

Wastewater Management Plan
for
Mercer County, New Jersey

Amending the
Mercer County Areawide Water Quality Management Plan

Watershed Management Areas 10, 11, and 20



Volume 1 – County Summary

Prepared for the

| *Mercer County Planning Board*

By

| *Mercer County Planning Division*

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COUNTY OF MERCER

WASTEWATER MANAGEMENT PLAN EXECUTIVE SUMMARY

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I. Introduction

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 infrastructure, in particular centralized sewer service, plays a significant role, along with other planning factors, on local and regional development patterns and intensity. The wastewater management planning process is intended to assign appropriate wastewater management treatment to defined geographic areas through a planning process based on the identification of existing conditions and analysis of these conditions with respect to land use planning policies, goals and objectives. The decision to extend public sewers is based on a rigorous review of existing conditions, and federal, state and local regulations, by state and local governing bodies.

Mercer County is the wastewater management planning agency for its thirteen self-governing municipalities. Of the thirteen municipalities, East Windsor, Pennington Borough, and Robbinsville Township have adopted Wastewater Management Plans. The County began the development of this Wastewater Management Plan (WMP) in October 2008 and is charged per NJAC 7:15 with on-going revisions and updates from the date of Plan adoption by the NJDEP. The planning process began with the appointment of municipal and municipal utility authority liaisons. Shortly thereafter in 2009, the county began to engage the business community, including private landowners, in the planning process. These municipal representatives and the public have been working with the County for the past two and a half years in developing the county-wide WMP.

Collaboration with government entities, the business community, and the general public was critical in developing the WMP. However, the process also required working with an enormous amount of data primarily developed by the NJDEP through models and aerial photo interpretation. As a result, this data did not always reflect field conditions. The County strongly suggests that users of this document consult the NJDEP metadata associated with the digital data and mapping required to be used in this document. There are limitations to the NJDEP data and the mapping. Throughout the WMP process the county has recommended that property owners field-verify this data. All metadata can be found on the NJDEP GIS Bureau of Geographic Information Systems website, <http://www.state.nj.us/dep/gis/>.

The wastewater management plan work was comprised of data collection, Geographic Information System (GIS) Analysis, Wastewater Management Plan Development, and meetings with liaisons, the public, and state agencies. In addition to this work, Mercer County was required by NJDEP to receive public comment on the DEP draft sewer service area map. Coordination of the county's sewer service area data with that of the draft NJDEP sewer service area map was primarily completed in one year. This process led to a sewer service area boundary that was used for the build-out analysis and eventually capacity determinations.

Mercer County has limited jurisdiction on local land use decisions. The County Planning Act, in addition to the Municipal Land Use Law, limits the county's role and jurisdiction in municipal land development, especially in matters directly related to zoning. While broad policies regarding the economy, transportation, and the environment are made to be consistent among local and state agencies, primarily through the State Plan planning process, in New Jersey specific land use and design decisions are carried out through site specific zoning standards at the municipal level.

The recently adopted Mercer County Master Plan is based on the premise that the interdependencies of three primary, regional systems—economy, transportation, and environment, must be balanced to approach sustainable development. Mercer County's vision for balanced growth relies on 1) an adequate level of housing choice and affordability, 2) adequate transportation and housing choice to maintain an educated workforce and a stable economy, 3) enhanced core transportation corridors through the implementation of access management, connectivity, and wise land use decisions, and 4) continued strategic investment in open space and recreational facilities. This premise, along with the fact that Mercer County has limited jurisdiction over local land use decisions, was used to guide this wastewater management planning process.

Alternative Assignment of Wastewater Management Planning Responsibility

As of the date of submittal, wastewater management planning responsibility for the entire County remains with the Mercer County Planning Board.

The Mercer County Executive identified the Mercer County Planning Division (MCPD) as the county agency charged with Wastewater Management Plan (WMP) preparation and maintenance. Any proposed revisions or amendments to this wastewater management plan shall be submitted to the Mercer County Planning Board.

Previously Approved WMPs within Mercer County

The WMP for Mercer County incorporates or replaces part or all of a variety of previously approved WMPs prepared by municipalities and wastewater authorities.

The Water Quality Management Plan (WQMP) rule provides that any local WMP previously approved by the New Jersey Department of Environmental Protection (NJDEP) may remain in force and effect until six (6) years from the date of the adoption of this plan. In Mercer County, East Windsor Township, Pennington Borough, and Robbinsville Township have currently valid WMPs as listed in Table 1. Amendments to the Robbinsville Township WMP are being made through the county-wide WMP adoption process. The amendments are defined in the Robbinsville municipal chapter of this document.

Table 1 lists previously adopted sewer service areas (SSAs) and facility tables from these local WMPs. This information from these previously adopted WMPs is incorporated by reference in

the Mercer County WMP. The remaining municipalities are represented by the municipal chapters found in Volume II of the WMP.

Table 1 - Current WMPs That Remain in Effect

WMP Planning Area	Municipality (or parts thereof)	Adoption Date
East Windsor Township	East Windsor Township	March 6, 2007
Pennington Borough	Pennington Borough	October 8, 2009
Robbinsville Township	Robbinsville Township	November 19, 2008

The WMP for Mercer County – Volume II includes a chapter for each of its 13 municipalities. The chapters for East Windsor Township and Pennington Borough chapters incorporate their adopted WMPs by reference. In the event a municipality does not participate in the development of the WMP for Mercer County, such municipalities will be listed in Table 2 below.

Table 2 - Municipalities Not Addressed in the WMP for Mercer County

None	
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As of the submittal date of this WMP, all municipalities have provided sufficient information. If at any point a municipality or any relevant wastewater agency does not provide the proper information (required by the WQMP rules at N.J.A.C. 7:15-8.1), the Sewer Service Areas (SSAs) for any area not currently connected to a wastewater treatment collection system, or fully permitted to do so, will be revoked.

Development that relies on discharges to ground water of 2,000 gpd or less is allowed, but will be required to comply with relevant NJDEP rules, including nitrate dilution analysis, where the proposed development exceeds an aggregate greater than 2,000 gpd in projected flow or requires a NJDEP permit or approval subject to N.J.A.C. 7:15-4.

Overview of Mercer County

Mercer County, New Jersey’s capital county, is located in the central part of New Jersey, between New York and Philadelphia, and within the greater urbanized region that extends from Boston to Washington, D.C. The county is served by major transportation facilities including the New Jersey Turnpike, Interstate highways, several local and regional rail systems, and the Trenton-Mercer Airport. Key corridors along the New Jersey Turnpike are considered the most lucrative commerce centers in New Jersey. Interstates 95, 195 and 295, as well as the state highway Routes 1, 29, 31 and 130 are key to Mercer’s economic growth. By standard land travel routes, Mercer County is located 45 minutes from Philadelphia, 1 hour from New York City, 4 hours from Washington, D.C. and 6 hours from Boston.

The county is also linked, both physically and thematically, to other eastern states via regional park systems, national heritage landmarks, and natural resource systems such as the

Washington Crossing Park National Heritage Landmark, the Crossroads of the American Revolution National Heritage Area, and the Delaware River. The county is integral to New Jersey and other states within the Northeast megapolitan area through goods movement, business linkages, cultural commonality, and physical environment.

Mercer County is centrally located within the Northeast megapolitan area and is very much part of a functional trans-metropolitan geography and broad regional economy.

With a highly skilled and educated labor pool the county is home to Mercer County Community College, Princeton Theological Seminary, Princeton University, Rider University, The College of New Jersey, The Institute for Advanced Study, and Thomas Edison State College. The county holds some of New Jersey's (and the nation's) greatest cultural and historic sites with Revolutionary War battle sites in Trenton and Princeton.

Mercer County is bounded on the north by Hunterdon and Somerset Counties, to the east by Middlesex and Monmouth Counties, to the south by Burlington County, and to the west by the Delaware River and Bucks County, Pennsylvania. Mercer's development pressure is shared among these adjacent counties primarily through shared major transportation routes—New Jersey Turnpike, Interstate 95, Interstate 295, State Routes 1, 29, 31, and 130.

Diverse land types including large areas of contiguous farmland in the northern and southern portions of the county, post-war and newer suburbs, an urban and regional center, towns, villages, and hamlets characterize Mercer County. With an area of 226 square miles, it is sixteenth in land size among New Jersey's twenty-one counties. Mercer County is fully incorporated into thirteen self-governing municipalities.

The current population estimate for Mercer County is 362,090 as of March 2005 (Mercer County Cross-Acceptance), a 3.2% increase from 2000. The rate of population growth is approximately equivalent to the State rate of 3.2%.

Overview of Current Wastewater Service

Centralized wastewater treatment systems in Mercer County serve approximately 55% of the total County area and approximately 70% of the total County population. Centralized wastewater treatment systems treat flow collected from within their designated SSA. SSAs may include industrial businesses that discharge process wastewater to the collection system for treatment by a facility not owned by that business. The wastewater collection and treatment infrastructure generally serve the more densely populated urban and suburban communities. Details of these existing systems are presented in Section II.

Rural and less densely developed areas not served by SSAs are defined as General Service Areas (GSAs) and are predominantly served by septic systems, also referred to in this WMP as Individual Subsurface Sewage Disposal Systems (ISSDS).

The City of Trenton has the only combined sewer system within Mercer County.

Overview of Major Environmental, Regional and Local Considerations to Wastewater Service

The 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 the following environmentally sensitive features:

- Wetlands;
- Riparian zones (300-feet in width) along both sides of a Category One (C1) waterway;
- Natural Heritage Priority Sites; and/or
- State and Federal threatened and endangered species habitat as depicted in NJDEP Landscape Project Area database (Rank 3, 4, 5).

A more detailed discussion of these environmental considerations is presented in Section III, Environmental and Other Land Features. Additional regional and local land use planning objectives used in delineating appropriate areas for public sewer service are discussed in the Section IV – Delineation of Service Areas and Planning Integration and in each individual municipal chapter included in this WMP.

Overview of Future Wastewater Service Areas

Sewer Service Areas (SSA)

The Future SSA reflects the coordination between NJDEP, the Mercer County Planning Division, municipal and municipal utility authority representatives, business and educational landowners, and the general public. The SSA boundary map reflects areas where sewer service either exists or is planned in the future and shows the location of existing environmentally sensitive areas. The future sewer service area delineation was also based on local land development approvals, municipal master plans and redevelopment plans, individual site specific environmental habitat studies, and environmental permits.

The following facilities are seeking approval to increase their NJPDES permit effluent limits to reflect either existing or future expected wastewater flow to these facilities.

Table 3 – Facilities Seeking Expansion

Facility
None

It should be noted that flow is not a permit limit per se, but is the basis on which NJPDES effluent limits are calculated. Section V – Future County Wastewater Demand and Facilities presents the results of the build-out analysis for each SSA and the associated sewage treatment plants.

General Service Areas (GSA)

All areas not in a SSA are designated as General Service Areas, with DGW less than 2,000 gpd (i.e. septic systems).

Proposed developments in the GSA with anticipated DGW planning flows greater than 2,000 gpd will require a WMP Amendment and subsequent adoption by NJDEP.

Summary of Significant Actions

The Water Quality Management Planning Rules adopted on July 7, 2008 necessitated a modification to certain SSAs based on environmental sensitivity and local planning objectives as described in this document. Map 2M and 3M in each municipal chapter shows the changes in SSA as a result of this wastewater management plan.

- Change in extent SSA Environmental Composite?
- Expansion of facilities?
- Areas pulled out?

II. Existing Infrastructure

This section addresses wastewater and water supply infrastructure and facilities within the County.

Wastewater Collection System Infrastructure

Major interceptors, trunk lines and pumping stations within the various SSAs for public wastewater treatment facilities are shown on a county-wide basis on Map 2 and on a municipal basis on Map 2M found in each individual municipal chapter.

Major Wastewater Treatment Facilities

Table 4 below lists the major domestic wastewater treatment facilities and the municipality or municipalities they serve. There are 18 major facilities serving Mercer County. For the purpose of this WMP, major facilities are generally considered to fall into one of the following categories:

- Non-industrial facilities that provide treatment to an entire municipality or
- A regionalized treatment plant serving two or more municipalities in one or more counties or;
- Residential or multi-use facilities serving distinct areas within municipalities where the potential for additional wastewater generation could occur.

Existing SSAs served by these wastewater facilities are shown on a county-wide basis on Map 2 and on a municipal basis on Map 2M found in each individual municipal chapter. Future SSAs proposed for each wastewater facility are shown on a county-wide basis on Map 3 and on a municipal basis on Map 3M found in each individual municipal chapter. Tables in Appendix D provide detailed information on each facility.

Existing wastewater infrastructure within the County was delineated with the use of collaborating information from municipalities, previous wastewater management plans, existing infrastructure documentation, and input from local wastewater entities.

SSAs may include industrial businesses that discharge process wastewater to the collection system for treatment by a facility not owned by that business.

Table 4 – Wastewater Facilities and Municipalities Served

Wastewater Utility	Municipalities Served
Trenton Sewer Utility	City of Trenton
Ewing-Lawrence Sewerage Authority	Township of Ewing Lawrence Township Hopewell Township
SBRSA – River Road STP	Princeton Borough Princeton Township West Windsor Township South Brunswick (Middlesex County)
SRBSA – Pennington STP*	Pennington Borough Hopewell Township
SBRSA – Hopewell STP	Hopewell Township
Hamilton WPCF	Hamilton Township
	West Windsor Township
	Robbinsville Township
Hightstown AWWTP	Hightstown Borough
East Windsor MUA*	East Windsor Township Hightstown Borough Robbinsville Township
Bristol Myers-Squibb (this site discharges to ELSA sewer system but BMS has a NJPDES permit to monitor effluent to the sewer)	Lawrence Township
Bristol Myers-Squibb	Hopewell Township
Educational Testing Service	Lawrence Township
Pennington Point West – II	Hopewell Township
Hopewell Township Municipal Complex	Hopewell Township
BASF Agricultural Research Center	West Windsor Township
Headwaters Technology Innovation Group	Lawrence Township
Hopewell Business Center	Hopewell Township
Mercer County Corrections Center	Hopewell Township
Pennytown/Kooltronics	Hopewell Township

*Note: Community has a currently adopted WMP. Robbinsville also has an adopted WMP but is requesting an amendment through the County WMP adoption process.

Minor Wastewater Treatment Facilities

All facilities that are not classified as major facilities described above were categorized as a minor facility.

On-site, Non-industrial Wastewater Facilities

These minor 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. Tables 1a (DGW) and 1b (DSW), found in each municipal chapter, 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. Details of these facilities can be found within the municipal chapters.

Industrial Treatment Works for Process Wastes and Sanitary Sewage

These minor facilities serve industrial land uses with 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. Tables 1a (DGW) and 1b (DSW), found in the municipal chapters, list all existing industrial treatment works that discharge 2,000 gallons per day or more of process and wastewater and are regulated under a NJPDES permit. Details of these facilities can be found within the municipal chapters.

III. Environmental and Other Land Features

This section includes a description of environmental and other land features used as constraints in preparation of this WMP as specified by NJDEP and the Water Quality Management Planning regulations at NJAC 7:15. These features are significant to wastewater management planning for three reasons: they may influence the delineation of SSAs, 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. These features have been used in the development of maps of environmentally sensitive areas of 25 acres or more (ESA 25) where the extension of SSAs is restricted (see Section IV - Delineation of Service Areas, below) unless it is determined through habitat studies, wetlands investigations, and/or stream studies that the environmental features as presented by the NJDEP data are incorrect. Environmentally Sensitive Areas are defined as any contiguous area of 25 acres or larger consisting of any of the following features alone or in combination:

- State and Federal Threatened and Endangered Species Habitat as shown on the NJDEP's Landscape Project Areas (Ranks 3, 4, 5) database.
- Natural Heritage Priority Sites excluding urban lands as identified by NJDEP using 2002 Land Use/Land Cover geographical information systems database as amended and updated.
- Category One waters and their tributaries. Surface waters that are designated Category One are listed in the Surface Water Quality Standards at N.J.A.C. 7:9B.
- Wetlands as mapped pursuant to 2002 Land Use/Land Cover shapefile available from NJDEP.

Figure 5A shows hydrologic features and related areas. Figure 5B shows other natural resources and land features. These features are summarized below. Most of these features are based on mapped data provided by the NJDEP, and the County has not verified the mapping of these areas. The location of these NJDEP mapped areas should be considered only in the context of this WMP. Site specific investigations and delineations may be necessary in connection with other projects and have been submitted to the County and NJDEP by property owners to verify presence or absence of these features.

The County strongly suggests that users of this document consult the NJDEP metadata associated with the digital data and mapping required to be used in this document. There are limitations to the NJDEP data and the mapping. Throughout the WMP process the county has recommended that property owners field-verify this data. All metadata can be found on the NJDEP GIS Bureau of Geographic Information Systems website, <http://www.state.nj.us/dep/gis/>.

A listing of all data sets used in the development of the county WMP can be found in Appendix M.

Environmental Features

Surface Waters and Classifications

Map 5A shows the surface waters as mapped by NJDEP.

Riparian Zones

The riparian zones were determined through an analysis of NJDEP data in accordance with the regulations. It is not intended to be used for regulatory purposes and is only intended to serve as a representation of the approximate riparian zone buffers.

Map 5A shows riparian zones or buffers. Pursuant to N.J.A.C. 7:15, Riparian zones are: 300 feet for Category One waters; 150 feet for waters designated as Trout Production, Trout Maintenance, waters flowing through acid-producing soils and water flowing through documented habitat for a threatened or endangered species of plant or animal; and; 50 feet for all other waters. Tributaries of each category above are included as described in N.J.A.C. 7:15-5.25 (g) et seq.

Surface waters designated as Category One are listed in the Surface Water Quality Standards at N.J.A.C. 7:9B. The Department's "Surface Water Quality Standards" GIS data layer was utilized to determine these waters.

Compliance with the riparian zone standards have been demonstrated by the adoption of Ordinances for Riparian Zone Protection by municipalities shown in Appendix J, which have been updated to be in compliance with the Flood Hazard Control Act Rules (N.J.A.C. 7:13) and Water Quality Management Rules (N.J.A.C. 7:15).

Freshwater Wetlands

Freshwater wetlands as mapped by the NJDEP based on 2002 LULC are shown on Map 5A. Freshwater Wetlands are regulated under the Freshwater Wetlands Protection Act Rules, which place stringent limits on development within these areas. The largest wetland complex is located in the southern portion of Mercer County along the Delaware River and Crosswicks Creek. This area is known as the Trenton-Hamilton-Bordentown Marsh and contains the precious archaeological resource known as the Abbott Farm National Historic Landmark. The Marsh is the subject of environmental and archaeological scholarly research and is the home to species unique to the Marsh. This area spans two counties and two municipalities in Mercer County and is adjacent to one of the densest populations in the county. Almost all of the open land within the Marsh is publicly owned and preserved. There are roughly 23,590 acres of wetlands representing more than 16% of the land in Mercer County as per NJDEP Freshwater Wetlands mapping data.

Suitable Habitat for Threatened and Endangered Species

For purposes of this WMP, areas identified by the NJDEP as being suitable habitat for threatened and endangered species are shown on Map 5B. This area includes Landscape

Project Areas (Ranks 3, 4 and 5) through the Landscape Project Version V.2.1 (Statewide), as described below. Four of the five available habitat types were used – forests, forested wetlands, emergent wetlands and grasslands. The coastal beaches and dunes habitat type is not applicable to the County.

Within Mercer County, Bald Eagle, Wood Turtle, and Barred Owl habitat are noted.

Approximately 30,500 acres or 21% of the land in Mercer County falls within NJDEP’s Landscape Project Areas Rank 3, 4, or 5 coverage.

Natural Heritage Priority Sites

Natural Heritage Priority Sites coverage identifies rare plant species and rare ecological communities. Map 5B shows the Natural Heritage Priority Sites mapped by NJDEP. There are approximately 2,400 acres or almost 2% of the land in Mercer County are designated as Natural Heritage Priority Sites.

Other Features

Mercer County Open Space

Open Space generally refers to parks, recreation areas, wildlife management areas, farmland, and other properties known to the County to be restricted from development.

Individual municipal maps (Maps 2M and 3M) show areas currently protected from development as preserved lands. Generally, preserved lands were not evaluated under build-out, unless planning level information was specifically provided to the County. These areas are not expected to generate significant amounts of additional wastewater. However, the County did consider the need for facilities to the serve public visitors to these areas where applicable.

Mapping of Environmentally Sensitive Areas

Mapping of Environmentally Sensitive Areas (ESAs) is shown on Maps 5A and 5B.

Map 5A shows Hydrologic Features in Mercer County including:

- Freshwater Wetlands
- Hydrology
- C-1 waters
- Wild and Scenic Rivers
- Riparian Buffers
- Municipal Boundaries

Map 5B shows Environmental Features in Mercer County including:

- Landscape Project Data (v 2.1)
- Natural Heritage Priority Sites
- Steep Slopes
- Hydrology
- Municipal Boundaries

This data was taken largely from datasets available through the NJDEP's Bureau of Geographic Information Systems (<http://www.state.nj.us/dep/gis/download.htm>).

Mapping of Other Features

Mapping of Mercer County Open Space is shown on Maps 2M and 3M in the municipal chapters. The areas are shown as a single composite layer and preserved farmland is not distinguished from preserved open space lands.

IV. Delineation of Service Areas and Planning Integration

This chapter provides the methodology used to delineate SSAs based on gathered data, mapping of environmentally sensitive areas, and consistency with other regional plans.

Sewer Service Area Delineation

The SSA designation is for areas from which wastewater is designated to flow to a permitted wastewater treatment facility.

In assigning the SSA designations shown, several data sources were considered:

- Cross-Acceptance proceedings (2004)
- NJDEP's adopted SSA map for Mercer County (2006)
- NJDEP's draft SSA map for Mercer County (2008) including revised editions based on public comments received from December 2008 through March 2011; editions of the original 2008 map were reviewed periodically during this period once in June 2009, once in February 2010, and once in November 2010 prior to the NJDEP Public Meeting in December 2010.
- Data (such as collection system extent) obtained from municipalities or private entities.
- Existing TWA permits
- Sewer service areas provided by existing sewerage authorities and wastewater treatment facilities

Parcels that were within previous draft or adopted sewer service areas, or existing sewer service areas provided by sewerage authorities or wastewater facilities, were given the SSA designation, unless specific guidance was provided to remove them. In early 2010, the NJDEP issued Administrative Consent Order 2010-03. Subsequent to adoption of the ACO, all mapping followed the protocol established in the ACO.

Proximity to existing collection system was considered if service for a given parcel was indeterminate based on other criteria.

Parcels with valid NJDEP Treatment Works Approvals (TWA) were automatically given an SSA designation.

GSA (General Service Area)

The GSA designation represents those areas served by septic systems. For the purpose of mapping, the GSA designation also represents those areas that are not designated as any of the other categories (SSA or Open/Utility as described below).

Open & Utility (Open Space, Open with Facilities, Utility)

The Open & Utility designation identifies the following:

- Open Space – Mercer County Planning Division maintains an open space layer. The county boundary is the layer’s geographic extent. The open space layer is developed from several sources including a county-owned land inventory, Green Acres ROSI, preserved farmland inventory, municipal open space inventories, and state and non-profit open space inventories. The open space layer served as the basis for identifying undevelopable land designated through the Plan as Municipal, County, or State Land, Deed Restricted properties, Conservation Easements, and certain lands overseen by non-profit entities.
- Open with Facilities - This category was created in response to comments received from municipalities to include recreational lands in the Future SSA. These open space properties currently have support facilities or may have them in the future. This category gives municipalities flexibility in planning for essential facilities that support existing and future recreational programming at the local level.
- Utility - tax assessment data was used to identify lands owned by public utilities.

This designation indicates that these parcels are undevelopable, except for instances where public programs require the construction of public facilities.

Environmentally Sensitive Areas

The Environmentally Sensitive Areas (ESAs) designation applies to those areas that have been mapped as such by NJDEP. They consist of the following:

- Wetlands – areas based on NJDEP’s Land Use/Land Cover feature class (2002)
- Stream corridors – areas which incorporate the appropriate buffer along surface waters based on NJDEP’s stream classification (2008)
- Natural Heritage Priority Sites – areas of critical importance due to the presence of rare plant species and ecological communities (2007)
- Landscape Project Areas (Rank 3, 4, and 5) – areas representing wildlife habitat mapping for community planning and endangered species conservation. Rank 3 is associated with NJ State threatened species. Rank 4 is associated with NJ State endangered species. Rank 5 is associated with Federal threatened or endangered species (2007)

Methodology

The following methodology was employed to designate all parcels within Mercer County as either SSA or GSA, except for parcels designated as Open/Open with Facilities/Utility as described above. The following is the general methodology used for preparing the Draft SSA Map.

1. Parcels were evaluated to determine if:
 - a. It was designated under the Mercer County’s open space inventory.

b. It was owned by a public utility.

Any parcels falling within the above categories were designated as Open/Utility.

2. The remaining parcels were evaluated to determine if they were part of previous approved SSA. If so, these parcels were designated SSA, unless directed otherwise by NJDEP, Mercer County, or the Municipality.
3. The remaining parcels not designated as previously part of an SSA were also evaluated to determine if any existing wastewater generating structures were present onsite using Mercer County's building footprint (January 2009) layer and aerial photography (2007). County staff further reviewed these parcels with more current aerial photography (2009). COAH and local approvals were also considered in this evaluation. If sewage generating potential was identified, the parcel was further evaluated to determine if it was readily sewerable by an existing collection system without extending it. If this was the case, the parcel was designated as SSA unless:
 - a. A significant portion of the parcel is undeveloped and falls within the constrained boundary AND
 - b. Comments were received from NJDEP indicating the constrained portion of the parcel was to be excluded from the SSA.

In cases where a) and b) above apply, the parcel was split along the Constrained boundary. In this case, the portion of the parcel within the Constrained boundary was designated GSA and the remaining unconstrained portion was designated SSA.

4. For parcels not addressed under 1, 2, or 3 above, any vacant lands were evaluated to determine if it was readily sewerable by an existing collection system without extending it. If this was the case, the parcel was designated as SSA unless:
 - a. Comments were received from NJDEP, Mercer County, or the Municipality indicating the subject parcel should be excluded from SSA category. If such was the case, the parcel was designated GSA.
 - b. The parcel was constrained in whole or in part by Environmentally Sensitive Areas (ESA). If this was the case, the portion of the parcel within the constrained boundary was designated as GSA and the remaining unconstrained portion was designated as SSA.
5. Parcels that were not designated under 1, 2, 3, or 4 above were designated as GSA.

Planning Integration

Delaware River Basin Commission

The Delaware River Basin Commission (DRBC) regulates the discharge of pollutants into, and the withdrawal of water from, the Delaware River Basin; therefore, wastewater and water supply decisions affecting the Delaware River Basin must be coordinated with the Commission. The Delaware River Basin covers nearly half of Mercer County. It does not cover any areas in Hopewell Borough, Princeton Borough, Princeton Township, East Windsor Township, or Hightstown Borough.

The following shows the Delaware River Basin Boundary within Mercer County.



Figure 1 - Delaware River Basin Boundary

A comment and confer letter was sent to the DRBC offering them the ability to comment on our plan. To date, Mercer County has not been contacted by them. [need to do this] Once the Plan goes to Public Notice then, they along with other potentially affected entities will have the ability to provide input, if they choose not to do so sooner.

V. Future County Wastewater Demand and Facilities

This chapter describes the build-out methodology used to project future wastewater treatment demand for future SSAs and GSAs within the WMP for Mercer County.

There are two methods used for projecting future wastewater management needs: a 20-year projection for urban municipalities and a build out based on existing zoning for non-urban municipalities described below.

Future Wastewater Generation in Sewer Service Areas

Wastewater Projections in Urban Municipalities

The Water Quality Management Planning rules define urban municipalities as those municipalities where 90 percent or more of the total land is considered urban. Mercer County performed further analysis on municipalities within the County performing technical corrections to the urban land classification. This approach consisting of the following:

- Removed all lands classified as water from the calculations.

Table 5 - Urban Municipalities

Pennington Borough	Princeton Borough
City of Trenton	Hightstown Borough

Future wastewater flows for the listed urban municipalities were calculated based on 20-year growth projections. Table 6 below shows the 20 year wastewater flow projections and method used for each urban municipality.

Table 6 - 20 Year Wastewater Flow Projections for Urban Municipalities

Urban Municipality	20-year Projected Incremental Residential Flow (gpd)	20-year Projected Incremental Non-Residential Flow (gpd)	Total Projected Incremental Flow (gpd)
Pennington Borough	0.020	0.000	0.020
Princeton Borough	0.005	0.000	0.005
City of Trenton	0.186	0.000	0.186
Hightstown Borough	0.000	0.000	0.000

Wastewater Generation Projections in Non-urban Municipalities

In the remaining municipalities it is anticipated that undeveloped and underdeveloped land will be the predominant factor in determining future wastewater treatment needs.

In designated SSAs the environmentally sensitive areas were delineated as discussed in Section III and Section IV. These environmentally sensitive areas were removed from land area evaluated under build-out for the SSAs. The existing zoning was then applied to the remaining developable land area within the SSA to project a build-out condition for use in estimating the future wastewater generation for each SSA. The build-out data was 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.

For example, single-family residential development was assumed to consist of houses having three or more bedrooms per house, and each projected new house was multiplied by 300 gallons per day to predict the future wastewater generated. For non-residential land uses the anticipated floor area was multiplied by 0.1 gallon per day to predict future wastewater generation. The projected wastewater data is shown by wastewater treatment plant in Table 7 in the following section for comparison to the existing permitted capacity of each facility. Build-out results are also found in Table 2a located in each individual municipal chapter.

The County used CommunityViz, a land use planning software package offered through Placeways, LLC. CommunityViz is an extension for ESRI's ArcGIS platform that uses existing zoning information to estimate future development. CommunityViz uses zoning data such as minimum lot size and set back requirements to evaluate potential number of future residential units or square feet of commercial space on individual parcels or within the municipality.

The County has identified a category of service indicated as "open with facilities". This category was created in response to a number of comments received from municipalities to include recreational lands, many purchased through public funding, in the Future SSA. The requests pertain to open space properties that currently have support facilities or may have them in the future. The intent of this service type category is to account for up to 2,000 gpd of wastewater generation from these parcels, while recognizing they will continue to function as municipal open space and recreational facilities. The estimated flow has been included in the capacity analysis for the facility serving the closest sewer service area. This category gives municipalities flexibility in planning for essential facilities that support existing and future recreational programming at the local level.

Septic System Development within Sewer Service Areas

Septic systems, or individual subsurface sewage disposal systems (ISSDS), for individual residences can only be constructed within depicted SSAs if legally enforceable guarantees are provided to ensure that the use of such systems will be discontinued when the depicted sewer service becomes available. This applies to ISSDS that require certification from the NJDEP

under the Realty Improvement Sewerage and Facilities Act (N.J.S.A. 58:11-23) or individual Treatment Works Approval or New Jersey Pollutant Discharge Elimination System Permits (under N.J.A.C. 7:14A). It also applies to ISSDS which require only local approvals if the WMP acknowledges adequate arrangements for enforcement of the requirement (such as through a municipal or sewerage authority ordinance).

For purposes of this WMP, all septic systems within an SSA are assumed to eventually be connected to its appropriate facility. Future flows attributed to these existing septic systems are accounted for in each municipal chapter, as well as the appropriate Facility Table found in Appendix D. Flow at each facility has been reserved for these existing septic systems and can be found in Table 2a in each municipal chapter.

Future Wastewater Generation in General Service Areas

Wastewater Generation Projections in Urban Municipalities

For the purpose of this WMP, general service areas have not been evaluated for urban municipalities.

Wastewater Generation Projections in Non-urban Municipalities

In designated GSAs, wetlands, riparian buffers, and steep slopes greater than 20%, as discussed in Section III and Section IV, were removed from land area evaluated under build-out for the GSAs. The existing zoning was then applied to the remaining developable land area within the GSA to project a build-out condition for use in estimating the future wastewater demand for each GSA. The build-out data was then converted to a projected future wastewater flow by applying the planning flow criteria from N.J.A.C. 7:9A-7.4 based on the type of development projected.

For example, single-family residential development was assumed to consist of houses having three or more bedrooms per house, and each projected new house was multiplied by 350 gallons per day to predict the future wastewater generated. For non-residential land uses the anticipated floor area was multiplied by 0.125 gallon per day per square foot to predict future wastewater generation. The projected wastewater data, expressed as equivalent dwelling units, is shown by HUC14 on Table 3 of the applicable municipal chapter.

Nitrate Dilution Analysis

In areas that are not designated as SSAs, the default wastewater management alternative to support development is a GSA, and is defined as discharge to groundwater less than 2,000 gallons per day. The nitrate dilution analysis for septic systems was performed for GSAs county-wide in similar fashion to that conducted for SSAs. While certain areas may be unbuildable, such as riparian zones or steep slopes, they still contribute to the overall available dilution of nitrate in groundwater. So, these areas were used when analyzing 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 2 ppm nitrate target. Thus while some areas may contribute less

overall groundwater recharge, due to factors such as soils or topography, these limitations have already been taken into consideration when calculating the maximum average density allowable.

This analysis used NJDEP's nitrate (NO_3^-) target of 2 mg/L, with the assumption that all ammonium and other nitrogen compounds are converted to nitrate within the property, and that the nitrate concentrations dilute evenly across the HUC11. These assumptions are implicit in the nitrate dilution model developed by NJDEP.

VI. Wastewater Capacity Analysis

The next step in the wastewater management planning process is to assess whether there is sufficient wastewater treatment capacity to meet the needs of the County based on the projections described above. For SSAs this requires the aggregation of municipal wastewater generation projections by sewage treatment plant to the existing permitted capacity of each facility. In GSAs, the default wastewater management alternative is discharge to groundwater less than 2,000 gallons per day, commonly referred to as septic systems. The assessment of water quality impacts from development on septic systems relies on nitrate concentration as determined by the nitrate dilution analysis.

Sewer Service Area Wastewater Capacity Analysis

For the Sewer Service Areas, this analysis required the aggregation of municipal wastewater projections by sewage treatment plant and a comparison of the projected future demand to the existing permitted capacity of the sewage treatment plant. This was done by delineating SSA and determining build-out in each SSA as described in the previous sections of this WMP.

Existing SSAs served by these wastewater facilities are shown on a county-wide basis on Map 2 and on a municipal basis on Map 2M found in each individual municipal chapter. Future SSAs proposed for each wastewater facility are shown on a county-wide basis on Map 3 and on a municipal basis on Map 3M found in each individual municipal chapter.

Table 7 – Sewer Service Area Evaluation by Facility and Municipality is a summary of committed, anticipated future flows, and permitted or allocated wastewater flows by sewage treatment facility, with a subsequent breakdown by municipality. Additional details are included within the municipal chapters that are presented in Volume II and in the facility tables located in Appendix D.

Table 7 - Sewer Service Area Evaluation by Facility and Municipality

Facility	NJPDES Permit	Facility Type (DSW/DGW)	Municipality	Committed Flow (mgd)	Build-out or 20-year Projected Flow (mgd)	Permitted/Allocated Flow (mgd)
Trenton Sewer Utility	NJ0020923	DSW	Facility Totals	10.860	11.046	20.000
			City of Trenton	10.860	11.046	N/A
ELSA	NJ0024759	DSW	Facility Totals	11.079	16.380	16.000
			Township of Ewing	6.557	10.221	N/A
			Lawrence Township	4.517	5.279	N/A
			Hopewell Township	0.340	0.880	0.887
SBRSA – River Road STP	NJ0031119	DSW	Facility Totals	9.868	12.026	13.060
			West Windsor Township	2.818	4.401	FCFS
			Princeton Township	1.792	2.362	FCFS
			Princeton Borough	1.468	1.473	FCFS
SBRSA – Pennington STP	NJ0035319	DSW	Facility Totals	0.295	0.327	0.030
			Pennington Borough	0.239	0.258	FCFS
			Hopewell Township (2)	0.056	0.0684	FCFS/Mbr
SBRSA – Hopewell STP	NJ 0035301	DSW	Facility Totals	0.213	0.023	0.300
			Hopewell Township (2)	XX	XX	FCFS/Mbr
			Hopewell Borough	0.213	0.234	FCFS
Hamilton Township WPCF	NJ0026301	DSW	Facility Totals	11.409	13.898	16.000
			Hamilton Township	9.950	11.231	No limit
			West Windsor Township	0.089	0.167	No limit
			Robbinsville Township	1.236	2.500	2.500
Hightstown AWWTP	NJ0029475	DSW	Facility Totals	0.769	0.769	1.000
			Hightstown Borough	0.769	0.769	0.769

Discussion of Sewer Service Area Wastewater Capacity Analysis

Sewer Service Area Evaluation

Table 8 shows the following facilities have a calculated deficiency in wastewater treatment capacity based on build-out estimates and their NJDPES permit flow value. All facilities listed are publically owned treatment works (POTWs).

Table 8 - Facilities and Municipalities Subject to Further Review

Facility	NJPDES Permit	Existing Permitted Flow/ Allocation (mgd)	Build-out Projection (mgd)	Calculated Difference (mgd)

Comments on Facilities here.

General Service Area Evaluation

Using a nitrate dilution analysis, Total Systems Allowed (Nitrate Dilution) was calculated for each HUC 11 and municipality with a target of 2 ppm nitrate concentration and based on the overall dilution available in the watershed. Only non-hydric soil types were considered in this analysis.

For comparison purposes, Total Systems Allowed (Zoning) was also calculated for these same areas. It is based on the potential wastewater flow in the GSAs expressed as the number of equivalent 3 bedroom single family homes generating 300 gpd each.

Table 11 compares the allowable units within each HUC 11 on a municipal basis and a HUC basis to the number of units that could be built under the existing zoning within that watershed. The zoning within the GSA for discharges to ground water equal to or less than 2,000 gallons per day (i.e., septic systems or individual subsurface sewage disposal systems, ISSDS) for the municipality was compared to the allowable densities as determined through nitrate dilution analysis. For the purposes of this analysis it is inconsequential if one municipality's zoning exceeds its allocation provided that the HUC 11 does not exceed the total sustainable development. Where a municipal chapter does not exist, the WMP for Mercer County removes that municipality's land area from the analysis. NJDEP will use its regulatory authority under NJAC 7:15 and other laws to ensure compliance with the 2 ppm nitrate dilution standard, whichever is more stringent, for any development regulated by NJDEP. Developments in such municipalities that do not require any NJDEP approval will not be affected.

Existing GSAs are shown on a county-wide basis on Map 2 and on a municipal basis on Map 2M found in each individual municipal chapter. Future GSAs are shown on a county-wide basis on Map 3 and on a municipal basis on Map 3M found in each individual municipal chapter. The delineation of GSAs include any area that are not specified as a SSA.

Discussion of General Service Area Results

Table 10 shows the HUC11s that have a calculated deficiency in nitrate dilution capacity versus municipal zoning.

Table 10 - HUC11s Subject to Further Review

HUC11	Calculated Deficit

Compliance with Environmental Protection Standards

One important purpose of the WMP is to help ensure that proposed wastewater service areas are properly located to minimize primary and secondary environmental impacts. The WQMP rules require that development densities and aggregated demands or impacts remain within thresholds. Where the thresholds are exceeded, either the size or development density of a SSA or the development density of a GSA must be reduced, or the impact must be mitigated. This plan has demonstrated compliance with these capacity constraints.

However, there are other environmental considerations regarding pollutant loadings, water supply and other factors. In some cases (e.g., riparian zones and steep slopes) the WQMP rules require that municipal ordinance ensure protection of these areas regardless of their wastewater service area. Further, the WQMP rules establish that development within these areas is inconsistent with the Statewide Water Quality management plans and the Department cannot issue any permits or approvals for development of these areas.

Environmental Protection Ordinances

Table 11 addresses the status of requirements for municipal ordinances regarding the protection of steep slopes, riparian zones and the maintenance of septic systems as addressed in the municipal chapters, with applicable ordinances provided in Appendices H through K.

Appendices

Appendix D – Wastewater Facility Tables

The wastewater facility tables for all sanitary and/or process wastewater discharge to surface water facilities and those sanitary and/or process wastewater discharge to groundwater facilities discharging greater than 2000 gallons per day (i.e., requiring NJPDES permits) are listed below, based on whether they are domestic or industrial wastewater treatment facilities, and whether they have service areas that affect more than one municipality.

Domestic Wastewater Facilities with SSAs in Multiple Municipalities – These facilities are listed in **Tables D-1 through D-10.**

Domestic Wastewater Facilities With SSA in One Municipality – These facilities are listed in **Tables D-11 through D-20.**

On-Site Domestic Treatment Facilities– These facilities are listed in Tables **insert ##s here.**

Industrial Wastewater Facilities – These facilities are listed in Tables **insert ##s here.**

**Infiltration/Inflow (I/I): Existing I/I should be identified. However, additional future I/I may not be projected. (The NJPDES Treatment Works Approval regulations make numerical allowances for I/I). The existing I/I can be carried-over and accounted for in the total future wastewater flow.*

** If some municipal projections are based on Build-out and others on 20-Year Projections specify which is used for each municipality.*

Glossary and Definitions

- 20-year projected flows – are the projected wastewater flows in an urban municipality based on the 20-year estimated population growth or the maximum additional residential units expected in the municipality, whatever is larger. This is the maximum flow that the sewer service area is expected to produce without expanding in size.
- Actual flow – is the volume of sewage and other wastes currently being conveyed to and treated by a centralized treatment facility in a given amount of time.
- Aggregate - is a collection of information or values that are combined together to form a total quantity.
- Allocated flow – is the agreed upon wastewater flow between two parties, typically between a treatment facility and a municipality. The allocated flow is only a portion of the overall permitted flow for the centralized wastewater treatment facility.
- Available land – includes both undeveloped and underdeveloped parcels as defined below.
- Build-out – is the estimated fully developed condition when all undeveloped and underdeveloped lots have been developed to their full potential based on existing zoning.
- Build-out flows – are the projected wastewater flows based on the sewer service area being fully developed or in build-out conditions. This is the maximum flow that a sewer service area is expected to produce without expanding in size.
- Category one waters - are defined as waters protected from any measurable changes in water quality because of their exceptional ecological significance, exceptional recreational significance, exceptional water supply significance, or exceptional fisheries resources as defined in the existing Surface Water Quality Standards rules at N.J.A.C. 7:9B-1.4.
- Centralized sewer service – is also know as a sewer service area or SSA and represents the area to be served by a centralized wastewater treatment facility.
- Combined sewer system – is a sewer system that is designed to carry sanitary sewage at all times and that also is designed to collect and transport stormwater from streets and other sources, thus serving a combined purpose.
- Committed flow – is the sum of the actual flow plus the sum of all flows which are anticipated from connections which have been approved but are not yet in operation.
- Contiguous – is a continuous mass, or a series of things in contact or proximity with each other.
- Constraint – is a limitation or restriction.

- Development – is the division of a parcel of land into two or more parcels, the construction, reconstruction, conversion, structural alteration, relocation or enlargement of any building or other structure, or of any mining, landfill, excavation, roads, sewers and other infrastructure and any use or change in the use of any building or other structure, or land or extension of use of land.
- DGW – Discharge to Groundwater
- DMR – Discharge Monitoring Report
- DSW – Discharge to Surface Water
- EDUs – Equivalent Dwelling Units - a measure where one unit is equivalent to wastewater effluent from one dwelling unit. NJDEP defines a dwelling unit to mean any building or portion of a building, permanent or temporary, used or proposed to be used as a residence either seasonally or throughout the year. Most often, EDU is used in reference to a single family home.
- Facility table – is a table summarizing all wastewater flows for of a centralized wastewater treatment facility and its associated sewer service area. This table includes the aggregation of all municipal flows segregated by each treatment facility.
- Future SSA –
- gpd – gallons per day, a unit of flow measurement.
- GSA – General Service Area – represents the area to be served by residential septic systems. NJDEP refers to septic systems as discharges to groundwater with a design capacity of less than 2,000 gallons per day.
- GW – groundwater
- HUC11 - Hydrologic Unit Code consisting of 11 digits – a United States Geological Survey (USGS) standard designation for subwatersheds delineated based on topography.
- HUC14 – Hydrologic Unit Code consisting of 14 digits – a USGS standard designation for subwatersheds delineated based on topography.
- Individual Subsurface Disposal System (ISSDS) – means a system for the disposal of sanitary sewage into the ground, which is designed and constructed to treat sanitary sewage in a manner that will retain most of the settleable solids in a septic tank and discharge the liquid effluent to a disposal field
- mgd – million gallons per day, a unit of flow measurement.

- Natural Heritage Priority Sites Coverage – was created to identify critically important areas to conserve New Jersey's biological diversity, with particular emphasis on rare plant species and ecological communities.
- NDM - Nitrate Dilution Model –The NDM is required by NJDEP and follows the calculations methodology developed by the New Jersey Geological Service. The NDM uses the soils type to estimate the minimum lot size needed to provide enough recharge to dilute nitrate to a specified target. This method is intended to be a guide for estimating the impact of nitrate from septic tanks on groundwater quality. The NDM uses the minimum lot size to calculate the number of EDUs possible for a given area.
- NJAC – New Jersey Administrative Code
- NJGS - New Jersey Geological Service
- NJDEP – New Jersey Department of Environmental Protection
- NJPDES – New Jersey Discharge Elimination System
- Non-discharge areas - areas where additional wastewater generation and/or discharge are prohibited.
- Non-Urban Municipality - any municipality that is not classified as urban. Build-out has been generated for these municipalities.
- Permitted flow – is the maximum allowable flow for a specific treatment works as stated in the facility's NJPDES permit or TWA, whichever is less.
- PPM – Parts per Million
- POTW – Publically Owned Treatment Works
- Riparian zone – is the land and vegetation within and directly adjacent to all surface waters including, but not limited to, lakes, ponds, reservoirs, perennial and intermittent streams.
- RMP – Regional Master Plan
- SSA – Sewer Service Area – represents the area to be served by a centralized treatment facility.
- STP – Sewage Treatment Plant; see also WPCF, WPCP, and WWTP.
- SW – surface water

- Threatened and Endangered Species Habitat – areas depict by NJDEP’s Landscape Project Area Maps v 2.1 & v 3.0 Rank 3, 4, 5 delineating areas used by or necessary for endangered and threatened species and other priority wildlife to sustain themselves successfully.
- Treatment Works Approval (TWA) – means an approval issued pursuant to N.J.S.A. 58:10A-6b and N.J.A.C. 7:14A.
- Undeveloped parcels - are those parcels where no development exists and the land has not been restricted from development through dedicated open space or agricultural preservation programs.
- Underdeveloped parcels – are those parcels where some level of development exists, but at a density less than allowed by zoning and where deed restrictions do not prevent further development.
- Urban Municipality – those municipalities where 90 percent of the developable land area appears as “Urban Lands” as designated in the New Jersey Department of Environmental Protection’s 1995/97 and 2002 Land Use/Land Cover geographical information systems database as amended and updated, available as a digital data download from the Department at www.state.nj.us/dep/gis , based on Level I of the Anderson Classification System (Anderson et al, 1976, modified by the New Jersey Department of Environmental Protection, 1999).
- Vacant Land – is a parcel of land without any building, structure or improvement, including impervious surfaces, but does not include recreation, green or open space created during development.
- Wastewater deficit – is when the projected build-out flow for a SSA or GSA would produce more wastewater than allowed by the allocation or nitrate dilution model.
- Wastewater Service Area - A sewer service area or a general service area approved for wastewater facilities with planning flows of less than 20,000 gallons per day (gpd) which discharge to groundwater and general service area for wastewater facilities with planning flows of less than 2,000 gallons per day (gpd) which discharge to groundwater.
- Wastewater surplus – is when the allocation or nitrate dilution model flow is greater than the projected build-out flows allowing the SSA or GSA to fully develop with excess capacity.
- WQMP – Wastewater Quality Management Plan
- WMP – Wastewater Management Plan
- WPCF – Water Pollution Control Facility

- WPCP – Water Pollution Control Plant
- WWTP or WTP – Wastewater Treatment Pla

