued Sewage Management Program enforcement by the Township will result in minimal cost to the Township. As documented in the financial analysis (Section VI) and Institutional Evaluation (Section VII), no additional resources are required by the Township for implementation. The cost to the average property owner to complete the required pumping and inspection is approximately Five Hundred Dollars ($500.00) every three (3) years, excluding repairs.

Water service to the Pickering Estates Development was coordinated with AQUA. The cost analysis contained in Section VI is based upon the budgetary costs furnished by AQUA for extension of the water main to serve the existing sixty-one (61) lots. The resulting water line extension cost per home, including service connection and well abandonment, is approximately Twenty-six Thousand Seven Hundred Dollars ($26,700.00).

D. Required Municipal Commitments for Plan Implementation

Since a large portion of the Township's wastewater disposal is successfully accomplished through individual on-lot sewage disposal systems, the continued future use of these OLDS should be protected to the extent that is practical. It has been shown through analysis within this plan that successful OLDS utilization is heavily dependent upon proper maintenance of these systems. The Township has passed an ordinance to ensure that proper maintenance occurs since proper maintenance has been shown to extend the useful life of OLDS. The Township's intends to implement a maintenance and inspection program to identify the need for repair or replacement of OLDS, along with a public education program to inform the public of the need for and the methods of properly maintaining their OLDS.

The Ordinance will require:

- All systems to be inspected by the Property Owner or a Responsible Management Entity on a three year cycle, including removal solids from tanks when the solids are in excess of manufacturer's recommendations or other regulatory requirements.

- All property owners to routinely inspect soil absorption areas to ensure that stormwater is being properly diverted to protect the area from physical damage, and to report any problems or suspected concerns to a Responsible Management Entity.

All property owners with sewage facilities requiring electrical power will have additional requirements depending on the specific type of sewage facility.

In addition to the Sewage Management Program, recommendations have been made to the Township officials to update their zoning ordinance to require any development either connect to public sewer or divide into larger lot size.

Lastly, the Township will have to enter into an Extension Agreement with AQUA for the proposed water main extension. The Township will examine the requirements for implementation of Ordinances to facilitate connection to the proposed main extension.

E. Implementation Schedule

Based upon approval of the Act 537 Plan for West Pikeland Township, the implementation schedule follows:

Action	Date
Act 537 Plan Submission to the Township	July-15
On-Lot Management Ordinance Review by Township	July-15
Update of OLDS Management Ordinance	August-15
On-Lot Management Public Education	Sepember-15
Act 537 Plan Submission to CCPC & CCHD	August-15
30-Day Public Comment Period	August-15
Address CCPC & CCHD Comments	October-15
Adoption of Act 537 Plan Resolution by Township	October-15
Submission of Act 537 Plan to PA DEP	November-15
Act 537 Plan Review Letter with Comments by PA DEP	March-16
Submission of Revised Act 537 Plan to PA DEP to Address PA DEP Comments	April-16
Final Act 537 Plan Approval by PA DEP	June-16
Extension of public water to Pickering Estates	January-2019 to August-2020

INTRODUCTION

A. Authority

"*Municipalities are required to develop and implement comprehensive official plans which provide for the resolution of existing sewage disposal problems, provide for the future sewage disposal needs of new land development and provide for the future sewage disposal needs of the municipality.*" [1]

Administration of the Sewage Facilities Planning Program comes under provisions of the PA Code Title 25, Chapter 71, issued under section 1920-A of the Administrative Code of 1929 (71 P.S. § 510-20); Sections 5 and 402 of The Clean Streams Law (35 P.S. §§691.5 and 691.402); and Section 9 of the Pennsylvania Sewage Facilities Act (35 P.S. §750.9), also known as Act 537.

B. General

In response to continuing growth within the Municipality, West Pikeland Township ("Township") recognizes its current official Act 537 Plan[2] is no longer adequate to meet existing or future sewage disposal needs of the municipality. This update is a comprehensive revision to the existing official plan and will provide guidance on current and future sanitary sewage disposal needs of the Township.

This update revision will:

- Consider present and future public sewerage service capacity in collection, conveyance, and treatment facilities for those areas of the Township zoned for medium and high density residential, commercial, and industrial development;

1 PA Code 25§71.11
2 Master Sewer Plan for Chester County (1968)

- Provide guidance on maintaining existing wastewater facilities to protect the health, safety, and welfare of the residents and businesses within the boundaries of the Township.

Ultimately, this update revision will provide a comprehensive sewage facility analysis that addresses the sewage disposal needs of the entire Township and outlines how to effectively meet those needs over the next 20 years. This update revision addresses various methods to ensure the proper operation and maintenance of all sewage facilities, including on-lot systems, within the borders of the Township through the development and implementation of a Sewage Management Program.

Currently, the only "public" wastewater treatment facility within the Township is the Twin Hills Wastewater Treatment Plant that services the Twin Hills Development and the Pickering Meadows Development. The sewage facilities are owned and operated by the Little Washington Wastewater Company, an Investor Owned Public Utility Company, regulated by the Pennsylvania Public Utilities Commission.

I. PREVIOUS WASTEWATER PLANNING

There are no other Township-wide sewage planning documents extant; however, the Chester County Master Sewer Plan and planning for specific land development areas have been performed. The significant plans are discussed below. Other planning component modules have been issued by the Pennsylvania Department of Environmental Protection (PA DEP) and site details from PA DEP EFACTS are included in Appendix 3.

A. Chester County Master Sewer Plan

West Pikeland Township was a participant in the Chester County Planning Commission's comprehensive area-wide sewerage plan for Chester County Pennsylvania, entitled "*Master Sewer Plan – Chester County*." This plan was conceptualized in 1966 and completed in June 1968, and was subsequently presented to all municipalities within the County for adoption.

The Chester County Master Sewer Plan (herein referred to as "The County Plan") was developed in concert with the Pennsylvania Sewage Facilities Act (Act 537), which was enacted on January 24, 1966 and became effective on January 1, 1968. The scope of the County Plan was revised to incorporate newly adopted guidance from the Commonwealth's Sewage Advisory Committee in 1967. The County Plan was later approved by the Pennsylvania Department of Health[3] on July 30, 1969 to satisfy the planning requirements of Act 537 for all municipalities within Chester County. The Revised 1970 Edition was a reprinting of the Master Sewer Plan which contained some amendments unrelated to West Pikeland Township.

The County Plan presented a Stage Development Program for two 10-year periods – 1968 to 1978 and 1978 to 1988. The County Plan projected West Pikeland

[3] In 1971, the Pennsylvania Department of Environmental Resources (DER) was formed and assumed responsibility for Sewage Facilities Planning Program. In 1995 DER was split into two departments, and the Pennsylvania Department of Environment Protection (DEP) assumed responsibility for the Sewage Facilities Planning Program.

Township would "…*likely develop at lower densities than the rest of the (Phoenixville) sub-region because of poor access and because of the presence of much land with excessive slope and poor drainage*." Planning for West Pikeland Township was not included in any of the regional sewer service areas, resulting in the Township's dependence on "…*on-site sewage disposal methods…for many years to come*."

B. Major Land Developments with Public/Community Sewage Facilities

1. Twin Hills Residential Development (Phases I & II)

In 1989, a Sewage Planning Component was approved by the Township and PA DEP for construction of a wastewater collection, treatment, and disposal facility in West Pikeland Township. The planning area serviced by this system is the Twin Hills Development, which is located north of the Byers Road/ Eagle Farms Road intersection. This development consists of 250 residential dwelling units. The sewerage facility was designed to provide tertiary treatment with sequencing batch reactors (SBRs) and filtration for ultimate disposal to a seepage bed soil absorption system.

The residential development was constructed in two (2) phases, as was the treatment and disposal facility. Phase I corresponded with the construction of 156 units – 48,000 gallons per day (GPD). During this phase, all mechanical equipment was installed in the treatment facility for the ultimate design flow. The remaining 104 residential units (Phase II) were constructed in the early 1990s. This resulted in an expansion of the facilities, including three additional Seepage Beds, to treat the permitted flow of 73,500 GPD. A permit amendment effectively de-rated the permitted capacity to 59,000 gallons per day, with a maximum monthly flow of 68,000 gallons per day.

2. 1999 Update Revision – Twin Hills Sewerage Facilities

Twin Hills Wastewater Facilities was initially privately owned and operated by the Twin Hill Sewage Corporation under a permit issued to West Pikeland Township. The 1999 sewage planning update revision provided for an institutional change for the Twin Hills System, whereby the ownership and permits were transferred to Little Washington Wastewater Company, a subsidiary of Aqua PA - an investor owned public utility company regulated by the Pennsylvania Public Utilities Commission (PUC).

The planning area for this Update Revision consisted of the 250 single-family residential homes in the Twin Hills Development and three additional properties along Byers Road.

3. Pickering Meadows-Windermere Residential Development

In 1996, a Water Quality Management Permit for new land development for the Windermere Development was submitted to PA DEP. The Permit provided for a new treatment and disposal facility to service the Windermere Development currently known as Pickering Meadows. This planning area consists of 78 new residences and two existing dwellings. The plan was to serve the individual homes with grinder pumps, with a pressure sewer collection system. The pressure sewers would convey the sewage to a Spray Irrigation Surface Land Application System consisting of an aerated treatment lagoon and a storage lagoon with spray fields, all within the open space of the development. On November 17, 1997, permit number 1597407 was issued to the Township for the proposed sewage facilities.

In 2000, a Component 3 Planning Module was submitted to PA DEP proposing the Twin Hills Wastewater Facility provide sewage service for the Pickering Meadows Development by conveying the sewage from the 80 homes to the existing Byers Road Pump Station for treatment at the Twin Hills Facility. The developer for Pickering Meadows conveyed an easement to Little Washington Wastewater Company for a future disposal system. This easement added a restriction in that the disposal method must be a subsurface system and not a surface land applied spray irrigation system.

4. Anselma Crossing Commercial Development

In 2011, a new land development sewage Plan Component 3 was approved by PA DEP. The Anselma Crossing project is a commercial redevelopment located in the V-2 Village Commercial zoning district along Conestoga Road near Walnut Lane, consisting of three adjacent parcels totaling approximately 8 acres. There are several existing commercial and light industrial buildings, along with a recently removed mobile home, all served with on-site water and sewage facilities. The redeveloped site is served by two grinder pump systems; sewage from the individual buildings flows by gravity to the grinder pump systems. Both grinder pumps connect to a common force main which connects to the existing force main at Byers Road; flow is then conveyed to the Twin Hills Wastewater Treatment Plant (Permit No. 1584409). The Anselma Crossing development is organized as a condominium association responsible for management of the on-site sewer collection system and grinder pump systems. The force main will be dedicated to the Little Washington Wastewater Company. Sewage flows for this subdivision are estimated to be 2,930 GPD (11 EDUs).

II. PHYSICAL AND DEMOGRAPHIC CHARACTERISTICS

The physical (i.e., geology, soil types, etc.) and demographic (i.e., population growth and distribution) characteristics of the Township are important considerations in sewage facilities planning. Physical features determine the suitability of areas in the Township for on-lot sewage disposal. Demographic characteristics, such as the location of older communities, which are not served by public/community sewer, and their relative location to physical features that limit the suitability of on-lot sewage disposal, are important in determining existing needs. The rate and distribution of population growth including the location of proposed developments are important factors in determining where dense population centers are likely to occur in the future. These growth areas represent potential sewer service needs especially if these developments will occur in areas unsuitable for on-lot sewage disposal.

Demographic and physical characteristics of West Pikeland Township are evaluated in the following sections. Issues presented in these sections begin to form the basis for determining the sewage facilities necessary to address both the Township's existing and future sewage service needs.

A. Location and Description of Planning Area

The planning area comprises the entire Township of West Pikeland. West Pikeland Township is an ex-urban, small-sized township located in the north-central region of Chester County. The Township forms a nearly perfect 10 square miles and is bordered by Charlestown Township to the east; East Pikeland and West Vincent Townships to the north and west, and Uwchlan and Upper Uwchlan Townships to the south. Exhibit No. I shows a general map of the Township and includes study areas and major developments.

The Pennsylvania Turnpike runs through the southern corner of the Township (there are no points of access or exit from the Turnpike within the Township). State Route 113, an arterial road, bisects the Township from the northeast to the southwest boundaries. State Route 401, also an arterial road, passes through the Township, from the northwest to southeast, intersecting with Route 113 at Opperman's Corner. Byers and Newcomen Roads run parallel with Route 113 to the north and south of Route 401, respectively. Byers and Newcomen Roads have been identified as collectors. Clover Mill Road, intersecting with Route 113 along the northeast boundary, is also considered a collector.

B. Physical Characteristics

West Pikeland Township can be divided into three (3) drainage basins; Pine Creek, Pickering Creek, and Pigeon Creek are all tributary to the main branch of Pickering Creek, designated as High Quality Waters.

Pickering Creek and its tributary streams run through the northern and western portions of the Township. Pine Creek and its tributary enter the Township from the south and have created, over time, less prominent valleys with steeper embankments. Pine Creek converges with Pickering Creek slightly northeast of the center of the Township. Pigeon Run is located mainly in Charlestown Township; however, it runs partially through the northeastern portion of West Pikeland Township. Pigeon Run continues northeast into East Pikeland Township where it converges with Pickering Creek. Pickering Creek then continues northeast into East Pikeland Township, ultimately reaching the Schuylkill River.

All streams within West Pikeland Township are High Quality, Trout Stocked streams. This is one class below the most pristine streams classified as Exceptional Value by Pennsylvania Code Title 25 §93 Water Quality Standards. Therefore, higher quality standards apply to any point source discharge proposed, so as not to impact current uses of the protected waters.

C. Soils

Soils are a critical factor affecting the suitability of a site for soil absorption areas. Because the majority of West Pikeland Township's residents utilize soil absorption areas for effluent disposal, analysis of soil suitability is an important consideration. Proper siting of soil absorption areas is important in helping to reduce groundwater and surface water pollution. Floodplains, wet soils, shallow soils, and areas with fractured rock are more susceptible to pollution because the contaminants can reach the water table before they are treated by the natural microbes and soil structure in the ground.

Field work for the "Soil Survey for Chester and Delaware Counties, Pennsylvania" was completed in 1959. The report was issued in May 1963 by the United States Department of Agriculture. This report provides information to determine the suitability of sites for the infiltration of wastes from septic tanks. This report clearly states, however, that the mapping and descriptions are "somewhat generalized and should be used only in planning more detailed field surveys." The original mapping has been transcribed to a Geographic Information System (GIS) by the Chester County GIS Department. According to the 1997 version of the Soil Survey Geographic Database for Chester County, Pennsylvania, there are twelve major soil series in West Pikeland Township. Soil characteristics from the original 1959 Soil Survey have been analyzed to classify the soils within West Pikeland Township into four general categories relating to soil absorption area suitability. Information regarding soil suitability for on-lot sewage disposal is given in Table 1 and shown on Exhibit No. II.

Table 1

Soil Suitability for On-lot Sewage Disposal

Soil Type	Category
Chester, Neshaminy	Generally Suitable (Moderate)
Brandywine, Edgemont, Glenelg, Manor, Penn	Provisionally Suitable (Moderate to Severe)
Glenville, Udorthents, Urban Land	Marginally Suitable (Variable)
Chewacla, Wehadkee, Worsham	Provisionally Unsuitable (Severe)

Generally Suitable (Moderate): Soils that are deep and well drained, with slopes less than 15%, generally have minimal limitations for on-lot soil absorption areas.

Provisionally Suitable (Moderate to Severe): Soils that are moderately well drained with slopes less than 15% could have limitations for use with on-lot soil absorption areas.

Marginally Suitable (Variable): Soils that are shallow or somewhat poorly drained, have high seasonal water tables, or slopes that are greater than 15% but less than 25%; such soils may require pretreatment prior application to an on-lot soil absorption area.

Provisionally Unsuitable (Severe): Soils that are classified as Floodplain soils or with slopes in excess of 25%.

Soil properties and site characteristics vary significantly within the original mapped designations. Areas depicted by the Soil Survey as having limitations may still be suitable for subsurface disposal. The adequacy of the surface soils and underlying strata for the intended disposal method must always be field verified by a professional, and such verification is a prerequisite to the permitting

process. Alternate and/or experimental methods, as identified by the PA DEP, may be available for areas where conventional subsurface disposal methods are not suitable. Any disposal method, however, is always subject to the requirements of the Department of Environmental Protection and the Chester County Health Department.

D. Geology

As shown on the Geology Map, Exhibit No. III, most of the Township is comprised of Granodiorite Gneiss and Graphitic Gneiss. Although Graphitic Gneiss can yield an adequate water supply, neither geologic formation is classified as a regional aquifer. The Township also contains Diabase, which is an extremely dense formation that is a poor source of water. The median yields for domestic wells in these geologic formations range from twelve (12) to fifteen (15) gpm, per the Pennsylvania Water Resources Compendium. This is usually sufficient for low density development of the type prevalent throughout a majority of the Township.

E. Topography

As shown in the Topographic Map, Exhibit No. IV, terrain within the Township generally consists of rolling hills with moderate to steep slopes. The highest elevation in the Township is approximately 550 feet above sea level, in the areas of Art School Road, Dunsinane Hill Road, and Horseshoe Trail Road in the northwestern section of the Township. The lowest elevation in the Township is approximately 250 feet above sea level in the area of Clover Mill Road, slightly west of PA Route 113 in the east/northeaster section of the Township.

The topography, or slope, of the land is an important factor when considering sewage facilities. Whether the facilities are individual on-lot sewage systems or a large community sewage system, the topography must be considered. On-lot

sewage systems require a suitable slope for their soil absorption areas and the design of collection and conveyance systems must consider the slope and the costs to pump wastewater to a point of sewage treatment and discharge.

The degree of slope provides an indication of site suitability for on-lot sewage systems. Soil absorption systems generally have the least constraints when they are in areas with slopes of less than 15 percent. Areas with slopes between 15 and 25 percent slopes pose moderate constraints for the use as soil absorption areas. Slopes over 25 percent are typically not suitable for soil absorption areas. "On-lot Sewage Systems" permitted under Pa Code Title 25§73 are prohibited on slopes over 25 percent, except under §73.71 "Experimental Sewage Systems" or for systems permitted under the Clean Stream Law.

Exhibit No. IV displays the various slope categories relative to soil absorption area constraints. Approximately 87 percent of the land in the Township is within the 0 to 15 percent slope category and approximately 10 percent is within the 15 to 25 percent slope category, while only 3 percent has slopes greater than 25 percent.

F. Potable Water Supplies

1. Public Water Supply

The majority of the Township' residents obtain their potable water supply from private individual wells. Aqua America, Inc., an investor owned public utility company regulated by the Pennsylvania Public Utility Commission, provides public water service area to developments along the southwestern boundary of the Township. Aqua America's local subsidiary, Aqua PA, provides public water to the developments listed in Table 2.

Table 2

Developments with Public Water Supply

Subdivision	Number of Connections
Bridlewood	62
Chantilly Farms	34
Fairfields	71
Pickering Meadows	79
Twin Hills	250

Aqua America's service territory, according to records, generally includes the area southwest of PA Route 401 and the Pickering Meadows Development. The primary sources of water supply for the service area are the Uwchlan, Bell Tavern, and Shoen Road Wells. System pressure is governed by the Lionville Booster Station. Water to the Twin Hills and Pickering Meadows Subdivisions is supplied by a 12" ductile iron supply main located along Lionville Station Road (Byers Road). Water to the Bridlewood Subdivision is provided by a 12" supply main along East Uwchlan Avenue and an 8" supply main along Davis Road. System pressure and supply are adequate for this system and there are no reported problems.

It is likely that extension of this public water system will continue in conjunction with further development within the Township. Exhibit No. V shows Aqua America's service territory. Future availability of public water within the Township remains limited to the service territory.

2. Community Water Supply

Community on-site water systems exist in the Montgomery School and Yellow Springs areas. These facilities are institutional or commercial in

nature. Exhibit No. V shows the locations and Table 3 describes the average daily usages of these water systems.

Table 3

Community On-Site Water Systems

Name	GPD
Montgomery School	4,080
Yellow Springs and Community Center	6,927

3. Private Water Supply

There are approximately 890 private wells in West Pikeland Township located outside of the existing public water service area, utilized for residential potable water supply. There are also some private wells within the public water service area that are still utilized. West Pikeland Township does not require that all properties adjacent to waterlines connect to the public water supply system.

4. Groundwater Quality Assurance

The high quality of the Township's groundwater is a very valuable resource. Due to the reliance on this resource for individual water supplies, a major reason to establish functioning sewage facilities is to protect the general health and safety of the Township's residents. To protect this valuable resource, the Chester County Health Department maintains records of private drinking water well tests results as part of well permitting requirements. Total coliform and nitrate-nitrogen levels were compiled from these records to estimate the quality of the groundwater in those areas of the Township dependent on private wells for a potable water supply.

When detected levels of total coliform bacteria exceed certain standards it is indicative of fecal contamination (sewage pollution). This may be the

result of improperly functioning on-lot disposal systems or surface water entering the aquifer without receiving adequate natural treatment.

Within the total coliform group, there are organisms such as E-coli, commonly found in human feces, and bacteria that are naturally occurring in soil and vegetation. The presence of total coliform is an indication, but not conclusive evidence, of fecal contamination or potential on-lot sewage disposal problems. Water from wells that test positive for coliform should not be consumed until further testing shows the absence of such fecal contaminating bacteria.

Nitrate is the common form on inorganic nitrogen in water. Nitrogen is a component of organic wastes which, when applied to the ground surface, is utilized by plants. However, when excess nitrogen is applied to the ground (i.e., heavy fertilizer applications, wastewater disposal, etc.), it is converted to nitrate through biochemical reaction as it migrates down into the groundwater. As a result, groundwater in areas relying on on-lot disposal systems (OLDS) or in farmed areas is likely to have measurable concentrations of nitrate.

Nitrates in the groundwater, under certain conditions, can create health risks. The United States Environmental Protection Agency's established maximum contamination limit (MCL) of 10 milligrams per liter (mg/L) of nitrate for the upper limit for safe drinking water.

Land developments proposing to utilize on-lot sewage disposal that are within a quarter of a mile radius of documented groundwater concentrations of nitrogen above 5 mg/L are required to conduct additional hydrogeologic studies.

Approximately 1.4 acres is needed to isolate each on-site sewage disposal system before nitrate-nitrogen dilution is raised above the 10 mg/l limit.[4]

There are several possible methods of preventing the possible contamination of groundwater:

a) Sewage Facilities Planning that limits the installation of OLDS in high nitrate-nitrogen zones. These areas typically require an advanced treatment process that provides nitrogen reduction.

b) Land use zoning, established by local government agencies which prohibits development using on-site wells in high nitrate nitrogen zones (this would eliminate drinking water use).

c) Use of alternative water supplies. For example, provide public water to all properties within the high nitrate-nitrogen zone.

d) Deed restrictions, easements, or other legal mechanism limiting use of affected groundwater areas.

e) Ownership of all property affected.

G. Wetlands and Floodplains

Wetlands are a restrictive feature to site planning, not only because of State and Federal laws protecting this resource, but also because of the elevated water levels associated with them.

Floodplains are areas associated with streams that are subject to flooding during storm events. As such, flood plains and wetlands represent areas that are considered provisionally unsuitable for on-lot sewage disposal systems. Areas of

[4] Pa DEP Doc. No. 362-2207-004 Impact of the Use of Subsurface Disposal Systems on Groundwater Nitrate Nitrogen Levels, last revised March 31, 2003

wetlands, floodplains, and streams within the Township are shown on the Water Resource Map in Exhibit No. VI. The wetlands and floodplains shown are reproduced from the National Wetlands Inventory Mapping and FEMA Mapping.

Although wetlands do not represent a major portion of the Township, there are concentrated areas of wetlands interspersed throughout West Pikeland Township. The largest wetlands areas are found in areas adjacent to Pickering and Pine Creeks. Most of these wetlands are in the Palustrine Ecological system and are classified as Open Water, Forested, or Emergent. The Riverine wetlands, composed of the intermittent and perennial streams and creeks, are also found along Pickering Creek and one of its tributaries.

III. EXISTING SEWAGE FACILITIES IN THE PLANNING AREA:

A. Municipal and Non-Municipal and Community Sewerage Systems

West Pikeland Township does not presently own or operate any community sewage systems. The Township borders municipalities with existing sewerage facilities: Uwchlan Township conveys sewage to the Downingtown Area Regional Authority; Charlestown Township conveys sewage to the Valley Forge Sewer Authority; and Upper Uwchlan Township is served by the Upper Uwchlan Municipal Authority. Each of these Authorities was contacted and capacity is not presently available (Figures 1, 2 and 3).

There are several community sewage systems within the Township that serve developments and schools. These systems, which are not owned by the Township, are described below, followed by a description of the individual OLDs systems.

1. Pine Creek Pumping Station

Uwchlan Township owns and maintains Pine Creek Pumping Station. This pumping station is located within West Pikeland Township along its southern border with Uwchlan Township, near the intersection of Davis and Upper Pine Creek Roads. This pumping station was constructed in 1975 and upgraded in 2003. Capacity is not available to West Pikeland Township.

Figure 1

Capacity Letter – Upper Uwchlan Township

West Pikeland Township, Chester County
Official Sewage Facilities Plan

Figure 4 – Letter from Upper Uwchlan Township

RECEIVED
AUG 27 2007
By

Upper Uwchlan Township

August 24, 2007

Mr. Theodore J. Gacomis
West Pikeland Township Engineer
125 Dowlin Forge Road
Exton, PA 19341

RE: West Pikeland Township Act 537 Update

Dear Mr. Gacomis:

Thank you for your June 25, 2007 letter, expressing West Pikeland Township's interest in purchasing approximately 100,000 gallons per day of sewage treatment capacity from Upper Uwchlan Township. I regret to inform you that Upper Uwchlan does not have treatment capacity available for purchase at the Route 100 Wastewater Treatment Plant currently in Phase I, nor will it with the Phase II expansion scheduled for 2009.

Should you have any questions, please contact Eugene Briggs, ARRO Consulting, the Upper Uwchlan Township Municipal Authority Engineer, at 610-495-2114 or eugene.briggs@thearrogroup.com.

Sincerely,

John J. Roughan, Jr.
Township Manager

JJR:ecb

c: Upper Uwchlan Township Board of Supervisors
Upper Uwchlan Township Municipal Authority
Matt Brown, PE, ARRO Consulting
Christopher Frantz, Municipal Authority Solicitor
Eugene Briggs, AICP, ARRO Consulting

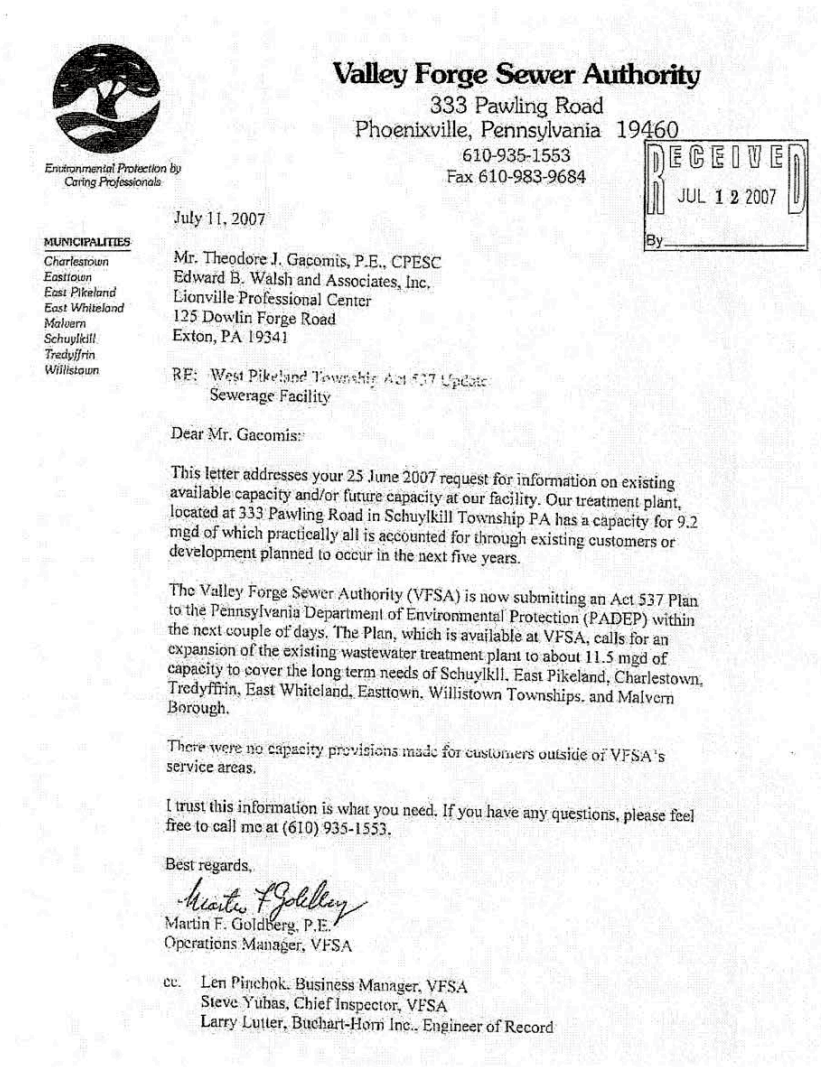
140 Pottstown Pike, Chester Springs, PA 19425
Phone: (610) 458-9400 • Fax: (610) 458-0307

Page 86

Figure 2

Capacity Letter – Valley Force Sewer Authority

Figure 5 – Letter from Valley Forge Sewer Authority



Environmental Protection by Caring Professionals

Valley Forge Sewer Authority
333 Pawling Road
Phoenixville, Pennsylvania 19460
610-935-1553
Fax 610-983-9684

RECEIVED
JUL 12 2007
By

MUNICIPALITIES
Charlestown
Easttown
East Pikeland
East Whiteland
Malvern
Schuylkill
Tredyffrin
Willistown

July 11, 2007

Mr. Theodore J. Gacomis, P.E., CPESC
Edward B. Walsh and Associates, Inc.
Lionville Professional Center
125 Dowlin Forge Road
Exton, PA 19341

RE: West Pikeland Township Act 537 Update
Sewerage Facility

Dear Mr. Gacomis:

This letter addresses your 25 June 2007 request for information on existing available capacity and/or future capacity at our facility. Our treatment plant, located at 333 Pawling Road in Schuylkill Township PA has a capacity for 9.2 mgd of which practically all is accounted for through existing customers or development planned to occur in the next five years.

The Valley Forge Sewer Authority (VFSA) is now submitting an Act 537 Plan to the Pennsylvania Department of Environmental Protection (PADEP) within the next couple of days. The Plan, which is available at VFSA, calls for an expansion of the existing wastewater treatment plant to about 11.5 mgd of capacity to cover the long term needs of Schuylkil, East Pikeland, Charlestown, Tredyffrin, East Whiteland, Easttown, Willistown Townships, and Malvern Borough.

There were no capacity provisions made for customers outside of VFSA's service areas.

I trust this information is what you need. If you have any questions, please feel free to call me at (610) 935-1553.

Best regards,

Martin F. Goldberg, P.E.
Operations Manager, VFSA

cc. Len Pinchok, Business Manager, VFSA
Steve Yubas, Chief Inspector, VFSA
Larry Lutter, Buchart-Horn Inc., Engineer of Record

Figure 3

Capacity Letter – Downingtown Area Regional Authority

Figure 6 – Letter from Downingtown Area Regional Authority

DOWNINGTOWN AREA REGIONAL AUTHORITY
6 West Lancaster Avenue
Downingtown, Pennsylvania 19335
Phone (610) 269-4084 Fax (610) 269-1580

RECEIVED
AUG 24 2007
By

August 22, 2007

Theodore J. Gacomis, P.E., CPESC
Edward B. Walsh & Associates, Inc.
125 Dowlin Forge Road
Exton, PA 19341

RE: West Pikeland Township
Act 537 Plan Update

Dear Mr. Gacomis:

The Authority has reviewed your June 25th letter to us requesting information regarding available capacity at the Authority's wastewater treatment facility, the Downingtown Regional Water Pollution Control Center ("DRWPCC"). After reviewing this matter with the municipalities, the Authority regretfully informs you that we currently have no treatment capacity available for sale to West Pikeland Township, nor any immediate plans to increase capacity at the DRWPCC that would allow us to grant the township's request.

If you have any comments or questions regarding this matter, please contact me.

Very truly yours,

Herbert J. Mays, P.E.
Executive Director

cc: Board Members
Municipalities
wpikeltr.doc

2. Charlestown Meadows Pumping Station

Valley Forge Regional Sewer Authority owns and operates the Charlestown Meadows Pumping Station. This pumping station is located in Charlestown Township along Conestoga Road (SR 401), approximately 1,600 feet east of Newcomen Road adjacent to Hillsover Lane. The pumping station serves the Charlestown Meadows Development and conveys sanitary sewage through East Whiteland Township, with ultimate disposal at the Valley Forge Sewer Authority Treatment Plant in Schuylkill Township. Capacity is not procurable for West Pikeland Township at the treatment plant.

3. Twin Hills Community Treatment Facility

The Twin Hills Wastewater Treatment Plant is located within the Twin Hill Development in the western portion of the Township, as shown in Exhibit No. VII. This plant was permitted by PA DEP on May 4, 1992 under WQM Permit No. 1591409 in the name of West Pikeland Township, to initially to serve the Twin Hills Development. On July 23, 1998, WQM permit 1584409 was issued to add a 5,000 gallon equalization tank, and on May 11, 2000 WQM permit No. 1598409A1 was issued to increase the capacity of the equalization tank from 5,000 gallons to 22,500 gallons and also to transfer ownership to Little Washington Wastewater Company. The transfer in ownership allowed for the connection of several existing single-family homes along Byers Road, which borders the development. Little Washington Wastewater Company is a subsidiary of Aqua Pennsylvania.

On May 25, 2001, WQM permit No. 1598409A2 was issued to accommodate the peak flow from the Pickering Meadows Development and to meet year round total nitrogen limit of 10 mg/l.

The plant is an advanced secondary treatment facility using a Sequencing Batch Reactor system, also known as the SBR process, with sand filtration and chlorine disinfection. Ultimate disposal of the treated effluent is to eight subsurface seepage beds.

The facility's original design and permitted capacity was 73,500 gallons per day. The 2002 permit amendment effectively de-rated the facility's permitted capacity to 59,000 gallons per day, with a maximum monthly flow of 68,000 gallons per day. The combined maximum hydraulic loading of the eight existing seepage beds is 73,500 gallons per day.

4. Twin Hills Collection System

Sewage from the Twin Hills Development is collected by 8-inch diameter sewers constructed throughout the development. The majority of the development's flows are conveyed by gravity to the influent lift station of the treatment plant. Approximately 50 units from the Twin Hills Development flow into the Byers Road Pump Station.

5. Byers Road Pumping Station

The Byers Road Pumping Station serves 50 of the 250 homes in the Twin Hills Development as well as 82 homes in the Pickering Meadows Development. The pumping station is owned and operated by Little Washington Wastewater Company and currently has a pumping capacity of 190 gallons per minute.

6. Pickering Meadows Collections Systems

Sewage from the Pickering Meadows Development is conveyed by individual residential grinder pumps and a pressure sewer system that conveys to the Byers Road Pumping Station. This pressure sewer system is

owned, operated, and maintained by the Little Washington Wastewater Company. The individual grinder pumps are owned and maintained by the private residents.

7. Twin Hills/Pickering Meadows Disposal Facilities

As part of the original design, eight seepage beds were constructed, which provide 73,500 gallons per day of disposal capacity. When the Pickering Meadows Development was connected to the Twin Hills facility two additional seepage beds were planned, but not constructed. If constructed, disposal capacity could increase by 5,200 gallons per day. However, additional hydrogeological studies will be required to confirm the increase in applied water will not cause issues with groundwater quality.

8. Historic Yellow Springs Community Treatment System

The Historic Yellow Springs is located at the intersection of Art School Road and Yellow Springs Road. This historic property consists of multiple structures including the Lincoln Building, the Washington Building, the historic Yellow Springs Inn, and the Chester Springs Studio. Four privately owned residences and one commercial restaurant surround this historic site and are also served by this system. The current wastewater treatment and disposal system was upgraded and expanded in 2000 through a Pennsylvania Infrastructure Investment Authority (PennVest) loan. This system consists of five 2,000 gallon septic tanks, two seepage beds installed in 1979, one seepage bed with infiltrator capacity, a valve box to regulate flows to the seepage beds, and a pump station required to move the effluent from the septic tanks to the seepage fields. This system is permitted for a design flow of 6,927 GPD.

During the planning process, PA DEP requested additional information regarding the system from the Township and Chester County Health Department. A copy of this request and supplemental information is located in Appendix

9. Montgomery School Community Treatment System

The Montgomery School is located on the west side of Route 113, approximately one mile north of Route 401. This private school serves children from preschool through 8th grade. The school consists of approximately 90 acres and nine buildings, including a dining hall, a gymnasium, and an indoor swimming pool. The school currently has a student enrollment of 305, with 39 faculty and staff. The Montgomery school is currently served by on-lot wastewater disposal. The current system was installed in 1989 and consists of two lift stations, a combination of septic tanks totaling 7,000 gallons, and dosing siphons to two seepage beds. This system has a permitted flow of 4,080 gallons per day. Actual water usage and sewage flows are currently not available.

B. Individual On-lot Sewage Disposal System (OLDS)

The remaining properties within West Pikeland Township are served by individual on-lot sewage disposal systems (OLDS). Conventional septic tank absorption field systems provide service for the majority of homes and commercial facilities that are not connected to the community sewer systems. With attention, proper operation, and routine maintenance, OLDS will protect the public health and the environment and often are more cost effective than public sewer alternatives.

Per the Chester County Health Department (CCHD) website *(http://www.chesco.org/index.aspx?NID=364)*, the CCHD is responsible for issuing permits for the installation of individual and small community on-lot sewage

disposal systems. Based on CCHD records, (Exhibit No. VII), there are approximately 1,085 parcels in the Township currently served by OLDS. With proper maintenance, these systems are designed to last the life of the home. Problems encountered with OLDS are typically due to improper maintenance or a latent defect in the design or installation.

All OLDS require maintenance. Inspection for and the removal of solids from tanks and the cleaning of distribution lines in the absorption area are part of the required maintenance. Minor repairs include replacement of tank baffles, access risers, pumps and other electrical controls. Minor repairs generally do not require a repair permit when the component is replaced with like or similar components. Major repairs, such as a replacement septic tank or repairs to the soil adsorption area, require a repair permit. Repairs to the existing soil absorption area are often not possible and a replacement area will be required. Replacing the absorption area requires additional soil testing. Replacement areas can be expensive and might require some alternative or innovative technology.

Currently, the Township has no formal OLDS operation and maintenance programs in place. There are no regulations regarding the frequency of pump-outs and inspections, and the Township does not have a system for tracking the occurrence of these important maintenance tasks.

More than 50% of the parcels served by OLDS in the Township are located in the Residential and Conservation (RC) District and the Village Districts, where densities, lot sizes, and the age of the developments are such that OLDS failures could be addressed within the existing lots. The rest of the parcels served by OLDS are located in the Residential Development (RD) District, where wide-scale failures are not expected. In the RD District, some small lot sizes, combined with other factors such as soil characteristics, hydrology, house placement, topography, and

system design, could pose challenges and concerns for on-site replacement of a failed system.

Homes in the Pickering Estates Development within the RD District are of particular concern due to age of the systems and site-specific conditions. The original OLDS in this area consisted of septic tanks with seepage pits (sometimes referred to as "cesspools"). Seepage pits were commonly built before the Act 537 standards for on-site disposal were adopted. Seepage pits are now considered non-standard forms of disposal. Many seepage pits continue to function successfully for a long time; however, regulations require replacement with a modern soil absorption system should they malfunction. This assumes there are adequate soils and space on the site for a proper soil absorption system. The existing lot sizes and house placements within this subdivision could make it difficult for conventional replacement on-lot systems to be effective and may require innovative approaches.

1. Well Sampling

Well sampling for nitrate-nitrogen is performed by the Chester County Health Department (1990 to present). Results of the well testing are presented in Appendix 4. PA DEP has established 10 mg/L of nitrate-nitrogen as the upper limit for background concentration in groundwater for an area to rely on OLDS as a sewage disposal method. It is important to note this limit is specific to sewage disposal system planning and not necessarily predicated on the safe drinking water standard.

Of the 139 wells tested records, 130 (93.5 %) had nitrate concentrations below 5 mg/L, nine (6.5%) had concentrations between 5 and 10 mg/L, and none had nitrate concentrations above the 10 mg/L limit for safe drinking water. Nitrate levels in the Township currently do not represent a concern for future development in areas that rely on wells for drinking water sources. However, since subsurface disposal systems depend on the soil for proper

treatment of sewage and upon groundwater for dispersion and dilution of incompletely treated contaminants, each proposal for a new subsurface disposal system must be considered uniquely to determine if proper treatment, dispersion, and dilution can take place at the site in question.

In September 2012, ARRO Consulting, Inc. (ARRO) performed well water sampling to help identify sewage Needs Areas within the Township. Water samples taken for this Plan Update were tested for two parameters: total coliform and fecal coliform. Section II.F.4 discusses the significance of the presence of each of these parameters. These well tests represent a "snapshot" of the characteristics of groundwater within the Township. Groundwater characteristics do vary over time depending on many factors; the intent is to meet PA DEP requirements for sewage needs identification, not to perform a comprehensive groundwater quality model.

In this study, a total of 71 wells were tested, representing approximately 8.0% of the total wells in the Township. Wells were randomly selected in the non-sewered areas of the Township, with a focus on the RD district. All wells tested as part of this study were untreated by any type of chlorination or ultraviolet light system. Water samples were collected from indoor or outdoor faucets after allowing the water to run for two to three minutes, on average. Only untreated water samples were collected (i.e. without being softened, disinfected, etc.) No parts of the bottleware edges or lid were contaminated during the sample collection process. All samples were preserved on ice to ensure that they would reach the laboratory at the appropriate temperature. A summary of test results are shown in Table 4. Individual test results and their locations are shown on Appendix 4.

Table 4

West Pikeland Township Well Water Test Results

	West Pikeland Township (71 Total Tested)		Pickering Estates Development (34 Total Tested)	
	Number	% of Total	Number	% of Total
Total Coliform Present	45	63.4%	21	61.8%
Fecal Coliform Present	6	8.5%	3	8.8%

It is important to note that PA DEP's concern when looking at groundwater quality is not only drinking water quality, but water quality in general. Therefore, knowing that on-lot sewage disposal systems do impact groundwater quality, the test results of the above listed parameters help identify sewage needs and affect the way that future development relying on on-lot sewage disposal systems is planned.

Of the 71 wells tested in the Township, coliform bacteria were present in 45 (63.4%) samples. As previously discussed, the presence of coliform bacteria in a well water sample can be an indicator of an improperly functioning OLDS system or of surface water entering the aquifer without undergoing adequate natural treatment. Additionally, 6 of the 71 wells (8.5%) tested within the Township tested positive for fecal coliform, a more specific indicator of fecal contamination in the well water. Testing results from the Pickering Estates Development show virtually the same percentage of contaminated wells as were found throughout the Township.

In order to identify any correlations between occurrences of well water contamination and the characteristics of the OLDS that are on the same site, the well test results were compared to the frequency of pump outs of the systems. Exhibit No. VII shows the pump-out frequency of the septic systems within the Township. Since April 2005, the Chester County Health

Department has required all licensed liquid waste haulers to report all pump-outs of septic tanks and similar tanks. PA DEP recommends septic tanks and the like be inspected once every three years and to remove the contents when the solids in the tank exceed 1/3 the liquid volume. The pumping of tanks once every three years is a common practice, once every year is generally considered excessive. Pumping of tanks more than once a year is usually an indication of a problem.

In order to determine whether infrequently pumped systems tend to influence well contamination more than frequently pumped systems, the results of the well tests were organized by these criteria. Table 5 shows well testing results grouped by the frequency of pumping (every 2 years or more frequently, every 3 to 4 years, or every 5 years or less frequently) of the OLDS located on the same property of the well that was tested. The top portion of Table 5 shows these data for the 71 wells that were tested in the Township, and the bottom portion of the table shows these values for Pickering Estates Development.

Table 5

Well Water Test Results

Grouped by Corresponding Pumping Frequency

West Pikeland Township					
Pumping Frequency	**Total Coliform Present**		**Fecal Coliform Present**		**Total**
	#	**%**	**#**	**%**	
Every 2 years or more often	12	63.2%	1	5.3%	19
Every 3 to 4 year	20	83.3%	4	16.7%	24
Every 5 years or less often	4	40.0%	1	10.0%	10
Frequency not specified	9	50.0%	0	0.0%	18
Total	45	63.4%	6	8.5%	71

Pickering Estates Development					
Pumping Frequency	**Total Coliform Present**		**Fecal Coliform Present**		**Total**
	#	**%**	**#**	**%**	
Every 2 years or more often	9	69.3%	2	15.4%	13
Every 3 to 4 year	11	78.6%	1	7.1%	14
Every 5 years or less often	1	25.0%	0	0.0%	4
Frequency not specified	0	0.0%	0	0.0%	3
Total	21	61.8%	3	8.8%	34

Examining the well test results by themselves does not indicate there is a direct link between pumping frequency and well water contamination within the Township. It is generally understood that septic tank pumping at regular intervals of about 3 years is an effective way to minimize malfunctions that lead to groundwater contamination. Noting that a correlation is not observed between occurrences of groundwater contamination and pumping frequency in the results of this study does not refute this rule of thumb. Rather, they indicate that pumping frequency may not be the primary factor responsible for observances of groundwater contamination within the Township planning area.

Sewage Enforcement Officer (SEO) records within the planning area were reviewed and categorized according to the repair reason – malfunction, unsatisfactory certification, or component replacement. The results are presented in Table 6.

Table 6

SEO Records for Sewage Repair Permit

for West Pikeland Township (1999-present)

	West Pikeland Township (1,085 Total OLDS)		Pickering Estates Development (64 Total OLDS)	
Repair Reason	Number	% of Total	Number	% of Total
Malfunction	60	5.5%	5	7.8%
Unsatisfactory Certification	52	4.8%	9	14.1%
Component Replacement	2	0.2%	0	0.0%

SEO records showed a higher OLDS malfunction rate in the Pickering Estates Development than in the remainder of the Township. SEO records also indicated that eight (8) properties have been installed either alternative or experimental system since 1999, which is more than 50% of the SEO records for the Township (14 properties in total).

To obtain further data and insight, a non-invasive inspection of existing OLDS was performed on various properties in West Pikeland Township by ARRO personnel, a licensed SEO, on April 29, 2013. ARRO personnel relied on visual signs at the ground surface for detecting any defects in the septic systems. Properties accessed as part of this inspection were chosen by the Township based on the following:

- Proximity of the inspected property to private individual on-lot well(s) that tested positive for fecal coliform.
- Property owners allowing access on their property.

Inspection techniques involved visually reviewing the property for (readily accessible) damaged access caps, ports, or cleans-outs, gray water drains, saturated soils with a strong organic component, and/or septic odors. Any of the aforementioned issues could indicate an on-lot septic failure. If an absorption area

was located and if the soil conditions merited it, a probe bar was used to check the amount of moisture in the soil and absorption area.

During inspection activities none of the above referenced indicator issues were encountered by ARRO personnel; however, the absence of these issues does not guarantee a septic system is properly functioning, nor does it provide assurance the on-site soils are adequate for treating effluent.

Based upon well water testing, SEO records, and site inspection results, the Pickering Estates Development was not identified as an Immediate Needs Area that would require addressing within the next five years. Also, since this area is at build-out condition, is not expected to experience any significant growth in the future.

During the process of well sampling, it became evident that some residents were not aware of the factors that contribute to groundwater quality. They were not clear about what they could do to improve groundwater quality. In general, residents were uninformed about coliform bacteria, what factors influence the presence of these contaminants, or how they could be removed from their water before consumption. This illustrates the need for an on-lot public education and maintenance program in the Township.

C. Areas in Need of Community Sewage Service

This update revision was initiated after two public hearings were held on the previous draft in 2013. During the hearings, residents had concerns about the data used to develop the preferred alternative. The use of OLDS pump out frequency over the past decade was used to justify the preferred alternative without additional supporting data.

Subsequently, the Township collected additional data in the form of the aforementioned residential well testing for coliform and on-site evaluation of

properties where fecal coliform was identified. The results of this evaluation led to the preferred alternative shown in this Plan.

As discussed in the previous section, the majority of OLDS in the RC zoning district can be replaced on their existing lots should an OLDS failure occur. The RD zoning district, with smaller lot sizes, could be problematic for replacement of a failed system. Therefore, the Needs Analyses were focused on the RD zoning district.

Initially, the entire RD zoning district was to be considered for public/community sewage service. The need for improved sewage facilities was based primarily on a petition circulated among property owners and the fact that several homes had unsatisfactory third-party certifications[5]. Properties lacking a satisfactory septic system certification are not necessarily malfunctioning; many of these OLDS just need proper maintenance. Very often malfunctioning systems can be repaired. However, whenever there is a high concentration of malfunctions in an area requiring various alternative repairs, concerns are raised and the benefits of public/community sewer alternatives must be considered.

In October, 2008, a public meeting was held to provide Township residents an update on this Plan revision. The plan, at that time, proposed that the RC zoning district could continue to be served with individual and small community on-lot sewage disposal systems, with the RD zoning district being the only area considered for public/community sewers. The RD zoning district was divided into two further areas of study. The area east of Route 113 was identified as the Windolph Knoll Study Area and the area west of Route 113 was identified as the Twin Hills Study Area. The initial plan was to investigate alternatives to provide public/community sewerage facilities for these areas, using land application for disposal of the treated effluent.

[5] Failed Certifications – On-lot system certifications are often performed prior to a real estate transaction. These "certifications" are an objective evaluation of the on-lot system based on the experience and expertise of the inspector. In Pennsylvania there are no regulatory requirements for an on-lot system certification; however, there are two recognized associations who provide training and certification for on-lot system evaluators, the Pennsylvania Septage Management Association (PSMA) and the National Sanitation Foundation (NSF).

One of the sites evaluated is known as the Windolph Knoll site**.** This 25-acre area is owned by the Township and could be considered for a land application system.

Soils studies and a preliminary hydrogeologic study were performed at the Windolph Knoll site located near Route 401 (Conestoga Road) and Upper Pine Creek Road. This site is comprised of approximately 25 acres and is primarily comprised of deep, well-drained soils suitable for the subsurface disposal of domestic sewage. Groundwater mounding was analyzed and found to be satisfactory for an application rate of 65,000 gallons per day.

Two other possible disposal sites were also evaluated, Pickering Meadows and the Elmer White Farm.

- When originally approved, the Pickering Meadows Development was permitted to be served with a spray irrigation system; however, during the land development process this plan was revised and sewage from Pickering Meadows was conveyed to the Twin Hills facilities. The spray irrigation fields remain for future use. However, per discussion with DEP, additional soil testing would be necessary to consider this site a viable option. Therefore, it was not considered a primary viable alternative. These spray fields were originally permitted to serve 80 homes.

- The Elmer White Farm was under a development agreement. The developer had performed extensive soils and hydrogeologic testing on 8.59 acres of the 66 acre farm, with a disposal capacity of 52,866 gallons per day. As of March 2013, the Elmer White property is no longer available for disposal consideration as the property is being developed as a community park.

In March 2009, a second public meeting was held with the purpose of updating property owners in the Windolph Knoll study area of the proposed plan. During

this meeting, public opinion indicated the need for public sewers was not as severe as once expressed, at least not for the entire study area. After the meeting, representatives of the Township met with officials from the County Health Department and reviewed the needs within the Township. A survey questionnaire was mailed to all property owners within the Windolph Knoll study area. This was followed by a review of Health Department septic tank pump-out records. A field survey of individual properties in those neighborhoods was then performed, which indicated a higher level of concern based on the mail-in surveys and pump-out records. The Windolph Knoll Needs Study is presented Appendix 5.

The initial sewer needs survey was completed in July 2009, and it became apparent the area of need was much smaller than previously thought. Only the Pickering Estates Development could potentially be in need for replacement sewage facilities. However, additional investigations (detailed in Section III B.2) verified the Pickering Estates Development is not an Immediate Needs Area.

This update revision identifies no immediate sewage needs areas within West Pikeland Township.

D. Wastewater Sludge and Septage Generation, Transport and Disposal

The Chester County Health Department has established minimum standards for the handling, transporting, storage, and disposal of solid and liquid waste materials. All haulers of such materials are licensed by Chester County.

IV. FUTURE GROWTH AND LAND DEVELOPMENT

A. Municipal and County Planning Documents

- *West Pikeland Comprehensive Plan adopted December 6, 2010.*

  The Comprehensive Plan is one of the primary guidance documents for growth and development in West Pikeland Township. This plan indicates the Township "…*has transitioned from an agricultural landscape to a primarily exurban bedroom community*." Goals and objectives of the Comprehensive Plan related to sewage facilities seek to "*Maximize groundwater recharge*" and to "*Promote effective septic system design/maintenance*." This plan also indicates similar concerns with aged and failing OLDS within the Township, although further investigations do not identify any Immediate Needs Areas. The Comprehensive Plan also indicates complaints by residents of Twin Hills regarding odors from the wastewater treatment plant, with a recommendation that any additions or upgrade to the WWTP address the issue.

- *Chester County Comprehensive Plan "Landscapes2" adopted November 2009.*

  "*We find the proposed areas to be served by sewer service to be consistent with the Livable Landscapes Map (2009).*" West Pikeland Township is located within areas defined as primarily Rural Landscape, with roughly one quarter of the Township lying in Suburban Landscape. The majority of the study area is located within this Suburban Landscape, while one area, associated with the Montgomery School, is located in the Rural Landscape. According to the County's Comprehensive Plan, the Act 537 Plan is consistent with the policies of *Landscapes2* as they relate to the Suburban Landscape, including *Landscapes2* Policies:

- LV 1.1: *Promote the urban and suburban landscapes as the designated growth areas of Chester County.*
- LV 3.2: *Direct development activity to areas with existing and planned infrastructure capacity.*
- UI 2.1: *Encourage coordination of water and wastewater planning efforts, based on projections of growth and demand, evaluation of existing local treatment and supply capacity, and assessment of the availability of new water supply sources and viable wastewater disposal options.*
- UI 2.2: *Support infrastructure expansion and improvements that are consistent with Landscapes2 and adopted regional and local plans that support projected future demands, avoid capacity shortfalls, protect natural resources, and provide safe and reliable utility services.*
- UI 2.3: *Support planning efforts that evaluate projected water withdrawals and wastewater disposals in order to identify long term local and regional water supplies.*
- UI 2.4: *Promote integrated water supply, wastewater, and land use planning efforts conducted in conjunction with affected municipalities, counties, and utility service providers.*
- UI 2.5: *Maintain, upgrade, or expand existing public sewer and water facilities to support redevelopment and new development in designated growth areas, where consistent with local land use planning, while discouraging the extension of those facilities in the rural, agricultural and natural landscapes.*
- UI 2.6: *Support public outreach that encourages water conservation and reuse, and the proper maintenance of on-lot sewage disposal systems and stormwater management facilities.*

- UI 2.7: *Encourage innovative wastewater treatment and disposal systems with preference given to land application of treated wastewater, to maintain the watershed water balance.*
- UI 2.8: *Support the rehabilitation of aging sewer and water supply infrastructure.*
- UI 2.9: *Support regular and expeditious updates to municipal Act 537 plans, which designate areas for on-lot disposal and public sewer service, based on current local and regional plans, and are consistent with Landscapes2.*
- UI 2.10: *Support development and redevelopment projects that implement current Act 537 plans are consistent with designated public sewer service areas, and that respect natural resources and site constraints.*
- UI 2.11: *Encourage local and regional planning that is consistent with the Pennsylvania State Water Plan, Watersheds, river basin, watershed, and other natural resource plans.*
- UI 2.12: *Protect water supplies in those areas not served by public water through* appropriate *land use densities and development designs.*
- UI 2.13: *Locate large water withdrawals and wastewater effluent disposal facilities where they have the least negative impact on aquifers, stream base flows, and other aquatic resources.*
- UI 2.14: *Encourage homeowner and condominium associations, and corporate and institutional landowners to properly maintain stormwater and wastewater disposal systems located on their common open space lands.*
- UI 2.15: *Support water conservation and re-use measures that reduce water supply demands.*

- *The Chester County Comprehensive Policy Plan Element, Landscapes, adopted in 1996*

  As a result of the *Landscapes* Comprehensive Plan, the Chester County Planning Commission issued *Planning Bulletin #54 - Individual Off-Lot Sewage Systems* in 1998. The Bulletin was designed to offer municipal officials and developers options in locating individual sewage systems and how these variations may be used as a method to achieve local and County environmental protection and open space preservation goals.

  The term "individual off-lot sewage systems" refers to the placement of the primary/and or replacement effluent absorption area outside of the boundaries of the building lot served by the system.[6]

As proposed, this Act 537 Plan is consistent with the goals and policies of *Landscapes* and *Landscapes2*.

Watersheds, the water resources element of the County Comprehensive Plan, identifies Objective 7.2 of Goal 7, "*concentrate planned utility service areas to support designated growth areas,"* to be achieved through key strategies such as the extension of community wastewater facilities in Urban and Suburban Landscapes. As such, West Pikeland Township, through its Act 537 Plan, intends to maintain the use of OLDS whenever possible since no Immediate Needs Areas were determined to exist within the Township. Therefore, the goals for wastewater in West Pikeland Township are generally consistent with those of *Watersheds* (Reference: The Chester County Planning Commission letter to the Township dated September 13, 2010).

[6] Chester County Planning Commission Bulletin #54, August 1998.

The Township's Comprehensive Plan is generally consistent with the Chester County Comprehensive Plan. The Township intends to use both as guides during the review of development proposals, infrastructure improvements, and other public improvements and programs.

1. Township Zoning Map

The Township Zoning Map, Exhibit No. VIII, identifies the residential, commercial, industrial, agricultural, recreational, and open space areas.

2. Township Zoning and Subdivision Regulations

a) West Pikeland Township Zoning Ordinance of 2005 adopted April 25, 2005

The Zoning Ordinance is one of the primary means of implementing the Comprehensive Plan. By establishing various districts, allowable uses, and area and bulk regulations (i.e. density of development), the Township specifies the form and location of future growth to best suit the needs of the community, protect natural and historic resources, and accommodate growth where existing facilities and infrastructure are most supportive.

The Zoning Ordinance Update, adopted April 25, 2005, provides three base zoning districts within the Township and two overlay districts. An Open Space Design Option is also provided.

b) West Pikeland Township Subdivision Ordinance, No. 15, Adopted February 18, 1974, Last Updated November 1, 1997

Development and use of available land throughout the Township is controlled by Subdivision and Land Development Ordinance (SALDO). These standards ensure that development within the Township is conducted with consideration given towards existing

natural resources, residents, safety, and consistency with the character of the Township.

The SALDO, No. 15 as amended, was adopted February 1974 by the West Pikeland Township Board of Supervisors. This ordinance, pursuant to the Pennsylvania Municipalities Planning Code, Act 247 of 1968, governs subdivision and land developments within the limits of West Pikeland Township, and provides for the planned development of the Township by:

- Assisting in the orderly and efficient integration of land developments within the Township.
- Ensuring that development and land uses pose no threat to the safety and health of the citizens and their environment.
- Ensuring the provision of adequate public facilities including roadways, walkways, street lighting, water supply, storm and sanitary sewerage facilities, recreation sites, open spaces, and other improvements for the public's health, safety, and welfare.
- Providing for the coordination of existing public facilities with proposed facilities. Particular emphasis is placed on the development of a safe, convenient, and functional roadway system to meet the demands of the current and future traffic needs.
- Ensuring the environmental and agricultural resources, as well as the existing topography, are protected and/or enhanced with future development.
- Securing equitable handling of all land development plans by providing uniform standards and procedures.

- In general, promoting greater health, safety, and welfare for the citizens of the Township.

3. Limitations Related to Floodplain, Storm Water Management and Special Protection Areas

a) Protection of Natural Resources

West Pikeland Township has established preservation of the existing natural and historic features within its boundaries as one of the main objectives in the Comprehensive Plan. The Township has incorporated overlay districts in the Zoning Ordinance Update specific to environmentally sensitive areas and those deemed as having historic value, in order to facilitate this goal.

The Residential Development (RD) District, as discussed in the Zoning Ordinance, has been identified as having the highest potential for population growth. The Township recognizes the need to have public infrastructure such as roadways, water facilities, and sewer facilities available to meet the demand for this growth. The Zoning Ordinance protects much of the remaining open space and encourages development into the Residential Development District by permitting smaller lots sizes and supporting infrastructure development in this district, while requiring larger lot sizes and discouraging infrastructure in other districts of the Township.

The Subdivision and Land Development Ordinance was written to foster an orderly integration of land development, allowing only those uses that provide no threat to the health, safety, and welfare of its residents while at the same time protecting the environment and agricultural resources. The Township's Comprehensive Plan highlights the natural resources by identifying sensitive natural

areas and resources. The Township's Zoning and Subdivision Ordinances limit development in these sensitive areas and offer incentives for development in other areas, in accordance with *Landscapes2* Policy UI-2.10.

b) Protection of Water Resources

Natural water resources within the Township have been identified to include floodplains, wetlands, and watercourses. The Zoning Ordinance does not allow any disturbance within a floodplain or wetlands unless appropriate permits have been obtained from the state or federal agencies having jurisdiction. Wetland margins and riparian buffers exist to reduce the disturbance to these areas and possible risk of water quality degradation.

The Comprehensive Plan recommends any proposed development outside of the existing public water supply area be evaluated with respect to groundwater capabilities and any possible negative effects on existing wells.

All of the streams and creeks within the Township have been designated as High Quality. Higher quality standards apply to any point source discharge proposed, so as not to impact protected waters. Pickering Creek and its tributaries flow through the planning area and feed Pickering Creek Reservoir, located in Schuylkill Township. This reservoir supplies approximately 1.5 billion gallons per year of potable water to approximately 500,000 residences. It is owned and maintained by Aqua Pennsylvania.

In 2008, the Pennsylvania Environment Hearing Board (EHB), in the case of Jeff Lipton et al. v. PA DEP 2008, EHB 223, ruled that anti-degradation requirements (required by Pa Code Title 25

Chapter 93) in special protection watersheds must be incorporated into sewage planning. Prior to this case, only point source discharges to surface waters were considered. PA Code Title 25 §93.4c(b)(2) states: "*Nonpoint source control - The Department will assure that cost-effective and reasonable best management practices for nonpoint source control are achieved.*"

4. Additional Limitations

a) Protection of Prime Agricultural Soils

The protection or preservation of prime agricultural soils is stated as an objective of the Agricultural Land Use Goal, in the Township's Comprehensive Plan. The U.S. Department of Agriculture has identified Prime Farmland Soils; those found in West Pikeland Township are shown in Table 7.

Table 7

Prime Agricultural Soils

Brandywine	Glenelg
Chester	Glenville
Chewacla	Neshaminy
Penn	

While the areas containing these soils are not specifically delineated in the Zoning Ordinance, conservation of these soils is inherent with the use, area, and bulk regulations specified for the Resource Conservation District. The program to transfer development rights from prime farmland and other naturally sensitive areas to the more appropriate Residential Development District also aids in the conservation of prime agricultural soils.

b) Protection of Historic Areas

The Historic Preservation Overlay District consists of properties in Yellow Springs and Anselma Mill. The majority of the lots in these areas are currently developed. The standards proposed for this District ensure that any further development will be compatible with the existing structures while allowing viable uses to continue.

The Anselma Mill is a grist mill that was constructed in 1747 and has been preserved in working condition. Yellow Springs is a historic village that dates back to the 18th century. In the 1700's, Yellow Springs was a fashionable spa village that built a social scene around its healing waters. A military hospital was commissioned at the village by George Washington to care for sick and injured soldiers from Valley Forge and the Battle of the Brandywine. After the Revolutionary War, the village was converted back into a spa and Civil War era orphanage; it later served as the Pennsylvania Academy of the Fine Arts Country School and was used as the headquarters of the film studio Good News Productions. Since 1974, Historic Yellow Springs, Inc. has preserved the village as a historical area.

B. Delineation and Description of Future Growth and Land Development

1. Areas of Existing Development

The impact of development of the last twenty to forty years has left its mark on West Pikeland Township. The RD District has witnessed the most development. Table 8 presents the subdivisions, the number of units with on-lot sewage disposal systems, and the number of units with public sewer within RD District. The locations of these subdivisions are presented in Exhibit No. I.

Table 8

Subdivisions within the RD – Residential Development District

Subdivision Name	Location	Number of Lots Sewage Disposal Type	
		Individual	Community
Spring View	Sycamore Lane, south of PA Turnpike	26	0
Fox Ridge	Talley Ho Lane & Harkaway Road	41	0
Pickering Estates	David Road & Hunt Club Lane	64	0
Bridlewood	Saddlebrooke Circle	62	0
Fairfield	PA Route 113 & Fairfield Lane	71	0
Meadow Creek	PA Route 401 & Meadow Creek Lane	17	0
Chantilly	Chantilly Lane and Horseshoe Trail	34	0
Haverhill	Haverhill Road	18	0
Twin Hills	Eagle Farms Road	0	250
Pickering Meadows	Creek Crossing Lane	0	80
Anselma Crossing LP	Conestoga Road	0	15

2. Establishment of Lot Sizes - Zoning Designations

a) RD – Residential Development District

This district is located in primarily west of Route 401 and is designated based on anticipated residential growth. The RD District is the area most accessible to major roadways and contains large commercial and employment areas. The Township's Comprehensive Plan and Zoning Ordinance determined it is the most likely area for future expansion of public or community water and sewer facilities, based upon development density. The maximum allowable single-family density within this district is 1.5 units per acre, based on the minimum tract size of ten acres for an Open Space Design subdivision. An Open Space Design subdivision requires forty percent open space, at a minimum.

Conventional subdivision design standards for the RD District allow a maximum development density of one unit per acre. A total of 297 acres of land was reserved for open space since the Township established the Open Space Referendum since 2007 to protect and preserve open space in the Township.

b) RC – Residential and Conservation District

This district, located throughout the majority of the Township, is designated to maintain the rural character of primarily agricultural and environmentally sensitive land. The Conventional Residential Development Option for existing parcels less than ten net acres allows two acre net lots for single-family residences. Lot averaging may also be utilized with a minimum average lot area over the subdivision of two net acres. Prime agricultural properties shall be a minimum of ten acres, with a total maximum number of residential units equal to the gross tract area in acres x 0.10. Non-residential and non-agricultural uses must be a minimum of five net acres. The Residential Open Space Option may be utilized if fifty percent of the net tract area is included in the minimum restricted open space. The density is calculated at 0.55 units per net tract area, in the open space option. A total of 297 acres of land was reserved for open space since the Township established the Open Space Referendum since 2007 to protect and preserve open space in the Township.

c) Village Preservation Districts

These districts preserve the historical development pattern of the Township and provide a non-residential and higher residential use within the Township. Three Village Preservation Districts have been designated within the Township.

1) *V-1 - Village Preservation District* – Opperman's Corner has been designated as a commercial center for the Township, allowing for the development of small commercial and institutional uses. The majority of the twenty-one lots contained within this District are currently developed. A gas station convenience store, a restaurant, and several small offices are located within the V-1 Village Preservation District.

2) *V-2 - Village Preservation District* – The Anselma Mill, Chester Springs, and Pikeland Village areas have been designated to encourage the continued minor commercial and industrial uses associated with this area. Portions of this District are included within the Historic Overlay District. Attached residential homes with commercial use exist in this district.

3) *V-3 - Village Preservation District* – Yellow Springs has been designated as the cultural center of the Township, preserving the historic features of the area. This area is also contained in the Historic Overlay District. Many of the lots in this district are developed. However, expansion of the existing facilities may be possible.

d) Overlay Districts

These districts are treated as additional regulations to the otherwise applicable base zoning district. The Act 167 Historic Districts of Yellow Springs and Anselma Mill were created to protect the historical character of these areas and to regulate the erection, reconstruction, alteration, restoration, demolition, or razing of buildings within these areas.

The Resource Overlay District protects and conserves natural resources within the Township. Areas such as floodplains, steep slopes, wetlands, watercourses, riparian buffers, and woodland are protected under this overlay district.

e) Open Space Design Option

This option is intended to conserve open land and provide greater design flexibility and efficiency while implementing the policies of the West Pikeland Comprehensive Plan.

Developments under the Open Space Design Option are served by individual, community, or public sewage disposal systems consistent with this Act 537 Plan and in accordance with applicable provisions of the West Pikeland Township Subdivision and Land Development Ordinances. This design option consideration is detailed in the Chester County Planning Bulletin #54. Developments must also demonstrate compliance with all applicable regulations of the Chester County Health Department and/or the Pennsylvania Department of Environmental Protection.

3. Population Projections and Future Growth Areas

a) Population Projections

Over the past ten years, West Pikeland Township has experienced growth in residential population by approximately 13%. According to the 2010 U.S. Census Bureau, there were 4,024 persons in West Pikeland Township. The 2010 Census, as shown in Table 9, indicates an average household size of 2.92 persons. This is higher than both the County and State averages.

Table 9

Average Household Size

(U.S. Census Bureau)

Year	West Pikeland Township	Chester County	Pennsylvania
1980	3.03	2.90	2.75
1990	2.95	2.73	2.57
2000	2.93	2.65	2.48
2010	2.92	2.65	2.45

Past population trends, as shown in Table 10, indicate a significant reduction in the rate of growth in the most recent decade. The 2010 Township Comprehensive Plan discusses a slow-down in growth beginning in 2006, stating this is, "*…likely a result of the nation's current economic climate.*"

Table 10

Population History

West Pikeland Township

(U.S. Census Bureau)

Year	Population	10-Year Growth (%)
1960	782	--------
1970	1,420	80.9
1980	1,536	8.2
1990	2,323	51.2
2000	3,551	52.9
2010	4,024	13.2

Population projections provided by the Chester County Planning Commission (CCPC) and the Delaware Valley Regional Planning Commission (DVRPC) are shown in Table 11. However, CCPC's projection was prepared prior to the 2010 US Census, which indicates a population of 4,024 in 2010. A review of average household size (Table 9) shows a consistent trend in smaller households; combined with less suitable land to develop for new homes and the current economic climate, it is unlikely there will be a drastic increase in population in the near future compared to the increases between 1980 and 2000.

Table 11

Population Projections

West Pikeland Township

Year	US Census Reported Population	Projected Population (CCPC, 2002)	Projected Population (DVRPC[7])
2000	3,551	3,551	3,550
2010	4,024	4,480	4,024
2020		5,670	4,366
2030		6,520	4,954
2040			5,296

b) Future Growth Areas

It is expected growth will continue to occur throughout the Township based on the future population projections discussed above, current development patterns, and available land throughout the Township. The Zoning Ordinance of 2005 encourages more dense development to occur in the Residential Development District

7 Delaware Valley Regional Planning Commission, Regional and County Population Forecasts 2015-2040, January 2012

in the south/southwestern portions of the Township. In this District, as shown on Exhibit No. IX, existing vacant land/undeveloped and unrestricted land totals approximately 320 acres.

Using a maximum 1.5 residential dwelling units per acre (density) for tracts greater than ten acres using the open space option and one residential dwelling unit per two acres for tracts less than ten acres (RD), the corresponding build-out density is approximately 409 residential units. This build-out projection for the RD District includes adjustments to tract acreage for constraints such as rights-of-way, wetlands, steep slopes, floodplain, riparian buffers, and other subdivision requirements.

Approximately 70% of the Township's lands are contained within the Residential Conservation (RC) District. Undeveloped land in this district that is not restricted from future subdivision or constrained lands totals approximately 1,568 acres. The residential density allowable in the RC Zoning District is considerably less than that of the other Districts. Two net acres of constrained lands, or 0.55 units per net acre using the Open Space Design Option, are required for development. Any public or community sewage planning in this district will be considered on a case-by-case basis as development of tracts is proposed. It is anticipated that most development in this area will continue with on-lot disposal systems due to the large lot sizes.

The West Pikeland Land Trust helped to pass an Open Space Tax referendum in the fall of 2007 to raise money to purchase land for open space. The restrictive zoning regulations and the conservation ambitions of the West Pikeland Land Trust make it impractical to project what the build-out density will be.

The allowable density in the Village V-1, V-2, and V-3 Zoning Districts is based on a minimum lot area of one acre for non-residential use and 15,000 square feet for residential use. The Zoning Ordinance requires a backup sewage disposal area be provided if public sewer service is not available. No more than 60% of the net area of the tract subject to development may be used to calculate compliance with Area and Bulk Regulations applicable to townhouses or multi- family dwellings. The Village Zoning Districts primarily contain commercial developments and have too many variables to predict the build-out density accurately.

c) New and Proposed Developments

Construction is currently underway for Fox Meadows and Nottingham, which consist of eight and eleven units, respectively. Both of these developments lie within the Residential Conservation District. There are no other developments before the Township as of January 2014. Several single lots, however, are currently being developed throughout the Township.

d) Restricted Growth Areas

The restricted growth areas within West Pikeland Township are those which are presently designated by the Township as Historic Resources or which have been restricted from future development by means of land trust ownership, agreements, dedication to the Township, deed restrictions, or other legal means. As of January 2014, the Historic Overlay District has been designated for the Yellow Springs and Anselma Mill Districts. Areas limited by topography, such as those located in steep slope regions or flood plains, also are considered restricted growth areas.

4. Zoning Regulations Relating to Development, Use and Protection of Land and Water Resources

The Zoning Ordinance provides the following guidance with regard to sewerage facilities in the various zoning districts:

a) *RD District*

1) Municipally or privately owned and operated community wastewater treatment and reuse or irrigation systems, in accordance with applicable provisions of the Zoning Ordinance, is permitted by Conditional Use.

2) Pre-existing Parcels less than One Net Acre, Not Resulting from Prior PRD or Open Space Design Subdivision: Sewage system certified as adequate for the size of the dwelling by the Chester County Health Department.

3) Conventional Residential Development Option for Pre-Existing Parcels less than Ten Net Acres: All lots must be capable of supporting individual on-lot systems, except where public or community sewage disposal acceptable to the Township is provided.

b) *RC District*

1) Municipally or privately owned and operated community wastewater treatment and reuse or irrigation systems, in accordance with applicable provisions of the Zoning Ordinance, is permitted by Conditional Use.

2) Pre-existing Parcels less than One Net Acre, Not Resulting from Prior PRD or Open Space Design Subdivision: Sewage system certified as adequate for the size of the dwelling by the Chester County Health Department.

3) Conventional Residential Development Option for Pre-Existing Parcels less than Ten Net Acres: All lots be capable of supporting individual on-lot systems, except where public or community sewage disposal acceptable to the Township is provided.

c) Village Preservation District

1) Public sewage disposal service is required for any use in the V-3 District, and public or community sewage disposal and water supply services, if available, is required for any use permitted in any Village Preservation District.

2) If public or community sewage disposal is not available and cannot reasonably be made available, any parcel containing an individual on-lot sewage disposal system must include a minimum contiguous area suitable for on-lot sewage disposal. The system must be sufficiently sized to accommodate disposal of all sewage generated on-site, in conformance with all applicable regulations, including provisions for a back-up disposal system. In no case shall such minimum contiguous area be less than 10,000 square feet.

d) Overlay Districts

1) Utilities and public facilities including streets, water lines, storm sewers, and sewage treatment plants may be permitted upon issuance of a special exception by the Township's Zoning Hearing Board.

2) All new or replacement water and sanitary sewer facilities and systems must be located, designed, and constructed to minimize or eliminate flood damage and the infiltration of flood waters.

3) Sanitary sewer facilities and systems must be designed to prevent the discharge of untreated sewerage into floodwaters.

4) No part of any on-site sewage system will be located within any identified floodplain area, except in strict compliance with all state and local regulations for such systems. If any such system is permitted, it shall be so located to avoid impairment to it, or contamination from it, during a flood.

5. Sewage Planning Needed for Future Growth and Land Development

Sewage planning will be needed for all new subdivisions (as defined under PA Code 25§71), except as provided by PA Code 25§71.55 (relating to exceptions) or PA Code 25§71.51(b) (relating to use of retaining tanks).

V. IDENTIFICATION OF ALTERNATIVES FOR NEW OR IMPROVED WASTEWATER DISPOSAL FACILITIES

Based on the needs analysis presented in Section III and the Township's anticipated future growth presented in Section IV, it is recognized there are some issues that should be addressed in order to meet the Township's existing and future sewerage needs. Pickering Estates Development was identified as a potential sewer needs area; however, it is not an immediate needs area that would require addressing within the next five years.

The following sections present alternatives evaluated by the Township, which include potential improvements and expansions to the public sewerage facilities, consideration for community on-lot systems, and measures to help ensure that OLDS are a viable sewage disposal plan for those areas where it is not appropriate to extend the existing community sewer systems.

A. Traditional "Centralized" and Alternative Sewage Treatment Facilities

1. The Potential for a Regional Wastewater Treatment Facility

West Pikeland Township is within a protected watershed, presently designated by PA DEP as High Quality. While designation as a High Quality watershed does not necessarily prohibit discharges to surface waters, non-discharge alternatives to surface waters must be evaluated. If no "environmentally sound and cost-effective" alternative is available then a combination of cost-effective treatment, land disposal, pollution prevention and wastewater reuse technologies must be evaluated. While there are other alternatives under Pa Code 25§93, the Township's preference for sewage disposal is toward subsurface land application and retaining water within the local watershed. Based on the Township's preferences combined with the lack of capacity at any of the existing regional sewage treatment facilities, construction of or connection to a

Traditional "Centralized" sewage treatment facility is not a feasible alternative for West Pikeland Township.

2. The Potential for Extension of Existing Sewage Facilities to the Area In Need of Improved Sewage Facilities

The surrounding townships and authorities were contacted to determine if sewage treatment capacity was available; they responded that currently capacity was not available (see Figures 1, 2 & 3). However, even if capacity were available, the cost to convey sewage would be prohibitive due to the distance from adjacent collection and conveyance facilities. Within the Township, the Little Washington Company's Twin Hills Plan has some limited capacity, but the area for land disposal is severely limited.

3. The Potential for the Continued Use of Existing Sewage Facilities

The Little Washington Wastewater Company's Twin Hills Plant appears to be well maintained, with little need of major repair; however, upgrades will be required to accommodate new connections. There is little room on the site for physical expansion; however, a major change in the treatment process could possibly result in a reduced footprint, thus allowing for plant expansion. The Township Comprehensive Plan notes residents near the Twin Hills plant are negatively impacted by odors from the wastewater treatment plant, and recommends these concerns be addressed with any future additions or plant upgrades.

4. Repair or Replacement of Existing Collection and Conveyance System Components

In discussions between the PA DEP Southeast Regional Office and the Township regarding the existing Twin Hills collection system, PA DEP indicated some concerns regarding an increase in reported flow to the treatment plant resulting from a possible increase of ground and surface

water into the collection system (inflow and infiltration or I&I). Repair and possible replacement of system components is often more cost effective than a plant expansion.

5. The Need for Construction of New Community Sewage Systems

There is no immediate need for additional treated effluent disposal areas in the Township. There is limited area available at the existing Twin Hills site. Other potential disposal areas that were reviewed were Windolph Knoll and Pickering Meadows.

6. Use of Innovative/Alternative Methods of Collection/Conveyance to Serve Areas of Need

Collection and Conveyance of Sewage:

The traditional method of sewage collection has been by conventional gravity sewers.

a) Gravity Sewer Systems

Gravity sewer collection systems have traditionally been the preferred method of sewage collection and conveyance. Gravity sewer collection systems are typically used wherever practical, especially in new construction. Pumping stations are required when gravity system cross from one drainage basin to another. Careful planning is essential when sizing a gravity sewer collection system in order to serve the future needs of the drainage basin.

Gravity collection systems can become expensive due to rock excavation or length of sewer lines required to serve less populated areas. Gravity collection systems are also prone to Inflow and Infiltration (I&I). Inflow is described as storm or rainwater that enters the collection system from leaks around manhole lids and cleanouts or by direct connections for roof and floor drains.

Infiltration is groundwater that enters the collection system through leaks in the piping, manholes, and other sanitary sewer structures.

During heavy rain events, I&I can overload the collection piping and pumping stations and cause a sanitary sewer overflow (SSO) event. The US EPA estimates there are at least 40,000 SSOs each year. The untreated sewage from these overflows can contaminate our waters, causing serious water quality problems. It can also back up into basements, causing property damage and threatening the the public health.

b) Pressure Sewer Systems

For these reasons, pressure sewers should be considered as a possible alternative for all new projects. Pressure sewers do not require pumping stations, are not as susceptible to I&I, and are less expensive to construct because the force main can follow the contours of the existing land rather than being required to have a continuous downward slope.

The two major types of pressure sewer systems are Grinder Pump systems and Effluent Pump systems. The major differences between them are with the on-site equipment and layout. Neither type of pressure sewer system requires modification to conventional household plumbing.

In Grinder Pump systems, household wastes are collected and conveyed by gravity to a small buried pump vault containing the grinder pump. Waste solids in the sewage are macerated into slurry and then pumped through a small diameter pipe to either a larger network of pressure sewers or a traditional gravity sewer collection system. The on-site piping arrangement includes at least one check

valve and one gate valve to allow isolation of each pump from the main sewer. Grinder pumps are generally not installed in the basements of homes because access to maintain the pump is more difficult than when the system is installed outside the home.

There are two types of grinder pumps: centrifugal and semi-positive displacement type. Both of these pump types have certain advantages and, in many cases, the pressure sewer system can be intermixed with either type of pump.

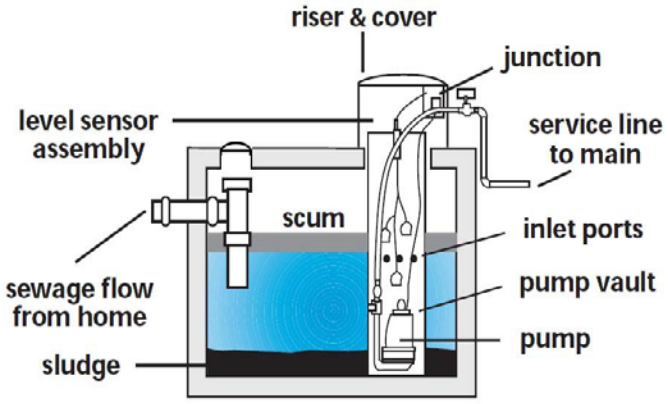
Grinder pump systems are particularly suitable for extending sewer service into existing residential communities. Traditional gravity sewers can be very costly and disruptive to the local environment. Effluent pump systems are advantageous when used in combination with Decentralized and Small Community Sewage Disposal systems and Community Land Application systems. Pressure sewer systems can be served by a combination of grinder pumps and effluent systems, provided the treatment system is not dependent on septic tank quality influent.

In Effluent Pump systems (see Figure 4), wastes flow by gravity to a conventional septic tank or other type of treatment tank. The primary purpose of the septic or treatment tank is to remove the solids and provide a clarified effluent that can be easily pumped. When a higher level of effluent quality is desired, an advanced treatment unit can be used in place of or after the septic tank. The effluent from the septic tank flows to a holding tank, which contains a pup with level control sensors. Normally, small centrifugal pumps are employed. These pumps are submersible and range in size from ¼ to ½ horsepower. When the pump is protected with a filter screen, turbine type pumps can be used. Turbine pumps

similar to the pumps used in deep drinking water wells can produce very high hydraulic head and allow pumping over great distances.

Figure 4

Effluent Pump System



(Pipeline; Fall 1996, Vol. 7, No. 4)

B. "Decentralized" or Alternative On-Lot Sewage Systems

1. Individual On-Lot Sewage Disposal Systems (OLDS)

Individual OLDS are the current preferred alternative within the Township. Due to the relatively low housing density in most of West Pikeland Township, these individual systems have been quite successful in meeting sewage disposal needs throughout the years.

2. Individual or Group Off-Lot Disposal Systems

The *Landscapes* Comprehensive Plan, the Chester County Planning Commission issued *Planning Bulletin #54 - Individual Off-Lot Sewage Systems* in 1998. The Bulletin was designed to offer municipal officials and developers options in locating individual sewage systems and how

these variations may be used as a method to achieve local and County environmental protection and open space preservation goals.

The term "individual off-lot sewage systems" refers to the placement of the primary/and or replacement effluent absorption area outside of the boundaries of the building lot served by the system.

3. Soil and Slope Suitability

Texture and structure play a key part soil's ability to absorb, disperse, and renovate sewage effluent. While some degree of slope will aid with water dispersion, slopes in excess of 25% may lead to breakout of partially treated sewage, which could be a health hazard.

4. Preliminary Hydrogeologic Evaluation

When there are many homes in close proximity, the effects of too many disposal systems can cause issues with groundwater quality, particularly with elevated nitrate-nitrogen levels in drinking water wells. In areas of known high background nitrate-nitrogen or a high density development, a preliminary hydrogeologic evaluation is required to assure the public drinking water supply is protected.

5. Establishment of a Sewage Management Program

In the past, it was common thought that all homes and businesses would be ultimately served with centralized or "public" sewers and that OLDS were merely a temporary solution. However, the current trend is for the continued use of OLDS for existing residences and future homes in areas where appropriate subsurface and hydrological conditions exist. Disposing of sewage by subsurface land application utilizes the natural soil to provide renovation prior to recycling the water back into the environment. This

method can reduce the amount of pre-treatment required. OLDS provide an acceptable degree of treatment and are often the most cost-effective means of sewage treatment disposal.

As with Centralized facilities, OLDS must also be properly operated and maintained to assure adequate sewage treatment and disposal over the functional life of the system. OLDS should be regularly inspected and pumped-out.

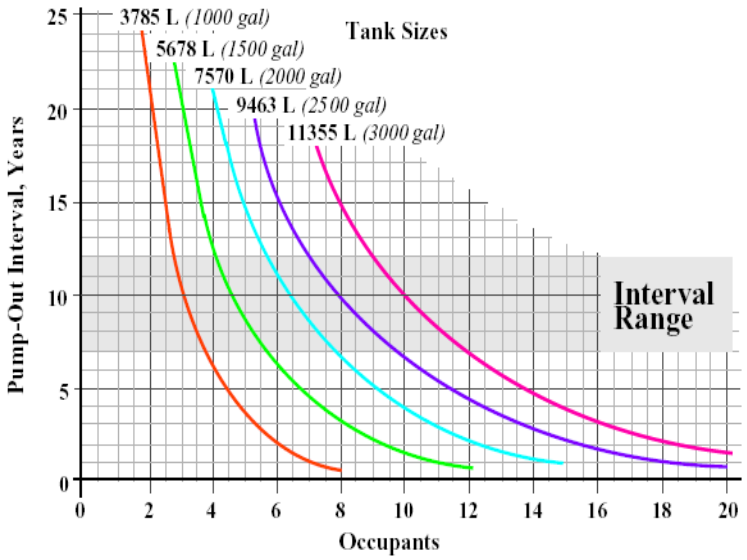
The Township recognizes the need to develop and implement a Sewage Management Program in order to foster the future reliability of the OLDS systems throughout the community. This program will focus on three components – educational, regulatory, and monitoring. The Township shall hold two public education meetings with the residents during the first year after plan adoption. These meetings will focus on understanding the operation of OLDS systems and the requirements for on-going maintenance. Materials supporting this will be developed for the Township's website and for distribution to new residents.

The Township shall adopt and implement a Sewage Management ordinance requiring regular pump-outs and inspections at no greater than a 3 year interval. A draft of the Sewage System Management Ordinance through this Act 537 update is presented in Appendix 6. Where site specifics conditions warrant the use of alternative systems through the use of a Sewage Planning Module, the Township shall also require that an individual O&M agreement be developed and recorded in the office of the County Recorder of Deeds. The Township shall require an escrow in support of the maintenance of these alternative systems should the property owner fail in their O& M obligation.

The Township shall establish a monitoring program for all properties containing OLDS systems. The tracking system can be tied into the Township's GIS system to track the frequency and content of inspection reports. Since April 2005, the Chester County Health Department (CCHD) has been recording the location and frequency of OLDS pump-outs. Septic tanks should be routinely inspected and pumped every three years (see Figure 5). The necessity of more frequent pumping is generally an indication of a problem.

Figure 5

Pump Out Interval Frequency of Septic and other Treatment Tanks



At 95% confidence level (Orenco Systems, Inc.)

Exhibit No. VII shows the location and pumping frequency since the CCHD began documenting these activities. There are a few isolated properties of concern throughout the Township; however, the area near the intersection of Yellow Springs Road and Street Road (Street Road towards the boundary with Charlestown Township) indicates a concentration of a high number of

pump-outs. With only a few certified failures reported in this area, it still warrants future study to watch for additional warning signs.

6. The Repair, Replacement or Upgrading of Existing Malfunctioning Systems in Areas Suitable for Individual Sewage Disposal Should Consider the Following:

a) Using alternative treatment technologies that reduce dependence on soil for renovation, which often permit a reduction in conventional disposal areas. Typically, an upgrade from a conventional septic tank to an advanced treatment unit can reduce the organic load in the soils, allowing the malfunctioning disposal area to recover.

b) Using an expanded absorption area, either on or off-lot.

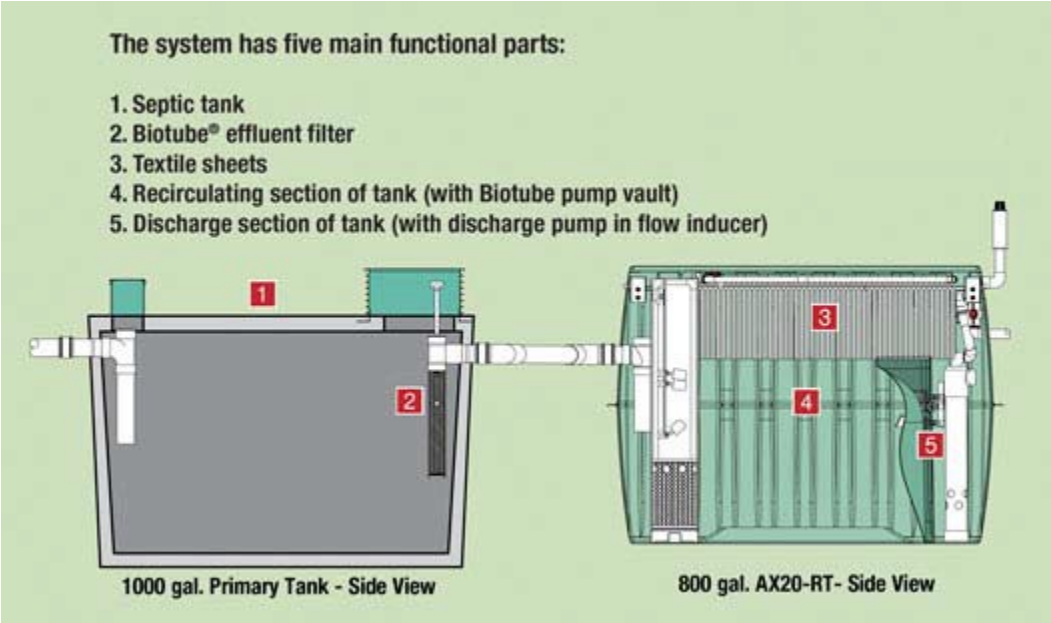
c) Using water conservation devices, including high-efficiency washing machines or dishwashers, and low-flow toilets and faucets.

C. Small Flow Sewage Treatment Facilities

Small flow facilities are intended to serve single-family residences, duplexes, and small commercial establishments that generate 2,000 gallons per day or less of domestic wastewater. Figure 6 shows an example of a small flow facility manufactured by AdvanTex.

Figure 6

AdvanTex® AN20-RT w/ Effluent Pump



1. Treatment and Discharge Requirements

Small flow facilities discharge treated water into a local stream, storm sewer, or dry ditch. Small flow facilities require a stream discharge or NPDES Permit and a PA DEP Water Quality Management Permit for the construction and operation of the facility. Small flow facilities are generally very expensive to permit, install, operate, and maintain. Discharges to protected watersheds, such as the entire watershed of West Pikeland Township, are not eligible for General NPDES Permits and require an Individual NPDES Permit. In protected watersheds, small flows facilities are generally not permitted for new construction, and are only used as replacements for malfunctioning OLDS when no other alternative is available.

2. Soil Suitability

Small Flow Sewage Treatment Facilities (small flow facilities) are used where on-site soils are completely unsuitable for any form of land disposal and a community sewer facility is not reasonably accessible.

3. Preliminary Hydrogeologic Evaluation

Where a small flow facility discharges overland or to a dry ditch, a preliminary hydrogeologic evaluation is typically required. This is to ensure the effluent flows to a surface water course without causing a public health hazard or nuisance.

4. Management of Small Flow Facilities

While small flow facilities do not require a PA licensed wastewater treatment plant operator, the local municipality is still required to operate and maintain the facility properly. This occurs through either a Sewage Management Program, a Municipal Ordinance, or an individual maintenance agreement with the property owner or homeowner association.

D. Community Land Disposal Alternatives – Decentralized Systems

In the April 1997 "*Response to Congress on Use of Decentralized Wastewater Treatment Systems*"[8], the United States Environmental Protection Agency reported that, "*Decentralized systems serve approximately 25 percent of the U.S. population, and approximately 37 percent of new land development.*" Decentralized systems include individual on-site systems and small cluster wastewater systems used to treat and dispose relatively small volumes of wastewater from dwellings and businesses located relatively close together.

[8] EPA doc No. 832-R-97-001b, April 1997

This same report lists several benefits of using properly managed decentralized systems:

- Treatment comparable to centralized systems and better watershed management (by avoiding potentially large transfers of water from one watershed to another).

This response also lists several barriers to implementing decentralized systems:

- Lack of Knowledge – The public often has the misperception that centralized systems are better for property values. Regulators and wastewater engineers are often not comfortable with decentralized systems, due to a lack of knowledge.

- Legislative and Regulatory Constraints – Lengthy approval processes dissuade developers from building decentralized systems.

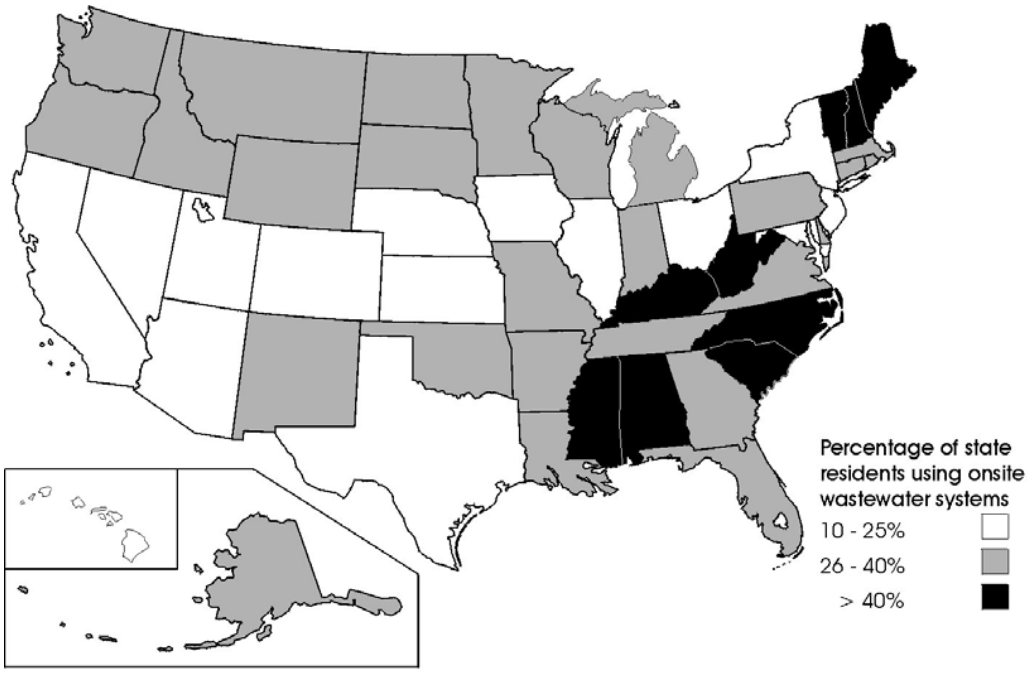
- Lack of Management Programs – Often municipalities do not have the organizational structure to manage decentralized systems effectively. This is mainly due to the low number of customers.

- Liability – Homeowners are typically not willing to accept responsibility and potential liability for systems with which they are unfamiliar.

Figure 7

Percentage of State Residents

Using On-site Wastewater Systems



Source: U.S. Census Bureau, 1990

Community On-Lot Disposal Systems (COLDS) is often used to describe Decentralized Systems. These COLDS can be privately owned or municipally owned. Privately owned systems can serve a single development or several developments. Privately owned systems are owned and operated by condominium/ homeowners associations or by private businesses servicing their own facilities. An example of a private business may be an apartment house, mobile home park, or shopping center. Municipally owned systems are usually owned and operated by investor owned public utility companies, regulated by the Pennsylvania Public Utility Commission. Public systems can also be owned by a municipality.

In Chester County, there are three prominent COLDS in use: Large Volume Subsurface, Spray Irrigation, and Drip Distribution.

Large Volume On-lot Systems:

Large Volume On-lot Systems are effluent dispersal systems constructed and operated very similarly to pressure dosed systems (which use a pump to move effluent to the designated disposal area), with the exception that these systems do not depend on the soil entirely for renovation of the applied effluent. Instead, an advanced secondary treatment system typically precedes the dispersal system. Treatment requirements vary depending on the specific site conditions. With these systems, the designer considers soil permeability (hydraulic conductivity), depth to perched or seasonal high water table, hydrology, and hydrogeology to design an effective system to disperse the effluent into the ground water.

There are several advantages of these systems over traditional community systems. One advantage is since the sewage is fully treated or partially treated, the system is not as dependent soil for renovation. Another advantage is that higher application rates are generally permitted, which reduces the amount of land required for the dispersal system, saving land costs. The disadvantage, however, is that the treatment process is much more complex and more costly to build, operate, and maintain.

Large Volume On-lot Systems are generally permitted for flow greater the 10,000 gallons per day and require Clean Streams Law permits, also known as PA DEP Water Quality Management Permits or Part II Permits.

Spray Irrigation:

Spray Irrigation involves applying treated or partially treated sewage effluent to the land surface. Hydraulic application rates vary for the site-specific soil types, topography, and climatic conditions. Application during and shortly after rain

events is typically stopped to reduce runoff. Additional treatment of the effluent can also be accomplished by plant uptake and through the soil matrix. Application rates vary based on plant nutrient absorption rates at that time of year. Spray Irrigation has been a popular land application technique for systems that depend on the soils and plants for renovation, and is generally accepted as a very reliable system by local regulating agencies.

Among the factors that affect the feasibility of Spray Irrigation are topography, soil conditions, weather conditions, agricultural practices, and economics. Spraying involves the application of effluent above the ground, through either nozzles or sprinkler heads. Other elements of the system include effluent storage lagoons, pumps, supply mains, laterals, and risers. Design of the system can be quite variable; it can be portable or permanent, moving or stationary. The use of fixed kicker type spray nozzles is the prominent design in the Chester County area. These systems provide an efficient and uniform flow distribution.

High wind, a problem common to spray irrigation systems, adversely affects the efficiency of distribution and can spread aerosol mists (fine sprays of effluent carried by the wind). Systems are easily designed to control this problem by providing large setbacks to other properties, installing high earthen berms with dense landscaping to shield the misting, or including an anemometer (an instrument for measuring wind velocities) in the pump control circuit to delay spraying until the wind has diminished.

Freezing weather can also be a problem with Spray Irrigation. If the effluent is applied when the air temperature is below freezing, the effluent will freeze as it leaves the sprayer. The frozen effluent will then accumulate on the ground surface. While this alone is not a problem, if additional applications are made and the frozen effluent continues to accumulate, when the air temperature rises the melting

rate of the effluent may exceed the rate at which the soil can absorb the effluent, and runoff may occur.

While the control of the spray system can be automated, common practice in Chester County is to operate the spray system manually. Designing a control system to consider all of the variables for spraying would be very complicated.

Spray Irrigation Systems in Chester County generally incorporate lagoon treatment systems, and depend on crop uptake for Total Nitrogen Removal. During the cooler seasons and particularly during the winter months, application rates are reduced to keep pace with the reduced nitrogen uptake. Because the nitrogen is bound up in the crop plant matter, the crop must be harvested and removed at least annually.

Drip Distribution:

Drip Distribution, also known as Drip Irrigation or Drip Dispersal, is a subsurface land application system that was first installed in Pennsylvania at Bridlewood Treatment Plant in Thornbury Township, Chester County. The system was installed in the fall of 1998 after being demonstrated at Delaware Valley College. While the Bridlewood Plant disposes highly treated effluent, Drip Distribution Systems have been extremely successful for many years for disposing septic tank effluent.

Drip Distribution has two major advantages over other land applications systems. First, it applies effluent directly into the most biologically active zone of the soil, just below the surface. Secondly, when properly designed and installed, it has "better distribution of effluent over a larger area."[9] Drip Distribution is an effective process for water reuse.

[9] Drip Irrigation Workbook Course #312, prepared by the Pennsylvania State Association of Township Supervisors in conjunction with Delaware Valley College for the Department of Environmental Protection(Pa DEP), p 1-2.

In wastewater application systems, the principal advantage of Drip Distribution over Spray Irrigation is that daily wastewater application rates are uniform and not as impacted by climate variables. Spray Irrigation has practical limitations during rainy, windy, and freezing weather, requiring large volumes of effluent to be stored during days when spraying is not recommended or permitted. Storage requirements for Drip Distribution are minimal.

Drip Distribution delivers effluent in small frequent doses, leaving the soil near the surface in an unsaturated state. This is accomplished by the use of tubing with specially designed emitters that allow the effluent to leave the tubing in small droplets. Because the soil is unsaturated, leaving a large portion of the void spaces still filled with air, the soil remains in an aerobic condition, providing for improved renovation of the effluent compared to spraying.

During freezing weather, if the soil moisture at the ground surface freezes, the air and void spaces remain, permitting continued movement of the effluent as it is applied below the surface. As long as the effluent is applied in small doses, the soil will remain unsaturated and water will continue to move downward and away from the colder surface. When the ambient air temperature is less than the soil temperature, the heat flux is upward and assists in the downward movement of the water. Drip Distribution Systems perform quite well in cold climates, as long as there is proper attention to design details.

Treatment requirements for Drip Distribution Systems vary from primary treatment (septic tank effluent) to advanced secondary treatment with denitrification. Because there is no potential for human contact, disinfection is not needed. Drip

Distribution Systems can be automated and are suitable to monitoring and control by a programmable logical controller (PLC), increasing its reliability.

1. Soil and Site Suitability

Land requirements for on-site disposal systems vary greatly. Individual on-site systems have required setbacks from property lines, wells, and other uses to the absorption field. Community systems require greater setbacks, with these setbacks based on site evaluations, studies, and other information provided about the site. Absorption areas can serve as passive open space and, with certain limitations, continue to be farmed or used for recreational activities.

As discussed in Section IV.B, in the event an Immediate Needs Area develops in the future, two areas were evaluated for potential Community Disposal Systems: the area locally known as Pickering Meadows and Windolph Knoll. Preliminary soil probes and test pits, witnessed by PA DEP soil scientists, along with described soil profiling, were performed on the Windolph Knoll. Copies of the soils reports are included in Appendices 7 and 8. The Windolph Knoll site is suitable for disposal of wastewater. The Pickering Meadows site will require further testing and evaluation because the two testings previously performed did not provide consistent results.

2. Preliminary Hydrogeologic Evaluation

Systems that will process 5,000 gallons per day or more may require additional field studies beyond the industry standard deep hole and percolation tests. These hydrogeological studies might determine that the proposed soil absorption field affects a much larger area than the actual area of the absorption field. Installing a soil absorption system may require

portions of land within the dispersion plume area be restricted against the drilling of wells for drinking water.

Preliminary hydrogeological studies were performed for the Windolph Knoll and site**.** A copy of the report is included in Appendix 7.

3. Management of Community Land Disposal Systems

Community Land Disposal Systems typically require a licensed wastewater treatment plant operator, depending on the size of the system and treatment technology. The plant operator can be an employee of the municipality or an independent contractor. For non-municipal disposal systems, the local municipality is typically required to ensure the facility is properly operated and maintained either through a Sewage Management Program, Municipal Ordinance, or individual oversight or management agreement with the system owner.

4. Rehabilitation or Replacement of Existing Malfunctioning Community Land Disposal Systems

Disposal areas are often divided into multiple sections or zones. It is recommended a reserve disposal area equal to the largest zone be tested and included in the original design and permit application. This reserve area could then be used in the future, if necessary.

E. Retaining Tanks, Holding Tanks, Privies, Chemical or Portable Toilets, Recycling, Incinerating, or Composting Toilets

1. Commercial, residential and industrial use

Retaining Tanks, commonly called holding tanks, are temporary holding facilities used to retain wastewater “sewage” before it is transported by truck to an authorized treatment facility.

Holding tanks are also very useful during the initial stages of a project, while the permanent system is being constructed. Sewage can be stored in holding tanks and then be pumped and hauled to a sewage plant for treatment.

Holding Tanks have also been used to aid a marginal system. By installing a holding tank between the septic tank and the absorption bed, the holding tank can serve as an emergency storage tank. Rather than having the system back up into the septic tank and then into the house, the wastewater overflows into the holding tank, which can be later pumped out or returned to the septic system, giving the absorption area time to rest.

Certain commercial and industrial uses, for example non-domestic wastes (grits and other settlements) from a car washing facility including other toxic and hazardous liquid wastes, may be stored on-site in a "holding tank," but are permitted through an Industrial Waste Permit issued by PA DEP.

2. Designated Conveyance Facilities

Conveyance of liquid wastes is typically contracted out to independent licensed haulers. The Chester County Health Department regulates and permits all liquid waste haulers in Chester County. The Health Department also routinely inspects all pumper trucks used for conveyance to treatment facilities.

3. Designated Treatment Facilities

There are no specific designated treatment facilities; liquid waste is hauled to a number of PA DEP permitted treatment plants in Chester County and several adjacent counties.

4. Implementation of a Retaining Tank Ordinance

The use and maintenance of new and existing holding tanks in West Pikeland Township is governed by Ordinance 2006-202. Under this ordinance, the Township ensures all retaining tanks are being maintained.

5. Financial Assurances

The West Pikeland Holding Tank Ordinance requires bonding and other financial assurances.

6. Other Retaining Tank Alternatives

a) Privies:

Privies (outhouses) are still permitted but are limited to sites where there is no potable water under pressure on-site. Privies are permitted by the Chester County Health Department in Chester County.

b) Chemical or Portable Toilets

Chemical or Portable Toilets are usually used on a temporary basis at construction sites, fairs, concerts, or camping events. Portable toilets are exempt from permitting by the Chester County Health Department (CCHD). CCHD has separate rules and regulations on the proper use of Portable Toilets and the licensing of the Liquid Waste Haulers to service portable toilets.

c) Recycling, Incinerating, or Composting Toilets

Recycling, Incinerating, or Composting Toilets can be used in new or existing residences or establishments. These devices shall bear the National Sanitation Foundation (NSF) seal indicating testing and approval under NSF Standard No. 41. For new residences or

establishments, an approved method of sewage disposal and a permit is required for the "Gray Water" (i.e. wash water for sinks, showers, bath tubs, and for excess water from the device). Such devices may be installed for existing residences and other establishments provided that no alteration of the existing on-lot system be proposed.

F. Sewage Management Programs

Municipalities are required to address the long-term operation and maintenance of all sewage facilities with their borders.

1. Municipal Ownership or Oversight of OLDS, Small Flow Treatment Facilities and Other Non-municipal Treatment Facilities

a) Municipal Ownership

Municipally-owned facilities include those systems owned by the Municipality itself, the Municipality's Authority, or a Joint or Regional Authority. While municipal ownership may be the preferred method to assure adequate operation and maintenance, it is often not practical or cost effective unless the sewage facility serves the majority of the municipality.

b) Oversight of OLDS, Small Flow Treatment Facilities and Other Non-municipal Treatment Facilities

There are two general types of sewage facilities: individual sewage systems and community sewage systems. For the purposes of the Township Sewage Management Program, an Individual sewage system serves a single lot and a Community sewage system serves two or more improved properties.

In general, property owners are responsible to properly operate and maintain the sewage facilities on their individual properties. Where an individual property is served by a community sewage system, property owners are responsible to comply with the rules and regulations of the Community sewage system.

Community sewage systems are often referred to as "public" sewers and may not be necessarily owned by the Municipality or an Authority, but owned by an Investor Owned Public Utility company or a Homeowners or Condominium Association.

2. Requirement for Inspection of Sewage Disposal Systems

Sewage disposal systems with Water Quality Management Permits are routinely inspected by PA DEP. Certain "Alternate" and most "Experimental" system permits contain requirements for scheduled inspections. Otherwise, any requirement for inspection of sewage disposal systems would be part of an established Sewage Management Program.

3. Requirements for Maintenance of Sewage Disposal Systems

A draft ordinance establishing procedures for the proper operation and maintenance of all individual sewage facilities is provided in Appendix 6.

4. Repair, Replacement or Upgrading of Malfunctioning On-lot Sewage Systems

a) The Chester County Health Department is currently the local agency who, on behalf of the Township, conducts investigations regarding potential malfunctioning OLDS and also issues any necessary permits for repairs, replacements, or upgrades.

b) Township residents are encouraged to use the Township's website, which contains useful information on the proper operation and maintenance of sewage disposal systems.

5. Establishment of Joint Municipal Sewage Management Programs

The Township remains open to considering a joint municipal sewage management program; none are proposed at the present time.

6. Requirements for Bonding, Escrow Accounts, Management Agencies or Associations to Ensure Operation & Maintenance for Non-municipal Facilities

Operation and maintenance of existing non-municipal facilities does not appear to warrant any financial assurances; however, future projects will be reviewed on a case by case basis.

G. Non-Structural Comprehensive Planning Alternatives

1. While the Township updated its Comprehensive Plan in December 2010, future updates should consider the following:

   a) *Land Use Designations* – A review of existing land use designations and make recommendations as needed.

   b) *Densities* – Consider decreasing lot densities, as lot sizes less than 1.4 acres should be evaluated for possible nitrate-nitrogen elevation in the ground water.

   c) *Municipal Ordinances* – A periodic review of existing municipal ordinances and regulations is recommended.

   d) *Improved Enforcement* – Continue to support the Chester County Health Department and PA DEP in their enforcement efforts.

e) *Protection of Drinking Water Sources* – Continue to support the Chester County Health Department with enforcement of the drinking water well program.

2. Review and update the Comprehensive Plan, as needed.

3. Alternatives for changing municipal subdivision regulations to ensure long-term use of OLDS that considers lot sizes and protection of replacement areas.

   a) For most on-site systems, including elevated sand mounds, the Chester County Health Department requires a suitable replacement area also be found during permitting. A major problem often occurs is that this replacement area is not protected and is not available should a replacement be needed.

4. Utilize Planning Bulletin #54 which details open space and off-lot system evaluations to assist in suitable replacement for a malfunctioning on-lot system.

5. Evaluation of existing local agency programs and the need for technical or administrative training.

   a) Support requiring regular maintenance of OLDS. Consider implementation of a Sewage Management Program for individual OLDS. Also, consider Operation and Maintenance oversight agreements with owners of community sewage facilities.

   b) Support requiring groundwater studies for new development projects not proposed for connection to public water service to ensure that adequate water supply is available and sustainable.

H. No-Action Alternatives

This update revision identifies no immediate sewage needs areas within West Pikeland Township. A no-action alternative would not address any future incidences of confirmed, suspected, or potential malfunctions and contaminated wells in a needs area. Therefore, a no-action alternative would not ensure adequate wastewater disposal facilities to protect the Township's public health and meet its community service needs. Thus, a “no action” alternative is not viable for any of the potential needs areas within the Township.

1. Water Quality/Public Health

The short term effects of the no-action alternative would not have a positive impact on water quality and public health. As identified on Appendix 4 – West Pikeland Well Water Testing Map, several wells have experienced elevated readings. With no action, these areas will continue to experience grater loadings and more potential contamination to ground water. Implementation of the Sewage Management Ordinance, inspection and certification will help to ensure proper operation of on-lot disposal systems. The long term effect of the no-action alternative would not have a positive impact to the overall water quality and public health within the Township. Planning measures identified in Section 4, will help ensure that future on-lot disposal systems do not adversely impact these resources.

2. Growth Potential

The no-action alternative is consistent with the West Pikeland Township Comprehensive Plan, Zoning Ordinance and Subdivision and Land Development Ordinance. The no-action alternative, in the short term duration, would not result in an increase or decrease in the potential for growth due to the number of planned developments existing in the Township. The alternative would minimize future development potential in the Township.

3. Community Economic Conditions

The West Pikeland Township economy currently consists primarily of a residential tax base, with some commercial properties. The no-action alternative would prohibit the expansion of this growth within the Township, as these types of uses generally require public utilities. Therefore, no short or long term benefit is realized by the no-action alternative for the economic condition in the Township.

4. Recreational Opportunities

Developments within West Pikeland Township are required to provide recreational facilities or a fee in lieu, as required by the Subdivision and Land Development Ordinance. Therefore, no short-term adverse effect will be experience through the implementation of the no-action alternative. However, this alternative will minimize future growth, thereby reduce the fees received by the Township. This will result in a long-term decrease in funds available to the Township for recreational opportunities

5. Drinking Water Source

The short term effects of the no-action alternative would not have a positive impact on water quality for individual on-lot wells. As identified on Appendix 4 - West Pikeland Well Water Testing Map, several wells have experienced elevated readings. The continued enforcement of the Sewage Management Ordinance will help to ensure proper operation and maintenance to minimize future contamination.

6. Other Environmental Concerns

This plan identifies other environmental features such as wetlands and other watercourses. The no-action alternative does not result in any direct impact, such earth disturbance in these areas. However, the alternative provides for continued short and long term pollution to these features by

loadings from on-lot disposal systems. Therefore, the alternative is considered to have a slight effect on the other environmental features within the Township.

I. Summary of Selected Alternatives

1. Individual Sewage Disposal Systems

Existing and proposed new building lots over two acres will continue to depend on the use of on-lot, and potentially off-lot sewage systems as their primary method of sewage disposal, where suitable conditions permit.

Existing building on lots less than two acres will continue to depend on the use of OLDS. When conventional repairs and replacement systems are not suitable, alternative individual sewage disposal systems shall be considered including the use of a “holding” tank system.

With proper operation and maintenance by the property owner, in most cases OLDS are cost effective, environmentally sound, and will protect public health.

2. Community On-lot Sewage Disposal Systems

Existing Facilities – The systems serving the Historic Yellow Springs and the Montgomery School are presently the only non-PUC privately owned Community On-lot Sewage Disposal Systems. With proper operation and maintenance, these systems should properly serve these properties for the near future.

Future Facilities – New Community On-lot Sewage Disposal Systems are the preferred alternative for New Land Development projects with flows less than 10,000 gallons per day. If, in the future, an existing community

would need to utilize either the Pickering Meadows or Windolph Knoll site for land disposal, information on the site is provided in this Plan, future testing might be needed for these sites.

3. Large Volume On-lot Sewage Systems

Large Volume On-lot Sewage Systems include both individual and community on-lot sewage systems that discharge to a subsurface disposal system with flows in excess of 10,000 gallons per day. This is preferred alternative for New Land Development projects with flows in excess of 10,000 gallons per day.

4. Small Flow Treatment Facilities

Small flow treatment facilities are individual or community sewerage systems that treat sewage flows of less than 2,000 gallons per day. Small flow treatment facilities that discharge to surface waters in High Quality classified watersheds are generally limited as replacement systems for existing, malfunctioning OLDS.

5. Water System Extension

The Township has identified the alternative of extension of the existing water main, through Extension Agreement with AQUA to the Pickering Estates Development as a feasible alternative. The water main extension by AQUA will serve sixty-one (61) existing residents within the development. The main extension consists of approximately 9,685 feet of new main. As part of the alternative, individual property owners are responsible for the decommissioning of their existing on-lot wells and installation of the service line to the house.

This alternative reduces public safety concerns with elevated contaminants identified during the well testing. The alternative also allows for increased area for replacement on-lot sewage disposal systems by eliminating the required well isolation distance.

VI. EVALUATION OF ALTERNATIVES

A. Consistency of Alternatives with Objectives and Policies

1. Plans Developed and Approved Under Sections 4 and 5 of the Clean Streams Law or Section 208 of the Clean Water Act

Comprehensive Water Quality Management Plans were developed under Sections 4 and 5 of the Clean Streams Law and 208 of the Clean Water Act for all areas of the Commonwealth. These plans have not been subject to an ongoing maintenance process; in fact, these plans are out of print and are no longer available. In the absence of the actual and likely outdated plan, since all of the alternatives proposed in this Plan Update promote enhanced water quality, it is believed this plan is consistent with those sections of the Clean Streams Law and Clean Water Act.

2. Municipal Wasteload Management under Chapter 94

There are no "municipal" sewerage facilities in the Township; non-municipal sewage facilities are not covered by Chapter 94.

3. Previous Plans Developed Under Title II of the Clean Water Act or Titles II & VI of the Water Quality Act of 1987

Title II of the Clean Water Act contains information on waste treatment management plans and practices which provides for the application of the best practicable waste treatment technology before discharge into receiving waters, including reclaiming and recycling of water; the confined disposal of pollutants so they will not migrate to cause water or other environmental pollution; and the consideration of advanced waste treatment techniques.

All of the alternatives in the Plan are consistent with the above.

4. Comprehensive Plans Developed Pursuant to the Municipalities Planning Code

All of the alternatives in the Plan are consistent with the above.

5. Anti-degradation Requirements Contained in Chapters 93, 95 and 102

All of the alternatives in the Plan are consistent with the above.

6. State Water Plan Developed Under the Water Protection Planning Act and the Pennsylvania Administrative Code

All of the alternatives in the Plan are consistent with the above.

7. Pennsylvania's Prime Agricultural Land Policy

The protection or preservation of prime agricultural soils is stated as an objective of the Agricultural Land Use Goal, as stated in the Township Comprehensive Plan. The U.S. Department of Agriculture has identified Prime Farmland Soils, and those found in West Pikeland Township were previously presented in Table 7.

While the areas containing these soils are not specifically delineated in the Zoning Update, the conservation of these soils is inherent with the use, area, and bulk regulations specified for the Resource Conservation District. The program to transfer development rights from prime farmland and other naturally sensitive areas to the more appropriate Residential Development District also aids in the conservation of prime agricultural soils.

8. County Stormwater Management Plan

Development within West Pikeland Township will continually be kept in agreement with the Chester County's stormwater management plans.

9. Wetland Protection under Chapter 105

All proposed facilities would be located to avoid impacts on wetlands. Wetlands in general are not suitable for sewage disposal areas; therefore there should be no impact with respect to the disposal areas. Ancillary facilities such as pumping stations should be located to avoid impacts on wetlands, along with other associated construction activities (road crossing, utility lines, etc.) that may require a Chapter 105 Permit prior to construction.

10. Protection of Rare, Endangered or Threatened Plant and Animal Species

A copy of the Pennsylvania National Diversity Inventory (PNDI) search document for the Windolph Knoll site is provided in the Appendix 9, along with response letters from the appropriate agencies. The Pickering Meadows site has an existing permit.

11. Historical and Archaeological Resource Protection

A copy of the Cultural Resource Notice for the Windolph Knoll site is included in the Appendix 10. Responses from the Pennsylvania Historic and Museum Commission indicating no potential impacts on known historic or archaeological resources are also included. The Pickering Meadows site has an existing permit.

B. Resolution of Inconsistencies

No inconsistencies exist to resolve.

C. Applicable Water Quality Standards

All alternatives evaluated are consistent with applicable water quality standards.

D. Cost Estimates

The continued implementation of the Sewage Management Program will not have a financial burden on the Township or its residents. This alternative does not require a capitol financing plan.

The financial analysis for the remaining alternatives examined for future needs areas are provided in Appendix 9 – Cost Evaluation. The analysis includes a present worth analysis for the construction, financing, on-going administration, operation and maintenance; the analysis results in a cost per EDU for evaluation of the cost effectiveness of the alternatives. Costs for the extension of public water are based upon planning costs furnished by AQUA.

E. Funding Methods

This section of the plan addresses financing methods that could be applicable to the proposed alternatives. Three financing alternatives, PENNVEST, municipal bond financing, and bank loans are deemed most applicable for the Township and are discussed below.

1. PENNVEST (Individual On-Lot Sewage System Loans)

The Pennsylvania Infrastructure Investment Authority (PENNVEST) has a special funding program for eligible homeowners who do not have access to a public sewage system and need to repair or replace their individual on-lot sewage disposal system. As of January 2014, assistance is in the form of loan at an interest rate of one percent. The monthly payment also includes a ¾ percent servicing and insurance fee. Loans will be secured by a mortgage on the borrower's home. The maximum loan is $25,000 with a maximum term of 20 years. A loan must be immediately repaid in full if the property is either sold or transferred. The property has to be the primary residence of the owner. Family income may not exceed $78,808. Other requirements may also apply.

2. Municipal Loans and Bonds:

a) *Municipal Bonds* – A debt security issued by a state, municipality, or county to finance its capital expenditures. The borrowing rate (interest) for municipal bonds is typically less than most other loans because the interest paid to the purchasers of Municipal Bonds are exempt from federal taxes and from most state and local taxes. The down side is the upfront costs that are somewhat fixed regardless of the total amount of the loan. Municipal Bonds are typically used for large, multi-million dollar projects.

b) *Bond Pools* – A bond pool is similar to municipal bond offering in which a sponsor, often a Municipal Authority or other Trust, sells an issue of bonds with proceeds used by a number of municipalities or other tax-exempt organizations. The pool permits smaller municipalities with low borrowing requirements to reduce the underwriting and interest costs inherent in a small issue. There are several such financial Authorities and Trusts.

1) *Pennsylvania Infrastructure Investment Authority (PENNVEST)* – PENNVEST has been empowered by the Pennsylvania Infrastructure Investment Authority Act 16 of 1988 to administer and finance the Clean Water State Revolving Fund (CWSRF) and the Drinking Water State Revolving Fund (DWSRF) pursuant to the federal Water Quality Act of 1987.

PENNVEST also finances, through the issuance of special obligation revenue bonds, water management, solid waste disposal, sewage treatment, and pollution control projects undertaken by or on behalf of private entities. Primarily low interest loans (some grant funding is available) are used to

pay for costs associated with the design, engineering, and construction of a public wastewater system. Ineligible uses include house laterals, interior plumbing, curb to curb paving, land and association costs, redesign, refinancing, and costs associated with litigation. The interest rate will depend upon resulting user rates in the community (typically 1% to 4%), with a term depending upon the useful life of the sewer system. Typically PENNVEST only considers "Shovel Ready" projects – those projects with designs completed, all permits obtained, all easements and land acquired, construction bids received, and with a construction contract ready to be executed.

2) *Pennsylvania Local Government Investment Trust (PLGIT)* – Intergovernmental Cooperation Act, originally adopted as Act 180 of 1972, authorizes two or more "local governments" to "jointly cooperate in the exercise or in the performance of their respective governmental functions, powers or responsibilities." PLGIT was initially formed in 1981 by two Boroughs as a vehicle for Pennsylvania municipal entities to pool their funds for investment purposes. Participation in the Trust requires the enactment of an Ordinance or a Resolution by the governing body of each prospective participant. PLGIT currently has three bond pools available to their members.

3) *Delaware Valley Regional Finance Authority* – DVRFA was formed in 1985 by Bucks, Chester, Delaware, and Montgomery Counties in order to provide financing to local governments within the four county region. The Authority is governed by a five-member board appointed by the

commission of each of the counties. DVRFA currently has several fixed rate programs for terms from 3 to 20 years, including variable rates. DVRFA is also able to structure a loan to meet the specific needs of the Township.

3. Bank Loans

There are four basic categories of bank loans. These are:

- Real Estate Loans (Mortgage)
- Participations and Interbank Loans
- Installment Loans (Personal)
- Commercial and Industrial Loans

Of the four types, a commercial and industrial loan would be the most applicable for the Township. Commercial and industrial loans may be made on a demand or time basis. A demand basis loan allows the bank to call for repayment at any time, or the borrower can repay when convenient. A time basis loan provides for a specific loan maturity date.

Most commercial and industrial loans are unsecured. The credit is extended on the basis of an analysis of all available information pertaining to the customer and the bank's confidence in that customer's ability and willingness to repay. An interest rate offering would be established, and an amortization schedule set. Interest rates may range from 5% to 10%, with current interest rates in the low end of the range.

4. USDA Rural Development Utility Grant and Loans

Unite States Department of Agriculture (USDA) Water and Environmental Programs (WEP) provides loans, grants, and loan guarantees for drinking

water, sanitary sewer, solid waste, and storm drainage facilities in rural areas and cities and towns of 10,000 or less. Public bodies, non-profit organizations, and recognized Indian tribes may qualify for assistance. WEP also makes grants to nonprofit organizations to provide technical assistance and training to assist rural communities with their water, wastewater, and solid waste problems.

F. Implementation of Alternatives

The potential needs areas identified in this Plan Update are not Immediate Needs Areas that must be addressed within the next five years. While no structural sewage disposal alternatives are recommended at this time, development and implementation of a Sewage Management Program is recommended. Besides the Sewage Management Program, an update to the Township's zoning ordinance is recommended to require that any development either connect to public sewer or divide into larger lot size.

West Pikeland Township, through extension agreement with AQUA, proposes to serve the Pickering Estates Development with public water. Implementation is planned in accordance with the implementation schedule in Section VII.C.

G. Administrative Organizations and Legal Authority

West Pikeland Township is a municipality regulated under the Second Class Township Code under the regulations of the Commonwealth of Pennsylvania. The Township is regulated by a Board of Supervisors, whom are elected for a term of six years. The Township employs full time staff, including the Township manager. The Township has sufficient staff, along with the Chester County Health Department, to implement the Official Sewage Plan.

VII. INSTITUTIONAL EVALUATION

A. Existing Wastewater Treatment Institutional Entities

1. Historic Yellow Springs Inc

Historic Yellow Springs Inc. owns and manages the Yellow Springs Community Treatment System.

No changes in this institutional arrangement is warranted or proposed.

2. Montgomery School

Montgomery School owns and manages the Montgomery School On-lot Sewage Disposal System.

No changes in this institutional arrangement is warranted or proposed.

3. Little Washington Wastewater Company

The Little Washing Wastewater Company, an Aqua PA subsidiary, owns and operates the Twin Hills Sewer system, which serves the Twin Hills and Pickering Meadows developments along with homes on Byers Road between the two developments. This sewer system includes the sewage collection, conveyance, treatment, and disposal systems. The sewage facilities (Grinder Pumps) on individual properties are owned by the individual property owners, who are also responsible for the proper operation and maintenance for their onsite sewage facilities. The 2014 rate for sewer service is a minimum monthly customer charge of $47.00 plus a consumption charge of $1.76 per 1,000 gallons of water used. Based on an average water consumption of 180 gallons per day, the annual charge for sewer service is $680.00.

No changes in this institutional arrangement is warranted or proposed.

4. Other Existing Wastewater Treatment Institutional Entities

There are no Municipal Authorities that provide wastewater service in West Pikeland Township. All other on-lot sewage disposal systems within the area are owned and maintained by individual landowners.

B. Identification of Administrative Alternatives

There are two types of administrative arrangements for sewage facilities: municipal and non-municipal.

Municipal sewage facilities typically include those sewage facilities:

- Owned & operated by the Municipality themselves,
- Owned & operated by Municipal Authority, or
- Owned by Municipal Authority then leased to the Municipality who then operates & maintains the facility.

Non-Municipal sewage facilities typically include those sewage facilities:

- Owned & operated by a Public Utility,
- Owned & operated by a Condominium / Homeowners Association, or
- Owned & operated by an individual property owner.

1. Municipal Authorities

The Pennsylvania Municipality Authorities Act of 1945 gives a county, city, town, borough, township, or school district the ability to incorporate a separate corporate body and give that corporate body (the authority) prescribing rights, powers, and duties. These rights, powers, and duties might include the authorization to acquire, construct, improve, maintain, and operate a project, and to borrow money and issue bonds. Authorities

can also be given the right of eminent domain and the ability to enter into contracts with and accept grants from the Federal Government.

There are two general types of municipal authorities, which deal with sewage facilities: operating and financing authorities. Operating authorities generally own, maintain, and otherwise operate the sewage facilities. Financing (lease back) authorities generally own and lease the sewage facilities back to the municipality, who in turn maintain and operate the facility.

Both municipal ownership and lease back options require the municipality to operate and maintain the sewage facilities. While it is possible for a municipality to contract out some of these services, the municipality is ultimately fiscally responsible. The fixed soft or overhead costs associated with operating small sewage facilities is not cost-effective to be distributed over such a small user base. In addition, the operational costs per unit for smaller facilities would be greater than for large facilities.

2. Public Utilities

The Pennsylvania Public Utility Commission (PUC) regulates and supervises the rates and service of the state's public utilities, including electricity, water/wastewater, natural gas, and telephone. The PUC's goal is to ensure that consumers receive safe, adequate service at reasonable prices. Public utilities are investor owned companies that charge rates for its services and can be a corporation, partnership, or a sole proprietor. The PUC generally does not have jurisdiction over municipally-owned facilities unless the municipality serves and directly charges customers outside the municipal corporate boundary. The PUC also generally does not regulate mobile home parks or bona fide cooperative associations, such as condominiums or homeowners associations.

The PUC recognizes an emerging competition between PUC-regulated (and tax-paying) companies and unregulated and tax-exempt municipally owned and municipal authority owned facilities for service areas. PUC-regulated companies are becoming increasingly accepted as viable entities to provide sewage services, where only municipally and municipal authority owned facilities used to exist. This acceptance can be seen in the number of large municipal facilities that have been sold to PUC-regulated companies.

3. Condominium and Homeowners Associations

Condominium and Homeowners Associations are typically considered properly chartered and bona fide not-for-profit associations whose shareholders or members are property owners within a political subdivision. Such associations can provide a variety of services for its members from landscaping and snow removal to operation and maintenance of utility services.

Only very large associations (greater than 1,000 units) have been successful in owning and operating their sewage facilities. Historically, smaller associations do not plan operational budgets very well and procrastinate on repairs until the money is available.

4. Individual Property Ownership

Individual property ownership is usually the simplest and easiest administrative or institutional arrangement. Ownership by an uninformed or misinformed property owner, however, will lead to environmental problems for the community and ultimately financial problems for the property owner. These problems can be reduced by appropriate municipal oversight of the system and proper education.

C. Needed Administrative and Legal Activities

1. Incorporation of Authorities or Agencies

Presently, the Township does not own or operate any sewage facilities. The Township should consider retaining an outside firm to administer the construction and operation of any proposed new sewage facilities. To accommodate those additional administrative duties, additional part-time staff can be hired if necessary.

2. Development of Municipal Ordinances, Regulations, and Standards

The Township will need to adopt an Individual Sewage System Management Ordinance to ensure all sewerage facilities are properly operated and maintained.

D. Proposed Institutional Alternative

West Pikeland Township will implement the selected technical alternative. The selected technical alternative is discussed further in Section VIII of this Plan.

VIII. IMPLEMENTATION SCHEDULE AND JUSTIFICATION FOR SELECTED TECHNICAL & INSTITUTIONAL ALTERNATIVES

Consistent with the Township's responsibility to protect the health, safety, and welfare of its residents, the alternatives presented in the previous Section have been thoroughly evaluated. Following are presentations and explanations of the selected alternatives in the identified sewer needs areas. These selected alternatives will be subject to comments from PA DEP, CCHD, and the general public.

A. Selected Alternatives

1. Existing Individual On-lot Sewage Disposal Systems

In order to manage existing OLDS within the Township and to help ensure OLDS remain a viable sewage disposal method for years to come, the Township will require regular maintenance and inspections through the adoption of an ISewage Management Ordinance, in order to prolong their life span, and minimize the need for future sewer extensions.

The Draft Individual Sewage System Management Ordinance is included in Appendix 6.

West Pikeland Township, through extension agreement with AQUA, proposes to serve the Pickering Estates Development with public water; the service area is shown on Exhibit X.

2. Justification for the selected alternative based on each of the following considerations is as follows:

a) Existing wastewater disposal needs:

This selected alternative addresses the current wastewater disposal needs throughout West Pikeland Township.

b) Future wastewater disposal needs

No future needs are foreseen within the Township. Given the Township's Open Space purchase program and the availability of developable land, the potential for future development is limited in the Township. Should new development occur greater than 5 lots, the Township shall require the connection to public water if within the franchise area of Aqua PA and shall require the set aside of adequate land area by the developer to accept the subsurface disposal of treated effluent from the development.

c) Operation and Maintenance Considerations

The chosen plan is the best alternative for operation and maintenance considerations because it requires regular maintenance to occur and provides public education to home owner's to allow for proper operation of the system.

d) Cost-effectiveness

A considerable part of the Township is served by OLDS. The chosen plan is the most cost effective means of addressing the system needs because it proposes continuing to utilize those systems, and to maximize their function and their useful life.

e) Available Management and Administrative Systems

The Township has the ability to strictly enforce the adopted OLDS Ordinance and implement an effective OLDS Management Plan chosen as part of this Plan, and to provide the required protection of the existing OLDS that form a portion of the existing wastewater disposal facilities of the Township. Additionally, it has the ability to plan and zone for development adjacent to existing public sewer service areas and to zone for proper accommodation of new OLDS,

providing the best solution to the future sewage disposal needs of the Township.

f) Available Finance Methods

See Section VI.E.

g) Environmental soundness and compliance with natural resource planning and preservation programs

Section VI of this Plan Update shows the plan is consistent with relevant environmental soundness considerations and natural resource planning and preservation programs.

B. Capital Financing Plan

At the present time, the long term capital financing plan has not been selected. This will be determined during plan implementation.

C. Implementation Schedule

Schedule of necessary action for plan implementation is as following:

Action	Date
Act 537 Plan Submission to the Township	July-15
On-Lot Management Ordinance Review by Township	July-15
Update of OLDS Management Ordinance	August-15
On-Lot Management Public Education	September-15
Act 537 Plan Submission to CCPC & CCHD	August-15
30-Day Public Comment Period	August-15
Address CCPC & CCHD Comments	October-15
Adoption of Act 537 Plan Resolution by Township	October-15
Submission of Act 537 Plan to PA DEP	November-15
Act 537 Plan Review Letter with Comments by PA DEP	March-16
Submission of Revised Act 537 Plan to PA DEP to Address PA DEP Comments	April-16
Final Act 537 Plan Approval by PA DEP	June-16
Extension of public water to Pickering Estates	January-2019 to August-2020

APPENDICES

APPENDIX 1

Plan Content and Environmental Assessment Checklist

TO BE INCLUDED AT A LATER DATE

APPENDIX 2

Approved Plan of Study and Task Activity Report

APPENDIX 3

Previous Wastewater Planning

APPENDIX 4

West Pikeland Township Well Water Testing Map

APPENDIX 5

Sewage Disposal Needs Study

APPENDIX 6

Draft Sewage Management Ordinance

APPENDIX 7

Windolph Knoll Soils and
Preliminary Hydrogeologic Study

APPENDIX 8

Pickering Meadows Soils and Preliminary Hydrogeologic Study

APPENDIX 9

Cost Evaluation

APPENDIX 10

PNDI Consistency Documentation

APPENDIX 11

Cultural Resource Notices

APPENDIX 12

PA DEP Request for Information

APPENDIX 13

Planning & County Health Department Agency Comments and Responses

TO BE INCLUDED AT A LATER DATE

APPENDIX 14

Proof of Public Notice

TO BE INCLUDED AT A LATER DATE

APPENDIX 15

Public Comments and Responses

TO BE INCLUDED AT A LATER DATE

APPENDIX 16

Municipal Adoption

TO BE INCLUDED AT A LATER DATE

APPENDIX 17

Implementation Schedule

Action	Date
Act 537 Plan Submission to the Township	July-15
On-Lot Management Ordinance Review by Township	July-15
Update of OLDS Management Ordinance	August-15
On-Lot Management Public Education	September-15
Act 537 Plan Submission to CCPC & CCHD	August-15
30-Day Public Comment Period	August-15
Address CCPC & CCHD Comments	October-15
Adoption of Act 537 Plan Resolution by Township	October-15
Submission of Act 537 Plan to PA DEP	November-15
Act 537 Plan Review Letter with Comments by PA DEP	March-16
Submission of Revised Act 537 Plan to PA DEP to Address PA DEP Comments	April-16
Final Act 537 Plan Approval by PA DEP	June-16
Extension of public water to Pickering Estates	January-2019 to August-2020