

**OFFICIAL SEWAGE FACILITIES PLAN
FOR
WEST CALN TOWNSHIP
CHESTER COUNTY, PENNSYLVANIA**

**PREPARED
IN ACCORDANCE WITH
PENNSYLVANIA SEWAGE FACILITIES ACT
ACT 537, AS AMENDED**

April 20, 2009

Table of Contents

	Page
I. EXECUTIVE SUMMARY	1
A. Introduction and Background.....	1
B. Sewage Management Program	1
C. Individual Onsite Systems Implementation Plan	1
D. Long Term Action Plan	2
II. PLANNING OBJECTIVES	3
III. PREVIOUS WASTEWATER PLANNING	3
IV. PHYSICAL AND DEMOGRAPHIC DESCRIPTION	4
A. Location	4
B. Soils.....	4
C. Ground Water and Public Water Supplies	4
D. Stream Drainage Basins.....	5
E. Farm Land	5
F. Historical Preserves.....	5
G. Park Lands	5
H. Population & Housing	6
V. EXISTING SEWAGE FACILITIES	6
A. Individual Sewage Systems.....	6
B. Existing Community Systems	6
VI. IDENTIFICATION OF SERVICE AREAS.....	8
A. Villages	8
B. Existing Development Areas.....	9
C. Proposed Development Areas.....	10
D. Areas Identified with Existing Environmental Contamination	10
E. PAWC Projected Sewer Service Area	11
VII. WASTEWATER TREATMENT SYSTEM ALTERNATIVES.....	11
A. Background	12
B. Decentralized Wastewater Treatment Systems.....	12
C. Community Onsite Disposal Systems (COLDS)	18
D. Gravity Sewer Systems	18
E. Pressure Sewer Systems	18
F. Land Application Options.....	20
G. Centralized Public/Community Sewer Systems.....	23
VIII. CONVEYANCE ALTERNATIVES FOR THE PAWC SEWER SERVICE AREA.....	23
A. Alternative No. 1	24
B. Alternative No. 2	26
C. Alternative No. 3.....	27
IX. SELECTED WASTEWATER TREATMENT SYSTEM ALTERNATIVES	27
A. Individual Systems.....	27
B. Public and Community Systems	29
X. PLAN IMPLEMENTATION	30

Table of Tables

	Page
Table 1 – Mobile Home and Trailer Park Communities.....	8
Table 2 – Campgrounds	8
Table 3 – Recent and Proposed Land Development Projects	10
Table 4 – Pennsylvania American Water Company.....	11
Table 5 – Ultimate Capacity Needs.....	24
Table 6 – Areas Served and Capacity Needs for the Evaluated Alternatives	26

Table of Exhibits

Exhibit 1 – Draft Sewage Management Ordinance	31
Exhibit 2 – Oversight Agreement with PAWC	38
Exhibit 3 – Master Sewer Plan - Selected Alternative	38
Exhibit 4 – Alternative No. 1.....	38
Exhibit 5 – Alternative No. 2.....	38
Exhibit 6 – Alternative No. 3.....	38
Exhibit 7 – Township Planning Commission Comment Letter and Response.....	38
Exhibit 8 – County Planning Commission Comment Letter and Response.....	38
Exhibit 9 – County Health Department Comment Letter and Response	38
Exhibit 10 – Proof of Publication, Public Comment Letters and Responses	38

I. Executive Summary

A. Introduction and Background

“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

The goal of this plan is to address the immediate and long-term needs of the Township, including both the needs generated by the recent growth in the Township and the existing older communities.

B. Sewage Management Program

“Municipalities are required to assure the proper operation and maintenance of sewage facilities within their borders. Proper operation and maintenance of sewage facilities is essential to the provision of adequate sewage treatment and disposal over the functional life of the sewage treatment system. Municipalities shall, therefore, address long-term operation and maintenance in official plans and revisions to official plans.”²

This plan provides for the immediate establishment of a Sewage Management Program to ensure that all Individual and Community Sewerage Systems are serviced and/or inspected on a regular schedule. The Township will provide recommendations to individual property owners on what they can do to keep their individual Onsite systems operating properly, in an effort to avoid costly repairs and replacement systems.

C. Individual Onsite Systems Implementation Plan

Individual onsite sewage systems, when properly operated and maintained, are believed to be the best short- and long-term alternative for most of the Township. Individual onsite sewage systems are also more environmentally acceptable and cost-effective than other sewage disposal alternatives. Individual onsite sewage systems will be owned, operated, and maintained by the property owner served by the system. The Chester County Health Department is the local agency that regulates the installation of sewage facilities, as authorized by Act 537. The Health Department, on behalf of the Township, reviews permit applications and conducts investigations and inspections.

¹ Pa Code 25§71.11

² Pa Code 25§71.71

D. Long Term Action Plan

- 1.** Pennsylvania American Water Company (PAWC) Projected Sewer Service Area - The PAWC Projected Sewer Service Area will require approximately 621,000 gallons per day of treatment and disposal capacity to meet the existing and projected community needs. Conveyance Alternative No. 2 was selected as the best alternative because of its flexibility to adapt to as the Township develops. The exhibit labeled “Master Sewer Plan – Selected Alternative” delineates the projected sewer service area of PAWC. Pressure sewers with individual grinder pumps will serve most of the existing homes within the PAWC sewer service area, unless gravity sewers are shown to be cost effective. Collection systems for New Land Development will be a combination of gravity and pressure sewers, with pumping stations to be centrally located all of which are subject to site specific planning.
- 2.** Individual Onsite Systems – Within five years after the implementation of the Sewage Management Program, the Township will review the sewage needs of Wagontown, Phillisville, Sandy Hill Road, and Telegraph road. Should there be a sufficient demand for public sewers in any of these areas; the Township would work with the PAWC to install public sewers. Otherwise, Individual Onsite Systems should be promoted.
- 3.** Community Systems – It is not the Township’s desire to be in the sewer business in the long term. However, due to restrictions on non-municipal developers, it is probable that community systems will be developed by the Township and later sold to a Public Utility Company. Areas with a potential need for a Community System include the Village of Martin’s Corner, the Village of Compass, and Valley Green.
- 4.** New Land Developments – All new land developments beyond the three recent developments of Calnshire West, Sandy Hill and Country Meadows, and the developments currently in the Land Development process (see page 9) shall be served with Individual Onsite Sewage Systems. Where individual systems are not feasible, conveyance to an existing Community Sewerage System shall be evaluated before proposing the construction of a new community system. The Township will also review the sewer needs within the surrounding area of the proposed land development and may require that the developer provide for these sewer needs.

II. Planning Objectives

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.

Municipalities are required to develop and implement a comprehensive official plan that will provide resolution of existing sewage problems and provide for the future sewage disposal needs of the municipality.

The objective of this plan is first to comply with the requirements as set forth by the Pennsylvania Sewage Facilities Planning Act (Act 537) but, more importantly, to develop a plan that will provide for the safe and effective disposal of wastewater in such a way as to protect and, if possible, enhance the environment. Finally, the plan shall be implemented in a reasonable time at an affordable cost and so as to provide the best service possible for the residents.

III. Previous Wastewater Planning

The current official plan was adopted on April 3, 1978 (referred to hereafter as the 1978 Plan) and was amended on February 9, 1987 and November 11, 1996. This plan recommended the following:

- Encourage the use of onsite land application disposal systems as a viable alternative to the County 537 Plan.
- Recognize the need for operation and maintenance agreements with owners of sewage treatment systems.
- Provide current residents information regarding the reduction of flows to the septic tanks and benefits of regular maintenance of their onsite systems.
- Water conservation devices needed.
- Establish an active policy to review proposed sewage treatment systems.
- Obtain public input for proposed sewage facilities.
- Adopt a policy to annually review the Township Act 537 Plan.

The 1987 and 1996 amendments established that where lots could not be served by conventional on-lot systems that these lots could be served by aerobic treatment systems (also known as Small flow treatment facilities) and that “The operation and maintenance of any individually-owned and individually-operated aerobic wastewater treatment system shall be the sole responsibility of the homeowner who applies for the installation of such system.”

The “County 537 Plan” – the Chester County Planning Commission prepared a Comprehensive Area-Wide Sewerage Plan for Chester County in 1968 and then revised this plan as the “Master Sewer Plan Revised Edition 1970 for Chester County Pennsylvania Existing – 1968 to 1978 – 1978 to 1988”. Many municipalities in the county adopted this plan as their Official Act 537 Plan while several municipalities conditionally adopted portions of the County 537 Plan. This plan indicated that a gravity sewer service would ultimately be extended up Rock Run along Wagontown Road toward Wagontown Road and along Mineral Spring Road (Valley Township) toward the Coatesville County Club. The County 537 Plan indicated this sewer system would serve a projected population of 1,600 with a sewage flow of 0.06 million gallons per day. Additional capacity will be required.

IV. Physical and Demographic Description

A. Location

West Caln Township, Chester County is a township of the 2nd class. The Township is located northwest of the City of Coatesville and straddles Route 322 north of the Coatesville Downtown Bypass (State Route 30). West Caln Township consists of 21.98 square miles and is located in the Coatesville Area School District.

B. Soils

Existing mapping performed by the Chester County Planning Commission as part of the 1968 Master Plan indicates the general soil suitability for onsite systems³. For the most part, the soils in the Township are generally suitable for many of the onsite treatment systems currently available. The only exceptions are the soils within the flood prone and low-lying areas along the streams. Areas previously designated as unsuitable due to steep slopes can now, in some instances, be used for onsite systems. Today there are many alternative onsite treatment systems available. Some of these systems can be more expensive to install and maintain than the conventional systems, but they provide an alternative to public sewers. All onsite systems need to be properly operated and maintained, not just alternative systems. Sometimes, the decision to provide a public sewer system is made partially out of a desire to assure adequate and affordable service, not because there is no onsite alternative available.

C. Ground Water and Public Water Supplies

³ See Exhibit 3

For the most part, the groundwater supplies are sufficient in quantity and quality to meet the Township's needs. Most of the older homes in the Township are served with individual drinking water wells.

D. Stream Drainage Basins

West Caln Township has two major drainage basins as identified on Exhibit 1: Pequea Creek and West Branch Brandywine Creek. The Pequea Creek is a part of the Susquehanna River Basin which, in turn, is part of the Chesapeake Bay Watershed. The West Branch Brandywine Creek is part of the Delaware River Basin, which is also known as the Delaware Bay. Many of the sub-basins within the major basins of West Caln are protected waters of the Commonwealth. The protected uses are for migratory fish and trout stocking streams. Many of the streams in the Township are also designated as high quality waters. High quality waters are those streams and watersheds which have excellent quality waters and have environmental or other features that require special water quality protection. Permits for stream discharge sewage treatment plants are often quite difficult to obtain in high quality water basins. Stream discharge plants serving new individual homes or small commercial establishments are not permitted under the current regulations in high quality water basins.

E. Farm Land

The Zoning Map of West Caln Township identifies large areas zoned within the 'Agricultural Preservation District'. The intent of this zoning district is to preserve areas where agriculture is the primary land use. It is the desire of the Township's Board of Supervisors to preserve the rural characteristic of West Caln Township and to discourage the development of these areas.

F. Historical Preserves

Historic locations and buildings are located throughout West Caln Township. The West Caln Township Historical Commission has developed an historic preservation program dedicated to the preservation of the remaining historic resources of the Township. These areas are subject to limited land development.

G. Park Lands

The preservation and development of park lands is highlighted in West Caln Township's Open Space, Recreation, and Environmental Resources Plan. Park lands, according to the Plan, contribute to the beauty and overall health of the community. The Open Space, Recreation, and Environmental Resources Plan of West Caln emphasizes the need the future development of

West Caln to include park lands as an integral part. Layton Community Park is West Caln's largest public park and is located on Water Works Road.

H. Population & Housing

The previous 1978 Plan reported that the Township population was 4,450 persons and that the projected population for 1980 was 3,178 and the projected population for 2000 was 3,200. According to the US Census Bureau at the time of the 2000 census there were 7,054 persons with a total occupied number of housing units of 2,406 and an average household size of 2.93. The 2006 estimated population was 8,085. The Chester County Planning Commission population projections are as follows: 8,150 (in 2010), 8,730 (in 2020) and 9,550 (in 2030). The net projected increase in the number of persons between 2006 and 2030 is 1,465 persons. The average household size in Chester County is 2.65 people, and assuming this housing trend the estimated number of new homes would be 553 new homes over the next 25 years. While not all approved, there are over 1,300 new housing units proposed by land developers (see Page 9). There is an obvious discrepancy between what developers propose and what is projected by the County Planning Commission.

V. Existing Sewage Facilities

A. Individual Sewage Systems

Consistent with previous planning most of the building lots within West Caln Township are served by Individual Sewage Systems, with onlot systems, those systems that rely on renovation through the natural soils being the most prominent. There are several Small Flow Treatment Facilities serving homes where the soils are unsuitable for an onlot sewer system.

B. Existing Community Systems

1. Country Ridge Development is a residential development situated mostly in Valley Township of which 16 homes are within West Caln Township. This development is served by Valley Township's Municipal Authority. Valley Township conveys its sewage to the Pennsylvania American Water Company's Coatesville Sewage Treatment Plant in South Coatesville.
2. PAWC sewer service territory - An agreement made between PAWC, Sadsbury Township and small group of developers provided for the construction a sanitary sewer force main from Calnshire West, Sandy Hill and County Meadows (aka Lawrence) developments in West Caln Township to the sanitary sewer collection system of Sadsbury

Township. The sewage is conveyed through Sadsbury to a point where Sadsbury's collection system reconnects to the PAWC interceptor for ultimate treatment and disposal at the PAWC sewage treatment plant in South Coatesville. The agreement limits the current conveyance capacity through Sadsbury to 110,000 gallons per day for these three land developments. Additional capacity or conveyance from outside the named development would be subject to a separate agreement.

3. Mobile Home Communities

There are several mobile home communities in the Township, four of which are served by community onlot sewage systems while the others are served with individual onlot sewage systems. The Township Comprehensive plan indicates the mobile home and trailer park communities represent a significant percentage of the population due to higher densities. A listing of the mobile home communities is presented in Table 1.

4. Campgrounds

There are two active campgrounds in the Township, Birchview Farm and Hidden Acres. Each of these campgrounds provides full water/electric/sewer hookups for a large number of the camp sites in addition to central bathhouse facilities. A listing of these Campgrounds is presented in Table 2.

Table 1 - Mobile Home and Trailer Park Communities West Caln Township, Chester County	
Baldwin's MHP	Individual
Beacon Lite TP	Individual
Beech Tree Village MHP	Individual
Hideaway MHP	Community
High Point Estates MHP	Individual
Imperial Courts MHP	Community
Phillips MHP	Community
Shady Oak Terrace MHP	Community
Spring Hill Estates MHP	Individual
Stoltzfus MHP	Individual
Taggart's TP	Individual

Table 2 – Campgrounds West Caln Township, Chester County	
Birchview Farm	Individual
Hidden Acres	Individual

VI. Identification of Service Areas

A. Villages

The Township Comprehensive Plan dated March 25, 1998 identifies three “villages” in West Caln Township. These villages evolved as service centers to the agricultural regions of the Township. The village setting

exhibits shallow set-back and narrow side yards often making installation of replacement onsite sewage disposal systems more difficult.

1. Martin's Corner – The Village of Martin's Corner is located the north of Hibernia Park. Martin's Corner is mostly low density residential, with very little non-residential except for the Martin's Corner Volunteer Fire Department.
2. Compass – The Village of Compass is located on the western extreme near the crossroads of Route 340 (Kings Highway) and Route 10 (Compass Road to the north and Octoraro Trail to the south). The Village of Compass is within the watershed of the Pequea Creek which ultimately discharges to the Susquehanna River and the Chesapeake Bay. Within the village are commercial facilities and medium and low density residential units. The land surrounding Compass consists of either vacant land or farms. To the east and the north along Rts 10 and 340 are a number of single family homes many of which are modular or manufactured homes.
3. Wagontown – The Village of Wagontown is both the largest village and the closest to the City of Coatesville. Located along Kings Highway (Rt 340) it serves as the eastern entrance to the Township. The Wagontown Post Office and Wagontown Fire Company are located within the village area. The Fire Company also has a social hall with banquet facilities. Along Kings Highway there are a several commercial properties, but the area is mainly low and medium density residential at the present time.

B. Existing Development Areas

1. Phillipsville - the Phillipsville area is generally east of the intersection of Ash and Old Wilmington Road. There are several small residential developments and a mobile home community within the Phillipsville area. A pressure sewer force main within the right of way of Old Wilmington Road from the Sandy Hill Pumping Station passes through the area.
2. Valley Green - The Valley Green Subdivision is west of Old Wilmington Road along the boundary of Sadsbury Township. There are several problematic malfunctioning onsite sewage disposal systems in this subdivision.

C. Proposed Development Areas

Within the Township are several land development projects in various stages of construction, development and approval, a listing of these projects are presented in Table 3.

Table 3 - Recent and Proposed Land Development Projects West Caln Township, Chester County	
Land Developments with final approval Presently under development	Number of Dwelling Units
Calnshire West	124 SFD
Sandy Hill	87 SFD
Land Developments with final approval pending approval of Act 537 Planning Modules	
County Meadows (aka Lawrence)	171 SFD
Land Development with preliminary approval	
Crane Tract	542 SFD
Land Developments in sketch plan phase	
Dogwood	99 SFD
Sands	500 Townhouses
Barrett Tract	90 SFD

D. Areas Identified with Existing Environmental Contamination

1. William Dick Lagoons –The William Dick Lagoons are comprised of a 4½ acre tract of land west of Sandy Hill Road and south of Telegraph Road. This area was contaminated from the late 1950s to 1970 by the use of three unlined lagoons for the disposal of final rinse water from the interior cleaning of tank trailers. Cleanup of the site began in July 2003 and it will be many years before clean up of the site is fully complete. Many private drinking water wells were affected and public water has been provided to the area. (EPA ID # PAD980537773)

2. **Blosenski Landfill** – The Blosenski Landfill covers approximately eight acres of a 13½ acre tract along Cambridge Road. The landfill operated between the 1940s to the 1970s when in 1971 was ordered to cease operation by the Chester County Health Department. Approximately 75 residences were provided with public water. Cleanup of the site began in 1992 removing approximately 1,300 buried drums and approximately 350 cubic yards of contaminated materials and soil. A groundwater treatment system was completed in September 1998 to repair contamination of the area aquifer. (EPA ID # PAD980539985)

E. PAWC Projected Sewer Service Area

PAWC current sewer service area is limited to providing sewer service to Calnshire West, Sandy Hill and Lawrence land development projects. This Plan provides for the ultimate expansion of the PAWC sewer service area. After approval of this plan PAWC will need to apply to the Pennsylvania Public Utilities Commission to expand their franchise area, a listing of the areas and land development within the ultimate sewer service area are presented in Table 4.

Table 4 - Pennsylvania American Water Company Projected Sewer Service Area
Telegraph & Hill Road Area
Lawrence LD
Sandy Hill Road Area
Barrett LD
Calnshire West LD
Sandy Hill LD
Phillipsville Area
Valley Green Area
Kings Highway Area
Dogwood LD
Crane Tract LD
Wagontown Area
Sands LD

VII. Wastewater Treatment System Alternatives

A. Background

Official plans shall evaluate various alternatives to provide for adequate sewage facilities. Each alternative shall be evaluated for its technical feasibility and the feasibility of implementation of its administrative and institutional requirements. One alternative shall be selected in each area of the Township to provide for the long-term collection, treatment, and disposal of sewage.

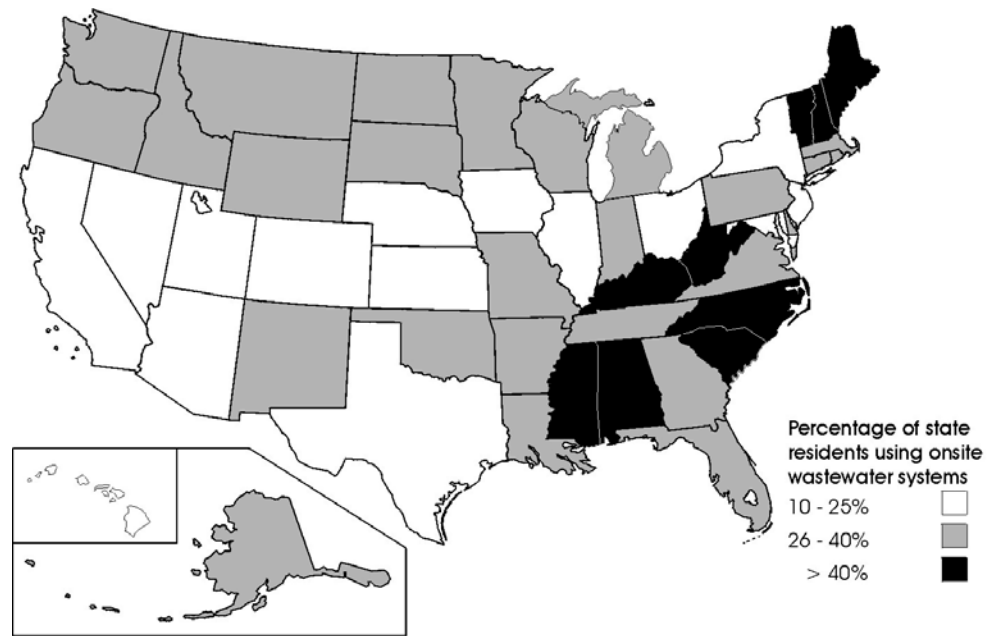
Our modern wastewater systems use, for the most part, potable (drinkable) water as a vehicle to transport human and household wastes from our homes and businesses to a local or remote treatment facility, where these wastes are treated and ultimately removed from the water so that this water can be returned into the environment for reuse.

Regardless of which alternative is selected for wastewater management, the primary goals are the same: 1) protect the public health, 2) minimize any negative impact on the environment, and 3) protect the rights of others from malfunctioning onsite systems, overloaded treatment facilities, and wildcat sewers (sewers that dump raw sewage directly into a stream or ditch).

The secondary goal of the wastewater management alternative is to ensure that the alternative selected can be implemented in a reasonable time at an affordable cost. Without implementation, the primary goals will never be achieved. While timing and cost are secondary, they are certainly essential and practical elements of any successful alternative.

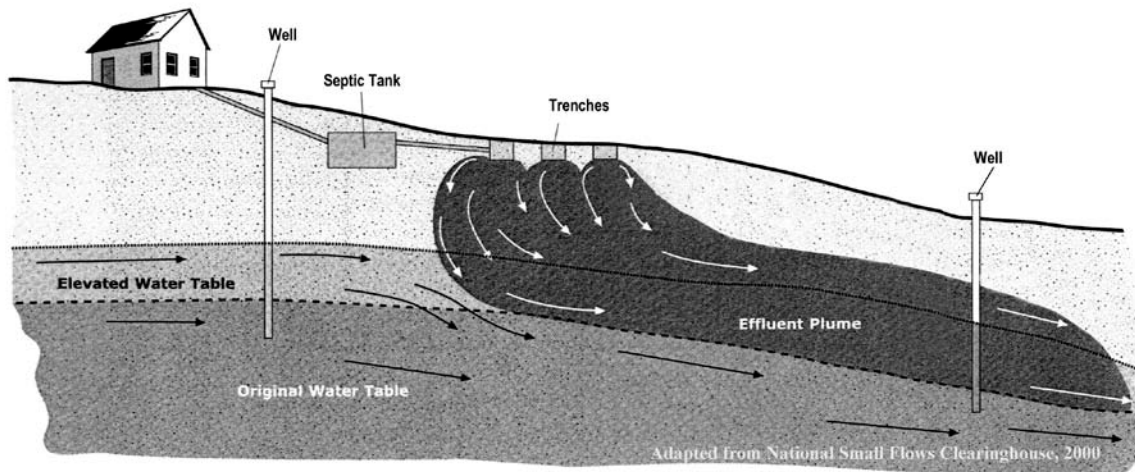
B. Decentralized Wastewater Treatment Systems

In the April 1997 Response to Congress on use of Decentralized Wastewater Treatment Systems, 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 included individual onsite systems and small cluster wastewater systems used to treat and dispose of relatively small volumes of wastewater, generally from dwellings and businesses that are located relatively close together.



Properly managed decentralized wastewater treatment systems offer many benefits over centralized (regional) systems. Decentralized systems can provide the same protection of public health and the environment as centralized systems. Often decentralized systems are more cost effective in communities with low population densities (less than one dwelling per acre). In areas with cluster development, decentralized systems can overcome the problem by constructing large conveyance systems between developments. In addition, the construction of decentralized systems can be more ecologically sensitive and provide additional benefits such as recharging local aquifers and the direct reuse of treated water for irrigation.

The management of decentralized wastewater treatment systems should be done on a regional basis and include requirements for the placement of drinking water wells and septage waste disposal.



1. Onsite systems - Onsite systems typically have three major components, a collection system, a treatment system, and a dispersal system.
2. Collection System - A collection system consists of plastic and cast iron pipe and fittings, cleanouts, and manholes. The pipe between the house and the first treatment unit is typically called the building sewer. Similar piping materials are used to convey treated and partially treated liquids between units.
3. Treatment Systems – Treatment systems typically consist of a primary tank and sometimes are followed by an advanced treatment unit. In accordance with current regulations to sufficiently renovate the sewage a minimum thickness of 48 inches of soil is needed between the bottom of dispersal system and any limiting condition such as a seasonal water table.
 - a. Primary Treatment Systems - A septic tank is a buried watertight tank designed and constructed to receive and pretreated wastewater by separating settleable and floatable solids from the wastewater. Grease and other light solids (scum) float to the top. Gases are normally vented through the building sewer. Inside the tank is an inlet baffle to help diffuse the incoming liquid and an outlet baffle to keep scum from exiting the tank. Septic tanks can be made of steel, plastic and concrete products. The septic tank must have access ports for routine inspections and pumping. Proper operation of the system requires that the non-biodegradable solids be pumped out of the septic tank every few

years. While not currently required, providing septic tank effluent filters and tank access extensions are recommended.

- b. Advanced treatment systems - These systems include aerobic treatment units (ATUs), packed bed filters (PBFs), intermittent sand filters, recirculating sand filters, and disinfection systems. Pre-engineered and packaged advanced treatment systems approved for use in Pennsylvania are required to meet NSF, International standards (Standard Number 40, NSF, 1996).
4. Dispersal Systems - Dispersal systems include many surface and subsurface options that provide additional treatment or polishing after the treatment component.
- a. Subsurface Dispersal Systems – A typical subsurface soil absorption system consists of perforated piping and gravel in a field or trench. The pipes uniformly distribute the wastewater by gravity throughout the gravel over the absorption field. Void space in the gravel provides air for the aerobic treatment of the wastewater and room to store effluent during peak flows. Ventilation is provided through the plumbing stack of the house and through the soil covering the absorption field. There are also systems that use plastic chambers in place of the gravel. In the conventional system, most of the actual treatment of the wastewater occurs in the absorption field. A properly operating system relies on leaching of the wastewater into the soil and adequate aeration of the bed. Malfunctioning systems are usually a result of the failure of one or both elements. Soil suitability is a major factor affecting the percolation of effluent. Soils with low permeability, impervious strata, and shallow depth to bedrock will inhibit percolation of the wastewater. High water table conditions that saturate the soil horizon during the wet weather season, inadequate design, and improper operation are other factors that can cause a system to fail. Wastewater may be delivered to the distribution piping by a pump should the absorption area be at a higher elevation than the treatment unit.
 - b. Elevated Sand Mounds can overcome some of the problems created by shallow rock and groundwater conditions. An approved sand mixture, of a sufficient thickness, is added on the prepared ground surface to make up for the lack of suitable parent soil. All elevated sand mound designs are now required to include a pressure dosed distribution system.
 - c. Pressure Dosed Distribution systems provide a more uniform distribution of the effluent over the absorption area. This is

advantageous in soils with high percolation rates. Effluent from the treatment unit is retained in a Dosing Tank and is dosed by an effluent pump or a dosing siphon to distribution system of 1½ inch diameter piping. This piping is placed along a gravel lined trench or arranged across a seepage bed. Drilled holes in the piping between ¼ and ½ inch are spaced up to 8 to 10 feet apart. The minimum size dose is a function of the internal liquid volume of piping system. In the past, systems were dosed by demand - the liquid level rises to a certain level, activates the pump, and doses the system. Timed dosing is quite similar; however, dosing is controlled by a timer, which activates the pump and doses the system at regular intervals. Because flows into the system occur in peaks or surges, the advantage of timed dosing is that the flow is dosed to the absorption area over a longer period of time. This is particularly important when homeowners have large social gatherings. The entire hydraulic load of a single event can be spread out over several days.

- d. Individual Residential Spray Irrigation Systems (IRSIS) are alternative dispersal systems that can be used to serve individual residences with shallow water table limitations (10 inches below grade), a minimum depth to rock of 16 inches, and slopes up to 25% in forested areas. IRSIS require a secondary treatment unit after the primary treatment unit. The primary treatment unit may be either a standard septic tank or aerobic treatment unit. The secondary treatment unit shall be either a free access or buried type Intermittent Sand Filter. These sand filters are single pass packed bed filters, also known as fixed film media units. Due to the increase in system complexity, IRSIS require periodic maintenance by the property owner; otherwise the system will fail and pollute the environment or cause a public health hazard.
- e. Drip distribution, also known as “drip or trickle irrigation,” is another alternative dispersal system that can be used to serve individual residences. Drip distribution has been extremely successful for many years in other states that have frequent water restrictions. Drip distribution has two major environmental advantages over other land application systems. First, it applies water directly into the most biologically active zone of the soil, just below the surface. Second, because the water is applied below the surface and into the plant root zone, there is no evaporation loss. Drip distribution is a very effective process for water reuse. For the homeowner, drip distribution eliminates the need to consider unsightly sand mounds. On restricted sites, drip distribution can also be installed on steeper slopes and in wooded areas.

- f. Retaining tanks, commonly called holding tanks, are temporary holding facilities used to retain wastewater before it is transported by truck to an authorized treatment facility. The use of holding tanks requires a Township ordinance. Under such an ordinance the Township is responsible to assure that all retaining tanks are being maintained.
- g. Holding tanks can be permitted by the local Sewage Enforcement Officer or, in Chester County, by the Health Department when they determine there is a health hazard. In the past, Townships were not directly informed of these permits. Therefore, the Township needs to perform an inventory of all systems to locate these holding tanks and then ensure they are being properly maintained. The use of all holding tank systems should be carefully monitored to ensure proper operation and maintenance.
 - i. Holding tanks are very useful during the initial stages of a project while the permanent system is being constructed. 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. The effluent can later be pumped out or returned to the septic system, giving the absorption area time to rest.
 - ii. Privies (outhouses) are still permitted but are limited to sites where there is no potable water under pressure on site.
 - iii. Chemical or portable toilets are usually used on a temporary basis at such places as construction sites, fairs, concerts, or camping events.
 - iv. Recycling, incinerating, or composting toilets can be used in new or existing residences or establishments.
- h. Small Flow Sewage Treatment Facilities (SFSTFs) are used where onsite soils are completely unsuitable for any form of land dispersal and public sewers are not foreseen in the reasonable future. SFSTFs often discharge treated water into a local stream, storm sewer, or dry ditch. SFSTFs require a NPDES and a Water Quality Management Permit. SFSTFs are very expensive to permit, install, operate, and maintain. Because all other reasonable alternatives are to be exhausted first, SFSTFs often take at least one year to process the necessary permits for the installation.

SFSTFs require a commitment from the property owner to properly operate and maintain the facilities for the life of the system. The Township and the property owner should enter into an agreement outlining the duties and responsibilities associated with this system.

C. Community Onsite Disposal Systems (COLDS)

COLDS (also known as Community On Lot Disposal Systems) are those systems that serve more than one lot or dwelling. COLDS can be municipally or privately owned. Privately owned systems can serve a single development or several developments. In the latter case, a Public Utility Commission (PUC) regulated company often owns such systems. Otherwise, COLDS 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. For the purpose of discussion in this Plan, public systems include both those systems owned by a municipality and PUC regulated companies. Community systems are those systems owned by condominium/homeowner associations or another private entity.

All public/community systems require a means of collecting and conveying wastewater from the individual users to the treatment facility. Traditionally, the collection of sewage is by gravity sewers that generally follow the natural contours of the land.

D. Gravity Sewer Systems

Traditional gravity sewer collection systems will be used wherever practical, particularly in new construction. Pumping stations will be necessary when crossing from one drainage basin to another. Careful planning will be required to foresee the reasonable future needs of the drainage basin.

Gravity collection systems become expensive due to rock excavation or length of sewer lines required to serve less populated areas, in such cases pressure sewers should be considered.

E. Pressure Sewer Systems

The two major types of pressure sewer systems are Grinder Pump systems and Septic Tank Effluent Pump (STEP) systems. The major differences between them are in the onsite equipment and layout. Neither

type of pressure sewer system requires any modification to conventional household plumbing.

1. In Grinder Pump systems, household wastes are collected and conveyed by gravity to a small buried vault or basin containing the grinder pump station. Waste solids in the sewage are macerated into a slurry then pumped through a small diameter pipe to either a larger network of pressure sewers or a traditional gravity sewer collection system. The onsite 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 through the home necessary 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 they can in many cases be intermixed.

2. In STEP systems, wastes flow by gravity to a conventional septic tank. The septic tank provides 5 to 10 days of hydraulic retention time and permits most solids to either settle to the bottom or float to the top of the tank. After the septic tank, the effluent then flows to a dosing pump tank, which houses the pump and level control sensors to control the pump. Normally, small centrifugal pumps are employed for the STEP system. These pumps are submersible and range in size from $\frac{1}{4}$ to $\frac{1}{2}$ horsepower.

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. STEP systems are advantageous when used in combination with Decentralized and Small Community Sewage Disposal systems and Community Land Application systems.

F. Land Application Options

In the Chester County region there are three prominent dispersal methods for a community land application system: Large Volume Subsurface, Spray Irrigation, and Drip Distribution.

1. Large Volume Subsurface systems are effluent dispersal systems that are constructed and operated very similarly to pressure dosed systems except that these systems generally do not depend on the soil for any renovation of the applied effluent. With these systems, the designer considers soil permeability (hydraulic conductivity), depth to perched or seasonal high water table, hydrology, and hydrogeology to disperse the effluent into the ground water. Typically an advanced secondary treatment system precedes the dispersal system. Treatment requirements vary depending on the specific site conditions.
2. Spray Irrigation involves applying treated or partially treated sewage effluent to the land surface. Hydraulic application rates vary for the site-specific soil types and climatic conditions. Application during and shortly after rain events is typically stopped to reduce the possibility of 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. For systems that depend on the soils and plants for renovation, Spray Irrigation has been a popular land application technique 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 either through 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 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 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. This of itself is not a problem however, if additional applications are made, the frozen effluent continues to accumulate, and 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 that can consider all of the variables for when spraying could occur would be very complicated.

Spray Irrigation systems in Chester County most often use 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.

3. Drip Distribution as a land application system for highly treated wastewater was first installed in Pennsylvania at Bridlewood Treatment Plant in Thornbury Township Chester County in the fall of 1998 after being demonstrated at Delaware Valley College. Drip distribution systems have been extremely successful for many years for disposing Septic Tank Effluent under US Patent No. 5,200,065. Drip distribution has two major advantages over other land applications systems: first, it applies water directly into the most biologically active zone of the soil, just below the surface; and second, when properly designed and installed, it has “better distribution of effluent over a larger area.”⁴ Drip distribution is a very effective process for water reuse. For wastewater application systems, Drip distribution’s principal advantage over Spray Irrigation is that the wastewater daily application rates are more uniform and are not as affected by climatic changes. 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.

⁴ 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

Drip distribution delivers the 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.

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 continues 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 systems perform quite well in a cold climate provided proper attention to design details is made.

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

Drip systems are easily automated and are very suitable to being monitored and controlled by a programmable logical controller (PLC), increasing its reliability.

4. Land Requirements

The land requirements for onsite disposal systems vary greatly. Individual onsite 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. Systems that will process 5,000 gallons per day or more may require additional field studies beyond the standard deep hole and percolation tests. These hydrogeological studies may determine that the proposed soil absorption field may affect a much larger area than the actual area of the absorption field. Installing a soil absorption system may require that portions of land within the dispersion plume area be restricted against the drilling of wells for drinking water. Absorption areas can serve as passive open space and, with certain limitations, continue to be farmed or used for recreational activities.

G. Centralized Public/Community Sewer Systems

The previous County Master Sewer Plan (1970-1988) proposed that only a small portion of West Caln Township would be served by the Coatesville Regional System (CRS). The Coatesville Sewage Treatment Plant located in South Coatesville is owned by the PAWC. On the eastern side of West Caln Township there are presently 16 homes, part of the Country Ridge subdivision (Ridge View Drive), that convey through Valley Township. Valley Township, in turn, conveys to the CRS. In the center of West Caln Township, the Sandy Hill pumping station located east of Sandy Hill Road on Sandy Way collects sewage of 124 homes of Calnshire West and 87 homes of Sandy Hill subdivisions. The Sandy Hill pumping station conveys by a force main to the Sadsbury Township sewer system before the Sadsbury system reconnects to the PAWC. The Sandy Hill pumping station is intended to serve the Country Meadows (aka Lawrence Tract) pending final approval.

VIII. Conveyance Alternatives for the PAWC Sewer Service Area

The ultimate capacity needs within the PAWC Sewer Service Area are presented in Table 5. Three conveyance alternatives have been evaluated. Each of these conveyance alternatives assumes that all the sewage collected within the PAWC Sewer Service Area will be treated at the Coatesville STP.

Table 6 lists the developments and communities to be served by various conveyance system components for each the three alternatives evaluated.

Under all three alternatives, the Sandy Hill Pumping station will need to be capable of handling 134,200 gallons per day. The Lawrence Development (aka Country Meadows) subdivision is one of the three subdivisions that has conveyance capacity through Sadsbury Township via the Sandy Hill Pumping Station. This development proposes construction of two pumping stations, one to serve the Lawrence Development and a second near Sandy Hill Road and Shank Lane. The Lawrence Pumping Station will need to be sized to convey a minimum of 38,475 gpd for the 171 proposed units. The second pumping station should be sized to convey a minimum of 66,475 gpd to provide conveyance capacity for Lawrence plus the 28,000 gpd for the Telegraph and Hill Road areas.

The Crane Tract is a proposed 542 unit residential land development. This project plans to extend both water and sewer services from the City of Coatesville. The proposed land development plan indicates an 8 inch diameter gravity sewer from the subdivision to a pumping station to be located near the Wagontown Fire Company; it is recommended that this

gravity sewer be increased to a 10 inch diameter sewer within the Kings Highway right of way to provide for the future needs of the community. The land development plan also proposes that the force main from the pumping station follow Kings Highway to Rt 82 and connect to the existing gravity sewer system in Coatesville. PAWC recommends that the force main from the Wagontown Pumping Station terminate to a gravity sewer at the high point along Kings Highway within West Caln Township and provide a new gravity sewer interceptor along Rt 82 to the existing Coatesville gravity sewer system.

In each of the three conveyance alternatives, sewage conveyance from the proposed Sands development is the same, through Valley Township.

Table 5 - Ultimate Capacity Needs			
Existing Areas with potential need of "public" sewers			
Phillipsville		88,000 gpd	
Sandyhill Rd		12,000 gpd	
Telegraph & Hill Rd		28,000 gpd	
Wagontown		128,000 gpd	
New Land Developments proposing "public" sewers (225 gpd/EDU)			
Calnshire	124 EDU's	27,900 gpd	} Totaling 382 EDU's for 85,950 gpd but limited to 110,000 gpd.
Sandyhill	87 EDU's	19,575 gpd	
Lawrence	171 EDU's	38,475 gpd	
Crane	542 EDU's	121,950 gpd	
Dogwood	99 EDU's	22,275 gpd	
Barrett	90 EDU's	20,250 gpd	
Sands	508 EDU's	114,300 gpd	
Total Treatment Capacity Needs		620,725 gpd	

A. Alternative No. 1

Presently there is an agreement dated September 16, 2003 (the 2003 agreement) between the Township of Sadsbury, PAWC and the land developers for the Calnshire West, Sandy Hill, and Lawrence Tract

projects. This agreement provides for the conveyance of sewage for only these land developments and limits the flow from these developments to 110,000 gallons per day. Sewage is collected by gravity to several pumping stations with the main receiving pumping station located on East Sandy Way within the Sandy Hill development. The force main from this pumping station follows Sandy Hill Road south to Kings Highway and then south on to Ash Road then along Old Wilmington Road into Sadsbury Township connecting to the Sadsbury Township Sewer System. Sewer flows are metered and recorded at the Sandy Hill Pumping Station. This agreement places two restrictions:(i) only the aforementioned developments may connect and (ii) the limits of the average and peak sewage flows. The average flow of 110,000 gallons per day and the peak flow not to exceed four times the average flow rate.

The other developments and service areas of the Township will be primarily serviced by low-pressure sewers where connecting by gravity to the sewers for the three projects included in the agreement with PAWC is not an option.

The Phillipsville Area will be sewered via low-pressure and will connect to the force main from Sandy Hill that pumps to Sadsbury Township. The Telegraph and Hill Road Area will also be sewered via low-pressure and will be connected to the force main that pumps from the Lawrence Subdivision to Sandy Hill Road.

This first alternative would require an amendment to the 2003 agreement to permit additional users to increase the average daily flow from 110,000 to 234,200 gallons per day (for Calnshire, Sandy Hill, Lawrence, Barrett, Phillipsville, Sandy Hill Road, Telegraph and Hill Road areas.)

A proposed pumping station in Wagontown would convey an average daily flow of 272,275 gallons per day to the PAWC City of Coatesville system, for the Crane Tract, Dogwood and the Wagontown area.

The existing pumping station near Airport Road in Valley Township will need to be upgraded to provide an additional 114,300 gallons per day for the Sands Tract.

Table 6 – Areas Served and Capacity Needs for the Evaluated Alternatives				
Developments and Communities	Average Daily Flow (gpd)	Receiving Municipality per Alternative		
		1	2	3
Calnshire, Sandy Hill, Lawrence	85,950	Sadsbury	Sadsbury	Coatesville
Telegraph & Hill Roads	28,000	Sadsbury	Coatesville	Coatesville
Barrett	20,250	Sadsbury	Coatesville	Coatesville
Sandy Hill Road	12,000	Sadsbury	Coatesville	Coatesville
Phillipsville	88,000	Sadsbury	Coatesville	Coatesville
Dogwood	22,275	Coatesville	Coatesville	Coatesville
Crane	121,950	Coatesville	Coatesville	Coatesville
Wagontown	128,000	Coatesville	Coatesville	Coatesville
Sands	114,300	Valley	Valley	Valley
Total Treatment Required from PAWC	620,725			
Conveyance Component	Capacity requirements per Alternative (gpd)			
	1	2	3	
Sandy Hill Pumping Station	134,200	134,200	134,200	
Sandy Hill Pumping Station #2	66,475	66,475	66,475	
Lawrence Pumping Station	38,475	38,475	38,475	
Sadsbury Conveyance System	234,200	85,950	0	
Wagontown Conveyance System	272,225	420,475	506,425	
Valley Conveyance System	114,300	114,300	114,300	

B. Alternative No. 2

A sewage flow meter and control valve would be installed near the municipal border with Sadsbury Township on the force main from the Sandy Hill Pump station. This control valve would be use to regulate both the rate of flow and daily volume of sewage to the Sadsbury sewer system. Excess sewage flows would then be diverted to a pressure sewer from the Wagontown system along Kings Highway near Ash Road. The Phillipsville area would be served with a pressure sewer system and would pump into the Sandy Hill force main.

In accordance with the current 2003 agreement only the Calnshire, Sandy Hill and Lawrence projects can convey through the Sadsbury system at present based on projected sewage flows and the number of homes in these development. This flow is an estimated 85,950 gallons of sewage per average day. The balance of 148,250 gallons per day of sewage would be diverted to the Wagontown system. Under this alternative the Wagontown system would need to be sized for approximately 420,475 gallons per day.

Sewage flows for the Sands Tract would remain the same as for Alternative No. 1.

C. Alternative No. 3

This Alternative proposes that all sewage conveyed through Sadsbury Township would be discontinued. The force main at the Township boundary would be valve closed with all sewage being conveyed to the proposed Wagontown pumping station and a gravity sewer system flowing out of the Township into the City of Coatesville along Route 82.

IX. Selected Wastewater Treatment System Alternatives

A. Individual Systems

1. Single Family Dwellings shall be served with “Individual onlot sewage systems”⁵ permitted by the local agency; owned, operated, and maintained by the property owner; and overseen by the municipality through a Sewage Management Program. For those individual properties where an “Individual onlot sewage system” cannot be permitted, conveyance to a “Community sewage system”⁵ shall be first investigated. If this alternative is not practical then the property owner shall request that the municipality revise this Plan to allow the use of an “Individual sewerage system”⁵ and enter into a Sewage Management Agreement with the municipality to ensure its long-term operation and maintenance.

Individual onlot sewage systems are conventional systems that are, for the most part, passive and durable treatment systems that provide acceptable treatment when installed under suitable site conditions requiring only a minimal amount of attention from the property owner. Where site conditions are less than desirable, more complex onsite

⁵ Refer to Definitions in Pa Code 25 § 71.1

treatment systems are worth consideration if conveyance to an existing public sewer system is not reasonably available. However, more complex onsite treatment systems will require a higher level of management to provide acceptable performance.

The benefits of this alternative are that these types of onsite systems are relatively easy and inexpensive to implement and maintain.

2. Large Volume Systems serving a single lot shall be served with “Community sewerage systems”⁶ owned by the property owner. These communities include trailer parks, campgrounds, schools, and commercial businesses, which are located on a single parcel of land. A large volume system within a single lot is differentiated from a single family dwelling by generating more than 400 gallons per day of sewage.

Such systems shall use the best available technology with land application of the treated effluent. The property owner shall enter into a Sewage Management Agreement with the municipality to ensure its long-term operation and maintenance. Where highly engineered treatment systems are needed to protect areas of higher environmental sensitivity, operation and maintenance of the treatment system should be performed by a professionally managed firm under contract with the property owner. The Sewage Management Agreement should provide that the operating firm be approved by the municipality and provide quarterly monitoring reports of the operating firm’s activities, with provisions addressing what will be done should the operating firm fail to properly operate and maintain the facility.

Non-residential uses include commercial and institutional users, or any uses other than strictly residential. PA Code Title 25, Chapter 73, §73.17 (b) lists different types of non-residential uses. Note that industrial uses often have a combined waste stream of domestic and process wastes. The domestic component, consisting of flush toilets, showers, and kitchen wastes, and certain janitorial wastes for office areas, should be separated from any process wastes. The domestic portion may be treated and disposed of by means of an onsite system. However, unless the process wastes can be pretreated to domestic waste standards, they will need to be treated by a separate industrial waste treatment system. Industrial wastes are not defined as “Sewage” and are not included under the Act 537 program.

The benefit of this alternative is that the responsibility for operation and maintenance is transferred from the property owner to a professionally

⁶ Refer to Definitions in Pa Code 25 § 71.1

managed firm, which has an economic incentive to comply with the Sewage Management Agreement. The benefit of the property owner retaining ownership of the sewage facility also provides an economic incentive to the property owner to have quality equipment installed and properly operated and maintained to keep the operating cost low and manageable.

B. Public and Community Systems

1. Public Sewers – Dwellings and businesses that are within the PAWC Sewer Service Area will be serviced by public sewers have sewage conveyed to the PAWC, located in the City of Coatesville, for treatment. Sewage is conveyed through Sadsbury Township, Valley Township, and/or the City of Coatesville. The areas where public sewers are currently available are limited to the developments of the Lawrence Tract, Sandy Hill, and Calnshire West. Future sewage facilities planning will allow for areas along West Kings Highway (SR Route 30) as well as additional areas along Sandy Hill Road and Ash Road to be connected to public sewers (see Alternatives 1-3).

The benefit of this alternative is that the homeowner is not burdened with the responsibility of owning and operating an individual onlot system. Septic systems require regular maintenance and are expensive to replace if they malfunction. Certain soils with limited permeability can also make it difficult for septic systems to operate effectively.

The disadvantage of public sewers is that there is a large initial capital investment required to install the system. For this reason, the areas of West Caln, which are currently served or will be served by a centralized sewer system, are areas with a relatively high density of people. It is not economically feasible to install public sewers in remote areas that will service only a few customers.

It will be required that West Caln Township and PAWC establish general service areas to be serviced by public sewers. When a tract of land within the service area is to be developed, it will be the developer's responsibility to provide the capital investment to build the public sewer infrastructure. Once the sewer system is built, ownership will be transferred to PAWC.

The development of public sewers in West Caln Township will require the Township to enter into a general oversight agreement with the PAWC. The agreement will require that PAWC accept ownership and maintenance of the sewer lines and pump stations. Where pressure sewers are installed, PAWC will also be responsible to offer service

contracts to cover the maintenance of individual grinder pumps. It will be up to the customers whether they elect to have a service contract through PAWC or through another qualified company.

2. Community Systems – Community systems are ideal for localized developments that are located outside of the main public sewer corridors and are not suitable for individual on-lot systems. There are many reasons why on-lot systems may not be practical: the properties may contain soils with poor drainage, be located near a floodplain, contain large areas of steep slopes, or be underlain with a high water table.

Should the need arise, community sewer systems for the villages of Compass and Martin’s Corner will be considered. A Special Study is recommended to investigate the alternatives.

X. Plan Implementation

Individual Systems – The Township plans to adopt a Sewage Management Program⁷ that will provide for the routine inspection of all individual onsite systems throughout the Township.

Public Sewers – The Township plans to enter into a letter of understanding with PAWC regarding future Community Sewer Facilities within West Caln Township.

Crane Tract – The Township will continue to work with the developers of the Crane Tract and PAWC. This land development project includes an internal pumping station located within the development, gravity sewers with existing public roads, a pumping station located next to the Wagontown Fire Station and a conveyance system to the existing Coatesville sewer system. The system will be designed as required by the Crane Tract in order to provide public sewers for current and future needs within the PAWC Sewer Service Area.

Community Systems – When needed the Township is committed to additional planning to address specific problems.

⁷ See Exhibit 1

Exhibit 1 – Draft Sewage Management Ordinance

WEST CALN TOWNSHIP
ORDINANCE NO. _____

INDIVIDUAL SEWAGE SYSTEM MANAGEMENT ORDINANCE

BE IT ENACTED AND ORDAINED by the Board of Supervisors of West Caln Township, Chester County, Pennsylvania, and it is hereby enacted and ordained as follows:

Section 1. Purposes. The purpose of this Ordinance is to establish procedures for the proper operation and maintenance of Individual Sewage Systems (as hereinafter defined) within West Caln Township (sometimes referred to herein as the “Municipality”). It is hereby declared that the enactment of this Ordinance is necessary for the protection, benefit and preservation of the health, safety and welfare of the inhabitants of the Municipality.

Section 2. Definitions. Unless the context specifically and clearly indicates otherwise, the meaning of terms used in this Ordinance shall be as follows:

- A). “Absorption Area” shall mean a component of an Individual Sewage System where liquid from a Treatment Tank seeps into the soil through a distribution system.
- B). “Act 537 Plan” shall mean a Municipality’s Official Plan as defined in the Pennsylvania Sewage Facilities Act, as of January 24, 1966, P.L. 1535 (1965), No. 537, as amended, 35 P.S. §§750.1-750.20a (“Sewage Facilities Act” or “Act 537”).
- C). “Building Sewer” shall mean the piping carrying liquid wastes, from a building to the Treatment Tank, Holding tank, or Grinder Pump Tank.
- D). “Cleanout” shall mean a component of a Sewage Facility that provides access for inspection and cleaning the -Building Sewer or other pipes.
- E). “Community Sewage Facility” shall mean a Sewage Facility whether publicly or privately owned, that receives and collects Sewage from two or more Improved Properties for treatment and disposal of the Sewage at another location.
- F). “Distribution Box” shall mean a Tank with one inlet that provides equal distribution of Effluent from a Treatment Tank through two or more outlets.

- G). “Domestic Sewage” shall mean Sewage derived principally from dwellings, business buildings, institutions and the like, and may not contain groundwater, surface water or storm water.
- H). “Effluent” shall mean a liquid waste discharged from a sewage system or component of a sewage system.
- I). “Improved Property” shall mean any property or lot within the Municipality upon which there is an erected structure intended for continuous or periodic habitation, occupancy or use by human beings or animals and from which structure Sewage shall or may be discharged.
- J). “Individual Sewage System” shall mean a Sewage Facility and all of its components serving a single lot. Individual Sewage Systems include the following:
 - i). Individual onlot sewage systems rely on a subsurface absorption or surface infiltration system for the renovation of Sewage through native soils prior to disposal or the retention of Sewage in a Retaining Tank. Individual onlot sewage systems are permitted through the Chester County Health Department and include but are not limited to the following systems defined by 25 Pa Code § 73.1:
 - (a) Conventional sewage systems
 - (b) Alternative sewage systems
 - (c) Experimental sewage systems
 - (d) Bonded disposal systems
 - (e) Individual residential spray irrigation systems
 - (f) Retaining tanks
 - ii). Individual sewerage systems rely on other means than native soils to renovate Sewage prior to disposal or retention in a Retaining Tank. Individual sewerage systems include but are not limited to the following:
 - (a) Gravity sewer connections – Where the Building Sewer connects to a gravity service lateral of a Community Sewage Facility.
 - (b) Pressure sewer connections – Where the Building Sewer is connected to a Tank containing a pump which conveys Sewage through a pressure sewer to either a gravity or pressure service lateral of a Community Sewage Facility.
 - (c) Small flow treatment facilities – An Individual sewerage system permitted by the Pennsylvania Department of Environmental Protection that is designed to adequately

treat Sewage flows no greater than 2,000 gallons per day with final disposal to surface waters, a dry stream channel, or storm water collection system.

- K). “Inspection Port” shall mean a component of a Sewage Facility that provides sufficient access for the inspection of the contents of a Tank.
- L). “Property Owner” shall mean any person vested with ownership, legal or equitable, sole or partial, of any property located in the Municipality.
- M). “Pump Tank” shall mean a Tank or chamber or sump that receives and temporarily stores Sewage or partially treated Sewage from which it is pumped or dosed. Pump Tanks include:
 - i). Effluent Pump Tank – A Tank that receives Septic Tank Effluent or partially treated Sewage and conveys the liquid portion of the wastewater to absorption system or other component of a Sewage Facility. Effluent pumps also include: Dosing Pumps, Lift Pumps, Dosing Siphons, and other specialized discharge control mechanisms.
 - ii). Grinder Pump Tank – A Tank that receives Domestic Sewage and contains a pump that macerates waste solids prior to ejection.
- N). “Responsible Management Entity” or “RME” shall mean an individual, firm or corporation experienced in the operation and maintenance of Sewage facilities, who is registered with the Municipality to perform such services. RME’s may also include through a general oversight agreement with the Municipality such entities as Municipal Authorities, Investor Owned Public Utility Companies and Homeowner Associations.
- O). “Retaining Tank” shall mean a Tank that retains Sewage and is designed and constructed to facilitate ultimate disposal of the Sewage to another site. Retaining Tanks include:
 - i). Chemical toilet – A permanent or portable non-flushing toilet using chemical treatment in a Retaining Tank for odor control.
 - ii). Holding tank – A Tank, whether permanent or temporary, to which Sewage is conveyed by a water-carrying system.
 - iii). Privy – A Tank designed to receive Sewage where water under pressure is not available.
 - iv). Incinerating toilet – A device capable of reducing waste materials to ashes.
 - v). Composting toilet – A device for holding and processing human and organic kitchen waste employing the process of biological degradation through the action of microorganisms to produce a stable, humus-like material.

- vi). Recycling toilet – A device in which the flushing medium is restored to a condition suitable for reuse in flushing.
- P). “Sewage” shall mean any substance that contains any of the waste products or excrement or other discharge from the bodies of human beings or animals and any noxious or deleterious substance being harmful or inimical to the public health, or to animal or aquatic life or to the use of water for domestic water supply or for recreation or any substance which constitutes pollution under the Clean Streams Law, 35 PS §§ 691.1- 691.1001, as amended.
- Q). “Sewage Facility” shall mean an all inclusive term for a Sewage collection, conveyance, treatment, and disposal system.
- R). “Sewer System” shall mean a system of pipes that collect Sewage from several Improved Properties; Sewer Systems include Pressure and Gravity Sewer Systems or any combination of both.
- S). “Tank” shall mean a water-tight receptacle which liquids pass through or are retained in.
- T). “Tank access cover” shall mean a component of a Sewage Facility that provides access for inspection, cleaning and maintenance of the internal components of a Tank.
- U). “Treatment Tank” shall mean a Tank designed to provide a suitable environment for the bacterial decomposition or disinfection of Sewage. Treatment Tanks include:
 - i). Septic Tank – A Treatment Tank or compartment of another Tank that provides for the anaerobic decomposition and the physical separation of solids in Sewage.
 - ii). Aerobic sewage treatment tank – A Treatment Tank or compartment of another Tank that provides for the aerobic biochemical stabilization of solids in Sewage.
 - iii). Filter tank – A Treatment Tank or compartment of another Tank that contains a media to which microorganisms attach and provide a suitable environment for the biochemical stabilization of solids in Sewage.
 - iv). Chlorine contact tank - A Treatment Tank or compartment of another Tank that provides a suitable environment for the disinfection of Effluent.

Section 3. Authority and purpose. In accordance with the Township Act 537 Plan and 25 Pa. Code §.71.71 “Municipalities are required to assure the proper operation and maintenance of Sewage Facilities within their borders.”

Section 4. Duties and Responsibilities of all Property Owners of Improved Properties.

- A). Property Owners are responsible to properly operate the Sewage facilities on their individual properties; this includes providing where necessary electrical power and access to conventional telephone service for the operation of the Sewage Facilities and to respond to any alarm notification.
- B). Property Owners shall not introduce or dispose of any substance into any Sewage Facility that would cause harm or in any way interfere with the proper operation of the Sewage Facility.
- C). The minimum requirements for the operation and maintenance of Sewage Facilities are as follows:
 - i). Routine inspections and maintenance: Sewage Facilities shall be inspected and maintenance by the Property Owner or a Responsible Management Entity in accordance with the following schedule:
 - (a) Monthly - Retaining Tanks: including but not limited to Chemical toilets, Holding tanks, Privies, Incinerating toilets, Composting toilets, and Recycling toilets, to be checked for water-tightness and structural integrity also remove septage and solids when 75% full.
 - (b) Semi Annually - Individual Residential Spray Irrigation Systems permitted in accordance with 25 Pa Code § 73.167.
 - (c) Annually - Absorption Areas, Cleanouts, Tank access covers, and Inspection Ports; surface contouring to be checked to see that storm water is diverted away, maintain ground cover and provide protection from physical damage.
 - (d) Annually - Pumps, aerators, any and all electrical, mechanical and chemical components, alarm devices, disinfection equipment to be checked for proper operation in accordance with manufacturer's instructions and recommendations.
 - (e) Once every three years - All Tanks, including but not limited to Treatment Tanks, Pump Tanks, and Distribution Boxes to be checked for water tightness, structural integrity and settlement of the structure, and remove excessive amounts of solids and scum.
 - ii). Maintenance Agreements: Sewage Facilities operated and maintained by any person other than the Property Owner shall be through a maintenance agreement between the Property Owner and a Responsible Management Entity (RME). The RME shall provide the Property Owner and the Municipality an annual inspection and maintenance report.

Section 5. Additional Duties and Responsibilities of Property Owners of Improved Properties. Property Owners whose Individual sewerage system connects to a Community Sewage Facility.

- A). Property Owners shall operate and maintain their individual Sewage Systems in accordance with any rules, regulations, and all other requirements of the receiving Community Sewage Facility, including paying fees for collection, conveyance, treatment, and disposal of Sewage, and the maintenance of certain components of their Individual Sewage System.
- B). Property Owners with an Individual Sewage System connecting to a public or private Sewage Facility by means other than with a Building Sewer shall retain the services of an RME to maintain their Individual Sewage System unless the Individual Sewage System is maintain by the Community Sewage Facility.

Section 6. Duties and Responsibilities of Responsible Management Entities.

- A). Registration Requirements - Any RME offering or performing installation, inspection, operation, or maintenance services on any Sewage Facility in the Municipality shall register with the Municipality each year unless the RME has as a general oversight agreement with the Municipality.
- B). Reporting Requirements – RMEs shall provide the Property Owner a copy of any and all annual inspection and maintenance reports including any supplemental report. In addition RMEs shall supply applicable information to the “Chester County Septage Management Database”.
- C). Evaluations of Sewage Facilities – Any person performing an evaluation of a Sewage Facility for a real estate transaction or a mortgage refinancing shall also be a registered RME and comply with reporting requirements above.
- D). Spare parts and miscellaneous materials – RMEs shall maintain an inventory of spare and replacement parts and other miscellaneous materials to make all reasonable repairs to systems they are contracted to provide service for.
- E). Emergency Services - RMEs shall include emergency services in all service and maintenance agreements that provide 24 hour contact information. This contact information shall be posted on or near a component of the sewage system in plain sight. If the RME is not licensed to pump and transport liquid waste by the Chester County Health Department, the RME shall provide a subcontract with a licensed liquid waste transporter who would be on 24 hour call to abate any nuisance or malfunction.

Section 7. Abatement of Nuisances. In addition to any other remedies provided in this Ordinance, any violation of Sections 4 and 5 above shall constitute a nuisance and the Municipality shall have the right to abate such nuisance by seeking mitigation of the nuisance by the Property Owner, or

seeking appropriate equitable or legal relief from a court of competent jurisdiction, or both.

Section 8. Rules and Regulations to be in Conformity with Applicable Law. All such rules and regulations adopted by the Municipality to effectuate this Ordinance shall be in conformity with the provisions herein, all other Ordinances of the Municipality, and all applicable laws, and applicable rules and regulations of administrative agencies of the Commonwealth of Pennsylvania.

Section 9. Repeal. All Ordinances or Resolutions or parts of Ordinances or Resolutions, insofar as they are inconsistent herewith, are hereby repealed.

Section 10. Severability. If any sentence, clause, section or part of this Ordinance is for any reason found to be unconstitutional, illegal or invalid, such unconstitutionality, illegality or invalidity shall not affect or impair any of the remaining provisions, sentences, clauses, sections, or parts of this Ordinance, it being the intent of West Caln Township, Chester County that such remainder shall be and shall remain in full force and effect.

Section 11. Effective Date. This Ordinance shall become effective five (5) days after the date of adoption.

ENACTED AND ORDAINED into an Ordinance this ____ day of _____, 2009, by the Board of Supervisors of West Caln Township, Chester County in Lawful Session duly assembled.

- Exhibit 2 - Letter of Understanding with PAWC**
- Exhibit 3 - Master Sewer Plan - Selected Alternative**
- Exhibit 4 - Alternative No. 1**
- Exhibit 5 - Alternative No. 2**
- Exhibit 6 - Alternative No. 3**
- Exhibit 7 - Township Planning Commission Comment Letter and Response**
- Exhibit 8 - County Planning Commission Comment Letter and Response**
- Exhibit 9 - County Health Department Comment Letter and Response**
- Exhibit 10 - Proof of Publication, Public Comment Letters and Responses**