Chapter IX.8

WASTEWATER MANAGEMENT PLAN
FOR
SALEM COUNTY, NEW JERSEY
LOWER DELAWARE WATER QUALITY MANAGEMENT PLANNING AREA

BOROUGH OF PENNS GROVE CHAPTER

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I. INTRODUCTION

This chapter represents the Borough of Penns Grove portion of the WMP. The WMP has been submitted to the New Jersey Department of Environmental Protection for approval so that it may be incorporated into the Lower Delaware Water Quality Management Plan via the Plan Amendment Procedure (NJAC 7:15).

The sewer service area for the Borough of Penns Grove includes the entire municipal area of the Borough. The planning area encompasses 583 acres. This planning area does not include portions of neighboring municipalities.

The Borough of Penns Grove is located in the Delaware River Drainage Basin and the Lower Delaware Water Quality Management Planning Area. The Planning Area is not located within the jurisdiction of the Pinelands Commission nor is it located within the Coastal Area Facility Review Act (CAFRA) area.

The Borough of Penns Grove is an urban-based municipality bounded by the Delaware River (to the west), and Carneys Point Township (to the north, east, and south). Penns Grove encompasses a total area of 583 acres (0.91 square miles). While no surface water exists, 0.7 miles of streams (shown in Map No.1) flow throughout the municipality. This municipality has been developed extensively and has the highest population density in Salem County (approximately 5,654 people/sq mi), according to (2010) U.S. Census data. There is currently no remaining land area for future development in this municipality. Land available consists of in-fill and redevelopment of existing vacant or abandoned properties.

Penns Grove has a population of 5,147 persons. The municipality's population trend over the last decade can be seen as a 0.53% growth in population each year (5.3% over ten years), according to the most recent (2010) U.S. Census data. Table 1.1 is a summary of the historic population and trends for the City of Salem. In terms of population change over the next three decades, Penns Grove is expected to steadily continue growing at a rate of 0.52-0.62% each year according to the most recent study by the South Jersey Transportation Planning Organization, prepared in 2011. A summary of the SJTPO projected population can be found below in Table 1.2:

Table 1.1: Penns Grove- Historic Population

Year	Population	Population Change	
		#	avg yearly %
1980	5,760		
1990	5,228	-532	-0.92%
2000	4,886	-342	-0.65%
2010*	5,147	261	0.53%

~Source: U.S. Census Bureau, *2010 U.S. Census

Table 1.2: Penns Grove- Projected Population

Year	Population	Population Change	
		#	avg yearly %
2010	5,147		
2020	5,480	333	0.65%
2030	5,776	296	0.54%
2040	6,077	301	0.52%

~Source: SJTPO, 2011

A. STATUS OF PREVIOUS APPROVED WMPS

The current WMP in effect for the Penns Grove Sewerage Authority (PGSA) is an amendment to the Lower Delaware WQMP submitted in coordination with Carneys Point Township, which was adopted on March 30, 1999.

The enclosed plan reflects current zoning with proposed sewer service areas consistent with the Municipality's Master Plan. The Penns Grove Sewerage Authority WMP has been incorporated within the overall Salem County Wastewater Management Plan. The proposed plan, upon adoption, will remain in force and in effect until the expiration date noted in the Chapter 1, Salem County Summary.

B. CURRENT WASTEWATER SERVICES

The Borough of Penns Grove community wastewater system serves approximately 5,147 persons within their sewer service area according to current municipal data. This equates to 7.77 percent of the total Salem County population (66,083 persons, 2010 U.S. Census) being served by the waster treatment plant.

Sewer service areas may include industrial facilities that discharge process wastewater to the collection system for treatment. The existing sewer service limits, delineated on Map No.2, are serviced by the Penns Grove Wastewater Treatment Plant and were derived from existing sanitary sewer infrastructure currently constructed and/or approved. The sewer service area includes all of the Borough of Penns Grove. The entire area within the Borough of Penns Grove is completely serviced by the PGSA.

The Penns Grove WWTP is located on Beach Avenue and operates under NJPDES Permit Number-NJ0024023 effective on October 1, 2010. Wastewater generated within the WMP existing sewer service area is conveyed to the WWTP, which is permitted to operate at 0.75 mgd. The PGSA-WWTP currently receives contributing flow from residential living and commercial units. The average monthly flow generated by these contributors for the year of 2010 was 0.372 mgd.

The PGSA wastewater treatment plant that utilizes a grit removal system, in-line grinders, a wet well bubbler system, and settling tanks to remove pollutants from the wastewater. Wastewater entering the plant is treated sequentially through the following process.

- A 5,000 gallon aerated grit chamber with a ring sparger at the bottom. A three-inch airlift is provided for removal of accumulated grit from the chamber's sump. The aerated grit chamber is supplied by (2) 60 cubic feet per minute (cfm) manually operated air blowers which gravity feeds into:
- A set of two (2) bar screens followed by two (2) in-line grinders (muffin monster and channel monster). These devices pulverize solids down to acceptable particle sizes for the sewerage pumps
- The raw sewerage falls into a 4,100 gallon wet well, controlled by a computer operated bubbler system
- This sewage is then pumped by two (2) 800-gpm raw sewerage pumps to the primary settling tanks.
- The primary effluent then flows through a system of (2) side-by-side aeration tanks, (2) side-by-side final settling tanks, and finally (2) side-by-side chlorine contact tanks.
- The final effluent is then pumped to the Delaware River.

C. CURRENT WATER SERVICES

The New Jersey American Water Company serves approximately 5,147 persons within Penns Grove's sewer service area, and is currently the only provider of water service to the municipality according to current NJDEP data. The number of persons served accounts for the residential population as well as commercial uses serving the public. This equates to 7.79 percent of the total Salem County population (66,083 persons, 2010 U.S. Census) being served by the water provider.

The Borough of Penns Grove does not own or operate its own public community water supply system, and is served solely by the New Jersey American Water Company (NJAW). NJAW presently draws from seven (7) ground water wells, all located within Carneys Point. Two of the wells pump water from the lower PRM and the other five draw from the upper PRM, as noted in Table 2.H.1. In addition, NJAW completed improvements in 2010 to interconnect their Penns Grove water system and Logan Township water system to allow for operational flexibility. The Logan system of NJAW draws from five (5) ground water wells, as noted in Table 2.H.1.

Generally, sanitary sewer service is available where potable water service is currently in place. Map No.1 depicts the areas actively served by existing public water supply facilities. As with sewer service, "actively served" means that the distribution lines exist and that the property either is connected or has all regulatory approvals necessary to be connected with no further review.

D. OVERVIEW OF ENVIRONMENTAL, AND LOCAL CONSIDERATIONS TO WASTEWATER SERVICES

Wastewater Management Planning is part of the continuing planning process required by the New Jersey Water Quality Planning Act (N.J.S.A. 58:11A-1 et seq.) and Section 208 of the federal Clean Water Act. The intent of the continuing planning process is to align federal, state, regional and local land use planning to ensure that these land use plans do not conflict with each other.

The provision of environmental infrastructure, in particular centralized sewer service, has a profound influence on development patterns and intensity. The wastewater management planning process is intended to assign an appropriate wastewater management treatment alternative to geographic areas based on environmental sensitivity and other land use planning objectives such as regional center-based development or farmland preservation. The extension of public sewers into areas designated for protection by federal, State, regional or local land use plans would be inconsistent with those protection objectives.

The adopted Water Quality Management Planning Rules (N.J.A.C. 7:15) generally exclude the extension of sewer service into large contiguous areas, defined as 25 acres or more, of wetlands, category one water buffers, Natural Heritage Priority Sites and/or endangered and threatened species habitat. The extension of sewer service into these areas would encourage their development and thus conflict with the Department of Environmental Protection's statutory mandate to protect these resources.

It should be noted that under limited circumstances environmentally sensitive areas that meet the 25 acre threshold may be included in the sewer service area as necessary to preserve the investment in projects having already received certain local and State approvals, to relate sewer service areas to recognizable geographic features, or to accomplish center based development proposed by the local land use planning authority and approved by the Department of Environmental Protection through the plan endorsement process. Additional local land use planning objectives used in delineating appropriate areas for public sewer service are discussed in this municipal chapter.

E. OVERVIEW OF WATER RESOURCE MANAGEMENT ISSUES

The Borough of Penns Grove's existing sewer service area is completely served by New Jersey American Water Company (NJAW). The municipality has not identified any issues regarding water quality, water supply or concerns with non-sewered areas.

F. OVERVIEW OF FUTURE WASTEWATER SERVICES

The Borough of Penns Grove is designated as an urban area. Consequently, infill development and redevelopment of previously developed portions of the municipality will make up the majority of the future wastewater management needs. Therefore, an application of zoning to the undeveloped and developable land area of the municipality in Penns Grove may underestimate its future wastewater management needs. For this reason a 20-year wastewater projection has been created based on population projections in accordance with DEP guidance regarding urban areas. The proposed Sewer Service Area is identified on Map No.3.

Based on the environmental, and local land use planning objectives discussed above, Map 2 and Map 3 identify areas presently served by public sewers and the appropriate areas to be served by public sewers in the future. These maps also identify sites that are served by an on-site treatment works, if applicable, that are regulated under a New Jersey Pollutant Discharge Elimination System permit. Each sewer service area is keyed to a specific sewage treatment plant which is the facility authorized under this plan to accept and treat wastewater from that sewer service area. Each sewage treatment plant identified in this plan has an accompanying facility table that provides information concerning that facility's owner, operator, permitted flow, existing flow, remaining permitted flow, projected build-out flow summarized by municipality.

Based on the build-out analysis of each sewer service area and the existing permitted capacity of the sewage treatment plant identified in this plan, sufficient wastewater treatment capacity exists to accommodate the currently proposed Sewer Service Area. Future expansion of the identified treatment works is not required to meet the future wastewater generation needs of the municipality.

G. SUMMARY OF SIGNIFICANT ACTIONS

Amendments to the Water Quality Management Planning Rules adopted on July 7, 2008, 40 N.J.R. 4000(a), necessitated a modification to certain sewer service areas based on environmental sensitivity and local planning objectives as described in this document. In accordance with the regulatory requirements, undeveloped lands within the existing sewer service area have been removed based on the limits of environmental constrained areas. In addition, areas have been added based on local planning objectives and an environmental sensitivity assessment. Maps No.2 and No.3 reflect the changes in sewer service area as a result of this wastewater management plan.

1. All areas not proposed to be included in the WSA sewer service areas in this WMP will be served by ISSDS's with 2,000 gpd or less flows.

II. EXISTING INFRASTRUCTURE AND TREATMENT FACILITIES

A. WASTEWATER TREATMENT PLANT

Map No. 2 depicts the areas actively served by existing wastewater facilities, and the facilities tables in Chapter 7 (VII) provide detailed information on each facility. As with sewer service, the term "actively served" means that the collection lines exist and that the property either is connected or has all regulatory approvals necessary to be connected.

The PGSA WWTP is a localized system for the conveyance, treatment, and disposal of the municipalities' wastewater within its service area. The WWTP treats domestic wastewater. Treated wastewater is discharged to the Delaware River under NJPDES Permit No.NJ0024023. The present permitted capacity is 0.75 MGD. Treatment system performance meets current permitted parameters under current conditions, based on 2010 data.

B. MAJOR TRANSMISSION PIPING AND PUMPING STATIONS

The Penns Grove Sewerage Authority (PGSA) owns and operates one WWTP and a sanitary sewer collection system conveying wastewater flow to the WWTP. The sanitary sewer collection system in Penns Grove is owned and maintained by the Authority. There is approximately 2.1 miles of sanitary sewer main with pipes ranging in size from 6 inches to 20 inches in diameter. The Authority does not currently own or operate any pump stations. All flow is conveyed to the PGSA WWTP for treatment. Map No.2 depicts the areas actively served by existing wastewater facilities, and the tables in Chapter 7 (VII) provide detailed information on each facility. "Actively served" means that the collection lines exist and that the property either is connected or has all regulatory approvals necessary to be connected

C. EXISTING ON-SITE, NON-INDUSTRIAL WASTEWATER FACILITIES

These facilities serve single developments, sites or other properties under single ownership, but do not treat industrial flows. These facilities typically provide wastewater treatment for apartment complexes, commercial properties and businesses where regional sewerage is not available. Table 2.C.1 lists all existing on-site, non-industrial treatment facilities that discharge 2,000 gallons per day or more of domestic wastewater and are regulated under a NJPDES permit. The Wastewater Facilities Tables provided in Chapter 7 (VII) list all existing on-site, non-industrial treatment facilities that discharge 2,000 gallons per day or more of domestic wastewater and are regulated under a NJPDES permit.

Table 2.C.1: Non-Industrial NJPDES Wastewater Facilities

Municipal Map Designation	Facility Name	NJPDES Permit Number	Discharge Type (Groundwater or Surface Water)	Facility Table Number
20	Penns Grove SA (WWTP)	NJ0024023	SW	20

D. EXISTING INDUSTRIAL WASTEWATER FACILITIES

Some industrial land uses have independent wastewater treatment facilities that treat and discharge manufacturing process waste or sanitary sewage, rather than other types of effluent such as non-contact cooling water. They may be discharged to ground water or to surface water. The Wastewater Facilities Tables provided in Chapter 7 (VII) list all existing industrial treatment facilities that discharge 2,000 gallons per day or more of domestic wastewater and are regulated under a NJPDES permit. However, Penns Grove Borough contains no industrial wastewater treatment facilities.

E. GENERAL WASTEWATER MANAGEMENT AREAS FOR SEPTIC SYSTEMS

Generally the remaining areas of the Municipality, not otherwise designated as service areas for treatment facilities requiring a NJPDES permit, are included within a general wastewater management area for septic systems and other small treatment works that treat less than 2,000 gallons per day of wastewater and discharge to ground water. However, the proposed SSA for the Borough of Penns Grove includes the entire municipality. Consequently, general wastewater management areas for septic systems have not been designated and do not apply to this municipality.

F. EXISTING WASTEWATER FLOWS

The existing wastewater flows conveyed to the PGSA WWTP were calculated based on flows metered by PGSA. The present average annual wastewater flow for 2010 is 0.405 mgd. The present average flow includes residential, commercial and industrial flows as well as an I/I component.

The following table 2.F.1 summarizes the permitted wastewater treatment plant capacity and associated average daily flows for 2010.

Table 2.F.1: Wastewater Treatment Plant Capacity and Flows 2010				
WWTP	**NJPDES Permit No.**	**Permitted Capacity (mgd)**	**Average Daily Flow 2010 (mgd)**	**Build-Out Projection (mgd)**
Penns Grove WWTP	**NJ 0024230**	**0.75**	**0.405**	**0.052**

Monthly wastewater flow data for 2010 is identified in Table 2.F.2 below.

Table 2.F.2: Existing Wastewater Flows		
Month	**Monthly Avg. (mgd)**	**Daily Max (mgd)**
10-Jan	0.464	0.71
10-Feb	0.528	0.97
10-Mar	0.61	0.961
10-Apr	0.456	0.702
10-May	0.358	0.439
10-Jun	0.31	0.347
10-Jul	0.307	0.421
10-Aug	0.31	0.361
10-Sep	0.342	0.689
10-Oct	0.419	0.862
10-Nov	0.363	0.484
10-Dec	0.387	0.447
Yearly Average	**0.405**	**0.616**

G. EXISTING WASTEWATER TREATMENT

The PGSA WWTP is currently operated under NJPDES Permit number NJ0024023. The present permitted capacity is 0.75 MGD. Treatment system performance meets current permitted parameters under current conditions, based on 2010 data.

H. EXISTING PUBLIC WATER SUPPLY INFRASTRUCTURE

The Borough of Penns Grove presently receives water service from the New Jersey American Water Company. The public water supply infrastructure of this system consists of 16.6 miles of water main ranging from 4 – 12 inches diameter in size. The following Table 2.H.1 summarizes each public community water supply facility currently serving the municipality. The wells located in this table are owned and operated by

NJAW. The system serves Carneys Point, Oldmans Township, and Penns Grove Borough. All wells in this system are located within the Carneys Point Township municipal boundary. In addition, the five (5) ground water wells included as part of the NJAW (Logan System) have also been identified within the table. The franchise areas are depicted on Map No.1.

Generally, sanitary sewer service is available where potable water service is currently in place. Map No.1 depicts the areas actively served by existing public water supply facilities. As with sewer service, "actively served" means that the distribution lines exist and that the property either is connected or has all regulatory approvals necessary to be connected with no further review.

Table 2.H.1: Existing Water Supply Wells

Water System	Well Permit Number	Well Designation	Pump Capacity (gpm)	Aquifer
Auburn Village Water Supply	3000001151	1	N/A	N/A
	3000011400	2	N/A	N/A
NJAW Penns Grove System	3000000563	7	500	Lower PRM
	3000001113	2	500	Upper PRM
	3000001815	4	450	Upper PRM
	3000003310	RF1A	250	Upper PRM
	3000003535	RF3A	100	Upper PRM
	3000008511	RF2B	250	Upper PRM
	3000019273	11A	250	Lower PRM
NJAW Logan System	3000001371	2	800	Mid PRM
	3000009444	4	590	Mid PRM
	3000005212	5	100	Mid PRM
	3000014797	6	600	Mid PRM
	E201002435	7	800	Mid PRM

I. EXISTING PUBLIC WATER SUPPLY ALLOCATION AND DAILY DEMANDS

New Jersey American Water (NJAW) is currently the sole source of water to the Borough of Penns Grove. NJAW purchased the Penns Grove Water System in 2007. NJAW operates under permit No.WAP070002 to provide water to a service area, which includes Carneys Point Township, Borough of Penns Grove and Oldmans Township. As a result, a specific allocation for each of these municipalities has not been established.

General information presented within this municipal chapter regarding the water system's overall annual demand and the estimated yearly demand for each municipality from 2008 through 2010 has been obtained from NJAW. Projected average daily demand values have been estimated for each of the three (3) municipalities served by this system. This was necessary as NJAW meters each individual connection to their system and not the municipality as a whole. Based on available water demand information provided, between 2008 through 2010, the following average demand percentages have been estimated to represent the water supplied by NJAW to the three municipalities: Borough of Penns Grove 30.5%, Carneys Point Township 62.5% and Oldmans Township 7%.

The Borough of Penns Grove currently has an estimated average daily demand of approximately 0.371 MGD based upon the 2010 calendar year. The Borough's peak annual and monthly water demand over a period of 5 years between 2006 through 2010 was shown to occur in the month of July 2008, which is based on the peak month of the system supplier. Estimates of monthly flows to Penns Grove Borough from 2006-2010 were made based on data supplied by NJAWC. Monthly data was formulated by adjusting total water supplied by NJAW by the associated demand percentage utilized by Penns Grove as indicated above. The reduction in average demand, over the last few years, is partially due to the enforcement of water restrictions and water conservation appurtenances in residential and commercial buildings and improvements/replacements within the system's infrastructure.

The following table 2.I.1 summarizes current water demands and allocation diversion limits permitted for the NJAW/Penns Grove water system, estimated as described above.

Table 2.I.1: Water Allocation and Demand 2010

Water Company (Breakdown by Municipality)		Permit No. / Program Interest ID	2010 Water Allocation		Average Demand 2010		Build-Out Projection	
			(MGM)	(MGY)	(MGM)	(MGY)	(MGM)	(MGY)
New Jersey American Water (Penns Grove System)	**% of System Demand**	**WAP070002/ 5328**	**70.400**	**753.000**	**37.95**	**455.409**	**140.07**	**1649.66**
Penns Grove	30.5	N/A	N/A	N/A	11.299	135.586	2.05	24.57
Oldmans	7.0	N/A	N/A	N/A	2.653	31.842	53.54	630.41
Carneys Point Township	62.5	N/A	N/A	N/A	23.998	287.981	84.48	994.68

The following Table 2.I.2.a summarizes historical daily, monthly and annual water demand estimates for the entire New Jersey American Water System. These demands are inclusive of the water service areas in Penns Grove Borough, Oldmans Township, and Carneys Point Township. The districts and franchise areas are depicted on Map No.1.

Table 2.I.2.a: Annual Water Demand Summary: New Jersey American Water

Year	Annual Demand Total (MGY)	Average Daily Demand (MGD)	Average Monthly Demand (MGM)	Peak Monthly Demand (MGM)	
2006	499.983	1.370	41.665	48.735	August
2007	517.576	1.418	43.131	49.626	June
2008	499.035	1.367	41.586	49.665	July
2009	454.020	1.244	37.835	43.426	July
2010	461.434	1.264	38.453	45.862	July

Table 2.I.2.b summarizes Penns Grove Borough's historical daily, monthly and annual estimates of water demand on the NJAW system. The Average Demand values indicated below represent data obtained from DEP water use results.

Table 2.I.2.b: Annual Water Demand Summary: Penns Grove Borough			
Year	**Annual Demand Total (MGY)**	**Average Daily Demand (MGD)**	**Average Monthly Demand (MGM)**
2006	152.372	0.417	12.698
2007	157.734	0.432	13.144
2008	154.829	0.424	12.902
2009	140.824	0.386	11.735
2010	135.586	0.371	11.299

III. ENVIRONMENTAL AND OTHER LAND FEATURES

A full description of the mapping of environmental features for the County can be found in Chapter I of this report. This section includes a summary of the environmental features and public open space for the municipality that were taken into account when preparing the mapping. These features are significant to wastewater management planning for three reasons: they may influence the delineation of sewer service areas, they may reduce the potential future wastewater generation due to existing regulatory programs, or they may be subject to federal grant limitations that prohibit the extension of sewer service into these areas. Some of this mapping has been used in the development of a map of environmentally sensitive areas where the extension of sewer service areas is restricted **(see Delineation of Sewer Service Areas, below).**

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 Department of Environmental Protection 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 statutes or rules.

The following environmental features have been identified within the County map set:

A. Surface Waters and Classifications—Refer to Map No.5A of County map set
B. Riparian Zones -- Refer to Map No.5C of County map set
C. Flood Prone Areas – Refer to Map No.5A of County map set
D. Freshwater Wetlands -- Refer to Map No.5B of County map set
E. Coastal Wetlands –Refer to Maps 5A and 5B of County map set
F. Public Open Space and Recreation Areas –Refer to Map No.5B of County map set
G. Preserved Agricultural Areas and Other Conservation Easements on Private Lands – Refer to Map No.5C of County map set
H. Suitable Habitat for Threatened and Endangered Species – Refer to Maps 5B and 5C
I. Natural Heritage Priority Sites –Refer to Map No.5C of County map set

IV. DELINEATION OF SEWER SERVICE AREAS AND PLANNING INTEGRATION

The results of the environmental analyses, summarized in Section III above, provide justification for the established service area delineations by demonstrating consistency with all applicable NJDEP requirements and criteria. This WMP chapter provides the most current planning efforts within the municipalities WMP planning area.

The WQMP rules NJAC 7:15-5.22 require coordination with and solicitation of comments or consent from certain agencies, entities and plans, and consistency with other plans. These requirements are addressed in the Chapter 1, Salem County Summary within this document.

This chapter provides the method used to delineate future sewer service areas based on the mapping of significant environmentally sensitive areas, and consistency with other regional plans.

A. ENVIRONMENTALLY SENSITIVE AREAS MAP

Under the Water Quality Management Planning Rules, large contiguous environmentally sensitive areas, generally defined as 25 acres or greater in size should be excluded from sewer service areas except under certain circumstances such as providing service to development that has already secured prior approvals or center based development approved by the Department of Environmental Protection through the Plan Endorsement process. Maps 5A, 5B and 5C, of the County map set, reflect the final results for the mapping of environmentally sensitive areas, based on the information described above and the WQMP rules. These maps were created using the following process:

1. Identify areas (to the extent that GIS interpretations are available) where pre-existing grant conditions and requirements (from Federal and State grants or loans for sewerage facilities) provide for restriction of sewer service to environmentally sensitive areas, and then delete areas (if any) where a map revision or grant waiver has been approved by USEPA. Note: pre-existing grant conditions and requirements (from Federal and State grants or loans for sewerage facilities) which provide for restriction of sewer service to environmentally sensitive areas are unaffected by adoption of this WMP and compliance is required.

2. Merge the GIS layers for wetlands, Category One riparian zones, Natural Heritage Priority Sites, and Threatened and Endangered Species habitats, and any others used by the County areas into a single composite GIS coverage.

3. Correct the composite areas by eliminating areas designated as urban in the most recent land use land cover layer (2002) to address land use/land cover modifications that have occurred since the environmental feature layers were prepared.

4. Identify and delete any composite areas less than 25 acres in size from the map of environmentally constrained areas. The resulting map shows the final environmentally sensitive areas, which is used to eliminate the potential for sewer service areas except where sewer service already exists, or exceptions are allowed for infill development or approved endorsed plans. It is noted for public information purposes that the excluded areas will be protected through other NJDEP regulatory programs such as the Flood Hazard Area Control Act and Freshwater Wetlands Act rules, and may be protected by municipal ordinances as well.

B. SEWER SERVICE AREAS IN ENVIRONMENTALLY SENSITIVE AREAS

The WQMP rules allow for inclusion of environmentally sensitive areas under limited conditions. The following modifications were considered for the WMP:

1. Where a development has secured approval under the Municipal Land Use Law and possesses a valid wastewater approval, the site may be included in the sewer service area if consistent with that valid wastewater approval. This information was gathered in consultation with municipalities.

2. Where a project has an approved site-specific water quality management plan and wastewater management plan amendment from the Department the project may be included in the wastewater management plan consistent with that approved site specific amendment for a period of six years from the date the amendment was adopted. The general locations of these developments are indicated on Map No.3, if applicable, and are keyed to a list of qualifying developments in each municipal chapter.

3. Where environmentally sensitive areas are bordered on either side by areas with existing sewer service, and where the infill development would generate 2,000 gpd or less of sewage based on existing zoning and where the area to be included does not include habitat critical to the recovery potential or the survival of a local population of an endangered or threatened species.

4. Where sewer service is necessary to support for center based development under an "endorsed plan" (through the State Planning Commission relative to the State Development and Redevelopment Plan) and would not remove habitat critical to endangered or threatened species. Where such modifications have been made, they are noted in the individual municipal chapters.

5. Where necessary to create a linear boundary that related to recognizable geographic features and would not remove habitat critical to the recovery potential or the survival of a local population of an endangered or threatened species. Where necessary to create a linear boundary that related to recognizable geographic features and would not remove habitat critical to the recovery potential or the survival of a local population of an endangered or threatened species.

C. EXCEPTIONS TO THE USE OF GEOGRAPHIC OR POLITICAL BOUNDARIES

The existing Sewer Service Area boundary was derived from existing sanitary sewer infrastructure currently constructed or approved. These boundaries hold tightly to geographical features and political boundaries within the municipality. No exceptions were made for the delineations used in this WMP.

D. ENVIRONMENTALLY SENSITIVE AREAS – DATA SOURCES

The information described above with regard to the mapping of proposed sewer service areas and Environmentally Sensitive Areas was obtained from various sources. Table 4.D.1 below highlights the information and sources used to delineate environmentally constrained areas.

Table 4.D.1: Information Sources for Environmentally Constrained Areas

Category	Source	Source Location	Original Date	Date Last Revised
Wetlands	NJDEP	www.state.nj.us/dep/gis	11/9/99	
Floodplains	FEMA	www.msc.fema.gov/webmap/wcs	1/9/03	
Stream Corridors	NJDEP	www.state.nj.us/dep/gis	8/1/08	12/1/10
Threatened & Endangered Species	NJDEP	www.njfishandwildlife.com	11/1/09	2/13/09
Parks, Preserves, & Open Space	Green Acres Recreation Program & NJDEP	www.state.nj.us/dep/gis	2/13/09	
Preserved Agricultural Lands	NJ SADC	www.nj.gov/agriculture/sadc	1/25/11	
Surface Water Quality Standards	NJDEP	www.state.nj.us/dep/gis	10/1/07	1/19/11
National Heritage Priority Sites	NJDEP	www.state.nj.us/dep/gis	2/13/09	
Zoning	Municipality	Current Master Plan	N/A	10/19/99

V. FUTURE WASTEWATER DEMAND AND FACILITIES

Proposed future sanitary sewer flows conveyed to the Salem City WWTP projected under build-out conditions were evaluated based on two sets of data; sanitary flows projected within the existing sewer service area and proposed flows for the future sewer service area. Future flows within the existing sewer service area utilize a "parcel based" method for calculating the flows of infill development. Whereas, future sanitary flows within the expanded sewer service area utilize a "zoning based" method for calculating the build-out. The build-out data is then converted to a projected future wastewater flow by applying the planning flow criteria from N.J.A.C. 7:14A based on the type of development projected.

A. CONFORMANCE AND NONCONFORMANCE WITH ZONING AND PRIOR LAND USE APPROVALS

Where the WMP build out deviates from either current zoning or prior land use approvals, such deviation and the reasons for the deviation are explained in this chapter.

B. MUNICIPAL ZONING AND COMPOSITE ZONING

The municipal zoning information provided below is specific to this chapter. Because municipal zoning ordinances are not uniform in their nomenclature or definitions, a composite zoning map has not been developed. Table 5.B.1 below identifies the zoning specific to this chapter and is being provided for reference. As indicated previously within this chapter, the Borough of Penns Grove is designated as an urban area. Therefore, a 20-year wastewater projection has been created based on population projections and is not based on zoning.

Table 5.B.1: Summary of Penns Grove Municipal Zones

Zone Name	Zone Description	Municipal Area (ac)
R-1	RESIDENTIAL (SINGLE-FAMILY DETACHED, CLUSTERING PERMITTED)	121.1
R-2	RESIDENTIAL (SINGLE-FAMILY ATTACHED, MULTIPLEX CLUSTERING)	282.3
R-3	RESIDENTIAL (TOWNHOUSE, GARDEN APARTMENT, MID-RISE)	35.1
MD-1	MARINA DISTRICT 1	34
MD-2	MARINA DISTRICT 2	19.6
COS	COMMERCIAL, OFFICE, SERVICE	42.5
H-C/I	HIGHWAY COMMERCIAL INDUSTRIAL	48.1

C. CALCULATING FUTURE WASTEWATER AND WATER SUPPLY NEEDS AND CAPACITY

Using the municipal information provided above regarding existing wastewater and water supply facilities, sewer service area delineation, environmentally sensitive areas, and municipal zoning to project build-out or 20 year growth projections for the listed urban municipalities, an analysis of wastewater and water supply demands was performed to determine whether existing infrastructure capacity or zoning is a constraining factor.

There are two methods used for projecting future wastewater management needs: a 20-year projection for urban municipalities or a build out based on existing zoning for non-urban municipalities. An urban municipality is defines as those municipalities where less than 10 percent of the total land area of the municipality is "available land for development" after subtracting out permanently preserved open space.

D. MUNICIPAL DEMAND PROJECTIONS IN URBAN MUNICIPALITIES

The Borough of Penns Grove qualifies as an urban municipality according to the definitions stated above. Table 5.D.1 lists the borough's 2002 land usage data collected from the NJDEP municipal profile for Penns Grove. It is assumed that redevelopment of previously developed portions of the municipality will make up the majority of the future wastewater management needs. Therefore, an application of zoning to the undeveloped and developable land area of the municipality in Penns Grove may underestimate its future wastewater management needs. For this reason a 20-year wastewater projection has been created based on population and employment projections.

Table 5.D.1 Determination of Urbanized Municipalities

Municipality	% Urban	% Preserved	% Developable	Urbanized?
Penns Grove Borough	96	2	2	Yes

Future wastewater is calculated from the population and employment projections by multiplying the projected increase in population by 75 gallons per day per person and the projected increase in employment by 25 gallons per day per person. Penns Grove Borough's population and employment 20-year projection was taken from an estimate made by the South Jersey Transportation Planning Organization (SJTPO), which employed data from historical U.S. Censuses.

Table 5.D.2 provides an analysis of the population projection for the Borough of Penns Grove through the next 20 years. The flows contributed from residential, commercial, and industrial production are expected to remain stable.

Table 5.D.2: 20-Year Wastewater Projection

Projection Parameter	Current (2010) Population	20-Year (2030) Population	Projected Flow	
			No. of People	Flow (gpd)
Population	5,147	5,776	629	47,175
Employment	1,119	1,295	176	4,400
Projected New Flow (gpd)				51,575
Current 2010 ADF (gpd)				405,000
		Total 20-year Flow (gpd)		**456,575**
		Total 20-year Flow (mgd)		**0.457**

E. MUNICIPAL DEMAND PROJECTIONS IN NON-URBAN MUNICIPALITIES

The Borough of Penns Grove does not meet the definition of a non-urban municipality as defined above. Consequently, future wastewater build out projections are based solely on the 20-year growth projection above.

F. FUTURE WASTEWATER OUTSIDE OF SEWER SERVICE AREAS

Generally, the default wastewater management alternative to support development in areas that are not designated as sewer service area is discharge to groundwater less than 2,000 gallons per day. A nitrate dilution analysis for septic systems is typically performed, in similar fashion to that conducted for sewer service areas, except that environmentally sensitive areas are not removed prior to performing the build out analysis. The intent of this analysis is to assess the available dilution on a HUC 11 basis used to establish the maximum number of units that can be built in a watershed and continue to meet the regulatory nitrate target.

The Borough of Penns Grove's existing sewer service area extends to the municipal boundary. Consequently, the nitrate dilution analysis necessary for assessing the future wastewater outside of a sewer service area is not applicable.

VI. ANALYSIS OF CAPACITY TO MEET FUTURE WASTEWATER NEEDS

This section of the wastewater management plan analyzes whether there is sufficient wastewater treatment capacity to meet the needs of the Municipality based on the projections described above. For sewer service areas this requires a comparison of the projected future demand to the existing capacity of the sewage treatment plant.

A. ADEQUACY OF SEWAGE TREATMENT PLANT CAPACITY

Table 6.A.1 provides a comparison of existing wastewater treatment capacity with existing and future flow demands within the municipality. The final column determines whether existing capacity is or is not adequate for the projected flows. Where capacities are inadequate, the issue is addressed in later sections. Details of the projections are included within the appendices and municipal chapters, which also address any needs for new or expanded treatment facility discharges.

TABLE 6.A.1: Wastewater Treatment Plant Capacity

Treatment Works	Permit No.	Current Treatment Capacity (mgd)	Average Daily Flows 2010 (mgd)	Population Build-Out Projection (mgd)	Remaining Treatment Capacity (mgd)
Penns Grove WWTP	**NJ 0024023**	**0.750**	**0.405**	**0.052**	**0.293**

The total treatment capacity for the sanitary sewer system that serves the municipality (0.75 mgd) is greater than the projected flows necessary to support existing demands and proposed development within the sewer service area (0.457 mgd). The calculations were based on the proposed build-out projections and average daily flow values utilized within the regulations for each type of development. Based on the analysis presented above, Sufficient wastewater treatment capacity exists to accommodate the currently proposed Sewer Service Area.

B. Analysis and Selection of Treatment Alternatives

This section is not applicable to this municipality as new or expanded wastewater facilities are not being proposed at this time.

C. Antidegradation Analysis for New and Expanded Domestic Treatment Works

This section is not applicable to this municipality as new or expanded wastewater facilities are not being proposed at this time.

D. Discharges to Ground Water

This Section is not applicable as the Borough of Penns Grove's existing sewer service area extends to the municipal boundary and a nitrate dilution analysis has not been provided, as indicated above.

E. Adequacy of Dilution To Meet Future Non-Sewer Service Area Demand

Generally, a wastewater estimation tool, provided by the Department is used to compare existing zoning to the available nitrate dilution within each HUC11 in an effort to determine whether adequate dilution is available to meet future non-sewer service area demands. However, as indicated above, the Borough of Penns Grove's existing sewer service area extends to the municipal boundary and this analysis is not applicable for this municipality.

VII. FUTURE WATER SUPPLY AVAILABILITY

The purpose of the Depletive/Consumptive Water Use Analysis is to determine if there is sufficient water supply to serve the proposed development of the municipality. The analysis should compare the build-out water supply need with the existing permitted water allocation. To complete the objective of this analysis, water allocation and drinking water demand within the existing sewer service area were compared. A build-out projection of the proposed sewer service area was then prepared to determine the additional water demands that may result. These demands were also compared to the water allocation to verify whether sufficient water supply exists to serve the proposed development.

A population-based water build-out projection (similar to the wastewater build-out) was used for this municipality. The information provided was made available by the New Jersey American Water Company or obtained from DEP online sources. The comparison of water allocation and projected build-out for the urbanized municipality are summarized in the table below.

A. SUFFICIENCY OF WATER SUPPLY

The Borough of Penns Grove's current water allocation and existing average water demands are identified in Section 2 of this municipal chapter. In terms of identifying demand, the projected changes in population and employment were the predominant factors in determining future water supply needs.

The Borough of Penns Grove is an urbanized municipality. It is assumed that redevelopment of previously developed portions of the municipality will make up the majority of the future potable water needs, with urban development throughout the municipality. Consequently, infill development has been considered by utilizing a population based build-out approach as defined below. For this reason, neither the parcel based nor zoning based analysis used in non-urbanized municipalities were applied to identify future demands for this municipality. A 20-year projection has been created based on population and employment projections.

Proposed daily demands required to support urban development within the future sewer service area utilized the same method of analysis as was performed for the sanitary sewer analysis. Future demands are generally evaluated and projected based on two sets of data; water demands from projected population increase/decrease within the existing SSA, and water demands from projected employment increase/decrease within the existing SSA.

1. Water Build-out Analysis

Neither parcel nor zoning based build-out was used in the analysis of the sewer service area as the build-out analysis was prepared utilizing a population and employment based approach. In this type of build-out, future water demand is calculated from the population and employment projections by multiplying the projected increase in population by 100 gallons per day per person and the projected increase in employment by 25 gallons per day per person. These numbers are an adjustment of the multipliers used to estimate wastewater flows in an urban municipality (set forth by NJDEP). This adjustment takes into account the most current NJDEP and NJAW data for water demand, in order to create a more accurate future water demand projection. Penns Grove Borough's population and employment 20-year projection was taken from an estimate made by the South Jersey Transportation Planning Organization (SJTPO), which employed data from historical U.S. Censuses.

Table 7.A.1 provides an analysis of the population projection for the Borough of Penns Grove through the next 20 years. The flows contributed from residential, commercial, and industrial production is expected to remain stable.

Table 7.A.1: 20-Year Water Demand Build-Out Projections				
	Current (2010)	20-Year (2030)	Projected Demand	
Projection Parameter	Population	Population	# of People	Demand (gpd)
Population	5,147	5,776	629	62,900
Employment	1,119	1,295	176	4,400
Current 2010 ADD (gpd)	362,896	Projected New Demand (gpd)		67,300
Current 2010 ADD (mgd)	0.363	Projected New Demand (mdg)		0.067
Current 2010 ADD (mgm)	11.250	Projected New Demand (mgm)		2.086
Current 2010 ADD (mgy)	132.457	Projected New Demand (mgy)		24.565
		Total 20-year Demand (gpd)		**430,196**
		Total 20-year Demand (mgd)		**0.430**
		Total 20-year Demand (mgm)		**13.336**
		Total 20-year Demand (mgy)		**157.022**

2. Analysis of Water Capacity to Meet Supply Needs

This section of the wastewater management plan analyzes whether there is sufficient potable water treatment capacity to meet the needs of the Municipality based on the projections described above. This requires a comparison of the projected future demand to the existing capacity of the water supply system.

Table 7.A.3.1 provides a comparison of existing water allocation with existing and future flow demands within the municipality. The final column determines whether existing capacity is or is not adequate for the projected daily demands. Where capacities are inadequate, the issue is addressed in later sections. Details of the projections are included within the appendices and municipal chapters, which also address any needs for new or expanded treatment facility discharges.

Table 7.A.3.1: Water Supply Capacity								
Water Company (Breakdown by Municipality)		Permit # / Program Interest ID	2010 Water Allocation / Avg. Demand*		Total Projected Water Demand		Remaining Water Allocation	
			(MGM)	(MGY)	(MGM)	(MGY)	(MGM)	(MGY)
New Jersey American Water (Logan System)		WAP100001/ 5003	60	392	N/A	N/A	(Alternative Source)	
New Jersey American Water (Penns Grove System)	**% of System Demand**	**WAP070002/ 5328**	70.4 / 37.95	753 / 455.41	178.02	2,105.07	-107.62	-1,352.07
Penns Grove	30.5	n/a	n/a	n/a	13.35	160.16	n/a	n/a
Oldmans	7	n/a	n/a	n/a	56.19	662.25	n/a	n/a
Carneys Point Township	62.5	n/a	n/a	n/a	108.48	1,282.66	n/a	n/a
Note: Total Projected Water Demand reflects the Average Daily Demand in 2010 and additional demand associated with the FWSA build-out projections.								

The total monthly water allocation for the water purveyor (NJAW) that serves the municipality (70.4mgm/ 753mgy) is greater than the water supply necessary to support existing demands and proposed development within the Penns Grove sewer service area (13.34 mgm/ 157.022 mgy). The projected calculations were based on the proposed build-out projections and average daily demand values utilized within the regulations for each type of development. Based on the analysis presented above, sufficient water supply exists to accommodate the currently proposed Sewer Service Area. However, the existing water allocation would not be sufficient if all of the municipalities currently connected to the NJAW system reached the FWSA buildout condition.

The available water supply for the water purveyor (NJAW), supplying the Carneys Point Township, Oldmans Township and the Borough of Penns Grove water systems is less than the water supply necessary to support the FWSA of these three (3) municipalities in its entirety. Due to the current economic climate, projected growth rate of the population, and the anticipated short-term need for additional water supply, these municipalities are not seeking additional water supply at this time. As NJAW is only operating at 54% of their monthly allocation and approximately 60% of their annual diversion limit, the existing water capacity is sufficient to support existing demands and short-term development in the future, based on the current water utilization indicated above. However, it should be noted that NJAW system has additional water production capabilities and could supply more than the current allocation.

NJAW supplies water to Penns Grove Boro, Oldmans and Carneys Point Townships through its Penns Grove system, which receives water from its local sources, as permitted by the Department, and from the Tri-County pipeline. NJAW completed improvements in 2010 to interconnect their Penns Grove water system and Logan Township water system to allow for operational flexibility. The Logan system of NJAW draws from five (5) ground water wells, as noted in Table 2.H.1. Therefore, NJAW could supply more than the current allocation if necessary. This may require NJAW to make adjustments or infrastructure improvements to its water system in order to supply additional water to the area.

VIII. MAPPING REQUIREMENTS

A. BASIS FOR SERVICE AREA DELINEATIONS

The results of the required environmental analyses, summarized in Section III and the delineation of the sewer service areas identified in section IV above provide justification for the established service area delineations by demonstrating consistency with all applicable NJDEP requirements and criteria. The Salem WMP provides the most current planning efforts within the Sewer Service Area.

The Penns Grove WMP proposed Sewer Service Area encompasses the future sewer service area necessary to implement the goals and objectives of the municipality. Those areas have been reduced to account for the buffer requirements regarding wetlands, the habitats of Threatened and Endangered Species and Riparian Corridors.

The proposed Penns Grove Borough WMP Sewer Service Area does not contain any areas located within the Pinelands. Areas located within the watershed of a Fresh Water One (FWl) stream, as classified in the Surface Water Quality Standards, and/or that have Class I-A ground water (Ground Water of Special Ecological Significance), as classified in the Ground Water Quality Standards, are identified as "Non-degradation water areas based on the Surface Water Quality Standards at NJ.A.C. 7:9B, and/or the Ground Water Quality Standards at NJ.A.C. 7:9-6." Areas so designated are included on Map 3. Non-degradation water areas shall be maintained in their natural state (set aside for posterity) and are subject to restrictions.

B. MAPPING CLASSIFICATION

The mapping for this municipal chapter of the WMP was created by using available data from NJDEP, online GIS data sets and has been prepared in accordance with NJDEP WMP guidelines. The maps included within this submission reflect the requirements for preparing a Water Quality Management Plan Amendment. Five (5) maps with specific features have been provided. Supplemental maps have been included to clarify information in an effort to clearly depict the required information. Each map has been provided with a complete and readily understandable legend. All 30" x 42" maps have been developed using New Jersey Department of Environmental Protection Geographic Information System digital data at a scale of 1" = 1 mile'. Additional 11" x 17" maps have been provided within each report for convenience. The maps are classified below:

1. MAP #1: WMP MUNICIPAL MAP/WATER INFRASTRUCTURE

The map depicts the current WMP planning area of for the municipality. This planning area is exclusive to the municipality's boundary. The map also includes HUC-11's, and existing water service infrastructure. Map No.1 shows areas of the municipality that lay within the Hackensack Meadowlands District, Pinelands Areas, Pinelands National Reserves, or franchise areas.

2. MAP NO.2: EXISTING FACILITIES & SERVICE AREAS

The map depicts the existing wastewater service area. This map also identifies the present extent of actual sewer infrastructure within the municipal boundary of Penns Grove Borough, including all sewer department buildings, existing NJPDES facility (WWTP) locations, pump stations, force mains, and gravity sewers. All areas outside the existing sewer service area are served by ISSDS with wastewater planning flows of less than or equal to 2,000 gpd.

3. MAP NO.3: PROPOSED FACILITIES & SERVICE AREAS

The map illustrates the wastewater service areas, non-degradation areas, pumping stations, major interceptors and trunk lines, which are proposed to exist in the future. The boundaries of future service areas coincide with recognizable geographic or political features (i.e., roads, lot lines, zoning area boundaries, water bodies). The proposed future infrastructure and facilities are also depicted on the map. The existing infrastructure and facilities from Map No.2 are also included in this map.

4. MAP NO.4: PENNS GROVE BOROUGH ZONING MAP

The map depicts the current zoning of Penns Grove Borough. The zoned minimum lot acreage for Commercial, Industrial and Residential areas within the WMP proposed Sewer Service Area indicated in Table 8.B.4.1 below were utilized to determine calculated flows within the future sewer service area.

Table 8.B.4.1: Zoning Regulations

ZONE	ZONE TITLE	MAXIMUM GROSS DENSITY	MINIMUM LOT AREA	MINIMUM AREA / DWELLING UNIT	MINIMUM LOT WIDTH	MINIMUM FRONT YARD SETBACK	MINIMUM SIDE YARD SETBACK	MINIMUM REAR YARD SETBACK	MAXIMUM BUILDING HEIGHT	MAXIMUM LOT COVERAGE
R-1	SINGLE-FAMILY DETACHED (CLUSTERING PERMITTED)	3.2	10,500 SF	10,500 SF	90/75	35'	12' EACH	35'	35'	30%
R-2		3.8	9,000 SF	9,000 SF	80/65	25'	10'	25'	35' 3 STORIES	35%
	SINGLE-FAMILY ATTACHED	4	14,000 SF	6,000 SF	60/60	25'	10'	25'	35' 3 STORIES	35'%
	ATRIUM	6.5	14,000 SF	2,500 SF	40'	25'	10'	25'	35' 3 STORIES	
	PATIO HOUSE	3.8	1 ACRE	4,500 SF	45'	25'	10'	25'	24'	
	MULTIPLEX (CLUSTERING)	5.8	1 ACRE	3,000 SF	80'	25'	10'	25'	3 STORIES	
R-3	TOWNHOUSE	12	3 ACRES	2,000 SF	20/20	25'	35'	35'	35' 3 STORIES	30%
	GARDEN APARTMENT	15	3 ACRES	2,940 SF	200/200	50'	35'	35'	35' 3 STORIES	30%
	MID-RISE	25	3 ACRES	SEE 220-14	100/100	50'	35'	35'	8 STORIES	30%
COS									5 STORIES	85%
H-C/I	COMMERCIAL		30,000 SF		100/100	35'	15'	15'		30%
	INDUSTRIAL		80,000 SF		150/150	35'	15'	15'		40%

5. MAP NO.5A: ENVIRONMENTAL FEATURES (REFER TO COUNTY MAP SET)

The map depicts environmental features indicated in N.J.A.C. 7:15-5.17 including major drainage basin boundaries (U.S.G.S. Hydrologic Unit Code (HUC) 11 Watersheds), CAFRA boundary and flood prone areas (FEMA). Map No.5A shows any New Jersey and Federal Wild and Scenic Rivers, FW 1-Trout Production or FW 2 Trout Production or farmlands preservation areas. Streams with FW2-NTC1/SE1 and FW2-NT/SE1 ranking are also shown.

6. MAP NO.5B: ENVIRONMENTAL FEATURES (REFER TO COUNTY MAP SET)

The map depicts environmental features indicated in N.J.A.C. 7:15-5.17 including wetlands, required wetlands buffers, public open space and recreation areas greater than or equal to (10) ten acres. Additional information including major drainage basin boundaries (U.S.G.S. hydrologic unit code (HUC) 11 watersheds), landscape project areas for grasslands, emergent and forested areas with rankings of 3, 4 and 5 are also shown. MapNo.5B shows any New Jersey and Federal Wild and Scenic Rivers, FW 1 Trout Production or FW 2 Trout Production or farmlands preservation areas.

7. MAP NO.5C: ENVIRONMENTAL FEATURES (REFER TO COUNTY MAP SET)

The map depicts environmental features indicated in N.J.A.C. 7:15-5.17 including the natural heritage priority sites for threatened and endangered species. Landscape Project Areas for Forested Wetlands and Bald Eagle Foraging are shown on this map. Map No.5C shows any New Jersey and Federal Wild and Scenic Rivers, FW 1-Trout Production or FW 2 Trout Production or Farmlands Preservation areas. C-1 water bodies are identified on the map as well. Sewer service areas are excluded from the 300ft buffers of C-1 water bodies and on all tributaries within the HUC 11 watershed.