Pilesgrove Township
Wastewater Management Plan

Lower Delaware Water Quality Management Plan

Maurice, Salem, and Cohansey Watershed Management Area 17
Lower Delaware Watershed Management Area 18

Wastewater Management Planning Agency:
Pilesgrove Township
Salem County, New Jersey

August 2, 2010
Revised and Endorsed November 9, 2010

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TABLE OF CONTENTS

List of Tables

List of Maps

Pilesgrove Township
Wastewater Management Plan Summary Table
November 9, 2010

The significant actions that are proposed in this WMP are summarized below.

Compliance with NJDEP Regulations
The primary purpose of this WMP is to develop a Wastewater Management Plan for the Township of Pilesgrove in accordance with NJDEP regulations. The draft WMP was issued in August of 2007 and this revision was endorsed on November 9, 2010 for inclusion in the County WMP.
Changes in the WMP Planning Area
The WMP Planning Area is the Township of Pilesgrove, Salem County, New Jersey. A small portion of the Planning Area was previously included within the WMP of the Woodstown Sewerage Authority (WSA). Pilesgrove Township is interested in pursuing an inter-local services agreement with the WSA for the provision of wastewater collection and treatment services for limited areas of the Township in order to effectively implement a residential clustering or transfer of development rights land use approach. Pilesgrove Township is not supportive of the regional wastewater treatment system due to concerns that a regional system may spur additional land development.
Sewer Service Area Changes
▶ Future Sewer Service Area (Sharptown Village) The WMP proposes to establish a sewer service area within and around the village of Sharptown in accordance with the Kings Road LLC Settlement Agreement only if this Project remains a component of the Township Housing Plan. The Township is submitting a petition to the Superior Court to have this defunct project removed from the Housing Plan. ▶ Future Sewer Service Area (Woodstown Extension) The WMP proposes to define potential sewer service areas around Woodstown Borough contingent upon the provision of water and sewer. Habitat suitability determinations would be needed for areas within the potential Future Sewer Service Area that are shown as containing ranked critical habitats on the Landscape Project. These areas would only be included within the Approved SSA to serve pre-existing development or if site-specific investigations indicate that the wetlands or critical habitats are a less substantive environmental constraint.
Environmental Analyses and Assessments
Point Source Pollutant Loading Analysis. The WMP does not propose any change in the existing surface water discharge permit rate or location within the Township or by treatment facilities serving the Township. All Individual Subsurface Disposal Systems (ISSDS) would need to comply with the results of a nitrate dilution model. Non-point Source Pollution. Pilesgrove Township has adopted a Stormwater Management Plan and Ordinance in compliance with the Stormwater Management Regulations (N.J.A.C 7:8) that will effectively address non-point source pollution. Riparian Corridors. The WMP proposes to establish stream corridor buffers or to require that projects within stream corridor buffers be designed to avoid, minimize or mitigate any impacts to the stream value. Consumptive Water Use Analysis. The Kings Road project was to have relied on two existing wells that are screened within the Potomac-Raritan-Magothy (PRM) formation. Since the total usage would not have exceeded 100,000 gpd, a water allocation would not have been required. The existing wells on that site were not in a critical water supply area and were previously used for an alternate purpose. Therefore, the reuse of the Richmans' wells would not represent a new groundwater withdrawal.

Woodstown Borough currently operates its own water supply and distribution system. The Borough has adequate supply sources but has a salt water intrusion problem. The Borough intends to construct a water filtration plant to allow the blending of water from different aquifers.

The potential developer of the Planned Light Industrial development has previously provided a "will serve" letter from New Jersey American Water Company (NJAW), which has a diversity of supply sources.

Endangered Species. The proposed treatment plants and plant improvement projects will not encroach on any ranked critical habitats. The Future SSA for any of the areas will not include critical habitats of listed species. It is recommended that the Landscape Project be refined with regard to grassland bird species and that habitat suitability determinations be required for any ranked areas shown on the affirmed Landscape Project mapping prior to inclusion in future sewer service areas or the issuance of WMP consistency determinations in unsewered areas.

Environmental Constraints. An environmental inventory and constraints analysis has been conducted to justify the limits of the Future Sewer Service Area and to support the projected wastewater flow calculation.

Nitrate Dilution. A nitrate dilution build-out analysis has been conducted based on the Township's existing target limit of 5.2 mg/l that was previously cited as the background target by the New Jersey Geological Survey and the proposed target of 2.0 mg/l. The difference between the existing zoning and the nitrate dilution buildout analysis is substantial. The Township is proposing a target of 5.2 mg/l for each development project as well as a mechanism to achieve the NJDEP target of 2.0 mg/l for each sub-watershed when preserved lands are considered.

New or Expanded Treatment Facilities

The WMP proposes that an inter-local services agreement be established between the WSA and Pilesgrove Township that would provide for the expansion of the Woodstown WWTP to serve the proposed Town Center Extension. The proposed plant improvements would provide for an increase in the permitted processing capacity within the parameters of the surface water permit discharge and will include the construction of a new clarifier.

The proposed Kings Road project would have entailed the construction of a new wastewater treatment plant to serve the planned residential development as well as serve the adjacent Sharptown area but this proposal is now defunct.

Abandonment of Treatment Facilities

It is recommended that the Waddington-Richmans' treatment plant in Sharptown be abandoned unless the owner submits redevelopment plans to the Township Planning Board prior to April 1, 2011 or the area is determined to be in need of redevelopment by the Pilesgrove Township Committee prior to that date.

It is further recommended that engineering reports be submitted for any facilities discharging more than 2,000 gpd to septic systems to demonstrate that the facilities are designed for the peak wastewater flow and that the facilities are being properly maintained.

I. INTRODUCTION

The purpose of this document is to provide a comprehensive Wastewater Management Plan (the "WMP") for the Township of Pilesgrove, Salem County, New Jersey. The WMP will be submitted to the Salem County Planning Department for inclusion in the County WMP that is currently being prepared. Pilesgrove Township supports the inclusion of the policies in this WMP in the County WMP in their entirety except when modifications or deletions are approved by the Township.

2.1 DESCRIPTION OF THE PLANNING AREA

2.1.1. Geographic Description

The Planning Area covered by this WMP is the entire Township of Pilesgrove which encompasses about 35.1 square miles as shown on ***Map 1: Planning Area Map.***

The Woodstown Sewerage Authority (the "WSA") currently provides limited sewer service within Pilesgrove Township. The portion of the Township that has been included within the WSA WMP encompasses about 0.16 square miles. The total WSA Planning Area is 1.77 square miles.

This WMP proposes that the Township of Pilesgrove and the WSA enter into an interlocal services agreement that clarifies planning and service responsibilities within the Township of Pilesgrove in the vicinity of the Borough of Woodstown.

2.1.2 Planning Area Population

2.1.2.1 Existing Population

Table 1 contains the historic population trend for Pilesgrove Township based on census data and other official population estimates, According to the U.S. Census, Pilesgrove Township had a total population of 3,923 persons in the year 2000. The most recent population estimate is that of the New Jersey Department of Labor which estimated the population to be 4,548 persons as of July 1, 2008. This population estimate represents a 16% increase over an eight-year period or an average annual population increase of 2¼ percent.

Table 1
Pilesgrove Township
Historic Population Trend (1950-2008)

Year	Population	% Change
1950	1,942	
1960	2,519	29.7%
1970	2,706	7.4%
1980	2,810	3.8%
1990	3,250	15.7%
2000	3,923	20.7%
2008	4,548	15.9%

Source: US Census:1950-2000; New Jersey Data Center: 2008 Estimate.

The Township believes that there were substantive errors in the 2000 Census with regard to the assignment of the group quarters population to the Township. Pilesgrove Township was reported to have 368 persons in group quarters, which should have been attributed to adjacent municipalities. Consequently, the Township believes that the correct population count in the year 2000 should have been 3,555 persons. Based on recent development activity, the current population has been estimated to be 4,198 persons.

2.1.2.2 Projected Population

The South Jersey Transportation Planning Organization (SJTPO) is the Metropolitan Planning Organization (MPO) for the southern tier of New Jersey. As shown in ***Table 2***, the SJTPO population projection for Pilesgrove Township anticipates an increase of 435 persons or 10% from 2010 to 2020 and 866 persons or 19.5% from 2010 to 2030. The population in 2030 is projected by the SJTPO to be 5,316 persons.

Table 2
Pilesgrove Township
SJTPO Population Projection

Year	Population	Pop. Increase	Percent increase
2000	3,955		
2005	4,410	487	12.4%
2010	4,450	40	0.9%
2015	4,687	237	5.3%
2020	4,885	198	4.2%
2025	5,096	211	4.3%
2030	5,316	220	4.3%
2035	5,529	213	4.0%

Source: SJTPO;

Table 3 is the Pilesgrove Township population projection from the recently adopted 2010 Housing Plan Update extrapolated to 2030. Based on recent development trends, the Township projects a growth rate of 1,047 persons or 23.7% over the next ten years and 2,263 persons or 60.3% over the next twenty years which is a growth rate that is significantly greater than the MPO projection. The projected population of 7,079 persons in 2030 is 33% higher than the MPO projection even though the MPO projection is based on the higher starting population estimate for 2000.

2.1.3 Regulatory Jurisdiction

The Township Planning Area is located in Delaware River Drainage Basin and the Lower Delaware Water Quality Management Planning Area. The Township is located in Watershed Management Area No. 17, which includes the Salem River watershed and Watershed Management Area No. 18 which contains the Oldmans Creek watershed.

The Township Planning Area is not located within the Coastal Zone or within the jurisdiction of the Pinelands Commission.

Table 3
Pilesgrove Township
Population Projection

Year	Beginning Population	New Units	Population Increase	Ending Population	Annual % Increase
2000	3,555	17	55	3,610	
2001	3,610	15	49	3,659	1.4%
2002	3,659	21	67	3,726	1.8%
2003	3,726	20	64	3,790	1.7%
2004	3,790	28	81	3,872	2.1%
2005	3,872	75	218	4,090	5.6 %
2006	4,090	22	64	4,154	1.6%
2007	4,154	9	26	4,180	0.6%
2008	4,180	6	17	4,198	0.4%
2009	4,198	1	3	4,201	0.1%
2010	4,201	74	215	4,416	5.1%
2011	4,416	4	12	4,428	0.3%
2012	4,428	11	32	4,460	0.7%
2013	4,460	32	93	4,553	2.1%
2014	4,553	32	93	4,646	2.0%
2015	4,646	40	116	4,762	2.5%
2016	4,762	53	154	4,916	3.2%
2017	4,916	44	128	5,044	2.6%
2018	5,044	45	131	5,175	2.6%
2019	5,175	49	143	5,318	2.8%
2020	5,318	50	146	5,463	2.7%
2021	5,463	51	148	5,612	2.7%
2022	5,612	52	151	5,763	2.7%
2023	5,763	53	154	5,917	2.7%
2024	5,917	54	157	56,075	2.7%
2025	6,075	55	160	6,235	2.6%
2026	6,235	56	163	6,398	2.6%
2027	6,398	57	166	6,563	2.6%
2028	6,563	58	169	6,732	2.6%
2029	6,732	59	172	6,904	2.6%
2030	6,904	60	175	7,079	2.5%
2031	**7,079**				

Source: Alaimo Group: 2010 Housing Plan Update;

2.2 WOODSTOWN SEWERAGE AUTHORITY (WSA) SEWER SERVICE AREA

Currently, the Woodstown Sewerage Authority (WSA) is the only municipal authority providing wastewater conveyance and treatment services in Pilesgrove Township. The WSA owns and operates a treatment plant in the Borough of Woodstown that primarily serves land development within the Borough. The WSA has agreed on a case-by-case basis to extend its service into Pilesgrove Township. The existing WSA Sewer Service Area includes the developed portion of the Borough of Woodstown; selected areas adjacent to Woodstown in Pilesgrove Township; and the County farm complex about 2.0 miles south of Woodstown located in Mannington and Pilesgrove Townships.

2.2.1 Approved Sewer Service Areas

The general extent of the WSA Wastewater Management Planning Area is shown in ***Map 1: Planning Area Map*** and is described below. The existing WSA planning area is the same as the previously approved sewer service area in Pilesgrove since the WSA has only included areas in which it intends to provide service.

Woodstown Borough

While all of Woodstown Borough is within the planning area, portions of the Borough are not developable due to environmental constraints or public policy. Furthermore, the Wastewater Management Planning Regulations (NJAC 7:15) require that critical habitats and environmentally constrained lands be excluded from the Future Sewer Service Area. Therefore, the County WMP will need to clearly define the Future Sewer Service Area within the Borough that complies with the updated regulations. ***Map 2*** indicates the properties that are actively served in Woodstown. About 50% of the land area is currently served by the WSA. Woodstown Borough had an estimated population of 3,333 persons in July 2006. It is believed that virtually all of this population was served by the WSA.

Pilesgrove Township

The previously approved sewer service area in the Township of Pilesgrove is the limited area served by the Woodstown Sewerage Authority (the "WSA") around Woodstown that encompasses approximately 110 acres. The previously approved sewer service area in Pilesgrove includes the following:

- The WSA has historically served an area of the Township that is immediately adjacent to the Borough and is a continuation of the residential land use pattern of the Borough along Grandview Avenue, West Grant Street, and Lee Street. A total of 44 single-family homes are served in this area.

- The WSA serves the Friends Home at Woodstown, which is a continuing care facility that extends into Pilesgrove Township. The residential units in Pilesgrove Township include 47 independent living attached residences and 20 apartments for a total of 67 units.

- The WSA serves a few isolated users along US Route #40 include five units east of the Borough and a few parcels west of the Borough and one unit along Old Salem Road. The total number of isolated EDUs is estimated to be 16.

- The WSA provides limited service to a commercial shopping center known as the Pilesgrove Town Center. The WSA has agreed to accept a maximum of 6,000 gpd from pre-treatment facilities located at the commercial center.

The WSA has made the following additional wastewater allocations for uses in Pilesgrove Township:

- The WSA has agreed under the terms of a court settlement agreement to provide service to the Bailey Corner affordable housing project. The project will entail a total of 76 EDUs including 74 affordable units, one manager's unit and one community building. The project site has an existing wastewater allocation of 26 units. The increase in the current allocation to the project site is estimated to be 12,220 gpd.

- The WSA has previously agreed to provide service to Block 36; Lot 17 in the Township of Pilesgrove for a new middle school. This project was previously pursued by the Board of Education but the referendum was not approved. The service allocation in a prior amendment to the WSA WMP was to be limited to 8,000 gpd.

- The WSA has previously certified the pre-existing EDUs for the commercial redevelopment area within the Bailey Corner Redevelopment Area.

County Complex

Salem County has a complex of buildings and facilities located along Route 45 at the Mannington-Pilesgrove Township boundary including various county offices, the Salem County Vocational School, and the County Jail. The sewage generated by this County complex is directed to the WSA treatment plant via a dedicated force main. The force main was sized specifically for the needs of the County and may not accept additional wastewater generators.

Salem County purchased 100,000 gpd of reserve capacity from the WSA in 1991 at a cost of $785,000. It has been reported that the complex currently generates about 35,000 gpd of wastewater, primarily from the jail. A recent evaluation of County facilities did not indicate any need to expand the county complex other than minor improvements to existing facilities. While double bunking could increase the capacity of the County jail, the facility is believed to be more than adequate for the foreseeable needs of the County.

2.2.2. Existing Sewer Service Area

Map 2: Existing Wastewater Facilities and Service Area Map indicates the general extent of the Existing Sewer Service Area. *Map 2* indicates the extent of the land development in Pilesgrove Township that is currently served by the WSA collection and conveyance system. This area has been clearly distinguished from the Approved Sewer Service Area. The WSA Existing Service Area encompasses about a 1.0 square mile area of which 0.12 square miles are in Pilesgrove Township.

2.2.3 Sewer Service Area Population

Pilesgrove Township

Table 4 indicates that the existing population being served by the WSA in Pilesgrove Township is approximately 264 persons or only 6.3% of the Township population.

Table 4
Pilesgrove Township
Sewer Service Area Population (2007)

Year	Units	PPH	Population
Single Family	49	2.91	143
Friends Home	67	1.80	121
Total Service Area Population	**116**	**2.27**	**264**
Current Township Population			**4,187**
Percent Served			**6.3%**

Source: Service Area Units: Woodstown Sewerage Authority WMP (Killam Associates)

Table 5 indicates the anticipated sewer service area population at the end of 2010 when the affordable housing project is fully occupied. This project is expected to increase the sewer service area population to 448 persons or 9.6% of the total Township population.

Table 5
Pilesgrove Township
Sewer Service Area Population Projection (2011)

Year	Units	PPH	Population
Single Family	49	2.91	143
Friends Home	67	1.80	121
Bailey Corner Affordable Housing	75	2.50	188
Total Service Area Population	**191**	**2.36**	**452**
Township Population Estimate			**4,585**
Percent Served			**9.8%**

Source: Alaimo Group

Table 6 indicates the future WSA sewer service area population in twenty years (2030) assuming that the Town Center Extension is fully implemented. As shown in ***Table 6,*** it is projected that the number of units served by a wastewater conveyance and treatment system in the Township would increase to 809 units which would represent a service area population of about 2,091 persons or almost 30% of the entire Township. It is projected that over 60% of the new growth in the Township would be within the Future Sewer Service Area. It should be noted that ***Table 6*** indicates a slight difference in the 2030 population projection compared to the trend projection due to proposed changes in development patterns that would occur as a result of the proposed wastewater management and related land use planning policies.

Table 6
Pilesgrove Township
Sewer Service Area Population Projection (2030)

Year	Units	PPH	Population
Single Family	465	2.9	1,349
Multi-Family	57	2.5	143
Friends Home	67	1.8	121
Bailey Corner Affordable Housing	75	2.5	188
Grandview Park Age Restricted	145	2.0	290
Service Area Totals	**809**	**2.58**	**2,091**
Unsewered Totals	**1,745**	**2.91**	**5,078**
Township Totals	**2,554**	**2.81**	**7,169**
Percent Served			**29.2%**

Source: Alaimo Group; Projection based on implementation of Town Center Extension proposal;

2.3 DESCRIPTION OF THE WASTEWATER MANAGEMENT FACILITIES WITHIN PLANNING AREA

2.3.1 Existing Discharge Permits

A review has been conducted of the NJPDES permit data that is available from the NJDEP. The Discharge to Surface Water (DSW) and Discharge to Groundwater (DGW) permits that involve treatment facilities that are within or impact the Township Planning Area are listed below in ***Table 7***.

Table 7
Pilesgrove Township
Surface/Ground Water Discharge Permits

Owner	Location	Facility Type	Discharge
DSW permits			
Woodstown Sewerage Authority	West Avenue, Woodstown Borough	Publicly Owned Wastewater Treatment Plant	Surface Discharge
Waddington-Richman Inc.	849 Route 40, Pilesgrove Township	Wastewater Treatment Plant	Surface Discharge via marsh
Coastal Service Station	US Route 40	Surface Discharge Private Treatment	Surface Discharge
DGW permits			
Waddington-Richman Inc.	849 Route 40, Pilesgrove Township	Wastewater Treatment Plant	Groundwater Discharge
Four Seasons Campground	158 Woodstown-Daretown Road	Onsite treatment >2000 gpd	Groundwater General Permit

This review determined that there are no publicly owned treatment plants (POTW) in the Township Planning Area. The WSA WWTP is a POTW that serves a limited portion of the Planning Area. In accordance with NJDEP requirements, Treatment Facilities Tables have been prepared for each identified treatment facility.

All existing, new, or expanded industrial pretreatment facilities requiring Significant Indirect User (SIU) permits and/or Treatment Works Approvals, and which are located within the specified sewer service area, are deemed to be consistent.

2.3.2 WSA Wastewater Treatment Plant

The WSA owns and operates the Woodstown Wastewater Treatment Plant (WWTP) located at West Avenue in the Borough of Woodstown which is the only designated publicly owned treatment works (POTW) currently providing service to the Pilesgrove Township Planning Area (see ***Map 2***). The WSA WWTP has a design capacity of 0.530 million gallon per day ("mgd"). ***Table 8*** provides a summary of the WSA WWTP. The treatment facility is not located within the Township Area but serves a portion of the Township.

2.3.3 Waddington-Richman

The Richman's ice cream plant property contains an industrial treatment plant that was used to handle the discharge from the defunct ice cream production plant. All of the wastewater generated by the former commercial/industrial operations was directed to an aerated lagoon and a sedimentation/chlorination basin.

Because the ice cream plant has terminated operations, there has only been one discharge event to the surface water in the last five years. Nevertheless, the facility has a surface water discharge permit for the plant

effluent as well as two groundwater discharge permits for the unlined aerated lagoon that acts as an infiltration/percolation lagoon and as a surface impoundment for stormwater runoff.

Table 9 summarizes the existing facility and provides DSW/DGW permit data. Even though the facility has a permitted discharge rate of 13,000 gpd, the current average discharge rate is about 2,000 gpd. The current influent consists of sanitary waste from three restrooms and a kitchen in the existing restaurant as well as stormwater from the property.

The treatment facility was part of the proposed Kings Road LLC land development. The Developer had proposed that the existing treatment facility be utilized as an interim facility during initial development phases. The Settlement Agreement required the Developer to demonstrate that the NJDEP had approved the facility for domestic wastewater and the specific limits of this interim use. Once the interim time frame had expired, the Developer would have been obligated to direct wastewater to a new treatment facility, to remove the plant facilities, and to restore the site to pre-existing conditions.

2.3.4 Existing Cycle-let Facility

The only other treatment facility within the Planning Area is a pre-treatment facility operated by the Town Center shopping center to substantially reduce the effluent discharge to the WSA conveyance system. *Table 10* summarizes this facility. The WSA has limited the discharge to 6,000 gpd but there have reportedly been frequent excursions to this discharge limit.

2.3.5 Four Seasons Campground

Pilesgrove Township contains a major seasonal campground along its eastern border. According to the County Health Department, the site contains the systems summarized in *Table 11*. Township records indicate that the campground is permitted to handle a maximum of 584 camping units.

The County Health Department Inspector (A. Hopman) has indicated that he is not aware of any problems with these systems. Annual inspections have not indicated any seepage or uplifting. There was a problem with a line break from the laundry house a few years ago that was repaired.

The County Health Department also indicated that the problems associated with fecal coliform levels in the lake may be attributable to wildlife and human activities in the lake area and are not associated with the subsurface disposal systems. The lake was reportedly drained a few years ago and a discharge pipe was detected but it was determined that it was used for groundwater discharge rather than any type of effluent discharge.

The primary concern with the Four Seasons campground with respect to this WMP is that the seasonal discharge is well in excess of 2,000 gpd and for that reason the system needs to be included in the WMP as an exception to the 2,000 gpd limit.

In this regard, it is recommended that the Township require the owner of the facility to provide an engineering report of current conditions and a discussion of future wastewater improvements. The report should also clearly state the management policies with regard to use of the facility since it has been licensed as a seasonal campground but shows evidence of long-term and continuing tenancy. The report should also address how the reported fecal coliform issues in the swimming lake have been or are being addressed.

Table 8
Pilesgrove Township Wastewater Management Plan
Existing Wastewater Treatment Facility Summary
Woodstown Sewerage Authority Wastewater Treatment Plant

Owner of Facility:	**Woodstown Sewerage Authority (WSA**
Operator of Facility:	Woodstown Sewerage Authority (WSA)
Discharge Permit Type	DSW
Treatment Plant Location:	West Avenue, Woodstown, New Jersey, (Intersection of U.S. Route 40/45 at Salem River)
Discharge/Operating Permit Number:	NJ 0022250
Location of Discharge:	Latitude - 39° 38' 58" North; Longitude - 77° 19' 18" West
Name of Receiving Surface Water:	Salem River
Classification of the Receiving Waters:	FW2-NT/SE1
Present Permitted Flow:	0.530 MGD
Present Design Capacity:	0.530 MGD
Population Served	3,600 (2006 Estimate)
Actual wastewater Flow:	0.327 MGD (based on 2004 DMRs)
Projected Wastewater Flow (2027)	0.700 MGD (after expansion)
Treatment Plant Process:	The WSA plant is a secondary treatment plant that utilizes trickling filters and settling tanks to remove pollutants from the wastewater. The treated discharge is sent to sand filtration units and UV disinfection systems for final treatment prior to being discharged into the Salem River.

Table 9
Pilesgrove Township Wastewater Management Plan
Existing Wastewater Treatment Facility Summary
Waddington-Richman Wastewater Treatment Plant

Owner of Facility:	**Waddington-Richman Inc.**
Operator of Facility:	Greene Environmental Services
Discharge Permit Type	DSW; DGW
Treatment Plant Location:	Kings Highway, Pilesgrove Township, New Jersey, NE of U.S. Route 40/Kings Highway Intersection (adjacent to wetlands near Salem River)
Discharge/Operating Permit Number:	NJPDES- DSW: NJ 0004308 NJPDES- DGW: NJ 0100218 Infiltration/percolation lagoon NJPDES- DGW: NJ 0100218 Surface impoundment
Location of Discharge:	Latitude - 39° 39' 34.1" North; Longitude - 75° 21' 31.6" West
Name of Receiving Surface Water:	via marsh to Salem River
Classification of the Receiving Waters:	FW2-NT/SE1
Present Permitted Flow:	0.013 MGD
Present Design Capacity:	0.02 MGD
Population Served	Unspecified; Serves three restrooms and kitchen as well as stormwater from property
Actual wastewater Flow:	Intermittent; One surface water discharge event in last 5 years
Projected Wastewater Flow (2025)	Unspecified; Future of site is unknown; Kings Road LLC is seeking to use the facility as interim disposal facility for up to 46 EDUs or 0.13 MGD
Treatment Plant Process:	All wastewater and stormwater is processed through an influent chamber; transfer pump; aerated lagoon; sedimentation/chlorination basin; discharge pump; Wastewater is generally discharged to the groundwater via unlined aerated lagoon; Maintenance procedures for sedimentation/chlorination basin are established as requirements for a surface impoundment

Table 10
Pilesgrove Township Wastewater Management Plan
Existing Wastewater Treatment Facility Summary
Acme Shopping Center Pre-Treatment Plant

Owner of Facility:	**Woodstown Associates**
Operator of Facility:	Greene Environmental Services
Discharge Permit Type	Discharge to sewer system
Treatment Plant Location:	U.S. Route 40; --feet west of Route 45 intersection
Discharge/Operating Permit Number:	N/A
Location of Discharge:	WSA conveyance system
Name of Receiving Ground Water:	N/A
Classification of the Receiving Waters:	N/A
Present Permitted Flow:	0.06 MGD
Present Design Capacity:	0.06 MGD
Population Served	Serves Town Center shopping center (10.0 acres)
Actual wastewater Flow:	6,000 gpd (excursions reported)
Projected Wastewater Flow (2025)	6,000 gpd
Treatment Plant Process:	Cycle-Let recycling system is used to substantially reduce the effluent discharge; The WSA has allowed a maximum discharge of 6,000 gpd to the conveyance system

Table 11
Pilesgrove Township Wastewater Management Plan
Four Seasons Campground
Community Subsurface Disposal Systems

1. Existing/Proposed Facility	Existing Facility
2. NJPDES Discharge Permit Number	NJG0136221 PI #50538
3. Discharge Permit Type	DGW Category T1
4. Name of Receiving Ground Water	Groundwater Discharge
5. Classification of the Receiving Waters	GW-2
6. Owner of Facility:	Four Seasons Campground Inc.
7. Operator of Facility:	Four Seasons Campground Inc.
8. Co-permittee of Facility	N/A
9. Location of Facility	158 Woodstown-Daretown Road, Pilesgrove, NJ Block 81; Lot 23
10. Location of Discharge	Various onsite locations
11. Present Permitted Flow:	No value
12. Population Served	Campground; 584 potential units
13. Existing/projected wastewater Flow:	No changes proposed
14. Treatment Plant Process:	System 1: 3,500 gallon septic tank with 6,000 square foot leach field serving bathhouses; System 2: 1,000 gallon septic tank with 6 disposal trenches and 284 square foot leach field serving main house; System 3: 1,000 gallon septic tank with 1,620 square foot common disposal field serving 40 campground sites; System 4: 1,500 gallon septic tank; 1,500 gallon pump station; 8,000 square foot disposal field; 4 beds with 2 d-boxes; pump station pumps sewage to disposal field; System 5: 1,500 gallon septic tank with 1,620 square foot disposal field serving laundry house

2.4 PROPOSED CHANGES: SMART GROWTH AREAS

Pilesgrove Township does not currently have a wastewater collection or treatment system under its control. The only existing wastewater collection and treatment services in the Township are those that are being provided by the Woodstown Sewerage Authority (the WSA). Historically, the WSA has sought to limit sewer service in the Township to ensure that the Borough's future wastewater needs will be adequately served.

2.4.1 Center-Based Development

One of the planning objectives of Pilesgrove is to provide for growth in the Township that is Center-based and to do so in a way that reduces the potential for sprawl. This WMP has been structured to support the Township's Plan Endorsement petition that seeks to change the planning area designations of the State Development and Redevelopment Plan to foster this controlled growth. Pilesgrove Township is pursuing a center-based planning policy through the Plan Endorsement process that will conform to the State Plan. The specific proposals are as follows:

- Development of an Agricultural/Industrial node along the Township's western boundary;.
- Establishment of a village center in the Sharptown area;
- Extension of an existing rural town center (Woodstown Borough);

All of these center and node designations are contingent upon the availability of planned infrastructure. The specific nature of each proposal is described below.

2.4.2 Planned Light Industrial (PLI) District

Pilesgrove Township has historically zoned an area in the southwestern corner of the Township for Limited Manufacturing (LM). For a variety of reasons, this zoning did not result in any industrial development. This zoning was reviewed in 2002 as part of a Master Plan Re-examination Report and it was determined that the area had potential for major industrial development but only if it was developed under a General Development Plan (GDP). The GDP approach would ensure that the development was implemented in a comprehensive manner, would provide the protection needed for staged development, and would justify the installation of planned infrastructure.

After the Land Use Plan was amended in February of 2005, this area was re-zoned as Planned Light Industrial (PLI) development. However, the PLI zoning district can only be developed after approval of a General Development Plan (GDP) by the Township Planning Board. A GDP ordinance has been adopted that establishes the GDP submission and review standards.

The Township Land Use Plan envisions that the Planned Light Industrial (PLI) zone would be developed as an agricultural/industrial agriculture node in accordance with the State Plan policies. A Plan Endorsement petition to establish such as node is being pursued concurrent with the preparation of this WMP. The advantages of the PLI district are as follows:

1. Integrated Plan. The potential advantages of the PLI district are that it will be developed under a General Development Plan (GDP) arrangement as an integrated complex;

2. Size. The district is capable of supporting major planned industrial development adjacent to the Salem County smart growth corridor. The district is approximately 430 acres and is capable of supporting approximately 3.6 million square feet of industrial development.

3. Access. The PLI district has excellent highway access. It is located immediately south of U.S. Route 40 ½ mile east of where the dualized road transitions into a two-lane road. It would be anticipated that the roadway would be improved to the site limit.

4. Regional Location. The PLI district is located in an area of excellent regional access. It is six miles east of the Delaware Memorial Bridge; five miles northeast of Exit 1 of the New Jersey Turnpike; 3½ miles southeast of Exit 4 on Interstate 295; ½ mile east of the State Route 48/40 intersection and 14 miles southeast of Commodore Barry bridge.

5. The site has limited environmental constraints relative to other proposed industrial development areas along the corridor. The site is entirely cleared due to its current use as a sod farm. The topography is flat to gently sloping. The wetlands within the area tend to be concentrated along the Salem river corridor that would be well buffered and protected.

6. The district has the potential to serve regional agricultural and transportation interests since it is located on the western fringe of the major agricultural districts in Salem County. It is also located within five miles of a proposed port facility in Carneys Point Township and within 15 miles of the Salem port facility.

7. The potential to be a unique complex that will blend the industrial development into the environment through the use of open space, landscaping, and "green" technologies.

2.4.2.1 Wastewater Disposal

The disposal of the wastewater from the Planned Light Industrial district would require the construction of an onsite treatment plant to treat the wastewater and to satisfy current standards for subsurface disposal as a beneficial reuse. The treatment plant would be constructed in modules to enable incremental treatment plant expansion as the demand increases. The area needed for the treatment plant would be between two and ten acres. The treated effluent would be disposed of using a subsurface drip system under the beneficial reuse guidelines. The actual area required for the disposal field would be dependent upon the soil characteristics and the actual amount of effluent generated. The prospective developer's engineer has estimated that the disposal area would be in the 10 to 60 acre range. The project site contains soils, which have the potential for surface infiltration suitable for beneficial reuse applications.

Table 12
Planned Light Industrial (PLI) Wastewater Projection

Category	Square Footage	Employees	Flow rate	Projected Flow
Sanitary Wastewater	3,641,000	3,641	25 gpd/employee	91,025 gpd
Process Wastewater	3,641,000	3,641	0.25 gpd/ SF	910,250 gpd
Total Wastewater	**3,641,000**	**275 gpd/employee**	**3.63 gpd/SF**	**1,001,275 gpd**

Notes: 1. Projected employees based on 1 employee per 1,000 square feet.
2. Process wastewater based on wastewater needs of food processing industry.

2.4.2.2 Project Development

A GDP application previously submitted to the Township Planning Board for review is not being pursued. Consequently, the Township is recommending that the PLI District not be included in the Future Sewer Service Area of Wastewater Management Plan at this time. Any future inclusion would require a site specific amendment to the WMP.

2.4.3 Sharptown Village Center

The existing settlement area known as Sharptown is located at the intersection of U.S. Route 40 and Kings Highway (C.R. #620). The existing development is primarily located to the south of Route 40 in a compact development pattern. The crossroads settlement area consists of about 80 residential units, a church, a restaurant, and several small commercial establishments. All of the existing land development in the Sharptown settlement area relies on individual wells and individual subsurface septic systems. Lot sizes ranges from 10,000 to 30,000 square feet and average less than 20,000 square feet.

The only existing water and sewer infrastructure within the settlement area are the facilities that were developed to serve the former Richman's ice cream plant. Although the industrial and commercial components of the Richmans' facility have now closed, the Site retains a permitted industrial treatment plant permit and two potable wells. These facilities were developed solely to serve the process and domestic wastewater from Richman's restaurant and ice cream plant and not any offsite uses.

2.4.3.1 Kings Road LLC Project

In October of 2002, a land development entity known as Kings Road LLC filed a Mount Laurel lawsuit seeking a builders' remedy. The litigation known as *Kings Road LLC v. Pilesgrove Township* culminated in a 2007 Settlement Agreement. In general, the proposed development under the Settlement Agreement would have entailed a maximum of 96 single-family dwelling units and approximately 35,000 square feet of neighborhood commercial development and would have been served by public water and sewer facilities constructed by the developer.

Project Site

The Kings Road LLC project site included Block 29, Lots 12 & 17 and Block 25, Lots 10 & 11 on the Pilesgrove Township tax assessment map and encompassed about 120.8± acres. These land parcels are no longer controlled by the Developer. The land to the west of Kings highway has been sold and the option agreement for the Richmans' property has expired. Nevertheless, the Settlement Agreement remains in force until 2013 and the reference to the Kings Road project site herein refers to the parcels listed above.

Water Supply.

The Kings Road project site included two existing potable wells that are screened in the PRM aquifer. These wells have a reported yield of at least 285 gpm. Under the Settlement, the Developer was obligated to maintain two wells on the project site tapping into the same formation and having the same yield; comply with all relevant regulations pertaining to water supply; and provide a 100,000 gallon water supply standpipe.

Wastewater

The Kings Road project site included the existing Richmans' treatment plant, which was designed to accept process wastewater from the former ice cream plant as well as sanitary waste from employees and patrons of the restaurant. The Developer was obligated to permit, design, construct, and start-up a new wastewater treatment plant that would have been capable of serving the project site and adjacent residences on the north side of US Route 40 as well as the capability to serve the existing settlement area and minor in-fill or new development within the proposed Sharptown village center.

Table 13 is a wastewater flow projection for the proposed wastewater treatment facility that would have been constructed within the Kings Road project site. ***Table 14*** presents the capital cost estimate of constructing the two-train wastewater treatment plant prepared by the Developer.

The first train would have had a capacity of 35,000 gpd and would have served the Kings Road project. Most of the basic costs of the treatment plant including the site improvements, the treatment building and concrete tanks, the power supply, and the effluent discharge system would have been constructed by the Developer. Under the Settlement Agreement, the Developer would have been obligated to provide the capital construction cost for the basic treatment plant that was estimated to be slightly over $1 million.

The Township would have had the option of constructing the second train in the future to serve the existing crossroads settlement. This treatment plant option would have offered the opportunity for a more environmentally sound method of wastewater disposal than the existing septic systems. If the extension of sewers into the village was determined to be economically feasible, the Township could have installed the treatment equipment in the second train. ***Table 14*** indicates that the cost of installing the equipment, the offsite pump station, and the conveyance force main for the optional second train would have been $530,000.

Interim Facility

The Settlement Agreement provided for limited, short-term use of the existing Richman's wastewater treatment plant prior to start-up of the new treatment plant. The terms of this limited use were as follows:

- The Developer would have been obligated to secure NJDEP approval of the interim arrangement designed to serve at least forty six (46) residential units;
- The Developer would utilize the interim facility to serve a maximum of 46 equivalent dwelling units for a period of no more than two years after the C.O. was issued;
- The building permit for the 47th dwelling unit would not have been issued until the new Sewer Facilities were receiving wastewater flow from all constructed units within the project;
- No surface water discharge during the interim period would have been permitted.

Treatment Facility Closure

The Settlement Agreement provided for the termination, removal, and proper closure of the existing Richman's treatment plant after the interim use had ended and the restoration of the site to a natural condition. The specific provisions of the Settlement Agreement in this respect are as follows:

- The Developer would have been obligated to remove the Richman's facility within 180 days of the start-up of the new Sewer facilities and to fully restore the site to a natural condition in accordance with all applicable statutes and regulations of the NJDEP;
- The building permit for the 70th dwelling unit would not have been issued until the Richman's facility had been shut down and removed. If the Richman's facility had not been closed and removed at that time, the Township would have had the right to remove the Richman's facility and to restore the site by drawing on the performance guarantee established for that purpose.

Township Obligations

Under the Settlement Agreement, the Township was obligated to amend its Land Use and Housing Plan elements and its Land Development Ordinance to create a Planned Residential Development (PRD-1) zoning district; prepare a Township-wide wastewater management plan that provides for the Kings Road project to be within a sewer service area; support the Developer in securing the necessary permits; and grant a franchise to the developer for the water and sewer systems.

The Township did amend its master plan elements and its land development ordinance in accordance with the Settlement Agreement and is bound to retain that zoning for a six-year period. **The Township also prepared a draft WMP in conformance with the Agreement to support the inclusion of the Kings Road project site within the Future Sewer Service Area. The Township is petitioning the Court remove this project from its adopted Housing Plan. If the Court approves this action, the Kings Road Project Site should not be included in the Future Sewer Service Area.**

Franchise

The Settlement Agreement stipulated that Pilesgrove Township was to grant Kings Road LLC a franchise for the water and sewer systems. While the timing of this designation was not specified, the Township would have granted a franchise to allow the Developer to serve as the water and sewer purveyor for the Kings Road property plus adjacent lots on the north side of US Route 40 by ordinance after the endorsement of this WMP by the Township Committee. Since the Developer no longer controls the Kings Road project site, the granting of a franchise to the Developer is a moot issue.

Ownership/Management

The Settlement Agreement provided for the new treatment plant to be permitted, constructed, and operated by the Developer or a qualified substitute owner. The capital cost of developing the plant would not have been passed on in any user rates. The Township would have had the option, but not the obligation, to acquire the plant at any time for $1.

Kings Road User Fees

The Developer had prepared a pro forma for the sewer system to indicate the estimated sewer rate structure. Based on preliminary information, the Developer's engineer had projected an annual sewer rate of $840.00 per year (see ***Table 15***). This figure does not include the capital cost of developing the collection and treatment system, which under the Settlement Agreement could not be passed on to the users. While an interim rate would have been established prior to the formal BPU petition, the Developer indicated that it would bear the actual deficiencies in operating revenue until final tariff was approved by the BPU.

The developer has estimated that prospective homeowners in the Kings Road development will have a family income of about $130,000 per year. Based on this estimate, the annual sewer rate will be 0.65% of annual income, which is well within NJDEP guidelines.

The Kings Road developer also projected operating costs in the event that existing Sharptown residences were included in the system. Based on an additional 65 users, the operating cost per unit would be reduced significantly to about $618 per equivalent dwelling unit on an annual basis. This figure does not include the capital cost of constructing the collection and treatment system for Sharptown. Nonetheless, it is evident that the addition of Sharptown has the potential to lower the average annual operating costs by defraying the basic operating costs over a larger base.

The Developer provided a pro forma for the water system and projected an annual water bill of $707.24 or 0.54% of the estimated annual household income. The combined water and sewer rate estimates would have been $1,551.24 or 1.19% of the estimated household income.

Effluent Discharge

The Developer had proposed to discharge the treated effluent into the Navesink and Hornerstown formation after ultra-violet disinfection. These formations function as leaking confining units (aquicludes) for the Wenonah Formation and the Mount Laurel aquifer.

2.4.3.2 Proposed Sharptown Village Center

Based on the fact that the Kings Road Developer no longer controls the project site and is no longer pursuing the land development project described in the Settlement Agreement, the Township intends to pursue the designation of a more limited Sharptown Village Center during the Plan Endorsement process. The limits of the proposed Village Center are to include the existing settlement area, and the former Waddington/Richman land holdings on both sides of King's Highway. The objective of the Village Center designation is to recognize the importance of the crossroads settlement, and to support limited development and redevelopment in this Village Center. The maximum number of residential units in the proposed Village Center would be 150 dwelling units.

With regard to wastewater treatment, the Township would support the use of innovative or community systems that would improve the environmental quality of the treatment systems in the designated Village. This objective could be achieved in a number of ways. **However, the Sharptown Village center is not proposed to be included in the Future Sewer Service Area of the County WMP until the means of wastewater treatment are clearly defined. At that time, an amendment to the WMP could be pursued, if necessary.**

2.4.4 Woodstown Town Center Extension

The WMP proposes that the WSA infrastructure be expanded to serve growth in the immediate vicinity of the Borough under a non-contiguous clustering or development rights transfer provision. This approach will support the economic growth of the Woodstown Town Center, encourage compact development, protect environmental resources, and preserve farmland in the Center environs. The Town Center Extesnio is further described in the Township's self-assessment report.

A Woodstown Town Center extension has been proposed in which compact development would be encouraged by an overlay zoning district provided that the developer acquires the necessary development rights from other parts of the Township. By acquiring these rights and preserving the lands in the environs of the Town Center, the Developer will enhance the town center approach to growth management. However, the wastewater collection and treatment services in the receiving area must be capable of meeting the center-based growth potential before there is an expressed need. The key policies of the WMP are as follows:

- Planned Infrastructure would be extended to serve portions of Pilesgrove Township where compact development is to be encouraged;
- The WSA WWTP would be expanded under an inter-local services agreement with Pilesgrove Township. The cost of the capital expansion would be covered by connection fees for land development within the overlay zone without exceeding the stream's assimilative capacity;
- The available capacity in the Township would be primarily allocated to residential development based on a transfer or clustering of development rights;

The anticipated smart growth implementation process would be as follows:

- The Town Center extension concept would be approved by the Office of Smart Growth (OSG) during the Plan Endorsement process,
- The County WMP would define the long-term service needs of the region based on this controlled growth scenario;
- The County WMP would define the phased sewer service area expansion;

- An inter-local agreement would be entered into between the Borough and Township that would define the bulk services purchase arrangement;
- The overlay zoning providing for the transfer of development rights would be adopted;
- Facility improvement plans would be implemented by the service provider based on the inter-local services agreement and Township developer agreements.

2.4.4.1 Outline of Inter-local Services Agreement

The key terms of an inter-local services agreement would be as follows:

1. The excess reserve capacity that was purchased by Salem County in 1991 would be re-acquired by the WSA. This capacity is needed to serve the development and redevelopment within Woodstown and could be considered a stranded public investment. The reserve capacity would be re-acquired at a price comparable to its prior sale on an incremental basis. It is anticipated that if the reserve capacity were re-procured, Woodstown would be capable of satisfying its development needs for the foreseeable future with the existing WTP.

2. Once the Office of Smart Growth approves the Woodstown Town Center Extension, Pilesgrove Township would enter into an agreement with the WSA for the expansion of the Woodstown treatment plant. The permit design flow capacity is anticipated to be at least 700,000 gpd, which would enable future growth in Pilesgrove and Woodstown that contributes to the town center extension. The terms of the agreement would provide for the WSA to recoup the capital upgrade cost ether through connection fees or other means. The capital upgrade cost would also include any capital improvements to the existing facility to enable it to operate without increasing the discharge loading on the stream. If an increased loading is necessary, it would need to be demonstrated that the discharge parameters are within the assimilative capability of the stream. Pilesgrove Township would have the ability to transfer the capital costs to developers through the issuance of sewer permits.

3. The differential costs of operating the treatment plant at a higher treatment efficiency would be offset by the increased cost-efficiency of spreading fixed operating costs over a larger number of users. If that were not the case, the Agreement would need to address the differential operating costs of an upgraded facility.

4. The agreement would stipulate that the increased allocation afforded to Pilesgrove Township would be used for the purpose of allowing clustering at higher density than would otherwise be possible with the understanding that the necessary development rights would be acquired from the Town Center Environs within specified farmland preservation areas.

2.4.4.2 Woodstown Buildout

Woodstown's professional planner, Leah Furey, P.P. has prepared a build-out analysis of the Borough based on current zoning. The results of the analysis are duplicated in ***Table 16***. As the Table indicates, it is projected that the current zoning would enable a maximum of 341 new units to be developed in the Borough generating 101,250 gpd of wastewater. In addition, the current zoning would enable a maximum of 160,544 square feet of commercial development generating 22,554 gpd and 38,600 square feet of industrial development generating 2,920 gpd. Woodstown also has three redevelopment areas that could generate an additional 124.700 square feet of commercial development with a projected wastewater flow of 33,420 gpd. It is estimated that the current allocation to the redevelopment areas accounts for about 3,400 gpd for a net potential increase of 30,000 gpd.

2.4.4.3 Pilesgrove Trend/Alternate Projection

Tables 17-19 provide a projection of future growth based on current trends in the Township. For this projection, it is assumed that recent residential growth patterns will continue and that the only facilities that would be sewered would be the projects listed in the adopted Housing Plan 2010 Update that was the basis of the Judgment of Compliance and Repose including the Bailey Corner affordable housing project, the proposed Grandview Park age-restricted project and a possible future municipally sponsored affordable housing project. The result of these assumptions is that only 236 additional units would be sewered over the next twenty years. Individual Subsurface Disposal Systems (ISDDS) would serve all of the remaining residential units.

Currently, only 116 units or 8% of all the dwelling units in Pilesgrove Township are served by a centralized sewer conveyance and treatment system. The result of the trend projection is that a total of 352 units or about 14% of the 2,434 projected units in the Township would be sewered in 2030. In other words, the number of ISSDS would increase by 760 units over the next twenty years. The population relying on septic systems is projected to be about 6,060 persons in 2030. ***Table 20*** provides a trend population projection based on the assumptions in the adopted housing plan update through 2018 and a trend extrapolation of growth to 2030. Based on these assumptions, the Township would have a population of 6,892 persons at the end of 2030.

Table 21 is a complete buildout projection for the area in Pilesgrove being considered for inclusion in the Woodstown Town Center extension. The key emphasis is on residential development since the intention is to require developers to acquire development rights that may be clustered within the smart growth area in exchange for preserved lands in the environs around the town center extension. As ***Table 14*** indicates, it is projected that about 1,000 units could be developed around Woodstown at a density comparable to that in the Borough. At least one age restricted development is also assumed. The projected wastewater flow rate is estimated to be about 246,000 gpd for the residential development areas.

Table 21 also projects that commercial and light industrial development areas to the east of Woodstown have the potential to generate about 960,000 square feet of non-residential development. It is anticipated that this development will be handled by ISSDS or by community septic systems or package treatment plants rather than interconnection to the WSA at this time.

Tables 22-24 provide a detailed projection of future residential growth based on the proposed Woodstown Town Center extension. The key conclusions of the projections are as follows:

- The implementation of the Town Center extension would be extended over a long period of time. While the initial phase within the extension area is projected to be occupied in 2015, substantive development from this approach is projected to be in about 10 years.

- It is assumed that 20-30 new dwelling units per year after 2018 would rely on ISSDS and the remainder would be sewered;

- The cluster alternative would result in more development during the study period due to the compact nature of development and the fact that the concept may be more attractive to builders than the conventional approach. The increased number of units is estimated to be 120 units over the trend projection to 2030. While the number of units may be slightly increased, the alternative would result in the preservation of about 3,000 acres of additional land.

- Based on these assumptions, it is projected that 60% of the new units constructed in the Township over the next twenty years would be sewered and that the remaining 417 units would be on ISSDS;

- The Town Center extension concept is dependent upon the availability of sewerage for the 693 units in the Woodstown area or 543 units more than that under the trend projection;

- ***Table 25*** is a long-term population projection for the Township based on the non-contiguous clustering or TDR alternative. The projected population at the end of 2030 is 7,152 persons or a 70% increase over the current population.

2.4.4.4 Wastewater Allocation

Table 26 provides a breakdown of the projected wastewater allocation between Woodstown Borough, Pilesgrove Township, and the County of Salem. The key components of this allocation are as follows:

- The existing flow is estimated to be about 365,000 gpd based on recent discharge monitoring reports (DMRs);

- The committed and reserved flow is estimated to be 465,500 gpd when approved projects including the Bailey Corner affordable housing and commercial redevelopment project and the excess reserve capacity assigned to Salem County are considered;

- The remaining capacity at the existing WWTP would be committed to the Woodstown water filtration plant, further development within the Borough limits, and the proposed Grandview Park project in Pilesgrove;

- In order to maximize the capacity available to the Borough for land development and to maximize the use of the public investment in the WSA WWTP, ***Table 26*** indicates that 65,000 gpd of reserve capacity would be re-procured from the County;

- The expansion of the WSA WWTP would make about 145,000 gpd available for land development within and around the Town Center; ***Table 26*** indicates that a maximum of 41,000 gpd would be available to Woodstown Borough to complete the build out of the Borough and that the remaining 101,070 gpd would be available for land development near the Borough under the Town Center Extension.

- While ***Table 26*** indicates the need for over 220,000 gpd to handle residential and related development for the long-term future, the projected wastewater allocation would be adequate for the town center extension phasing until about 2016.

2.4.4.5 Woodstown rates

The minimum sewer rate per EDU in Woodstown is $533 per year. The actual charge is calculated using a basic charge of $425 per year plus 60% of the annual water bill. For the average homeowner, the annual sewer rate is about $750 per year.

Table 13

Pilesgrove Wastewater Management Plan

Sharptown Village Wastewater Flow

Train #1 (Kings Road)			
Residential	**Units**	**GPD/Unit**	**Projected Flow**
North Route 40	8	300	2,400
Kings Road PRD	96	300	28,800
Commercial	**SF**	**GPD/SF**	**Projected Flow**
Kings Road Commercial	38,000	0.1	3,800
Total Projected Wastewater			**35,000**

Train #2 (Future Sharptown)			
Residential	**Units**	**GPD/Unit**	**Projected Flow**
South Route 40	72	300	21,600
Future Residential	24	300	7,200
Commercial	**SF**	**GPD/SF**	**Projected Flow**
Future Commmercial	62,000	0.1	6,200
Total Projected Wastewater			**35,000**

Note: The second train will only be utilized if determined to be in the interest of the Township.

Table 14
Proposed Kings Road/Sharptown Treatment Plant
Capital Cost Estimate

	Kings Road LLC First Train(35,000 gpd)				*Sharptown/Kings Road LLC. Two Trains (70,000 gpd)*		
Line Item	**Unit**	**Quantity**	**Unit Price**	**Line Cost**	**Quantity**	**Unit Price**	**Line cost**
Wastewater treatment components	LS	1	$294,511.00	$294,511.00	1	$294,511.00	$294,511.00
Concrete Tanks	LS	1	93,000.00	$93,000.00	N/A	N/A	N/A
Equipment installation	LS	1	85,000.00	$85,000.00	1	85,000.00	$85,000.00
Chain Link Fencing	LF	400	30.00	$12,000.00	N/A	N/A	N/A
Auxilliary Power	LS	1	32,200.00	$32,200.00	N/A	N/A	N/A
Electric Service/Panel box/controls	LS	1	25,000.00	$25,000.00	N/A	N/A	N/A
Building	SF	3,608	30.00	108,240.00	N/A	N/A	N/A
Site Restoration	LS	1	15,000.00	$15,000.00	N/A	N/A	N/A
Fine screening equipment	LS	1	70,000.00	$70,000.00	N/A	N/A	N/A
Boring under route 40	LF	N/A	N/A	N/A	100	400.00	$40,000.00
Force main	LF	N/A	N/A	N/A	1,800	25.00	45,000.00
Aquifer Recharge	LS	1	285,000.00	$285,000.00	N/A	N/A	N/A
Offsite Pump Station		N/A	N/A	N/A	1.00	50,000.00	$65,000.00
Developer Capital Cost Subtotal				$1,019,951.00			
Township Capital Cost Subtotal							$529,511.00
EDUs				115			115
Capital Cost/EDU				**$8,869.14**			**$4,604.44**

Source: Kings Road LLC (Train #1); Alaimo Group (Train #2)

Table 15
Proposed Kings Road/Sharptown Treatment Plant
Annual Operating Cost Estimate

Scenario	Kings Road Start-up	Kings Road Start-up	Kings Road Residential	Kings Road Final	Sharptown Residential
Equivalent Units	20	45	75	115	180
GPD	6,000	13,600	22,500	34,500	54,000
Line Item					
Electric	$2,400.00	$5,200.00	$8,600.00	$13,800.00	$21,291.43
Insurance	10,000.00	10,400.00	10,816.00	11,248.64	12,000.00
Vehicle insurance	1,800.00	1,872.00	1,946.88	2,024.78	1,800.00
Telephone Answering Service	500.00	520.00	540.80	562.43	500.00
Telephone-Dedicated Fax	300.00				300.00
Telephone Fax	500.00	520.00	540.80	562.43	500.00
Office Telephone	600.00	624.00	648.96	674.92	600.00
Heat,electricity (building, pump static	2,000.00	2,080.00	2,163.20	2,249.73	2,000.00
Licensed operator	2,500.00	2,600.00	2,500.00	2,600.00	2,704.00
Field Personnel	5,000.00	5,200.00	15,000.00	15,600.00	15,600.00
Office Accounts Clerk	5,000.00	5,200.00	10,000.00	10,400.00	10,400.00
Office Manager	5,000.00	5,200.00	10,000.00	10,400.00	10,400.00
Postage, Monthly billing, etc.	600.00	700.00	800.00	832.00	1,500.00
Office Supplies	400.00	416.00	432.64	449.95	750.00
Computer	500.00	520.00	540.80	562.43	750.00
Vehicle expenses	2,500.00	2,600.00	2,500.00	2,600.00	2,500.00
Vehicle registration	160.00	166.40	125.00	130.00	125.00
Laboratory tests	3,500.00	3,640.00	3,785.00	3,937.02	3,500.00
NJDEP Annual fees	600.00	600.00	600.00	624.00	600.00
NJ-BPU Assessment	500.00	500.00	500.00	500.00	0.00
Accounting (including BPU Report)	750.00	780.00	811.20	843.65	1,000.00
Professional fees	3,500.00	3,500.00	3,500.00	3,640.00	5,000.00
Property taxes	1,500.00	1,560.00	1,622.40	1,687.30	0.00
Other taxes -Payroll etc.	2,250.00	2,340.00	5,250.00	5,460.00	5,678.40
Gross Receipts & Franchise taxes	1,230.60	5,537.70	9,967.86	14,151.90	0.00
Small tools & small parts	350.00	364.00	378.56	393.70	750.00
Maintenance & repairs	5,000.00	5,200.00	5,408.00	5,624.32	5,000.00
Miscellaneous	750.00	780.00	811.20	843.86	1,000.00
Sludge removal & disposal	2,000.00	2,080.00	2,163.20	2,249.73	5,000.00
Annual Operating Costs	$61,690.60	$70,700.10	$101,952.50	$114,652.79	$111,248.83
O&M Cost per unit	3,084.53	1,571.11	1,359.37	996.98	618.05
Equivalent Dwelling Units	20	45	75	115	180
Annual Charge	840.00	840.00	840.00	840.00	618.00
Estimated Annual Revenue	$16,800.00	$37,800.00	$63,000.00	$96,600.00	$111,240.00
Net Income	-$44,890.60	-$32,900.10	-$38,952.50	-$18,052.79	-$8.83

Table 16
Pilesgrove Township Wastewater Management Plan
Woodstown Buildout

Residential

Block	Lot	Zone	Acres	Density (Avg.)	Max. Units	Rate/Unit	Projected Flow	Comments
15	29	R-6	17.2	2.7	47	300	14,100	
15	2	R-6	19.8	2.7	54	300	16,200	
15	3	R-6	8.8	2.7	24	300	7,200	
50	6	R-5	12.0	10.0	120	300	36,000	Proposed agreement
51	10	R-5	16.5	2.1	34	300	10,200	Reduced buildout; wetlands;
45	13	R-5	1.2	3.4	4	300	1,200	Remote location; Category one watershed
46	6	R-5	5.7	2.1	12	300	3,600	Approved
46	5	R-5	11.3	2.7	30	300	9,000	Remote location; Category one watershed
40	49		7.0	2.3	16	235	3,750	Affordable Housing Project
Total Residential			99.5		341		**101,250**	

Commercial

Block	Lot	Zone	Acres	FAR	Floor Area	Flow Rate	Projected Flow	Comments
51	12	C-3	3.8	0.23	37,800	0.10	3,780	
51	12	C-3	4.8	0.23	47,800	0.10	4,780	
43	1	C-3	6.2	0.23	62,400	0.20	12,740	Includes restaurant
40	45	LC	0.5	0.30	5,880	0.10	588	
40	46	C-2	0.5	0.30	6,664	0.10	666	
Total Commercial			15.8		160,544		**22,554**	

Commercial Redevelopment

24	1,2,3,19,20,21	Area 3	3.4	0.10	14,700	0.19	2,770	Includes restaurant
18	29,30,31,32,34	Area 2	5.2	0.29	65,000	0.16	10,150	Includes restaurant
20	14,15,27,28,37	Area 1	4.6	0.22	45,000	0.46	20,500	Includes restaurant; health club
Deduct existing allocation							-3,420	
Total Redevelopment Areas			13.2		124,700		**30,000**	

Industrial

Block	Lot	Zone	Acres	FAR	Floor Area	Flow Rate	Projected Flow	Comments
14.01	1	LI	3.9	0.23	38,600	0.08	2,920	73 employees
Total Industrial			3.9		38,600		**2,920**	
Total Projected Wastewater Flow (2007-2027)							***156,724***	

Table 17

Pilesgrove Township Trend Projection

Projected Dwelling Units

	Year																							
Property				0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Totals
Bailey Corner				75																					75
Musumeci Tract										15	15	15	15	15	15	15	15	15	10						145
Unspecified Site																			5	11					16
	0	*0*	*0*	*75*	*0*	*0*	*0*	*0*	*0*	*15*	*15*	*15*	*15*	*15*	*15*	*15*	*15*	*15*	*15*	*11*	*0*	*0*	*0*	*0*	*236*

Table 18

Pilesgrove Township Trend Projection

Wastewater Flow Projection

Property				0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Totals
Bailey Corner				12,220																					12,220
Musumeci Tract										3,150	3,150	3,150	3,150	3,150	3,150	3,150	3,150	3,150	2,100						30,450
Unspecified Site																			1,050	2,310					3,360
New Flow	*0*	*0*	*0*	*12,220*	*0*	*0*	*0*	*0*	*0*	*3,150*	*3,150*	*3,150*	*3,150*	*3,150*	*3,150*	*3,150*	*3,150*	*3,150*	*3,150*	*2,310*	*0*	*0*	*0*	*0*	*46,030*
Cum Flow	34,800	34,800	34,800	47,020	47,020	47,020	47,020	47,020	47,020	50,170	53,320	56,470	59,620	62,770	65,920	69,070	72,220	75,370	78,520	80,830	80,830	80,830	80,830	80,830	

Table 19

Pilesgrove Township Trend Projection

Sewer/Individual Subsurface Disposal System Projection

				0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Totals
New WSA SSA Units	0	0	0	75	0	0	0	0	0	15	15	15	15	15	15	15	15	15	15	11	0	0	0	0	*236*
New Kings Road Units	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*0*
New Sewered Units	0	0	0	75	0	0	0	0	0	15	15	15	15	15	15	15	15	15	15	11	0	0	0	0	*236*
New ISSDS Units	9	6	1	-1	4	11	32	32	40	38	29	30	34	35	36	37	38	39	40	45	57	58	59	60	*769*
Total New Units	**9**	**6**	**1**	**74**	**4**	**11**	**32**	**32**	**40**	**53**	**44**	**45**	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**	*1,005*
Cum. Sewered Units	116	116	116	191	191	191	191	191	191	206	221	236	251	266	281	296	311	326	341	352	352	352	352	352	
Cum. ISSDS Units	1,322	1,328	1,329	1,328	1,332	1,343	1,375	1,407	1,447	1,485	1,514	1,544	1,578	1,613	1,649	1,686	1,724	1,763	1,803	1,848	1,905	1,963	2,022	2,082	
Cum. Total Units	1,438	1,444	1,445	1,519	1,523	1,534	1,566	1,598	1,638	1,691	1,735	1,780	1,829	1,879	1,930	1,982	2,035	2,089	2,144	2,200	2,257	2,315	2,374	2,434	
Percent Sewered	8.1%	8.0%	8.0%	12.6%	12.5%	12.5%	12.2%	12.0%	11.7%	12.2%	12.7%	13.3%	13.7%	14.2%	14.6%	14.9%	15.3%	15.6%	15.9%	16.0%	15.6%	15.2%	14.8%	14.5%	
Percent UnSewered	91.9%	92.0%	92.0%	87.4%	87.5%	87.5%	87.8%	88.0%	88.3%	87.8%	87.3%	86.7%	86.3%	85.8%	85.4%	85.1%	84.7%	84.4%	84.1%	84.0%	84.4%	84.8%	85.2%	85.5%	

Table 20

Pilesgrove Township

Trend Population Projection

Year	*Begin*	*Net New*	*PPH*	*Persons*	*End*
2007	4,157	9	2.91	26	4,183
2008	4,183	6	2.91	17	4,201
2009	4,201	1	2.91	3	4,204
2010	4,204	74	2.26	167	**4,371**
2011	4,371	4	2.91	12	4,382
2012	4,382	11	2.91	32	4,414
2013	4,414	32	2.91	93	4,508
2014	4,508	32	2.91	93	4,601
2015	4,601	40	2.91	116	4,717
2016	4,717	53	2.65	140	4,858
2017	4,858	44	2.60	114	4,972
2018	4,972	45	2.40	108	5,080
2019	5,080	49	2.63	129	5,209
2020	5,209	50	2.64	132	**5,341**
2021	5,341	51	2.64	135	5,475
2022	5,475	52	2.65	138	5,613
2023	5,613	53	2.65	140	5,754
2024	5,754	54	2.66	144	5,897
2025	5,897	55	2.74	151	6,048
2026	6,048	56	2.91	163	6,211
2027	6,211	57	2.91	166	6,377
2028	6,377	58	2.91	169	6,546
2029	6,546	59	2.91	172	6,717
2030	6,717	60	2.91	175	**6,892**
Total (2007-2030)		1,005		2,735	

Table 21
Woodstown Town Center Extension
Projected Buildout of Development Area

Residential

Block	*Lot*	*Property*	*Gross Area*	*Net Area*	*Density*	*Units*	*Factor*	*GPD*	*Comments*
North									
26	4	Musumeci/Township	85.4	38.2	3.8	145	210	30,444	Restricted; SSA
28	2	Route 45 West	4.0	4.0	2.5	10	300	3,000	Rezone; SSA
28	2.07	Route 45 West	6.4	6.4	2.5	16	300	4,800	Rezone; SSA
28	8	Route 45 West	33.2	25.0	2.5	63	300	18,900	Rezone; SSA
13	17	Route 45 East	15.0	10.0	2.5	25	300	7,500	Rezone; SSA
13	13	Route 45 East	27.0	25.0	2.5	63	300	18,900	Rezone; SSA
13	13.01	Route 45 East	30.7	10.0	2.5	25	300	7,500	Rezone; SSA
39	2	Davis Tract	113.4	113.4	2.5	280	300	84,000	Rezone; SSA
Subtotal				*232.0*	*2.7*	*627*		*175,044*	
West									
63	1	Bailey Street Project	6.8	6.8	11.0	75	161	12,220	Approved SSA
65	6	Bailey Street East	17.5	17.5	6.0	105	220	23,100	Rezone; SSA
65	4	Wawa Tract	28.5	9.5	6.0	57	220	12,540	Rezone; SSA
Subtotal				*27.0*	*8.8*	*237*		*35,640*	
RESIDENTIAL TOTAL				***299.9***		***864***		***210,684***	

Commercial

Block	*Lot*	*Property*	*Gross Area*	*Net Area*	*FAR*	*Square Feet*	*Factor*	*GPD*	*Comments*
East									
40	12.07	HC3-Route 40 East	12.8	4.0	0.15	26,136	0.1	2,614	ISSDS
40	12	HC3-Route 40 East	7.0	3.5	0.15	22,869	0.1	2,287	ISSDS
40	12.11	HC3-Route 40 East	26.4	13.2	0.15	86,249	0.1	8,625	ISSDS
40	13	HC3-Route 40 East	55.3	7.5	0.15	49,005	0.1	4,901	ISSDS
38	2.04	HC3-Route 40 East	15.4	7.7	0.15	50,312	0.1	5,031	ISSDS
79	1	HC3-Route 40 East	24.5	5.0	0.15	32,670	0.1	3,267	ISSDS
Subtotal				*40.9*		*267,241*		*26,724*	ISSDS
West									
64	5.01	HC3-Route 40 East	40.8	7.0	0.15	45,738	0.1	4,574	ISSDS
65	1	HC3-Route 40 East	28.5	4.0	0.15	26,136	0.1	2,614	ISSDS
Subtotal				*11.0*		*71,874*		*7,187*	ISSDS
COMMERCIAL TOTAL				***51.9***		***339,115***		***33,911***	

Industrial

Block	*Lot*	*Property*	*Gross Area*	*Net Area*	*FAR*	*Square Feet*	*Factor*	*GPD*	*Comments*
East									
40	12.07	PLI-Route 40 East	12.8	6.0	0.2	52,272	0.07	3,659	Rezone; ISSDS
40	12	PLI-Route 40 East	7.0	3.5	0.2	30,492	0.07	2,134	Rezone; ISSDS
40	12.11	PLI-Route 40 East	26.4	13.2	0.2	114,998	0.07	8,050	Rezone; ISSDS
40	13	PLI-Route 40 East	55.3	7.5	0.2	65,340	0.07	4,574	Rezone; ISSDS
40	20	PLI-Route 40 East	22.5	13.5	0.2	117,612	0.07	8,233	Rezone; ISSDS
38	2.04	PLI-Route 40 East	15.4	7.7	0.2	67,082	0.07	4,696	Rezone; ISSDS
79	1	PLI-Route 40 East	24.5	10.0	0.2	87,120	0.07	6,098	Rezone; ISSDS
79	2	PLI-Route 40 East	19.4	10.0	0.2	87,120	0.07	6,098	Rezone; ISSDS
INDUSTRIAL TOTAL				***71.4***		***622,037***		***43,543***	Rezone; ISSDS

Institutional

Block	*Lot*	*Property*	*Gross Area*	*Net Area*	*New Students*	*Factor*	*GPD*	*Comments*
East								
36	17	School-Rt. 40 East	23.8	23.8	250	25	6,250	Sewer
INSTITUTIONAL TOTAL							***6,250***	

Summary	
Residential	210,684
Institutional	6,250
Total Wastewater Flow	**216,934**
Commerical	33,911
Light Industrial	43,543
Total ISSDS	**77,454**

Table 22
Woodstown Town Center Extension
Projected Dwelling Units

Property	Year																							
	2007	2008	2009	0 2010	1 2011	2 2012	3 2013	4 2014	5 2015	6 2016	7 2017	8 2018	9 2019	10 2020	11 2021	12 2022	13 2023	14 2024	15 2025	16 2026	17 2027	18 2028	19 2029	20 2030	Totals
Bailey Corner				75																				75
Musumeci Tract										15	15	15	15	15	15	15	15	15	10					145
Davis Tract									20	19	15	15	15	15	15	15								129
Route 45 West																	14	15	18	15	15	12		89
Route 45 East																	15	15	15	15	15	15	15	113
Bailey Street East																				7	9	12	25	32	85
WaWa Tract												5	12	13	13	14								57
TOTAL UNITS	*0*	*0*	*0*	*75*	*0*	*0*	*0*	*0*	*20*	*34*	*30*	*35*	*42*	*43*	*43*	*44*	*44*	*45*	*43*	*37*	*39*	*39*	*40*	*40*	*693*

Table 23
Woodstown Town Center Extension
Wastewater Flow Projection

Property				0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Totals
Bailey Corner				13,500																					13,500
Musumeci Tract										3,150	3,150	3,150	3,150	3,150	3,150	3,150	3,150	3,150	2,100						30,450
Davis Tract									6,000	5,700	4,500	4,500	4,500	4,500	4,500	4,500									38,700
Route 45 West																	4,200	4,500	5,400	4,500	4,500	3,600			23,100
Route 45 East																	4,500	4,500	4,500	4,500	4,500	4,500	4,500	2,400	22,500
Bailey Street East																				2,100	2,700	3,600	7,500	9,600	4,800
WaWa Tract												1,050	2,520	2,730	2,730	2,940									11,970
New Flow	*0*	*0*	*0*	*13,500*	*0*	*0*	*0*	*0*	*6,000*	*8,850*	*7,650*	*8,700*	*10,170*	*10,380*	*10,380*	*10,590*	*11,850*	*12,150*	*12,000*	*11,100*	*11,700*	*11,700*	*12,000*	*12,000*	*145,020*
Cum Flow	34,800	34,800	34,800	48,300	48,300	48,300	48,300	48,300	54,300	63,150	70,800	79,500	89,670	100,050	110,430	121,020	132,870	145,020	157,020	168,120	179,820	191,520	203,520	215,520	

Table 24
Pilesgrove Township Wastewater Management Plan
Sewer/Individual Subsurface Disposal System Projection

				0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Totals
New WSA SSA Units	0	0	0	75	0	0	0	0	20	34	30	35	42	43	43	44	44	45	43	37	39	39	40	40	*693*
New Kings Road Units	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*0*
New Sewered Units	0	0	0	75	0	0	0	0	20	34	30	35	42	43	43	44	44	45	43	37	39	39	40	40	*693*
New ISSDS Units	9	6	1	-1	4	11	32	32	20	19	14	10	17	17	18	18	19	19	22	29	28	29	29	30	*432*
Total New Units	**9**	**6**	**1**	**74**	**4**	**11**	**32**	**32**	**40**	**53**	**44**	**45**	**59**	**60**	**61**	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**	*1,125*
Cum. Sewered Units	116	116	116	191	191	191	191	191	211	245	275	310	352	395	438	482	526	571	614	651	690	729	769	809	
Cum. ISSDS Units	1,322	1,328	1,329	1,328	1,332	1,343	1,375	1,407	1,427	1,446	1,460	1,470	1,487	1,504	1,522	1,540	1,559	1,578	1,600	1,629	1,657	1,686	1,715	1,745	
Cum. Total Units	1,438	1,444	1,445	1,519	1,523	1,534	1,566	1,598	1,638	1,691	1,735	1,780	1,839	1,899	1,960	2,022	2,085	2,149	2,214	2,280	2,347	2,415	2,484	2,554	
Percent Sewered	8.1%	8.0%	8.0%	12.6%	12.5%	12.5%	12.2%	12.0%	12.9%	14.5%	15.9%	17.4%	19.1%	20.8%	22.3%	23.8%	25.2%	26.6%	27.7%	28.6%	29.4%	30.2%	31.0%	31.7%	
Percent UnSewered	91.9%	92.0%	92.0%	87.4%	87.5%	87.5%	87.8%	88.0%	87.1%	85.5%	84.1%	82.6%	80.9%	79.2%	77.7%	76.2%	74.8%	73.4%	72.3%	71.4%	70.6%	69.8%	69.0%	68.3%	

Table 25

Pilesgrove Township

TDR/Non-Contiguous Cluster Population Projection

Year	*Begin*	*Net New*	*PPH*	*Persons*	*End*
2007	4,157	9	2.91	26	4,183
2008	4,183	6	2.91	17	4,201
2009	4,201	1	2.91	3	4,204
2010	4,204	74	2.26	167	**4,371**
2011	4,371	4	2.91	12	4,382
2012	4,382	11	2.91	32	4,414
2013	4,414	32	2.91	93	4,507
2014	4,507	32	2.91	93	4,601
2015	4,601	40	2.83	113	4,714
2016	4,714	53	2.60	138	4,851
2017	4,851	44	2.55	112	4,963
2018	4,963	45	2.37	107	5,070
2019	5,070	59	2.54	150	5,220
2020	5,220	60	2.55	153	**5,373**
2021	5,373	61	2.55	156	5,528
2022	5,528	62	2.55	158	5,687
2023	5,687	63	2.62	165	5,852
2024	5,852	64	2.62	168	6,019
2025	6,019	65	2.69	175	6,194
2026	6,194	66	2.82	186	6,380
2027	6,380	67	2.82	189	6,569
2028	6,569	68	2.82	192	6,761
2029	6,761	69	2.82	194	6,955
2030	6,955	70	2.82	197	**7,152**
Total (2007-2030)		1,125		2,995	

Table 26

Woodstown Town Center

Wastewater Management Plans

	Woodstown	Pilesgrove	Salem County	Total
Existing Flow	***300,000***	***30,000***	***35,000***	***365,000***
Reserved Flow			***65,000***	
Approved Projects:				
Bailey Corner	3,750	18,300		
Project Freedom	13,500			
Committed Flow	***317,250***	***48,300***	***100,000***	***465,550***
Town Center Modification				
Projected Flow				
Grandview Park		30,450		
Water filtration	15,000			
Woodstown Buildout	84,000			
County buyback			-65,000	
Projected Flow	***416,250***	***78,750***	***35,000***	***530,000***
WWTP Expansion				
Town Center Extension				
Woodstown allocation	41,000			
Township allocation		101,070		
Future Flow	***457,250***	***179,820***	***35,000***	***672,070***

Notes:

1. *Existing WSA WWTP has a permitted capacity of 530,000 gpd.*
2. *Expanded WSA WWTP would have a rated capacity of at least 675,000 gpd.*
3. *County buyback refers to reprocurement of unused reserve capacity from Salem County;*
4. *Township allocation prior to plant expansion would be at the discretion of the WSA and Superior Court*

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III. DISCUSSION OF EXISTING AND FUTURE DOMESTIC AND INDUSTRIAL TREATMENT FACILITIES

3.1 WOODSTOWN SEWERAGE AUTHORITY (WSA) TREATMENT FACILITY

The WSA Engineer, Remington, Vernick & Walberg (RV&W), conducted a maximum plant capacity analysis in April 2005. The purpose of the study was to determine the maximum average daily wastewater flow rate that could be accommodated by each of the existing treatment components and consequently by the plant as a whole.

3.1.1 Existing Wastewater Treatment Plant

The Woodstown Sewerage Authority Wastewater Treatment facility is designed for an average daily flow of 530,000 gallons per day (GPD). The plant is designed to withstand an instantaneous peak flow rate of 1.4 MGD. According to the NJDEP, the average daily flow rate in 2005 was about 326,500 GPD and the average flow rate for the peak three months was 368,800 GPD. Therefore, based on the discharge monitoring reports (DMRs), the available remaining capacity was estimated to be 161,200 gpd.

According to RV&W, the current design flows for the major plant components are listed in ***Table 27***.

Table 27
Woodstown WWTP
Existing Treatment Plant Design Flow

Component	Average Daily Design Flow Rate	Peak Instantaneous Design Flow Rate	Source
Front Loader Bar Screen	0.53 MGD	1.476 MGD	Schreiber O&M Manual
Aerated Grit/Grease Removal Equipment	0.53 MGD	1.476 MGD	Schreiber O&M Manual
Aeration Basins	0.53 MGD	1.400 MGD	Schreiber O&M Manual
Peripheral Drive Clarifiers	0.53 MGD	1.400 MGD	Schreiber O&M Manual
Hydro Clear Rapid Sand Filter	0.53 MGD	1.476 MGD	Zimpro O&M Manual
System UV 3000	0.53 MGD	1.400 MGD	Trojan O&M Manual

The design flow rates were based on the current service area demand, twenty-year demand projections for the existing service area, and the probable level of contaminant loading on the system. These concentration values were used in the initial design of the plant and were used as design criteria for R.V.&W's capacity analysis. The total loading is a function of the concentration and design flow rate.

Currently, the design loading values reflect the design capacity of 0.53 MGD. As the average daily flow rate increase, the contaminant loadings increase proportionately. Critical design waste loadings are shown below in ***Table 28***.

Table 28
Woodstown WWTP
Existing Waste Loadings

Parameter	Concentration (mg/l)	Loading (lbs./day)
BOD_5	250	1105
Suspended solids	250	972
Ammonia	25	111
TKN	40	177
Total Phosphorus	10	44

3.1.2 Design of Component Systems

The design capabilities of each component system are described below.

- Front Loader Bar Screen (Screiber Corporation Inc.). The screening unit consists of an automatically cleaned bar screen with a bypass channel containing a manually cleaned bar screen. The automatic bar screen is 1'-6" wide, with a maximum head loss of 8" through the screen at the peak instantaneous flow rate of 1.40 MGD.

- Aerated Grit/Grease Removal Equipment (Schreiber Corporation, Inc.). The aerated grit chamber forces the flow into a spiral circulation pattern, which scours and washes grit and deposits it into the grit hopper. The sewage then flows through a grease separation zone where the grease is skimmed from the surface of the wastewater with a skimming blade. N.J.A.C. 7:14A-23.16(b) stipulates that "*detention [time] shall be adequate to deposit grit courser than 0.20 millimeters*". The design detention time is five (5) minutes at the peak flow rate of 1.4 MGD.

- Aeration Basins (Schreiber Corporation, Inc.). The aeration system includes two (2) 58' diameter counter current extended aeration tanks with a side water depth of 16'. The existing aeration blowers include four (4) Compact II, Rotary Lobe, and Positive Displacement Blowers. There are two (2) single speed, 15 hp, and two (2) two-speed, 15/10 hp motors. Each motor is capable of delivering 270 ft^3/minute. N.J.A.C. 7:14A-23-21(g)2 stipulates that the "*Total required detention period of aeration tanks based upon 125 percent of design flow, shall not be less than six hours*" and N.J.A.C. 7:14A-23.21(j)2 requires "*at least 1.5 cubic feet [of air] per gallon of incoming raw sewage…*". The hydraulic detention times at the design flows of 0.53 MGD and 1.4 MGD are 28.62 and 10.83 hours respectively. The aeration requirement for the current design flow of 0.53 MGD is 552 ft^3/min. At their peak, the blowers can contribute as much as 1,080 ft^3/min.

- Peripheral Drive Clarifiers (Schreiber Corporation, Inc.). The clarification system consists of two (2) 33' diameter units with 15' side water depths. N.J.A.C. 7:14A-23.21(1)5 indicates that "*Final settling tanks shall provide at least a 3.5 hour detention period based upon design flow without recirculation*" and N.J.A.C. 7:14A-23.21(e)3 states that "*final settling tanks shall have a …maximum surface settling rate of 800 [gal/ft^2/day]*" The hydraulic Detention times at the design flows of 0.53 MGD and 1.4 MGD are 8.35 and 3.16 hours respectively. The surface overflow rates at the design capacity and peak are 393.36 and 1039.07 gal/ft^2/day respectively. RV&W has concluded that the hydraulic detention time and surface settling rate associated with the peak instantaneous flow rate of 1.4 MGD are in violation of the state regulations.

- Hydro Clear Rapid Sand Filter (Zimpro Environmental, Inc.). The sand filtration system consists of two (2), three (3) cell units, each having 165 ft^2 of effective filtering surface area. The Recommended Standards for Wastewater Facilities states that "*filtration rates shall not exceed 5 gpm/sq. ft. based on the design peak hourly flow rate applied to the filter units*". According to the design engineer, acceptable loading rates for average and peak flows are 2.00 gpm/ft^2 and 5.00 gpm/ft^2. The hydraulic loading on the filters at the design flow rates of 0.53 MGD and 1.40 MGD are 1.12 gpm/ft^2 and 2.95 gpm/ft^2 respectively.

- System UV3000 (Trojan Technologies, Inc.). The ultraviolet light disinfection system consists of a single concrete channel with two (2) banks of UV lamps. Each bank contains a total of forty (40) 64-inch UV lamps, and the system is capable of disinfecting the instantaneous peak flow rate of 1.4 MGD to a level of 33 enterococci organisms per 100 milliliters of less in accordance with N.J.A.C. 7:9B-1.14(c)iii.(1).

3.1.3 Projected Maximum Capacity

To determine the maximum average daily flow rate of the entire plant, each component was analyzed by RV&H as if operating independently. In reality, the performance of each station hinges in part on the performance of those that precede it.

The components were first analyzed in terms of hydraulic loading. In other words, a maximum wastewater flow rate was generated for each unit. Some of the constraints that limit the flow rate of the plant include: pump size, channel cross-section, pipe diameter, influent contaminant loading, hydraulic detention time, surface settling rate, weir overflow rate, hydraulic loading, channel/pipe velocity, and NJPDES permit requirements for effluent contaminants. In the event that the maximum projected hydraulic flow rate exceeded that which is stipulated by one of the aforementioned constraints; the lesser of the two values was used by RV&W as the acceptable average daily flow rate.

For the purposes of the capacity analysis, each component was re-evaluated by its corresponding manufacturer. ***Table 29*** contains the original design flow rate; the projected maximum average daily capacity; and the source from which the information was obtained. ***Table 30*** indicates the projected maximum average daily capacity under conservative design limitations with one-half of the units operating.

Front Loader Bar Screen (Schreiber Corporation, Inc.)

The bar screen's mechanical systems are designed to handle flows up to 16 MGD depending on the size of the flow channel (Schreiber Corporation, Inc.). Conservatively, the bar screen is equipped to handle the peak flow of 1.40 MGD as an average daily operational capacity.

Aerated Grit/Grease Removal Equipment (Schreiber Corporation, Inc.)

The grit/grease removal system has been estimated to function at a maximum operational capacity of 1.32 MGD for a detention time of five minutes. The minimum detention time of five minutes is recommended by Schreiber to achieve peak performance. The absolute maximum capacity of the grit/grease removal system is 2.20 MGD based on a detention time of three (3) minutes. For a projected required instantaneous peak flow rate of 1.75 MGD, the hydraulic detention time is 3.7 minutes. It is recommended that "*Detention time in the tank should be in the range of 3 to 5 minutes at design peak hourly flows*" (Standards, 1997 Edition, 63.3). Based on the foregoing, it was concluded by RV&W that the grit/grease removal system is adequate for an average daily flow of 0.7 MGD and a corresponding 250% instantaneous peak flow of 1.75 MGD.

Aeration Basins (Schreiber Corporation, Inc.)

. N.J.A.C. 7:14A-23.21(g)1. states that "*Aeration tanks for the activated sludge process shall be designed in conformance with the following: Multiple units, capable of independent operation, shall be provided for all installations*".

The aeration basin analysis resulted in a maximum design capacity of 1.50 MGD. The maximum recommended flow rate is one-half of the total capacity (0.75 MGD) and assumes the use of one operating basin. The GRO Aeration System can handle the projected design flows of 0.70 MGD and 1.75 MGD with acceptable hydraulic detention time and surface settling rate.

Peripheral Drive Clarifiers (Schreiber Corporation, Inc.)

The clarifiers are estimated to have a maximum capacity of 0.95 MGD. The recommended maximum daily flow for the clarifiers is one-half of the maximum capacity (0.475 MGD). The surface area of the clarifiers was reduced from the value used in initial design. Originally, the design was based on the total area reflecting the overall diameter of the clarification tanks. The physical performance of the system has not reflected the original design dimensions. The RV&W analysis took into account the discrepancy between anticipated and actual performance, and applied a corresponding reduction to the effective surface area of the clarification units.

According to the N.J.A.C. Standards referenced in section I of this report, the clarification units can withstand an instantaneous peak flow of 1.125 MGD when governed by the minimum hydraulic detention time and the maximum surface overflow rate. Therefore, the maximum average daily flow for the existing system is reduced to 0.450 MGD (result of a peaking factor of 2.5 (N.J.A.C. 7:14A-23.10(b)). The projected design flows would result in violations of the standards shown in the previous section for surface settling rate and hydraulic detention time. The clarification system is one that will need to experience upgrades in order to accommodate the committed and projected flows.

Schreiber Corporation performed a Preliminary Basis of Design Expansion Evaluation Report (Schreiber). Parameters of the report include a design average daily flow of 0.70 MGD and an instantaneous peak flow of 1.75 as discussed in the projected capacity analysis. Design waste loading concentrations were held constant, but the overall loading by weight was increased proportionally with the increase in hydraulic flow. The report demonstrates, in full detail, the inadequacies associates with the clarifiers. According to Schreiber, the minimum surface area for the maximum allowable surface settling rate is 2,228 ft^2. However, the current set of clarification tanks possesses only 1,461 ft^2. In other words, an upgrade would need to include a minimum of 767 additional ft^2 of effective settling surface area.

Hydro Clear Rapid Sand Filter (Zimpro Environmental, Inc.)

The sand filtration system has been found to have a maximum daily capacity of 1.40 MGD. The RV&W analysis estimated total influent suspended solids to be at a concentration of 10 mg/L. Under typical flow conditions, the sand filter experiences influent loadings an order of magnitude less than 10 mg/L. The estimated capacity was determined with the assumption that a total of six (6) filter cells would be in use at all times. In the event that one of the filtration units would be inactive for cleaning or maintenance, the maximum daily flow rate with three (3) cells operating is 0.7 MGD.

RV&W indicated that the manufacturer also analyzed the hydraulics associated with an instantaneous peak flow rate of 1.75 MGD. This analysis assumed that at any given time the sand filtration unit could be without the services of one (1) cell from each unit. In other words, peak flow was analyzed for four (4) out of

the six (6) total cells online. It was determined that the sand filtration system could safely handle a peak flow of 1.75 MGD for short durations during the course of a day.

There are recommended constraints that govern the allowable flow in the sand filters. Hydraulic loading for a filtration unit shall not exceed 5.00 gpm/ft^2 (Standards, 1997 Edition, 112.31). Also, "the filtration rate shall be calculated on the total available filter area with one unit out of service" (Standards, 1997 Edition, 112.32). In this case, the loading on the units with one cell out of service for each is 5.52 gpm/ft^2. Events, which might cause an instantaneous flow rate of up to 1.75 MGD, are deemed to be rare. The sand filtration units can handle the projected peak flow for short durations with little or no impact on the filter performance.

System UV3000 (Trojan Technologies, Inc.)

The UV disinfection system was designed to operate continuously at the peak flow rate of 1.40 MGD with both of the banks operating. One bank is capable of achieving the required level of disinfection up to 0.70 MGD. The system is designed to handle a peak flow of 1.4 MGD at the design loading rates. Should the loading rates remain consistently lesser than those set forth in the original design it stands to reason that the UV disinfection system could handle peak flows higher than the current peak flow rating. However, at this time an allowable peak flow based on the actual influent contaminants is not known.

Table 29
Woodstown Wastewater Treatment Plant Capacity Analysis
Maximum Capacity

Component	Average Daily Design Flow Rate	Maximum Average Daily Capacity	Source
Front Loader Bar Screen	0.53 MGD	1.400	Schreiber Corporation, Inc.
Aerated Grit/Great Removal Equipment	0.53 MGD	1.320	Schreiber Corporation, Inc.
Aeration Basin	0.53 MGD	1.500	Schreiber Corporation, Inc.
Peripheral Drive Clarifiers	0.53 MGD	0.950	Schreiber Corporation, Inc.
Hydro Clear Rapid Sand Filter	0.53 MGD	1.400	Zimpro Environmental, Inc.
UV Disinfection	0.53 MGD	1.400	Trojan Technologies, Inc.

Table 30
Woodstown Wastewater Treatment Plant Capacity Analysis
One-Half Capability (Conservative Design Limitation)

Component	Average Daily Design Flow Rate	Maximum Average Daily Capacity	Source
Front Loader Bar Screen	0.53 MGD	1.400	Schreiber Corporation, Inc.
Aerated Grit/Great Removal Equipment	0.53 MGD	1.320	Schreiber Corporation, Inc.
Aeration Basin	0.53 MGD	0.750	Schreiber Corporation, Inc.
Peripheral Drive Clarifiers	0.53 MGD	0.450	Schreiber Corporation, Inc.
Hydro Clear Rapid Sand Filter	0.53 MGD	0.700	Zimpro Environmental, Inc.
UV Disinfection	0.53 MGD	0.700	Trojan Technologies, Inc.

3.1.4 Effluent Criteria Discussion

Table 31 presents the required concentration values associated with various plant volumetric flow rates. These concentrations are those that would need to be met in order to comply with the current NJPDES surface water discharge permit. In general, an increase from 0.50 MGD to 0.70 MGD in the average daily flow rate would require a decrease in effluent contaminant concentration of about 30% across the board (a proportionally linear decrease).

Table 31
WSA WWTP
Required Effluent Concentration of Critical Contaminants
NJPDES Permit #NJ0022250

Loadings	Total Suspended Solids		Nitrogen, Ammonia		BOD	
Average Daily Flow (MGD)	Monthly Average Concentration (mg/L)	Weekly Average Concentration (mg/l)	Monthly Average Concentration (mg/l)	Weekly Average Concentration (mg/l)	Monthly Average Concentration (mg/l)	Weekly Average Concentration (mg/l)
0.50	30	45	20	38	16	26
0.52	29	43	19	37	15	25
0.54	28	42	19	35	15	24
0.56	27	40	18	34	14	23
0.58	26	39	17	33	14	22
0.60	25	37	17	32	13	22
0.62	24	36	16	31	13	21
0.64	24	35	16	30	13	20
0.66	23	34	15	29	12	20
0.68	22	33	15	28	12	19
0.70	22	32	14	27	11	19
0.72	21	31	14	26	11	18
0.74	20	30	14	26	11	18
0.76	20	30	13	25	11	17
0.78	19	29	13	24	10	17
0.80	19	28	13	24	10	16

Currently the plant effluent is comfortably meeting the regulations set forth by the original NJPDES permit. However, the limit for Phosphorus effluent concentration (not shown) has been decreased from 1.0 mg/L to 0.1 mg/L. Special consideration will need to be given to the chemical coagulation needed to settle out the Phosphorus. Aluminum Sulfate (Alum) is used to precipitate the Phosphorus and has been doing so to a degree that meets requirements. But according to RV&H, the flash mixers designed to maximize the efficiency of the Alum injected into the wastewater have not been working properly. It stands to reason that effluent phosphorus concentration will decrease to a certain degree upon restoration of the mixing chamber. At this time it is difficult to assess as to what degree the effluent levels will decrease, but according to RV&H, current effluent readings (mean = 0.34 mg/L) suggest that it is within the realm of possibility that the phosphorus concentration can be reduced to a level that would meet the new requirement of 0.1 mg/L on average.

3.1.5 Existing Wastewater Flow

Table 32 shows the wastewater discharge flow rate for the WSA WWTP based on the Discharge Monitoring Reports (DMRs) provided to the NJDEP. In 2004, the average monthly discharge rate was 327,000 GPD and the maximum average for three consecutive months was 369,000 GPD or about 70% of the plant capacity. In 2009, the average monthly discharge rate was 317,000 GPD and the maximum average for three consecutive months was 337,000 GPD or about 64% of the plant capacity.

Table 32
Woodstown Sewerage Authority
Wastewater Discharge Flow Data

Month	2004 MGD	2009 MGD
January	0.320	0.318
February	0.338	0.303
March	0.354	0.299
April	0.415	0.332
May	0.304	0.367
June	0.300	0.312
July	0.303	0.287
August	0.291	0.288
September	0.297	0.309
October	0.344	0.301
November	0.318	0.306
December	0.335	0.386
Annual Average	**0.327**	**0.317**
Maximum 3 Month Average	**0.369**	**0.337**
Percent capacity	**69.6%**	**63.6%**

Source: NJDEP DMRs (2010)

While ***Table 32*** indicates a decrease in the average flow rate over the last 5 years, the primary factor appears to be the discharge rate during peak periods, which may be indication of infiltration or inflow. DMRs for 2010 indicate a substantive increase in waste flow without any corresponding land development which may be indicative of an infiltration issue.

3.2 Existing Waddington-Richman Inc. Treatment Plant

The Kings Road LLC project site contains an existing treatment facility known as the Waddington-Richman (W-R) treatment plant. The W-R treatment plant was originally designed as an industrial treatment plant for an ice cream production facility and a related restaurant. Since ice cream production ceased in 2003, a significantly lesser volume of wastewater has been processed at the facility in recent years.

The wastewater that has been directed to the treatment facility consists of intermittent sanitary and kitchen wastewater as well as some stormwater from the former industrial property. **However, the facility is currently vacant.** The most recent surface water discharge permit indicates that only one surface water discharge event has occurred in the last five years. Therefore, all wastewater is currently discharged to groundwater from the unlined aerated lagoon, which functions as an infiltration percolation lagoon.

All wastewater and stormwater is processed through an influent chamber; transfer pump; aerated lagoon; sedimentation/chlorination basin; and discharge pump. Maintenance procedures for sedimentation/chlorination basin are established as requirements for a surface impoundment. Any residuals from the facility are managed off-site at an approved residual management operation.

The recently renewed DSW permit states that the Department changed the classification from a Category 6 industrial treatment plant to a Category 1 domestic treatment works. In accordance with the Settlement Agreement, the Developer would need to verify the current classification of the system by the NJDEP.

3.3 KINGS ROAD LLC TREATMENT PLANT

The proposed Kings Road LLC project would have been served by a new wastewater treatment plant located on the developer's property. The proposed treatment plant was to have utilized the ZeeWeed MBR process which is a proprietary technology that consists of a suspended biological reactor integrated with ultra filtration membrane system based on the ZeeWeed hollow fiber membrane. The ultra filtration system basically replaces the solids separation function of secondary clarifiers and sand filters in a conventional activated sludge system. The membranes are submerged in the bioreactor in direct contact with the mixed liquor. A suction duty pump is used to create a vacuum on the header connecting the membranes to draw the treated water through the membranes and into the pump. The pump then discharges the treated water.

This proposed project is currently defunct since the Developer has sold a portion of the property and allowed the option to expire on the remainder of the tract. The project reference remains in this Township WMP in conformance with the Settlement Agreement until that Agreement is voided by the Court. **It is recommended that this project be included in the County WMP only if the Developer demonstrates site control on or before April 1, 2011 and the Project remains in the Township Housing Plan.**

3.4 CONVEYANCE FACILITIES

3.4.1 Existing Conveyance Facilities

Map 2 indicates the existing conveyance system within Pilesgrove Township around the Woodstown Borough boundary. There are no pump stations in Pilesgrove Township. All of the current wastewater flow from the development fringe around Woodstown is via gravity.

The WSA conveyance system primarily relies on gravity sewers since the plant is located in an area of lower elevation near the Salem River. The only primary pump stations in the WSA system are one behind the municipal building on West Avenue that serves the western part of the Borough and a pump station directly adjacent to the plant on the north side of the Salem River. The County also uses a pump station to convey its wastewater flow from the County facilities on State Route #45. Any other pump or lift stations are needed for specific developments to reach an elevation within the main gravity conveyance system.

3.4.2 Proposed Conveyance Facilities

Sharptown

The wastewater from the Kings Road project would have been directed to an onsite pump station on the east side of Kings Highway. The wastewater would then be pumped to the interim treatment plant location, and when that facility is closed, to the permanent treatment plant location. The Developer would also have provided connection locations for the existing adjacent residences and businesses.

In the event that the Township decided to provide sewer facilities to treat wastewater from the existing crossroads settlement on the south side of Route $#40, a gravity conveyance system would have been constructed leading to a pump station at a down-gradient location. The influent would then be conveyed via force main to the treatment plant location.

Woodstown

Map 3 indicates the proposed Future Sewer Service Area in Pilesgrove under the Woodstown Town Center extension. It is believed that all of the areas to the north of Woodstown and to the southwest of Woodstown can be served by extensions to gravity sewers. Any project specific lift stations would be designed to discharge into the gravity system at an existing manhole.

County

The County complex has an onsite pump station that is connected to the WSA WWTP by a dedicated force main. The force main was sized and designed so that no other facilities would interconnect into this conveyance segment.

3.5 Environmental Impacts of Proposed Projects

The proposed treatment plant development and improvement projects described in this WMP would not result in any significant environmental impacts as summarized below:

- Endangered/Threatened Species. The treatment plant sites are not located within or adjacent to defined critical habitats. A site-specific analysis has been conducted for the Kings Road project site and a similar study would need to be conducted for the planned industrial project site.

- Wetlands/Floodplains. There will be no impact on regulated wetlands, floodplains or stream corridors. The WSA WWTP has an existing surface water discharge facility and the two proposed treatment facilities would involve groundwater discharge.

- Important Farmlands. The proposed construction of the treatment plants would not encroach upon any important farmlands.

- Parks. The proposed treatment plant construction, the expansion of the WSA WWTP, and related force mains would not encroach upon any public parks.

- Vegetation. The proposed construction of the treatment plants, the modifications to the existing WSA WWTP, and the related force mains would not result in the removal of significant vegetation.

- Cultural Resources. The treatment plants and the expansion of the WSA WWTP would not have any impact on archaeological features. A Phase I study may be necessary for the Kings Road pump station location to verify that no additional analyses are necessary.

- Future Sewer Service Area. Portions of the proposed Future Sewer Service Areas would only be included in the County WMP if the Landscape Project ranking for grassland birds was refuted either on a *prima facia* basis or as a result of a site specific habitat evaluation. Farmland that has been routinely committed to cropland does not satisfy the habitat suitability criteria for the threatened and endangered grasslands birds.

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IV. SUMMARY OF ENVIRONMENTAL ASSESSMENTS AND ANALYSES

4.1 POINT SOURCE POLLUTANT LOADING ANALYSIS

4.1.1 Surface Water Discharges

This Wastewater Management Plan ("WMP") does not propose any new surface water discharges or any increase in the surface water discharge parameters in the Planning Area. The WSA WTP currently has a NJPDES permit with an authorized discharge to the Salem River. All plant improvements will be designed to increase the process flow capacity without impacting the assimilative capacity of the stream. All discharge parameters will remain unchanged.

The existing Richman's treatment plant currently represents a small and intermittent surface water discharge. While the plant would have been used for interim purposes by the Kings Road Developer, no surface water discharge would have been permitted. Once the plant's interim use had expired, the plant would have been closed in accordance with NJDEP guidance and the site restored to its pre-existing condition.

It is recommended that the Waddington-Richman treatment facility be closed and not be included on *Map 3* except if the site is included within a Redevelopment Area designation approved by the Pilesgrove Township Committee or the owner of the property presents viable plans for the redevelopment of the commercial site to the Township Planning Board on or before April 1, 2011.

4.1.2 Ground Water Discharges

The two treatment facilities that were proposed for the Township Planning Area both involve groundwater discharge. A modular treatment plant would have been developed to serve the proposed Agricultural/Industrial nodal development and would have discharged to a subsurface effluent disposal system. Preliminary estimates indicated that between 10 and 160 acres of the 475± acre development project would have needed for effluent disposal depending upon the actual discharge rate and onsite soil conditions.

The treatment plant for the Kings Road project would have involved the discharge of treated effluent via groundwater injection wells. The specific effluent discharge criteria and the discharge strata would have been determined by the NJDEP during the discharge permitting process. The use a leach field had been considered but the suitable soils for such a system were limited in extent on the project site.

There are no new or expanded groundwater discharges proposed for the Service Area designated for Wastewater Facilities with planning flows of less than 2,000 gpd which discharge to Ground Water under this WMP Update. **All current discharges in excess of 2,000 gpd would only be permitted to continue under this WMP if an engineering report is submitted, reviewed, and approved by the Township.**

Nitrate Dilution

In the event that new or expanded groundwater discharge facilities are proposed, a Nitrate Dilution model shall be applied to demonstrate the anti-degradation standard for groundwater or the background standard of 5.2 mg/l has been satisfied on a site-specific basis and 2.0 mg/l on a watershed basis. In the event that this standard cannot be met, the applicant would need to adjust the development intensity to conform to the model or would need to use alternative treatment units with denitrification.

4.2 NON-POINT SOURCE POLLUTANT LOADING/HYDROMODIFICATION ANALYSIS

The objective of the non-point source pollutant loading analysis is to prevent any increase in non-point source pollution. Pilesgrove Township has adopted a stormwater management ordinance in accordance with the NJDEP Stormwater Management Regulations that establishes stormwater quality, stormwater quantity, and groundwater recharge performance criteria for all new land development. The adopted ordinance will be the most effective means of controlling non-point source pollution at the municipal level. Certain non-point sources such as agricultural practices along stream corridors cannot be regulated at the municipal level.

4.3 CONSUMPTIVE WATER USE ANALYSIS

The only existing water purveyor in the Township Planning Area is the Woodstown Borough water department. New purveyors in the Planning Area will be proposed to serve the Agricultural/Industrial node and the Kings Road LLC project.

4.3.1 Woodstown Borough Water Supply System

The Woodstown Borough Engineer (Remington, Vernick & Walberg) has provided the information in this section pertaining to the Woodstown water supply system and the proposed facilities to be constructed. The intent of this WMP is to provide water and wastewater treatment to the same areas of the Township.

The existing water supply system consists of four wells in two different aquifers as shown in ***Table 33.***

Table 33
Woodstown Borough Water Supply System
Existing Well Data

Source	Rated Capacity	Aquifer
Well #2	425 gpm	Potomac-Raritan-Magothy (PRM) Middle
Well #3	600 gpm	Potomac-Raritan-Magothy (PRM) Middle
Well #4	200 gpm	Mount Laurel–Wenonah (MLW)
Well #5	550 gpm	Potomac-Raritan-Magothy (PRM) Middle

The three PRM wells are between 675 feet and 712 feet deep with static water levels approximately 30 feet or more below sea level. The water quality of the PRM wells is characterized as high in sodium (175-315 mg/l), chlorides (135-240 mg/l), and total dissolved solids (565-860 mg/l). The NJDEP recommended limits for these secondary contaminants are 50 mg/l for sodium, 250 mg/l for chlorides, and 500 mg/l for total dissolved solids. Because the high sodium level may be of concern to individuals on a restricted diet or with health problems, the water department has been required to notify all doctors in the area.

Woodstown Borough drilled Well #4, along East Millbrooke Avenue, in the 1990's within the Mount Laurel-Wenonah aquifer as an alternate source to the PRM aquifer wells. Well #4 was drilled to a depth of 160 feet, with a production of 200 GPM and a specific capacity (GPM/drawdown) of approximately 3.7. Well #4 was low in sodium (2-3 mg/l), chlorides (5 mg/l) and total dissolved solids (300 mg/l) but met or exceeded the NJDEP recommended secondary standards for hardness (215-250 mg/l) and iron (1.75-2.00 mg/l).

A continuous regeneration potassium permanganate water treatment plant was constructed to remove iron from the Well #4 effluent but the hardness of the water was not addressed. Consequently, the water from Well #4 was much "harder" than what the residents of Woodstown were normally accustomed. A hardness level above 150 mg/l is generally considered objectionable to customers. Examples of "hard" water problems include not interacting well with soap, leaving dirt on clothing during washing and scale forming more easily within hot water heaters, causing reduced efficiencies.

The third PRM well (Well #5) was drilled in 1997 to a depth of 715 feet at the Well #4 location. This well has the same general characteristics as Wells #2 and #3. In order to abate the high hardness level in Well #4, the raw water from Well #5 is blended at a ratio of 2.3:1 to provide the water quality detailed below.

Table 34
Woodstown Borough Water Supply System
Finish Water Quality (2002)

Water Quality Parameter	Well #4 &5 Finish Water 2002 Average
Sodium	206 mg/l
Chloride	174 mg/l
Total dissolved solids (TDS)	660 mg/l
Iron	0.14 mg/l
Hardness	72 mg/l

The blending of the water from Wells #4 and #5 achieved a lower sodium level than what would be expected from Well #5 and a lower hardness level than would be expected from Well #4. However, both the sodium and total dissolved solids levels are still higher than NJDEP recommended upper limits. In addition, constructing Well #5 and blending it with water from Well #4 defeated the original purpose of Well #4 which was to provide an alternate source for Woodstown's reliance on the PRM aquifer and to reduce the sodium levels in the water system to 50 mg/l, the NJDEP recommended upper limit.

4.3.1.1 Water Allocation Permit and Usage.

The limits for the Borough of Woodstown water supply system as set forth in the most recent NJDEP Water Allocation Permit #5167, dated September 2004 are presented in ***Table 35*** below.

Table 35
Woodstown Borough Water Supply System
Permit Limits

Parameter	PRM (Wells #2, 3 & 5)	Mount Laurel (Well #4)	All Sources
Instantaneous Rate	1,575 gpm	200 gpm	
Monthly Diversion Rate	15.0 mg	8.9 mg	18.1 mg
Yearly Diversion Rate	119.0 mg	55.1 mg	174.1 mg

The actual water usage reported for 2004 is shown below in ***Table 36.***

Table 36
Woodstown Borough Water Supply System
Actual Usage

Parameter	PRM (Wells #2, 3 & 5)	Mount Laurel (Well #4)	All Sources
Peak Day	0.5157 mg	0.1775 mg	
Average Day			0.3373 mg
Peak Month	9.455 mg	3.4454 mg	12.1714 mg
Average Month			10.2912 mg
Total	89.6598 mg	33.8343 mg	123.4941 mg

Source: RV&W

For the PRM wells, it is important to note that Well #5 had the greatest usage for 2004 (75.6053 MG), compared to Well #2 (7.8981 MG) and Well #3 (6.1564 MG). This was due to the fact that water from Well #5 was utilized to blend with Well #4 effluent to provide "less hard" water for Woodstown residents.

4.3.1.2 Proposed Water Supply System Modification

Woodstown has recently constructed a new community water supply well in the Mount Laurel-Wenonah Aquifer (Well #6) about 600 feet from the water treatment plant on East Millbrooke Avenue. Water from well #6 is to be pumped to the existing treatment facility and will be modified based on the volume and quality of the water withdrawn from well #6 during testing.

Ultimately, the existing water treatment facility on East Millbrooke Avenue will be modified to accommodate the new water supply. The treatment processes and piping design will be based on an analysis of the well output. Combined with well #4, the new well provides the Borough with 400 GPM of low iron, low hardness, and most importantly, low sodium quality water.

The Borough of Woodstown has sufficient firm capacity but has water quality issues that are being addressed with the Bureau of Safe Drinking Water. The Borough's water allocation permit will need to be modified to reflect projected demands in the Township. The Township and the Borough intend to cooperatively pursue the long-term goal of adequate water supply sources in terms of quantity and quality.

4.3.2 Sharptown Village Center

The Kings Road LLC Developer proposed to utilize two existing wells in the PRM aquifer with an approximate depth of 480 feet. These wells were previously used by the former Richman's ice cream plant (Registration # 10673W). The Developer intended to rely on these wells to provide the water supply for the Kings road project. According to the Developer, the water supplied by the wells would not have required treatment for potable use. The water supply design requirements for the Kings Road project were as follows:

- General. The water supply and distribution system will comply with the Water Supply Management Act, N.J.A.C. 7:19-1; AWWA Specifications; the Safe Drinking Water Act, N.J.A.C. 7:10-1; Residential Site Improvement Standards, N.J.A.C. 5:21-5 and the Safe Drinking Water Works Facilities Approval Technical Manual.

- Well Site. The Developer will own the property within a minimum fifty-foot (50') radius of the well locations. A one (1) acre conservation easement shall be provided to the Township around the well site. Each well site will be fenced with a six foot high (minimum) black vinyl coated galvanized fence and shall have a vehicle access road.

- Well yield. The Developer will develop and maintain two potable water wells to ensure reliable water supply. The two existing or proposed wells will have a total demonstrated yield of 285 gpm certified by a licensed well driller. The well capacity will meet the projected demand with the largest well out of service. The wells will meet wellhead protection standards: located greater than fifty feet (50') from any sanitary sewer, located greater than 100 feet from any sanitary sewer manhole or connection.

- Water Storage Tank. A standpipe water storage tank 100 feet in height will be provided with a minimum of 100,000 gallons of storage capacity. The water storage tank and appropriate appurtenances will be designed to provide adequate pressure and fire flow to the project (in excess of 1,000 gpm for two (2) hours).

The Kings Road Developer proposed to inject treated effluent into the ground in a manner that would have recharged the underlying aquifers without impacting water quality. Therefore, the only consumptive use would have been evaporation associated with surface irrigation. The beneficial reuse of the effluent would have ensure that the project did not consume or deplete water resources.

4.3.3 Agricultural/Industrial Node (PLI District)

The prospective developer of the proposed Agricultural/Industrial node in the Planned Light Industrial zoning district previously indicated that it intended to enter into a contract with New Jersey American Water (NJAW) for the provision of process and potable water. Because the planned industrial development was in the early planning stages, the specific water demand had not been definitively determined but the maximum water demand was expected to be about 1.2 MGD. A Will Serve letter dated June 25, 2007 was provided by NJAW which indicated that NJAW was under agreement to purchase the Penns Grove Water Company and that the provision of water service would be conditioned upon the completion of the acquisition and ownership of the system by NJAW. The NJAW indicated a willingness to connect the proposed Pilesgrove project into its larger system if the project warrants such investment and if planning approvals are obtained from the Office of Smart Growth.

There is a water quality issue with the Penns Grove water company relating to an unregulated contaminant (PFOA). A minimum contaminant level (MCL) is to be set by the NJDEP. It is expected that the Company will be below the MCL established by the NJDEP.

New Jersey American Water Company is the state's largest water utility serving over two million people in 176 communities throughout the state. NJAW has an interconnection with the Tri-County water pipeline, which is a major source of surface water, to supplement groundwater resources. The interconnection is currently limited by regulation to 1.5 MGD but could be increased to 3.0 MGD in the future, if that was deemed necessary to meet local demands. In the event that NJAW interconnects Salem County with its conjunctive use system, it is anticipated that it will continue to operate within its 90% non-consumptive use/10% consumptive use accepted by the Delaware River Basin Commission.

In this particular case, the Planned Light Industrial Development could be a significant water user if it included a food processing facility. However, the proposed onsite discharge of treated effluent would minimize the consumptive use of the project. **However, the prospective Developer of the industrial park has recently decided not to pursue GDP approval. As a result of this decision, the Township is not recommending inclusion of this Project in the Wastewater Management Plan at this time.**

4.3.4 Critical Water Supply Areas

The Woodstown and Kings Road water systems do not draw from wells that are located within the critical water supply areas. However, Woodstown has experienced salt-water intrusion problems that are being addressed by a combination of treatment and blending water from other aquifers. The Kings Road developer has indicated that the proposed wells for that project would not have required treatment.

The proposed water purveyor for the planned light industrial development has a diversity of ground and surface water supply sources that are outside of critical water supply sources including the pipeline from the Delaware River intake. The proposed acquisition of the Penns Grove water company and future interconnections with the NJAW system will advance the diversity of water supply sources in Salem County without impacting critical water supply areas.

4.3.5 Water Conservation Measures

The potential of reusing treated effluent for recharge and irrigation purposes will be analyzed in conjunction with the WSA to contribute toward water conservation efforts. Conservation based outside water use ordinances may also be considered by the local municipalities in the future if it is determined that these provisions are necessary to meet long-term needs. The proposed treatment plants for the PLI district and the Kings Road projects would have used groundwater discharge in accordance with beneficial reuse guidelines.

4.4 ENVIRONMENTAL INVENTORY

An Environmental Inventory was conducted of the Planning Area to compile the information needed for the Environmental Constraints Analysis (ECA). The Environmental Inventory is summarized below with specific references to the inventory maps prepared for the Planning Area.

4.4.1 Surface Water Resources

4.4.1.1 Hydrology.

Map 5-1: Surface Water Resources Map indicates the surface waters, the subwatersheds, and the flood prone areas in the Township Planning Area. The subwatersheds shown on ***Map 5-1*** are the HUC 14 watersheds which refers to the 14 integer hydrologic unit code (HUC) that is used by the NJDEP to define subwatersheds throughout the State. There are a total of eleven (11) subwatersheds in the Planning Area. Various water quality and build-out calculations are conducted for each HUC 14 to analyze and manage water quality issues on a watershed basis.

Pilesgrove Township contains portions of five major drainage basins as described below:

- Salem River. Two-thirds of Pilesgrove Township or 23.1± square miles (as well as all of Woodstown) is within the upper Salem River watershed. The primary stream corridors within the drainage basin are the Salem Creek/River which bisects the Township, Nichomus Run, and Majors Run. The confluence of these three stream corridors is in the Sharptown village area.

- Oldmans Creek. The northern tier of Pilesgrove Township is located within the Oldmans Creek watershed. In general, the limits of this watershed are defined by Lincoln Road, Point Airy Road, and Auburn Road. This drainage basin contains three subwatersheds that are defined by the drainage areas associated with the minor tributaries of Oldmans Creek. A total of 4.12± square miles of the Township is within the Oldmans Creek drainage basin.

- Game Creek. A 1.9± square mile area of the Township drains to Game Creek in Carney's Point via Two Penny Run and converges with the Salem River outside of the Township limits.

- Alloway Creek. The extreme southeastern corner of the Township is within the Alloway Creek watershed. This 1.82± square mile area is drained by the Alloway Creek through Alloway, Quinton, and Lower Alloways Creek Townships to the Delaware Bay.

- Mannington Creek. A very small portion of the Township (40± acres) drains into Mannington Township and is part of the lower Salem River watershed.

4.4.1.2 Surface Water Classification.

All of the surface watercourses in the Planning Area are currently classified as FW2-NT. "FW2" is the general surface classification applied to those fresh waters that are not located wholly within Federal or State parks, forests, fish and wildlife lands, or other special holdings, or those waters not located within the boundaries of the Pinelands Area. "NT" indicates that the waterway has not been designated as a trout production or trout maintenance stream. The NJDEP has recently proposed to designate the following surface waters as Category One waters within the Planning Area:

- Oldmans Creek: 22.4 mile segment between Harrisonville Lake and Kings Highway;
- Nichomus Run: Entire watershed in Woodstown and Pilesgrove;

- Majors Run: Entire watershed in Pilesgrove and Mannington Townships; and,
- Salem River: Segment between Nichomus Run and Majors Run in Sharptown.

The 300-foot restrictive buffer that applies to Category One waters would be a significant development constraint for certain properties in Woodstown and Sharptown. The proposed regulations provide for some exceptions to the buffer requirement in hardship situations.

Currently, all of the surface waters in the Township are classified as SE1 which applies to waterbodies with a salinity concentration greater than 3.5 parts per thousand at mean high tide. The Department has proposed to change this classification to refer to those portions of the Oldmans Creek and Salem River that are downstream of the Category One designations since the designated waters, by definition, support freshwater species that are not present in saline conditions.

4.4.1.3 Flood Prone Areas.

Map 5-1 also indicates the extent of the flood hazard areas in the Township based the NJDEP GIS database. In general, the flood hazard areas in the Township are confined by topography to the areas immediately adjacent to the stream corridor. However, there are flood hazard areas along the Salem River and the Oldmans Creek that are more expansive. In particular, the flood hazard area of the Salem River to the west of Woodstown and in the Sharptown area is quite broad. In addition, ***Map 5-1*** indicates that some areas of the Township in the southeastern quadrant are considered flood hazard areas that overflow into the surface water corridors. These depressions act as headwater areas for the Salem River tributaries.

4.4.1.4 Surface Water Discharge Locations.

According to the NJDEP database, there are two existing NJPDES surface water discharge permit locations in the Township and one in the Borough that are listed on ***Map 5-1.*** The Township discharge locations are the Waddington-Richman treatment plant located east of Kings Highway in Sharptown and Coastal Mart, a clean-up project that had a permitted discharge to the Salem River via storm sewer. The only permitted surface water discharge in the Borough is the WSA's WWTP located just east of U.S. Route 40.

4.4.1.5 Ambient Bio-monitoring Network (AMNET)

The NJDEP has established an Ambient Biomonitoring Network (AMNET) to document the health of the state's waterways. There are over 800 AMNET sites throughout New Jersey. These sites are sampled for benthic macroinvertebrates by NJDEP on a five-year cycle. Streams are classified as non-impaired, moderately impaired, or severely impaired based on the AMNET data. The data is used to generate a New Jersey Impairment Score (NJIS), which is based on a number of biometrics related to benthic macroinvertebrate community dynamics. The AMNET monitoring locations in Pilesgrove Township are shown on ***Map 5-1*** and the impairment score for each location is shown in ***Table 37.***

In general, the AMNET monitoring data indicates that the major waterways in the Township are moderately to severely impaired. ***Table 37*** also indicates changes in the characterizations since 1995. Certain segments have improved while others have been degraded. Majors Run is the only station that has consistently been rated as severely impaired. This tributary of the Salem River is located along the Township's southern boundary near Sharptown.

The AMNET data also includes a qualitative habitat assessment based on an evaluation of the condition of the stream habitat. As shown in ***Table 37***, three locations in the Township were determined to have optimal habitat value, four locations were determined to have sub-optimal value, and one location

(Majors Run) was determined to have marginal value. Two sediment toxicity tests were conducted in the Township on Majors Run and Nichomus Run. Neither test demonstrated acute toxicity conditions.

The fact that there are three severely impaired sites within or immediately adjacent to Pilesgrove Township is of concern. These sites include Majors Run, Salem River at Commissioners Pike, (upgradient) and Oldmans Creek at Pointers-Auburn Road (down-gradient). Within Watershed Management Area (WMA) # 17, one quarter of the AMNET monitoring stations were non-impaired, 66% were moderately impaired, and 8% were severely impaired. It should be noted that the percentage of non-impaired sites in WMA 17 was higher and the percentage of severely impaired sites was lower than that any of the other watershed management areas along the Delaware River.

Table 37
Pilesgrove Township
AMNET Monitoring Stations (1995; 2001)

Station No.	Location	Impairment Score (1995-96)	Impairment Score (2001)	Habitat Value
AN0687	Oldmans Creek, Harrisonville Lake Road Pilesgrove Township	18; Moderately Impaired	21; Moderately Impaired	186; Optimal habitat
AN0688	Oldmans Creek, Kings Highway Pilesgrove Township	18; Moderately Impaired	12; Moderately Impaired	145; Sub-Optimal
AN0689	Oldmans Creek, Pointers-Auburn Road Oldmans Township	12; Moderately Impaired	6; Severely Impaired	160; Optimal
AN0690	Salem River; Commissioners Pike Upper Pittsgrove Township	9; Moderately Impaired	12; Severely Impaired	163; Optimal
AN0691	Salem River; Memorial Lake Outlet; Woodstown;	6; Severely Impaired	15; Moderately Impaired	147; Sub-Optimal
AN0692	Nichomus Run; Route 45 Pilesgrove Township	6; Severely Impaired	15; Moderately Impaired	138; Sub-Optimal
AN0693	Salem River; Kings Highway Pilesgrove Township	12; Moderately Impaired	12; Moderately Impaired	135; Sub-Optimal
AN0694	Majors Run; Sharptown-Auburn road Pilesgrove Township	6; Severely Impaired	0; Severely Impaired	94; Marginal
AN0695	Two Penny Run; East Quilleytown Road; Carney's Point Township	15; Moderately Impaired	15; Moderately Impaired	126; Sub-Optimal

4.4.1.6 Ambient Surface Water Monitoring (ASWM)

The NJDEP also maintains three Ambient Surface Water Monitoring locations that monitor the conditions of the watercourses in Pilesgrove Township. These monitoring stations are located on the Salem River at Woodstown, on Majors Run at Sharptown, and on Two Penny Run near Dancer's Corner in Carney's Point. The results of the monitoring data indicate that the Salem River at Woodstown and Major's Run at Sharptown are attaining all of the water quality parameters except for fecal coliform and phosphorus. Two Penny Run is reportedly attaining the criteria for dissolved oxygen and ammonia but has been determined to be impaired for fecal coliform and phosphorus. Insufficient data is available at this location to assess the status of various other water quality parameters.

4.4.1.7 Sublist 5 of Integrated List

The NJDEP is required under the Clean Water Act to submit the New Jersey Integrated Water Quality Monitoring and Assessment Report (305(b) including the Integrated List (303(d)) on a biennial basis to the EPA. This combined report is a valuable source of water quality information since it presents the extent to which New Jersey waters are attaining water quality standards and identifies waters that are impaired. Sublist 5 of the Integrated List constitutes the list of waters impaired or threatened by pollutants, for which one or more total maximum daily load limits (TMDLs) are needed.

Table 38 contains the 2004 Integrated List of locations within or near Pilesgrove Township that have water quality problems and their priority ranking. The highest ranked conditions are the fecal coliform problems at the Four Seasons Campground and along Majors Run and the high mercury levels reported for Memorial Lake based on fish tissue sampling. The medium priority problems are the elevated phosphorus levels in certain segments of Oldmans Creek, Salem River, and Majors Run.

Table 38
Pilesgrove Township
2004 Integrated List (Sublist 5) with Priority Ranking

Station No.	Location	Impairment	Priority	Data source
	Four Seasons Campground, Pilesgrove	Fecal Coliform	High	Salem County HD
AN0688	Oldmans Creek, Kings Highway; Pilesgrove/Woolwich	Benthic Macroinvertebraes	Low	NJDEP AMNET
EWQ0689	Oldmans Creek, Pointers-Auburn Road; Oldmans	Phosphorus	Medium	EWQ
EWQ0689	Oldmans Creek, Pointers-Auburn Road; Oldmans	Total Suspended Solids		EWQ
AN0690	Salem River; Commissioners Pike; Upper Pittsgrove	Benthic Macroinvertebraes	Low	NJDEP AMNET
01482500	Salem River; Memorial Lake; Woodstown	Phosphorus	Medium	NJDEP/USGS Data
01482500	Salem River; Memorial Lake; Woodstown	Mercury	High	Tissue Monitoring
AN0693	Salem River; Kings Highway; Pilesgrove Township	Benthic Macroinvertebraes	Low	NJDEP AMNET
AN0694	Majors Run; Sharptown-Auburn Road; Pilesgrove	Benthic Macroinvertebraes	Low	NJDEP AMNET
01482530	Majors Run; Sharptown-Auburn Road; Pilesgrove	Fecal Coliform	High	NJDEP/USGS Data
01482530	Majors Run; Sharptown-Auburn Road; Pilesgrove	Phosphorus	Medium	NJDEP/USGS Data

4.4.1.8 Proposed Total Maximum Daily Loads (TMDLs)

The NJDEP is required to develop a Total Maximum Daily Load (TMDL) for the specified pollutants for each impaired waterway. These TMDLs will address the elevated phosphorus at Memorial Lake and the elevated fecal coliform levels on Majors Run and the upper reaches of the Salem Creek. It is not clear whether a TMDL will be pursued for the high mercury levels in the fish at Memorial Lake.

A TMDL is the amount of a pollutant that can be accepted by a waterbody without causing an exceedance of water quality standards or interfering with the ability to use a waterbody for designated uses. The allowable load is allocated to the various sources of the pollutant, such as point wastewater discharges that require an NJPDES permit to discharge, and nonpoint sources including stormwater runoff from agricultural

areas and residential areas. Provisions may also be made for future sources in the form of reserve capacity. An implementation plan is developed to identify how the various sources will be reduced to the designated allocations. Implementation strategies may include improved stormwater treatment plants, adoption of ordinances, re-forestation of stream corridors, retrofitting stormwater systems, and other BMPs.

TMDL for Phosphorus

There are two TMDLs that have been proposed by the NJDEP that impact Pilesgrove Township. In April of 2003, the NJDEP proposed a TMDL for phosphorus to address 13 eutrophic lakes in the Lower Delaware region. Two of these lakes are Memorial Lake in Woodstown and Harrisonville Lake along the Pilesgrove Township boundary with South Harrison. Phosphorus is the pollutant of concern for the TMDL since it is the nutrient that is primarily responsible for overfertilization of inland lakes leading to eutrophication. Phosphorus sources are characterized on an annual scale (kg TP/yr) since long-term pollutant loadings are more critical to overall lake water quality than the load at any particular time.

While Memorial Lake is located outside of the Township, about 50% of the Salem River watershed that feeds the lake is within Pilesgrove Township. The 22-acre lake has an average depth of four feet. Because the lake has such a large drainage area (9,300 acres), it has been classified by the NJDEP as a "rapidly flushing system" with a mean detention time of 1.5 days. The NJDEP has indicated that there are no known point sources to Memorial Lake but "agricultural runoff specifically from livestock may be significant".

Harrisonville Lake is an 18-acre impoundment along Oldmans Creek that is owned by the New Jersey Division of Fish and Wildlife. According to the NJDEP, the lake has developed a severe eutrophication problem over the last 20 years that progressively worsens in the late summer. An analysis of this lake has determined that the lake has a mean depth of 3.1 feet and a hydraulic residence time of 1.9 days. As with Memorial Lake, the lake shed to lake surface ratio is very high (over 300:1). The total amount of unconsolidated sediments was estimated to be over 45,000 cubic yards.

Runoff from land surfaces comprises most of the point and non-point sources of phosphorus into lakes. The NJDEP has estimated the breakdown of the current phosphorus loads by applying export coefficients to land cover information. The breakdown for the relevant lakes is shown in ***Table 39***.

Table 39
NJDEP TMDL for Phosphorus
Estimated Land Cover Sources

	Memorial Lake			*Harrisonville Lake*		
Land Use Loadings	**Acres**	**Kg/Yr**	**Percent**	**Acres**	**Kg/Yr**	**Percent**
Medium density residential	22.8	14.7	0.3	9.8	6.3	0.3
Low density rural residential	485	137	3	567	161	7
Commercial	62.2	50.4	1	8.7	7	0.3
Industrial	73.9	50.9	1	4.3	3	0.1
Mixed urban	185	74.9	2	61.1	24.7	1
Agricultural	6,530	3,970	91	2,780	1,690	77
Forest wetlands water	1,930	78.1	2	2,170	88	4
Barren land	20.7	4.2	0.1	23.2	4.7	0.2
Septic systems					157	8
Internal load					5.2	0.2
Natural loads	21.7	0.6	0.01	18	0.5	0.02
Totals	**9,340**	**4,380**	**100**	**5,640**	**2,210**	**100**

The current average Total Phosphorus influent is 0.175 mg/l to Memorial Lake and 0.168 mg/l to Harrisonville Lake. The target average influent for both lakes is 0.025 mg/l. The current steady state condition

of 0.141 mg/l for Memorial Lake and 0.133 mg/l for Harrisonville Lake must be reduced to a steady state concentration of 0.03 mg/l to avoid exceeding the 0.05 mg/l total phosphorus water quality criterion. The overall TP load reduction for Memorial Lake is 86% and for Harrisonville Lake 85%. The NJDEP intends to achieve these reductions through a variety of means including the implementation of the stormwater management regulations, the development of lake restoration plans, and the development of various non-point source control measures.

TMDL for Fecal Coliform

In April of 2003, the NJDEP also proposed a TMDL for fecal coliform to address 27 streams in the Lower Delaware Water region. The stream segments identified included the Salem River at Woodstown, the Salem River at Courses Landing and Two Penny Run near Dancer's corner. The watersheds for each of these stream segments include a portion of Pilesgrove Township. The TMDL was approved by the EPA on September 29, 2003.

The TMDL indicates that nonpoint and stormwater point sources are the primary contributants to fecal coliform loads in these streams. These sources include "*storm-driven loads transporting fecal coliform from sources such as geese, livestock, and domestic pets to receiving waters as well as failing sewage conveyance and inappropriately located or designed septic systems.*" Publicly owned treatment works (POTWs) are not believed to be a source of fecal coliform since these systems are required to use disinfection to achieve discharge limitations. Treatment plants should only be a significant source of fecal coliform due to substantive equipment malfunctions.

The options available to control nonpoint sources of fecal coliform typically include wildlife (goose) management, pet waste ordinances, agricultural conservation management plans, and septic system maintenance and replacement. Detailed water modeling is needed to determine the effectiveness of these control measures. The NJDEP is proposing to establish wasteload allocations (WLAs) for all NJPDES regulated point sources (including regulated stormwater) and Load Allocations (LAs) for all nonpoint sources that are not regulated by the NJDEP. The proposed TMDL indicates that an 84% reduction will be needed in both the wasteload allocation and load allocations to achieve the fecal coliform water quality criterion.

The key to reducing fecal coliform levels is understanding the potential sources in the Township and matching the implementation of specific strategies to address these sources. Because of the presence of numerous livestock and horse farms within the Salem River watershed, attention will need to be focused on the implementation of conservation, management plans and best management practices. There are several programs to assist the farmer in implementing improved management practices including the Environmental Quality Incentive Program (EQIP), the Conservation Reserve Program (CRP), the State Conservation Cost-Sharing Program, and the Soil & Water Conservation Cost-Sharing Program under the voluntary farmland preservation program.

4.4.2 Groundwater Resources

4.4.2.1. Geology.

Pilesgrove Township is located within the physiographic province known as the Atlantic Coastal Plain. The Township is underlain by two geologic systems (Cretaceous and Tertiary) which are broken down into nine (9) sub-group geologic formations. The geologic formations in New Jersey are oriented in a down dip pattern toward the Atlantic Ocean. ***Table 40*** describes the lithologic and hydrologic characteristics of these formations. ***Map 5-2: Geology and Groundwater Resources*** displays the geologic formations that are evident in Pilesgrove Township based on the NJDEP GIS natural resource database.

Table 40
Pilesgrove Township Wastewater Management Plan
Geologic Formations

Geologic Formation	Symbol	Lithology	Hydrologic Characteristics	Maximum Thickness
Cohansey Sand	*Tch*	Light colored medium to coarse grained sand with occasional laminates of light colored clay	**Major aquifer capable of yielding 220 gpm of satisfactory quality**	82 feet
Kirkwood Formation	*Tkw*	Thick beds of dark colored clays with some layers of silt and fine grained quartz sand	Contains minor aquifers in certain areas with a yield of 50 gpm; Aquiclude in most areas;	275 feet
Vincentown Sand	*Tvt*	Medium grained, slightly clayey sands; Non water bearing zone consists of green clayey glauconitic sand	**Major aquifer with potential yield of 270 gpm**	160 feet
Hornerstown Sand	*Tht*	Dark green clayey sand	A leaky aquiclude; no wells tap this formation in Salem County;	
Navesink Marl	*Kns*	A dark green glauconitic composition of sand, silt and clay;	A leaky aquiclude; no wells tap this formation in Salem County;	52 feet
Mount Laurel/ Wenonah Sand	*Kw*	Fine to coarse grained glauconitic quartz sand;	**Major aquifer with potential yield of 500 gpm;**	120 feet
Marsalltown Formation	*Kmt*	Olive green to black colored sandy clay containing many fossils	A leaky aquiclude; dug wells have low yields (15-75 gpm); water has high iron content and undesirable odor	45 feet
Woodbury Clay	*Kwb*	Black silty clay	Major aquiclude; no wells tap this formation	90 feet

4.4.2.2 Aquifer Recharge Areas

Map 5-2 indicates the primary aquifer outcrops in Pilesgrove Township. It is important to emphasize that the mapped areas represent outcrop areas or the areas where formations are near the surface and capable of being recharged by surface water. The potential for environmental degradation is greater in recharge areas since there is a more direct connection between surface and ground water discharges and the underlying aquifer.

Pilesgrove Township contains the outcrop areas of three major aquifers. The Mount Laurel/Wenonah Sand outcrops along the Township's western boundary; the Vincentown formation outcrops in a narrow irregular band to the west and northwest of Woodstown; and the Cohansey formation outcrops along the eastern Township boundary. The aquifer outcrops along the Township western and eastern boundaries encompass an expansive area that needs to be carefully managed.

The Township also contains several aquicludes that consist of clay or silt layers that confine the aquifers and prevent recharge. For example, the area to the east of the Mount Laurel aquifer outcrop is a band of confining units that confine and protect the underlying aquifer.

4.4.2.3 Groundwater Resources

The major wells in the Woodstown/Pilesgrove area do not necessarily tap the formations that outcrop in the Township. In fact, most of the major wells in this area including the Woodstown and Richman's wells are screened in the Potomac-Raritan-Magothy (PRM) formation that outcrops along the Delaware River. The PRM is capable of the greatest yields in southern New Jersey but is also a water source that has historically been over-utilized in Camden and Gloucester counties resulting in cone of depressions that cause water levels to drop and salt water to intrude.

From a wastewater management planning standpoint, the key groundwater resource issues are the protection of the water supply capabilities of the underlying aquifers and the protection of the outcrop areas from environmental degradation.

4.4.2.4 Groundwater Water Supply.

The Woodstown water department serves a small portion of the Planning Area. The location of public and non-public community water supply wells in the Planning Area is shown on ***Map 5-2.*** According to the NJDEP natural resource database, there are no designated well-head protection areas within the Planning Area.

4.4.3 Topography

Map 5-3: USGS Topographic Map is a generalized topographic map for the Planning Area that graphically displays the relative elevations and slopes in the Township and Borough. As the Map depicts, the highest elevations are found in the eastern part of the Township and the lowest elevations are in the extreme southwestern and northwestern corners along the Oldmans Creek and Salem River corridors. The Map illustrates that the central part of the Township, in and around Woodstown, is flat or gently sloping except for the defined stream corridors. The major drainage divides that separate the major drainage basins are also evident.

Map 5-3 also indicates the general slope of the land in the Township by using different colors for each elevation range. Steep slopes are evident where there are different color bands close together and are found along the Oldmans Creek and Salem River corridors in the eastern, southeastern, and extreme northern parts of the Township. In general, the areas with slopes greater than ten percent (10%) within the Planning Area are very limited.

4.4.4 Soils

Map 5-4: Important Farmland Soils indicates the soil types within the Planning Area based on the updated NRCS soil survey data and indicates the most important agricultural soils based on their classification as prime soils, soils of statewide importance, and soils of unique value. As ***Map 5-4*** indicates, the Township contains extensive areas with prime soils and soils of statewide importance. In addition, the areas with soils of lesser importance particularly in the western part of the Township contain highly productive farms specifically suited to the sandy nature of the soils.

Map 5-4 also identifies hydric soils within the Planning Area. These soils are generally capable of supporting hydrophytic vegetation. The hydric soils in the Planning Area include the soils along the major stream corridors, headwater areas, as well as expansive areas with a substratum of slow permeability to the west of Woodstown Borough. Extensive areas of the Township are rated as having both prime agricultural soils as well as hydric soils due to a substratum of variable permeability.

4.4.5 Critical Habitats of Plant/Animal Communities

The critical habitats throughout the State have been delineated by the NJDEP Landscape Project that divides the landscape into habitat type using land cover data and then ranks each habitat type based on the status of the species present as follows:

Rank 1: Habitat of sufficient size for priority wildlife species but no confirmed occurrences of such species;
Rank 2: Habitat containing one or more occurrences of at least one non-listed State priority species;
Rank 3: Habitat containing one or more occurrences of at least one State threatened species;
Rank 4: Habitat containing one or more occurrences of at least one State endangered species;
Rank 5: Habitat containing one or more occurrences of at least one Federal endangered/threatened species.

Map 5-5: Critical Habitats Map indicates the critical habitats (ranked 3, 4, or 5 under the Landscape Project) that need to be considered in wastewater management planning decisions for the Planning Area. The key conclusions of the Critical Habitats Map can be summarized as follows:

- Grasslands. The Landscape Project indicates an expansive area of grasslands throughout the Township that contains listed threatened or endangered species, including an area owned by the NJDEP along Kings Highway. In general, the most suitable habitat for grasslands birds is the area used for cattle grazing rather than cropland. The tilled areas within this district may be suitable as foraging areas rather than nesting areas due to the level of disturbance.

- Forests. The Landscape Project indicates the presence of forested areas that contain state or federally listed threatened or endangered species along the Nichomus Run, Salem River, and Majors Run in the vicinity of Sharptown and along a segment of Oldmans Creek.

- Emergent. Emergent wetland areas that contain federally listed threatened or endangered species have also been identified within the Planning Area along the Nichomus Run east of Sharptown and the Salem River west of Sharptown.

- Bald eagles. The Landscape Project also identifies bald eagle foraging areas along the Salem River east of Woodstown, the Camp Crockett area, the extreme northwestern corner of the Township along Oldmans Creek, and in the extreme southwestern corner of the Township along the Salem River.

4.4.5.1. Natural Heritage Priority Sties

Four (4) 'Priority sites' have been designated by the Natural Heritage Program of the NJDEP in the Township. These Sites are considered worthy of public acquisition and converge on the Sharptown area. The 'Sharptown Priority Site' extends from US Route 40 to Auburn Road and from Kings Highway to Sharptown-Auburn road and reportedly contains a diverse population of rare and endangered grassland bird species. The remaining three Priority Sites, known as the 'Salem River Floodplain', 'Majors Run' and 'Nichomus Run' Priority Sites, contain a diversity of rare and endangered plant and wildlife along stream corridors. Since these priority sites have local, regional, and statewide environmental significance, they warrant special protection in Township planning documents.

4.4.5.2. Kings Road LLC Project Site

Due to the presence of Natural Heritage Priority sites in the vicinity of Sharptown, Pilesgrove Township conducted a detailed habitat suitability investigation of the Kings Road LLC property. The report prepared by Herptological Associates determined that the site has extensive biodiversity. The specific conclusions with regard to threatened and endangered species were as follows:

- A botanical survey of the site resulted in the determination that the Salem River floodplain forest contains an extensive population of Greek Valerian, a critically imperiled plant.

- An avian survey of the project site determined that a Cooper's Hawk nest is present in the forested swamp along the Salem River and that two grasshopper sparrows were evident in the upland farm fields.

- A reptilian survey found that the site contained "typical" bog turtle habitat but that no bog turtles were determined to be present.

Based on the foregoing conclusions, the Kings Road LLC project was modified to protect the critical habitats. In particular, the project was reconfigured to provide extensive buffers along the Salem River floodplain; to provide a buffer around the presumed location of a Cooper's Hawk nest; to provide for the removal of the Richman's treatment plant and the restoration of that site; and to provide for extensive open space, a portion of which could be set aside for passive open space for grassland birds and other species.

4.4.6 Open Space and Conservation Areas

Map 5-6: Open Space and Conservation Map indicates the public open space and preserved farmland within the Township Planning Area.

4.4.6.1 Public Open Space

The public open space shown on ***Map 5-6*** includes all lands that have been acquired by local, county and state government regardless of whether these areas have been developed into parks. A total of 769± acres have been acquired for public open space purposes as listed below.

- *State Open Space/Parks.* The State has acquired lands along the Salem River east of Woodstown, lands to the east of Sharptown, lands along Kings Highway, and lands to the north of US Route #40 about 1 mile east of Woodstown. These State owned lands are managed for resource protection purposes by the Fish and Wildlife Service. The only State park in the Township is a small portion of Harrisonville Lake Park in the extreme northeastern corner of the Township.

- *County Open Space/Parks.* The only County Park in the Planning Area is Camp Crockett located along Avis Mill Road and encompasses 50.7 acres.

- *Local Open Space/Parks.* The only municipal park in the Planning Area is Marlton Park which is operated jointly be Pilesgrove Township and Woodstown Borough and encompasses 64.6 acres.

4.4.6.2 Preserved Farmland

Map 5-6 indicates the farmland that has been preserved to date within the Township under municipal, county, and state farmland preservation programs. Approximately 4,000 acres of land have been preserved in the Township at the time of the preparation of this WMP under various farmland preservation programs. Preserved lands are concentrated in the northwestern quadrant and the extreme eastern part of the Township. Several hundred additional acres are being considered for preservation depending upon the availability of funding and are shown as pending applications on ***Map 5-6***.

4.4.7 Environmental Features

4.4.7.1 Environmentally Critical Areas

Map 5-7: Environmental Features Map displays the extent of critical environmental features that are worthy of protection. The specific areas that are included on ***Map 5-7*** are described below.

- Wetlands. ***Map 5-7*** indicates the potential freshwater wetlands that have been identified within the Township. The term 'potential wetlands' is used since wetlands can only be delineated based on a field investigation by a trained specialist. The potential wetlands shown on the Environmental Features Map are from the GIS Natural Resource Data issued by the NJDEP which indicates the presence of wetlands along the major tributaries in the Township as well as extensive wetlands within headwaters areas in the eastern part of the Township.

- Floodplains. ***Map 5-7*** indicates the 100-year floodplains within the Township based on mapping conducted by the USGS. The floodplains shown are those areas that extend beyond the potential wetlands areas. The most expansive floodplains are along the Salem River to the west of Woodstown. Generally, the flood prone areas tend to be concentrated within 500 feet of the stream corridor.

- Stream Corridors. The Township contains two primary stream corridors and several minor tributaries previously described in the Environmental Inventory. The NJDEP has requested that a 50' buffer be maintained along stream corridors. The stream corridor buffer areas are shown on ***Map 5-7.*** Any proposed encroachment on the stream corridor buffers will require project specific analyses to ensure that the value of the stream corridor is not impacted.

- Threatened and Endangered Species. The Critical Habitats shown on ***Map 5-7*** are those areas where State or federally listed imperiled species have been identified in the Landscape Project. T&E areas are shown where they extend beyond the limits of the features described above.

4.4.7.2 Other Important Environmental Features

There are other important environmental features that have been shown on the inventory maps but are not shown on ***Map 5-7*** since they are not considered environmentally critical areas including the following:

- Mount Laurel/Wenonah aquifer recharge area. The acquisition of open space, the preservation of farmland, and the use of groundwater recharge measures will ensure the recharge capabilities of the region. The presence of an important aquifer recharge area support specific land management practices in the outcrop area but does not warrant development exclusion.

- Parks/Preserved Lands. Lands that have already been acquired for public open space or preserved as farmland are an important development constraint. These areas are not shown on ***Map 5-7*** since the Environmental Features Map is intended to display environmentally critical areas without regard for whether they have been acquired or preserved by public action.

- Agricultural Development Areas. Pilesgrove Township has designated Project Areas for the purpose of targeting local farmland preservation efforts. These areas indicate program eligibility rather than any objective environmental criteria but the limits may impact land conversion patterns. A minor change in the Project Area limits would be required to the north of Woodstown to enable the use of the transfer mechanisms discussed for this area.

4.5 Environmental Constraints Analysis

The NJDEP requires that an Environmental Constraints Analysis (ECA) be conducted to assess the proposed sizing of the treatment facilities and the appropriate location and extent of the proposed Sewer Service area. The ECA is a build-out analysis that takes into account specific environmental constraints to development. ***Map 5-8: Environmental Constraints Map*** indicates the developed, environmentally constrained, and developable lands within the Planning Area. A build-out analysis based on current zoning is described below.

4.5.1 Developed Lands

For clarity purposes, the developed lands are represented on the Environmental Constraints Map by the underlying parcel mapping without any coloration. The limits and type of existing land development are best shown on ***Map 4-1: Existing Land Use Map***. The only portion of the developed lands that were considered developable were the undeveloped portions of residential parcels in excess of 5 acres and designated redevelopment areas. A total of 2,267± acres are considered developed lands of about 10% of the total Township. An additional 596± acres or 2.7% of the Township land area is devoted to public street rights-of-way.

4.5.2 Constrained Lands

The environmentally constrained lands represent lands that are not available for major development due to substantive environmental limitations, natural resource value, or deed restrictions. The environmentally constrained lands include wetlands, floodplains, publicly owned open space, preserved farmland, and the critical habitats that have been ranked as 3, 4 and 5 for forest, forest wetland, and emergent areas.

Lands that have been acquired in fee simple by a public entity as well as parcels in which the development rights have been acquired have been excluded from the developable area. A total of 4,021± acres in the Township or 17.9 % of its land area is not available for land development due to the public acquisition of the land or development rights. An additional 2,512± acres or 11.2% of the Township are considered wetlands based on the NJDEP natural resource database. Therefore, over 6,500 acres or 29.1% of the Township are excluded from future development due to deed or regulatory restrictions.

The grassland critical habitats are shown as an environmental constraint but were not factored into the build out analysis since land development on ISSDS are not precluded in these areas. It should be noted that virtually the entire grassland bird critical habitat coincides with the Agricultural Retention (AR) zoning district. Portions of the AR district are used for cropland that is frequently disturbed and other portions are used for ranchland that is more suited to the preferred habitat conditions for the grassland birds. The Township currently requires threatened and endangered species to be addressed in the environmental impact assessment that is prepared as part of development approval process.

4.5.3 Developable Lands

Developable land is land that is capable of being developed without encroaching on the environmentally constrained lands described above. ***Map 5-8*** indicates in yellow the lands that are considered developable. In addition, as noted above, lands within the grasslands critical habitat (shown in olive green) were considered developable subject to site-specific investigations due to the low density of existing zoning and the current land disturbances. As shown on ***Map 5-8,*** the developable lands in the Township are primarily clustered in the northern and southern parts of the Planning Area. The Township's farmland preservation program is becoming an effective limiting factor to land development in the western part of the Township.

4.6 BUILD-OUT ANALYSES

4.6.1 Existing Zoning

Table 41 is a build-out analysis based upon the existing zoning regulations by subwatershed (HUC 14). The analysis defines the total area by zoning district and deducts preserved farmland, public open space, water, and wetlands to calculate the total developable acreage by zoning district. The maximum units per acre were determined for each zoning district based on the assumption that at least 20% of a tract is devoted to roads, stormwater management, and buffer areas. Typically, there is also some loss in lotting efficiency due to the configuration of the tract.

Residential

A build-out analysis was conducted to determine the extent of development that could occur on these developable lands. ***Table 41*** indicates the breakdown of developable land by zoning district and subwatershed. A total of 12,000± acres in the Township is considered developable within residentially zoned districts. An additional 392± acres are considered developable on existing lots with residential use that are in excess of five acres. For these lots, it is assumed that one acre would be retained for residential use and the remainder could be used for future development. Therefore, the total developable land including the unused portions of large residential tracts is estimated to be 12,393± acres.

Based on the maximum yield of current zoning regulations, it is projected that 5,955 residential units could be built in the Township under complete build-out conditions in addition to the current estimated 1,513 units. Therefore, the total residential build-out under existing zoning regulations would be approximately 7,467 units or 21,500 persons. The current residential zoning equates to an average overall density of just under 0.5 units per acre (5,955 potential units/12,393 developable acres).

Non-Residential

Table 41 also includes the potential buildout in non-residential zoning districts. The developable land that is zoned or allotted for commercial or industrial development in Pilesgrove Township is 665± acres. Based on the permitted building intensity in the zoning regulations, a build out of 5.26 million square feet of commercial or industrial development is projected based on current zoning regulations. This figure takes into account the 3.65 million square feet that could be developed within the Planned Light Industrial (PLI) zoning district under a General Development Plan (GDP). The potential commercial land development also includes 1.7 million square feet within the Neighborhood and Highway Commercial zoning districts.

Sewer Service Area

The residential build-out under the existing zoning regulations includes the 116 units that are currently sewered and the 75 units of affordable housing within the Bailey Corner redevelopment area for a total of 191 sewered residential units. The additional units that may be sewered as part of the Woodstown town center extension would be as a result of the clustering or transferring of existing development rights and would not represent an increase in the build-out. Similarly the inclusion of the existing crossroads settlement area in Sharptown as part of the sewer service area for that proposed village center would represent a minimal increase in the buildout. The village is currently zoned for moderate density development but the potential for in-fill development would be more if planned infrastructure was available.

Kings Road Overlay Zoning

An overlay Planned Residential Zoning (PRD-1) district was adopted in accordance with the Kings Road Settlement Agreement contingent upon the provision of water and sewer infrastructure. The concept plan that was appended to the Settlement Agreement provided for 96 single family detached units. The underlying zoning would provide for approximately 41 single-family detached units with individual onsite disposal systems. Therefore, the effect of the PRD-1 zoning overlay was to increase the build-out over the prior zoning by 45 homes. Since this project appears to be defunct, it has not been included in the analysis.

Woodstown Town Center Overlay Zoning

The second area of overlay zoning would be the proposed Woodstown town center extension primarily on the north side of Woodstown Borough under a non-contiguous clustering arrangement. The basic premise of the non-contiguous clustering provision would be the shift the location of residential units. Therefore, it would not appreciably change the build-out calculation since land developers within the sewer service area would need to acquire development rights from landowners in the preservation area in order to build at the maximum permitted density. It is expected that the establishment of the overlay zones would change the pattern and timing of land development in the Township but not the total build-out. The Township may consider reducing the number of development rights in the agricultural areas to increase the land preservation impact on the Township and to more closely reflect the build-out under the proposed nitrate dilution standards.

Critical Habitats

Most of the Future Sewer Service Area around Woodstown and at the PLI district would be outside of the limits of the grassland bird critical habitat. The Township conducted a habitat suitability analysis for the Kings Road and determined that the conversion of the land would not impact this expansive critical habitat due to the disturbed nature of the existing cropland. As previously indicated, the grassland critical habitats were not factored into the analysis as a substantive environmental constraint. It should be noted that a significant portion of the development rights for the farmland within this critical habitat has been acquired.

Watershed Breakdown

Table 42 indicates the existing and future build out by sub-watershed. The analysis indicates that under current regulations there is the potential for an additional 3,675 dwelling units on the Salem River watershed and 1,986 dwelling units in the Oldmans Creek watershed. There is also the potential for 5.2 million square feet of commercial/industrial development in the Salem River watershed.

Preliminary County Zoning Buildout Analysis

The Salem County Planning Board has recently issued a build out analysis based on the Township's existing zoning regulations. ***Table 42*** compares the Township and County analyses based on the existing regulations by watershed. As the Table indicates, the preliminary County analysis indicates a much greater build out than the analysis conducted by the Township. The differences can be attributed to two factors. First, the County analysis is a total theoretical bailout analysis that does not recognize the existing developed land while the Township analysis applies zoning to the vacant developable or underutilized land. Second, the County analysis does not appear to deduct all of the environmentally constrained and preserved lands in the Township. The result is the County overstates the residential build out of the existing zoning by about 20%. Furthermore, the County build out appears to substantially underestimate the build out of the commercial and industrial districts and does not recognize the potential significance of the PLI district.

Table 41
Pilesgrove Township Build-out Calculation
Existing Zoning Analysis

HUC14 and Zone	Total Area (Acres)	Developed Lands	Streets	Preserved Farmland/ Open Space(Acres)	Wetlands/ Water Area (Acres)	Developable Area (Acres)	Residential lots over 5 acres	Units/Acre	Potential Units
02040202160020 Oldmans Creek (East)									
Agricultural Retention (AR)	157.07	0.01	2.23	0.00	0.00	154.82	0.00	0.40	62
Conservation District (CD)	159.47	0.00	0.00	0.00	159.47	0.00	0.00	0.00	0
Restricted Residential (RR)	906.29	48.08	11.34	0.00	0.00	829.42	17.36	0.40	339
Single-Family Residential (SR)	118.27	48.13	7.26	0.00	0.00	62.87	0.00	0.80	50
TOTALS	**1,341.10**	**96.22**	**20.83**	**0.00**	**159.47**	**1,047.11**	**17.36**	**0.42**	**451**
02040202160030 Oldmans Creek (Central)									
Agricultural Retention (AR)	839.15	57.02	19.31	55.73	0.00	676.90	30.15	0.40	283
Conservation District (CD)	381.21	0.00	0.00	0.00	381.21	0.00	0.00	0.00	0
Restricted Residential (RR)	104.36	64.11	8.66	0.00	0.00	31.57	0.00	0.40	13
Single-Family Residential (SR)	1,268.98	137.28	38.09	77.95	0.00	1,007.77	7.85	0.80	812
TOTALS	**2,593.70**	**258.41**	**66.06**	**133.68**	**381.21**	**1,716.24**	**38.00**	**0.63**	**1108**
02040202160050 Oldmans Creek (West)									
Agricultural Retention (AR)	176.19	3.80	3.79	94.19	0.00	73.88	0.49	0.40	30
Conservation District (CD)	80.69	0.00	0.00	0.00	80.72	0.00	0.00	0.00	0
Single-Family Residential (SR)	1,082.42	481.91	81.08	22.63	0.00	389.35	107.14	0.80	397
TOTALS	**1,339.30**	**485.71**	**84.87**	**116.82**	**80.72**	**463.23**	**107.63**	**0.75**	**427**
02040206030010 Salem River (East)									
Agricultural Retention (AR)	2,299.07	58.25	54.46	757.95	0.00	1,390.19	37.49	0.40	571
Conservation District (CD)	428.51	0.00	0.00	0.00	428.51	0.00	0.00	0.00	0
Public - Parks - Education (PPE)	392.96	9.94	5.70	353.19	0.00	24.75	0.00	0.00	0
Restricted Residential (RR)	832.83	202.88	25.49	4.04	0.00	559.00	41.26	0.40	240
Single-Family Residential (SR)	85.35	26.01	2.79	0.00	0.00	52.69	3.84	0.80	45
TOTALS	**4,038.72**	**297.08**	**88.44**	**1,115.18**	**428.51**	**2,026.63**	**82.59**	**0.41**	**856**
02040206030020 Nichomus Run									
Agricultural Retention (AR)	1,109.76	40.26	33.49	108.13	0.00	927.10	2.86	0.40	372
Conservation District (CD)	511.98	0.00	0.00	0.00	511.98	0.00	0.00	0.00	0
Public - Parks - Education (PPE)	8.28	0.01	0.14	8.13	0.00	0.00	0.00	0.00	0
Restricted Residential (RR)	1,017.60	76.13	29.95	0.00	0.00	841.40	70.05	0.40	365
Single-Family Residential (SR)	232.92	37.13	9.06	0.15	0.00	181.13	5.46	0.80	149
TOTALS	**2,880.54**	**153.53**	**72.64**	**116.41**	**511.98**	**1,949.63**	**78.37**	**0.44**	**886**
02040206030030 Salem River (Central)									
Affordable Housing 1 (AH1)	7.81	5.72	0.08	0.00	0.00	2.01	0.00	11.00	74
Agricultural Retention (AR)	2,341.39	114.94	61.23	1,140.15	0.00	1,018.40	6.68	0.40	410
Conservation District (CD)	352.57	0.00	0.00	0.00	352.57	0.00	0.00	0.00	0
Public - Parks - Education (PPE)	66.00	0.22	0.00	65.68	0.00	0.03	0.00	0.00	0
Restricted Residential (RR)	855.70	242.35	20.58	0.11	0.00	587.16	5.49	0.40	237
Single-Family Residential (SR)	282.28	138.15	24.42	0.00	0.00	118.21	1.43	0.80	96
Single-Family Residential (SR-5)	15.58	11.55	3.14	0.09	0.00	0.77	0.00	1.60	1
Single-Family Residential (SR-CL)	87.79	3.13	1.12	0.06	0.00	83.40	0.00	0.80	67
PRD	89.75	3.54	2.31	0.00		83.88	0.00	1.15	96
Village Neighborhood (VN)	10.01	8.93	1.03	0.00	0.00	0.04	0.00	1.60	0
TOTALS	**4,108.88**	**528.53**	**113.91**	**1,206.09**	**352.57**	**1,893.90**	**13.60**	**0.51**	**981**

Pilesgrove Township Build-out Calculation

Existing Zoning Analysis

HUC14 and Zone	Total Area (Acres)	Developed Lands	Streets	Preserved Farmland/ Open Space(Acres)	Wetlands/ Water Area (Acres)	Developable Area (Acres)	Residential lots over 5 acres	Units/Acre	Potential Units
02040206030040 Salem River (Sharptown)									
Agricultural Retention (AR)	2,072.98	20.65	42.73	323.79	0.00	1,682.56	2.95	0.40	674
Conservation District (CD)	342.11	0.00	0.00	0.00	342.11	0.00	0.00	0.00	0
Public - Parks - Education (PPE)	92.51	21.52	3.63	67.24	0.00	0.03	0.00	0.00	0
Restricted Residential (RR)	44.01	6.68	0.01	0.00	0.00	29.47	7.86	0.40	15
Single-Family Residential (SR)	33.92	19.32	2.86	0.00	0.00	11.71	0.00	0.80	9
PRD	0.30	0.00	0.00	0.00		0.30	0.00	1.15	0
Village Neighborhood (VN)	54.10	37.49	10.20	0.00	0.00	6.41	0.00	1.60	10
TOTALS	**2,639.93**	**105.66**	**59.43**	**391.03**	**342.11**	**1,730.48**	**10.81**	**0.41**	**709**
02040206030050 Game Creek									
Agricultural Retention (AR)	1,053.44	25.11	13.23	606.97	0.00	408.13	0.00	0.40	163
Conservation District (CD)	61.13	0.00	0.00	0.00	61.13	0.00	0.00	0.00	0
Single-Family Residential (SR)	76.13	47.40	10.96	0.05	0.00	6.96	10.74	0.80	14
TOTALS	**1,190.70**	**72.51**	**24.19**	**607.02**	**61.13**	**415.09**	**10.74**	**0.42**	**177**
02040206030060 Salem River (West)									
Agricultural Retention (AR)	236.08	0.00	4.67	65.82	0.00	165.57	0.00	0.40	66
Conservation District (CD)	6.63	0.00	0.00	0.00	6.63	0.00	0.00	0.00	0
TOTALS	**242.71**	**0.00**	**4.67**	**65.82**	**6.63**	**165.57**	**0.00**	**0.40**	**66**
02040206040010 Mannington Creek									
Conservation District (CD)	3.20	0.00	0.00	0.00	3.20	0.00	0.00	0.00	0
Public - Parks - Education (PPE)	5.08	3.99	1.08	0.00	0.00	0.00	0.00	0.00	0
Restricted Residential (RR)	7.04	0.00	0.00	0.00	0.00	7.02	0.00	0.40	3
Single-Family Residential (SR)	23.49	0.37	1.50	0.00	0.00	21.63	0.00	0.80	17
TOTALS	**38.81**			**0.00**	**3.20**	**28.65**	**0.00**	**0.70**	**20**
02040206060020 Alloway Creek									
Agricultural Retention (AR)	696.59	2.57	17.67	269.36	0.00	403.01	3.98	0.40	163
Conservation District (CD)	184.78	0.00	0.00	0.00	184.78	0.00	0.00	0.00	0
Public - Parks - Education (PPE)	35.88	33.15	2.72	0.00	0.00	0.00	0.00	0.00	0
Restricted Residential (RR)	138.09	25.98	4.92	0.00	0.00	93.31	13.84	0.40	43
Single-Family Residential (SR)	108.12	14.36	9.93	0.00	0.00	68.77	15.06	0.80	67
TOTALS	**1,163.46**	**76.06**	**35.24**	**269.36**	**184.78**	**565.09**	**32.88**	**0.46**	**273**
RESIDENTIAL ZONE TOTALS	**21,577.85**	**2,073.71**	**570.28**	**4,021.41**	**2,512.31**	**12,001.62**	**391.98**	**0.48**	**5,955**

Table 41 Continued
Pilesgrove Township Build-out Calculation
Existing Zoning Analysis

HUC14 and Zone	Total Area (Acres)	Developed Land Area (Acres)	Streets (Acres)	Preserved Farmland/ Open Space(Acres)	Wetlands/ Water Area (Acres)	Developable Area (Acres)	Residential lots over 5 acres	Intensity	SF
02040206030010 Salem River (East)									
Highway Commercial (HC)	133.42	25.39	6.99	0.00	0.00	101.03	0.00	15%	660,130
TOTALS	**133.42**	**25.39**	**6.99**	**0.00**	**0.00**	**101.03**	**0.00**	**15%**	**660,130**
02040206030020 Nichomus Run									
Highway Commercial (HC)	49.55	28.76	1.99	0.00	0.00	18.80	0.00	15%	122,839
TOTALS	**49.55**	**28.76**	**1.99**	**0.00**	**0.00**	**18.80**	**0.00**	**15%**	**122,839**
02040206030030 Salem River (Central)									
Highway Commercial (HC)	48.65	33.44	4.45	0.00	0.00	10.75	0.00	15%	70,241
Neighborhood Commercial (NC)	13.42	9.52	1.69	0.00	0.00	2.21	0.00	25%	24,067
TOTALS	**62.07**	**42.96**	**6.14**	**0.00**	**0.00**	**12.96**	**0.00**	**17%**	**94,307**
02040206030040 Salem River (Sharptown)									
Highway Commercial (HC)	192.58	92.26	3.31	0.00	0.00	96.98	0.00	15%	633,667
Neighborhood Commercial (NC)	22.12	3.62	2.41	0.00	0.00	16.09	0.00	15%	105,132
Planned Light Industrial (PLI)	359.28	0.71	2.10	0.00	0.00	356.41	0.00	20%	3,105,044
TOTALS	**573.98**	**96.59**	**7.82**	**0.00**	**0.00**	**469.48**	**0.00**	**19%**	**3,843,843**
02040206030060 Salem River (West)									
Planned Light Industrial (PLI)	65.56	0.00	3.26	0.00	0.00	62.29	0.00	20%	542,670
TOTALS	**65.56**	**0.00**	**3.26**	**0.00**	**0.00**	**62.29**	**0.00**	**20%**	**542,670**
NON-RESIDENTIAL ZONE TOTALS	**884.58**	**193.70**	**26.20**	**0.00**	**0.00**	**664.56**	**0.00**	**18%**	**5,263,790**

TOWNSHIP TOTALS	**22,462.43**	**2,267.41**	**596.48**	**4,021.41**	**2,512.31**	**12,666.18**	**391.98**		
Percent	**100.0%**	**10.1%**	**2.7%**	**17.9%**	**11.2%**	**56.4%**	**1.7%**		

Table 42
Pilesgrove Township
Zoning Buildout AnalysisComparison

		Township Zoning Buildout				*County Zoning Buildout*	
Sub-watershed	HUC 14	Exisitng Dwelling Dwelling Units	Future Dwelling Units	Total Dwelling Units	Future Non-Residential (SF)	Total Dwelling Units	Total Non-Residential (SF)
Oldmans Creek (East)	**02040202160020**	64	451	515	0		
Oldmans Creek (Central)	**02040202160030**	177	1,108	1,285	0		
Oldmans Creek (West)	**02040202160050**	304	427	731	0		
Oldmans Creek Total		***545***	***1,986***	***2,531***	***0***	***2,655***	***0***
Salem River (East)	**02040206030010**	243	856	1,099	660,130		
Nichomus Run	**02040206030020**	137	886	1,023	122,839		
Salem River (Central)	**02040206030030**	382	981	1,363	94,307		
Salem River (Sharptown)	**02040206030040**	100	709	809	3,843,843		
Game Creek	**02040206030050**	55	177	232	0		
Salem River (West)	**02040206030060**	3	66	69	542,670		
Salem River Total		***920***	***3,675***	***4,595***	***5,263,789***	***5,796***	***1,177,674***
Mannington Creek	**02040206040010**	1	20	21	0		
Mannington Creek Total		***1***	***20***	***21***	***0***	***23***	***0***
Alloway Creek	**02040206060020**	47	273	320	0		
Alloway Creek Total		***47***	***273***	***320***	***0***	***466***	***0***
Pilesgrove Township Total		***1,513***	***5,954***	***7,467***	***5,263,789***	***8,940***	***1,177,674***

**Includes Bailey Corner & Friends Home*

4.6.2 Nitrate Dilution Build-out Analysis

Pilesgrove Township adopted the New Jersey Geological Survey nitrate dilution model for the assessment of major subdivisions several years ago. The existing Land Development Ordinance specifically states that land developers must demonstrate that the nitrate generated by the proposed Individual Subsurface sewage disposal systems (ISSDSs) will be adequately diluted to achieve a nitrate standard of 5.2 mg/l. The ordinance specifies that the analysis be based on the proposed size of single-family dwellings (bedrooms).

The NJDEP water quality management regulations were amended in 2009 to achieve a target of 2.0 mg/l. This level has been represented to be an ambient nitrate quality in ground water for the whole state. The State also proposes that the nitrate modeling be based on an average loading of 30 lbs. per dwelling assuming 3 persons per residence and 10 lbs. per person. However, the NJDEP regulations specify that the 2.0 mg/l target be achieved on a gross watershed basis, taking into account dilution from preserved or publicly owned lands.

4.6.2.1 NJDEP/Salem County Analysis

Table 43 summarizes the preliminary nitrate dilution buildout analysis recently issued by the Salem County Planning Department based on HUC 11 density figures calculated by the NJDEP.

Table 43
Pilesgrove Township
Preliminary Septic Buildout: Salem County

Watershed	Zoning	Acres	Units
Oldmans Creek	AR-1; AR-2	1,049.7	148
	RR	838.0	118
	SR	1,597.9	225
	JCOAH	78.4	11
Subtotal		***3,563.9***	***502***
Salem River	AR-1; AR-2	8,180.8	1,136
	RR	2,316.6	322
	SR	363.5	50
	JCOAH	73.7	10
Subtotal		***10,934.6***	***1,519***
Mannington Creek	RR	7.0	1
	SR	19.5	2
Subtotal		***26.5***	***3***
Alloway Creek	AR-1; AR-2	673.9	92
	RR	97.8	13
	SR	74.1	10
Subtotal		***845.9***	***116***
Residential Total		**15,370.9**	**2,140**

This analysis indicates a total build out of 2,140 dwelling units or an average of one (1) dwelling unit using an ISSDS per 7.2 acres. It should be noted that the County build out analysis included the PPE zone which is public land that is not available for development. Under this analysis, the total development potential for the Township in the unsewered area would only be 900 dwelling units once existing dwelling units on septic systems are deducted.

The County has projected a zoning build out of 8,940 units and a nitrate dilution build out of 2,140 units for a differential of 6,800 units between the zoning and NJDEP nitrate dilution build out analyses.

4.6.2.2 Current Township Ordinance Analysis

Table 44 is a build-out analysis based on nitrate dilution modeling for each HUC 14 watershed. The analysis computes the area required to dilute the nitrate concentration in the effluent from individual septic systems to the 5.2 mg/l and 2.0 mg/l targets. The analysis uses the NJGS model for each soil type within the HUC 14 subwatershed to determine the area required to dilute the nitrate to the specified standard.

The initial case shown in ***Table 44*** computed the number of equivalent dwelling units (EDUs) that could be developed in the Township using ISSDSs based on a target limit of 5.2 mg/l. This analysis resulted in the determination that the soils in the Township are capable of supporting about 9,005 EDUs. The Township currently has about 1,438 dwelling units of which 1,322 units use individual systems. If these systems were deducted, the Township would have the ability to develop an additional 7,677 EDUs. If 700 EDUs were deducted for commercial and industrial uses, the Township would have the ability to construct almost an additional 7,000 units, which would support an additional 20,375 persons.

When the total number of dwelling residential units is divided by the total Township land area, the overall density is 1 unit per 2.5 acres or 0.4 units per total acre. Therefore, the 5.2 mg/l target is only slightly more restrictive than current zoning regulations from a build-out perspective even though it can be moderately limiting on a project-specific basis depending on soil conditions.

4.6.2.3 NJDEP Target: Township Analysis

The other case analyzed in ***Table 44*** computed the number of equivalent dwelling units (EDUs) that could be developed in the Township using ISSDSs based on a target limit of 2.0 mg/l. This analysis results in the determination that the soils in the Township are capable of supporting 3,682 EDUs or an additional 2,346 EDUs. If 700 EDUs were deducted for commercial and industrial uses, the Township would have the ability to construct an additional 1,646 dwelling units that rely on ISSDS, which could support an additional 4,790 persons. When the total number of residential units under this scenario is divided by the total land area, the overall density is 1 unit per 6.1 acres of land or 0.16 units per total acre.

4.6.3 Summary of Nitrate Dilution Analysis

Table 45 compares the three (3) nitrate dilution build out analyses by subwatershed. The differences in the build-out from the three cases are substantial.

The base case is that of the current Township nitrate dilution model which provides for a build out that is comparable to current residential district zoning even though it may be moderately restrictive on a project-specific basis. The zoning buildout provided for 5,954 dwelling units in residential districts. The ND analysis provides for a total of 7,683 EDUs which includes non-residential development.

Table 45 illustrates that the use of the same methodology based on the NJDEP nitrate dilution target of 2.0 mg/l provides for substantially less future dwelling units than is permitted by current zoning. Using this target, the Township analysis computes a total buildout of 2,359 additional EDUs or 5,324 units less than the current Township ordinance requirement or almost a 70% reduction from the build out under the current Township Ordinance.

Table 45 further indicates that the County/NJDEP analysis with the same target only provides for 900 future EDUs. The basis of this difference is unclear but appears to be related to the specificity of the NJDEP analysis in which gross density figures are used for the entire watershed without clear substantiation.

4.6.3.1 Watershed Breakdown

Table 45 indicates the breakdown of the future residential units by subwatershed and indicates the differences by specific watershed. The Township Ordinance nitrate dilution analysis projects about 800 dwelling units less than the current zoning in the Oldmans Creek watershed but almost 1,000 more dwelling units than the zoning permits in the Salem River watershed. The difference shown for the Salem River watershed is reduced when the EDUs for commercial and industrial development are deducted.

The breakdown of the future residential units by subwatershed for the Township analysis indicates that no addiotnla units can be accommodated in the Oldmans Creek west subwatershed and relatively minor growth in the remainder of the Oldmans Creek watershed. The addiotnal units in the Salem River watershed tend to be evenly distributed since pre-existing growth is relatively low in this watershed. ;

The County/NJDEP analysis provides for a total of 501 total dwelling units in the Oldmans Creek watershed which is less than the existing land development in this watershed. In other words, the County analysis appears to indicates that the existing land development exceeds the assimilative capabilities of the watershed and does not provide for any residential growth in this watershed.

The Township analysis using the NJDEP target provides for 1,831 EDUs in the Salem River watershed compared to 868 EDUs for this watershed in the preliminary County analysis which is a substantive difference. The basis of these variances requires further attention.

4.6.3.2 Water Quality Management Planning Regulations

The NJDEP Water Quality Management Planning Regulations (N.J.A.C. 7:15 et. seq.) indicate the potential importance of these build out analysis. N.J.A.C. 7:15-5.25(e)(2)iv states that if the wastewater management planning entity determines that the number of additional equivalent dwelling units calculated based on existing zoning regulations exceeds the allowable number of additional equivalent dwelling units based on the attainment of 2.0 mg/l using the nitrate dilution model "*then the plan shall include an adjustment to the zoning in order to achieve consistency between zoning and the allowable number of equivalent dwelling units at buildout in the undeveloped and underdeveloped areas*".

The regulations further state that "*the allowable number of additional equivalent dwelling units may be distributed within the HUC 11 at the discretion of the municipality provided that the total number of additional equivalent dwelling units in the HUC 11 does not exceed the allowable number*".

Notwithstanding that the NJDEP regulations indicate that the County shall require that the local zoning to be modified to match the nitrate dilution analysis, the Salem County Planning Director has indicated that this provision will not advocated by the County nor enforced by the NJDEP.

In the event that the nitrate dilution provision is to be implemented and enforced as stipulated in the current NJDEP regulations, it is recommended that the Township build out analysis be further refined and reconciled with the build out analysis issued by the County. Once the total number of EDUs is established for each watershed, the Township should establish a equitable means of allocating these EDUs to land developments which may or may not replicate zoning.

It should be emphasized that the Township's current nitrate dilution model is actually between these two build-out cases since the analysis is conducted on a project site basis and does not factor in the dilution that takes place on lands that will be preserved.

4.6.4 Proposed Policies

It is recommended that the nitrate dilution modeling issue and regulations be implemented in the following manner:

- Salem County should establish a consistent policy that equitably distributes the EDUs determined based on the capabilities of the soils of each watershed rather than reliance on overall density figures issued by the NJDEP as shown in ***Table 43***.

- The NJDEP target limit of 2.0 mg/l should be applied on a subwatershed basis to establish a build-out that is related to the soil conditions in that subwatershed and to enable an equitable distribution of the build-out by municipality using an analysis similar to that presented in ***Table 43***. The use of a watershed based analysis without a clear relationship to soil conditions is contrary to the intent of the NJDEP regulations. The preliminary analysis in ***Table 43*** indicates that the Township soils can support a maximum of 2,359 additional equivalent dwelling units using ISSDS under build out conditions while attaining the 2.0 mg/l target.

- Once the maximum development rights for each subwatershed are determined, the most effective means of equitably distributing these units should be determined by the Township. Development rights that exceed the equitable distribution of the fixed number of rights by subwatershed could only be utilized if the units use advanced treatment methods involving denitrification or under a transfer mechanism to a sewered area under a development rights transfer or clustering arrangement.

- The 5.2 mg/l target limit should continue to be applied on a project specific basis. Developers should be required to satisfy the model for a determination of their development rights. If the site-specific development rights were exceeded, the developer would need to provide advanced treatment units with de-nitrification in order to satisfy the project-specific model.

- The Township supports a process that would enable the use of alternative treatment units (ATUs) without reliance on NJDEP permitting. The process may involve an agreement between the NJDEP and the Salem County Health Department to enable the permitting of these facilities based on defined unit parameters.

- Differences between the NJDEP 50+ Certification nitrate dilution model and the Township model need to be reconciled on a technical basis.

The trend projection in ***Table 19*** indicates the projected need for 760 EDUs for residential purposes thru 2030. It appears that the trend projection can be accommodated in the Township but that there would be limitations within specific watersheds that would need to be overcome with alternative treatment units. If this approach is not feasible, the Township could consider zoning changes that maximize the availability of EDUs in the Township. However, zoning based solely on nitrate dilution may not be in the interests of the Township.

Table 24 indicates that the use of ISSDS would be reduced to 432 new units under the transfer/cluster alternative, which would effectively eliminate the need for alternative treatment units. In other words, the need for a means of overcoming the watershed nitrate dilution limitations with alternative treatment units would be reduced under the Town Center Extension option that is being pursued by the Township. Therefore, the Township supports a process that enables landowners and developers to transfer development rights to sewered areas using a development rights transfer mechanism provided that infrastructure can be extended to areas capable of receiving the units.

Table 44
Pilesgrove Township Build-out Calculations
Nitrate Dilution Analysis

HUC14 and Zone	Total Area (Acres)	Area required to dilute nitrate to 5.2 mg/l	Equivalent Dwelling Units	Area required to dilute nitrate to 2.0 mg/l	Equivalent Dwelling Units
02040202160050 Oldmans Creek (West)					
Chicone Silt Loam (ChsAt)	54.7	0.0	0	0.0	0
Downer loamy sand (DocB)	10.9	1.8	6	4.4	2
Downer loamy sand (DocC)	17.3	1.8	10	4.4	4
Downer-Galestown complex (DopB)	23.3	1.8	13	4.4	5
Fort Mott loamy sand (FodB)	144.0	1.7	85	4.1	35
Galestown Sand (GabB)	84.6	1.7	50	4.1	21
Manahawkin Muck (MakAt)	59.2	0.0	0	0.0	0
Marlton Silt loam (MasB)	100.6	2.1	48	5.1	20
Marlton Silt loam (MasC)	73.8	2.1	35	5.1	14
Muttontown sandy loam (MutA)	2.0	2.2	1	5.4	0
Othello & Fallsington soils (OTKA)	5.2	0.0	0	0.0	0
Sharptown Silt Loam (ShnB)	67.8	2.3	29	5.6	12
Swedesboro loamy sand (SwtB)	538.8	1.9	284	4.6	117
Swedesboro loamy sand (SwtC)	114.7	1.9	60	4.6	25
Urban Land (UR)	16.1	0.0	0	0.0	0
Water (WATER)	23.2	0.0	0	0.0	0
TOTALS	**1,336.0**		**620**		**256**
02040202160030 Oldmans Creek (Central)					
Alloway Sandy loam (AhmB)	8.4	2.1	4	5.2	2
Alloway loam (AhpB)	31.2	2.1	15	5.2	6
Alloway loam (AhpC)	125.2	2.1	60	5.2	24
Aura gr. Sandy loam (AuhB)	31.7	1.8	18	4.5	7
Chicone Silt Loam (ChsAt)	206.3	0.0	0	0.0	0
Chillum silt loam (ChtB)	145.0	1.8	81	4.5	32
Downer loamy sand (DocB)	26.0	1.8	14	4.4	6
Downer loamy sand (DocC)	14.1	1.8	8	4.4	3
Downer sandy loam (DoeB)	39.5	1.8	22	4.4	9
Downer-Galestown complex (DopB)	116.8	1.8	65	4.4	27
Evesboro Sand (EveC)	7.7	1.7	5	4.1	2
Fort Mott loamy sand (FodB)	194.5	1.7	114	4.1	47
Galestown Sand (GabB)	188.9	1.7	111	4.1	46
Galloway loamy sand (GamB)	20.3	1.8	11	4.4	5
Manahawkin Muck (MakAt)	6.9	0.0	0	0.0	0
Marlton Silt loam (MasB)	99.3	2.1	47	5.1	19
Marlton Silt loam (MasC)	63.4	2.1	30	5.1	12
Matapeake Silt loam (MbrC)	11.3	1.9	6	4.7	2
Mattapex Silt loam (MbuA)	17.8	2.3	8	5.6	3
Mattapex Silt loam (MbuB)	16.2	2.3	7	5.6	3
Muttontown sandy loam (MutA)	215.0	2.2	98	5.4	40
Othello & Fallsington soils (OTKA)	214.6	0.0	0	0.0	0
Pedricktown/Askecksey/Mullica Soils (PEEAR)	20.7	0.0	0	0.0	0
Sassafras sandy loam (SacB)	258.3	1.9	136	4.6	56
Sassafras sandy loam (SacC)	75.1	1.9	40	4.6	16
Sharptown Silt Loam (ShnB)	113.2	2.3	49	5.6	20
Swedesboro loamy sand (SwtB)	163.3	1.9	86	4.6	35
Swedesboro loamy sand (SwtC)	72.6	1.9	38	4.6	16
Water (WATER)	2.1	0.0	0	0.0	0
Woodstown sandy loam (WoeA)	71.5	2.2	32	5.4	13
TOTALS	**2,576.8**		**1,104**		**453**

Table 44 Continued
Pilesgrove Township Build-out Calculations
Nitrate Dilution Analysis

HUC14 and Zone	Total Area (Acres)	Area required to dilute nitrate to 5.2 mg/l	Equivalent Dwelling Units	Area required to dilute nitrate to 2.0 mg/l	Equivalent Dwelling Units
02040206030050 Game Creek					
Downer-Galestown complex (DopB)	28.1	1.8	16	4.4	6
Fort Mott loamy sand (FodB)	482.9	1.7	284	4.1	118
Hammonton loamy sand (HbmB)	40.4	2.2	18	5.4	7
Manahawkin Muck (MakAt)	50.1	0.0	0	0.0	0
Marlton Silt loam (MasB)	38.6	2.1	18	5.1	8
Muttontown sandy loam (MutA)	18.6	2.2	8	5.4	3
Pedricktown/Askecksey/Mullica Soils (PEEAR)	46.9	0.0	0	0.0	0
Sharptown Silt Loam (ShnB)	9.0	2.3	4	5.6	2
Swedesboro loamy sand (SwtB)	372.7	1.9	196	4.6	81
Swedesboro loamy sand (SwtC)	94.9	1.9	50	4.6	21
Urban Land (UR)	0.1	0.0	0	0.0	0
Water (WATER)	8.6	0.0	0	0.0	0
TOTALS	**1,190.8**		**595**		**246**
02040202160020 Oldmans Creek (East)					
Alloway Sandy loam (AhmB)	79.6	2.1	38	5.2	15
Alloway loam (AhpB)	83.4	2.1	40	5.2	16
Alloway loam (AhpC)	27.7	2.1	13	5.2	5
Alloway silt loam (AhrB)	11.8	2.1	6	5.2	2
Aura loamy sand (AucB)	43.8	1.8	24	4.5	10
Aura sandy loam (AugC)	35.3	1.8	20	4.5	8
Aura gr. Sandy loam (AuhB)	23.6	1.8	13	4.5	5
Chicone Silt Loam (ChsAt)	75.1	0.0	0	0.0	0
Chillum silt loam (ChtB)	51.2	1.8	28	4.5	11
Downer loamy sand (DocB)	5.6	1.8	3	4.4	1
Downer-Galestown complex (DopB)	95.8	1.8	53	4.4	22
Evesboro Sand (EveC)	20.8	1.7	12	4.1	5
Fort Mott loamy sand (FodB)	187.5	1.7	110	4.1	46
Galestown Sand (GabB)	7.7	1.7	5	4.1	2
Galloway loamy sand (GamB)	3.5	1.8	2	4.4	1
Hammonton loamy sand (HbmB)	5.4	2.2	2	5.4	1
Keyport loam (KeoC)	22.6	2.1	11	5.2	4
Matapeake Silt loam (MbrC)	7.3	1.9	4	4.7	2
Mattapex Silt loam (MbuA)	7.4	2.3	3	5.6	1
Mattapex Silt loam (MbuB)	12.8	2.3	6	5.6	2
Othello & Fallsington soils (OTKA)	167.9	0.0	0	0.0	0
Othello/Fallsington/Trussum Soils (OTMA)	19.3	0.0	0	0.0	0
Pedricktown/Askecksey/Mullica Soils (PEEAR)	14.2	0.0	0	0.0	0
Sassafras sandy loam (SacB)	120.5	1.9	63	4.6	26
Sassafras sandy loam (SacC)	12.1	1.9	6	4.6	3
Sharptown Silt Loam (ShnB)	5.6	2.3	2	5.6	1
Swedesboro loamy sand (SwtC)	8.3	1.9	4	4.6	2
Water (WATER)	4.3	0.0	0	0.0	0
Woodstown sandy loam (WoeA)	151.6	2.2	69	5.4	28
TOTALS	**1,311.7**		**539**		**220**
02040206030060 Salem River (West)					
Downer-Galestown complex (DopB)	176.6	1.8	98	4.4	40
Fort Mott loamy sand (FodB)	47.9	1.7	28	4.1	12
Hammonton loamy sand (HbmB)	69.3	2.2	31	5.4	13
Othello/Fallsington/Trussum Soils (OTMA)	12.1	0.0	0	0.0	0
Pedricktown/Askecksey/Mullica Soils (PEEAR)	0.6	0.0	0	0.0	0
Water (WATER)	1.7	0.0	0	0.0	0
TOTALS	**308.2**		**158**		**65**

Table 44 Continued
Pilesgrove Township Build-out Calculations
Nitrate Dilution Analysis

HUC14 and Zone	Total Area (Acres)	Area required to dilute nitrate to 5.2 mg/l	Equivalent Dwelling Units	Area required to dilute nitrate to 2.0 mg/l	Equivalent Dwelling Units
02040206030040 Salem River (Sharptown)					
Alloway loam (AhpB)	172.1	2.1	82	5.2	33
Alloway silt loam (AhrA)	185.4	2.1	88	5.2	36
Alloway silt loam (AhrB)	19.6	2.1	9	5.2	4
Chicone Silt Loam (ChsAt)	168.8	0.0	0	0.0	0
Downer loamy sand (DocB)	21.9	1.8	12	4.4	5
Downer-Galestown complex (DopB)	770.8	1.8	428	4.4	175
Fort Mott loamy sand (FodB)	79.1	1.7	47	4.1	19
Hammonton loamy sand (HbmB)	105.9	2.2	48	5.4	20
Hammonton sandy loam (HboA)	3.4	2.2	2	5.4	1
Hammonton-Urban complex (HbrB)	35.3	2.2	16	5.4	7
Marlton Silt loam (MasB)	35.9	2.1	17	5.1	7
Marlton Silt loam (MasC)	137.0	2.1	65	5.1	27
Matapeake Silt loam (MbrC)	40.6	1.9	21	4.7	9
Othello/Fallsington/Trussum Soils (OTMA)	25.8	0.0	0	0.0	0
Pedricktown/Askecksey/Mullica Soils (PEEAR)	185.4	0.0	0	0.0	0
Sharptown Silt Loam (ShnA)	53.0	2.3	23	5.6	9
Sharptown Silt Loam (ShnB)	1,004.9	2.3	437	5.6	179
Swedesboro loamy sand (SwtB)	56.9	1.9	30	4.6	12
Swedesboro loamy sand (SwtC)	18.1	1.9	10	4.6	4
Urban Land (UR)	56.6	0.0	0	0.0	0
Water (WATER)	33.2	0.0	0	0.0	0
TOTALS	**3,209.5**		**1,335**		**546**
02040206030030 Salem River (Central)					
Alloway loam (AhpB)	24.4	2.1	12	5.2	5
Alloway loam (AhpC)	55.0	2.1	26	5.2	11
Alloway silt loam (AhrA)	78.5	2.1	37	5.2	15
Alloway silt loam (AhrB)	149.2	2.1	71	5.2	29
Aura loam (AupB)	13.3	1.8	7	4.5	3
Chicone Silt Loam (ChsAt)	288.4	0.0	0	0.0	0
Chillum silt loam (ChtB)	42.9	1.8	24	4.5	10
Galestown Sand (GabB)	76.7	1.7	45	4.1	19
Marlton Silt loam (MasB)	29.6	2.1	14	5.1	6
Marlton Silt loam (MasC)	398.2	2.1	190	5.1	78
Matapeake Silt loam (MbrA)	10.8	1.9	6	4.7	2
Mattapex Silt loam (MbuB)	18.0	2.3	8	5.6	3
Muttontown sandy loam (MutA)	25.4	2.2	12	5.4	5
Othello & Fallsington soils (OTKA)	450.1	0.0	0	0.0	0
Sassafras sandy loam (SacB)	155.0	1.9	82	4.6	34
Sassafras sandy loam (SacC)	40.3	1.9	21	4.6	9
Sharptown Silt Loam (ShnA)	472.7	2.3	206	5.6	84
Sharptown Silt Loam (ShnB)	1,133.6	2.3	493	5.6	202
Swedesboro loamy sand (SwtB)	323.7	1.9	170	4.6	70
Swedesboro loamy sand (SwtC)	265.3	1.9	140	4.6	58
Water (WATER)	3.6	0.0	0	0.0	0
Woodstown sandy loam (WoeA)	117.0	2.2	53	5.4	22
TOTALS	**4,171.3**		**1,616**		**663**

Table 44 Continued
Pilesgrove Township Build-out Calculations
Nitrate Dilution Analysis

HUC14 and Zone	Total Area (Acres)	Area required to dilute nitrate to 5.2 mg/l	Equivalent Dwelling Units	Area required to dilute nitrate to 2.0 mg/l	Equivalent Dwelling Units
02040206030020 Nichomus Run					
Alloway sandy loam (AhmB)	29.8	2.1	14	5.2	6
Alloway loam (AhpB)	762.0	2.1	363	5.2	147
Alloway loam (AhpC)	39.5	2.1	19	5.2	8
Alloway silt loam (AhrA)	130.4	2.1	62	5.2	25
Alloway silt loam (AhrB)	267.2	2.1	127	5.2	51
Aura sandy loam (AugC)	21.8	1.8	12	4.5	5
Aura loam (AupB)	27.1	1.8	15	4.5	6
Chicone Silt Loam (ChsAt)	206.5	0.0	0	0.0	0
Chillum silt loam (ChtB)	159.6	1.8	89	4.5	35
Downer loamy sand (DocC)	0.3	1.8	0	4.4	0
Evesboro Sand (EveC)	11.4	1.7	7	4.1	3
Galestown Sand (GabB)	126.7	1.7	75	4.1	31
Manahawkin Muck (MakAt)	27.0	0.0	0	0.0	0
Marlton Silt loam (MasC)	14.4	2.1	7	5.1	3
Matapeake Silt loam (MbrB)	4.8	1.9	3	4.7	1
Matapeake Silt loam (MbrC)	0.5	1.9	0	4.7	0
Mattapex Silt loam (MbuA)	2.8	2.3	1	5.6	0
Mattapex Silt loam (MbuB)	35.5	2.3	15	5.6	6
Othello/Fallsington/Trussum Soils (OTMA)	526.3	0.0	0	0.0	0
Pits,sand,gravel (PHG)	4.7	1.6	3	3.9	1
Sassafras sandy loam (SacB)	109.1	1.9	57	4.6	24
Sassafras sandy loam (SacC)	3.9	1.9	2	4.6	1
Sharptown Silt Loam (ShnA)	199.0	2.3	87	5.6	36
Sharptown Silt Loam (ShnB)	216.9	2.3	94	5.6	39
Woodstown sandy loam (WoeA)	10.2	2.2	5	5.4	2
TOTALS	**2,937.5**		**1,057**		**429**
02040206030010 Salem River (East)					
Adelphia sandy loam (AdkB)	6.0	2.1	3	5.2	1
Alloway sandy loam (AhmB)	11.0	2.1	5	5.2	2
Alloway loam (AhpB)	335.2	2.1	160	5.2	64
Alloway loam (AhpC)	33.9	2.1	16	5.2	7
Alloway silt loam (AhrA)	0.1	2.1	0	5.2	0
Alloway silt loam (AhrB)	311.2	2.1	148	5.2	60
Aura sandy loam (AugB)	50.8	1.8	28	4.5	11
Aura sandy loam (AugC)	47.2	1.8	26	4.5	10
Aura loam (AupB)	88.6	1.8	49	4.5	20
Chicone Silt Loam (ChsAt)	336.4	0.0	0	0.0	0
Chillum silt loam (ChtA)	1.2	1.8	1	4.5	0
Chillum silt loam (ChtB)	846.4	1.8	470	4.5	188
Evesboro Sand (EveC)	12.6	1.7	7	4.1	3
Galestown Sand (GabB)	52.3	1.7	31	4.1	13
Hammonton sandy loam (HboA)	12.6	2.2	6	5.4	2
Manahawkin Muck (MakAt)	2.2	0.0	0	0.0	0
Matapeake Silt loam (MbrB)	10.9	1.9	6	4.7	2
Matapeake Silt loam (MbrC)	229.9	1.9	121	4.7	49
Mattapex Silt loam (MbuA)	81.6	2.3	35	5.6	15
Mattapex Silt loam (MbuB)	313.6	2.3	136	5.6	56
Mattapex-Urban land complex (MbxB)	0.5	2.3	0	5.6	0
Muttontown sandy loam (MutA)	22.7	2.2	10	5.4	4
Othello & Fallsington soils (OTKA)	677.9	0.0	0	0.0	0
Othello/Fallsington/Trussum Soils (OTMA)	109.1	0.0	0	0.0	0
Pedricktown/Askecksey/Mullica Soils (PEEAR)	31.6	0.0	0	0.0	0
Sassafras sandy loam (SacB)	190.4	1.9	100	4.6	41
Sassafras sandy loam (SacC)	154.3	1.9	81	4.6	34
Water (WATER)	54.1	0.0	0	0.0	0
Woodstown sandy loam (WoeA)	148.4	2.2	67	5.4	27
TOTALS	**4,172.5**		**1,508**		**611**

Table 44 Continued
Pilesgrove Township Build-out Calculations
Nitrate Dilution Analysis

HUC14 and Zone	Total Area (Acres)	Area required to dilute nitrate to 5.2 mg/l	Equivalent Dwelling Units	Area required to dilute nitrate to 2.0 mg/l	Equivalent Dwelling Units
02040206040010 Mannington Creek					
Alloway sandy loam (AhmB)	4.7	2.1	2	5.2	1
Chillum silt loam (ChtB)	9.9	1.8	5	4.5	2
Downer loamy sand (DocC)	11.6	1.8	6	4.4	3
Othello/Fallsington/Trussum Soils (OTMA)	8.2	0.0	0	0.0	0
Woodstown sandy loam (WoeA)	2.0	2.2	1	5.4	0
TOTALS	**36.3**		**15**		**6**
02040206060020 Alloway Creek					
Alloway loam (AhpB)	14.6	2.1	7	5.2	3
Alloway loam (AhpC)	13.5	2.1	6	5.2	3
Aura sandy loam (AugB)	0.7	1.8	0	4.5	0
Chicone Silt Loam (ChsAt)	11.6	0.0	0	0.0	0
Chillum silt loam (ChtA)	315.4	1.8	175	4.5	70
Downer loamy sand (DocC)	10.4	1.8	6	4.4	2
Galestown Sand (GabB)	96.4	1.7	57	4.1	24
Matapeake Silt loam (MbrC)	12.3	1.9	6	4.7	3
Mattapex Silt loam (MbuA)	7.5	2.3	3	5.6	1
Mattapex Silt loam (MbuB)	65.7	2.3	29	5.6	12
Muttontown sandy loam (MutA)	55.8	2.2	25	5.4	10
Othello/Fallsington/Trussum Soils (OTMA)	204.0	0.0	0	0.0	0.0
Pedricktown/Askecksey/Mullica Soils (PEEAR)	56.9	0.0	0	0.0	0.0
Sassafras sandy loam (SacB)	103.9	1.9	55	4.6	23
Sassafras sandy loam (SacC)	53.3	1.9	28	4.6	12
Water (WATER)	8.7	0.0	0	0.0	0.0
Woodstown sandy loam (WoeA)	133.4	2.2	61	5.4	25
TOTALS	**1163.7**		**458**		**186**
TOWNSHIP TOTALS	**22,414.2**		**9,005**		**3,682**
Acres/Unit			**2.5**		**6.1**

Table 44

Pilesgrove Township

Nitrate Dilution Buildout Analysis-Unsewered Area

		Township ND Ordinance Buildout (5.2mg/l)			NJDEP ND Target Buildout (2.0 mg/l)			County Nitrate Dilution Buildout (2.0 mg/l)			
Sub-watershed	HUC 14	Total Units	Existing Units	Future Units	Total Units	Existing Units	Future Units	Total Units	Existing Units	Future Units	Non-Res. (SF)
Oldmans Creek (East)	02040202160020	539	64	475	220	64	156				
Oldmans Creek (Central)	02040202160030	1,104	177	927	453	177	276				
Oldmans Creek (West)	02040202160050	620	304	316	256	304	-48				
Oldmans Creek Total		*2,263*	*545*	*1,718*	*929*	*545*	*384*	*501*	*545*	*-44*	*0*
Salem River (East)	02040206030010	1,508	176	1,332	611	176	435				
Nichomus Run	02040206030020	1,057	137	920	429	137	292				
Salem River (Central)	02040206030030	1,616	258	1,358	663	258	405				
Salem River (Sharptown)	02040206030040	1,335	100	1,235	546	100	446				
Game Creek	02040206030050	595	55	540	246	55	191				
Salem River (West)	02040206030060	158	3	155	65	3	62				
Salem River Total		*6,269*	*729*	*5,540*	*2,560*	*729*	*1,831*	*1597*	*729*	*868*	*100132*
Mannington Creek	02040206040010	15	1	14	6	1	5				
Mannington Creek Total		*15*	*1*	*14*	*6*	*1*	*5*	*4*	*1*	*3*	*0*
Alloway Creek	02040206060020	458	47	411	186	47	139				
Alloway Creek Total		*458*	*47*	*411*	*186*	*47*	*139*	*120*	*47*	*73*	*0*
Pilesgrove Township Total		*9,005*	*1,322*	*7,683*	*3,681*	*1,322*	*2,359*	*2,222*	*1,322*	*900*	*100,132*

4.7 Riparian Corridor Analysis

The "riparian zone" has been defined by the NJDEP as "*the land and vegetation within and directly adjacent to all surface waters including, but not limited to, lakes, ponds, reservoirs, perennial and intermittent streams, up to and including their point of origin*". Numerous studies have demonstrated the value of vegetated buffers along stream corridors to surface water quality including but not limited to stabilizing the soil along the stream, reducing nutrients and pollutants in stormwater runoff, moderating storm flow discharge rates, providing cover to moderate stream temperatures, providing cover and habitat for aquatic and terrestrial organisms, and promoting groundwater recharge.

Because the value of riparian corridors has been clearly documented in scientific studies, storm water management and wastewater management regulations in New Jersey require that stream corridors be protected. The method of protecting or enhancing these natural resources has typically been in the form of state and local regulations that protect a designated riparian zone width.

The objective of the riparian corridor analysis is no loss of value due to short-term or long-term disturbance of stream corridors. This objective can be achieved by ensuring that there is no disturbance along stream corridors or to demonstrate that any disturbance is designed to avoid, minimize, or mitigate any impairment of the functions of the stream corridor.

4.7.1 Stream Corridor Protection

Pilesgrove Township intends to review its current ordinances and to adopt a stream corridor protection ordinance that conforms to the NJDEP Water Quality Management Planning Regulations. In particular, the ordinance will define the riparian zone to be as follows:

- 300 feet along both sides of Category one waters and all upstream tributaries,
- 150 feet along any trout production or trout maintenance waters and upstream tributaries;
- 150 feet along stream segments with documented habitat for water dependent threatened or endangered species and upstream tributaries;
- 50 feet along all other permanent surface waters not included in the above categories;

Map 5-7: Environmental Features Map shows the 50 feet minimum stream corridor protection zone along all permanent streams and the 300-foot stream protection zone along the existing and proposed Category One waters.

In accordance with the NJDEP regulations, Pilesgrove Township intends to adopt a stream corridor protection ordinance that prevents new disturbance for projects or activities within the designated zones except for 1) redevelopment activities within the limits of existing impervious surfaces and 2) new disturbances that are necessary to protect public, health safety or welfare; to provide an environmental benefit; and to prevent extraordinary hardship of the property owner provided that the hardship was not created by the property owner.

The ordinance shall require that any encroachment within the riparian zone protect the stream functions including, but not limited to, the filtering of stormwater runoff, nutrient uptake, groundwater recharge, forest canopy, vegetative litter, wildlife habitat, bank stabilization, and flood protection.

4.7.2 Steep Slope Regulation

The NJDEP has also proposed that steep slopes be regulated in Wastewater Management Plans. The proposed regulations state the issue as follows:

It has become widely recognized that disturbance of steep slopes should be restricted or prevented based on the impact disturbance of steep slopes can have on water quality and quantity and the environmental integrity of landscapes.

Although Pilesgrove Township is primarily gently sloping, there are areas along stream corridors that warrant protection. In this regard, it is recommended that the Township review its ordinances and adopt additional regulations that will prohibit the disturbance of steep slopes defined as those in excess of ten percent with limited exceptions. The specific exceptions would be similar to those established for riparian zone disturbance and would include the following:

- Redevelopment activities within the limits of prior development or disturbances in the steep slope zone;
- Development that is necessary to protect public, health safety or welfare;
- Development that will provide an environmental benefit; and
- Development to prevent extraordinary hardship of the property owner provided that the hardship was not created by the property owner.

Slopes in excess of ten percent are specifically excluded from the Future Sewer Service Area. If any such steep slope areas are included within the Future Sewer Service Area, these areas shall not be eligible for service unless they satisfy one of the above-cited exceptions.

4.8 ENDANGERED/THREATENED SPECIES ANALYSIS

The Future Sewer Service Areas in the Township Planning Area will need to conform to the NJDEP endangered and threatened species analysis program objectives. The Future SSA for the Woodstown Town Center extension and for the PLI zoning district will not include any lands ranked as 3, 4, or 5 based on the current version of the Landscape Project or will need to conduct a habitat suitability analysis to refute the Landscape Project.

4.8.1 Sharptown Village Center

The Township is proposing that the Sharptown Village Center be designated by the Office of Smart Growth. The village center will consist of the existing crossroads settlement including the former Richmans' ice cream plant. Sharptown is located at the confluence of several important tributaries as well as priority critical habitats. All of the four Natural Heritage Priority Sites are located in the Sharptown area. The intent of the proposed village center is to establish a limited and defined village and not to make the area part of a continuing growth corridor. Infill land development will be encouraged within the crossroads settlement provided that it does not impact the defined critical habitats.

The Township previously conducted a site-specific habitat analysis for the Kings Road LLC project site, which concluded that the site contained an extensive population of Greek Valerian, a critically imperiled plant, and a Cooper's Hawk nest. While the Salem River corridor was determined to have extensive biodiversity, it was determined that bog turtles were not present. Grasshopper sparrows were also evident in the upland farm fields.

Based on the foregoing conclusions, the Kings Road LLC project was modified to protect the critical habitats. In particular, the project was reconfigured to provide extensive buffers along the Salem River floodplain; to provide a buffer around the presumed location of a Cooper's Hawk nest; to provide for the removal of the Richman's treatment plant and the restoration of that site; and to provide for extensive open space, a portion of which could be set aside for passive open space for grassland birds and other species. Any land development on this Site would need to adhere to these principles.

4.8.2 Town Center Extension

Map 3 indicates potential future Sewer Service Areas based on the Town Center Extension concept adjacent to Woodstown. The portions of the potential Sewer Service Areas that will require habitat suitability evaluations are shaded. However, the Township believes that the rankings shown on the Landscape Project mapping need to be re-affirmed since much of the area shown as being critical habitat for grasslands birds does not conform to the life-cycle habitat suitability criteria for the species of concern.

4.8.3 Proposed WMP Policy

It is recommended that site specific habitat analyses be required for any future land development projects that are located within areas ranked as 3, 4, or 5 based on an affirmed version of the Landscape Project. The Township is concerned that the rankings under the Landscape Project are too inclusive for grassland birds. Tilled land or cropland generally involves more disturbance than is suitable for these species.

However, the Township believes that where critical habitats for threatened or endangered species are confirmed on the Landscape Project, site specific habitat suitability analyses should be undertaken regardless of whether the land development project is within or outside of the Future Sewer Service Areas. The site specific analysis would need to determine whether the species of concern are present and, if so, demonstrate that the project can be constructed without adversely impacting the defined critical habitats.

4.9 INDIVIDUAL SUBSURFACE SEWAGE DISPOSAL SYSTEMS

As noted previously, the residents and businesses in Pilesgrove Township are primary dependent on Individual Subsurface Sewage Disposal Systems ("ISSDS") for wastewater disposal. It is estimated that 93% of Township residents currently have some type of ISSDS on their property. Septic systems are a suitable method of wastewater treatment when they are properly designed, constructed, and operated. All ISSDSs must be designed by a professional engineer and permitted by the County Health Department. The Health Department also issues a Certificate of Compliance when the system is completed to confirm that the system was properly constructed.

The primary regulatory concerns with ISSDSs is that some systems pre-date the individual subsurface disposal system regulations and that many systems are not being properly maintained. While health departments are required to notify homeowners with septic systems on long-term operation and maintenance practices, there is currently no program that documents system maintenance. The responsibility for these wastewater systems is that of the property owner.

Many property owners fail to properly maintain their ISSDS until a problem is evident. The problem with this approach is that there is often an environmental impact associated with a failing system. The NJDEP states that "*proper maintenance of ISSDSs is essential in order to offset the high costs of repair or replacement and hazards to the environment that failing systems pose*". For this reason, the NJDEP is proposing that a mandatory maintenance program be established at the local level. The Department is not proposing to specify the form that the program must take beyond the requirement that pump-outs of accumulated septage occur every 3-7 years and that malfunctioning parts be repaired.

4.9.1 Management Options

The USEPA has listed the ISSDS management options to be as follows:

- Option 1: Homeowner Awareness Model: Retain homeowner responsibility but increase awareness and ensure basic system maintenance;
- Option 2: Maintenance contract model; Require maintenance contracts for complex system designs;
- Option 3: Operating Permit model: Regulate systems by issuing permits or licenses to provide a mechanism for continuous oversight;
- Option 4: Responsible Management Entity (RME) Operation and Maintenance. Public or private RME is designated as responsible agent for O&M with established rate schedule for services paid by homeowner;
- Option 5: Responsible Management Entity Ownership. Public or private RME owns and maintains systems and is fully responsible for system; User fees are paid by property owners to defray costs;

Certain areas of the country have rigorous septic tank management programs. In particular, the State of Massachusetts has established a model community septic management program. The program is unique because the Commonwealth provides no interest State Revolving Fund Loan funds to communities that are interested in implementing a comprehensive management program that conforms to state guidelines. The program involves an assessment of the systems that require repair and the implementation of Betterment Agreements to fund the upgrades.

While New Jersey has not yet implemented a similar program, there are communities in the state that have developed septic management ordinances. Many of these ordinances require all property owners to obtain licenses from the Health Department to operate an ISSDS. The license is issued upon the issuance of a certificate of compliance for a new system and in accordance with a maintenance schedule for existing systems. The licenses can only be issued based on as-built plot plans and after inspection of the systems by the Health Department. The licenses usually must be renewed every three (3) years. License fees are often used to defray the cost of the program. If problems are detected, the property owner is directed to correct the problem before the license can be issued or renewed.

Pilesgrove Township typically includes an article relating to septic maintenance each year in its Township newsletter. The Township Planning Board is also cognizant of determining lot suitability during subdivision review and seeks to ensure that nitrates from these systems are adequately diluted.

4.9.2 Proposed ISSDS Policy

NJDEP regulations specify that the WMP shall include a mandatory maintenance program to ensure that septic systems are being maintained. **Pilesgrove Township believes that the County should be responsible for developing and implementing any required septic maintenance program through the County Health Department.**

The recommended policies with regard to ISSDSs are as follows:

1. Pilesgrove Township should adopt an ordinance that allows alternative treatment units (ATUs) with denitrification as a means of achieving adequate nitrate dilution in future developments. Where these systems are to be proposed, the developer should be required to designate the lots that are to have these alternative systems on the subdivision plat. These lots would be deed restricted to ensure that the systems are properly permitted, designed, constructed, and maintained. All such systems would need to have a service contract with the manufacturer or other approved third party and shall abide by any permit requirements of the NJDEP.

2. An existing ISSDS or a series of ISSDSs on the same parcel that receive more than 2,000 gpd of wastewater shall not be permitted to continue in operation unless they are specifically included in this WMP as an approved facility. The owner of any such facility shall submit an engineering report fully describing the facility and any future improvements before being included in the WMP. The report shall also demonstrate that the nitrates from the system are being adequately diluted on the subject property based on the NJGS model. As a condition of approval by the Township, the owner of such a facility shall submit an annual inspection report prepared by a licensed professional engineer that includes a certification documenting that the system is operating in accordance with the design.
3.

4.10 ALTERNATIVES ANALYSIS

4.10.1 No Action Alternative

Under the No Action Alternative, no improvements would be made to the existing WSA WTP which would increase the capacity of the treatment plant. The result would be that the WSA WTP would not be capable of serving the regional planning needs based on the Town Center Extension. If no additional wastewater treatment capacity is made available to Pilesgrove Township, the potential for clustering land development near Woodstown Borough and the resultant preservation of farmland in the environs around the Town Center using a transfer mechanism would not be feasible. In the absence of this approach, land development would continue in the Township based on ISSDS without any effective control and land development would infringe on agricultural retention districts in a continuing sprawl pattern. It is highly unlikely that the Township will be able to preserve contiguous agricultural districts without the implementation of clustering mechanisms to supplement various development easement acquisition programs.

The No Action alternative with regard to Kings Road would thwart the implementation of a Settlement Agreement of *Mount Laurel* litigation. The Township and the Plaintiff reached an agreement on a builders remedy lawsuit after years of litigation and discussions under the guidance of a court assigned master. Because of changes in site ownership, the Township now only supports the inclusion of this project in the Water Quality Management Plan based on the principles and conditions described in this WMP.

The No Action alternative for the PLI development would preclude the development of over 3.6 million square feet of planned industrial development. It is the position of the Township that this area is well suited for planned industrial development and has the potential to contribute substantial employment to the smart growth corridor. However, the planned industrial development would need to be undertaken in strict accordance with an approved General Development Plan (GDP) and should only be included in the WMP with the prior approval of the GDP.

4.10.2 Regional Dupont Treatment Plant Alternative

Salem and Gloucester counties are currently working on a regional treatment plant alternative that would involve the conversion of a portion of the existing Dupont treatment plant for domestic wastewater. While this alternative is still being developed, it would provide an option to the upgrade of the small existing treatment plants around the County. This alternative has the potential of concentrating regional wastewater treatment flow to create the economies for efficient operation and would eliminate upstream discharges such as that of the WSA plant in Woodstown.

Pilesgrove Township does not support the regional treatment plant alternative due to concerns that a regional system would spur more land development in the Township. In the event that the WSA plant cannot or will not be expanded, the Township would need to evaluate other sub-regional alternatives to implement any development rights transfer mechanism.

4.10.3 Site Alternatives.

4.10.3.1 WSA WWTP.

The WSA plant is located off West Avenue in the Borough of Woodstown. While there are physical limitations, the WSA has acquired sufficient adjacent land to enable the plant to be expanded. The Township has not considered alternative treatment plant sites since the expansion of an existing POTW is preferable for both economic and environmental reasons to the creation of a new treatment plant in the same development area. The expansion of the treatment plant is also expected to be in the interest of the ratepayer since the capital cost will be borne by prospective developers and the basic operating costs would be defrayed over a larger user base. The existing ratepayer should therefore accrue certain operating cost benefits in future user fees.

4.10.3.2 Kings Road.

Alternate sites were considered for the Kings Road treatment plant. The Township determined that the onsite location was preferable from both economic and environmental perspectives. The site was also chosen by the Developer due to the presence of permeable soils in the event that subsurface discharge of the effluent is necessary. However, the Developer represented that the onsite soils were only adequate for the effluent from the first train and prefers the use of groundwater injection.

4.10.3.3. Planned Light Industrial (PLI) District

The prospective Developer has indicated that a modular onsite treatment plant with groundwater discharge is the most viable treatment approach for this type of project. **However, this project is not being pursued at this time.**

4.10.4 Treatment Process Alternatives

4.10.4.1 WSA

The basic process alternatives for expansion of the WSA treatment plant will be assessed by the WSA as owner and operator of the treatment plant. Pilesgrove Township intends to pursue the implementation of an inter-local services agreement with the WSA to support operating improvements related to future expansion.

4.10.4.2 Kings Road.

The Developer proposed the use of Zenon membrane filtration as the basis of the Kings Road treatment plant. The Zenon MBR process is capable of achieving high effluent quality in small-scale treatment plant applications. Plant operations are also simplified and require only periodic attention. While the capital and operating costs per EDU are not comparable to centralized systems, the Zenon system has been determined to be well suited to the Kings Road project size (35,000 gpd).

4.10.4.3. Planned Light Industrial (PLI) District

The planned industrial district would have utilized a modular package plant that is capable of achieving the groundwater discharge effluent quality standards.

V. DISCUSSION OF JUSTIFICATION OF SERVICE AREA DELINEATIONS

5.1 PROPOSED SEWER SERVICE AREA

Map 3: Future Wastewater Facilities and Service Areas indicates the following:

- **Existing Sewer Service Area**. The approximate actual sewer service area limits are shown on *Map 2* for comparison purposes to the Future Sewer Service Area.

- **Conveyance Facilities**. The existing conveyance facilities shown on *Map 2* are also shown on this map. Proposed facilities needed to serve the areas beyond the actual limits of existing service have not been located or designed.

- **Future Sewer Service Area.** The potential Future Sewer Service Area limits are shown. The actual limits would be determined based upon inter-municipal discussion as well as the Plan Endorsement process. Habitat suitability determinations would be required for the portions of tracts that are shaded on *Map* 3 to refute the information contained in the Landscape Project.

- **Preserved Farmland/Open Space Areas** These areas are areas owned by federal, state, county or municipal government agencies or preserved through programs administered by any government agency or preserved through private investment or the purchase of development rights where no sewerage generating structures are planned to occur.

- **Restricted Septic Service Area (Planning flows of less than 2,000 gpd)** These areas are shown as areas suitable for individual surbsurface disposal systems with flows of 2,000 gpd or less. These areas would be restricted to six residential units until the nitrate dilution issue is resolved by the adoption of the Salem County WMP.

In accordance with NJAC 7:15-5.20(b)2, the boundaries of the Future Sewer Service Area coincides with recognizable geographic or political features (i.e., roads, lot lines, zoning district limits, water bodies), wherever feasible. To the extent possible, individual lots are not divided into different service areas unless a zoning boundary or obvious feature is used that divides the lot.

Individual subsurface sewage disposal systems (ISSDS) for individual residences can only be constructed in depicted sewer service areas if legally enforceable guarantees are provided, before such construction, that use of such systems will be discontinued when the depicted sewer service becomes available. This provision applies to ISSDS that require certification from the NJDEP under the Realty Improvements Sewerage and Facilities Act (N.J.S.A. 58:11-23) or Individual Treatment Works Approval or New Jersey Pollutant Discharge Elimination Permits (under N.J.A.C. 7:14A). It also applies to ISSDS which require only local approval if the WMP acknowledges adequate arrangements for enforcement of the requirement (such as through a municipal or sewerage authority ordinance).

Development in areas mapped as wetlands, flood prone areas, designated river areas, or other environmentally sensitive areas may be subject to special regulation under Federal or State statutes or rules. Interested persons should check with the NJDEP for the latest information. Depiction of environmental features is for general information purposes only, and shall not be construed to define the legal geographic jurisdiction of such statues or rules.

5.2 LAND USE

Map 4-1: Aerial Photograph provides an overview of the rural Township Planning Area surrounding a small, densely developed town center (Woodstown). The parcel mapping on the aerial also illustrates the historic pattern of land development in the Township as well as a general indication of agricultural lands and environmental constraints.

Map 4-2: Existing Land Use Map depicts the general land use conditions in the Planning Area based on tax assessment classifications using an accepted land use color scheme. ***Map 4-2*** illustrates that land development within Woodstown Borough is approaching build-out conditions. The Map also illustrates the extent of developable land if the qualified farmland were to be converted to a developed use. The land use patterns can be summarized as follows:

Pilesgrove Township

- Residential land use is predominantly comprised of single family detached dwellings of moderate density within the limited sewer service area and rural large lot development outside of the sewer service area;
- Due to the limited availability of planned infrastructure and the rural nature of the region, the Township does not currently have any multi-family residential development other than the Bailey Corner affordable housing project currently under construction;
- The limited commercial land use in the Township is concentrated along the U.S. Route 40 corridor.
- Major commercial recreation uses include the Cowtown Rodeo in the western part of the Township, the Town and Country golf course near Woodstown, and the Four Seasons campground along the eastern border.
- Industrial land use in the Township is very limited and includes the defunct Richman's Ice Cream plant;
- The public schools and library that serve Woodstown and Pilesgrove are located in Woodstown Borough:
- Churches are the primary form of tax-exempt developed land use in the planning area.
- Public open space tends to be concentrated along the Salem River corridor. The County and the State have acquired a series of parcels along this corridor. Other public open space includes Marlton Park along Marlton Road, the bird sanctuary along Kings Highway, and Harrisonville Lake Park.
- Agricultural land use encompasses virtually all of the undeveloped land in the Township. Qualified farmland that has not been preserved is the primary area available for land development within the Planning Area;
- The vacant land category generally includes land parcels that are available for development or under development. In some cases, the development capabilities of these vacant land parcels are constrained by environmental conditions (wetlands) or by prior use (landfills).

5.3 PROPOSED LAND USE REGULATIONS - ZONING

Map 4-3: Composite Zoning Map provides an overview of the existing zoning regulations in the Planning Area based on the Pilesgrove Township Land Development Ordinance. The zoning regulations in adjacent communities including Woodstown Borough are also shown in a generalized manner. The composite zoning map correlates zoning districts of similar use and intensity to provide a general indication of the pattern and intensity of proposed land use. A careful review of the composite zoning map has resulted in the following conclusions:

Pilesgrove Township

- Most of Pilesgrove Township is included in Agricultural Retention (AR) zoning districts where the intent is to preserve farmland. The current minimum lot size is two acres for lots that front on internal streets and three (3) acres on lots fronting on collector roads.

- The Restricted Residential (RR) zoning district encompasses areas with environmental constraints or severe soil limitations for individual subsurface sewage disposal systems (ISSDS). The intent of this zoning district is to restrict or control land development in a manner that is compatible with the environmental constraints. This district includes important headwaters areas of the Nichomus Run and tributaries of Oldmans Creek and Salem River. The minimum lot size is two acres in the RR district.

- The Single Family Residential (SR) zoning district encompasses two areas along the northern fringe of the Township. The area to the northwest includes several existing low- density residential developments where in-fill development is permitted. The zone in the northeastern corner of the Township is less developed. Both areas generally have suitable soils for an ISSDS. The minimum lot size under the current zoning is one acre.

- The SR-5 residential zoning district encompasses an area adjacent to Woodstown that is served by the existing water and sewer systems. The density in this area is consistent with that in Woodstown.

- Village Neighborhood. The VN district encompasses the existing crossroads settlement area known as Sharptown. Most of this district is already developed with single-family detached units with a compact development pattern. The intent of the district is to allow in-fill development and to respect pre-existing conditions.

- Planned Residential. The Planned Residential (PRD-1) zoning district was established in compliance with the Kings Road Settlement Agreement. The zoning district provides for traditional neighborhood design (TND) development of 96 single-family detached dwelling units. The use of this zoning is contingent upon the development of community public water and sewer facilities by the developer to support the project.

- Neighborhood Commercial. The intent of the Neighborhood Commercial (NC) zoning district is to allow for the development of commercial entities to serve local needs. The NC district is specifically designed to serve the proposed Sharptown village center and surrounding areas.

- Highway Commercial. There are three highway commercial districts along US Route 40. The intent of these districts is to serve the needs of the region and the traveling public

- Planned Light Industrial. The PLI zoning district is located in the extreme western part of the Township. The Ordinance specifies that this 470± acre tract must be developed under a General Development Plan (GDP). The planned development is to be located within an Agricultural/Industrial Node and would be capable of supporting the Salem County growth corridor as well as the expansive farmland to the east.

- Affordable Housing. Pilesgrove Township established the AH-1 zoning district in 2002 to provide for the development of affordable housing. The Township subsequently designated a redevelopment area and adopted a redevelopment plan to foster the implementation of a municipally sponsored affordable housing project within this zone.

- Judicially Court Ordered Affordable Housing. This zoning district was created as a result of prior Mt. Laurel litigation. The developers are no longer seeking to be included in the Wastewater Management Plan. A revised settlement agreement is anticipated.

- Public, Parks, & Education. The PPE zone recognizes the lands that have been acquired for public purposes. These lands are focused along the Salem River.

- The Conservation zoning district includes all of the potential wetlands and delineated wetlands in the Township. These wetlands are located along stream corridors and in headwaters areas. Development is not permitted within regulated wetlands.

A comparison of ***Map 4-2: Existing Land Use Map*** and ***Map 4-3: Composite Zoning Map*** results in the conclusions that the potential for very low-density residential development under current zoning regulations in the Township is extensive. There are no substantive opportunities for moderate density development due to the absence of planned infrastructure.

The local zoning regulations are fully compatible with the Future Sewer Service Area for the PLI and Sharptown areas. However, these areas would only be included in the County WMP if affirmative action is taken by the owner/developers.

The zoning for the Woodstown town center will be modified to enable overlay zoning under a non-contiguous clustering or transfer of development rights option. The specific mechanism of the proposed zoning is dependent upon the nitrate dilution modeling issue and the provision of additional treatment capacity to serve the receiving areas.

5.4 State Development and Redevelopment Plan (SDRP)

5.4.1 Adopted SDRP

Map 4-4: State Development and Redevelopment Plan Map illustrates the policy recommendations of the most recent version of the State Development and Redevelopment Plan (SDRP) for the Planning Area. The key SDRP recommendations for the Planning Area are as follows:

- Rural Planning Area (PA 4). Virtually all of the Township Planning Area has been designated as Rural Planning Area (PA 4). The growth policy for PA 4 is to limit infrastructure extensions to those serving designated centers.

- Environmentally Sensitive/Rural Planning Area (PA 5). The extreme northeastern corner of the Township is designated as Planning Area 5. The growth policy for PA 5 is to discourage infrastructure extensions to this environmentally sensitive area.

- Designated Centers. The SDRP indicates that the Borough of Woodstown is a designated rural town center. The limits of the town center designation are the Borough boundaries.

5.4.2 Preliminary Plan Cross Acceptance

The Office of Smart Growth (OSG) has issued a Preliminary Plan that proposes to change the designation of the Rural Fringe Planning Area to PA4. Pilesgrove Township was actively involved in the cross-acceptance process but was advised that its objections to this change were more suited to Plan Endorsement process.

5.4.3 Plan Endorsement

The Township of Pilesgrove and the Borough of Woodstown are in the process of pursuing their respective interrelated Plan Endorsement petitions. The key issues being pursued by the Township in Plan Endorsement process are as follows:

1. To support the continuation of the Woodstown Town Center designation;

2. To modify the existing town center designation to include the actively sewer service area and a limited extension thereto to conform to affordable housing regulations. The current designation of areas within the SSA as a Rural Planning Area designation is not sound planning. The Township has sought to have its affordable housing project site deemed to be a smart growth area to no avail.

3. To enable the Woodstown Town Center to be extended in select areas for the purpose of reinforcing the town center and to enable the environs to be preserved through clustering and transferring mechanisms. This concept requires that the receiving areas have sufficient planned infrastructure.

4. To designate the village of Sharptown as a village center; Planned infrastructure would only be supported if the owners/developers of the Kings Road project established site control prior to April 1, 2011.

The policies in this WMP are intended to be fully consistent with the Plan Endorsement petition and the recently endorsed Municipal Self-Assessment Report.

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VI. MAPPING REQUIREMENTS

This Wastewater Management Plan has been prepared in accordance with NJDEP requirements (NJAC 7:22-10.5). The referenced maps have been prepared at a scale of 1:24000 and are included in the Appendix. All maps have been prepared in accordance with the NJDEP Geographic Information System (GIS) requirements and rely on the natural resource database of the Department. The referenced maps follow the appendices.

The referenced maps are numbered in accordance with the NJDEP guidance. Where more than one map was required to address a specific information requirement, the maps were numbered as sub-parts as shown below:

Map 1: **Existing Planning Area Map**
Map 2: **Existing Wastewater Facilities and Service Area Map**
Map 3: **Future Wastewater Facilities and Service Area Map**
Map 4: **Land Use/Zoning Maps**
- *Map 4-1: Existing Land Use Map*
- *Map 4-2: Composite Zoning Map*
- *Map 4-3: State Development & Redevelopment Plan Map*

Map 5: **Environmental Constraints Map**
- *Map 5-1: Surface Water Resources Map*
- *Map 5-2: Geology and Groundwater Resources Map*
- *Map 5-3: Topographic Map*
- *Map 5-4: Important Farmland Soils Map*
- *Map 5-5: Critical Habitats Map*
- *Map 5-6: Open Space & Conservation Map*
- *Map 5-7: Environmental Features Map*
- *Map 5-8: Environmental Constraints Map*