Municipal Stormwater Management Plan

for the

City Master Plan

in the City of Rahway, Union County, New Jersey

Prepared by:

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Introduction

This Municipal Stormwater Management Plan (MSWMP) documents the strategy for the City of Rahway ("the City") to address stormwater-related impacts. The creation of this plan is required by N.J.A.C. 7:14A-25 Municipal Stormwater Regulations. This plan contains all of the required elements described in N.J.A.C. 7:8 Stormwater Management Rules. The plan addresses groundwater recharge, stormwater quantity, and stormwater quality impacts by incorporating stormwater design and performance standards for new major development, defined as projects that disturb one or more acre of land. These standards are intended to minimize the adverse impact of stormwater runoff on water quality and water quantity and the loss of groundwater recharge that provides baseflow in receiving water bodies. The plan describes long-term operation and maintenance measures for existing and future stormwater facilities.

The plan also addresses the review and update of existing ordinances, the City Master Plan, and other planning documents to allow for project designs that include low impact development techniques. The final component of this plan is a mitigation strategy for when a variance or exemption of the design and performance standards is sought. As part of the mitigation section of the stormwater plan, specific stormwater management measures are identified to lessen the impact of existing development.

Goals

The goals of this MSWMP are to:

- reduce flood damage, including damage to life and property;
- minimize, to the extent practical, any increase in stormwater runoff from any new development;
- reduce soil erosion from any development or construction project;
- assure the adequacy of existing and proposed culverts and bridges, and other in-stream structures;
- maintain groundwater recharge;
- prevent, to the greatest extent feasible, an increase in non-point pollution;
- maintain the integrity of stream channels for their biological functions, as well as for drainage;
- minimize pollutants in stormwater runoff from new and existing development to restore, enhance, and maintain the chemical, physical, and biological integrity of the waters of the state, to protect public health, to safeguard fish and aquatic life and scenic and ecological values, and to enhance the domestic, municipal, recreational, industrial, and other uses of water; and
- protect public safety through the proper design and operation of stormwater basins. To achieve these goals, this plan outlines specific stormwater design and performance standards for new development. Additionally, the plan proposes stormwater management controls to address impacts from existing development. Preventative and corrective maintenance strategies are included in the plan to ensure long-term effectiveness of stormwater management facilities. The plan also outlines safety standards for stormwater infrastructure to be implemented to protect public safety

Stormwater Discussion:

Land development can dramatically alter the hydrologic cycle (See Figure C-1) of a site and, ultimately, an entire watershed. Prior to development, native vegetation can either directly intercept precipitation or draw that portion that has infiltrated into the ground and return it to the atmosphere through evapotranspiration. Development can remove this beneficial vegetation and replace it with lawn or impervious cover, reducing the site's evapotranspiration and infiltration rates. Clearing and grading a site can remove depressions that store rainfall. Construction activities may also compact the soil and diminish its infiltration ability, resulting in increased volumes and rates of stormwater runoff from the site. Impervious areas that are connected to each other through gutters, channels, and storm sewers can transport runoff more quickly than natural areas. This shortening of the transport or travel time quickens the rainfall-runoff response of the drainage area, causing flow in downstream waterways to peak faster and higher than natural conditions. These increases can create new and aggravate existing downstream flooding and erosion problems and increase the quantity of sediment in the channel. Filtration of runoff and removal of pollutants by surface and channel vegetation is eliminated by storm sewers that discharge runoff directly into a stream. Increases in impervious area can also decrease opportunities for infiltration which, in turn, reduces stream base flow and groundwater recharge. Reduced base flows and increased peak flows produce greater fluctuations between normal and storm flow rates, which can increase channel erosion. Reduced base flows can also negatively impact the hydrology of adjacent wetlands and the health of biological communities that depend on base flows. Finally, erosion and sedimentation can destroy habitat from which some species cannot adapt.

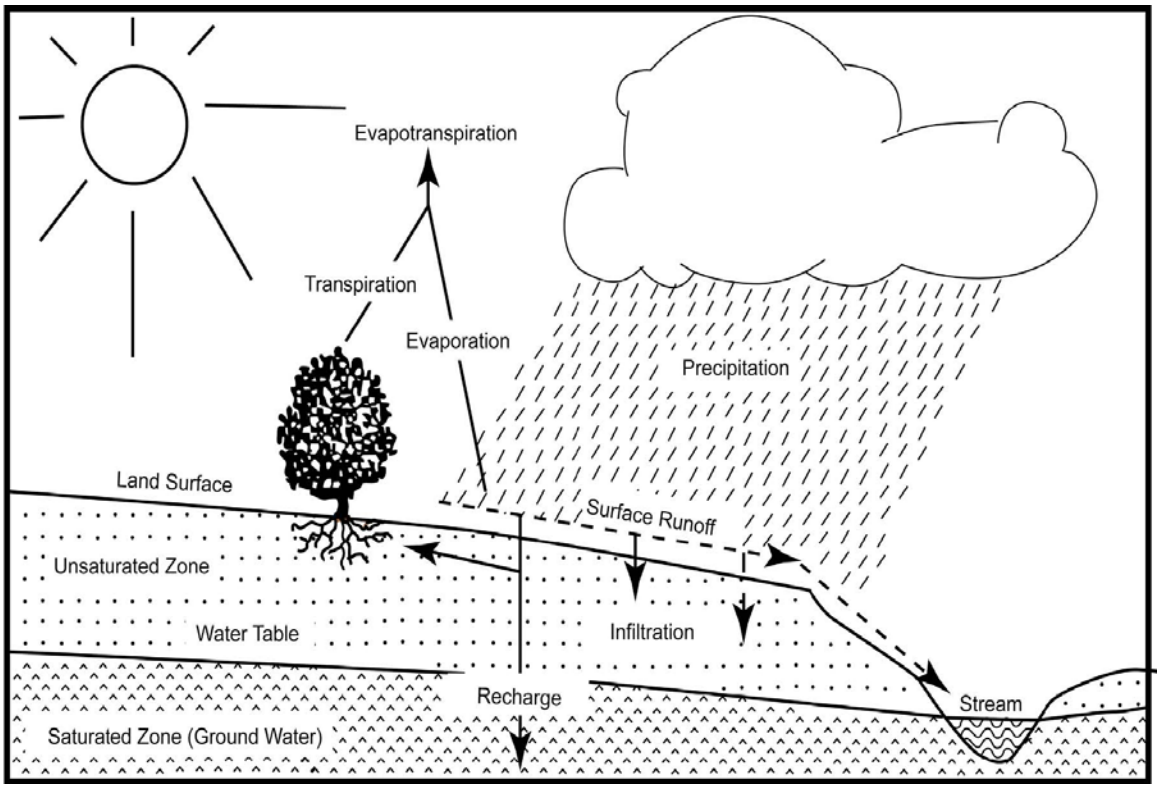

Figure C-1: Groundwater Recharge in the Hydrologic Cycle; Source: New Jersey Geological Survey Report GSR-32.

In addition to increases in runoff peaks, volumes, and loss of groundwater recharge, land development often results in the accumulation of pollutants on the land surface that runoff can mobilize and transport to streams. New impervious surfaces and cleared areas created by development can accumulate a variety of pollutants from the atmosphere, fertilizers, animal wastes, and leakage and wear from vehicles. Pollutants can include metals, suspended solids, hydrocarbons, pathogens, and nutrients.

In addition to increased pollutant loading, land development can adversely affect water quality and stream biota in more subtle ways. For example, stormwater falling on impervious surfaces or stored in detention or retention basins can become heated and raise the temperature of the downstream waterway, adversely affecting cold water fish species such as trout. Development can remove trees along stream banks that normally provide shading, stabilization, and leaf litter that falls into streams and becomes food for the aquatic community.

Background

The City encompasses a four (4) square mile area in Union County, New Jersey. The City is undergoing redevelopment in accordance with its Master Plan. The population of the City has increased from 25,325 in 1990, to 30,130 in 2017. This population increase has been accommodated primarily by projects of a redevelopment nature on previously developed sites. While stormwater runoff increases are not significant, the need for stormwater quality management, and groundwater recharge, where possible, is necessary to enhance the overall watershed quality. Figure C-2 illustrates the waterways in the City. Figure C-3 depicts the City boundary on the USGS quadrangle maps.

The New Jersey Department of Environmental Protection (NJDEP) has established an Ambient Biomonitoring Network (AMNET) to document the health of the state's waterways. There are over 800 AMNET sites throughout the state of New Jersey. These sites are sampled for benthic macroinvertebrates by NJDEP on a five-year cycle. Streams are classified as non-impaired, moderately impaired, or severely impaired based on the AMNET data. The data is used to generate a New Jersey Impairment Score (NJIS), which is based on a number of biometrics related to benthic macroinvertebrate community dynamics. The two major rivers that run through the City are the Rahway River and Robinsons Branch of the Rahway River. Based on AMNET Data, these rivers have been classified respectively as severely and moderately impaired. (See Figure C-5 for December 2012 Raritan Water Region Ambient Biomonitoring Network Study)

In addition to the AMNET data, the NJDEP and other regulatory agencies collect water quality chemical data on the streams in the state. These data show that the instream total fecal coliform concentrations of the Rahway River and Robinsons Branch frequently exceed the state's criteria. This means that these rivers are impaired waterways and the NJDEP is required to develop a Total Maximum Daily Load (TMDL) for these pollutants for each waterway. NJDEP has not yet developed a TMDL prior to the preparation of this Municipal Stormwater Management Plan (MSWMP). A TMDL for Fecal Coliform has been prepared for a portion of the Rahway River. (See Figure C-6 for applicable portion of the Total Maximum Daily Loads for Fecal Coliform to address 48 streams in the Raritan Water Region)

A TMDL is the amount of a pollutant that can be accepted by a waterbody without causing an exceedance of water quality standards or interfering with the ability to use a waterbody for one or more of its designated uses. The allowable load is allocated to the various sources of the pollutant, such as stormwater and wastewater discharges, which require an NJPDES permit to discharge, and nonpoint source, which includes stormwater runoff from agricultural areas and residential areas, along with a margin of safety. Provisions may also be made for future sources in the form of reserve capacity. An implementation plan is developed to identify how the various sources will be reduced to the designated allocations. Implementation strategies may include improved stormwater treatment plants, adoption of ordinances, reforestation of stream corridors, retrofitting stormwater systems, and other BMPs. The City is currently considering various goose management strategies to address the TMDL for Fecal Coliform.

The New Jersey Integrated Water Quality Monitoring and Assessment Report (305(b) and 303(d)) (Integrated List) is required by the Federal Clean Water Act to be prepared biennially and is a valuable source of water quality information. This combined report presents the extent to which New Jersey waters are attaining water quality standards, and identifies waters that are impaired. Sublist 5 of the Integrated List (Figure C-7) constitutes the list of waters impaired or threatened by pollutants, for which one or more TMDLs are needed. Based on this list, the Rahway River has a phosphorus, arsenic and TCE impairment, while the Robinson's Branch has a phosphorous and arsenic impairment. (See Figure C-7 for New Jersey 2004 Integrated Water Quality Monitoring and Assessment Report (305(b) and 303(d)).

As stated in N.J.A.C. 7:8-5.4 groundwater recharge will be required on sites which are classified as Major Development, defined as any development that disturbs one or more acres of land or increases impervious surfaces by one-quarter acre or more. The minimum design and performance standards for groundwater recharge shall comply with N.J.A.C. 7:8-5.4(a)2. If recharge is required, the calculation of groundwater recharge shall comply with N.J.A.C. 7:8-5.6 (b.) and in-situ soil testing shall be conducted to support these calculations.

A map entitled "NJGS Groundwater Recharge for New Jersey Project" within the City of Rahway is shown in Figure C-8A. In addition, a Groundwater Recharge map identifying the various soil types within the City, based on the Union County Soil Survey issued 2002, is enclosed in Figure C-8B. As stated in the New Jersey Stormwater Best Management Practice Manual, dated February 2004, Table 9.5-1: Minimum Design Permeability Rates for Infiltration Basins, for groundwater recharge, a minimum design permeability rate of 0.2 in/hr is required for subsurface basins and 0.5 in./hr for surface basins. The attached table indicates whether soils within the City have a permeability of greater than 0.2 in./hr

A map of the Well Head Protection Areas is shown in Figure C-9. No areas within the City of Rahway have been classified as well-head protected areas.

Portions of the City of Rahway are located within a flood plain as delineated in the Flood Insurance Rate Map (FIRM) by the Federal Emergency Management Agency (FEMA). The City regulates any development within the flood plain through the Flood Damage Prevention Ordinance (Chapter 213) and the Stormwater Runoff Ordinance (Chapter 361). The City also participates in FEMA's Community Rating System (CRS) to ultimately reduce the number of structures affected by flooding.

The SWMP has been prepared and the regulations will be adopted to ultimately reduce the quantity and improve the quality of stormwater runoff.

In the past, insignificant development has taken place within the City, however more recently, but primarily in the immediate future, property improvement will take place in the form of redevelopment projects. The MSWMP and subsequent NJDEP Regulation adoption by the City will provide the necessary control to reduce the quantity of stormwater runoff and increase the quality to improve the overall Rahway River eco-system.

Design and Performance Standards

The City has adopt the design and performance standards for stormwater management measures as presented in N.J.A.C. 7:8-5 to minimize the adverse impact of stormwater runoff on water quality and water quantity. The design and performance standards include the language for maintenance of stormwater management measures consistent with the stormwater management rules at N.J.A.C. 7:8-5.8 Maintenance Requirements, and language for safety standards consistent with N.J.A.C. 7:8-6 Safety Standards for Stormwater Management Basins. The ordinances have been submitted to Union County for review and approval within 12 months of adoption of the Stormwater Management Plan, or within 24 months of the effective date (April 1, 2004) of the Stormwater Management Rules.

During construction, City inspectors will observe the construction of the project to ensure that the stormwater management measures are constructed and function as designed.

Plan Consistency

The City is located within a Regional Stormwater Management Planning Area (Robinson's Branch Regional Stormwater Management Plan) (RBRSMP) and no TMDLs have been developed for waters within the City. The Robinson's Branch Regional Stormwater Management Plan is currently being generated. Upon completion of the RBRSMP, and if any TMDLs are developed in the future, this Municipal Stormwater Management Plan will be updated to be consistent.

The development of the Municipal Stormwater Management Plan will be consistent with the Residential Site Improvement Standards (RSIS) at N.J.A.C. 5:21. The City will utilize the most current update of the RSIS in the stormwater management review of residential development. This Municipal Stormwater Management Plan will be updated to be consistent with any future updates to the RSIS.

The City's Stormwater Management Ordinance requires all new development and redevelopment plans to comply with New Jersey's Soil Erosion and Sediment Control Standards. During construction, City inspectors will observe on-site soil erosion and sediment control measures and consult with the Somerset-Union Soil Conservation District.

Nonstructural Stormwater Management Strategies

The City has reviewed the master plan and ordinances, and has provided a list of the sections in the City land use and zoning ordinances that are to be modified to incorporate nonstructural stormwater management strategies. The City of Rahway currently has an ordinance relating to stormwater runoff (Chapter 361 in the Code of the City of Rahway). This ordinance has been amended through the adoption of a Stormwater Management Control Ordinance. This ordinance will adopt the design standards presented in N.J.A.C. 7:8-5 (Design and Performance Standards for Stormwater Management Measures). Once the ordinance text is completed, they will be submitted to the County review agency for review and approval within 12 months upon adoption of the SWMP or 24 months of the effective date (April 1, 2004) of the Stormwater Management Rules. A copy will be sent to the Department of Environmental Protection at the time of submission.

The Land Use Legislation of the Code of the City of Rahway was reviewed with regard to incorporating nonstructural stormwater management strategies. In addition, several changes were made to Chapter 349 Site Plan Review to incorporate these strategies.

Section 349 – 3.I.: General Standards – This section will be added to ensure that any residential development and residential re-development projects comply with the Residential Site Improvement Standards (RSIS) for Stormwater Management (N.J.A.C. 5:21-7).

Section 349 - 3.J.: General Standards – This section will be added to ensure compliance with the City's Stormwater Runoff Ordinance, or, upon completion, the new Stormwater Management Control Ordinance.

Section 349-5: Off-street Parking – **Provision for Proper Drainage and Maintenance** – This section will be amended to allow for flush curb with curb stop, or curbing with curb cuts, to encourage developers to allow for the discharge of impervious areas into landscaped areas for stormwater management. Also, language will be added to allow for use of natural vegetated swales for the water quality design storm, with overflow for larger storm events into storm sewers.

Section 349-7: Landscaping and Buffering – Landscaping and buffering is required to enhance the aesthetic and environmental appeal and character of buildings and sites being developed within the City. The landscape requirements for these buffer areas in the existing section do not recommend the use of native/urban tolerant vegetation. The language of this section will be amended to require the use of native vegetation, which requires less fertilization and watering than non-native species. Additionally, language will be included to allow buffer areas to be used for stormwater management by disconnecting impervious surfaces and treating runoff from these impervious surfaces.

Section 361-5.I: Design of Stormwater Detention Facilities – This ordinance requires developers to comply with the New Jersey Soil Erosion and Sediment Control Standards and outlines some general design principles. Detention and sediment and erosion control facilities shall be designed in conformance with the Standard for Soil Erosion & Sediment Control in New Jersey. This section will be amended upon adoption of the new Stormwater Management Control Ordinance.

Section 369-10.B: Curbs and Gutters – Curbs and gutters are required in all subdivisions, with specific details listed in RSIS. This section will be amended to allow for curb cuts or flush curbs with curb stops to allow vegetated swales to be used for stormwater conveyance and to promote the disconnection of impervious areas.

Section 421-34 R: Townhouses or Row Houses and Section 421-35 T. Low-rise Apartments – These sections describe sidewalk requirements for the City for townhouses or row houses and low-rise apartments. Sidewalks are to be a minimum of four feet wide and shall provide access to the municipal street serving the development, whether or not a sidewalk exists on that municipal street. Although sidewalks are not required along all streets, this section will be amended to include that the City can require them in areas where the probable volume of pedestrian traffic, the development's location in relation to other populated areas and high vehicular traffic, pedestrian access to bus stops, schools, parks, and other public places, and the general type of improvement intended indicate the advisability of providing a pedestrian way. Language will be added to this section to require developers to design sidewalks to discharge stormwater to neighboring lawns where feasible to disconnect these impervious surfaces, or use permeable paving materials where appropriate.

Section 421-72 Storage and Waste Disposal – This section provides pollution source control. It prohibits materials or wastes to be deposited upon a lot in such form or manner that they can be transferred off the lot, by natural causes or forces. It also requires that all materials and wastes that might create a pollutant or a hazard be enclosed in appropriate containers. No amendments to this section will be made at present.

Section 421-79: Nonconforming Uses, Structures or Lots requires a variance for existing single or two (2) family homes from the Board of Adjustment for expansion of an existing non-conforming use. If the additional impervious coverage falls under "major development" (as defined in NJDEP's Stormwater Regulations), the builder will be required to mitigate the impact of the additional impervious surfaces unless the stormwater management plan for the development provides for these increases in impervious surfaces. This mitigation effort must address water quality, and quantity which will be described in the City's new Stormwater Management Control Ordinance.

Several changes will be made to the Code of the City of Rahway. The City has four (4) types of residential districts. Each district has a maximum percent allowable impervious surface coverage, ranging from 50 percent for the R-1 District, which has a minimum lot size of 7,500 square feet for detached single-family homes, to 60 percent for the R-2, R-3 and R-4 Districts, which have a minimum lot size of 5,000 square feet for single-family detached homes. The City has 11 types of nonresidential districts. Each of these districts has a maximum allowable percent impervious surface coverage, ranging from 70 percent for the B-1 District to 100 percent for the B-5 District.

Although each zone has a maximum allowable percent impervious coverage, the Code of the City of Rahway will be amended to remind developers that satisfying the percent impervious requirements does not relieve them of responsibility for complying with the Design and Performance Standards for Stormwater Management Measures to be contained in the new Stormwater Management Control Ordinance. Also, if a developer is given a variance to exceed the maximum allowable percent imperviousness and the proposed project is classified as a "Major Development" as defined by the NJDEP Standards, the developer must mitigate the impact of the additional impervious surfaces. This mitigation effort must address water quality, and quantity as described in the new Stormwater Control Management Ordinance. A detailed description of how to develop a mitigation plan is included in this Municipal Stormwater Management Plan.

Land Use/Build-Out Analysis

As shown on the official Zoning Map of the City of Rahway (Figure C-6), the City currently has a combined total of less than one square mile of vacant land (0.14 square miles), mostly, if not all of which is active park land. A Land Use Map has also been attached indicating the highly urbanized nature of the City. The City is therefore not required to complete a build-out analysis.

Mitigation Plans

This mitigation plan is provided for a proposed development that is granted a variance or exemption from the stormwater management design and performance standards. Presented is a list of examples of mitigation projects. The available mitigation measures shall be established by the City and the available options can be amended as needed. Upon finalization of the Robinson's Branch Stormwater Management Plan, additional mitigation measures will be available.

Mitigation Project Criteria

1. The mitigation project must be implemented in the same drainage area as the proposed development. The project must provide protection from stormwater runoff quality and quantity from previously developed property that does not currently meet the design and performance standards outlined in the Municipal Stormwater Management Plan. The developer must ensure the long-term maintenance of the project, including the maintenance requirements under Chapters 8 and 9 of the NJDEP Stormwater BMP Manual.

   The applicant can select one of the following projects listed to compensate for the deficit from the performance standards resulting from the proposed project. More detailed information on the projects can be obtained from the City Engineer. Listed below are specific projects that can be used to address the mitigation requirement.

Groundwater Recharge

- The City of Rahway is located within the Metropolitan Planning Area (PA1) delineated in the New Jersey State Plan Policy Map. Any redevelopment within the Urban Redevelopment Area defined as previously developed portions of areas (N.J.A.C.7:8-1.2) located within the PA1 area does not require groundwater recharge. The New Jersey State Plan Policy Map is available from the New Jersey Department of Community Affairs website at www.nj.gov/dca/osg/resources/maps/index.shtml (Figure C-7).

Water Quality

- Retrofit an existing public parking lot's drainage system to provide for water quality in accordance with the NJDEP Standards. Due to site constraints, the retrofit BMP may be installed underground and cannot reduce the existing number of parking spaces.

- Retrofit the existing stormwater inlets to provide enhanced water quality.

Water Quantity

- Some properties located within the City's tidally influenced areas are exempt from compliance with the NJDEP Stormwater Runoff Quantity Standards as stated in 7:8-5.4(a)3.iv. Exemptions from these standards for development within this area will be reviewed on a case-by-case basis and exemption shall be determined by the City Engineer.

- Install stormwater management measures in existing municipally owned properties to reduce the peak flow from the upstream development on the receiving stream by 20 cfs, 35 cfs and 100 cfs for the 2-, 10-, 100-year storms respectively.

2. If a suitable site cannot be located in the same drainage area as the proposed development, as discussed in Option 1, the mitigation project may provide mitigation that is not equivalent to the impacts for which the variance or exemption is sought, but that addresses the same issue. For example, if a variance is given because the 80 percent TSS requirement is not met, the selected project may address water quality impacts due to a fecal impairment. Listed below are specific projects that can be used to address the mitigation option.

Water Quality

- Re-establish a vegetative buffer (minimum 50 foot wide) along 1,500 linear feet of the shoreline at the listed public parks in the City as a goose control measure and to filter stormwater runoff from the high goose traffic areas.

- Provide goose management measures, including public education at the various City parks.

The municipality may allow a developer to provide funding or partial funding to the municipality for an environmental enhancement project that has been identified in a Municipal Stormwater Management Plan, or towards the development of a Regional Stormwater Management Plan. The funds expended must be equal or greater than the cost to improve the site to comply with the NJDEP Standards.

A-1:
FIGURES

FIGURE C-1:
GROUNDWATER RECHARGE IN THE HYDROLOGIC CYCLE

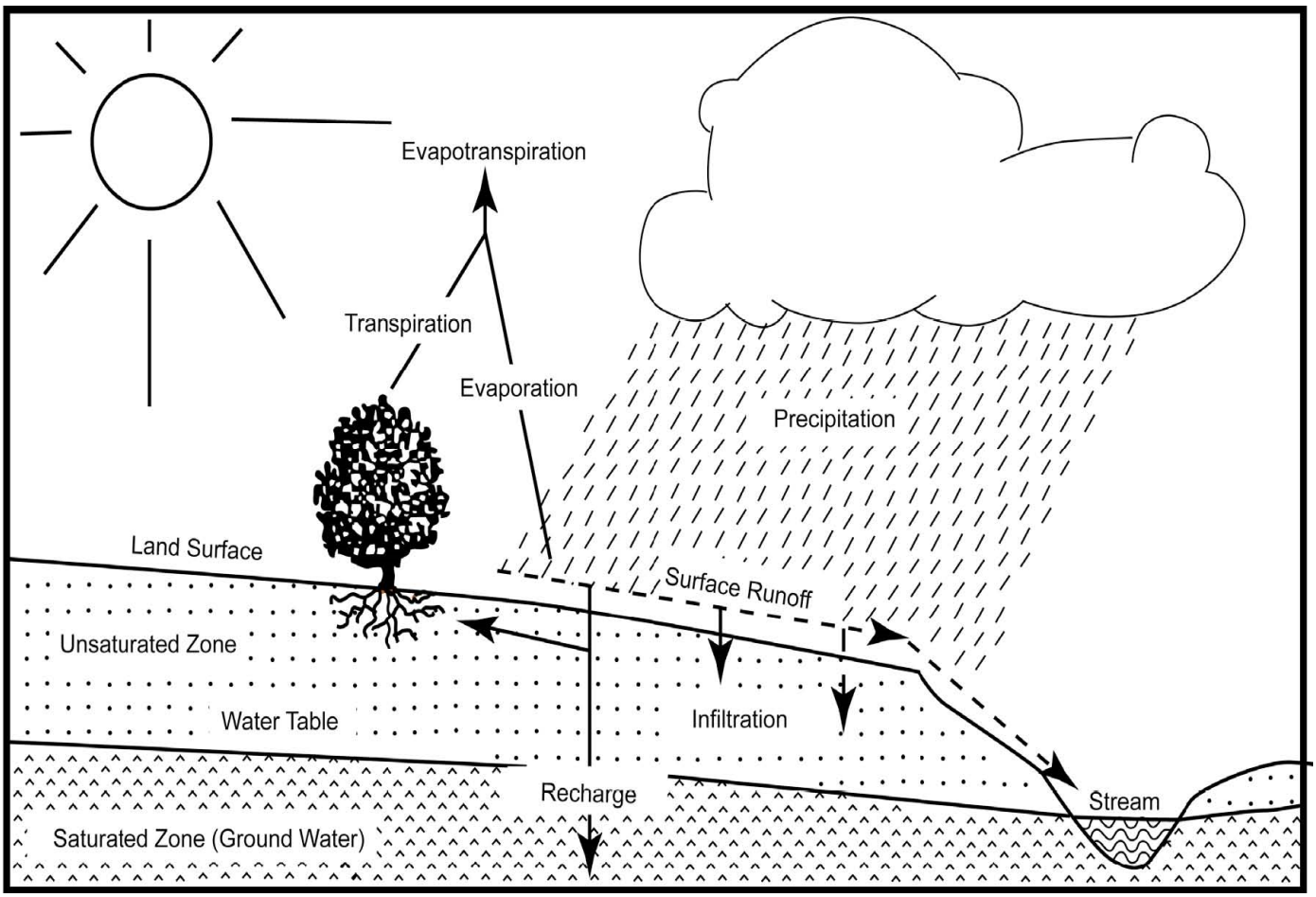
Evapotranspiration
Transpiration
Evaporation
Precipitation
Land Surface
Surface Runoff
Unsaturated Zone
Water Table
Infiltration
Recharge
Stream
Saturated Zone (Ground Water)

FIGURE C-2:
CITY OF RAHWAY AND ITS WATERWAYS

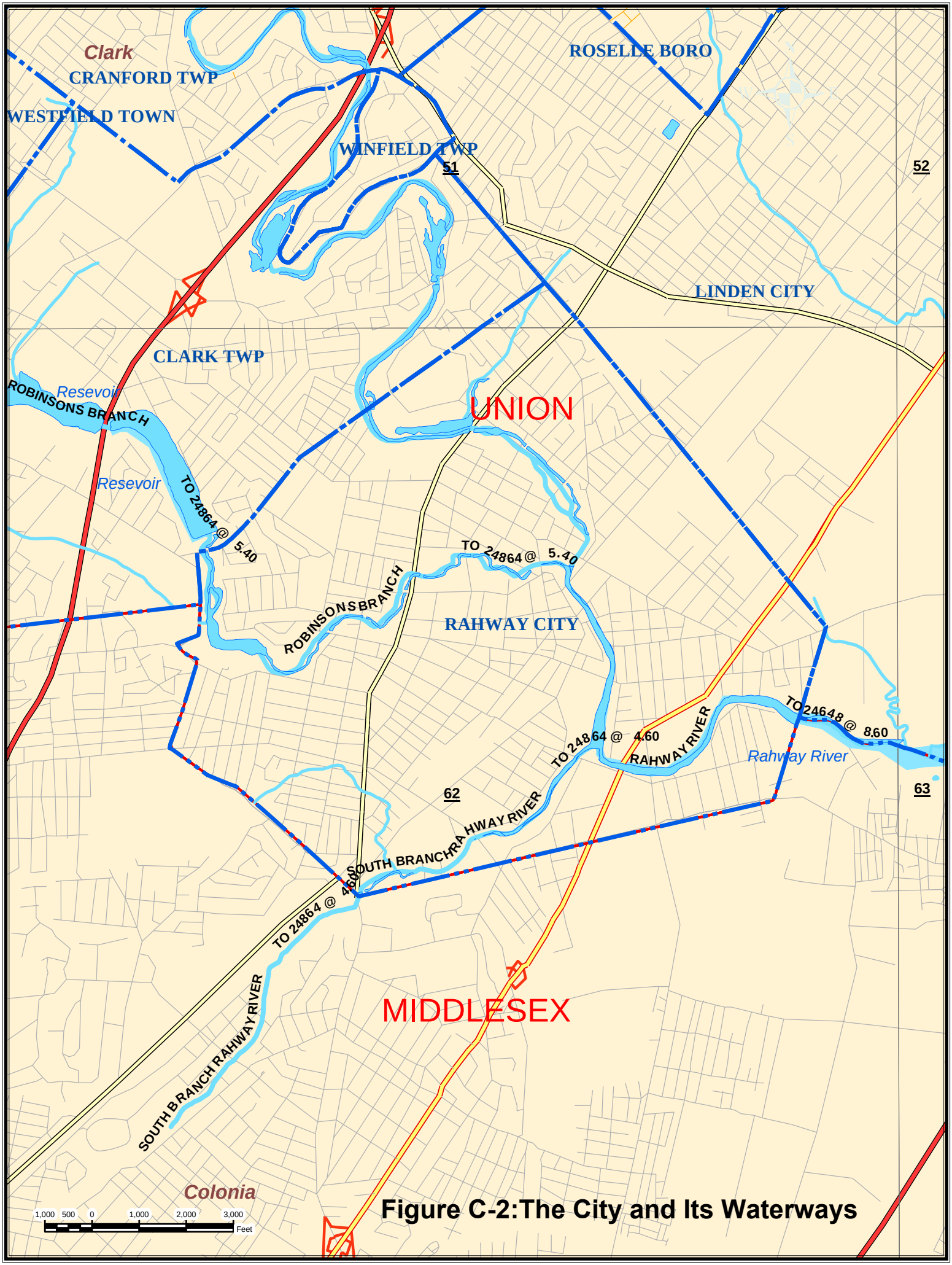

Figure C-2:The City and Its Waterways

FIGURE C-3:
CITY OF RAHWAY BOUNDARY ON USGS QUADRANGLE

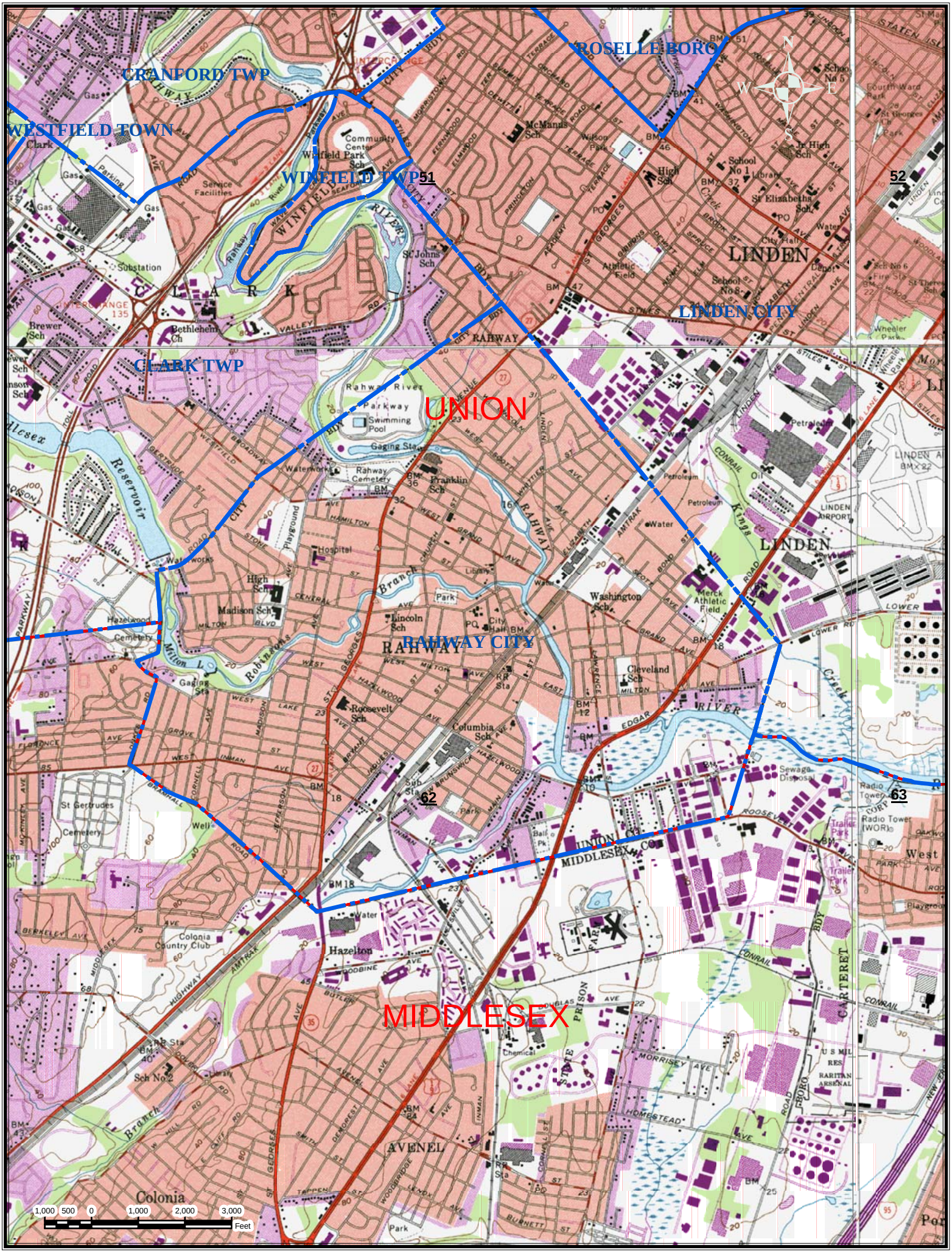
ROSELLE BORO
CRANFORD TWP
WESTFIELD TOWN
WINFIELD TWP
51
52
LINDEN
LINDEN CITY
CLARK TWP
UNION
RAHWAY CITY
RAHWAY
LINDEN
MIDDLESEX
AVENEL
Colonia
62
63
1,000 500 0 1,000 2,000 3,000
Feet

FIGURE C-4:
OFFICIAL ZONING MAP OF THE CITY OF RAHWAY
AND CITY OF RAHWAY LAND USE MAP

OFFICIAL ZONING MAP OF THE CITY OF RAHWAY UNION COUNTY, NJ

CLARK TOWNSHIP

WOODBRIDGE TOWNSHIP

CITY OF LINDEN

- AREAS OF ADOPTED REDEVELOPMENT PLANS WITH ZONING OVERLAYS (Rev. 7/02)
- Revised 1/05
- Revised 7/24/07

ZONING DESIGNATIONS

R-1	LOW DENSITY SINGLE FAMILY
R-2	MEDIUM DENSITY SINGLE FAMILY
R-3	LOW-RISE MULTI-FAMILY
R-4	HIGH-RISE MULTI-FAMILY
B-1	NEIGHBORHOOD BUSINESS
B-2	REGIONAL BUSINESS
B-3	HIGHWAY BUSINESS
B-4	SERVICE BUSINESS
B-5	CENTRAL BUSINESS
MX	MIXED USE
OR	OFFICE-RESEARCH
I-L	LIGHT INDUSTRIAL
I-H	HEAVY INDUSTRIAL
O	OPEN SPACE
H	HOSPITAL
	HISTORIC PRESERVATION OVERLAY

Feet
0 400 800

Prepared in 1997 by **Abeles Phillips Preiss & Shapiro, Inc.** Planning & Real Estate Consultants 434 Sixth Avenue New York, New York 10011

FIGURE C-5:
NEW JERSEY 2004 INTEGRATED WATER QUALITY MONITORING AND ASSESSMENT REPORT (305(b) AND 305(d)), JUNE 2004

NEW JERSEY 2004 INTEGRATED WATER QUALITY MONITORING AND ASSESSMENT REPORT (305(b) AND 303(d)).

June 2004

A Report on the Water Quality In New Jersey Pursuant to The New Jersey Water Quality Planning Act, and Sections 305(b) and 303(d) of the Federal Clean Water Act

State of New Jersey
Department of Environmental Protection
Water Assessment Team

James E. McGreevey, Governor
Bradley M. Campbell, Commissioner
Ernie Hahn, Assistant Commissioner

Companion Water Quality Inventory Reports for interstate waters are prepared by:

Delaware River Basin Commission
P.O. Box 7360
West Trenton, New Jersey 08628-0360
609-883-9500

Interstate Environmental Commission
311 West 43rd Street
New York, New York 10036
212-582-0380

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List of Acronyms

Act: Federal Clean Water Act
AMNET: Ambient Biological Monitoring Network
ASMN: Ambient Stream Monitoring Network
Ag: Silver
As: Arsenic
AQLa: Aquatic Life Acute
AQLc: Aquatic Life Chronic
BBNEP: Barnegat Bay Estuary Program
BFF: Bureau of Freshwater Fisheries
BMP: Best Management Practice
CAFRA: Coastal Area Facility Review Act
CCMP: Comprehensive Conservation and Management
Cd: Cadmium
Cr: Cromium
CSO: Combined Sewer Overflow
Cu: Copper
DELEP: Delaware Estuary Program
DO: Dissolved Oxygen
DRBC: Delaware River Basin Commission
DVRPC: Delaware Valley Regional Planning Commission
DWM: Division of Watershed Management
EIC: Estuary Implementation Committee
EIFP: Environmental Infrastructure Financing Program
ENSP: Endangered and Nongame Species Program
FC: Fecal Coliform
FW: Fresh Water
FW1: Fresh Water Category 1
FW2: Fresh Water Category 2
FWPA: Federal Wetlands Protection Act
GIS: Geographic Information Systems
Harbor: NY-NJ Harbor
Hg: Mercury
HEP: Harbor Estuary Program
HH: Human Health
HUC: Hydrologic Unit Code
IBI: Index of Biotic Integrity
IEC: Interstate Environmental Commission
MDL: Method (minimum) Detection Limit
MOA: Memorandum of Agreement
MPN: Most Probable Number (for Fecal Coliform bacteria)
MSW: Municipal Solid Waste
NAWQA: National Ambient Water Quality Assessment

N.J.A.C.: New Jersey Administrative Code
NJDWSC: North Jersey District Water Supply Commission
NJDEP: New Jersey Department of Environmental Protection
NJADN: New Jersey Atmospheric Deposition Network
NJIS: New Jersey Impairment Score
NJSWSP: NJ Surface Water Supply Plan
NJWSA: New Jersey Water Supply Authority
NJDHSS: New Jersey Department of Health and Senior Services
NJHDG: New Jersey Harbor Discharge Group
NJMSC: NJ Marine Science Consortium
NJPDES: NJ Pollution Discharge Elimination System
NJR: New Jersey Register
NRCS: Natural Resources Conservation Service
NSSP: National Shellfish Sanitation Program
Ni: Nickel
NO_3: Nitrate
ONRW: Outstanding Natural Resource Waters
PAC: Public Advisory Committee
PAH: Polycyclic Aromatic Hydrocarbon
PBT: Persistent Bioaccumulative Toxics
PCB: Polychlorinated Biphenyl
Pb: Lead
PL: Pinelands
QA/QC: Quality Assurance/Quality Control
RATS: River Assessment Teams
RF3: River Reach File 3
RPP: Regional Planning Partnership
SCMUA: Sussex County Municipal Utilities Authority
Se: Selenium
SFY: State Fiscal Year
SIIA: Sewerage Infrastructure Improvement Act
Sq Mi: Square Miles
SWAP: Source Water Assessment Program
SWO: Stormwater Outfall
SWQS: Surface Water Quality Standards
TAC: Technical Advisory Committee
TCE: Tetrachloroethlylene
TDS: Total Dissolved Solids
Th: Thallium
TMDL: Total Maximum Daily Load
TSS: Total Suspended Solids
TP: Total Phosphorus
UIA: Unionized Ammonia
USFWS: US Fish and Wildlife Service
UWNY: United Water of New York
UWNJ: United Water of New Jersey

USEPA: US Environmental Protection Agency
USGS: US Geological Survey
VOC: Volatile Organic Compound
WET: Water Education for Teachers
WMA: Watershed Management Area
WQM: Water Quality Management
WQ: Water Quality
Zn: Zinc

Part I: Introduction and Executive Summary/Major Finding

NEW JERSEY 2004 INTEGRATED WATER QUALITY MONITORING AND ASSESSMENT REPORT [305(B) AND 303(D)].

INTRODUCTION

Genesis of the Integrated List

Water Quality Inventory Report [305(b) Report]

The Federal Clean Water Act (Act) mandates states to biennially report to the US Environmental Protection Agency (USEPA) on the quality of their waters as per their support of designated uses and attainment of water quality standards. This report is called the *Water Quality Inventory Report* or the 305(b) Report, named from the section of the Act mandating it. The report contains assessments of water quality and descriptions of water resources management programs. These 305(b) reports are used by Congress and USEPA to establish program priorities and funding for federal and state water resources management programs.

List of Water Quality Limited Waters [303(d) List]

The Act also requires states to biennially provide USEPA with a list of waterbodies for which required technology-based effluent limits are not stringent enough to achieve the state's surface water quality standards. This list is termed the *List of Water Quality Limited Waters* or the 303(d) List (also termed the Impaired Waterbodies List), based upon its corresponding section of the Act. This regulation requires the identification of impaired waterbodies: those waters for which technology-based pollution controls were not stringent enough to achieve the state's surface water quality standards. The state is required to establish Total Maximum Daily Loads (TMDLs) for these impaired waterbodies based on a priority ranking. Impaired Waterbodies Lists must be based on a documented methodology that includes an evaluation of existing and readily available data. Waterbodies continue to be included on subsequent Impaired Waterbodies Lists until:

1. TMDLs are completed; or
2. Applicable criteria are met; or
3. The original basis for the listing is shown to be flawed.

Integrated Water Quality Monitoring and Assessment Report

The close association between the two reporting requirements is evident in that the 305(b) report presents the water quality status of all waters of the state while the 303(d) list represents a subset of these waters that statutorily require a TMDL. Additionally, both efforts utilize shared data sets. In 2000 USEPA encouraged states to integrate the two into a single document which would be termed an *Integrated Water Quality Monitoring and Assessment Report* (Integrated Report*)*. New Jersey developed its first Integrated Report in 2002. USEPA guidance for the preparation of the Integrated Lists for 2004 is available at http://www.epa.gov/nheerl/arm/documents/epa2003_1466.pdf. This 2004 combined report presents the extent to which waters of the State are attaining water quality standards (pursuant to section

305(b)) and identifies waters that are impaired and need TMDLs as required under section 303(d) of the Act. The Integrated Report also identifies waters that are being removed from the 303(d) List because they are attaining water quality standards.

The Integrated Report describes attainment of designated uses specified in New Jersey's Surface Water Quality Standards (SWQS) which includes: aquatic life, recreation, drinking water, fish and shellfish consumption, industrial and agricultural. In addition, ongoing and planned strategies to maintain and improve water quality statewide are described.

The Integrated Report provides water resources managers and citizens with information regarding the following:

- Methods used to assess water quality standards attainment status;
- Water quality standards attainment status;
- Pollutants and waterbodies requiring Total Maximum Daily Loads (TMDLs);
- Management strategies (including TMDLs) under development to attain water quality standards;
- Delineation of water quality assessment units providing geographic display of assessment results;
- A delineation of the State's monitoring needs and monitoring project schedules;
- Progress toward achieving comprehensive assessment of all waters.

Sublists

The Integrated List consists of five categories or lists (New Jersey terms them sublists). All assessed waterbodies are placed on a sublist based upon: 1) the degree of support of designated uses; 2) how much is known about the waterway's water quality status; and 3) the type of impairment preventing use support. Based on USEPA's assessment and listing methodology (USEPA, 2001; USEPA, 2002), each waterway should be placed in only one of the five unique assessment sublists. Each sublist is described below as per USEPA's guidance:

Sublist 1. **Attaining the water quality standard and no use is threatened.** Threatened is defined as currently supporting uses but information suggests that such uses will not be met within the next two years. Waterways are listed in this sublist if there are data and information that meet the requirements of the state's assessment and listing methodology and support a determination that the water quality standard is attained and no use is threatened.

Sublist 2. **Attaining some of the designated uses; no use is threatened; and insufficient or no data and information is available to determine if the remaining uses are attained or threatened.** Waterways are listed in this sublist if there are data and information which meet the requirements of the state's assessment and listing methodology to support a determination that some, but not all, uses are attained and none are threatened. Attainment status of the remaining uses is unknown because there is insufficient or no data or information.

Sublist 3. Insufficient or no data and information to determine if any designated use is attained. Waterways are listed on this sublist where the data or information to support an attainment determination for any use is not available, consistent with the requirements of the state's assessment and listing methodology. To assess the attainment status of these waterways, the state should obtain supplementary data and information, or schedule monitoring as needed.

This category also includes locations where there are sufficient data to make assessments, however, criteria or guidelines for making a use attainment assessment are currently not available.

Sublist 4. Impaired or threatened for one or more designated uses but does not require the development of a TMDL.

4A. TMDL has been completed. Waterways are listed on this sublist once all TMDL(s) have been developed and approved by USEPA that, when implemented, are expected to result in full attainment of the standard. Where more than one pollutant is associated with the impairment of a waterway, the water will remain on sublist 5 until all TMDLs for each pollutant have been completed and approved by USEPA.

4B. Other pollution control requirements are reasonably expected to result in the attainment of the water quality standard in the near future. Consistent with the regulation under §§130.7(b)(i), (ii), and (iii), waterways are listed on this sublist where other pollution control requirements required by local, state, or federal authority are stringent enough to attain any water quality standard applicable to such waters.

4C. Impairment is not caused by a pollutant. Waterways are listed on this sublist if the impairment is not caused by a pollutant but instead is due to factors such as habitat degradation, stream channeling, etc. States and territories should consider scheduling these waterways for monitoring to confirm that there continues to be no pollutant-caused impairment and to support water quality management actions necessary to address the cause(s) of the impairment.

Sublist 5. The water quality standard is not attained. The waterway is impaired or threatened for one or more designated uses by a pollutant(s), and requires a TMDL. This sublist constitutes the Section 303(d) list of waters impaired or threatened by a pollutant(s) for which one or more TMDL(s) are needed. A waterway should be listed on this sublist if it is determined, in accordance with the state's assessment and listing methodology, that a pollutant has caused, is suspected of causing, or is projected to cause an impairment. Where more than one pollutant is associated with the impairment of a single waterway, the waterway will remain on sublist 5 until TMDLs for all pollutants have been completed and approved by USEPA.

The Integrated Report streamlined water quality reporting since data sources and assessment methods are the same in both CWA reporting requirements. However, these changes have also

brought new challenges. For example, under USEPA's guidance (USEPA, 2001), a waterbody should be included in only one of the 5 sublists (i.e., the sublist that conveys the highest degree of impairment) as a result of the integrated assessment. Thus, if a waterbody meets all applicable surface water quality standards except fecal coliform, the waterbody would be included only in sublist 5 - *"Water quality standard is not attained and a TMDL is required"* - until the fecal coliform TMDL is completed, even though all other water quality standards are met. This approach may result in an overly negative evaluation of overall water quality and mask those uses for which waterbodies are fully supported. Therefore, the Department modified its listing methods and has chosen to develop the Integrated List by waterbody/parameter, not just by waterbody. This will enable the Department to present each parameter for each waterbody in the appropriate sublist and allows waterbodies to be placed on multiple sublists. The waterbody/parameter assessment also results in the elimination of sublist 2 since a parameter is placed either on sublist 1 (full attainment) or sublist 3 (insufficient data).

The Integrated Report combines the non-regulatory requirements of the Water Quality Inventory Report [305(b) Report] with the regulation driven List of Impaired Waterbodies [303(d) List] (i.e., only the latter mandates TMDL development). Successful merging into a single report required a thorough and accurate integration of requirements and procedures. Sublist 5 of the Integrated List meets USEPA's reporting requirements under Section 303(d) (Impaired Waterbodies), and the remaining sublists document assessments under Section 305(b) (Water Quality Inventory). Therefore, the regulatory requirements (i.e., USEPA approval and adoption; public participation, etc.) for 303(d) impaired waterbodies listing only apply to sublist 5 of the Integrated List.

Integrated Water Quality Monitoring and Assessment Methods

The methods used to develop the 2004 Integrated Report (and subsequent Reports) are described in the document entitled *Integrated Water Quality Monitoring and Assessment Methods* (Methods Document) (NJDEP, 2003). The goal of this Methods Document is to provide an objective and scientifically sound waterbody assessment methodology including:

- A description of the data that NJDEP will use to assess attainment of surface water quality standards;
- The quality assurance aspects of the data;
- A detailed description of the methods used to evaluate water quality standards attainment;
- The placement of waterbodies within the four sublists.

This Methods Document is a companion to the 2004 Integrated Report. It was developed with public input. This document will be modified, as appropriate, to accompany subsequent Integrated Reports.

Integrated Report Package

Along with the 2004 Integrated List, there are four other documents that support and explain the development of the Integrated Report. The five components of New Jersey's Integrated Report Package are as follows:

- A front-end report entitled *New Jersey 2004 Integrated Water Quality Monitoring and Assessment Report,* summarizing the contents of the integrated list as it applies to designated use attainment statewide within New Jersey. This is the document you are currently reading.
- The Integrated List itself, comprised of sublists 1-5 and priority ranking (Appendix I).
- A document entitled *Integrated Water Quality Monitoring and Assessment Methods* (Methods Document) (NJDEP, 2003), detailing NJDEP's assessment methods as applied to the Integrated List and discussed above. This represents the "documented methodology" referred to in this introduction.
- A *Comparison Document* indicating where waters previously listed on sublist 5 of the 2002 Integrated List currently are within the 2004 Integrated List.
- A *Response to Comments Document* containing all NJDEP responses to public and USEPA comments on the Methods Document and Integrated List as mandated by the public process.

The 2004 Integrated List and the Public Process

The Department began developing the 2004 Integrated List in February of 2003 by soliciting water quality data through the New Jersey Register (35 NJR 891) and posting requests for information on the NJDEP website. A GroupWise Postmaster notice was also used to solicit data from other NJDEP programs. Data were accepted for a period of 6 months. On June 2, 2003, the Department public noticed the 2004 Integrated Water Quality Monitoring and Assessment Methods Document via the New Jersey Register (35 NJR 2530(b)) and the NJDEP website (http://www.state.nj.us/dep/wmm/sgwqt/wat/integratedlist/integratedlist2004.pdf). A 30 day comment period was provided and the amended Methods Document and Response to Comment Document were posted on the Department's website. The Department officially provided notice on the proposed 2004 Integrated List (sublists 1-5) to the public via the New Jersey Register (35NJR 4920(b)). The printing of the Public Notice began a 30-day comment period that ended on December 4. A public hearing was held in Trenton on November 26. After consideration of the comments received during the comment period and the inclusion of the Delaware River assessments received from the Delaware River Basin Commission, the Department renoticed the revised 2004 Integrated List (sublists 1-5) on March 1, 2004, for an additional 30-day comment period closing on March 31. A summary of the public process is listed below.

Summary of the Public Process for the 2004 New Jersey Integrated List

2003

February 3	Solicitation of water quality related data to support the development of the Integrated List via the New Jersey Register (NJR) and NJDEP website

June 2	Public Notice of Methods in the NJR and web site followed by a newspaper notice. Beginning of 30-day comment period.
October 20	Public Notice of Integrated List (including a priority ranking of impaired waterbodies and at two-year TMDL schedule) June 2 in the NJR and NJDEP web site followed by a newspaper notice. Beginning of 30-day comment period.
November 26	Public Hearing at NJDEP in Trenton
December 4	End of Comment Period

2004

March 1	Public Notice of amended proposed 2004 Integrated List of Waterbodies (including a priority ranking of impaired waterbodies and at two-year TMDL schedule). Start of 30-day comment period.
March 31	Close of comment period.

Data Solicitation

The Department made a concerted attempt to locate and analyze all relevant information in developing the Integrated List. Given the importance and long-term ramifications of a waterbody being placed on the 303(d) List, data which meet the minimum quality assurance and quality control (QA/QC) requirements must be used. It is the intention of the Department, that through the efforts of providing a detailed Methods Document, that data that meet the QA/QC requirements will be even more readily available in the future.

In preparation for the 2004 Integrated List, the Department solicited data and information from the public for use in developing the List. USEPA guidance recommends including the solicitation of data as part of the public process. The solicitation was published on February 3, 2003, in the New Jersey Register (35NJR 891(b)) and on the NJDEP website (www.state.nj.us/dep/wmm/sgwqt/wat/2004-datasolicitation.pdf). A GroupWise Postmaster notice was also used to solicit data from other NJDEP programs. Data packages were accepted for a period of 6 months with no data accepted after August 3, 2003.

Quality assurance considerations are particularly important because the adopted sublist 5 of the Integrated List is used to establish priorities for water quality improvement measures, including, TMDL development. Given the importance of sublist 5, the Department must use data that meet the quality assurance requirements outlined in Section 3 of the Methods Document (NJDEP, 2003).

The Department developed the Integrated List using appropriate, readily available data collected by government and non-government entities. In determining which data were appropriate and readily available, the Department considered quality assurance/ quality control, monitoring design, data age, accuracy of sampling location information, data documentation, and use of electronic format for data. The Department recommends that a data package include:

1) **A completed QA/QC project plan.** Stakeholder water quality data must be collected in accordance with the Department's QA/QC program. For their data to be considered,

stakeholders must have a previously approved QA/QC project plan on file with the Department's QA/QC program.

2) Data should be provided in electronic format, preferably STORET. Data may be provided in Excel, Access, or a compatible format on floppy disc, ZIP drive or CD ROM. Station location data should be provided in ArcView, ArcInfo, or compatible format when possible, or mapped on a USGS Quadrangle Sheet; and,

3) **A citable report** that includes name, address, and telephone number of the entity that generated the data set.

The Department received data from public and private sources as identified in Table I-2-1 below. If the data were not used, the rationale as to why is noted in the comment column.

Table I-1. Stakeholder Data

Submitted By	General Location	Data Type	Parameter	Comment
Pequannock River Coalition	Pequannock River and tribs.	Water Chemistry	Temperature	Used in Assessment
Interstate Environmental Commission	NY/NJ Harbor Estuary	Water Chemistry	Fecal Coliform; DO	Used in Assessment
Sussex County MUA	Wallkill Basin	Water Chemistry	Conventionals	Used in Assessment
Pinelands Commission	Pinelands Area	Water Chemistry	Conventionals	Used in Assessment
USEPA	Atlantic Ocean	Water Chemistry	Fecal Coliform, DO	Used in Assessment
Monmouth County Health Dept.	Monmouth County	Water Chemistry, Biological	Conventionals, Macroinvertebrate	Used in Assessment
PVSC	NY-NJ Harbor, Passaic River	Water Chemistry	Conventionals	Used in Assessment
DHSS	Statewide	Water Chemistry	Fecal Coliform	Used in Assessment
DRBC	Delaware River/Bay	Water Chemistry	Conventionals, toxics	Used in Assessment

Sublist 5 of the 2004 Integrated List (New Jersey's 2004 list of water quality limited waterbodies 303(d))

In accordance with the Federal Clean Water Act, NJDEP prepared New Jersey's 2004 List of Water Quality Limited Waterbodies (**sublist 5 of the Integrated List**). This list is required by section 303(d)(1)(A) of the Federal Clean Water Act, and is a component of the Statewide Water Quality Management Plan, as required by the Water Quality Management Planning Rules at

N.J.A.C. 7:15-2.1(a) 8ii and 7:15-6. This list is adopted as an amendment to the Statewide Water Quality Management Plan.

Section 303(d) of the Federal Clean Water Act requires states to identify waters that are not attaining water quality standards, despite the implementation of technology based effluent limits. States must prioritize these waters for Total Maximum Daily Loads (TMDLs) and are also required to identify those high priority waterbodies for which they anticipate establishing a TMDL in the next two years. New Jersey has fulfilled this requirement by listing all waterbodies on sublist 5 of the Integrated List based on: 1) observed or expected violations of water quality criteria; and 2) where designated uses are impaired or believed to be impaired but do not necessarily have criteria violations on record. This second category is illustrated by listings based upon macroinvertebrate assessments. The designated use (maintenance, migration and propagation of natural and established biota) is believed to be impaired, however, no specific chemical or physical pollutant violation has been identified.

Sublist 5 of this 2004 Report supercedes sublist 5 of the 2002 Integrated List. The new sublist presents all water quality limited waters, prioritizes waterways with regard to scheduling for TMDLs, and includes waters for which TMDL development is occurring or will occur within two years. As stated previously, waterbodies listed on sublist 5 have confirmed violations of surface water quality standards or are suspected of having designated use impairments. Some waterbodies are listed based upon relatively recent data collection. It is important to note, however, that sublist 5 also contains waterbodies based upon assessment results from as far back as 1989 that are based upon conditions observed in the mid-1980s. Sublist five also contains 5 sites placed there under a USEPA remand by reason of being associated with Super Fund sites. The Department is assessing the current status of many of these historical listings, especially those based upon metals. Significant progress has been made and it is expected that future Integrated Lists will reflect only current water quality conditions.

Assessments of Interstate Waters

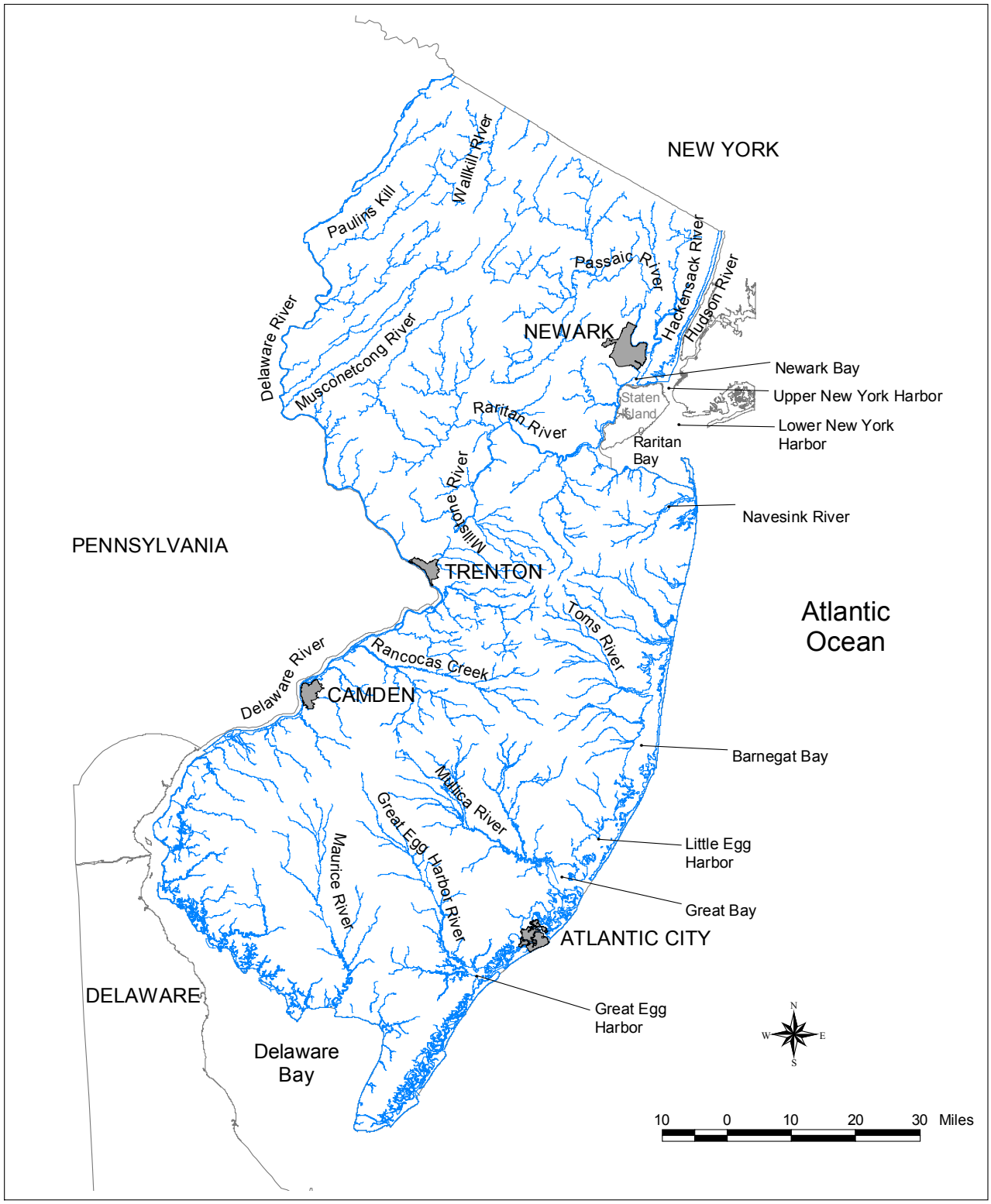
Companion Water Quality Inventory Reports for neighboring Interstate Waters are prepared by and are available from:

- The Delaware River Basin Commission (DRBC), PO Box 7360, West Trenton, NJ 08628-0360 [tel. (609) 883-9500]. The DRBC assesses the Delaware River and Delaware Bay.
- The Interstate Environmental Commission (IEC), 311 West 43rd St, New York, NY 10036 [tel. (212) 582-0380]. The IEC assesses the shared waters of New York – New Jersey Harbor including the Lower Hudson River, Upper and Lower New York Bay, Kill Van Kull, Arthur Kill, Upper Raritan Bay, and Newark Bay. The IEC also assesses waters shared between New York and Connecticut.

These agencies, however, do not prepare 303(d) Lists of impaired waterbodies. At USEPA's request, New Jersey (as well as other participating states) prepared a 303(d) list that includes the interstate waters assessed based upon data collected by these two Interstate Agencies. For the 2004 Integrated List, New Jersey has listed portions of the Delaware River and Bay under this State's jurisdiction based upon data and assessments prepared by the DRBC. Portions of the

New York-New Jersey interstate waters in the north-east portion of the State, under NJ jurisdiction, are also listed based upon data collected by the IEC. These data, however, were assessed by New Jersey using this state's methods and not those of an interstate agency.

Figure I-1 New Jersey Geography



Executive Summary and Major Findings

Section 305(b) of the Federal Clean Water Act requires states to report on the status of water quality in their principal waters in terms of overall water quality and the support of designated uses. States must report on strategies to maintain and improve water quality.

Section 303(d) of the Federal Clean Water Act requires states to identify waters that are not attaining water quality standards, despite the implementation of technology-based effluent limits. States must prioritize these waters for Total Maximum Daily Load (TMDL) analyses. States are also to identify those high priority waterbodies for which they anticipate establishing TMDLs in the next two years.

Beginning with the 2002 reporting cycle, New Jersey under USEPA's guidance has integrated the reporting requirement of Clean Water Act section 305(b) and section 303(d) into a single document which is termed an *Integrated Water Quality Monitoring and Assessment Report*. This integrated report presents the extent to which waters of the State are attaining water quality standards pursuant to section 305(b) and identifies waters that are impaired and need TMDLs as required under section 303(d) of the Act. The Integrated Report also identifies waters that are being removed from the 303(d) List because either they are attaining water quality standards, TMDLs have been completed, or the impairment is not due to a pollutant.

The development of the 2004 Integrated List of Waterbodies is accomplished in three phases. The first phase began with the solicitation of water quality related data to support the development of the Integrated List. The Department provided notice in the New Jersey Register (35 N.J.R. 891(b)) and the Department's website on February 3, 2003. Data collected as of December 31, 2002, was accepted by the Department until August 2, 2003. Any data received after that date will be used for subsequent assessments as outlined in the February 2003 notice.

During the second phase, the Department updated the 2002 Integrated Water Quality Monitoring and Assessment Methods Document. The goal of this methods document is to provide an objective and scientifically sound waterbody assessment methodology. This document includes a description of the quality assurance requirements as well as methods used to evaluate water quality data and assess water quality standards attainment. Additionally, it includes the rationale for the placement of waterbodies on Sublists 1 through 5.

The third and final phase is the development of the Integrated List of Waterbodies, and the Two-Year TMDL Schedule as well as the Integrated Report which includes a summary of the Integrated List as well as program information.

The integrated listing is based upon placing a state's waterbody segments into one of five possible sublists based upon: 1) the degree of support of designated uses; 2) how much is known about the waterway's water quality status; and 3) the type of impairment preventing use support. Each sublist is described below as per USEPA's guidance:

The Department has chosen to develop the Integrated List by waterbody/pollutant, not just by waterbody. This enables the Department to present each parameter for each waterbody in the appropriate sublist and allows waterbody segments to be placed on multiple sublists. Waterbodies are thereby not assessed in terms of support status of all uses at one time as delineated in the USEPA method. This results in the **elimination of sublist 2** since waterbodies are not assessed in terms of their total use support status.

Sublist 1. Attaining the water quality standard and no use is **threatened** (threatened defined as currently supporting uses but information suggests that uses will not be met within the next two years).

Sublist 3. Insufficient or no data and information to determine if any designated use is attained.

Sublist 4. Impaired or threatened for one or more designated uses but does not require the development of a TMDL.

4A. TMDL has been completed.

4B. Other pollution control requirements are reasonably expected to result in the attainment of the water quality standard in the near future.

4C. Impairment is not caused by a pollutant.

Sublist 5. The water quality standard is not attained. The waterway is impaired or threatened for one or more designated uses by a pollutant(s), and requires a TMDL. This sublist constitutes New Jersey's 303(d) list of waters impaired or threatened by a pollutant(s) for which one or more TMDL(s) are needed.

New Jersey's Integrated Report Package for 2004 is comprised of five components:

- *New Jersey 2004 Integrated Water Quality Monitoring and Assessment Report,* summarizing the contents of the integrated list as it applies to designated use attainment statewide within New Jersey.
- The Integrated List, comprised of sublists 1-5 and priority ranking (Appendix I).
- *Integrated Water Quality Monitoring and Assessment Methods* (Methods Document), detailing NJDEP's assessment methods as applied to the Integrated List.
- A *Comparison Document* indicating where waters previously listed on sublist 5 of the 2002 Integrated List currently are within the 2004 Integrated List.
- A *Response to Comments Document* containing all NJDEP responses to public and USEPA comments on the Methods Document and Integrated List.

New Jersey's Water Resources

New Jersey is the fifth smallest state in the nation and contains a wide variety of land use types, water resources, geologic characteristics, and natural biota and fauna. Within the state's 7,788 square miles are as follows:

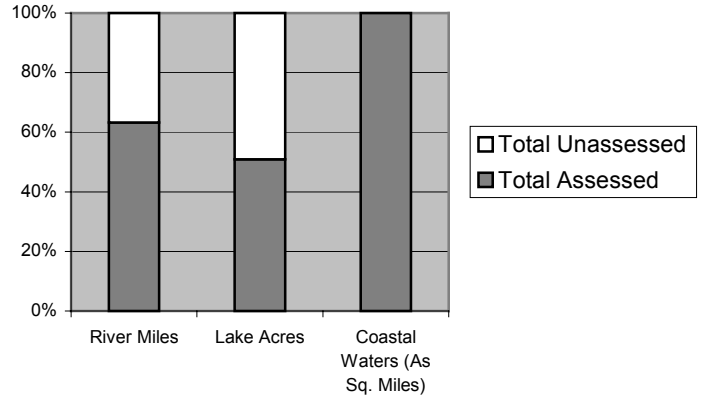
- There are 7,840 miles of rivers and streams including 6,330 miles of non-tidal rivers and 1,510 miles of tidal rivers. Of the total miles of rivers and stream, 4,957 miles (63%) are assessed (see Figure I-2);
- 69,825 acres of lakes and ponds larger than 2 acres, of which 35,584 (51%) are assessed (Figure I-2);
- 1,069 square miles of estuarine* and ocean* waters, of which all (100%) are assessed (Figure I-2); and;
- 1,482 square miles of fresh and saline marshes and wetlands, of which none are currently assessed.
- Note that all spatial scales presented in this report are based upon a USEPA national map scale of 1:100,000.

*Note that the term "coastal waters" when used here refers to both open estuarine and ocean waters combined.

Spatial Extent and Comprehensive Assessment

The U.S. Environmental Protection Agency (USEPA) guidance (USEPA, 2002) recommends that each assessment of sampled data be applied to a waterbody with a specific spatial extent (e.g., stream miles; lake, estuary and ocean acres). NJDEP revised and improved its assessment methods in 2002 which included the development of a new method to determine **spatial extent** of the monitoring networks. Spatial extent is associating a single sampling point to a waterbody segment such as a river stretch and applying the assessment results to this waterbody. The goal in developing the new spatial extent approach is to improve estimates of assigning waterbody segments to monitoring stations by maximizing the use of monitoring data without overestimating spatial extent. The spatial extent method combined with currently available data has resulted in assessment extents of the state's waterbodies as displayed in Figure I-2 below.

Figure I-2: Percentage of Total Waters Assessed for One or More Pollutant(s) by the 2004 Integrated Report



- A total of 63% of the total river miles (tidal and non-tidal) were assessed in the state for at least one designated use.
- 100% of estuaries, bays, and ocean waters were assessed, again for at least one designated use.
- In contrast to other waterbody types, limited progress has been made in the comprehensive assessment of lakes. Of the total of lake acres in New Jersey (lakes 2 acres or larger) 51% have been assessed for at least one use. When expressed in numbers of lakes, however, only 14% were assessed.

Within the scope of waters assessed, overall assessment status (i.e., impaired, not impaired, etc.) for rivers (tidal and nontidal), lakes, and coastal waters (estuary and ocean) in New Jersey based upon spatial extent is delineated in Figure I-3 below.

A total of 2,151 waterbody segments have been assessed. Of these, 973 segments have at least one parameter exceeding a water quality standard criterion. Each parameter-waterbody segment is considered a distinct listing. The Department has identified 1,365 distinct listings on sublist 5. Of a total of 36 parameters assessed for the 2004 Integrated List, the following number of listings has been assigned to each parameter (Table I-2):

Table I-2: Number of distinct listings on sublist 5 within the 2004 Integrated List by parameter.**

Parameter	Number of Listings		Parameter	Number of Listings
Benthic Macroinvertebrates	314		Total Suspended Solids	15
Phosphorus	154		Fish Community	7
Fecal Coliform	141		Silver	6
Mercury	120		Cyanide	5
Total Coliform	90		Dissolved Solids	5
pH	87		Nitrate	4
Arsenic	68		Tetrachloroethylene	4
Lead	43		Thallium	3
Temperature	43		Trichloroethylene	2
Pineland Biological Community	40		Chloride	1
PCB	37		Chlorinated Benzenes	1
Dissolved Oxygen	33		DDT	1
Copper	30		DDT, DDE, DDD	1
Dioxin	30		PAHs	1
Cadmium	21		Pesticides	1
Zinc	19		Sedimentation	1
Chromium	18		Selenium	1
Unknown Toxicity*	17		Toxic Discharge	1
			Total Number of Listings =	**1365**

*These represent benthic macroinvertebrate sites where unusually high numbers of abnormalities were encountered on the organisms sampled.

** Although data are collected at point locations, the Department has defined a spatial extent (linear miles, acres) associated with each sampling point assessed (see Section 7 of the Methods Document). Hence, assessment results can be presented in two ways: a count of the individual segments assessed for a given parameter; or as a spatial extent (i.e., miles, acres listed). Depending on the stream morphology and landuse, the spatial extent associated with a single sampling point varies from station to station. The Department presents the assessment results as a spatial extent as historically required by USEPA. However, the Department, at USEPA's request, is now also reporting the number of impairments for each pollutant category. This counting of impaired segments reflects the number of TMDLs that the Department must address. Since the spatial extent for each sampling station is different, there is no correlation between the number of segments impaired for a pollutant and the magnitude of the spatial extent of the impairment (i.e., three segments could equal 1.5 miles or 10 miles). For the purposes of counting TMDLs, the Department has prepared Table I-2. This table should not be used to compare the magnitude of impairments for the various pollutants. Assessment results are provided throughout the report as miles, square miles and acres which can be used for comparison purposes.

Table I-2 illustrates that benthic macroinvertebrate listings comprise the majority of listings on the 2004 Integrated List. This is followed by listings for phosphorus, fecal coliform, and fish consumption advisories based upon mercury.

Statewide Water Quality and Designated Use Attainment

The Federal Clean Water Act requires the state to maintain water quality in existing high quality waters and to restore impaired waters. The Department accomplishes this by developing and implementing Surface Water Quality Standards (SWQS). These standards establish **designated uses** to be achieved for individual water bodies and specify the water quality criteria necessary to achieve these uses. Designated uses include potable water supply (drinking water use), propagation of fish and wildlife (aquatic life use), recreation in and on the water (primary and secondary contact), agricultural and industrial supplies, and navigation. As part of this process, the Department establishes stream classifications and an antidegradation designation for each waterbody.

Rivers, Nontidal

A total of 2,870 **nontidal river miles** were assessed for at least one of the following parameters (using 457 monitoring stations); total phosphorus, pH, dissolved oxygen, temperature, fecal coliform, nitrate, total suspended solids, total dissolved solids, unionized ammonia, metals, and toxics. Of these assessed miles, 2,187 river miles (76%) did not meet the SWQS for at least one parameter.

Figure I-4 displays the relative distribution of pollutants and assessment results for nontidal rivers in terms of river miles listed on the Integrated List. Note that although benthic macroinvertebrates are listed on table I-2, they are not reflected Figure I-4 because the pollutant which causes the biological impairment is not always known. In addition, a subset of these impairments may be due to issues of habitat and may not be due to a chemical exceedance. Figure I-4 only reflects the distribution of pollutants, it does not contain macroinvertebrate listings.

As Figure I-4 shows for the chemical parameters, impairments of nontidal river segments were primarily due to total phosphorus, pH, and metal exceedances. The next most frequently encountered pollutants (in terms of number of river miles listed as impaired) were mercury in fish tissue, fecal coliform and temperature exceedances. It is evident from Figure I-4 that there is variation in the number of sites for each parameter as reflected in the number of miles assessed. This is the result of data being derived from a variety of monitoring networks, each of which includes a different suite of parameters. With the exception of metals and mercury in fish, the number of nontidal river miles assessed is similar – ranging from 2,450 to 2,750 miles. Resources for metals analyses have only been available at a subset of sites so fewer nontidal river miles (760) have been monitored for these parameters. The following additional points and qualifications are observed for the data:

- A comparison of background, **natural watersheds without anthropogenic inputs**, and stations randomly placed that represent statewide conditions (reflecting anthropogenic impacts) indicate that nutrients and fecal coliform are significantly higher at statewide sites than at background sites. On the other hand, dissolved oxygen, unionized ammonia, and

temperature data were similar at the background and statewide sites. Further, pH varied widely depending on the site's location and the geology of the area.

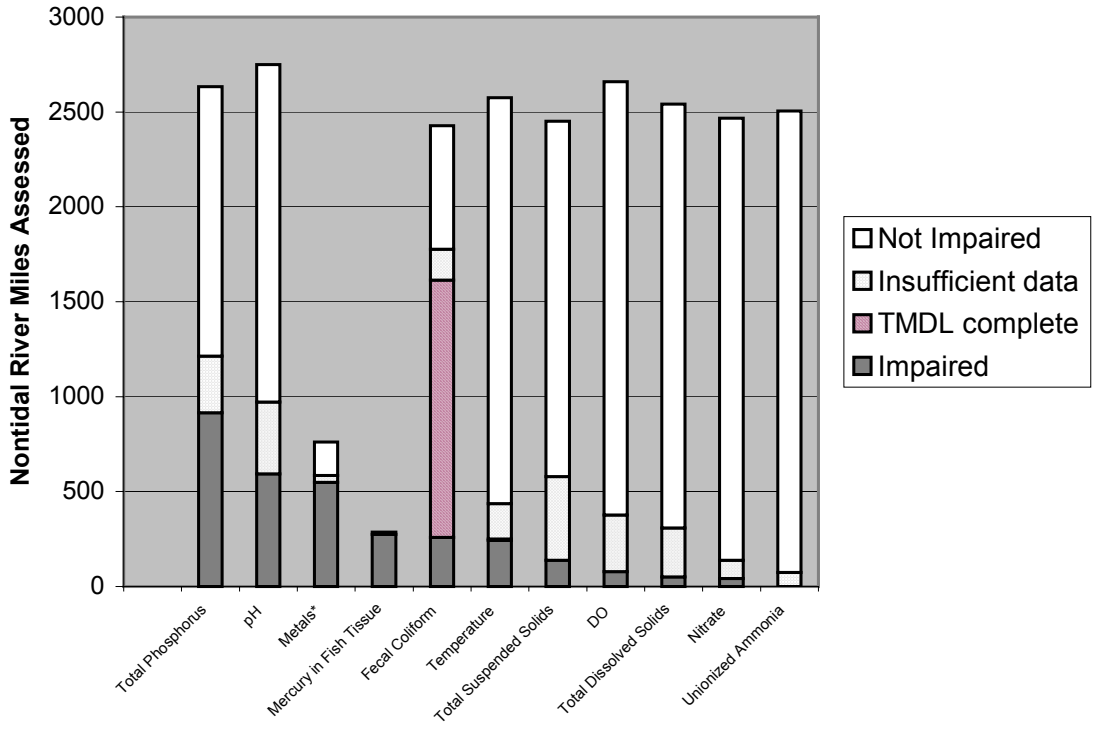
- **Total Dissolved Solids** (TDS) also had significantly higher average statewide concentrations compared to background conditions, however, very few samples exceeded the surface water criterion.
- **Overall results** indicate that dissolved oxygen and temperature in the state fall within water quality standards. Regarding dissolved oxygen, it should be noted that recordings are taken well into daylight hours and do not reflect the most stressful period immediately before the initiation of daylight. Diurnal DO records will allow a more accurate assessment of attainment of this criterion.
- The statewide **Total Phosphorus (TP)** average was 0.09 mg/l with more than half of the stations meeting TP standards (54% attaining, 35% non attaining) when excluding insufficient data sites. The Pinelands and northwest portions of the state had the majority of their stations fully meeting TP criteria, while the remaining sections of the state had a substantial number of sites not meeting standards. In response, the Department is taking steps to assess whether phosphorus is the limiting nutrient in waters with high phosphorus levels and whether the phosphorus renders the waters unsuitable for designated uses.
- Although **pH** exceedances are accountable for the third highest number of river miles impaired, a large number of stations with exceedances were located in areas directly surrounding the Pinelands. These rivers are classified as FW-2 and not Pineland waters within the SWQS, however, these areas are characterized as having environmental conditions such as soils, geology, and vegetation very similar to the Pinelands. The Department will be refining the stream classifications within these transition areas to correct this problem.
- Prior to upgrades and regionalization of sewage treatment plants, **ammonia** exceedances were common in streams receiving effluent. Since then, the improvement of unionized ammonia concentrations in water quality statewide has been dramatic. Of the 300 stations assessed, all are fully attaining the SWQS criteria.
- Only 138 miles are listed as impaired for **Total Suspended Solids.** Exceedances of the SWQS are frequently detected during high flow/storm events. Because the Department's statewide monitoring program is not designed to sample high flow storm events, impairments due to suspended solids may be underestimated. In February 2004, the Department adopted new Stormwater Management and Stormwater Permitting rules which include new techniques for managing stormwater runoff, including 300 foot buffers for Category One waterbodies.

A suite of 11 metals (arsenic, lead, mercury, copper, zinc, cadmium, chromium, silver, thallium, selenium, nickel) were monitored at 12% of nontidal rivers. Of these monitored miles, 72% exceeded a standard for one or more metals. Arsenic, lead, mercury, and copper were responsible for the highest number of impairments of river miles in non-tidal waters. Arsenic and lead were responsible for the highest number of new metal listings based on the most current sampling, 310 and 110 miles respectively. Mercury and copper exceeded their criteria but to a lesser extent, impacting 47 and 50 river miles. Exceedances of the metal criteria occurred throughout the state, in all physiographic regions, and in all land use types. When combined with older listings, the total miles represented individually by arsenic, lead, mercury and copper on sublist 5 are 356, 246, 187, and 158 miles respectively.

The following additional observations have been made from the data:

- Conditions at **background sites**, natural watersheds without anthropogenic inputs, showed that metal levels were very low with few detections above the Method Detection Limit (MDL). Results show arsenic, copper, nickel, and lead had significantly higher average statewide concentrations; while cadmium, chromium, mercury, selenium, and zinc had statewide average concentrations similar to the background concentrations.
- A total of 356 miles of non-tidal streams are listed as impaired for **arsenic**. In general, if arsenic is detected, it exceeds the human health criteria of 0.0178 ug/l. At four locations, the arsenic concentrations exceeded the proposed New Jersey Drinking Water Maximum Contaminant Level (MCL) of 5ug/l.
- Recent sampling detected only nine sites with exceedances for mercury with all the sites exceeding the aquatic life criteria. Although water column mercury levels (measured as Total Recoverable) in the state are relatively low and exceedances of the criteria are not common, mercury is commonly found in the tissue of fish and other aquatic life throughout the state. Waters with mercury-based fish consumption advisories have been assessed as being in non support and placed on sublist 5. It is important to note that although data show elevated levels of mercury in certain fish, the quality of the waters used for drinking and bathing are not affected.

Figure I-4: Relative Distribution of Pollutants in Nontidal Rivers



*This represents metals (including mercury) in the water column and not metals in fish tissue.

- **Toxic substances**, including cyanide, PCE, TCE, and DDT had exceedances of their criteria that caused them to be listed on the 1998 303(d) List. These sites have no recent additional data to re-assess their status and remain listed on sublist 5 of the 2004 Integrated List. In addition, the Raritan River at Bound Brook has been added to sublist 5 for benzene based on new data, where recent sampling showed multiple exceedances of the criterion

Designated Use Attainment in Nontidal Rivers

Recreational Use Attainment: All nontidal rivers in New Jersey are designated for primary contact recreation. A total of 2,423 miles of rivers represented by 290 monitoring stations were assessed for recreational use attainment. Only 26% of the assessed sites were fully attaining the standards for recreational activity. The assessment results for fecal coliform show that concentrations exceeded standards throughout the state. The only region in the state without widespread impairments is the Pinelands. As one of the first priorities for TMDL development, the Department has developed over 165 TMDLs for fecal coliform since March of 2003.

Drinking Water Use Attainment: All nontidal rivers in New Jersey are designated for drinking water supply after standard treatment. Nitrate, metals, toxic organic compounds, and supplemental treatment of drinking water were used as indicators to determine drinking water use support. Overall, results show 496 river miles (18% of assessed rivers) do not meet drinking water uses in rivers in the state designated as either a current or possible drinking water source. Of these 496 miles not supporting the use, 461 miles are due to an exceedance of a metal or toxic organic compounds (DDT, cyanide, benzene, tetrachloroethene, and/or trichloroethene) criterion. A total of 86 river miles are impacted by one or more toxic organic compounds.

Agricultural Use Attainment: All nontidal rivers in New Jersey are designated for agricultural use. All waters, in turn, meet the use. Total dissolved solids and salinity were used as indicators to determine agricultural designated uses.

Industrial Use Attainment: All nontidal rivers in New Jersey are designated for industrial use. Total suspended solids and pH were used as indicators for support of this use. A total of 343 stations representing 2,180 river miles were assessed for industrial uses. Results indicate that there are no areas in the state where a water supply is confirmed to be unsuitable for industrial use.

Aquatic Life Use Attainment: NJDEP evaluated aquatic life designated use support (biological status) in non-tidal rivers and streams using benthic macroinvertebrates sampled between 1997 and 2001. The Department also assessed benthic macroinvertebrate data collected and analyzed by the Monmouth County Health Department as well as finfish, anuran (frogs) and stream vegetation data collected and analyzed by the New Jersey Pinelands Commission.

A total of 2,580 river miles were assessed for aquatic life designated use support status. Thirty percent fully support the designated use, 34% do not support the use, and 36% are designated as

having insufficient data with which to make an assessment. The third category (insufficient data) represents a blend of sites for which there are: 1) insufficient biological data necessary to make a use attainment assessment; and 2) sites (all in the Pinelands) where there are sufficient data, however, clear thresholds are currently unavailable to clearly differentiate between impaired and nonimpaired communities at some locations.

Dissolved oxygen (DO) and unionized ammonia (UIA) are relevant to aquatic life uses: DO is required for most forms of aquatic life and unionized ammonia is toxic to aquatic life in elevated concentrations. Based on data collected between 1998 and 2002 in the Ambient Stream Monitoring Network (ASMN), with few exceptions, monitored rivers attain these SWQS criteria or have water quality better than what is required by the SWQS

Research by the USGS in New Jersey has indicated that hydrologic instability, substrate quality, the density and percent of impervious surface cover in the upstream watershed and total annual flow of municipal effluent were important factors that contribute to benthic impairment.

Rivers - Tidal

In contrast to nontidal rivers and streams, monitoring in tidal rivers is much more limited. There are fewer physical/chemical parameters and no biological monitoring. Aquatic life support is assessed based upon dissolved oxygen measurements in the water column. New Jersey has 1,510 tidal river miles, of which 95% were assessed for at least one parameter. Of the miles assessed, only 28 river miles met all criteria. Parameters assessed include, fecal coliform, total phosphorus, dissolved oxygen, nitrate, pH, temperature, solids (dissolved and suspended), unionized ammonia, and toxic organic compounds. Also sampled were finfish and shellfish tissue for the purpose of issuing consumption advisories. Fish consumption advisories were responsible for the highest number of impaired miles in tidal rivers, 1,073 miles. Total coliform impacting shellfish harvesting were responsible for the second highest count of impaired miles with 880 miles exceeding that criterion. Most of these impaired miles overlap with one another and are not cumulative. Note that of the 1,073 miles listed for various fish consumption advisories, 310 miles had an advisory only with no other violations.

A limited amount of new **metal** data exists in tidal rivers. Twenty-three sites representing 269 miles were assessed for metals with all of the rivers having at least one metal or **toxic** exceeding its criteria. Several sites had metals or other toxic substances placed on sublist 4 because of a TMDL or other reduction plan. The sites listed on sublist 4 include: the Delaware River Zones 2, 3, and 4 for Tetrachloroethene; 1,2 Dichlorethane; and PCBs; the Tidal Hackensack River for Nickel; and the Hudson River for Mercury. In addition, recent data from the Delaware River Basin Commission has resulted in the Delaware River in Zone 4 being assessed as impaired for copper.

Of the 441 miles of tidal rivers assessed for **Aquatic Life Use Attainment** using water column dissolved oxygen measurements, 378 miles (86%) were assessed to be in full attainment, 52 miles were in non attainment (12%). Areas of non-support included tidal portions of the

Matawan Creek, Shark River, tidal Oyster Creek, the Middle River (tributaries to the Great Egg Harbor River), Bidwell Ditch, Dennis and Dividing Creeks.

Of the 192 miles of tidal rivers assessed for support of **recreational uses** based upon sanitary quality, 112 miles (59%) were assessed to be in full attainment, 58 miles (30%) were in non attainment. Areas of non-support included Matawan, Waackaack, Chingarora, and Luppatatong Creeks, all tributaries to the Raritan Bay, and the lower Maurice River.

Lakes

There are approximately 3,268 lakes, reservoirs and ponds over 2 acres in New Jersey. There are 380 public lakes (24,000 acres) and 64 reservoirs. Designated uses of New Jersey's lakes, reservoirs, and ponds assessed in this Report are recreation (assessed in terms of both sanitary and aesthetic quality) and aquatic life support.

One hundred and eight lakes (totaling 14,547 acres) were assessed by the Division of Fish and Wildlife and the New Jersey Pinelands Commission for **aquatic life designated use support**. A total of 61 lakes fully support the use (one lake is fully supporting but threatened) and 21 lakes do not support the use. Twenty-six lakes (all Pinelands Lakes) were classified as not being able to be assessed given that clear thresholds for biological status have not been established for Pinelands lakes (see Methods Manual, page 24).

Lake bathing beaches are monitored for sanitary quality by county and local health departments with oversight and program coordination from New Jersey Department of Health and Senior Services (NJDHSS). Two hundred and eleven lakes (75% of assessed lakes) representing 12,531 acres provided bathing beaches of excellent recreational swimming quality (full attainment of the use). Seventy lakes (25%) representing 6,400 acres showed non attainment of the primary contact use based upon the sanitary quality of their bathing beaches.

The recreational value of lakes in terms of aesthetics is assessed by determining its trophic status. Of the 119 public lakes on the GIS system assessed for **trophic status**, 6 lakes (320 acres) were assessed as mesotrophic and are listed on sublist 1: Lake Atsion, Tuckahoe Lake, Manahawken Lake, Lake Matawan, Lake Absegami and Turnmill Lake. Sixteen lakes were assessed as eutrophic and are placed on sublist 5. Sixty-two lakes are listed under Insufficient Data (placed on sublist 3) and 34 lakes have undergone TMDLs that have been approved by USEPA and placed on sublist 4a.

Many of the lakes in New Jersey are constructed impoundments that are highly prone to **eutrophication**. Eutrophication occurs naturally as lakes age, however, this process can be accelerated by excessive inputs of nutrients and suspended sediments from the surrounding watersheds. The excessive algal growth, be it planktonic or rooted, often creates aesthetically unpleasant conditions for swimming and difficult conditions for boating.

Estuaries and Ocean

The Department currently assesses the condition of the coastal marine biota to assess the Aquatic Life Designated Use in coastal waters by indirect methods, using dissolved oxygen (DO) measurements. Of the 616 square miles of **open estuarine waters** assessed from Newark Bay south to Cape May and around to those portions of Delaware Bay under New Jersey's jurisdiction, 48% had sufficient dissolved oxygen levels to support a healthy biota. The remaining 52% were assessed as being in non attainment due to periodic drops in DO levels to unacceptable levels. Locations where DO violations were observed centered around the Shark River, Lower Manasquan River, and Great Egg Harbor.

Factors contributing to low dissolved oxygen concentrations in New Jersey estuaries are both natural and anthropogenic. Estuarine DO levels are characteristically lowest in summer, when water is warm and biological activity is at its highest. Many of the estuaries along the New Jersey coast are shallow waterbodies, often with poor mixing which contributes to the warming of the waters in summer. This warming in turn contributes to low oxygen levels. An additional contributing factor to low DO is input of naturally oxygen depleted waters from adjacent wetlands, especially during ebb tides.

Recreational use attainment assessment in estuaries (based upon bathing beach closure and/or water column sanitary data) found that of 616 square miles assessed (from the tip of Sandy Hook to the tip of Cape May), 309 sq. miles (50%) fully met recreational uses and 2 sq. miles (0.3%) did not support recreational uses. A remaining 305 sq. miles (49.7%) did not have sufficient data necessary to make an assessment (Sublist 3). The region of nonsupport was in the Maurice River and Cove.

In the open ocean; of 454 square (statute*) miles assessed (Sandy Hook south to Cape May and out 3 nautical* miles) 100 percent of the surface waters (based upon samples taken at a depth of one meter) have historically had adequate dissolved oxygen to support a healthy biota. In contrast, surface water monitoring by NJDEP has found violations of DO criterion near the inlets of some embayments in southern New Jersey.

Bottom waters, however, show a much different condition. Here all 454 assessed square miles of ocean bottom are in non attainment (sublist 5) due to a benthic low DO cell which forms off the coast during the summer months and breaks up in the fall. This is in contrast to the ocean assessment results presented in the last Integrated Report where 30 percent of the waters were in full attainment.

It is important to note that the biological impacts on marine biota on the ocean floor are not known: DO concentrations provide a surrogate indicator of aquatic life designated use attainment and do not provide an assessment of actual biological conditions. In open waters, fish can avoid areas with low DO, and many crustaceans and other benthic inhabitants are naturally tolerant of temporary low DO conditions. The Department does not have data to characterize the status of the benthic community in these waters, therefore, the significance of temporary DO conditions below 5 mg/l to aquatic life uses is unclear.

* Statute mile equals 5280 feet; a nautical mile is 6080 feet.

An assessment of these benthic DO data indicate that **when viewed from the late 1970s to the present, there has been an observable reduction in these benthic low DO conditions**. This improving trend is evident only when current data are compared with data collected from the late 1970s and early 1980s.

Occurrences of low DO in the ocean have been attributed to a combination of natural processes and anthropogenic inputs of nutrients. Ocean waters naturally stratify as they warm in the summer. As phytoplankton bloom and die during the summer, natural biological activity decomposes the algae which in turn reduces DO levels near the ocean floor.

Recreational use attainment assessment in the ocean based upon bathing beach closures found that of 454 square miles assessed, greater than 99% fully met recreational designated uses. Areas of nonsupport are the York Street and Brown Street Beaches in Monmouth Co. A source trackdown found that both beaches receive contaminated stormwater from Wreck Pond in Wall Township.

The **National Shellfish Sanitation Program** (NSSP) collects data on the levels of total coliform in waters that are harvested for shellfish. The Department monitors the sanitary quality of estuarine and ocean waters by observing measurements of coliform bacterial concentrations (indicators of the presence of pathogens) in the water column. The results are used to classify bay, estuarine and ocean waters for shellfish harvesting. The data are analyzed for compliance with federal standards. Of the 1053 sq. miles of open coastal waters (estuary and ocean) assessed for shellfish harvesting, 83% fully support the use while 17% fail to support the use.

Sources and Causes of Nonsupport of Recreational and Shellfishing Uses in Coastal Waters:

Although recreational designated uses were largely met in NJ estuarine and ocean waters, localized problems occur. Sources of fecal coliform (FC) contamination that may affect NJ estuarine and ocean waters include:

- Municipal stormwater and runoff;
- Wildlife – congregations of seagulls are a suspected source of FC pollution in some areas;
- Sanitary discharges from boats;
- Municipal sewage treatment plants (STP) – There are 15 municipal STPs that discharge to the ocean in NJ;
- Possible downstream transport of fecal contamination from nontidal waters situated upstream;
- Transport from lakes – Field investigations have revealed that outflow from lake outlets have lead to bathing beach closures.

Fish Consumption Advisories

As far back as 1976, NJDEP instituted a comprehensive program to survey possible contamination of fish and crabs in New Jersey waters. Several fish and crab species have been identified as having contaminants in excess of advisory levels for PCBs, Dioxin and Mercury. In response, New Jersey along with many other states have developed fish consumption advisories that apply to specific species, generally in specific areas. Fish consumption advisories generally limit frequency of consumption.

The Department has issued statewide advisories for American eel, bluefish, striped bass, and American lobster for PCB contamination. Additional advisories in certain areas have been issued for white perch and white catfish for PCBs and finfish and crabs for dioxin.

The Department has also issued statewide mercury advisories in freshwater for largemouth bass, yellow and brown bullhead, and chain pickerel. Additional species such as yellow perch and sunfish are under an advisory but on a regional or waterbody specific basis. The complete list of exceptions to this advisory are noted in Table 3.4-2 of this Report.

New Jersey has placed waters with **mercury-based fish advisories** on sublist 5 with a low priority ranking. The Department will wait for an USEPA-sponsored national mercury policy before reconsidering its listing policy regarding mercury advisories and their placement on the Integrated List.

Surface Water Quality Management Program Updates and Monitoring Schedule

Chapter 4 provides **updates to surface water quality management programs** most of which focus on controlling land use as a vehicle to protect and improve water quality. Most of these programs are either newly developed within the last five to seven years, or have been well established but have recently undergone significant changes within that time period.

Of note for this cycle of the Integrated Report is the Department's implementation of numeric water quality criteria for Total Phosphorus and the development of new stormwater rules. These two initiatives are summarized below.

In 2003, the Department began implementing the numeric water quality criteria for Total Phosphorus to better control the discharge of phosphorus to the State's freshwater streams and lakes. The Department is implementing the numeric water quality criteria for total phosphorus as necessary to ensure that surface water quality standards are achieved. This process began in the fall of 2003 when the Commissioner announced the imposition of appropriate water quality based effluent limits through the New Jersey Pollutant Discharge Elimination System (NJPDES) discharge to surface water permits. It is expected that this initiative will provide additional

information for the assessment process and result in significant reductions of nutrients into state surface waters and a reduction in eutrophication statewide.

In 2004, the Department adopted modifications to the regulations which govern stormwater discharges. The adoption involved two new stormwater management rules, the first major update since such rules were first adopted in 1983. These rules govern the development of standards for state, municipal and regional stormwater management requirements, plans and ordinances. The rules focus on protecting environmentally sensitive and critical areas while encouraging continued growth in non-critical/sensitive regions within the state. The Department intends to prevent the loss and encourage restoration of environmentally critical areas in order to moderate the effects of development on water as well as overall environmental quality. A significant provision of the new rules is the requirement of a 300-foot buffer minimizing new development to protect Category One waterbodies. These buffers are designed to protect critical drinking water and sensitive ecological resources from degradation.

Chapter 4 contains descriptions of the NJDEP's Source Water Assessment Program (SWAP), the Surface Water Quality Standards Program (SWQS) and the expansions of C1 designations. Included are the Watershed Management Program and associated activities such as the new Stormwater Rules, the Nonpoint Source Control Program, and the Barnegat Bay Program. Also included are the Wetlands Protection Program, the Environmental Infrastructure Program and Green Acres Program. The section outlines New Jersey's efforts to reduce environmental mercury, to control floatables in coastal waters, and implement water quality-based effluent limits for Total Phosphorus through the Division of Water Quality. The chapter closes with an outline of the Department's surface water monitoring schedule indicating current and future monitoring priorities of the Department's Bureau of Freshwater and Biological Monitoring.

Ground-Water Quality

Ground-water quality data from 71 shallow wells in the Lower Delaware and Atlantic Coastal Water Regions within the New Jersey Coastal Plain were sampled. Data were stratified as a function of undeveloped, urban and agricultural land uses to assess non-point source impacts. Results are as follows:

- Well water quality in undeveloped areas form a good baseline for evaluating anthropogenic contaminant loads in agricultural and urban land uses.

- Total dissolved solids concentrations as well as the concentration, frequency, and variety of trace elements, nutrients, volatile organic hydrocarbons (VOC) and pesticides are found to be significantly higher in wells from agricultural and urban areas. These findings clearly illustrate man's impact to shallow groundwater.

- Shallow ground water samples in agricultural land use areas have the highest frequency of pesticide detection, highest median nitrate concentrations, gross alpha particle activity and total dissolved solids concentrations. These levels are likely to be related to the application of agricultural chemicals.

- Urban areas generally have lower dissolved oxygen, higher dissolved iron, chloride, and VOC concentrations.

In addition to the monitoring effort described above, the Department expects to obtain additional information regarding ground water as well as drinking water quality through the Private Well Testing Act (PWTA). Through this act, certain wells must be tested before a house can be sold.

Part II: Background: New Jersey Water Resources

Part II: BACKGROUND

New Jersey Water Resources

New Jersey is the fifth smallest state in the nation and contains a wide variety of land use types, water resources, geologic characteristics, and natural biota and fauna. Within the state's 7,788 square miles are 127 miles of coastline; 7,840 miles of rivers and streams (based upon USEPA's River Reach File 3 (RF3) hydrology); and 109 square miles (69,920 acres) of lakes and ponds larger than 2 acres. In addition, there are 1,482 square miles of fresh and saline marshes and wetlands, and 1,069 square miles of coastal waters. A summary of the state's population and water resources is presented in Table II-2.1 below:

Table II-2.1: New Jersey Water Resources Atlas

Resource	Extent
State Population (2000)	8,414,350
State Surface Jurisdictional Area	8,919 sq. miles[1]
State Surface Area	7,788 sq. miles[2]
Rivers and Streams	
Miles of rivers and streams (total)	7,840
Miles of nontidal rivers and streams	6,330
Miles of tidal river and streams	1,510
Miles of perennial rivers and streams (nontidal and tidal)	7,530
Miles of intermittent (non-perennial) streams (nontidal and tidal)	310
Miles of canals and ditches[3]	675
Border miles shared rivers/streams (nontidal and tidal)	197
Lakes, Ponds and Reservoirs	
Number of lakes/reservoirs/ponds (2 acres and larger)	3,268
Acres of lakes/reservoirs/ponds (2 acres and larger)	69,825
Number of significant publicly owned lakes/reservoirs/ponds	380
Acres of significant publicly owned lakes/reservoirs/ponds	24,000
Estuaries and Ocean	
Square Miles of Estuaries/Harbors/Bays	615
Miles of Ocean Coast (linear miles)	127
Miles of Ocean Coast (sq. mi. of jurisdictional waters)	454
Wetlands	
Acres of Freshwater Wetlands	739,160
Acres of Tidal Wetlands	209,269

Notes:

1 Includes coastal waters within New Jersey jurisdiction as shown on Figure II-2, based on the sum of 151 HUC-11 watersheds using 1986 Land Use/Land Cover GIS coverage.

2 Excludes coastal waters within New Jersey jurisdiction as shown on Figure II-1, based on the sum of 5 Water Regions using 1986 Land Use/Land Cover GIS coverage.

3 Not included in the total miles of rivers and streams

It should be noted that the lake data provided in this report are different than data reported in the 2002 New Jersey Water Quality Inventory Report. Although the same computer based mapping system (GIS) was used to determine lake acreage; the data was reviewed and updated to more accurately reflect the state's hydrology. The number of lakes and lake acreage was reduced by excluding municipal and industrial holding ponds, cranberry bogs, and merging lakes that shared the same name and were hydraulically connected.

The five Water Regions in the state are shown on Figure AII-1 in the Appendix**.** These include the Northwest (1,226 sq. miles), Lower Delaware (2,228 sq. miles), Northeast (953 sq. miles), Raritan (1,284 sq. miles) and Atlantic Coastal (2,877 sq. miles). Drainage areas include New Jersey portions only.

The 5 Water Regions have been divided into 20 Watershed Management Areas (WMA's) for Management purposes, as shown on Figure AII-1. Watershed Management Areas are comprised of 151 HUC-11 watersheds, which are shown on Figure AII-2. These 151 HUC-11 watersheds are part of a national system of watershed based hydrologic units (HUC's) developed by the United States Geological Survey, United States Soil Conservation Service and the US Environmental Protection Agency.

Figure II-1 New Jersey Watershed Management Areas and Regions

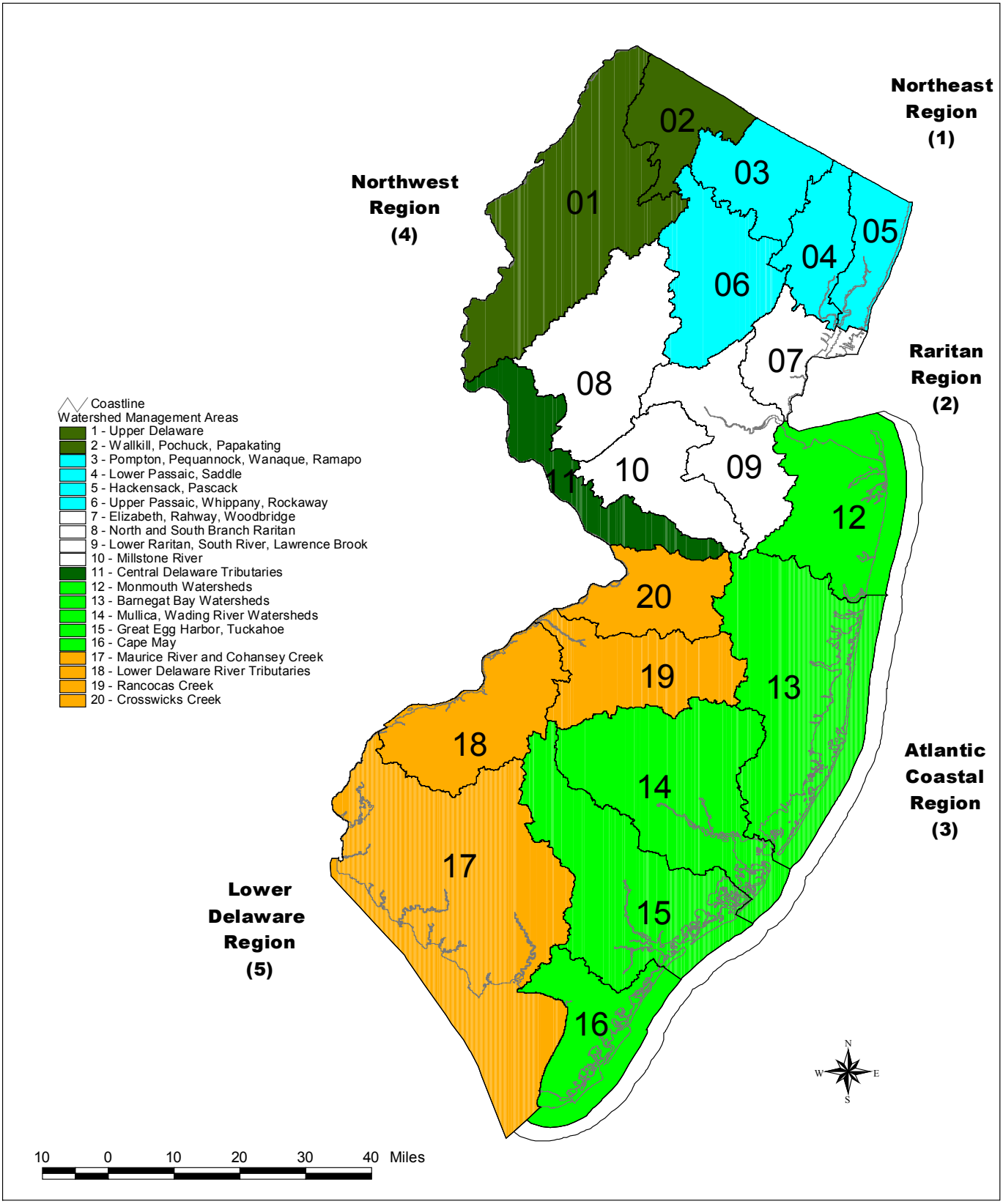
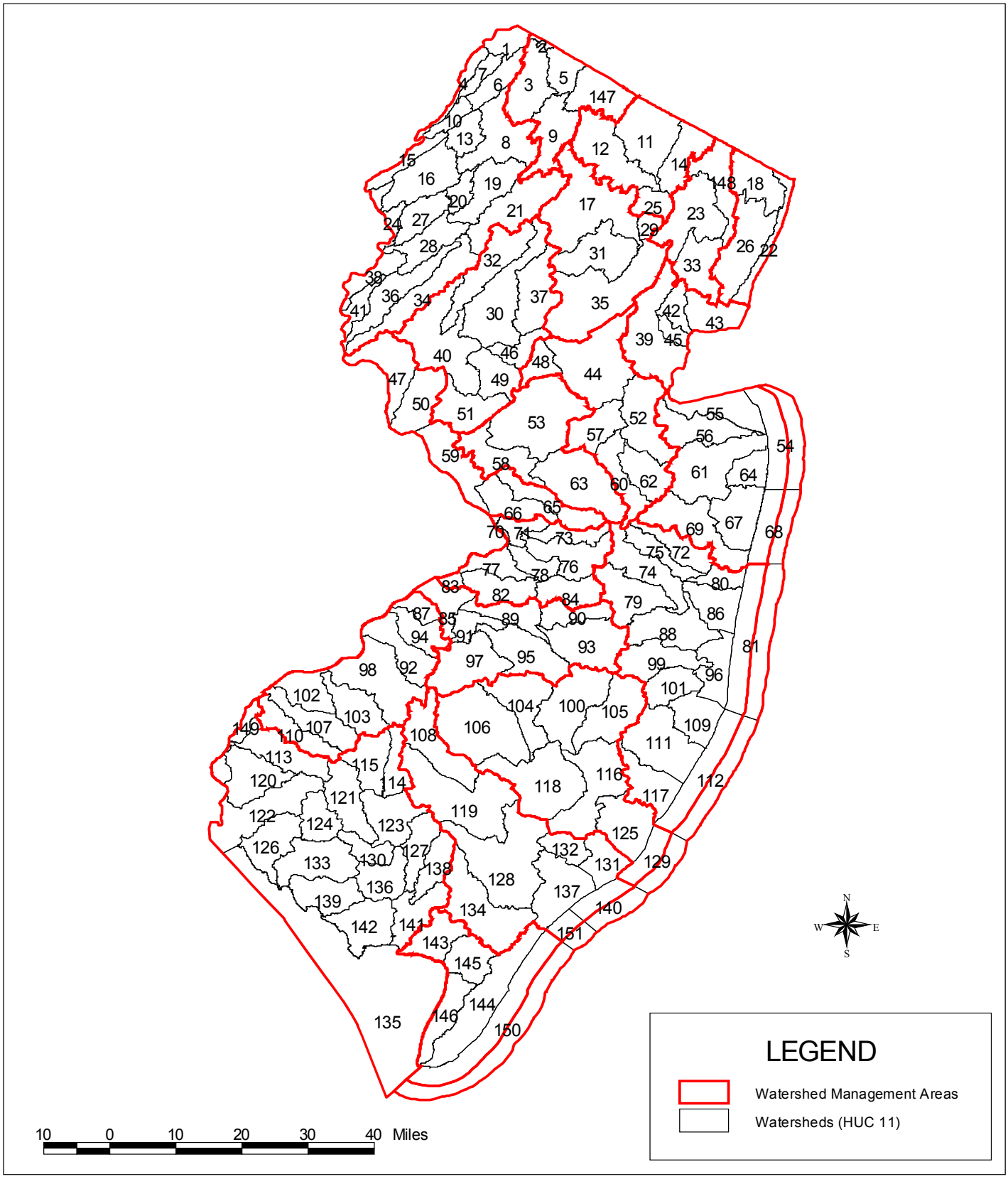


Figure II-2 New Jersey Watersheds (HUC 11)



Designated Use Summary Tables

River and Stream – Non Tidal

Individual Use Support Summary Table: River and Stream miles (National Uses)

Rivers and Streams Designated Use	Total Miles Assessed	Sublist 1		Sublist 3		Sublist 4		Sublist 5	
		monitored	estimated	monitored	estimated	monitored	estimated	monitored	estimated
Overall Use Support	3,829	665	150	547	0	254	31	1,922	260
Aquatic Life Support [1]	2,580	729	44	930	0	0	0	795	82
Primary Contact Recreation [2]	2,423	499	152	127	36	1,138	213	211	47
Agricultural Use [3]	2,541	1,821	462	232	26	0	0	0	0
Industrial Use [4]	2,180	1,190	262	258	0	0	0	392	78
Drinking Water [5]	2,683	1,656	487	108	2	0	0	416	14
Fish Consumption	358	0	0	0	0	0	0	358	0

[1] - based upon assessments of benthic macroinvertebrate communities
[2] - based upon assessments of fecal coliform
[3] - based upon assessments of total dissolved solids
[4] - based upon assessments of pH and total suspended solids
[5] - based upon assessments of nitrate, metals, and toxics

River and Stream – Tidal

Individual Use Support Summary Table: River and Stream miles (National Uses)

Rivers and Streams Designated Use	Total Miles Assessed	Sublist 1		Sublist 3		Sublist 4		Sublist 5	
		monitored	estimated	monitored	estimated	monitored	estimated	monitored	estimated
Overall Use Support	1,128	38	0	9	0	22	0	1,059	0
Aquatic Life Support [1]	441	378	0	11	0	0	0	52	0
Primary Contact Recreation [2]	192	112	0	22	0	0	0	58	0
Agricultural Use [3]	89	68	0	15	6	0	0	0	0
Industrial Use [4]	143	108	6	0	0	0	0	29	0
Drinking Water [5]	101	30	6	0	0	0	0	66	0
Fish Consumption	1,073	0	0	0	0	0	0	1,073	0
Shellfish Consumption	910	30	0	0	0	0	0	880	0

[1] - based upon assessments of dissolved oxygen
[2] - based upon assessments of fecal coliform
[3] - based upon assessments of total dissolved solids
[4] - based upon assessments of pH and total suspended solids
[5] - based upon assessments of nitrate, metals, and toxics

Lakes

Individual Use Support Summary Table: Lake Acres (National Uses)

Lake Designated Use	Total Acres Assessed	Sublist 1		Sublist 3		Sublist 4		Sublist 5	
		monitored	estimated	monitored	estimated	monitored	estimated	monitored	estimated
Overall Use Support	35,584	9,170	0	1,407	0	982	0	24,025	0
Aquatic Life Support [1]	14,547	8,781	0	951	0	0	0	4,815	0
Primary Contact Recreation [2]	18,948	12,531	0	17	0	0	0	6,400	0
Fish Consumption	19,947	0	0	0	0	0	0	19,947	0
Aesthetics	10,263	320	0	4,087	0	4,055	0	1,801	0

[1] - Lakes in this category are assessed via the Bureau of Fresh Water Fisheries.

[2] - based on 283 of 321 lake bathing beaches that have been located on GIS. GPS locations of remaining lakes are being collected and will be available for a future report.

Estuaries

Individual Use Support Summary Table: Estuaries in Sq. Miles (National Uses)

Estuary Designated Use	Total Sq. Miles Assessed	Sublist 1		Sublist 3		Sublist 4		Sublist 5	
		monitored	estimated	monitored	estimated	monitored	estimated	monitored	estimated
Overall Use Support	616	134	0	0	0	0	0	482	0
Aquatic Life Support [1]	616	294	0	0	0	0	0	322	0
Primary Contact Recreation [2]	616	309	0	305	0	0	0	2	0
Fish Consumption	429	0	0	0	0	0	0	429	0
Shellfish Consumption [3]	600	455	0	<1	0	0	0	145	0

[1] - based upon assessments of dissolved oxygen levels

[2] - based upon assessments of fecal coliform

[3] - These numbers reflect all waters located within New Jersey's jurisdiction including Delaware Bay, Sandy Hook Bay and Raritan Bay. The Interstate Environmental Commission (IEC) submits a 305(b) Report for interstate waters which includes parts of Raritan and Sandy Hook Bays and the 305(b) Report submitted by the Delaware River Basin Commission (DRBC) includes portions of Delaware Bay. NJ will work with EPA to identify NJ waters assessed by IEC and DRBC to eliminate double counting these waters in the national 305(b) Report.

Ocean

Individual Use Support Summary Table: Ocean in Sq. Miles (National Uses)

Ocean Designated Use	Total Sq. Miles Assessed	Sublist 1		Sublist 3		Sublist 4		Sublist 5	
		monitored	estimated	monitored	estimated	monitored	estimated	monitored	estimated
Overall Use Support	454	0	0	0	0	0	0	454	0
Aquatic Life Support [1]	454	0	0	0	0	0	0	454	0
Primary Contact Recreation [2]	454	454	0	0	0	0	0	0	0
Fish Consumption	187	0	0	0	0	0	0	187	0
Shellfish Consumption	453	416	0	<1	0	0	0	37	0

[1] - based upon assessments of dissolved oxygen levels

[2] - based upon assessments of fecal coliform

Coastal Waters

Individual Use Support Summary Table: Coastal Waters in Sq. Miles [1] (National Uses)

Coastal Waters Designated Use	Total Sq. Miles Assessed	Sublist 1		Sublist 3		Sublist 4		Sublist 5	
		monitored	estimated	monitored	estimated	monitored	estimated	monitored	estimated
Overall Use Support	1,070	134	0	0	0	0	0	936	0
Aquatic Life Support [2]	1,070	294	0	0	0	0	0	776	0
Primary Contact Recreation [3]	1,070	762	0	306	0	0	0	2	0
Fish Consumption	617	0	0	0	0	0	0	617	0
Shellfish Consumption[4]	1,054	871	0	1	0	0	0	182	0

[1] - this table provides a sum of Estuarine and Ocean Tables

[2] - based upon assessments of dissolved oxygen levels

[3] - based upon assessments of fecal coliform

[4] - These numbers reflect all waters located within New Jersey's jurisdiction including Delaware Bay, Sandy Hook Bay and Raritan Bay. The Interstate Environmental Commission (IEC) submits a 305(b) Report for interstate waters which includes parts of Raritan and Sandy Hook Bays and the 305(b) Report submitted by the Delaware River Basin Commission (DRBC) includes portions of Delaware Bay. NJ will work with EPA to identify NJ waters assessed by IEC and DRBC to eliminate double counting these waters in the national 305(b) Report.

Part III: Surface Water Assessment and Program Update

Part III: SURFACE WATER ASSESSMENTS AND PROGRAM UPDATES

Chapter 1: Spatial Extent and Comprehensive Assessment

The U.S. Environmental Protection Agency (EPA) guidance (USEPA 2002) recommends that each assessment of collected sampling data be applied to a waterbody with a specific spatial extent (e.g., stream miles, lake, estuary and ocean acres). Additionally, the National Academy of Sciences published a report to Congress that addressed the need for improved scientific basis for assessments completed by states for the 305(b) and 303(d) reports. In response, NJDEP revised and improved its assessment methods including the development of a new method to determine the spatial extent of monitoring networks. Spatial assessment methods were first developed in the late 1990's that estimated the stream miles associated with each monitoring site, however, the methods had many limitations and the need for an improved scientific-based approach was clear.

Prior to the 2002 Integrated Report, the Department made two attempts to determine the spatial extent of assessed river reaches. Both of these efforts aimed to create simple, easy to apply methods due to limited personnel staffing and resources. The first approach assumed each sampling site represented 5 river miles, 2.5 miles upstream and 2.5 miles downstream of the monitoring site. This method was derived from EPA's 305(b) guidance, but lacked any scientific basis in determining the spatial extent. Although this approach was user friendly, the most obvious shortcoming was that each monitoring site was treated as the same notwithstanding that environmental conditions were unique to each site. The consequences included overestimating the spatial extent of aquatic life sites, and underestimating the spatial extent of chemical monitoring sites on larger rivers. Many aquatic life sites were overestimated by overlapping assessment areas caused by sites being located within 3 miles of each other. On the other hand, chemical sites were underestimated on larger rivers such as the Passaic and Raritan Rivers where sites represent river stretches longer than 5 miles. Additionally, no tributaries were associated with the sampling site although conditions could be similar.

In order to treat each site as having unique environmental conditions, the new spatial extent approach assigns each sampling site to the river segment in which it is located. These river segments are assigned using USEPA's Reach File 3 (RF3) hydrological map, a 1:100,000 hydrology Geographic Information System (GIS) coverage of the state. The delineation of the RF3 river segments is based on a change in hydrology such as a river confluence, a water impoundment (lake), or other significant hydrological change. The limitation to this approach is that the assessment length is very short for the monitoring sites. Many of the spatial extents are less than one mile and seem to underestimate the assessment length for the majority of sites. Thus very small tributaries (1^{st} or 2^{nd} order streams) are causing stream segments to be very short in many areas, although their impact on the mainstem could be negligible. In addition, tributaries are not associated with the sampling site as in the previous spatial extent method. The consequences of this method resulted in only 176 of 7,800 river miles being assessed for chemical sites, while over $1 million was spent on collecting data from the network.

The goal in developing the new spatial extent approach is to improve estimates of assigning waterbodies to monitoring stations by maximizing the use of monitoring data without overestimating spatial extent. The approach overcomes the limitations of the previous attempts to determine assessment lengths by extending the size of the RF3 segments. This avoids the shortfalls of assigning a fixed assessment area for each site, including tributaries with similar water quality conditions, while at the same time, preventing overestimating the spatial length of the assessments. Under this new method, an estimation of the spatial extent for each monitoring site in the NJDEP's biological and chemical networks is also applicable to other monitoring stations where data is collected. In addition to developing spatial extents for rivers, the Department applied new methods to determine spatial extent for lakes, estuaries, and ocean areas. See the Methods Document, Section 6, for the procedures to determine spatial extents.

The results of the new spatial extent method shows a total of 3,841 non-tidal river miles were assessed accounting for 61% of the total non-tidal river miles in the state (See Figure 1-1). The remaining 39% of the river miles had no data collected at their locations or were not assessed for this report. Of the assessed rivers, 2,573 miles were assessed for aquatic life, 2,870 miles were assessed for chemicals and metals, and 358 miles posted fish advisories. In tidal areas, a total of 1,438 river miles were assessed accounting for 95% of tidal rivers, and 100% of estuaries, bays, and ocean waters were assessed for at least one designated use (See Figure 1-2). The tidal river assessments consisted of: 910 miles for shellfish, 482 miles for chemicals and metals, 446 miles for aquatic life, and 1,073 miles of fish advisories. Meanwhile, coastal waters were assessed for shellfish (1,054 sq. mi.), aquatic life (1,070 sq. mi.), recreation (1,070 sq. mi.), fish advisories (617 sq. mi.), and metals (75 sq. mi.). The assessment of lakes had the lowest comprehensive coverage of all the waterbodies. Only 451 of 3,268 lakes were assessed (See Figure 1-3). This accounted for only 14% of the lakes in the state and included the following designated use assessments: 321 lakes for recreation, 119 lakes for trophic status, 168 lakes for aquatic life, and 65 lakes for fish advisories.

As mentioned in the "Methods Document," evaluated waters are categorized into two types:

- **Monitored Waters**: assessment results applied to a waterbody based on monitoring site data using the hydrologic method for estimating spatial extent (discussed in Section 6). Given the high degree of confidence in these results for monitored waters, they will be used to place a waterbody in Sublists 1 through 5.

- **Estimated Waters**: assessment results extrapolated from adjacent monitored waters using the hydrologic method for estimating spatial extent (discussed in Section 6). Extrapolations will be based on land use, possible pollution sources, and best professional judgement. Given the lower degree of confidence in these results for estimated waters, they will not require a TMDL if estimated as impaired.

A total of 505 non-tidal river miles (18% of chemical assessments) were estimated based on chemical monitoring stations, while only 126 non-tidal river miles (5% of aquatic life

assessments) were estimated for aquatic life monitoring stations. No tidal rivers, lakes, estuaries, or ocean waters were estimated for any designated uses.

FIGURE 1-1. Assessed River Reaches. Includes monitored and estimated rivers.

FIGURE 1-2. Assessed Coastal Waters.

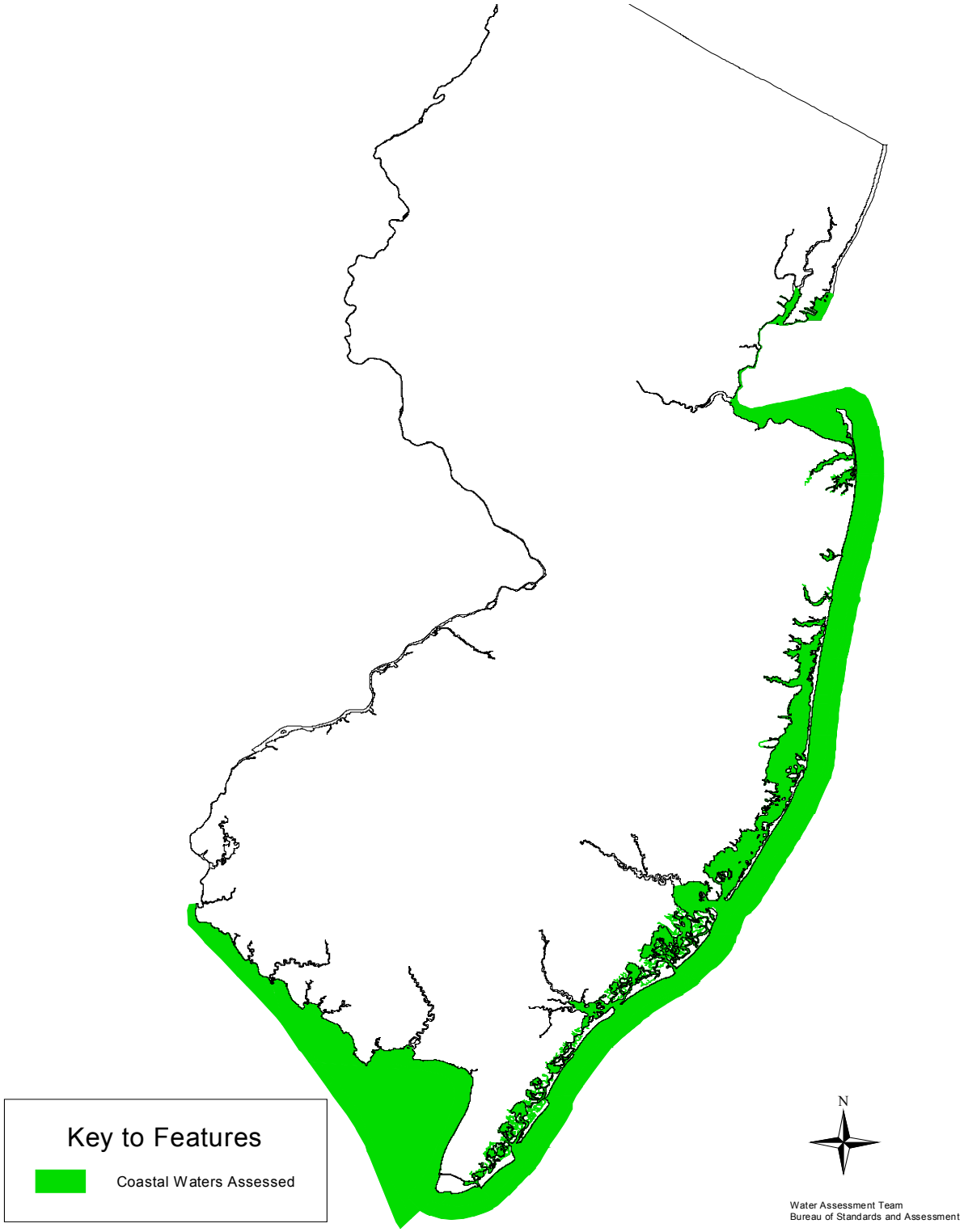
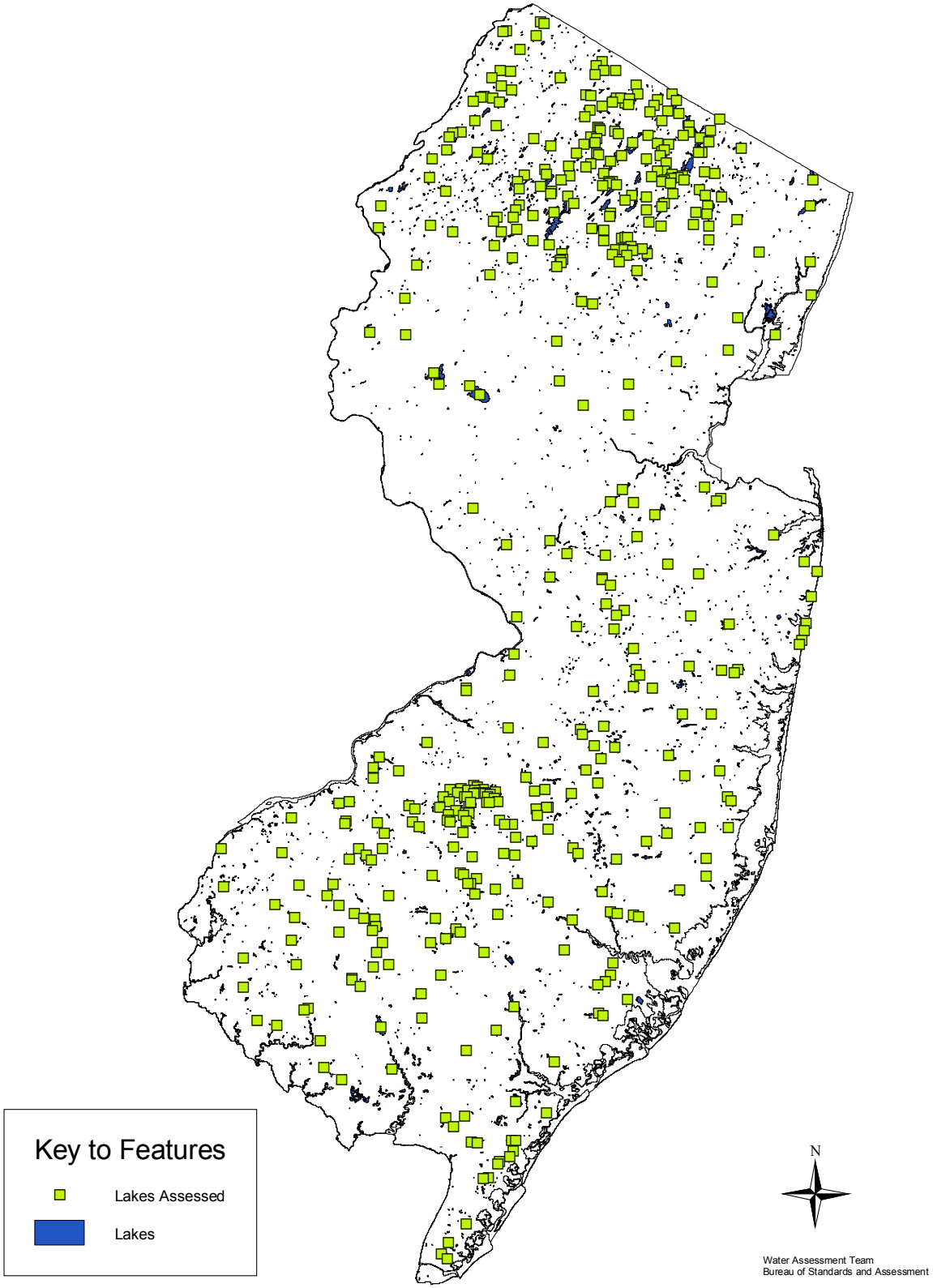


FIGURE 1-3. Assessed Lakes.



Chapter 2: Chemical Water Quality Assessment

Section 2.1 Non-Tidal Rivers

New Jersey's rivers are used for multiple purposes such as water supplies for drinking water, industry and agriculture, trout and warm-water fisheries, aquatic resources, recreation (e.g., boating, swimming), and waste disposal. The characterization that follows describes water quality in freshwater, non-tidal rivers. The assessments are based on water quality status and trends with respect to the Surface Water Quality Standards (SWQS), and attainment of designated uses for recreation, drinking water, agriculture, and industry.

Approximately 457 stations representing 2,870 river miles were assessed for at least one of the following parameters; total phosphorus, pH, dissolved oxygen, temperature, fecal coliform, nitrate, total suspended solids, total dissolved solids, unionized ammonia, metals, and toxics. Of the 2,870 assessed river miles, 2,187 river miles (76% of assessed non-tidal river miles) did not meet the SWQS for at least one parameter. As Figure 2.1-1 shows, the chemical parameters of most concern in the state are fecal coliform, total phosphorus, pH, and metals. The Department is addressing these issues primarily through the development of Total Maximum Daily Loads (TMDLs). In addition, the Department has selected fecal coliform, which comprises over 38% of all chemical exceedances, as the priority parameter for TMDL implementation. At this time, EPA has approved TMDLs for approximately 80% of the fecal coliform impairments. Total phosphorus also continues to be a major concern and will be addressed through a combination of permitting strategies and TMDL development. For pH, the exceedances may not be as significant as the figure demonstrates and is explained in the pH Water Characterization Section. The Department continues to sample metals data and will plan future courses of action when all data is evaluated.

FIGURE 2.1-1. River Miles with Chemical Exceedances. Graph based on 10 chemical parameters evaluated in non-tidal rivers.

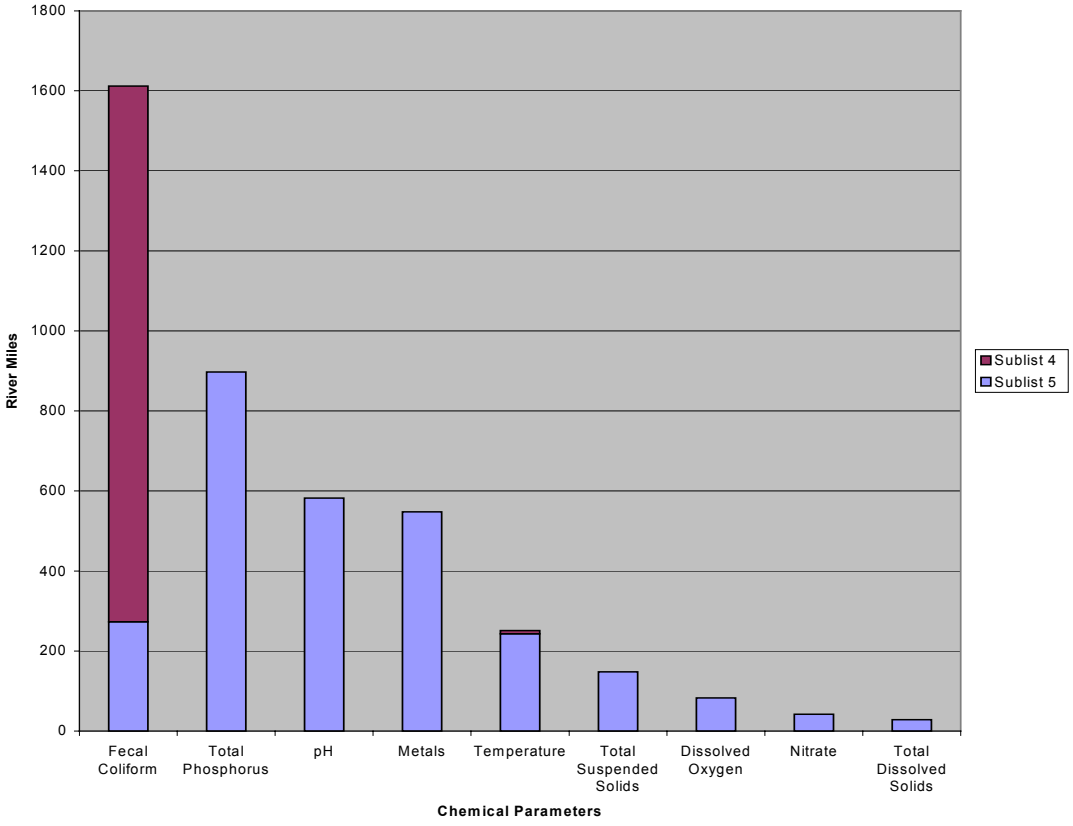


FIGURE 2.1-2. Chemical Monitoring Stations.

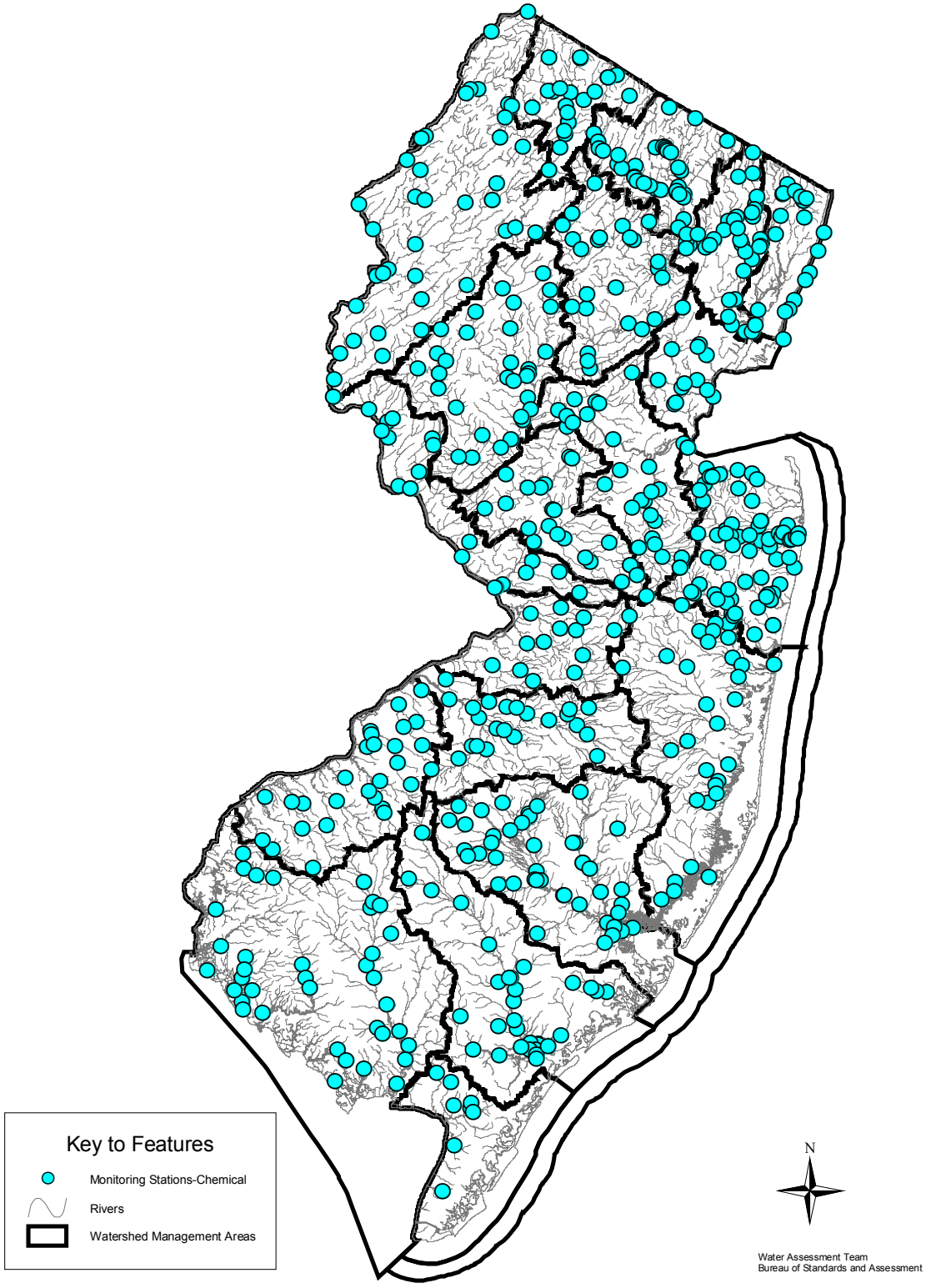
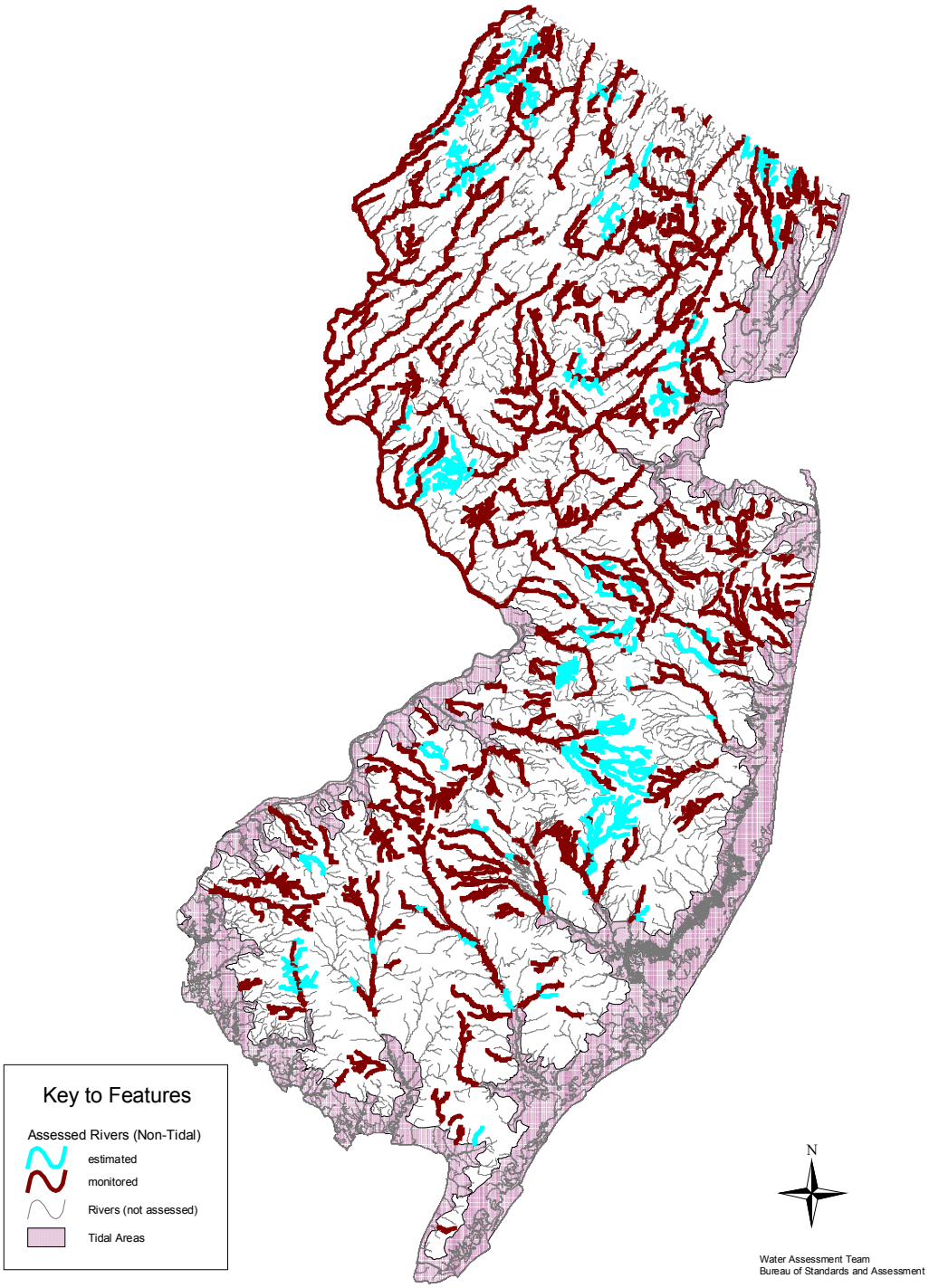


FIGURE 2.1-2b. Types of Assessed Non-Tidal Rivers. Monitored and estimated river reaches.



Section 2.1a Conventional Assessments

Conventional water quality parameters include: total phosphorus, pH, dissolved oxygen, temperature, fecal coliform, nitrate, total suspended solids, total dissolved solids, and unionized ammonia. Prior exceedances of the SWQS for conventional water quality parameters in non-tidal rivers have been documented at 103 sites in the 1998 303(d) List with many of the sites having multiple conventionals exceeding the standards. Since the publication of the 1998 303(d) List, extensive data sampling has been completed (see Data Sources below). In addition to many new sites being monitored, a majority of the sites on the 1998 303(d) List have been re-sampled, resulting in only 14 sites without new data. (see Table 2.1a-1).

Table 2.1a-1: Monitored Sites on the 1998 303(d) List Without New Data

WMA	Site Number	Site Name	Conventionals Carried Over
18	01467120	Cooper River At Lidenwold	Phosphorus, Fecal Coliform
05	01378500	Hackensack River At New Milford	Phosphorus, Fecal Coliform
09	01399200	Lamington River Near Ironia	Phosphorus, Fecal Coliform, Dissolved Oxygen,
09	01405400	Manalapan Brook Near Spotswood	Fecal Coliform
10	01401440	Millstone River At Kingston	Phosphorus, Fecal Coliform, pH, Temperature
10	01402540	Millstone River At Weston	Phosphorus, Fecal Coliform, pH
01	01455500	Musconetcong River At Lake Hopatcong	Fecal Coliform, pH, Temperature
01	01455500	Musconetcong River At Lockwood	Phosphorus, Fecal Coliform, Temperature
19	01465970	NB Rancocas Creek At Browns Mills	Phosphorus, Fecal Coliform, pH
04	01389130	Passaic River At Sigac	Fecal Coliform
17	Salem	Salem River At Courses Landing	Phosphorus, Fecal Coliform, Dissolved Oxygen, Temperature
12	01407750	Shark River Near Neptune	Fecal Coliform
08	01396800	Spruce Run At Clinton	Phosphorus, pH, Temperature
03	01387000	Wanaque River At Wanaque	Phosphorus, Fecal Coliform, Dissolved Oxygen

On the 2004 Integrated List, 375 stations representing 2,797 river miles were listed with 2,064 river miles (74% of total assessed miles) exceeding a standard for at least one conventional parameter (representing sublist 4 and 5 combined) (see Table 2.1a-2). Waterbodies assessed as impaired were primarily due to fecal coliform, total phosphorus, and pH exceedances; 1,615, 915, and 592 miles respectively. On sublist 4, 62 of the 63 listings are based on fecal coliform TMDLs.

TABLE 2.1a-2: Overall Conventional Status in Non-Tidal Rivers

Conventionals Status	Number of Stations	Percent of Stations	Number of Assessed River Miles		Percent of Assessed River Miles	
			Monitor	Estimate	Monitor	Estimate
Sublist 1	80	21%	506	172	23%	34%
Sublist 3	6	2%	55	0	2%	0%
Sublist 4	63	17%	399	40	17%	8%
Sublist 5	226	60%	1,333	292	58%	**58%**
Totals	375	100%	2,293	504	100%	100%

Since 1998, the NJDEP/USGS Redesigned Ambient Stream Monitoring Network (Redesigned ASMN) has conducted sampling at seven background sites that represent undisturbed, natural ambient river conditions. It is presumed the only input into these systems are natural and from atmospheric deposition. The data at the background sites were compared to statewide conditions (using statewide status stations) encompassing data between 1998 to 2002. Comparing the statewide data to the background sites gives us an indication how manmade sources are impacting the state's waterways. The results show that nutrients, fecal coliform, and dissolved solids all have significant differences between background and statewide averages. Nutrient concentrations were very low at the background sites and showed very little variation; while statewide concentrations for total phosphorus exceeded its criteria frequently, and nitrate showed elevated levels in some areas, but no exceedances of its criteria. Fecal coliform at the background sites had overall low averages, but there were some occurrences of exceedances and one site, Double Kill at Wawayanda, was listed on the Integrated List as impaired. Statewide averages for fecal coliform were significantly higher and showed widespread impairment throughout the state. Dissolved solids at the background sites were low and although the statewide average was higher, there were few exceedances at sites. In addition, dissolved oxygen, unionized ammonia, and temperature data were similar at the background and statewide sites while pH varied widely depending on the site's location and geology of the area.

Table 2.1a-3: Background and Statewide Data

Statewide	**Total Phosphorus**	**Nitrate**	**Temperature**	**Dissolved Oxygen**	**pH**	**Dissolved Solids**	**Unionized Ammonia**	**Fecal Coliform**
Total Samples	776	776	784	781	779	712	755	870
Average	0.09	0.95	11.72	9.22	6.77	167.81	0.58	1879.54
Maximum	1.76	9.77	28	0.3 (min)	9/3.4 (max/min)	4190	39.65	30000
Background								
Total Samples	120	120	120	119	116	103	115	136
Average	0.014	0.18	10.77	9.29	6.30	65.71	0.09	129.11
Maximum	0.06	1.59	24.5	2.2 (min)	8/3.9 (max/min)	179	0.818	2400

Data Sources

Sites represented on the 1998 303(d) list are primarily based upon data from the NJDEP/USGS Ambient Surface Water Monitoring Network (ASMN). The collection of new data has expanded the number of sites significantly. See Appendix II, Data Sources in the 2004 Integrated Report for details of the monitoring networks. Below are the data network sources for conventional water quality parameters on the 2004 Integrated List:

- NJDEP/USGS Ambient Stream Monitoring Network (ASMN) (76 sites)– Data collected prior to October 1997. In October 1997, 42 stations were discontinued. These sites are based on the latest assessment results from the 2000 305(b) report which used data from 1995 to 1997. The current protocol described in the Methods Document was followed for the final assessment results.

- NJDEP/USGS Redesigned Ambient Stream Monitoring Network (Redesigned ASMN) (198 sites) – Data collected from October 1997 to Present.

- NJDEP Existing Water Quality Network (81 sites) – Data collected from 2000-2002.

- Monmouth County Health Department (39 sites) – Data collected from 1996-2000.

- USGS/Pinelands Commission Network (15 sites) – Data collected from 1996–1998.

- Pequannock River Coalition (21 sites) – Data collected from 1998–2002.

- National Water Quality Assessment Network (NAWQA) (6 sites) – Data collected from 1996-1998.

- Delaware River Basin Commission Network (DRBC) (15 sites) – Data collected from 1999-2002.

- Sussex County Municipal Utilities Authority (SMUA) (8 sites) – Data collected from 2002-2003.

- Passaic Valley Sewage Commission (PVSC) (17 sites) – Data collected from 2000-2002.

Total Phosphorus Water Quality Assessment

Description

Total phosphorus (TP) is a nutrient that has been found to be limiting in many freshwater systems. "Limiting nutrients" are present in pristine systems in very low concentrations and tend to limit the growth of aquatic algae and vegetation. Elevated nutrients can contribute to excessive primary production (i.e., growth of aquatic algae and vegetation). Waterbodies affected by excessive primary productivity are characterized by significant algae and weed growth and episodes of low dissolved oxygen. Low dissolved oxygen episodes occur when the algae die off, and bacteria consume the dissolved oxygen in the process of decomposition. Euthrophic water are also characterized by fluctuating dissolved oxygen levels during the diurnal cycle. During the day, dissolved oxygen levels are elevated as photosynthesis occurs, and low dissolved oxygen levels occur during the night when the plants and aquatic organisms respirate. To protect surface waters from excessive primary productivity, New Jersey's SWQS includes nutrient policies and criteria for total phosphorus. (See N.J.A.C. 7:9B-1.5(g) and 1.14(c)). For this report, the total phosphorus criteria of 0.1 mg/l was used to determine if water quality was impaired. In the case of rivers at the point where it enters lakes, the criteria is 0.05 mg/l. However, no stations are located at the point of entering lakes, therefore, the criteria of 0.05 mg/l was not applied to any assessment of water quality.

Excessive primary productivity may impair aquatic life and recreational designated uses. Additional assessments are needed to identify designated use impairments due to

excessive primary productivity and to evaluate the relative contributions of phosphorus, nitrate and other nutrients. Therefore, it was not possible to link elevated concentrations of TP to use impairment. Some major considerations during assessments should include the following factors:

- Attached periphyton is often the major location of primary productivity in streams- not free floating algae.
- Nutrient cycling between the water column and the sediments, and in turn the sediments and the aquatic periphyton community, may result in water column nutrient measurements that have very low concentrations even though the waterbody is eutrophic (nutrients are fixed in aquatic plants and algae).
- Watershed Location is Critical: Depositional areas, wetlands, lakes, and reservoirs are most prone to eutrophication, not fast flowing streams. Existing monitoring sites are not targeted to these areas.
- Season, stream flow, storm events have significant effects on primary production and nutrient limitation.

Assessment

A total of 347 stations representing 2,634 river miles were assessed for total phosphorus. The statewide TP average was 0.09 mg/l with more than half of the stations meeting TP standards (54% attaining, 35% non attaining) when excluding sites with insufficient data. The Pinelands and northwest portions of the state had a majority of their stations fully meeting TP criteria, while the remaining sections of the state had a substantial number of sites not meeting standards. Two sites on the Whippany River were mistakenly placed on Sublist 4 as not requiring a TMDL in the 2002 Integrated List. These sites were placed back on Sublist 5 and TMDLs will be developed for this waterbody by the Department. Ten sites representing 26 miles did not have new data for assessments and were carried over from the 1998 303(d) List.

Twelve sites, mostly in the Pinelands, had extremely low TP concentrations with TP averages less than 0.011 mg/l (see Table 2.1a-6). On the other hand, 25 stations exceeded the criteria in at least 80% of samples collected. Review of the data shows that TP levels in the Passaic River Basin are elevated with seven sites included in the top ten highest median total phosphorus concentrations statewide (see Table 2.1a-7).

Results of the TP assessment are summarized below in Table 2.1a-4. Results for individual stations are depicted in Figure 2.1a-1 and in Table II-1 and Table II-10 in the Appendix.

Table 2.1a-4: Total Phosphorus Status

TP Status	Number of Stations	Percent of Stations	Number of Assessed River Miles		Percent of Assessed River Miles	
			Monitor	Estimate	Monitor	Estimate
Sublist 1	174	50%	1,119	300	53%	59%
Sublist 3	46	13%	262	38	12%	8%
Sublist 4	0	0%	0	0	0%	0%
Sublist 5	127	37%	748	167	35%	33%
Totals	347	100%	2,123	505	100%	100%

Table 2.1a-5: Stations Exceeding SWQS for TP

Station Name	Station Number	Station Name	Station Number
01464578	Annaricken Brook near Jobstown	01377500, 5-PAS-1	Pascack Brook at Westwood
01464020, 01464000, DRBCNJ1338	Assunpink Creek at Peace Street at Trenton	EWQ0231	Passaic River at Eagle Rock Ave in East Hanover
4	Assunpink Creek at Route 539 in Upper Freehold	01389880, 01389870, Passaic-8, Passaic-9, Passaic-10	Passaic River at Elmwood Park
01464583	Barkers Brook N Br near Jobstown	01389500, Passaic-11, Passaic-12	Passaic River at Little Falls
56	Barren Neck Brook at Long Bridge Rd in Colts Neck	01389130	Passaic River at Singac
01413013	Barrett Run at Bridgeton	01382000	Passaic River at Two Bridges
01401600	Bedens Brook near Rocky Hill	01389005	Passaic River Below Pompton River at Two Bridges
EWQ0470, 21, 57	Big Brook at Colts Neck	01379500	Passaic River near Chatham
01467359	Big Timber Creek N Br at Glendora	01379000, EWQ0224	Passaic River near Millington
01467329	Big Timber Creek S Br at Blackwood Terrace	01443250	Paulins Kill at Warbasse Junction Rd near Lafayette
01378855	Black Brook at Madison	01467069	Pennsauken Creek N Br near Morrestown
Wallkill F	Black Creek at Rt 94/517 in Vernon	01467081	Pennsauken Creek S Br at Cherry Hill
01368950, Wallkill H	Black Creek near Vernon	01445500	Pequest River at Pequest
01464527	Blacks Creek at Chesterfield - Georgetown Rd	01446400, DRBCNJ0033	Pequest River on Water Street at Belvidere
54	Bordons Brook at Rt 520 in Holmdel	01401700	Pike Run near Rocky Hill
01403900	Bound Brook at Middlesex	01455200	Pohatcong Creek at New Village
01403385	Bound Brook at Route 28 at Middlesex	DRBCNJ0027	Pohatcong Creek at River Rd Bridge
01396900	Cakepoulin Creek at Lansdown Rd near Lansdown	01388910	Pompton River at Rt 202 in Wayne
01412800	Cohansey River at Seeley	01407630, 59	Poplar Brook at Deal
01378560	Coles Brook at Hackensack	01477160	Raccoon Creek at Rt 130 in Bridgeport
01467150, 01467140	Cooper River at Haddonfield	01477120	Raccoon Creek near Swedesboro
01467120	Cooper River at Lindenwold	01395000	Rahway River at Rahway
01467155	Cooper River N Br at Kresson	01394500	Rahway River near Springfield
01464500	Crosswicks Creek at Extonville	01396030	Rahway River S Br at Colonia
01464504	Crosswicks Creek at Groveville Rd at Groveville	01393960	Rahway River W Br at Northfield Av at West Orange
2	Crosswicks Creek at Walnford Rd in Upper Freehold	53	Ramanessin Brook at Willow Rd in Holmdel
01464420	Crosswicks Creek near New Egypt	01388100, 01388000	Ramapo River at Dawes Highway
01379200	Dead River near Millington	01387500	Ramapo River near Mahwah
01464515	Doctors Creek at Allentown	01465970	Rancocas Creek N Br at Browns Mills
3	Doctors Creek at Route 539 in Upper Freehold	01467005, 01467006, 01467003	Rancocas Creek N Br at Iron Works Park at Mt Holly
01475090	Edwards Run at Jefferson	01465850	Rancocas Creek S Br at Vincentown
01393450	Elizabeth River at Ursino Lk at Elizabeth	EWQ0169	Rancocas Creek SW Br at Rt 70 in Medford
01393350	Elizabeth River W Br near Union	01400500	Raritan River at Manville
20	Gravelly Brook at Lloyd Rd in Marlboro	01403300	Raritan River at Queens Bridge
01378500	Hackensack River at New Milford	01396280, EWQ0316	Raritan River S Br at Middle Valley

Table 2.1a-5: Stations Exceeding SWQS for TP (cont.)

Station Name	Station Number	Station Name	Station Number
01409416	Hammonton Creek at Westcoatville	01398102, 01398070	Raritan River S Br at South Branch
01465847	Jade Run at Rt 206 in Vincentown	01397400	Raritan River S Br at Three Bridges
32	Lafetras Brook at Hope Rd in Tinton Falls	01395200	Robinson Branch at Scotch Plains
61	Lake Topanemus Lake at Pond Rd in Freehold	01396003	Robinson Branch at St Georges Av at Rahway
01399780	Lamington River at Burnt Mills	01399700, EWQ0369	Rockaway Creek at Whitehouse
EWQ0358	Lamington River at Rt 24 in Milltown	01381200	Rockaway River at Pine Brook
01399200	Lamington Rive near Ironia	01391500, 01391200, 01391490, 01391550	Saddle River at Lodi
01399500	Lamington River near Pottersville	Salem River at Courses Landing	Salem River at Courses Landing
DRBCNJ0013	Lockatong Creek at Rosemont-Raven Rock Rd Bridge	01482500	Salem River at Woodstown
01407868, 25	Long Brook at Wyckoff Mills	Passaic-5	Second River at Union Av in Newark
01482530	Major Run at Sharptown	30	Shark River Brook at Shark River Station Rd in Tinton Falls
01405340	Manalapan Brook at Federal Rd near Manalapan	01407750, EWQ0482	Shark River near Neptune
01408000, EWQ0489	Manasquan River at Squankum	01465884	Sharps Run at Rt 541 at Medford
01405302, EWQ0451	Matchaponix Brook at Spotswood	EWQ0409	Six Mile Run at Canal Rd in Blackwells Mill
22	McGolliard Brook at Main St in Englishtown	01396800	Spruce Run at Clinton
6	Metedeconk River N Br at Jackson Mills Rd in Freehold	01401000	Stony Brook at Princeton
EWQ0175	Mill Creek at Levitt Pkwy in Willingboro	7	Toms River at Route 537 in Millstone
01402000	Millstone River at Blackwells Mills	01482560	Two Penny Run near Danceys Corner
01401440	Millstone River at Kingston	01387014, 01387041	Wanaque River at Pompton Lakes
01402540	Millstone River at Weston	01387000	Wanaque River at Wanaque
01400640, 01400650	Millstone River near Grovers Mills	01368900	Wawayanda/Pochuck River at Alt Rt 515 in Maple Grange
01400540, 01400530, 5	Millstone River near Manalapan	9	Weemaconk Creek at Main St in Manalapan
01463850	Miry Run at Route 533 in Mercerville	69	Wemrock Brook at Rt #9 (After 1St Pipe) in Freehold
01455801	Musconetcog River at Lockwood	68	Wemrock Brook at Rt #9 (Before Pipes) in Freehold
01457400, DBRCNJ0025	Musconetcong River at Riegelsville	01461300, DRBCNJ0012	Wickecheoke Creek at Stockton
01377499	Musquapsink Brook at River Vale	52	Willow Brook at Willow Brook Rd in Holmdel
01398000	Neshanic River at Reaville	01381500	Whippany River at Morristown
01477510	Oldmans Creek at Porches Mill	01381800	Whippany River near Pine Brook
01367910, 01367909	Papakating Creek at Sussex		

Table 2.1a-6: Top 12 sites with Lowest Median Total Phosphorus Concentrations

Location	Station Number	Station Name	Number of Samples	Median TP	Percent Exceed
Pinelands	01408702	Jakes Branch at Dover Rd near Double Trouble	8	0.0035	0%
Pinelands	01409435	Skit Branch near Hampton Gate	8	0.004	0%
Pinelands	01410150	Bass River E Br near New Gretna	20	0.00795	0%
Pinelands	01466100	Mount Misery Brook at Upton	8	0.0085	0%
Pinelands	0140940050	Mullica River near Batsto	8	0.0085	0%
Pinelands	01411427	Dennis Creek Trib 2 above Lake at Dennisville	4	0.0085	0%
Pinelands	01466500	McDonalds Branch in Lebanon State Forest	20	0.00865	0%
Pinelands	01408830	Cedar Brook at Cedar Crest	20	0.0095	0%
Background Site	01442760	Dunnfield Creek at Dunnfield	20	0.00965	0%
Pinelands	01411290	Tuckahoe River near Estelle Manor	8	0.00975	0%
Background Site	01411955	Gravelly Run at Laurel Lake	20	0.01055	0%
Pinelands	01409500	Batsto River at Batsto	20	0.01065	0%

Table 2.1a-7: Top 10 sites with Highest Median Total Phosphorus Concentrations

Watershed	Station Number	Station Name	Number of Samples	Median TP	Percent Exceed
Passaic	01379200	Dead River near Millington	24	1.21	92%
Passaic	01391500, 01391200, 01391490, 01391550, Passaic-7	Saddle River at Lodi	32	1.01	100%
Passaic	EWQ0231	Passaic River at Eagle Rock Ave in East Hanover	8	0.745	100%
Assunpink	01464020, 01464000, DRBCNJ1338	Assunpink Creek at Peace Street at Trenton	30	0.631	100%
Passaic	01382000	Passaic River at Two Bridges	32	0.557	100%
Passaic	01389500, Passaic-11, Passaic-12,	Passaic River at Little Falls	20	0.5195	100%
Raritan	01402000	Millstone River at Blackwells Mills	19	0.365	100%
Passaic	01389880, 01389870, Passaic-8 , Passaic-9, Passaic-10,	Passaic River at Elmwood Park	51	0.354	88%
Rancocas	01465847	Jade Run at Rt 206 in Vincentown	8	0.3155	71%
Pennsauken	01467082	Pennsauken Creek at Rt 130 in Pennsauken	8	0.3055	100%

FIGURE 2.1a-1. Total Phosphorus Station Status.

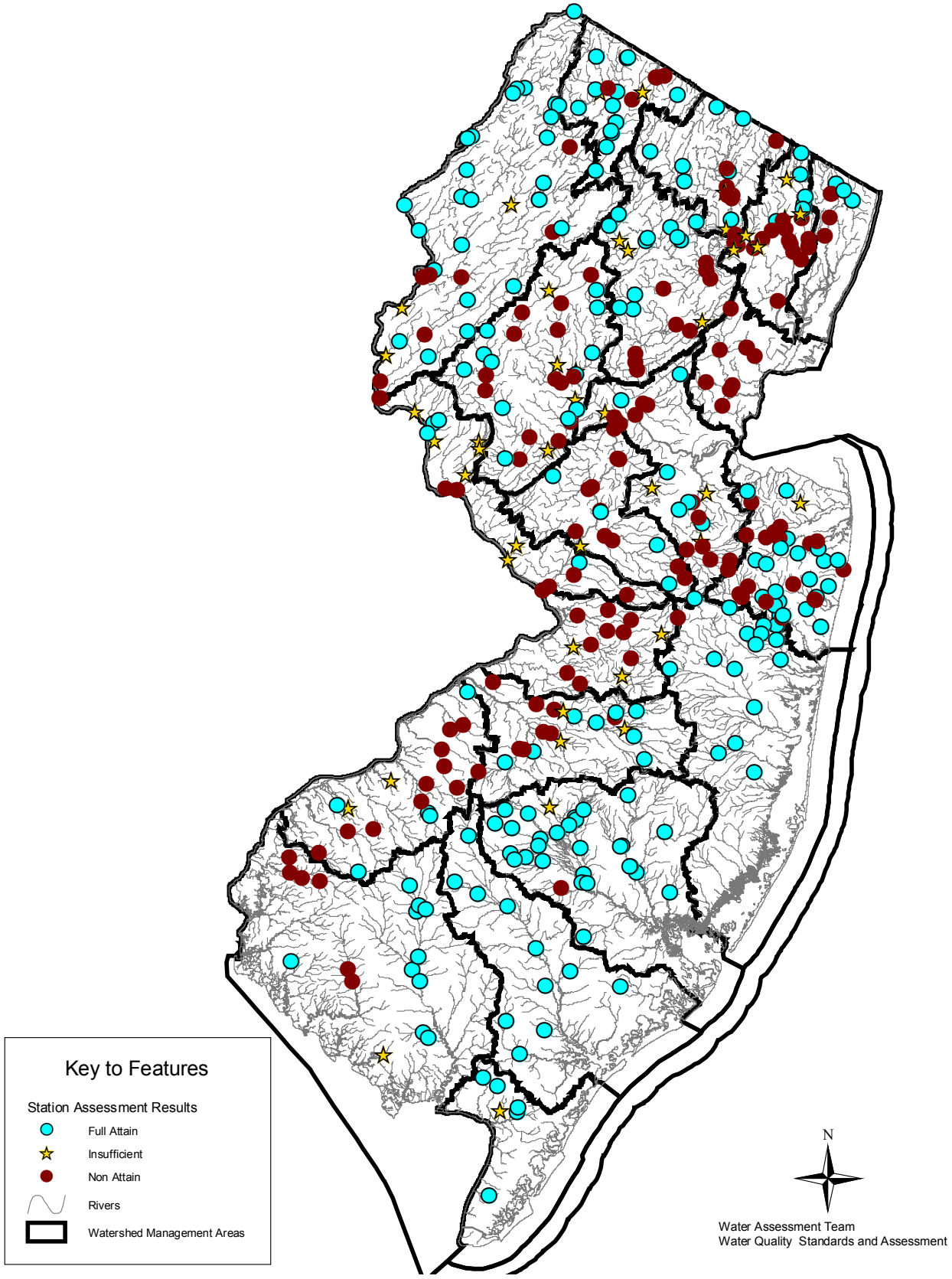
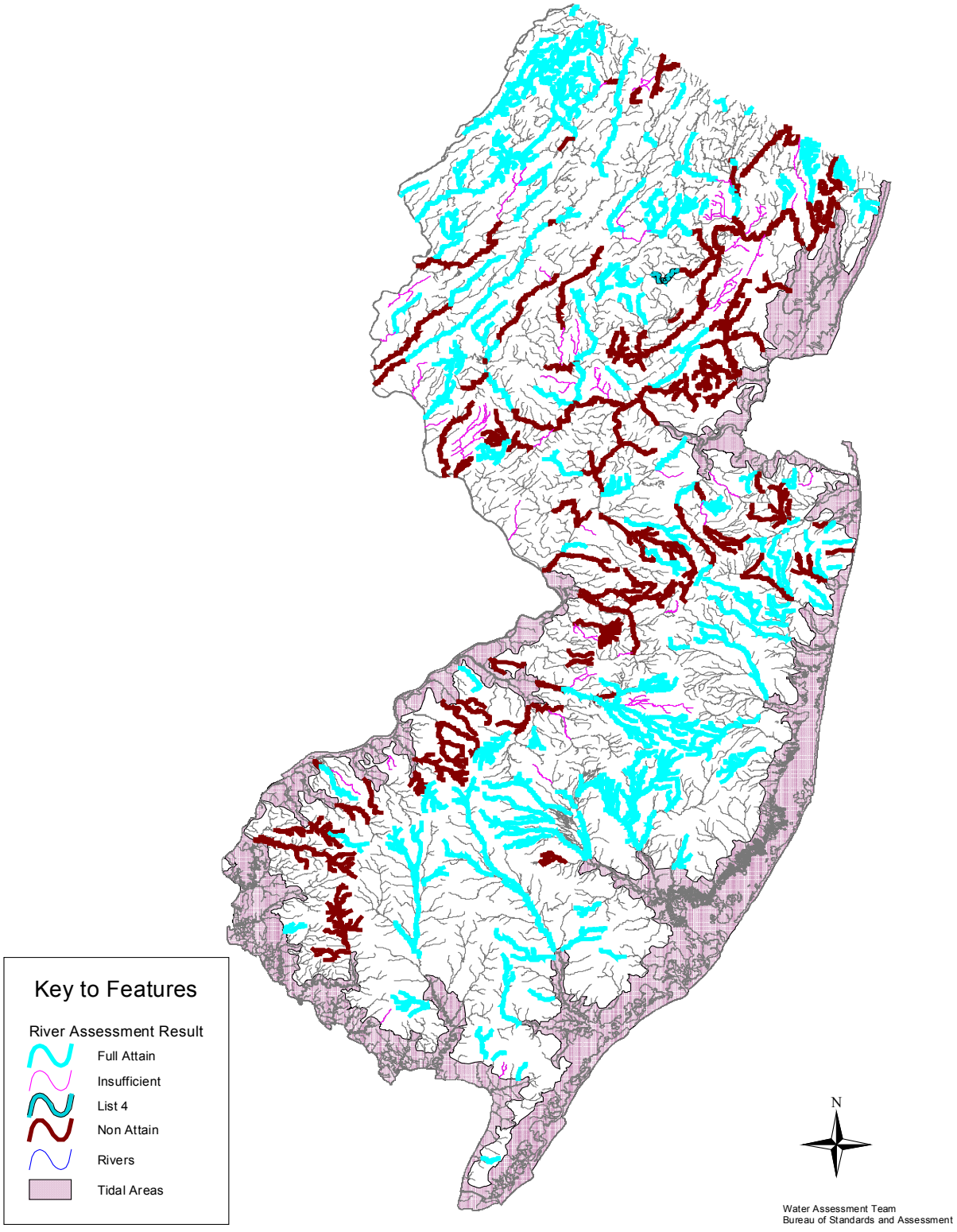


FIGURE 2.1a-2. Total Phosphorus Assessed River Segments. Includes monitored and estimated river assessments.



pH Water Quality Assessment

Description

pH is a measure of the acidity of water. Criteria for pH were established to protect aquatic organisms from pH measurements that are too basic or too acidic. Exceedances of pH can impact young fish and immature stages of aquatic organisms, and can affect the cellular membranes of fish. Low pH levels also accelerates the release of metals from rocks or sediments impacting water quality. Thus, criteria for pH require levels between a specified range, and exceedances of the criteria can occur if pH is either too low or too high. Criteria for the naturally acidic Pineland waters require pH between 3.5 and 5.5 pH units. Criteria for all other nontidal streams in the state (FW2 waters) require pH between 6.5 and 8.5 pH units.

Assessment

A total of 347 stations representing 2,748 river miles were assessed for pH. Of the 84 stations that are "Non Attaining" for pH; 46 stations are above the pH criteria, 33 stations are below the pH criteria, and 5 stations were carried over from the 1998 303(d) list. All impaired sites in the Pinelands have pH levels above the criteria. Results show that Pineland sites with impairments are located in watersheds impacted by development, while fully attaining sites are usually in pristine or low developed watersheds.

Of the 33 stations below the pH criteria, 31 sites are located in the Coastal Plain. The only exceptions are Dunnfield Creek at Dunnfield, where it is suspected the local geology is causing the low pH levels, and Miry Run in Mercerville, where the source for the low pH is not known. Furthermore, the other 31 stations with low exceedances are all located in areas directly surrounding the Pinelands (see Table 2.1a-10). These areas are characterized as having environmental conditions such as soils, geology, and vegetation very similar to the Pinelands, therefore, there is speculation that the low pH at these sampling sites may be attributable to natural conditions. At all of these stations, pH levels are primarily between the SWQS for Pineland waters and FW2 waters and do not meet the criterion for pH. At four other stations in the same geographical area, pH levels meet the pH criteria for Pineland waters although their stream reaches are categorized as FW2. These sites, which include a background site with no anthropogenic inputs, are assessed as "Full Attainment", and consist of: Gibson Creek at Rt. 50 near Corbin City, Indian Branch near Malaga, Buckshutem Creek near Laurel Lake, and Gravelly Run at Laurel Lake. The SWQS include a provision to use natural water quality in place of numeric criteria for all water quality characteristics that do not meet the promulgated water quality criteria as a result of natural causes. (See N.J.A.C. 7:9B-1.5(c)1). Further technical approaches will be studied to determine if a change to the SWQS for pH to reflect natural conditions can be developed for the waterways surrounding the Pinelands. Results for individual stations are depicted in Figure 2.1a-8 and in Table II-2 and Table II-11 in the Appendix. The overall pH results are summarized below in Table 2.1a-6.

Table 2.1a-8: pH Status

pH Status	Number of Stations	Percent of Stations	Number of Assessed River Miles		Percent of Assessed River Miles	
			Monitor	Estimate	Monitor	Estimate
Sublist 1	191	55%	1346	431	60%	85%
Sublist 3	72	21%	361	19	16%	4%
Sublist 4	0	0%	0	0	0%	0%
Sublist 5	84	24%	536	55	24%	11%
Totals	347	100%	2,243	505	100%	100%

Table 2.1a-9: pH Stations Exceeding SWQS

Station Name	Station Number	Station Name	Station Number
Albertson Branch near Elm	0140940970	Marsh Bog Brook at Squankum	01407997, 24
Babcock Creek near Mays Landing	01411196	Matchaponix Brook at Spotswood	01405302, EWQ0451
Bacons Creek near Mansfield Square	01464529	Maurice River at Norma	01411500
Barclay Brook near Englishtown	01405285	Metedeconk River N Br at Lakewood	01408100
Barkers Brook N Br near Jobstown	01464583	Millstone River at Kingston	01401440
Barton Run at Tuckerton Rd on Hoot Owl Estate	EWQ0166	Millstone River at Weston	01402540
Batsto River at Batsto	01409500	Millstone River near Manalapan	01400540, 01400530, 5
Batsto River at Hampton Furnace	01409432	Mingamahone Brook near Earle	01408009
Batsto River at Quaker Bridge	01409470	Miry Run at Route 533 in Mercerville	01463850
Blue Anchor Brook at Elm	0140940950	Mullica River at Green Bank	Mullica River at Green Bank
Canton Drain at Maskell Mill	01413065	Mullica River near Atco	01409375
		Mullica River near Batsto	0140940050
Cooper River N Br at Kresson	01467155	Musconetcong River at Lake Hopatcong	01455500
Cranbury Book near Prospect Plains	01400690	Musconetcong River near Bloomsbury	01457000, EWQ0072
Deep Run at Rt 516 in Old Bridge	EWQ0454	Nescochague Creek at Pleasant Mills	01409411
Dennis Creek Trib 2 at Dennisville	01411428	Newton Creek at Rt 168 in W Collingswood	EWQ0653
Dunnfield Creek at Dunnfield	01442760	Ong Run at West Lake Shore Dr in Pemberton	EWQ0149A
FishIng Creek at Rio Grande	01411400	Pages Run at Newport	01412200
Great Egg Harbor River at Folsom	01411000	Pequest River at Pequest	01445500
Great Egg Harbor River at Weymouth	01411110	Pequest River on Water Street at Belvidere	01446400, DRBCNJ0033
Great Egg Harbor River near Sicklerville	01410784	Pohatcong Creek at New Village	01455200
Great Swamp Branch Below Rt 206 near Hammonton	0140941070	Pump Branch near Waterford Works	01409408
Hakihokake Creek at Bridge St Bridge in Milford	DRBCNJ0023	Ramapo River at Dawes Highway	01388100, 01388000
Hammonton Creek at Westcoatville	01409416	Rancocas Creek N Br at Browns Mills	01465970
Hannabrand Brook at Old Mill Rd near Sprink Lk Heights	01407816, EWQ0484	Rancocas Creek N Br at Iron Works Park at Mt Holly	01467005, 01467006, 01467003
Hays Mill Creek at Atco	01409401	Rancocas Creek S Br at Vincentown	01465850
Hays Mill Creek near Chesilhurst	01409402	Rancocas Creek SW Br at Rt 70 in Medford	EWQ0169
Hospitality Branch at Blue Bell Rd near Cecil	01411035	Raritan River S Br at South Branch	01398102

Table 2.1a-9: pH Stations Exceeding SWQS (cont.)

Station Name	Station Number	Station Name	Station Number
Hospitality Branch near Cecil	01411050	Raritan River S Br at Stanton Station	01397000
Indian Mills Brook at Indian Mills	01409449	Saddle River at Ridgewood	01390500, 01390518, 01390510
Ireland Brook at Patricks Corners	01404470	Second River at Union Av in Newark	Passaic-5
Jacobs Creek above Rt 29	DRBCNJ0003	Shannoc Brook Trib at Colliers Mills	01408480
Jade Run at Rt 206 in Vincentown	01465847	Sleeper Branch near Atsion	0140940370
Jumping Brook at Green Grove	01407720	South River near Belcoville	01411220
Jumping Brook near Neptune	01407760	Springers Brook near Hampton Furnace	01409455
Little Creek at Chairville	01465893	Still Run near Malaga	01411453
Little Ease Run at Porchtown	01411458	Stony Brook at Princeton	01401000
Long Brook at Wyckoff Mills	01407868, 25	Toms River near Toms River	01408500, 01408300
Manalapan Brook at Federal Rd near Manalapan	01405340	Whale Pond Brook at Route 35 in Eatontown	01407617, 31
Manalapan Brook at Rt 524 in Ely	EWQ0437	Woodbury Creek at Rt 45, Woodbury Ck Park in Woodbury	01474730
Manalapan Brook near Spotswood	01405440, EWQ0440		

Table 2.1a-10: pH Sites with Similar Conditions as Pinelands or Influenced by Pinelands

WMA	Station Number	Station Name	Max pH	Min pH	Percent Exceedance
20	01464529	Bacons Creek near Mansfield Square	6.7	4	75.0%
09	01405285	Barclay Brook near Englishtown	3.6	3.5	100.0%
17	01411950	Buckshutem Creek near Laurel Lake	4.2	4	100.00%
17	01413065	Canton Drain At Maskell Mill	6.1	5.3	100.0%
17	01412800	Cohansey River at Seeley	7.1	6.10	26.3%
10	01400690	Cranbury Book near Prospect Plains	6.5	5.12	75.0%
09	EWQ0454	Deep Run at Rt 516 in Old Bridge	4.8	3.50	100.0%
16	01411400	Fishing Creek at Rion Grande	7.3	6.30	16.7%
15	01411241	Gibson Creek at Rt 50 near Corbin City	5.4	4.8	100.00%
17	01411955	Gravelly Run at Laurel Lake	5.4	4.30	100.0%
12	01407806, EWQ0484	Hannabrand Brook at Old Mill Rd near Sprink Lk Height	6.6	6.10	37.5%
17	01411466	Indian Branch near Malaga	5.6	4.10	100.0%
09	01404470	Ireland Brook At Patricks Corners	6.5	6.1	75.0%
12	01407760	Jumping Brook at Corlies Ave	6.8	6.40	12.5%
12	01407720	Jumping Brook at Green Grove	6.5	5.9	75.0%
17	01411458	Little Ease Run at Porchtown	6.1	5.6	100.0%
12	01407868	Long Brook at Wyckoff Mills	7.1	6.4	18.2%
09	EWQ0440	Manalapan Brook at Old Forge Rd in Helmetta	6.5	5.53	87.5%
09	EWQ0437	Manalapan Broo k at Rt 524 in Ely	6.7	5.00	87.5%
09	01405340	Manalapan Brook at Federal Road near Manalapan	7.9	4.30	31.6%
09	01405440, EWQ0440	Manalapan Brook near Spotswood	6.5	5.53	87.5%
12	01407997, 24	Marsh Bog Brook at Squankum	6.5	4.7	75.0%
09	01405302, EWQ0451	Matchaponix Brook at Spotswood	7.40	5.40	38.1%

Table 2.1a-10: pH Sites with Similar Conditions as Pinelands or Influenced by Pinelands (cont.)

WMA	Station Number	Station Name	Max pH	Min pH	Percent Exceedance
17	01411500	Maurice River at Norma	7	6.10	33.3%
10	01400540, 01400530, 5	Millstone River near Manalapan	8.10	6.00	30.8%
12	01408009	Mingamahone Brook near Earle	7.1	5.70	52.6%
20	01464583	NB Barkers Brook near Jobstown	7.3	5.8	33.3%
18	01467155	NB Cooper River At Kresson	7.6	6.10	15.4%
13	01408100	NB Metedeconk River at Lakewood	7.2	5.90	33.3%
19	01467005	NB Rancocas Creek at Iron Works Park at Mt Holly	7.2	5.3	31.5%
17	01412200	Pages Run at Newport	6.5	5.9	75.0%
19	01465850	SB Rancocas Creek at Vincentown	6.60	4.40	92.9%
17	01411453	Still Run near Malaga	6.6	5.6	50.0%
13	01408500	Toms River near Toms River	6.4	4.40	97.2%
12	01407617, 31	Whale Pond Brook at Larchwood Ave at Oakhurst	6.8	6.20	25.0%

FIGURE 2.1a-3. pH Station Status. Also depicts sites on sublist 5 that are influenced by Pineland conditions.

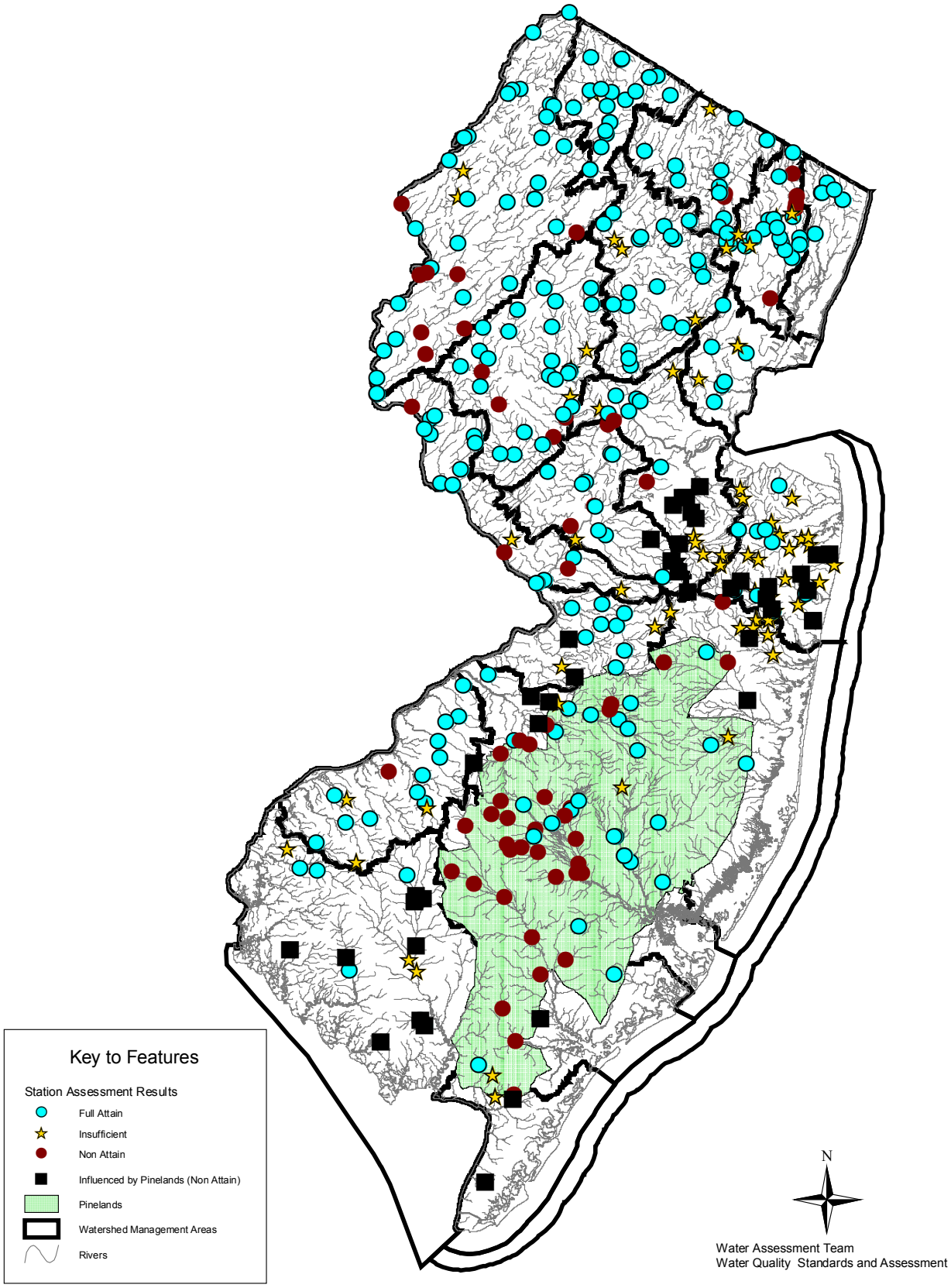
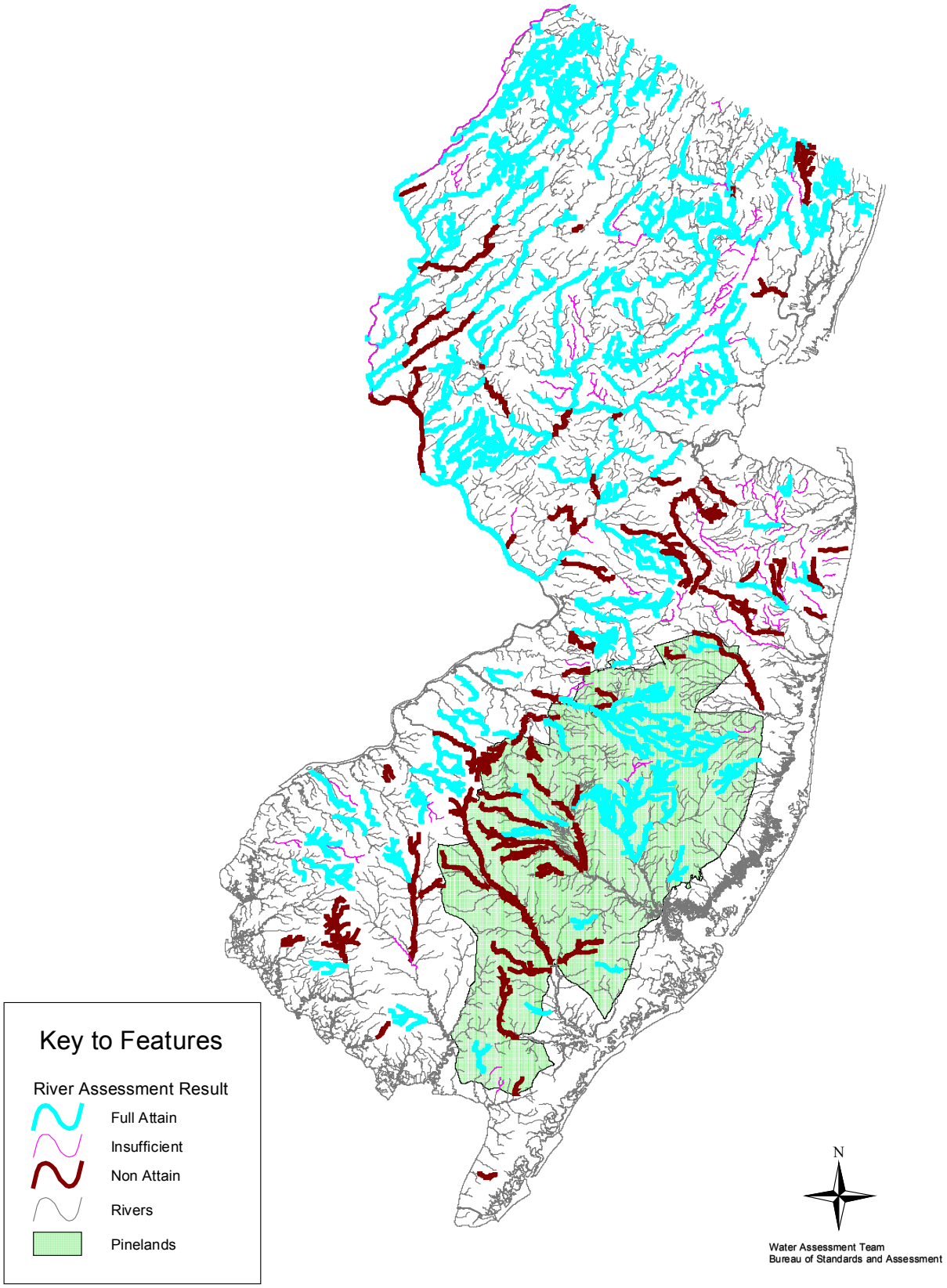


FIGURE 2.1a-4. pH Assessed River Segments. Includes monitored and estimated river assessments.



Dissolved Oxygen Water Quality Assessment

Description

Dissolved oxygen (DO) is necessary for almost all aquatic life, consequently concentrations of dissolved oxygen in water also provide an indicator of the health of aquatic ecosystems. In low DO conditions, Fish are more susceptible to other pollutants such as metals and toxics, and in very low DO levels trace metals from the sediments are released into the water column. Cold water fisheries and many benthic macroinvertebrates are sensitive to DO concentrations which explains the higher DO criteria in waterbodies where these organisms reside. When DO levels decrease, aquatic organisms intolerant of low DO will move or die and be replaced by organisms tolerant of low DO. When in equilibrium with air, the ability of water to maintain dissolved oxygen is dependant on temperature, atmospheric pressure, and to a lesser extent dissolved solids (USGS 2000). Temperature is the major factor in determining DO levels under ambient conditions with increasing temperatures causing decreasing DO. Because of this direct correlation, temperature data should be closely monitored when DO levels exceed Surface Water Quality Standards.

Dissolved oxygen criteria are based on the following stream classifications:

- FW2-Trout Production: Not less than 7.0 mg/l DO
- FW2-Trout Maintenance: Not less than 5.0 mg/l DO, 24 hr. average not less than 5.0 mg/l DO
- FW2-Non Trout/Pinelands: Not less than 4.0 mg/l DO, 24 hr. average not less than 5.0 mg/l DO

Assessment

A total of 310 stations representing 2,653 river miles were assessed for DO. Overall results indicate that dissolved oxygen levels in the state are relatively healthy. The data assessment shows that 13 of 310 sites are not attaining dissolved oxygen standards and the overall statewide average is 9.2 mg/l DO. When including sublist 3 sites with insufficient data, 96% of the stations are fully attaining, while 4% are non attaining the standards for DO. This represents only 78 river miles not attaining standards for dissolved oxygen in the state. Of theses 78 miles, 12 miles were listed as impaired from the 1998 303(d) List because no new data exists to conduct an assessment. These findings are consistent with historical improvements in water quality as wastewater treatment plants were upgraded and regionalized in the 1980's and early 1990's.

During the assessment, two Pineland sites were recognized as exceeding the DO criteria, but are located in pristine areas. The McDonalds Branch impairment in Lebanon State Forest is due to natural conditions with a location in an area dominated by ground water and low DO, and the impairment at Jake Branch near Double Trouble is suspected to be caused by low DO in ground water.

It should be noted that the collection of DO data was taken during the day and consequently does not characterize the natural diurnal DO cycle. The diurnal cycle may

show significant variations in DO levels during a 24 hour period caused by temperature changes, photosynthesis, and respiration variations in the streams. In order to help understand this process, NJDEP and USGS are collecting diurnal DO data at about 30 locations each summer starting in 2001. Selected locations included background stations in the redesigned Ambient Surface Water Monitoring Network (ASMN), locations with exceedances of DO criteria, and locations with high DO saturation values which may indicate DO impairments. This data will be included in future assessments of dissolved oxygen conditions.

The overall status of DO is shown in Table 2.1a-11 and results for stations that exceeded criteria and their use support status are provided on Table 2.1a-12 below. Results for individual stations are depicted on Figure2.1a-5 and shown in Table II-4 in the Appendix.

Table 2.1a-11: Dissolved Oxygen Status

DO Status	Number of Stations	Percent of Stations	Number of Assessed River Miles		Percent of Assessed River Miles	
			Monitor	Estimate	Monitor	Estimate
Sublist 1	260	84%	1,798	477	84%	95%
Sublist 3	37	12%	285	15	13%	3%
Sublist 4	0	0%	0	0	0%	0%
Sublist 5	13	4%	65	13	3%	2%
Totals	310	100%	2,148	505	100%	100%

Table 2.1a-12: Stations with Exceedances of DO

WMA	Station Name	Station Number	Number of Samples	Exceedance Percent
02	Black Creek at Sandhill Rd in Vernon	Wallkill G	10	20%
18	Cooper River N Br at Kresson	01467155	13	15%
01	Honey Run near Hope	01445900	8	25%
19	Jade Run at Rt 206 in Vincentown	01465847	8	29%
09	Lamington River near Ironia	01399200	1998 303(d) List	
03	MacopIn River at Echo Lake	01382410	15	14%
11	Miry Run at Route 533 in Mercerville	01463850	20	15%
14	Mullica River at Indian Mills	01409383	18	17%
01	Paulins Kill at Warbasse Junction Rd near Lafayette	01443250	8	25%
03	Pequannock River at Macopin Intake Dam	01382500	22	14%
03	Ramapo River at Dawes Highway	01388100, 01388000	8	25%
17	Salem River at Courses Landing	Salem River at Courses Landing	1998 303(d) List	
03	Wanaque River at Wanaque	01387000	1998 303(d) List	

FIGURE 2.1a-5. Dissolved Oxygen Station Status.

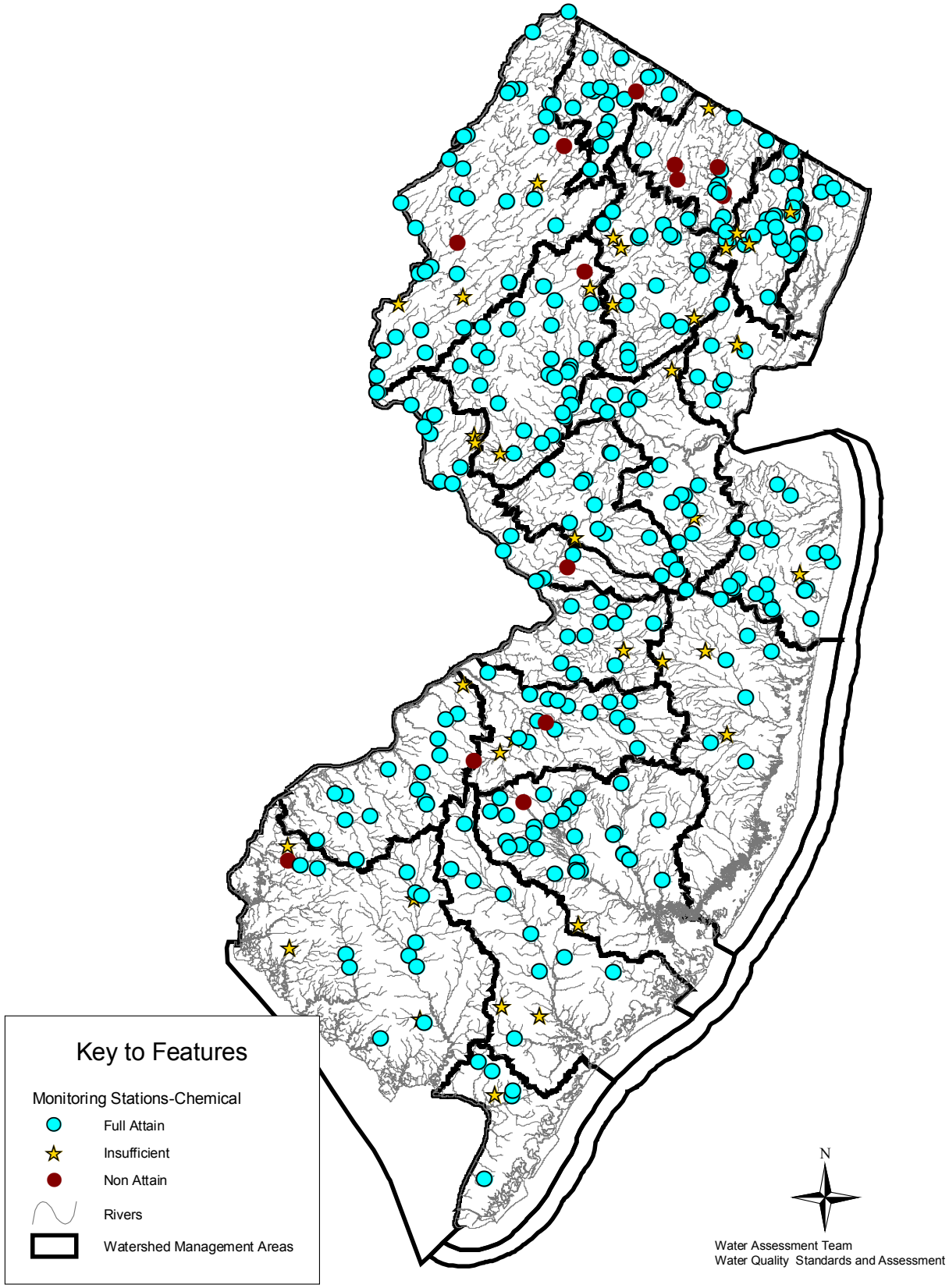
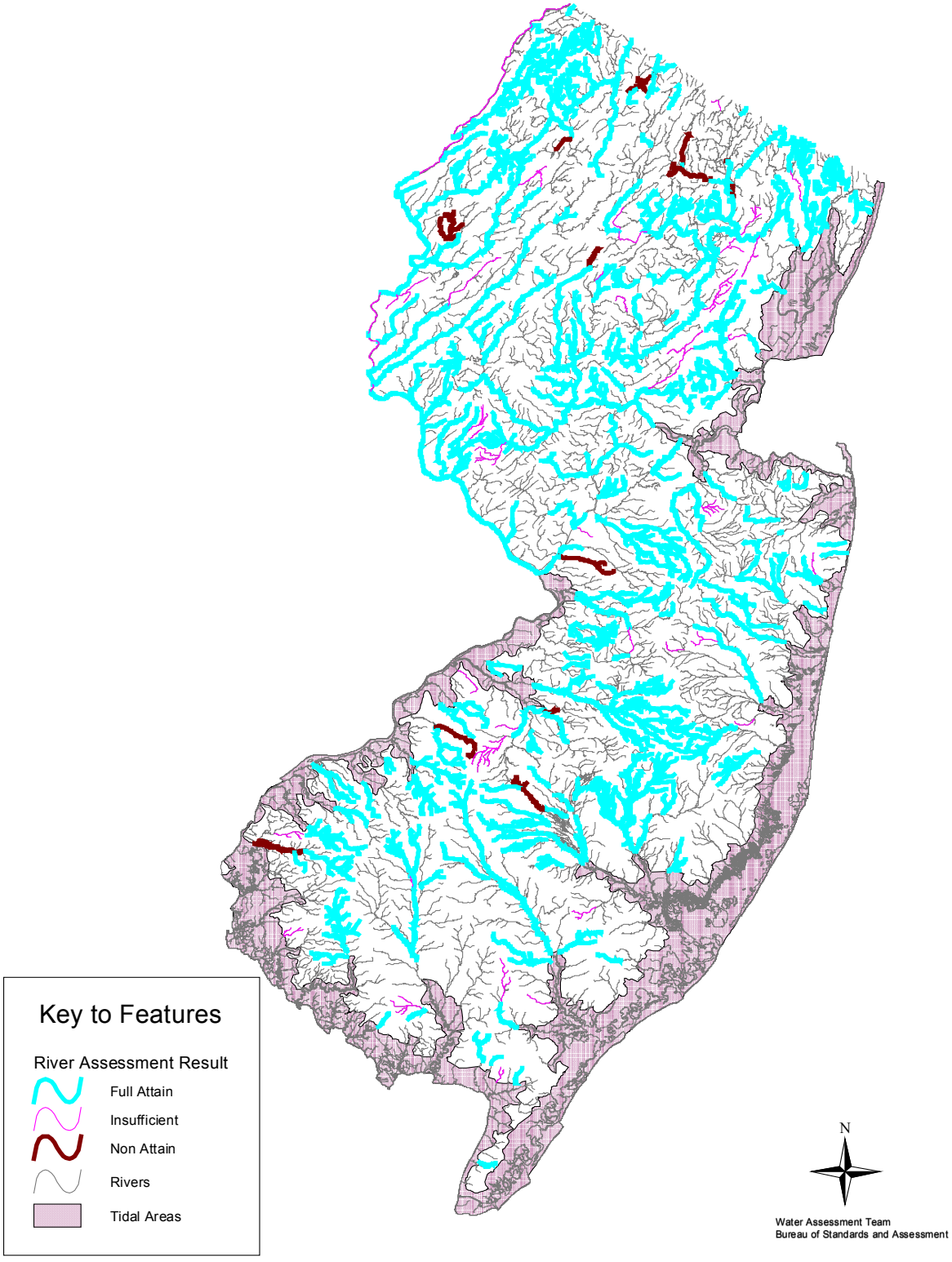


FIGURE 2.1a-6. Dissolved Oxygen Assessed River Segments. Includes monitored and estimated river assessments.



Temperature Water Quality Assessment

Description

Temperature of water is a very important factor for aquatic life. It controls the rate of metabolic and reproductive activities, and determines where fish species can survive. Temperature affects the concentration of dissolved oxygen and can influence the activity of bacteria and toxic chemicals in the water. Temperature criteria were established to protect aquatic life designated uses, and are based upon stream classifications, as with dissolved oxygen criteria. The criteria for stream classifications do not allow thermal alterations that would cause temperatures to exceed ambient temperatures by an established limit, in addition, enforce a maximum temperature limit. The stream classification criteria include:

- Trout Production waters – No temperature deviations of 0.6^0C above ambient temperatures or (20^0C used as a maximum temperature);
- Trout Maintenance waters – No temperature deviations of 1.1^0C above ambient temperatures or a maximum temperature no greater than 20^0C;
- Non trout waters – No temperature deviations greater than 2.8^0C above ambient temperatures or maximum temperatures no greater than 27.8^0C for small mouth bass or yellow perch waters or 30^0C for other non trout waters,
- Pineland waters – No temperature deviations greater than 2.8^0C above ambient temperatures or maximum temperatures no greater than 30^0C.

The assessments in this report used the maximum temperature as the criteria since ambient water temperatures for streams have not been calculated.

Assessment

Approximately 2,568 river miles represented by 322 sites were assessed for temperature. Including sites having insufficient data, results indicate 88% of the sites fully attain standards for temperature and 12% of the sites exceed the standards. All sites with exceedances for temperature were either trout production or trout maintenance waters, whereas streams classified as non trout or Pineland waters fully attained standards for temperature throughout the state. The only exceptions were 5 sites carried over from the 1998 303(d) List that have no updated data (see Table 2.1a-16). One site, Pequannock River above Pacock, was placed on List 4 due to the building of a beaver dam causing the temperature exceedances. Most of the sites not attaining temperature standards are located in northwest New Jersey and the upper portion of South Branch Raritan River.

Included in the assessment for temperature was a special study conducted by the Pequannock River Coalition from 2000 and 2002. The results of the study indicated widespread temperature violations along the Pequannock River and many of its tributaries. With the basin dominated by reservoirs along its waterway, it is suspected that reservoir discharge rates may be affecting water temperature in the Pequannock

River Basin. In addition, consistent temperature violations occurred on West Brook, tributary in Wanaque Reservoir, during the summer months.

The overall status of temperature assessments is provided in Table 2.1a-13. Results for individual stations are depicted on Figure2.1a-7 and shown in Table II-3 in the Appendix.

Table 2.1a-13: Temperature Status

Temperature Status	Number of Stations	Percent of Stations	Number of Assessed River Miles		Percent of Assessed River Miles	
			Monitor	Estimate	Monitor	Estimate
Sublist 1	256	80%	1,662	471	81%	93%
Sublist 3	26	8%	184	1	9%	<1%
Sublist 4	1	<1%	8	0	<1%	0%
Sublist 5	39	12%	209	33	10%	7%
Totals	322	100%	2,063	505	100%	100%

Table 2.1a-14: Temperature Stations Exceeding SWQS

Station Name	Station Number	Station Name	Station Number
Apshawa Brook	PQ15	Pequannock River above Macopin	PQ7
Black Creek at Rt 94/517 in Vernon	Wallkill F	Pequannock River at Macopin Intake Dam	01382500, PQ8
Clinton Brook below Clinton Reservoir	PQ16	Pequannock River at Riverdale	01382800, PQ11
Hakihokake Creek at Bridge St Bridge in Milford	DRBCNJ0023	Pequannock River below Clinton	PQ5
Lamington River at Rt 523 in Lamington	EWQ0363	Pequannock River below Pacock	PQ3
Lockatong Creek at Rosemont-Raven Rock Rd Bridge	DRBCNJ0013	Pequest River on Water Street at Belvidere	01446400, DRBCNJ0033
Macopin River at Macopin Reservoir	01382450, PQ6	Pohatcong Creek at New Village	01455200
MacopIn River at Echo Lake	01382410	Pohatcong Creek at Tunnel Hill Rd in Mansfield	EWQ0055
Metedeconk River N Br at Lakewood	01408100	Raritan River S Br Arch St at High Bridge	01396535, 8-SB-2
Millstone River at Kingston	01401440	Raritan River S Br at Middle Valley	01396280, EWQ0316
Musconetcog River at Lockwood	01455801	Raritan River S Br at Stanton Station	01397000
Musconetcong River at Beattystown	01456200	Ringwood Creek at Manor Rd in Ringwood St. Park	01384495
Musconetcong River at Lake Hopatcong	01455500	Salem River at Courses Landing	Salem River at Courses Landing
Musconetcong River at Riegelsville	01457400, DBRCNJ0025	Spruce Run at Clinton	01396800
Outlet Trib of Maple Lake	PQ14	Spruce Run at Newport	01396550
Paulins Kill at Blairstown	01443500	Spruce Run near Glen Gardner	01396588
Paulins Kill at Rt 46 Bridge near I-80	DRBCNJ0036	Wallkill River at Sparta	01367625, Wallkill A
Pequannock River - Butler	PQ10	Wawayanda/Pochuck River at Alt Rt 515 in Maple Grange	01368900
Pequannock River above Clinton	PQ4	West Brook	WB1, WB2, WB3, WB4, WB5, WB6
		Wickecheoke Creek at Stockton	01461300, DRBCNJ0012

FIGURE 2.1a-7. Temperature Station Status.

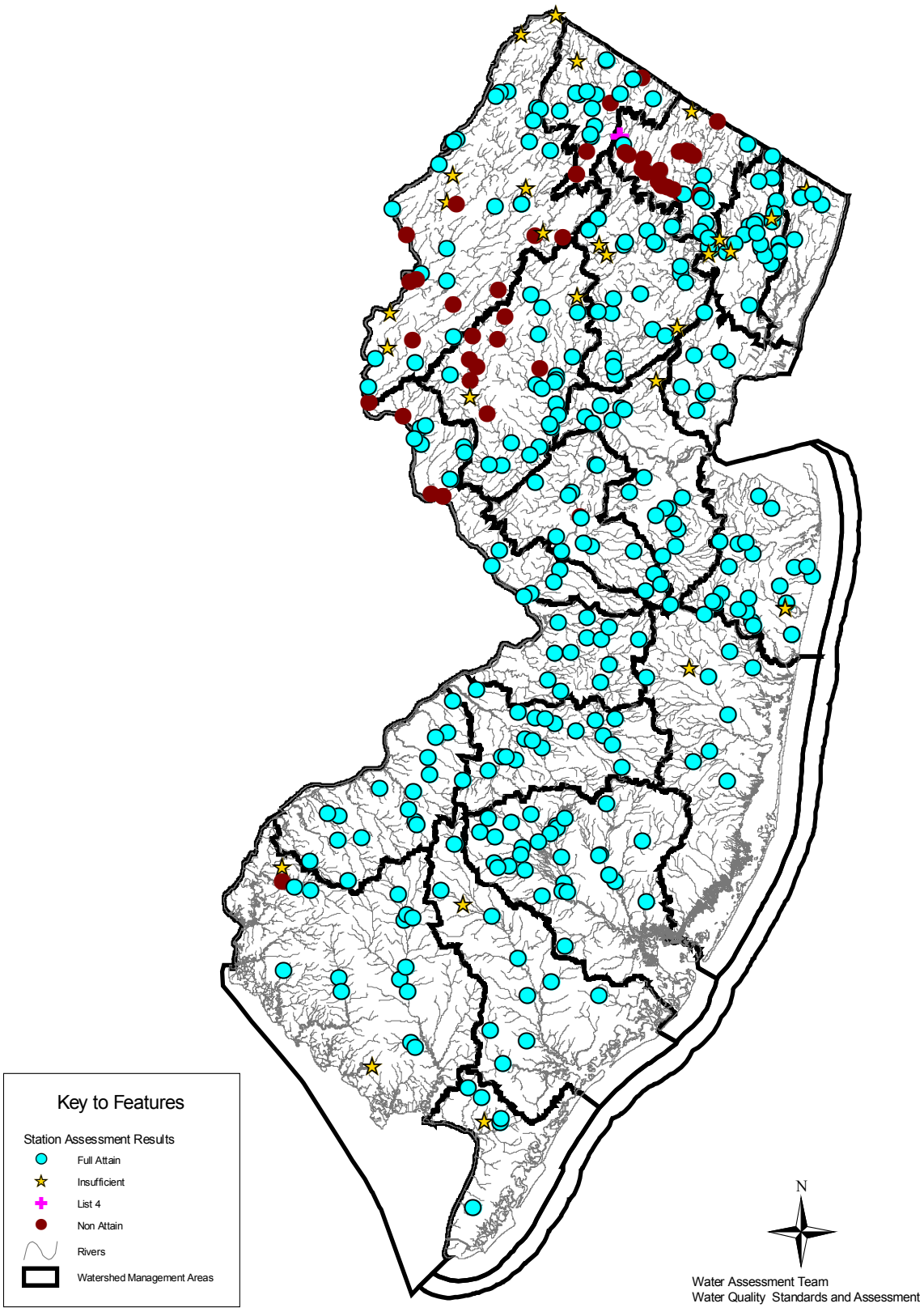
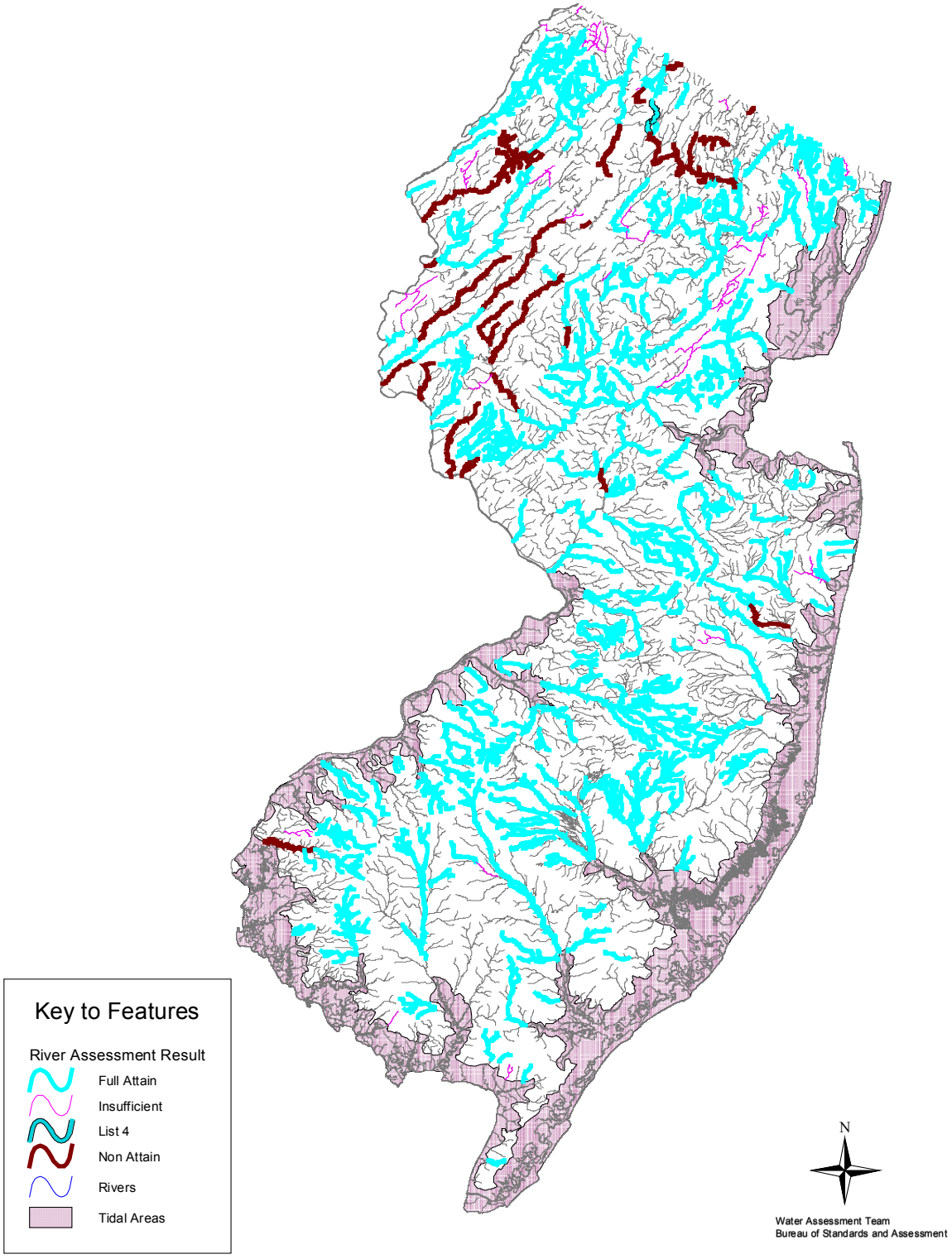


FIGURE 2.1a-8. Temperature Assessed River Segments. Includes monitored and estimated river assessments.



Ammonia Water Quality Assessment

Description

Ammonia exists in two forms in water, ionized ammonia (NH_4^+) and unionized ammonia (NH_3). Together both forms of ammonia are called total ammonia nitrogen. Most ammonia is in the ionized form and used by phytoplankton and other aquatic plants as a nutrient. To the contrary, the unionized form is toxic to fish and other aquatic life. The calculation to determine the percentage of NH_3 is dependant on temperature and pH. Increasing temperature and pH levels increase the concentration of unionized ammonia. The criterion for unionized ammonia in non-trout (NT) and Pinelands waters is set at 50 parts per billion (ppb or ug/l), and in trout production (TP) and trout maintenance (TM) waters, the criterion is set at 20 ppb.

Assessment

Prior to upgrades and regionalization of sewage treatment plants, ammonia exceedances were common in streams receiving effluent. Since then, the improvement of unionized ammonia concentrations in water quality statewide has been dramatic. Of the 300 stations assessed, all are fully attaining (possessing less than 10% of total samples showing violations) the SWQS criteria for unionized ammonia. These findings are consistent with decreasing trends in total ammonia associated with reduction of ammonia in effluent. Only 7 stations had any unionized ammonia violations (here again, less than 10% of samples): Wallkill River at Sparta, mouth of Hohokus Brook at Paramus, South Branch Raritan River at Stanton Station, Paulins Kill at Blairstown, Second River at Newark, Passaic River at West Patterson, and Passaic River at Elmwood. All but one are listed as nonimpaired. Hohokus Brook is on sublist 3 due to a lack of sufficient data necessary for a full assessment. Each site had only one violation with Second River having the highest concentration of 205 ppb. Results are summarized on Table 2.1a-15 below and provided for each station in Table II-8 in the Appendix.

Table 2.1a-15: Unionized Ammonia Status

UIA Status	Number of Stations	Percent of Stations	Number of Assessed River Miles		Percent of Assessed River Miles	
			Monitor	Estimate	Monitor	Estimate
Sublist 1	290	97%	1,935	504	96%	100%
Sublist 3	10	3%	74	0	4%	0%
Sublist 4	0	0%	0	0	0%	0%
Sublist 5	0	0%	0	0	0%	0%
Totals	300	100%	2,009	504	100%	100%

FIGURE 2.1a-9. Unionized Ammonia Station Status.

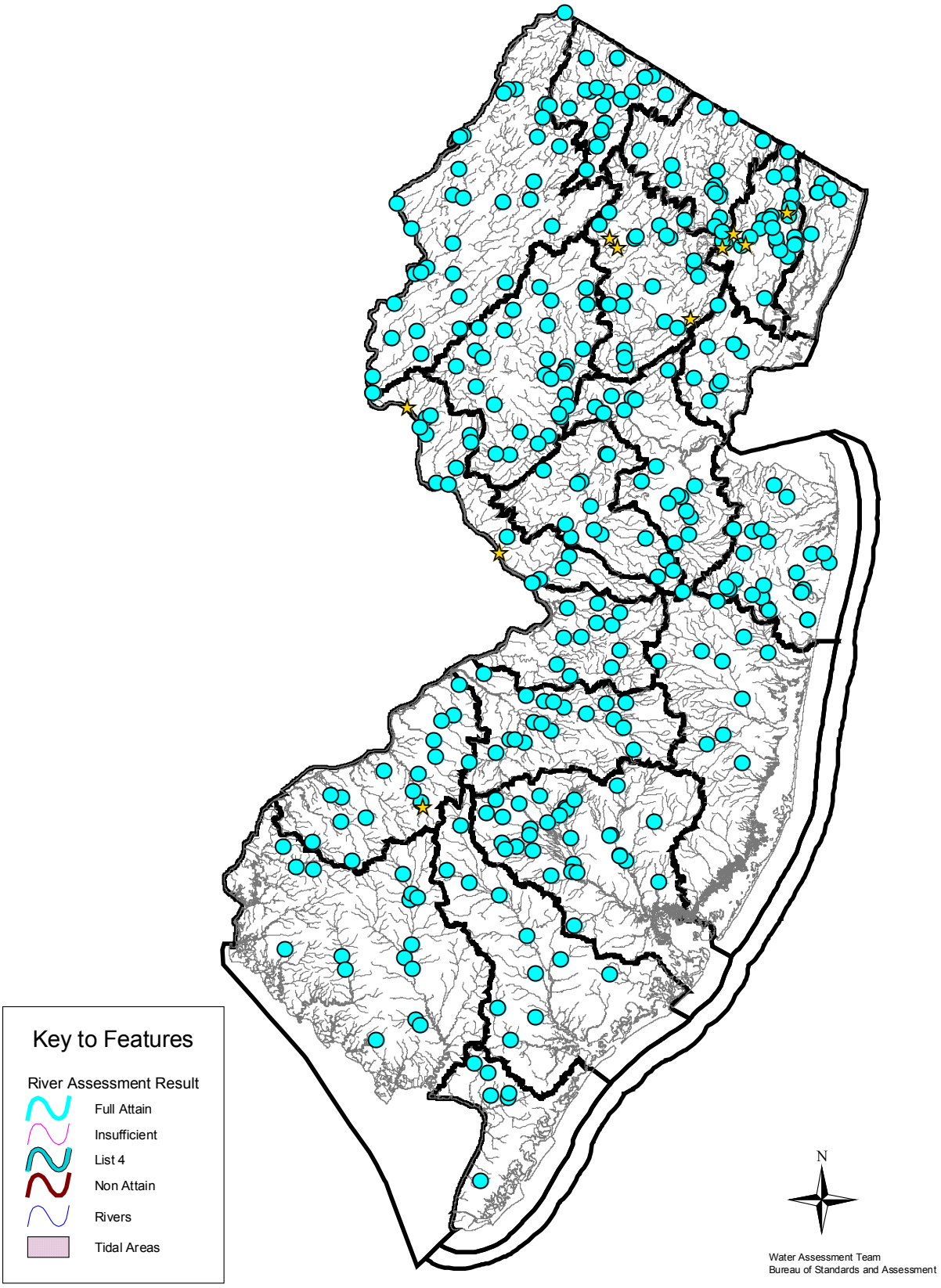
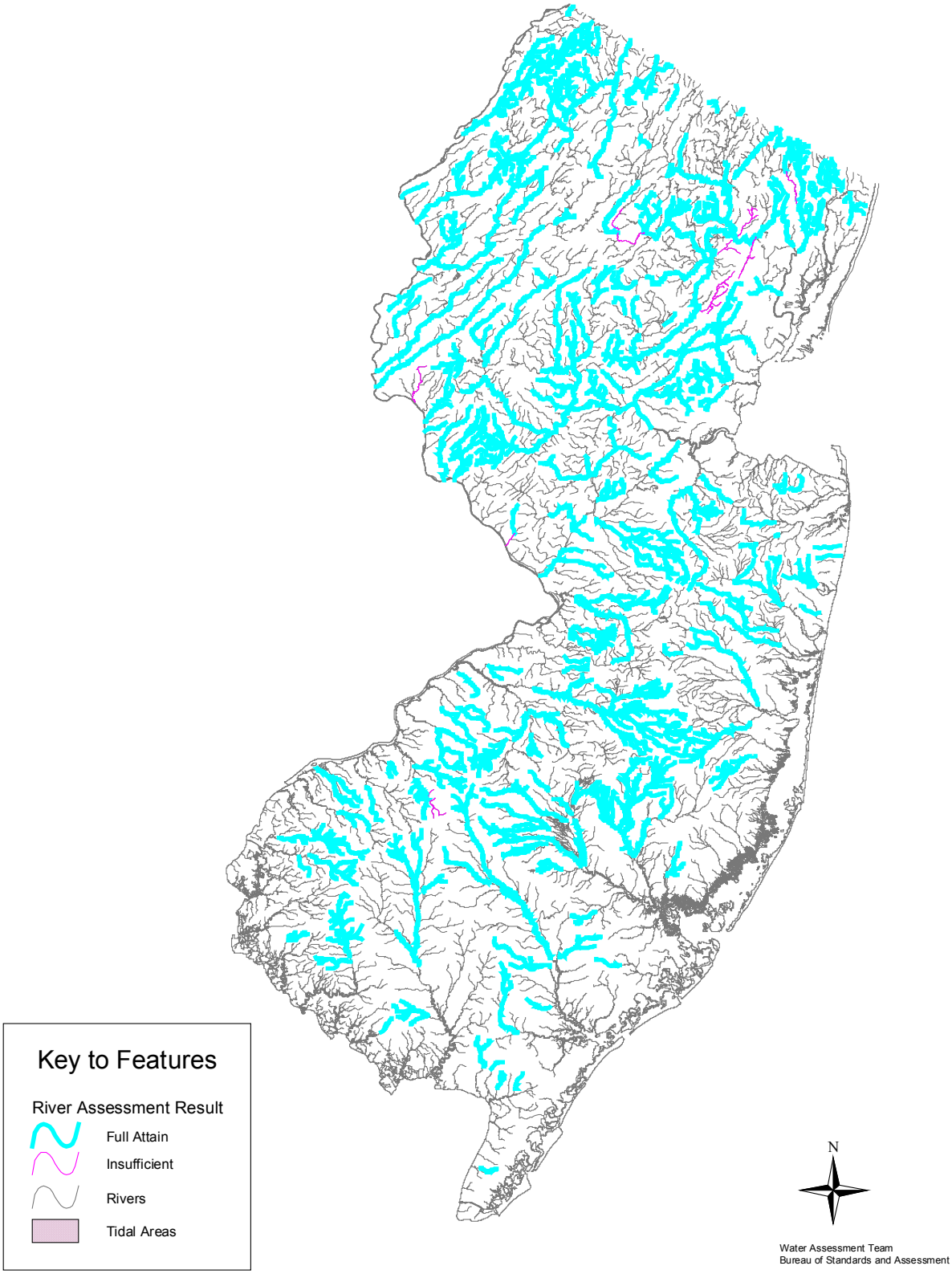


FIGURE 2.1a-10. Unionized Ammonia Assessed River Segments. Includes monitored and estimated river assessments.



Total Suspended Solids Water Quality Assessment

Description

Total suspended solids (TSS) measures suspended sediment particles contained within the water column; specifically those particles that are retained on a 0.45 um membrane filter. TSS can consist of silt, sediment, industrial and municipal waste, and decaying plant and animal matter. In addition, TSS is related to turbidity. The standards for total suspended solids are: 25 mg/l for trout production and trout maintenance waters, and 40 mg/l for non trout and Pinelands waters.

In order to protect aquatic life from excessive sedimentation, total suspended solids (TSS) criteria were established. High TSS can reduce growth rates, reduce DO levels, decrease water clarity, decrease resistance to disease, clog fish gills, and prevent egg and larval development. At high TSS levels, sunlight is blocked from reaching submerged vegetation reducing photosynthesis and causing lower dissolved oxygen to be released into the water column. If light is completely blocked from reaching bottom dwelling plants, the plants will eventually die. High TSS can also cause an increase in surface water temperature since the suspended particles absorb heat. The higher temperatures can then cause dissolved oxygen levels to fall even further.
Suspended solids settling to the river bottoms can smother the eggs of fish and aquatic insects as well as suffocate insect larvae. Furthermore, the settling sediments can fill in spaces between rocks and deny aquatic organisms of an adequate habitat. High TSS is associated with higher concentrations of bacteria, nutrients, pesticides, and metals in the waterbody. These pollutants have an affinity toward attaching onto soil and sediment particles and are then carried into waterbodies during storm runoff. Once in the waterbody, the pollutants may be released into the water column or settle in the sediments where they can either be released into the water column or re-suspended during future storms.

Assessment

A total of 321 sites representing 2,450 river miles were assessed for TSS. The fully attaining sites comprise over 95% of the assessed sites (when including the sites with insufficient data), while only 5% exceed the standards for TSS,. TSS exceedances most commonly occur during high flows when erosion of streambanks and soils in runoff contribute to elevated TSS levels. This is evident at the 15 sites exceeding TSS criteria experiencing a majority of their exceedances during high flows. Consequently, stations with none to very little high flow data available may be masking their TSS exceedances.

The contribution of soil erosion to TSS exceedances can be noted with 9 of the 14 impacted sites located north of the Coastal Plain Region. The Coastal Plain Region is characterized by sandy soil and flat terrain that limits soil erosion into rivers and streams; whereas the other regions in the state are more susceptible to erosion. Although 5 sites with TSS exceedances are located in the Coastal Plain, they are in areas where the soil comprises mostly of clay and silt and are vulnerable to erosion. Impervious surface is also associated with higher TSS levels by causing higher runoff rates and not allowing any filtering of the storm runoff before it enters the streams and rivers.

Results for individual stations are depicted in Figure 2.1a-16, Table II-6, and Table II-12 in the Appendix. Results are summarized below:

Table 2.1a-16: Total Suspended Solids Status

TSS Status	Number of Stations	Percent of Stations	Number of Assessed River Miles		Percent of Assessed River Miles	
			Monitor	Estimate	Monitor	Estimate
Sublist 1	226	70%	1,530	342	76%	76%
Sublist 3	80	25%	367	73	18%	16%
Sublist 4	0	0%	0	0	0%	0%
Sublist 5	15	5%	104	34	6%	8%
Totals	321	100%	2,001	449	100%	100%

Table 2.1a-17: TSS Stations Exceeding SWQS

WMA	Station Number	Station Name	Number of Samples	Percent Exceed	TSS Maximum
09	Bound Brook at Middlesex	01403900	46	20%	328
06	Dead River near Millington	01379200	25	52%	68
10	Millstone River near Manalapan	01400540, 01400530, 5	15	13%	132
12	Mingamahone Brook near Earle	01408009	20	20%	40
01	Musconetcong River at Riegelsville	01457400, DBRCNJ0025	50	14%	145
08	Neshanic River at Reaville	01398000	29	12%	302
18	Oldmans Creek at Pointers - Auburn Rd in Auburn	EWQ0689	8	38%	65
06	Passaic River at Eagle Rock Ave in East Hanover	EWQ0231	8	25%	47
06	Passaic River near Chatham	01379500	13	15%	76
18	Pennsauken Creek S Br at Cherry Hill	01467081	15	13%	73
01	Pequest River at Pequest	01445500	8	25%	102
17	Raccoon Creek at Rt 130 in Bridgeport	01477160	8	38%	60
09	Raritan River at Queens Bridge	01403300	51	14%	269
10	Stony Brook at Princeton	01401000	35	17%	510

FIGURE 2.1a-11. Total Suspended Solids Station Status.

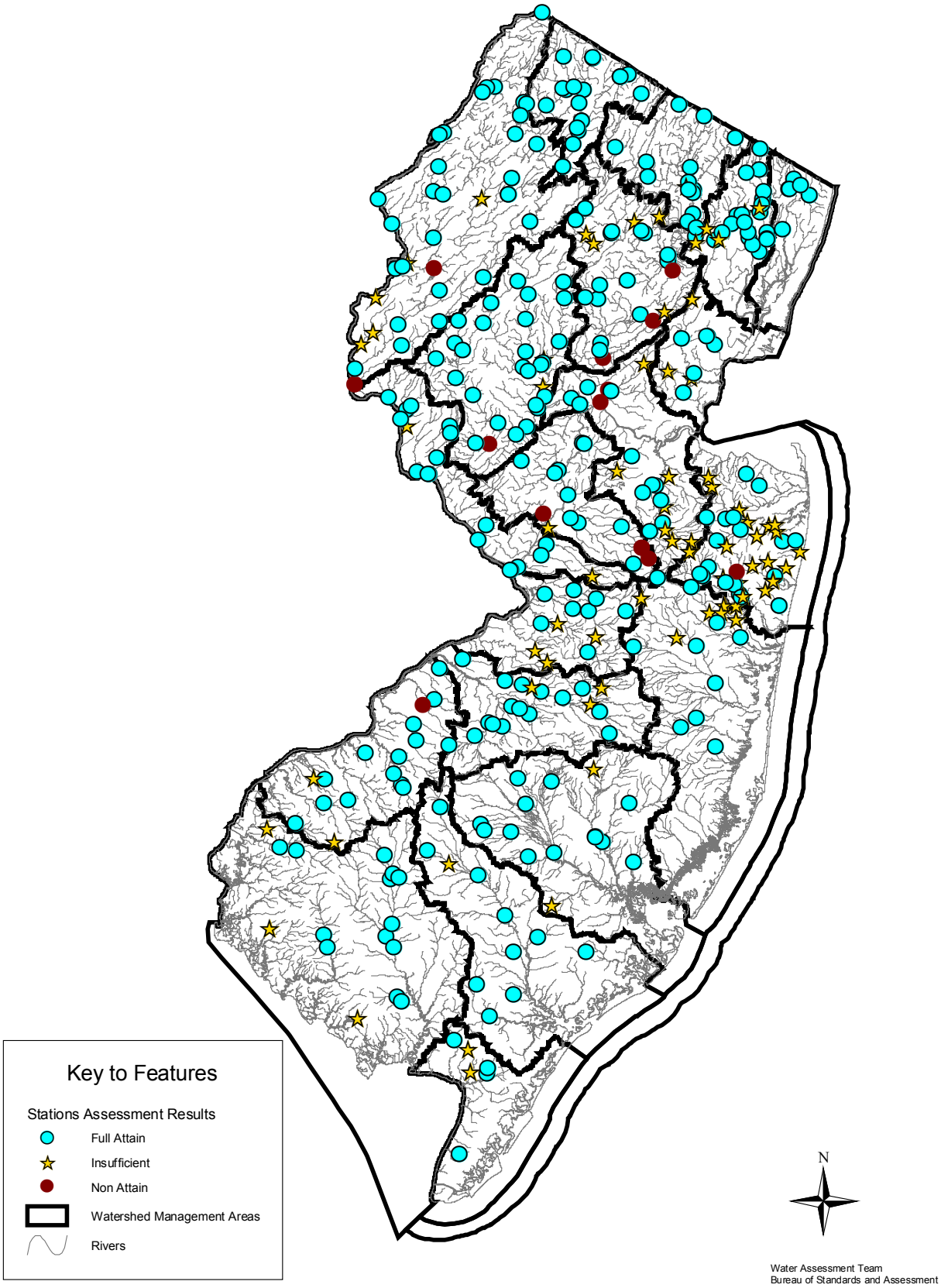
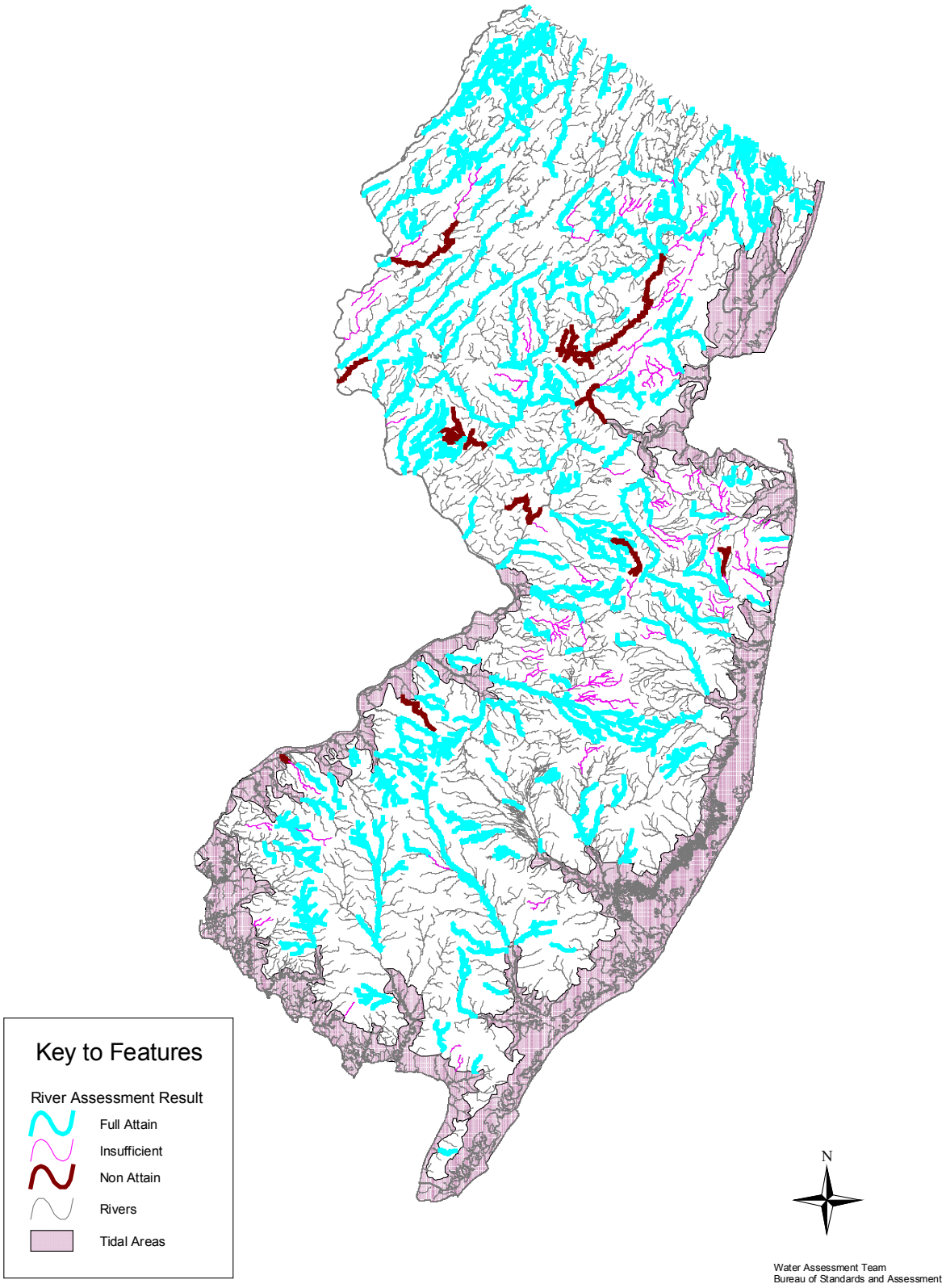


FIGURE 2.1a-12 . Total Suspended Solids Assessed River Segments. Includes monitored and estimated river assessments.



Total Dissolved Solids Water Quality Assessment

Description

Total dissolved solids (TDS) is comprised of minerals, inorganic salts, cations, and anions dissolved in water. The chemical composition of TDS includes principal ions such as carbonate, bicarbonate, calcium, magnesium, potassium, sodium, chloride, and sulfate. Changes in TDS levels can affect aquatic organisms since the density of the water determines the flow of water through cell membranes. This can retard the growth of many aquatic organisms or even cause death. High TDS levels can reduce water clarity, contribute to a decrease in photosynthesis, combine with toxic chemicals and metals, and lead to an increase in water temperature. High TDS concentrations in water is also unsuitable for many industrial applications. Furthermore, TDS is an indicator of drinking water quality, since it can indicate possible increase of pollutants in the water column. Thus, the total dissolved solids criteria, 500 mg/l, was established in the SWQS to primarily meet secondary drinking water standards. Water with levels above this criteria often possesses a bad taste and may result in a laxative effect.

Assessment

For the assessment of total dissolved solids, 297 sites representing 2,541 river miles were evaluated. Over 98% of the stations fully met the standards for TDS when including sites with insufficient data. Five sites exceeded the criteria for TDS and included Delaware River Zone 1, Elizabeth River at Ursino Lake at Elizabethtown, Passaic River at East Hanover, West Branch Rahway River at West Orange, and Saddle River at Lodi (see Table 2.1a-19). All of the sites are located in watersheds that are heavily urbanized except for the impaired segments on the Delaware River. The Delaware River was listed for exceeding dissolved solids for an aquatic life criteria established by DRBC.

Assessment results for total dissolved solids are summarized in Table 2.1a-18 below. Results for individual stations are depicted in Figure 2.1a-13 and in Table II-5 in the Appendix.

Table 2.1a-18: Total Dissolved Solids Status

TDS Status	Number of Stations	Percent of Stations	Number of Assessed River Miles		Percent of Assessed River Miles	
			Monitor	Estimate	Monitor	Estimate
Sublist 1	262	88%	1,777	455	87%	93%
Sublist 3	30	10%	232	26	11%	6%
Sublist 4	0	0%	0	0	0%	0%
Sublist 5	5	2%	44	7	2%	1%
Totals	297	100%	2,053	488	100%	100%

Table 2.1a-19: Stations with Exceedances of TDS

Land Use	Station Number	Station Name	Number of Samples	Percent Exceedance	TDS Maximum
Mixed	Delaware River Zone 1	1D2, 1D3, 1D4, 1D6	(Aquatic Life Criteria Exceeded)		
Urban	Elizabeth River at Ursino Lk at Elizabeth	01393450, 7-ELI-2	15	20.0%	1440
Urban	Passaic River at Eagle Rock Ave in East Hanover	EWQ0231	8	25%	524
Urban	Rahway River W Br at Northfield Av at West Orange	01393960	12	42%	567
Urban	Saddle River at Lodi	01391500, 01391200, 01391490, 01391550, Passaic-7	28	29%	553

FIGURE 2.1a-13. Total Dissolved Solids Station Status.

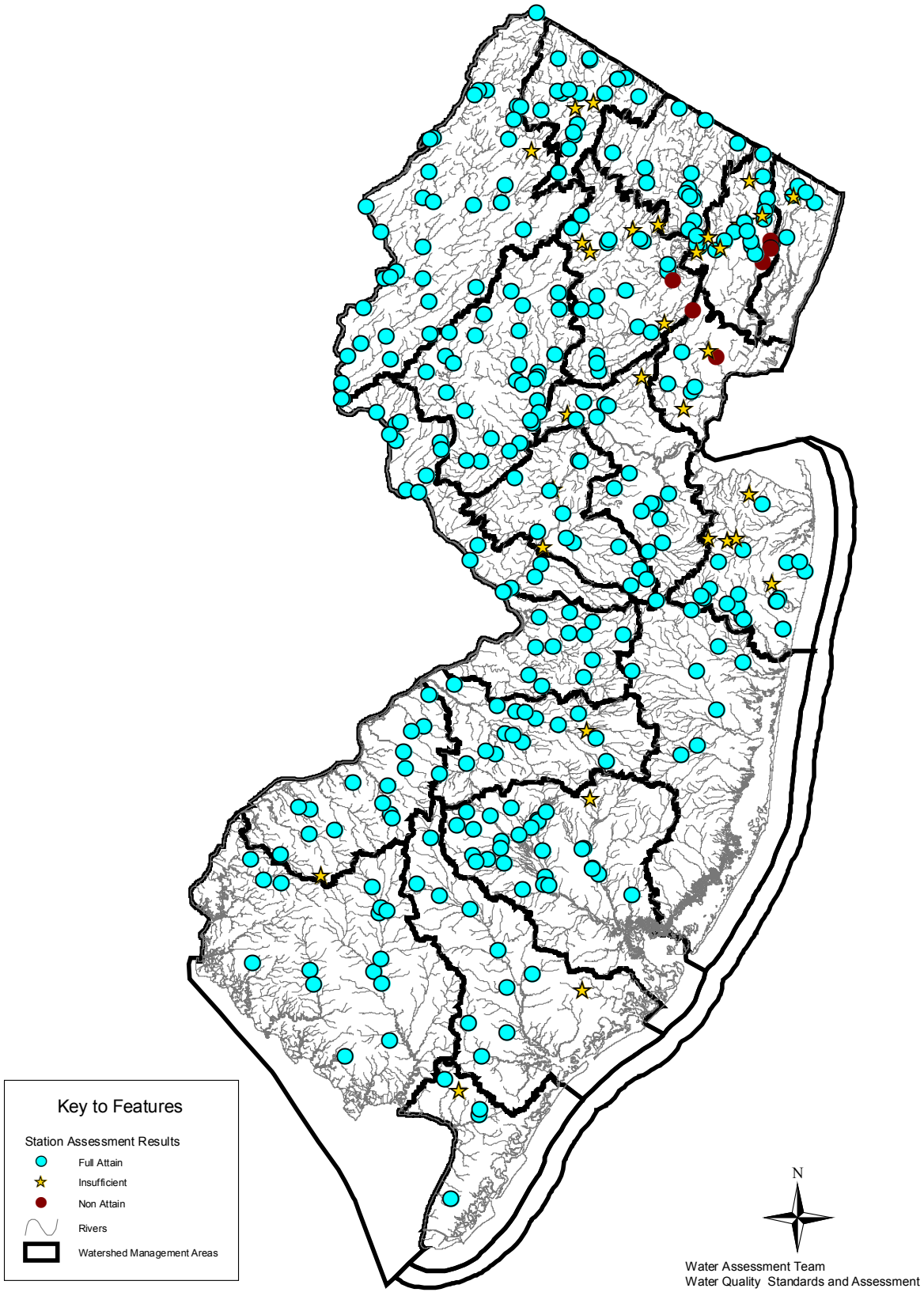
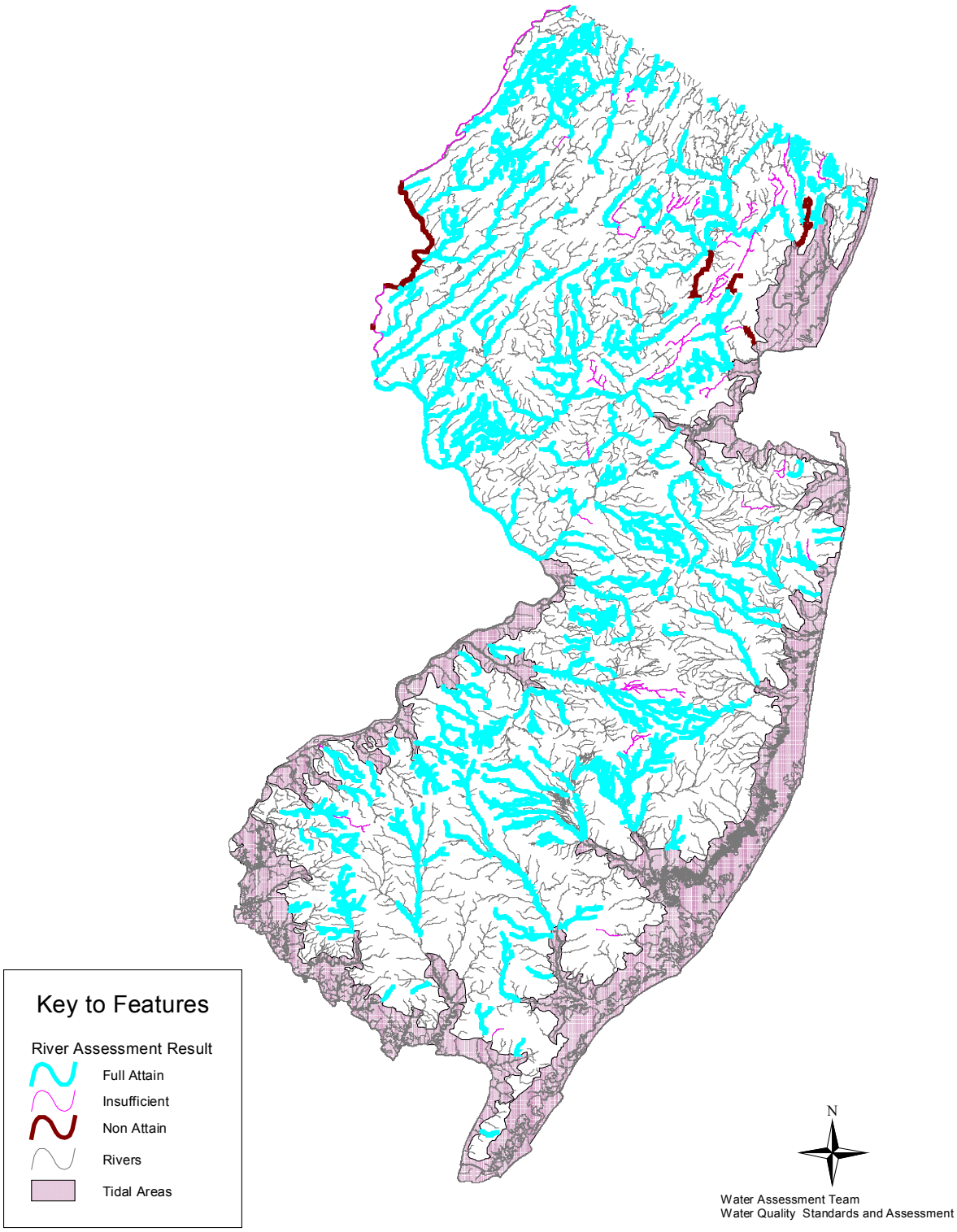


FIGURE 2.1a-14. **Total Dissolved Solids Assessed River Segments**. Includes monitored and estimated river assessments.



Fecal Coliform Water Quality Assessment

See Recreational Designated Use Assessment in Chapter 3, Section 3.1.B.

Nitrate Water Quality Assessment

See Drinking Water Designated Use Assessment in Chapter 3, Section 3.1.C.

Source Assessment For Conventional Parameters

Total Phosphorus Source Assessment: As discussed above, elevated TP may contribute to excessive primary productivity in streams, lakes and reservoirs. Additional data and assessments are needed to evaluate whether excessive primary production is occurring and contributing to use impairments in streams.

Potential sources of nutrients (including TP) include domestic sewage effluent, agricultural runoff, municipal stormwater, golf courses, waste disposal, septic systems, sediment flux, air deposition, and contaminated groundwater. These sources were identified using water quality data, field observations and best professional judgement. This source assessment is considered preliminary. Further assessments will be done to evaluate relationships between flow, nutrients and primary productivity in rivers, lakes and reservoirs. Additionally, such assessments will assist in evaluating point and nonpoint source contributions to TP exceedances as TMDLs are planned, developed and implemented.

Relative Contributions of Point and Non-Point Sources - Under contract to NJDEP, USGS conducted a study to evaluate the relative contributions of point and nonpoint sources of pollution to freshwater streams. (USGS, 1999) The study included a statistical evaluation of water quality data collected between 1976 and 1993 in the Ambient Stream Monitoring Network (ASMN) at 79 stations. Water quality data for 20 parameters collected under high and low flow conditions were used to indicate the relative contribution of constant sources (i.e., point sources and groundwater inflow) and intermittent sources (i.e., nonpoint and stormwater sources).

According to a USGS study, relative contributions of point and nonpoint sources to total phosphorus concentrations from the USGS study indicate that point sources contribute relatively more total phosphorus at 15 locations (20%), whereas nonpoint sources contribute relatively more total phosphorus at 12 locations (16%). However, both point and nonpoint sources are important at 46 locations (63%). The results of this study provide a general indication of relative contributions of point and nonpoint sources. However, additional assessment and modeling will be conducted to evaluate indicators of excessive primary productivity issues in the watersheds and to develop TMDLs as needed.

Elevated TP in Bottom Sediments- Between 1995 and 1997, streambed sediments were sampled once at 33 stations in the ASMN. The concentrations ranged from 40 parts per

million (ppm) TP to 4,200 ppm TP; the average concentration was 510 ppm TP. Concentrations in sediments are significantly higher than those in the water column.

TP Management Measures: Currently, NJDEP has included total phosphorus monitoring requirements or limits in NJPDES permits for 157 facilities that discharge treated effluent to freshwater rivers. In addition, the USDA is developing a policy to reduce or eliminate manure applications to farms based on TP concentrations in soils and the TP needs of crops. As TMDLs are planned and developed, areas with excessive primary productivity will be identified and targeted for management measures, including as appropriate, TP reduction strategies (see 2 year TMDL Schedule and Priority Listing in Appendix 1C and 1B).

pH Source Assessment: pH measurements that are outside acceptable criteria ranges may occur because of natural conditions (e.g., naturally acidic soils) or may be due to runoff of liming agents and nutrients from fertilizer, failing septics, animal wastes, or point source dischargers. Additional assessments are needed to identify pH excursions attributable to natural conditions from those caused by pollution. Normally, anthropogenic inputs tend to increase pH levels except for a few industries that may discharge acidic by-products. This may explain why the majority of impacted sites have elevated pH measurements, except for waterways surrounding the Pinelands.

pH Management Measures: Areas that exhibit contravention of SWQS, with respect to pH, will be evaluated as TMDLs are planned and developed. The factors that contribute to these contraventions will be identified and managed according to the schedule developed in the TMDL Memorandum of Agreement (see 2 year TMDL Schedule and Priority Listing in Appendix 1C and 1B). As mentioned earlier, the Department will study technical approaches to determine if site specific pH criteria are needed for the waters surrounding the Pinelands.

Dissolved Oxygen Source Assessment: Potential causes of exceedances of DO criteria include temperature, flow, eutrophication, biochemical oxidation demand (BOD) and chemical oxidation demand (COD). Further assessment will be done to evaluate point and nonpoint source contributions to DO exceedances as TMDLs are planned, developed and implemented.

Dissolved Oxygen Management Measures: Areas that exhibit contraventions of SWQS, with respect to dissolved oxygen, will be evaluated as TMDLs are planned and developed. The factors that contribute to these contraventions will be identified and managed according to the schedule developed in the TMDL Memorandum of Agreement (see 2 year TMDL Schedule and Priority Listing in Appendix 1C and 1B).

Temperature Source Assessment: Development in and around waterways is perhaps the primary source of temperature criteria exceedances in the state. Development can bring about the reduction or elimination of vegetation and trees in riparian zones that are needed to shade and cool the rivers. Further, the building of impervious surface in the watershed can increase surface temperatures causing rising water temperatures. Development of waterways may include the damming of streams creating ponds and

lakes that increase surface water area and consequently water temperatures. Currently, there are less than 50 lakes in the state that are natural. Finally, potential sources may include thermal inputs by point source dischargers such as cooling water.

Temperature Management Measures: Areas that exhibit contraventions of SWQS, with respect to temperature, will be evaluated as TMDLs are planned and developed. The factors that contribute to these contraventions will be identified and managed according to the schedule developed in the TMDL Memorandum of Agreement (see 2 year TMDL Schedule and Priority Listing in Appendix 1C and 1B).

UIA Source Assessment: Exceedance of unionized ammonia (UIA) normally does not occur naturally. Most sources of criteria exceedances occur from failures in wastewater treatment plants or septics, runoff especially from animal feed lots, or possibly discharges from point sources.

UIA Management Measures: Further sampling at two impacted sites will be explored to determine if high UIA conditions still exist. Areas that exhibit contraventions of SWQS, with respect to UIA, will be evaluated as TMDLs are planned and developed. The factors that contribute to these contraventions will be identified and managed according to the schedule developed in the TMDL Memorandum of Agreement (see 2 year TMDL Schedule and Priority Listing in Appendix 1C and 1B).

TSS Source Assessment: Elevated TSS may occur naturally in watersheds with highly erodable soils. Elevated TSS may also be caused by stream bank and streambed erosion, runoff due to land disturbance, stormwater discharges, and other flow-related conditions. Point source dischargers are also potential contributors to total suspended solids and to a smaller extent decaying plants and animals. Additional assessments are needed to evaluate potential causes of elevated TSS in the 10 locations identified in this assessment.

TSS Management Measures: Areas that exhibit contraventions of SWQS, with respect to TSS, will be evaluated as TMDLs are planned and developed. The factors that contribute to these contraventions will be identified and managed according to the schedule developed in the TMDL Memorandum of Agreement (see 2 year TMDL Schedule and Priority Listing in Appendix 1C and 1B).

TDS Source Assessment: Elevated TDS can occur naturally such as from runoff as it flows over rocks and soils, salt water intrusions, or mineral springs. On the other hand, TDS exceedances have been associated with runoff; runoff from urban and agricultural areas, wastewater treatment discharges, failing septics, and decaying plants and animals. Further assessment will be done to evaluate point and nonpoint source contributions to DO exceedances as TMDLs are planned, developed and implemented.

TDS Management Measures: Further sampling at the two impacted sites, carried over from the 1998 303(d) List, will be explored to determine if high TDS conditions still exist. Areas that exhibit contraventions of SWQS with respect to TDS will be evaluated as TMDLs are planned and developed. The factors that contribute to these contraventions will be identified and managed according to the schedule developed in the

TMDL Memorandum of Agreement (see 2 year TMDL Schedule and Priority Listing in Appendix 1C and 1B).

Section 2.1b Metals

Trace elements, also known as metals, are a high priority issue in New Jersey because of the historical and present use of metals in the state and its persistence in the environment. The hazardous impact of metals on human and aquatic life are also well-known and continues to be a concern. Although sources of metals may be natural from the weathering of rocks and soils, major sources derive from anthropogenic sources such as wastewater discharges, stormwater runoff, landfills, industrial waste, atmospheric deposition, fertilizers, inorganic pesticides, and automobile exhaust. Many of these metals are found in the streambed sediment of rivers. The metals in the sediments can be an additional source of metals in the water column through re-suspension of the sediments during high flows or by certain physiochemical conditions releasing the metals into the water column. For the 2004 Integrated Report the following metals were assessed: arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, thallium, and zinc.

Prior exceedances of the SWQS for metals in non-tidal rivers were documented at 71 sites on the 1998 303(d) List with many of the sites having multiple metals exceeding the standards. In 1998, the Department initiated a monitoring program to address the numerous metals listed on the 1998 303(d) List. The purpose of the new network, called the 303(d) Evaluation Monitoring Network, was to target sampling sites that had exceedances of metals using the latest sampling protocols and laboratory methods to determine if current conditions were still impaired.

Historical sample collection and analyses procedures, while acceptable at the time, were less rigorous than current procedures and may have resulted in overestimating concentrations of some metals. In addition, metals were monitored less frequently than conventionals (2 samples every 3 years), thus fewer data points were available for listing decisions. Improvements have been made to water quality criteria for metals, including the conversion of most aquatic life criteria for metals from total recoverable to dissolved metals. Most available metals data were total recoverable metal. Therefore, some waterbodies were identified as impaired because concentrations of total recoverable metals were above dissolved criteria. See the Integrated Assessment and Listing Methodology Report, Section 4.2.2, Metal Assessment (in non-tidal waters), for a detailed explanation of the new sampling protocol.

As a result of the new data collection, a total of 201 individual metal listing (49% of the metal listings on the 1998 303(d) List) were delisted after new data confirmed that conditions met the SWQS. Fifty metal listings (14% of the listings on the 1998 303(d) List) were found to continue to have exceedances of metal standards, and 139 listings (37% of the listings on the 1998 303(d) List) were carried over to the 2004 Sublist 5 due to no new data available or insufficient data to make a new assessment. Due to the lack of high flow data, many of the sites do not have sufficient data for assessment. Currently, NJDEP is in the process of collecting high flow data at the majority of the sites.

On the 2004 Integrated List, 119 stations representing 760 river miles were assessed with 548 river miles exceeding a standard for at least one metal (see Table 2.1b-1). As seen in

Figure 2.1b-1, arsenic, lead, mercury, and copper had the highest impairment of river miles in non-tidal waterways. Arsenic and lead had the highest number of new listings based on the most current sampling, 310 and 110 miles respectively. Mercury and copper exceeded their criteria, to a lesser extent, impacting 47 and 50 river miles respectively. Exceedances of the metal criteria occurred throughout the state, in all physiographic regions, and in all land use types.

Table 2.1b-1: Overall Metals Status in Non-Tidal Rivers

Metals Status	Number of Stations	Percent of Stations	Number of Assessed River Miles		Percent of Assessed River Miles	
			Monitor	Estimate	Monitor	Estimate
Sublist 1	24	20%	177	0	23%	NA
Sublist 3	9	8%	35	0	5%	NA
Sublist 4	0	NA	0	0	NA	NA
Sublist 5	86	72%	548	0	72%	**NA**
Totals	119	100%	760	0	100%	NA

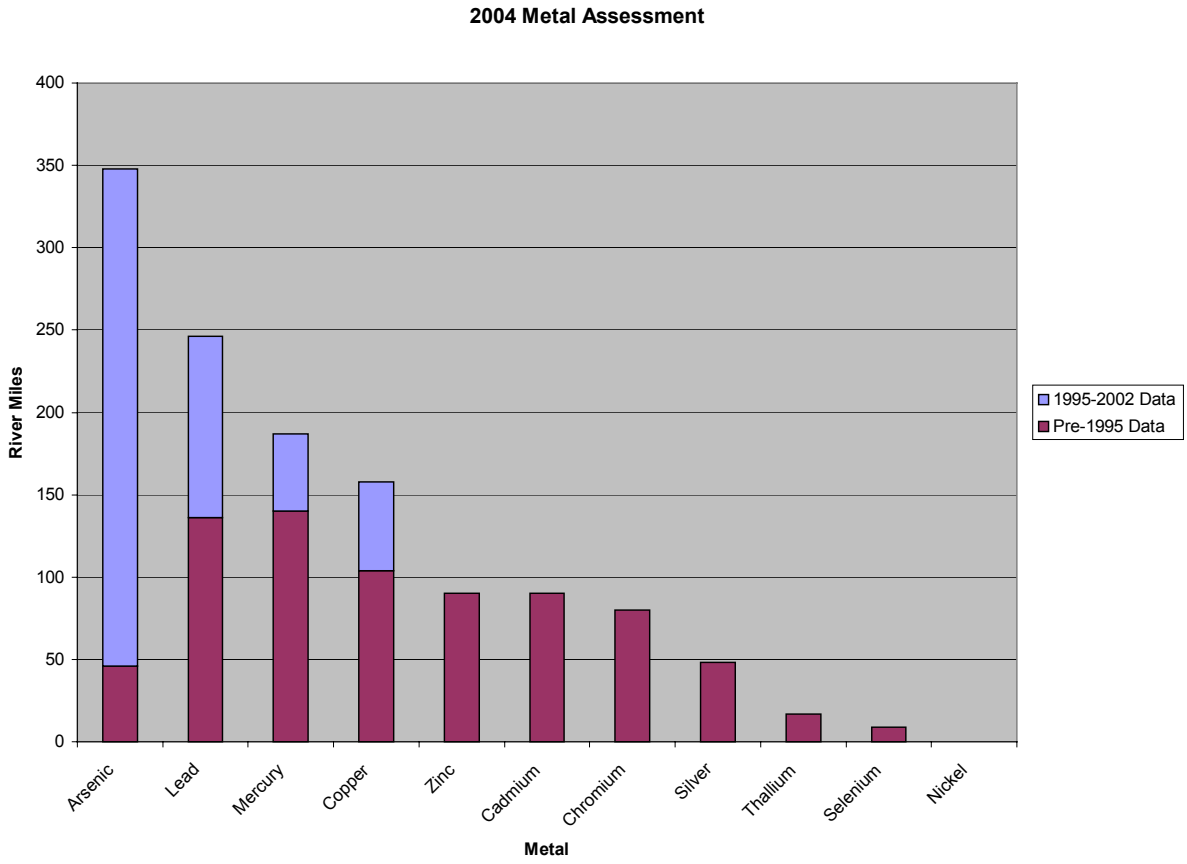


FIGURE 2.1b-1. River Miles with Metal Exceedances. Nickel exceeds criteria in the Hackensack River, however, a TMDL has been developed and approved by EPA. Therefore, nickel is not included in the chart as an exceedance.

Since 1998, the NJDEP/USGS Redesigned Ambient Stream Monitoring Network (Redesigned ASMN) has conducted metal sampling at 7 background sites that represent undisturbed, natural ambient river conditions. It is presumed that the only input of metals into these systems are natural and atmospheric deposition. The data at the background sites were compared to statewide conditions (using statewide status stations) and focused on data collected between 1998 to 2002. Conditions at the background sites showed that metal levels were very low with few actual detections above the MDL. Many of the metals showed significant differences between background and statewide conditions. Arsenic had a significant higher average statewide concentration with all of the detected samples exceeding the surface water criteria. Additionally, copper, nickel, and lead had significantly higher statewide averages and detections. The metals with statewide average concentrations similar to the background concentrations included cadmium, chromium, mercury, selenium, and zinc. Comparing the statewide data with the background data gives us an indication how manmade sources are impacting the state's waterways. Although some metals had similar statewide conditions as background conditions, there may still be local contamination not monitored by the networks.

The only actual exceedance of a criteria at a background site occurred at Double Kill at Wawayanda where arsenic exceeded its criteria. It is suspected the occurrence of arsenic at this site is from natural sources since no anthropogenic sources are known to be in the area. In the table below, the detections, average concentrations, and maximum values for statewide and background sites are summarized. All data were based on total recoverable samples.

Table 2.1b-2: Background and Statewide Metals Data

STATEWIDE	ARSENIC	CADMIUM	CHROMIUM	COPPER	LEAD	MERCURY	NICKEL	SELENIUM	SILVER	ZINC
Total Samples	194	194	194	194	194	194	194	194	194	194
Detected Samples	79	62	48	148	61	16	110	35	42	110
Detected Samples (%)	41%	32%	25%	76%	31%	8%	57%	18%	22%	57%
Average	1.08	0.26	0.74	2.31	1.33	0.05	2.04	0.41	1.84	11.10
Maximum	30	0.49	10.57	21.06	36.527	0.15	40	1.572	36	94
BACKGROUND										
Total Samples	26	26	26	26	26	26	26	26	26	26
Detected Samples	1	5	2	9	2	0	5	1	0	13
Detected Samples (%)	4%	19%	8%	35%	8%	0%	19%	4%	0%	50%
Average	0.063	0.269	0.516	0.613	0.646	0.059	0.848	0.415	0.354	7.968
Maximum	1.196	0.05	0.94	1.2	2.793	No Detections	2	0.4	No Detections	10

Detected: Values larger than the method detection limit (MDL).
Average: Nondetected samples used ½ of the method detection limit to determine average concentrations. Arsenic used the SWQS, 0.0178, as the value for nondetected samples.

Impaired waterbodies were categorized as either exceeding human health criteria, aquatic life criteria, or could not be determined because impairment was based on old data that were not available (see Water Quality Criteria for Metals below). A summary of the data showed 287 miles exceeded a human health criterion, 60 miles exceeded an aquatic life criterion, 108 miles exceeded both a human health and aquatic life criteria, and 95 miles were undetermined.

Water Quality Criteria for Metals

Criteria for the protection of human health, acute aquatic life, and chronic aquatic life must all be met in order for a metal to meet its designated use. Some aquatic life criteria are hardness-dependant, and decrease as water hardness decreases. Criteria were calculated using hardness at the time of sampling. See Table 2.1b-3 for SWQS metals criteria.

Some aquatic life criteria are based on the dissolved form of the metal. In the 303(d) Evaluation Monitoring, samples were analyzed for both total recoverable and dissolved metals. In the Ambient Stream Monitoring Network (ASMN) and Redesigned ASMN, only total recoverable metals were analyzed. This approach was used because review of historical data have shown that total recoverable metals were not detected at many locations; concentrations of dissolved metals are lower than total metals. For evaluations of previously listed waterbodies, an impairment was identified if the concentration of total recoverable metal exceeded the dissolved criterion, providing a conservative assessment. In these cases, collection of additional data on both total and dissolved metals concentrations is being conducted as part of the watershed/TMDL planning.

Table 2.1b-2 provides the minimum detection limit for the 303(d) Evaluation Monitoring Program data, numerical criteria for metals in freshwaters in New Jersey and the form of the metal for acute criteria. All human health criteria are based on the total recoverable metal. The table shows how hardness-dependant criteria changes and gives an example of low hardness (10.0 mg/l) compared to high hardness (100 mg/l)

Table 2.1b-3: SWQS Metals Criteria

Sample Hardness:			10		100		
SWQS	**MDL**	**HH**	**AQL(a)**	**AQL(c)**	**AQL(a)**	**AQL(c)**	**Acute Criteria Form**
Arsenic	1	0.0170	360	190	360	190	dissolved
Cadmium	1	10	0.3	0.2	3.7	1.0	dissolved
Chromium-Tot	1	160	NA	NA	NA	NA	NA
Chromium-Hex	5	NA	15	10	15	10	dissolved
Copper	1	NA	2	2	17	11	dissolved
Lead	1	5.0	5	0.19	65	2.5	dissolved
Mercury	0.04	0.14	2.1	0.012	2.1	0.012	AQLa-dissolved AQLc-total recoverable
Nickel	1	516	202	22	1415	157	dissolved
Selenium	3	10	20	5.0	20	5.0	total recoverable
Silver	1	164	0.07	NA	3.4	NA	dissolved
Thallium	1	1.70	NA	NA	NA	NA	NA
Zinc	2	NA	16	15	114	105	dissolved

Calculated Concentration Factors

SWQS		AQL(a)	AQL(c)	AQL(a)	AQL(c)	
Cadmium		1.04	1.01	0.94	0.91	
Lead		1.13	1.13	0.79	0.79	

Notes:
SWQS Criteria in ug/l
MDL: Method Detection Limit
HH: Human Health Criterion; compare to Total Recoverable data
AQL(a): Acute Aquatic Life Criterion; Compare to Dissolved data
AQL(c): Chronic Aquatic Life Criterion; Compare to Dissolved data
Formulae used to calculate aquatic life criteria are available from the Surface Water Quality Standards Program.
From: Surface Water Quality Standards (N.J.A.C. 7:9B) and National Toxics Rule (40 C.F.R. 131.36)

Data Sources
Historically, data assessed for metal impairments in freshwaters were generated primarily from the 1990 Assessment of Waters Impaired by Toxic Pollutants (NJDEP, 1989) also known as the 304(l) List; and, to a lesser extent, the NJDEP-USGS Cooperative Ambient Stream Monitoring Network (ASMN). Since many waterbodies had data based on water quality and effluent data collected in the early and mid-1980's, the need to reassess water quality for metals has been a high priority issue. In order to address this need, data collection commenced in 1998 with the 303(d) Evaluation Monitoring Network, as well as, continued data collection in the ASMN and Redesigned ASMN. These data have

provided much needed information in the determination of the status of metals in the state's waterways.

See Appendix II, Data Sources for the 2004 NJ Integrated Report for details of the monitoring networks. Below are the data network sources for metals on the 2004 Integrated List:

- 303(d) Evaluation Monitoring (101 sites) – Primary source of new metal data. Targeted sites on the 1998 303(d) List for metals. Sampled between 1998 to 2002. Forty-six sites did not have high flow data available to complete the assessment.

- NJDEP/USGS Ambient Stream Monitoring Network (ASMN) (76 sites) –These sites were sampled prior to October of 1997.

- NJDEP/USGS Redesigned Ambient Stream Monitoring Network (Redesigned ASMN) (168 sites) – implemented in October, 1997. Only one sample available. Since these sites lacked the data required for an assessment, they were not included in this report. However, if these sites overlapped with 303(d) Evaluation Sites or older ASMN Sites then the data from the Redesigned ASMN Sites were included in the assessment. All of the six Background sites were used in the assessment since these sites were sampled every year from 1998 to 2002 and had sufficient data to conduct an assessment.

Several sites were excluded from the 2002 metals assessment because these sites could not be located on the GIS maps and therefore the river miles could not be calculated (see Table 2.1b-4 below).

Table 2.1b-4: Metal Sites excluded from Assessment Results

WMA	Station Name	Metals
05	Ackermans Creek Adjacent to Berry's Creek Reach 02030103-034-0.11	Chromium, Mercury, PCB, Chlorinated Benzenes
12	Birch Swamp Brook Adjacent to Matawan Creek Reach 02030104-328-0.42	Arsenic, Lead, Copper, PCB
09	Edmunds Creek Adjacent to Mill Brook at 02030105-059-0.00	PCB

Arsenic (As)

Description

Arsenic is a steel gray, brittle, semimetallic solid that occurs naturally in rocks, soil, water, and air. The most common natural source is from erosion of rocks but other contributions include forest fires and volcanic activity. Approximately 90 % of industrial use of arsenic is as a wood preservative, but it is also used in paints, dyes, metals, drugs, soaps, and semiconductors. Agricultural application, mining, and smelting also contribute to arsenic releases in the environment (EPA Fact Sheet). Although arsenic is no longer used in making pesticides and weed killers, prior use before the ban has contributed to environmental contamination (EPA Technical Fact Sheet).

In the environment, arsenic can be found in either the inorganic or organic form. In the inorganic form it is usually in two oxidation states, arsenite (+3) and arsenate (+5). The arsenate form is dominate in oxygenated surface water, and the arsinite form is dominate in groundwater.

The arsenite form is more toxic than arsenate and the inorganic form more toxic than the organic form. Arsenic precipitates with phosphorus, iron, manganese, sulfur, and organic matter and under most conditions, co-precipitation or sorption with iron oxides is probably the predominant process in the removal of dissolved arsenic from the water column (USEPA 1979 and Canadian WQ Guideline). Usually, arsenic concentrations are found to decrease from sources of pollution predominately caused by settling out in sediments (Nat'l Academies Press).

Arsenic is a known human carcinogen. Long term exposure can cause cancer of the bladder, lungs, skin, kidney, nasal passages, liver, and prostate. Non-cancer effects include cardiovascular, pulmonary, immunological, neurological and endocrine effects (EPA Fact Sheet). Chronic animal studies have shown body weight changes, decreased blood hemoglobin, liver damage, and kidney damage.

Assessment

A total of 116 sites representing 756 river miles were assessed for arsenic. Approximately half of the sites do not meet the criteria for arsenic, while the other half is listed on sublist 3. Because the human health criteria is below the method detection level (MDL), no sites were placed on sublist 1 as "Full Attainment." (see the Methods Document, Section 4.2.2 for an explanation of MDLs for metals) Data showing no exceedances were listed under sublist 3 as "Insufficient Data." Of the 60 sites on sublist 3, 35 of the sites had no exceedances, 19 had insufficient data, and 6 sites had only one exceedance. Only 9 sites of the 56 exceeding the criteria were carried over from the 1998 303(d) List (see Table 2.1b-6b).

Extensive new sampling for arsenic in the 303(d) Reconnaissance Network reveals that arsenic is widely detected throughout the state (see Table 2.1b-6). It has the highest exceedance rate in the state with all of the violations exceeding the human health criteria of 0.0178 ug/l. One of the few areas in the state without arsenic impairments is the Pinelands. However, even this area had a site (Hammonton Creek at Westcoatville) with

arsenic levels higher than the criteria. Here, anthropogenic sources are the probable cause for impairment.

Results of the arsenic assessment are summarized below in Table 2.1b-5. Results for individual stations are depicted in Figure 2.1b-2 and in Tables II-15 through 18 in the Appendix.

Table 2.1b-5: Arsenic Status

Arsenic Status	Number of Stations	Percent of Stations	Number of Assessed River Miles		Percent of Assessed River Miles	
			Monitor	Estimate	Monitor	Estimate
Sublist 1	0	NA	0	0	NA	NA
Sublist 3	60	51%	400	0	53%	NA
Sublist 4	0	NA	0	0	NA	NA
Sublist 5	56	49%	356	0	47%	**NA**
Totals	116	100%	756	0	100%	NA

Table 2.1b-6: Arsenic Sites Exceeding Criteria (based on most recent sampling)

WMA	Station Number	Station Name	WMA	Station Number	Station Name
11	11-AS-2	Assunpink Creek near Clarksville	19	19-RA-4N	North Br Rancocas Creek, off Pine St, Mt. Holly
11	11-AS-3	Assunpink Creek on Peace St., Trenton	2	2-PAP-1	Papakating Creek on Rte 23 nr Lower Unionville Rd
10	10-BED-2, 10-BED-3	Bedens Brook on Rte 206, Rocky Hill	5	5-PAS-1	Pascack Brook on Harrington Ave., Westwood
	01378855	Black Brook at Madison	6	6-SITE-3	Passaic at Two Bridges
18	01467150, 18-CO-4	Cooper River at Haddenfield	4	4-SITE-6; 4-PAS-3	Passaic River at Little Falls
18	18-CO-1	Cooper River at Rte 130, Camden	4	4-SITE-4; 4-PAS-4	Passaic River at Singac
5	5-DOR-1	Dorotockys Run on Old Tappan Rd, Old Tappan	6	6-SITE-1; 6-PAS-2	Passaic River nr Chatham
5	5-HAC-2	Hackensack River on Old Tappan Rd., Rivervale	1	1-PAU-1	Paulins Kill on Route 626 in Balesville
5	5-HAC-3	Hackensack River on Westwood Ave., Rivervale	7	7-RAH-1	Rahway River on St. George Ave, Rahway
14	14-HAM-2, 14-HAM-1	Hammonton Creek at Westcoatville	9	01403300	Raritan River at Queens Bridge
17	17-HUD-1	Hudson Branch @ Vineland	7	7-ROB-1	Robinson's Br. @ Central Ave, Rahway
9	9-LAW-1	Lawrence Brook on Davidson's Mill Rd, Black Horse	10	01400585	Rocky Brook at Perrinville
17	01411500	Maurice River at Norma	8	8-SB-3	S Br Raritan River on Stanton Station Rd @ Stanton

Table 2.1b-6: Arsenic Sites Exceeding Criteria (based on most recent sampling) (cont.)

WMA	Station Number	Station Name	WMA	Station Number	Station Name
17	17-MAU-1	Maurice River nr Millville	4	4-SITE-12, 4-SITE-13; 4-SAD-1	Saddle River at Lodi
10	10-MIL-5	Millstone River @ Blackwell Mills	19	19-RA-1S	South Br Rancocas Creek, Rte 38, Hainsport
10	10-MIL-3	Millstone River above Raritan River confl. in Manville	19	19-RA-2S	South West Br Rancocas Creek, Rte 70, Medford
10	01400650	Millstone River at Grovers Mills	10	10-STO-1; 10-STO-4	Stony Brook on Rte 206, Princeton
10	10-MIL-7	Millstone River off Rte 1, Plainsboro	5	5-TEN-2	Tenakill Brook on Cedar Lane, Closter
10	10-MIL-2	Millstone River off Rte 27 in Kingston	2	2-WAL-3	Wallkill River on Ames Blvd (Rte 94), Hamburg
10	10-MIL-1	Millstone River on Baird Rd, Millstone Twp.	2	2-WAL-5	Wallkill River on Bassets & Owen Sta. Rds. Nr Owen
10	10-MIL-6	Millstone River on Wilhousky St, Manville	2	2-WAL-2	Wallkill River on Davis Rd nr Scott Rd in Franklin
1	1-MUS-3	Musconetcong River on Kings Hwy in Beattystown	2	2-WAL-4	Wallkill River on Glenwood Rd off Rte 23 nr Martin
	01377499	Musquapsink Brook at Rivervale	2	2-WAL-1	Wallkill River on Maple St nr Police Sta. nr Frank
18	18-CO-2	North Br Cooper R, Kresson Rd, Kresson			
18	18-PE-1, 18-PE-2	Pennsauken Creek N Br near Morrestown			

Table 2.1b-6: Arsenic Sites Carried Over From 1998 303(d) List

WMA	Station Number	Station Name	WMA	Station Number	Station Name
11	11-AS-4	Assunpink Creek at Route 535	06	01379000, 6-PAS-1, 6-SITE-2	Passaic River near Millington
20	20-AS-1	Assiscunk Creek at Cedar Lane in Springfield	18	01467081, 18-PE-3	SB Pennsauken Creek at Cherry Hill
01	01447000	Delaware River at Easton	01	01446400, 1-PEQ-3	Pequest River at Belvidere
17	01411800, 17-MAU-1	Maurice River near Millville	06	01380500, 6-SITE-11	Rockaway River at Boonton
04	01389880, 4-SITE-5	Passaic River at Elmwood Park			

FIGURE 2.1b-2. Assessment Status of Stations Monitored for Arsenic. Includes sites delisted and carried over from the 1998 303(d) List.

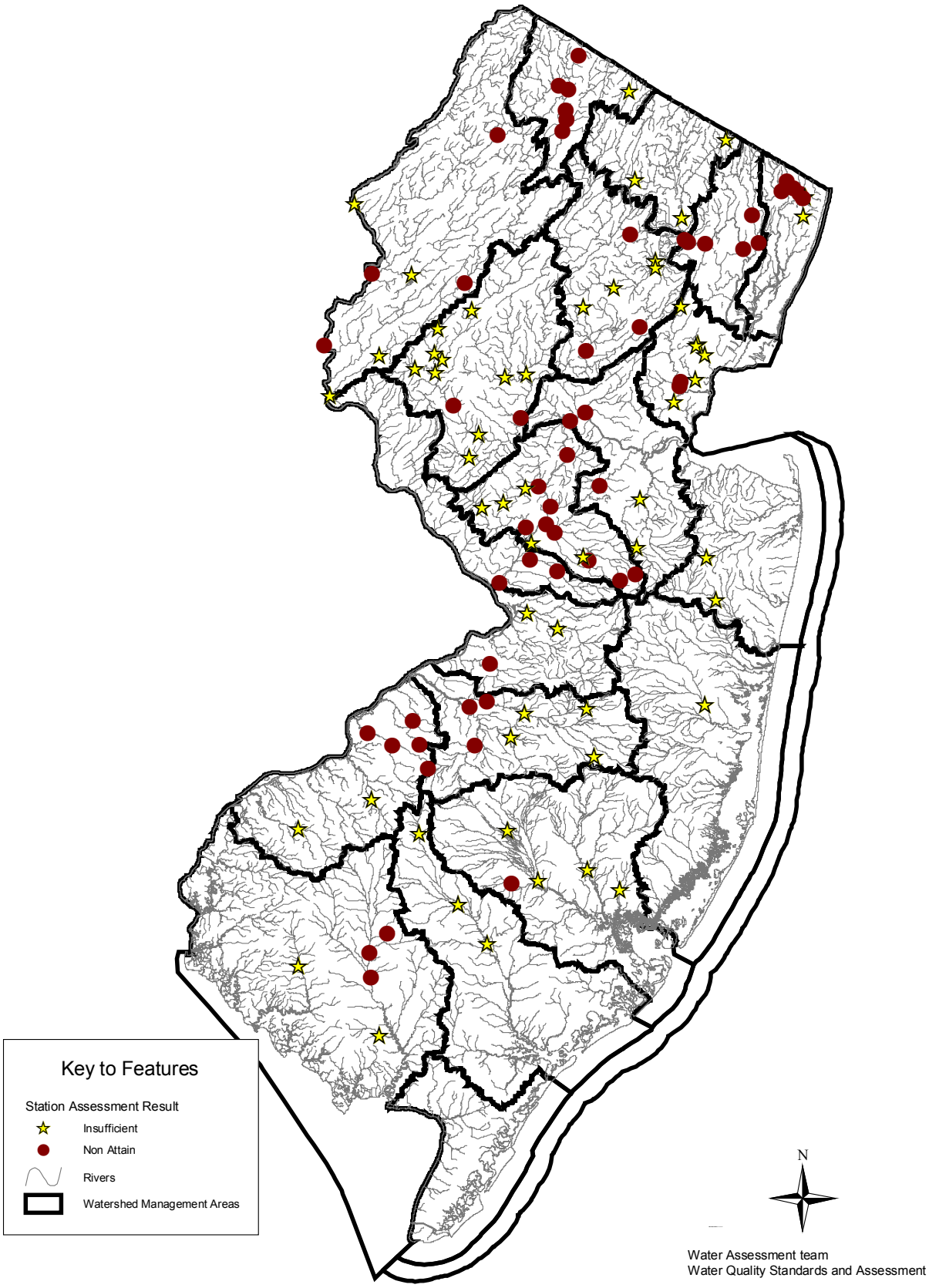
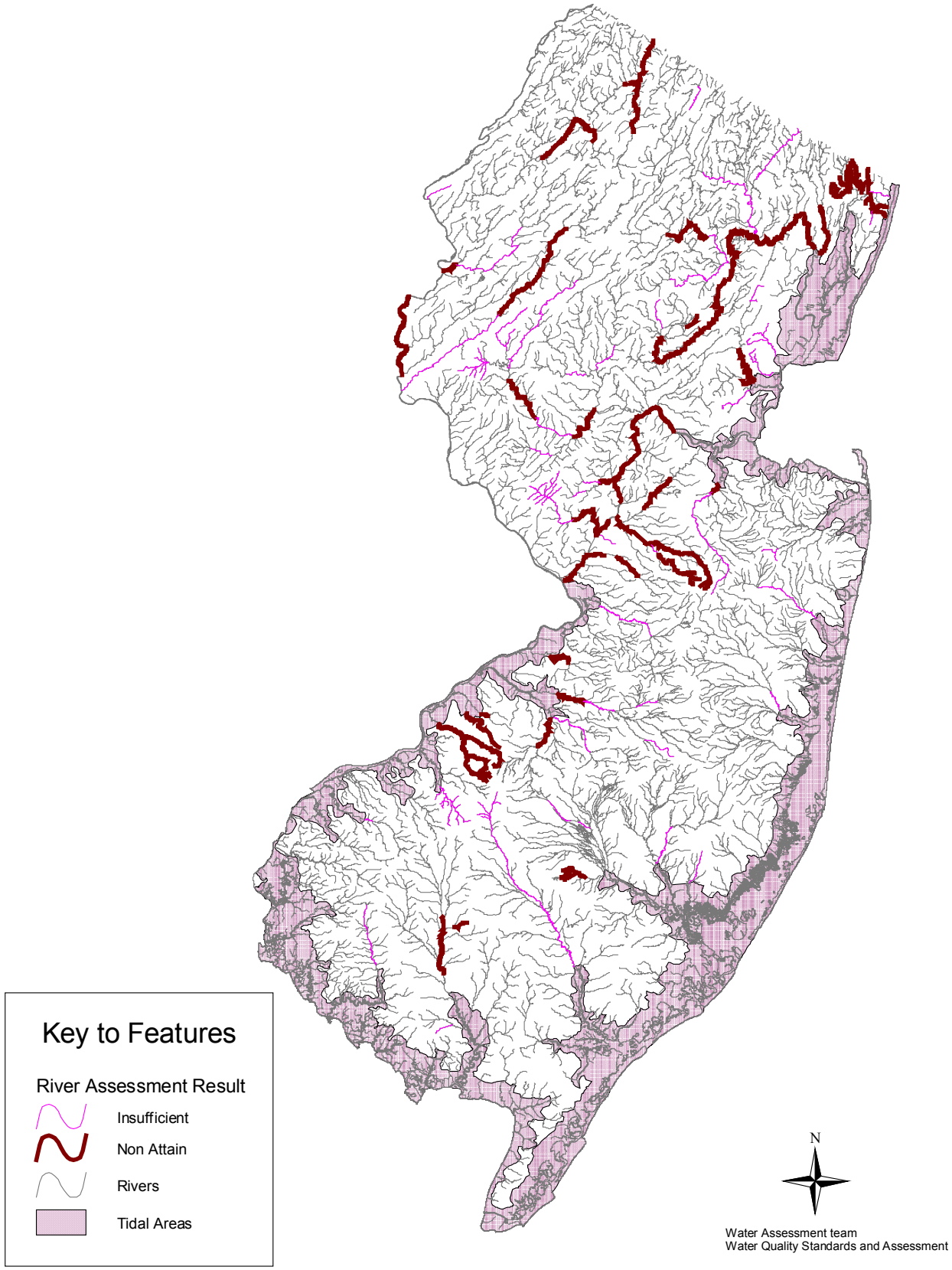


FIGURE 2.1b-3. Assessment Status for Arsenic in Rivers.



Cadmium (Cd)

Description

Cadmium is a soft, bluish-white metal found naturally in the environment. The most common natural source of cadmium is from erosion of rocks but contributions from forest fires and volcanic activity may be significant. Anthropogenic sources include industrial discharge, leakage from landfills and contaminated sites, and use of sludge and fertilizer in agriculture. Cadmium is mostly used in rechargeable nickel-cadmium batteries (70%), and is widely used in special alloys, pigments, coating stabilizers, solders, electronic equipment, lubricants, glass, ceramics and stabilizer in plastics. It is also present in the phosphate rock used for fertilizers(Cadmium.org).

In the environment, cadmium occurs predominately in the divalent state (+2) and is associated with inorganic (halides, oxides, sulfides) and organic compounds. The co-precipitation and adsorption with iron, aluminum, magenese oxides, as well as, with organic complexing agents are significant and allows settling in the sediment as a major sink (Canadian Council of Resource and Environment Ministers, 1987).

Cadmium is toxic and is classified by EPA as a probable human carcinogen. The kidney is the primary organ that cadmium targets, and chronic exposure can cause kidney failure. Other complication to humans and animals from cadmium exposure include hypertension, anemia, and liver damage. In addition, cadmium is associated with bone disease and respiratory complication when primary intake is by inhalation (Cadmium.Org).

Assessment

A total of 117 sites representing 742 river miles were assessed for cadmium. At low hardness levels, the criteria for cadmium is below the method detection level (MDL) and is therefore assessed as "Insufficient Data" although no exceedances of the criteria are detected (see the Methods Document, Section 4.2.2 for an explanation of MDLs for metals). As a consequence, 75% of sites are on sublist 3. Of the 88 sites on sublist 3, 67 sites (76% of sublist 3 sites) had no exceedances, but were assessed as "Insufficient Data." Only 11% of the sites were assessed as "Non Attainment," of which all were carried over from the 1998 303(d) List due to insufficient data available for new assessments (see Table 2.1b-8). Recent sampling shows no exceedances of cadmium with statewide average cadmium concentrations similar to concentrations at background sites. Recent data do not indicate any threat to human health or aquatic life in any areas of the state, and the Department will conduct high flow sampling at the remaining sublist 5 sites to determine delisting.

Results of the cadmium assessment are summarized below in Table 2.1b-7. Results for individual stations are depicted in Figure 2.1b-4 and in Tables II-15 through 18 in the Appendix.

Table 2.1b-7: Cadmium Status

Cadmium Status	Number of Stations	Percent of Stations	Number of Assessed River Miles		Percent of Assessed River Miles	
			Monitor	Estimate	Monitor	Estimate
Sublist 1	16	14%	114	0	15%	NA
Sublist 3	88	75%	538	0	73%	NA
Sublist 4	0	NA	0	0	NA	NA
Sublist 5	13	11%	89	0	12%	NA
Totals	117	100%	741	0	100%	NA

Table 2.1b-8: Cadmium Sites Carried Over From 1998 303(d) List

WMA	Station Number	Station Name	WMA	Station Number	Station Name
20	20-AS-1	Assiscunk Creek, Cedar Lane, Springfield	04	01389500, 4-PAS-3, 4-SITE-6	Passaic River at Little Falls
11	01463620, 11-AS-2	Assunpink Creek near Clarksville	06	01379000, 6-PAS-1, 6-SITE-2	Passaic River near Millington
11	11-AS-4	Assunpink Creek at Route 535	04	01389130, 4-PAS-4	Passaic River at Sigac
01	01447000	Delaware River at Easton	01	01446400, 1-PEQ-3	Pequest River at Belvidere
09	9-LAW-1	Lawrence Brook at Davidsons Mill Rd at Black Horse	06	01380500, 6-SITE-11	Rockaway River at Boonton
06	01379500, 6-PAS-2, 6-SITE-1	Passaic River near Chatham	08	01396800, 8-SP-1	Spruce Run at Clinton
04	01389880, 4-SITE-5	Passaic River at Elmwood Park			

FIGURE 2.1b-4. Assessment Status of Stations Monitored for Cadmium. Includes sites delisted and carried over from the 1998 303(d) List.

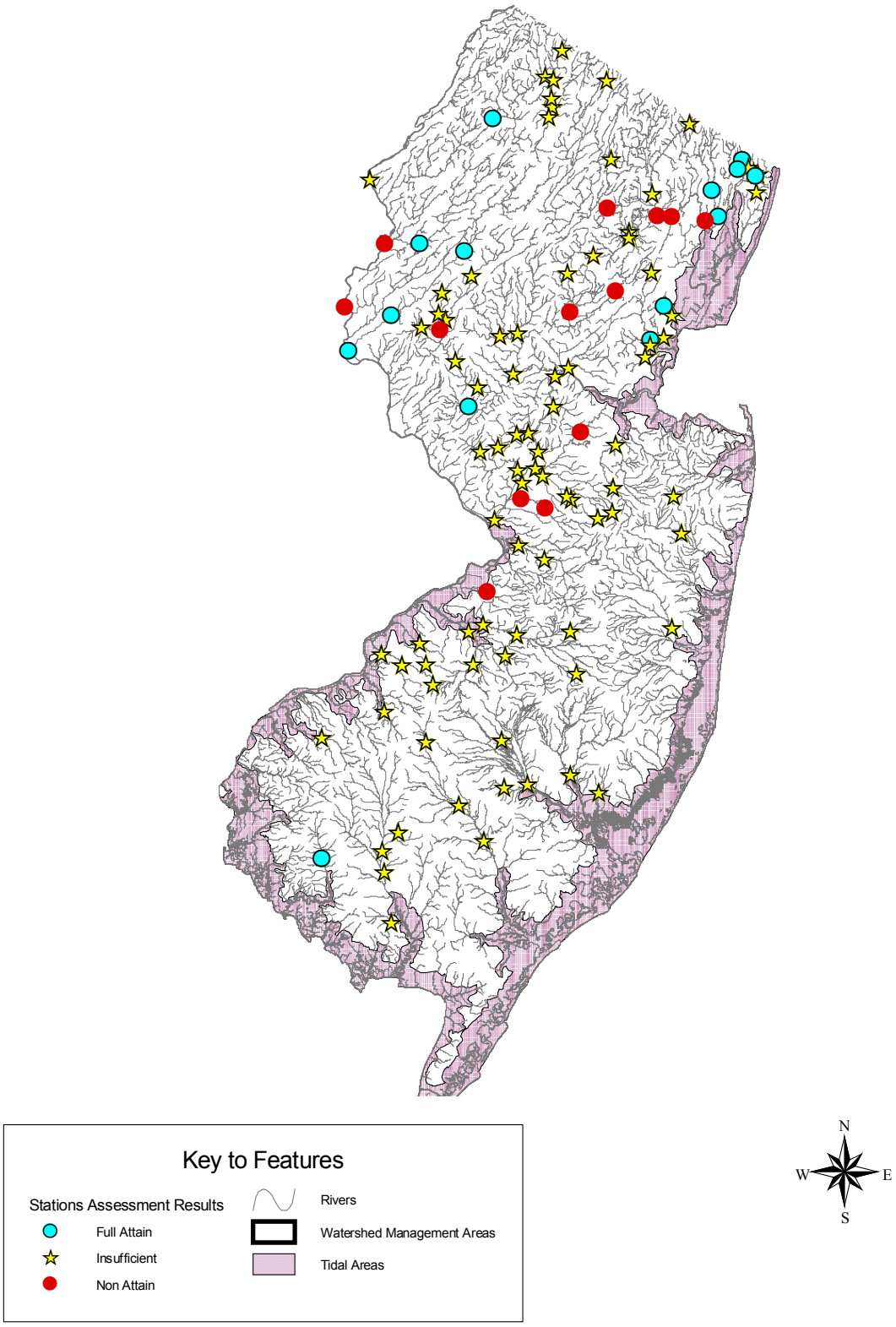
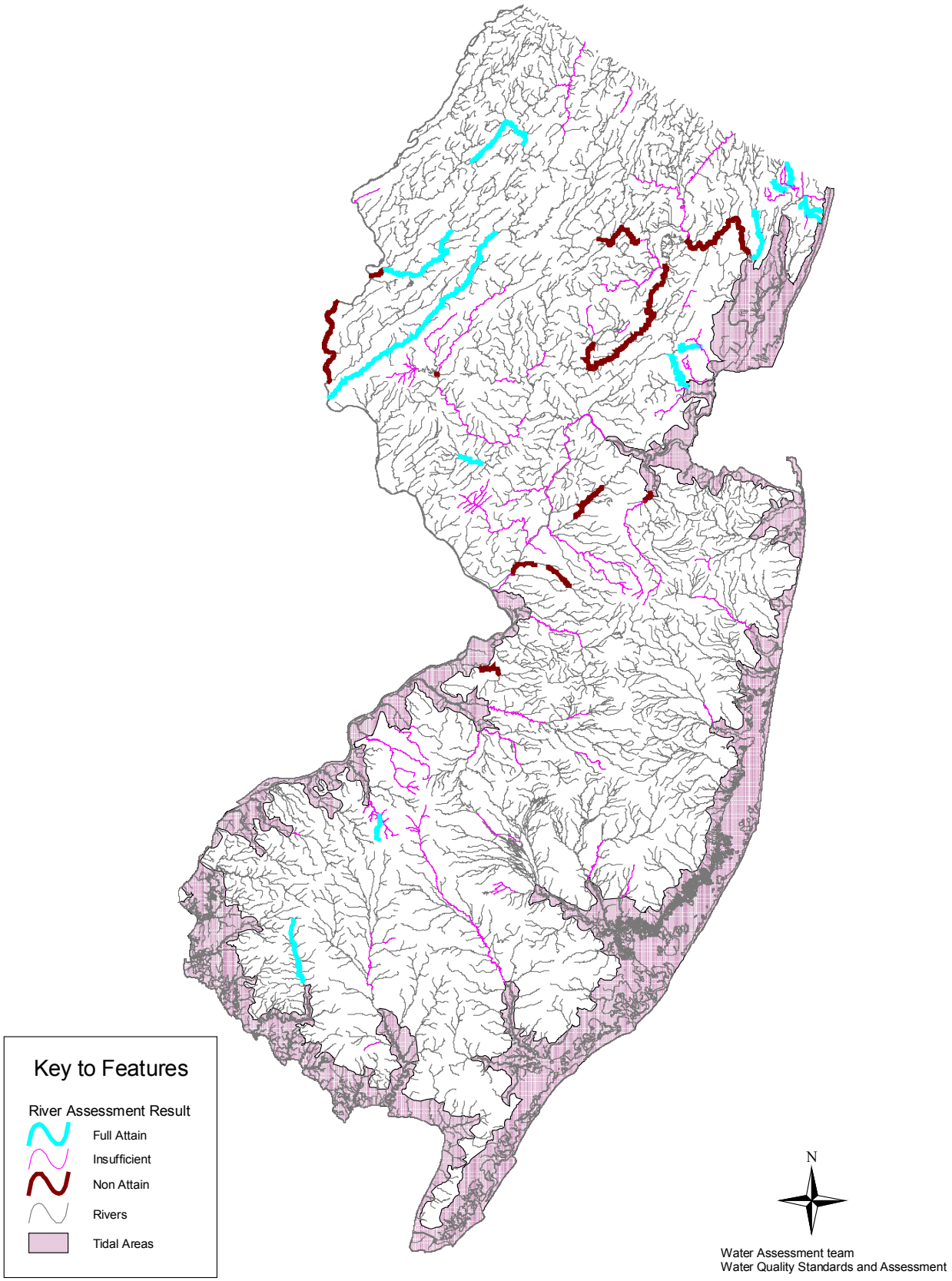


FIGURE 2.1b-5. Assessment Status for Cadmium in Rivers.



Chromium (Cr)

Description

Chromium is an odorless, steel to semi-gray, lustrous metal by which weathering is the main natural process it is released into the environment. Chromium has a wide range of uses in metals, chemicals, and refractories. Its use in iron, steel, and nonferrous alloys enhances hardenability and resistance to corrosion and oxidation. The most common application of chromium is to produce stainless steel, alloy cast steels, and nonferrous alloys with additional uses as wood preservatives, pigments, and metal finishing (USGS Web Page at http://info.er.usgs.gov/). Hexavalent chromium compounds are also used in leather tanning, corrosion-resistance, textile dyeing, water treatment, inks, drilling muds, pyrotechnics, photography, process engraving, lithography, synthetic perfumes, and chemical synthesis.

In the environment, chromium is found in oxidation states ranging from –2 to +6, but is present mainly in the trivalent (+3) and hexavalent (+6) states. In the hexavalent state, chromium is a strong oxidizer and is highly corrosive. Hexavalent chromium is quite soluble, existing in the water column as a complex anion and is not sorbed to any significant degree by soil or particulate matter. In water containing very little organic material, hexavalent chromium is stable for long periods of time. Under anaerobic conditions, the hexavalent state is reduced to the trivalent state which hydrolyzes and deposits as chromium oxide at a neutral or slightly alkaline pH. Trivalent chromium is least soluble in the pH range of natural waters and precipitation is thought to be the dominant removal mechanism for chromium in natural waters (Canadian Council of Resource and Environment Ministers, 1987).

Chromium is a nutritionally essential element, but in excess amounts it is harmful with hexavalent chromium much more toxic than the trivalent state. Hexavalent chromium compounds are known to be human carcinogens and has been shown to produce liver and kidney damage, internal hemorrhage, and respiratory disorders (10th Report on Carcinogens available at: http://ehp.niehs.nih.gov/roc/toc10.html). Chronic exposure can cause dermatitis, ulceration of the skin spinal/joint degeneration, depressed immune system, and lymphatic swelling.

Assessment

A total of 115 sites representing 756 river miles were assessed for chromium. Only 10% of the sites were listed on sublist 5, with all of the sites being carried over from the 1998 303(d) List due to insufficient data to make an assessment (see Table 2.1b-10). As stated prior, all of the listings on sublist 3 have insufficient data to make an assessment. As with cadmium, recent sampling showed no exceedances of chromium, and statewide average concentrations were similar to concentrations at background sites. Chromium does not seem to pose a threat to human health or aquatic life in any areas of the state, and the Department will conduct high flow sampling at the remaining sublist 5 sites in order to delist those sites.

Results of the chromium assessment are summarized below in Table 2.1b-9. Results for individual stations are depicted in Figure 2.1b-6 and in Tables II-15 through 18 in the Appendix.

Table 2.1b-9: Chromium Status

Chromium Status	Number of Stations	Percent of Stations	Number of Assessed River Miles		Percent of Assessed River Miles	
			Monitor	Estimate	Monitor	Estimate
Sublist 1	78	68%	550	0	73%	NA
Sublist 3	23	20%	126	0	17%	NA
Sublist 4	0	NA	0	0	NA	NA
Sublist 5	14	12%	80	0	10%	NA
Totals	115	100%	756	0	100%	NA

Table 2.1b-10: Chromium Sites Carried Over From 1998 303(d) List

WMA	Station Number	Station Name	WMA	Station Number	Station Name
20	20-AS-1	Assiscunk Creek at Cedar Lane in Springfield	04	01389130, 4-PAS-4	Passaic River at Sigac
01	01447000,	Delaware River at Easton	01	01446400, 1-PEQ-3	Pequest River at Belvidere
05	5-HAC-3	Hackensack River on Westwood Ave., Rivervale	08	01398102, 8-SB-6	SB Raritan River at South Branch
17	17-HUD-1	Hudson Branch at Vineland	06	01380500, 6-SITE-11	Rockaway River at Boonton
09	9-LAW-1	Lawrence Brook at Davidsons Mill Rd in Black Horse	10	10-ROC-1	Rocky Brook on Rte 33 in Hightstown
04	01389880, 4-SITE-5	Passaic River at Elmwood Park	10	10-ROC-2	Rocky Brook at Rocky Bk Rd and Rte 130 in Hightstown
04	01389500, 4-PAS-3, 4-SITE-6	Passaic River at Little Falls	10	01400585	Rocky Brook at Perrineville

FIGURE 2.1b-6. Assessment Status of Stations Monitored for Chromium. Includes sites delisted and carried over from the 1998 303(d) List.

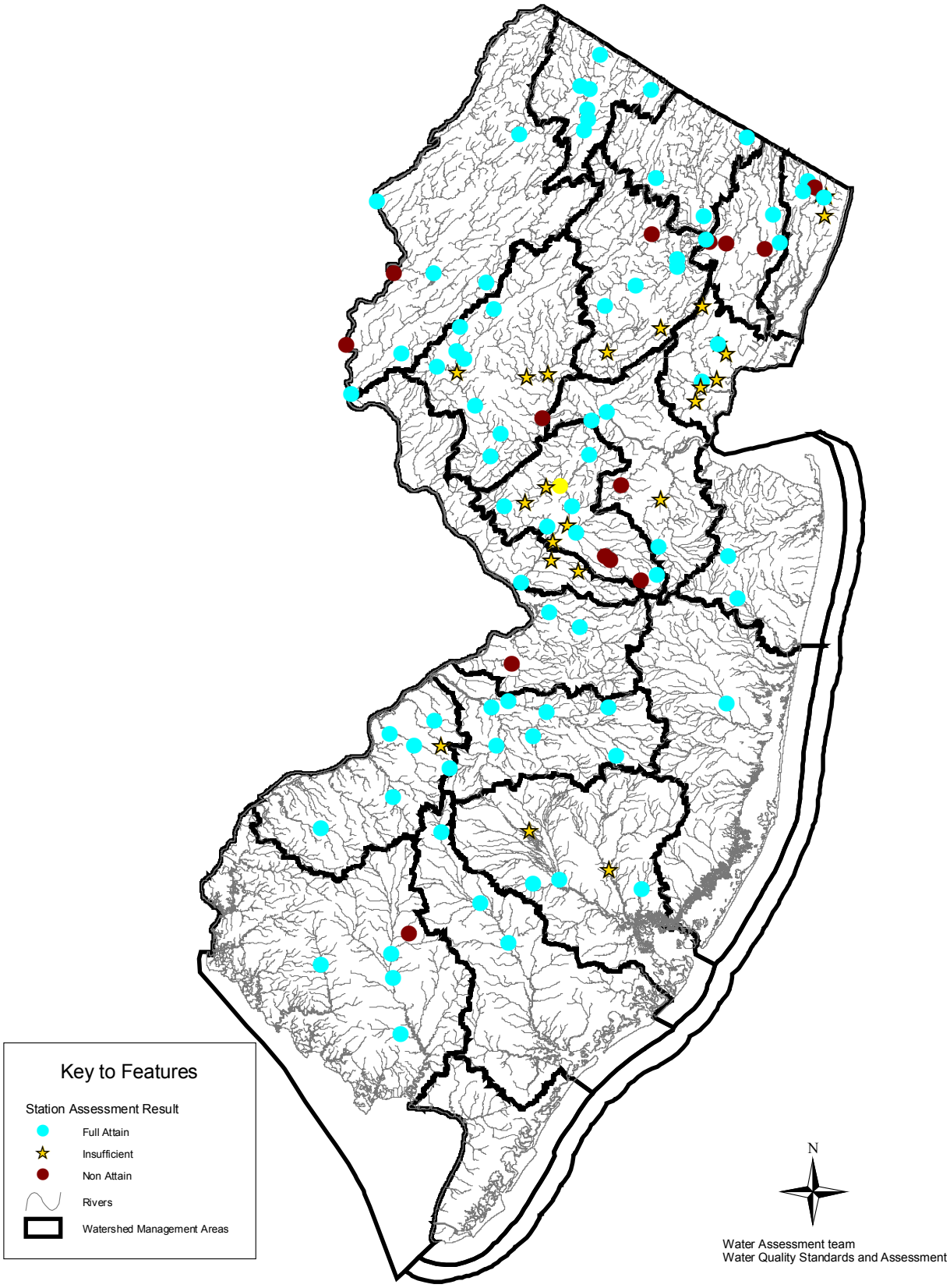
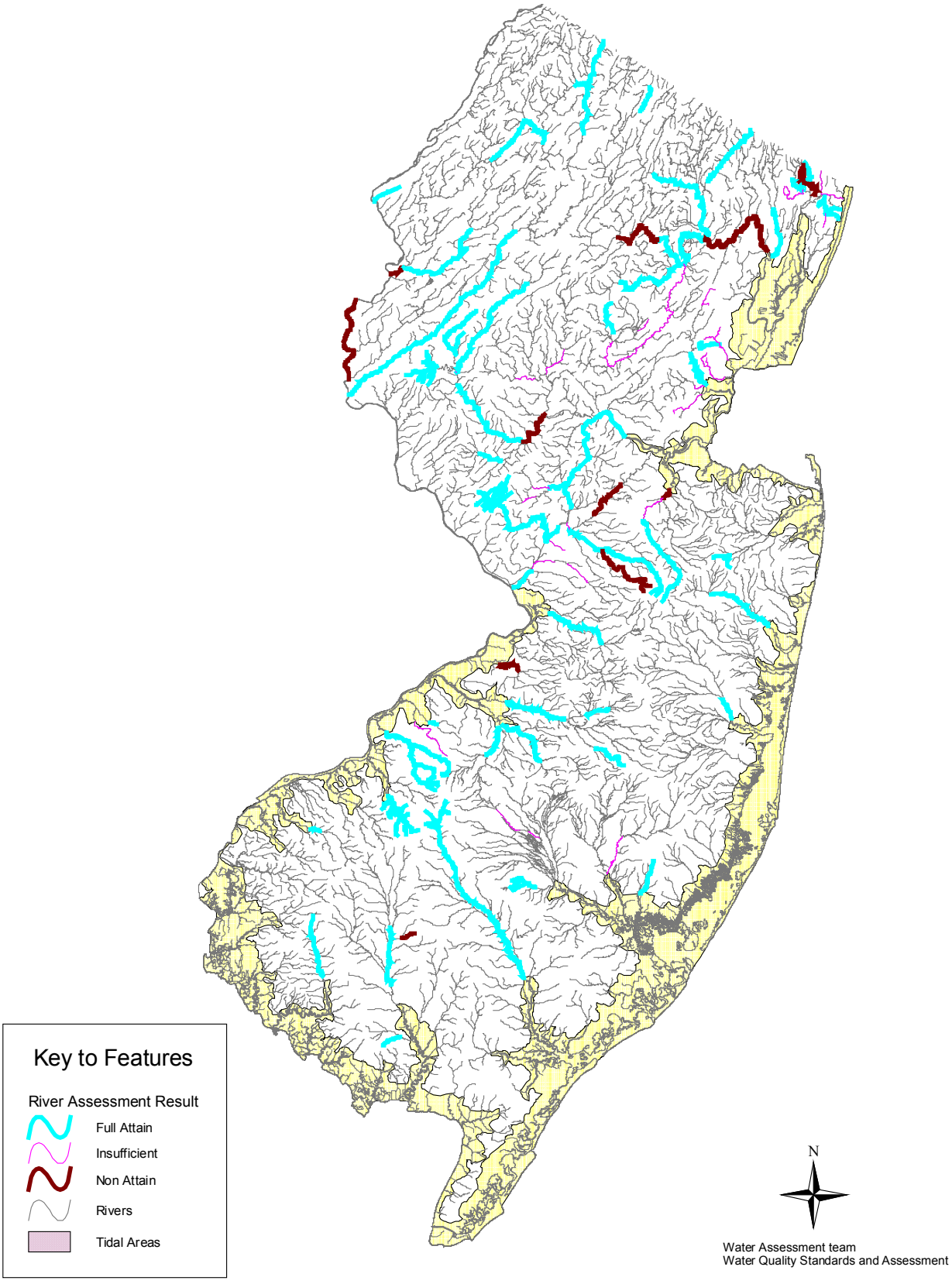


FIGURE 2.1b-7. Assessment Status for Chromium in Rivers.



Copper

Description

Copper is a reddish brown metal and is a natural element with widespread distribution. Sources of copper in aquatic environments include weathering rocks and soil, corrosion of brass and copper pipe, copper compounds as aquatic algaecides, agricultural uses of copper as fungicides and pesticides, sewage treatment plants, and industrial effluent. As an industrial metal, the consumption of copper only ranks behind iron and aluminum due to its properties of high ductility, malleability, thermal and electrical conductivity, and its resistance to corrosion. Building construction is the single largest market, followed by electronics and electronic products, transportation, industrial machinery, and consumer and general products (USGS Site at: http://info.er.usgs.gov/). Electrical uses of copper, including power transmission and generation, building wiring, telecommunication, and electrical and electronic products, account for about three quarters of total copper use.

In the environment, copper's most common oxidation states are cuprous (+1) and cupric (+2). Cuprous copper is unstable in aerated waters and normally oxidizes to the cupric state. In water, copper is generally adsorbed to insoluble particles or in complex with inorganic compounds. Copper has a high affinity with iron and manganese oxides, clays, carbonate minerals and organic matter. Copper is generally more soluble in acidic waters, and precipitates at pH values above 6.5. Characteristics of water that can increase the leaching of copper include low pH, high temperature, and reduced hardness (Canadian Council of Resource and Environment Ministers, 1987).

Copper is an essential micronutrient and is required for adequate growth, cardiovascular integrity, lung elasticity, neovascularization, neuroendocrine function, and iron metabolism. However at high concentrations, copper is toxic and can cause hepatic and renal failure, cirrhosis, hemolysis, vomiting, melena, hypotension, cardiovascular collapse, stupor, and coma. Less sever acute copper toxicity include nauseas, vomiting, and diarrhea. Chronic exposure to copper can cause liver toxicity.

Assessment

A total of 116 sites representing 747 river miles were assessed for copper. Only 23 sites were listed on sublist 5, with 16 of the sites being carried over from the 1998 303(d) List due to insufficient data to make assessments (see Table 2.1b-12b). All of the listings on sublist 3 have insufficient data to make an assessment.

Recent sampling shows that 7 sites do not meet the criteria for copper (see Table 2.1b-12). The majority of the sites were in the Pinelands where exceedances were found in the Great Egg Harbor River, North Branch Rancocas Creek, and East Branch Bass River. The high number of exceedence in the Pinelands is attributed to the low pH and hardness levels in the rivers. The low pH and hardness concentrations contribute to higher solubility of copper in the water column. The low hardness concentrations cause the aquatic life criteria to be lower than other areas of the state. The only exceedence outside the Pinelands was in the Passaic River near Millington. All of the exceedances were for aquatic life.

Results of the copper assessment are summarized below in Table 2.1b-11. Results for individual stations are depicted in Figure 2.1b-8 and in Tables II-15 through 18 in the Appendix.

Table 2.1b-11: Copper Status

Copper Status	Number of Stations	Percent of Stations	Number of Assessed River Miles		Percent of Assessed River Miles	
			Monitor	Estimate	Monitor	Estimate
Sublist 1	66	57%	491	0	66%	NA
Sublist 3	27	23%	98	0	13%	NA
Sublist 4	0	NA	0	0	NA	NA
Sublist 5	23	20%	158	0	21%	NA
Totals	116	100%	747	0	100%	NA

Table 2.1b-12: Copper Sites Exceeding Criteria (based on most recent sampling)

WMA	Station Number	Station Name	WMA	Station Number	Station Name
14	14-EBR-1	East Branch Bass River by 654, Bass River SF	19	19-RA-3N	North Br Rancocas Creek, Hanover St, Pemberton
15	15-GEH-2	Great Egg Harbor River @ Folsom	19	19-RA-4N	North Br Rancocas Creek, off Pine St, Mt. Holly
15	15-GEH-3	Great Egg Harbor River @ Weymouth	6	6-SITE-2; 6-PAS-1	Passaic River nr Millington
19	19-RA-1N	North Br Rancocas Creek, below Hanover Lake, Pembe			

Table 2.1b-12b: Copper Sites Carried Over From 1998 303(d) List

WMA	Station Number	Station Name	WMA	Station Number	Station Name
11	01463620, 11-AS-2	Assunpink Creek near Clarksville	18	Newton Creek	Newton Creek
11	11-AS-4	Assunpink Creek at Route 535	14	01410000, 14-OSW-1	Oswego River at Harrisville
14	01409500, 14-BAT-1	Batsto River at Batsto	06	01379500, 6-PAS-2, 6-SITE-1	Passaic River near Chatham
01	01447000,	Delaware River at Easton	04	01389880, 4-SITE-5	Passaic River at Elmwood Park
05	01377000, 5-HAC-3	Hackensack River at Rivervale	04	01389500, 4-PAS-3, 4-SITE-6	Passaic River at Little Falls
09	9-LAW-1	Lawrence Brook at Davidsons Mill Rd in Black Horse	04	01389130, 4-PAS-4	Passaic River at Sigac
14	01409387, 14-MUL-2	Mullica River at Outlet Of Atsion Lake at Atsion	08	01398102, 8-SB-6	SB Raritan River at South Branch
08	01398000, 8-NE-1	Neshanic River at Reaville	08	01399120, 8-NB-2	NB Raritan River at Burnt Mills

FIGURE 2.1b-8. Assessment Status of Sites Monitored for Copper. Includes sites delisted and carried over from the 1998 303(d) List.

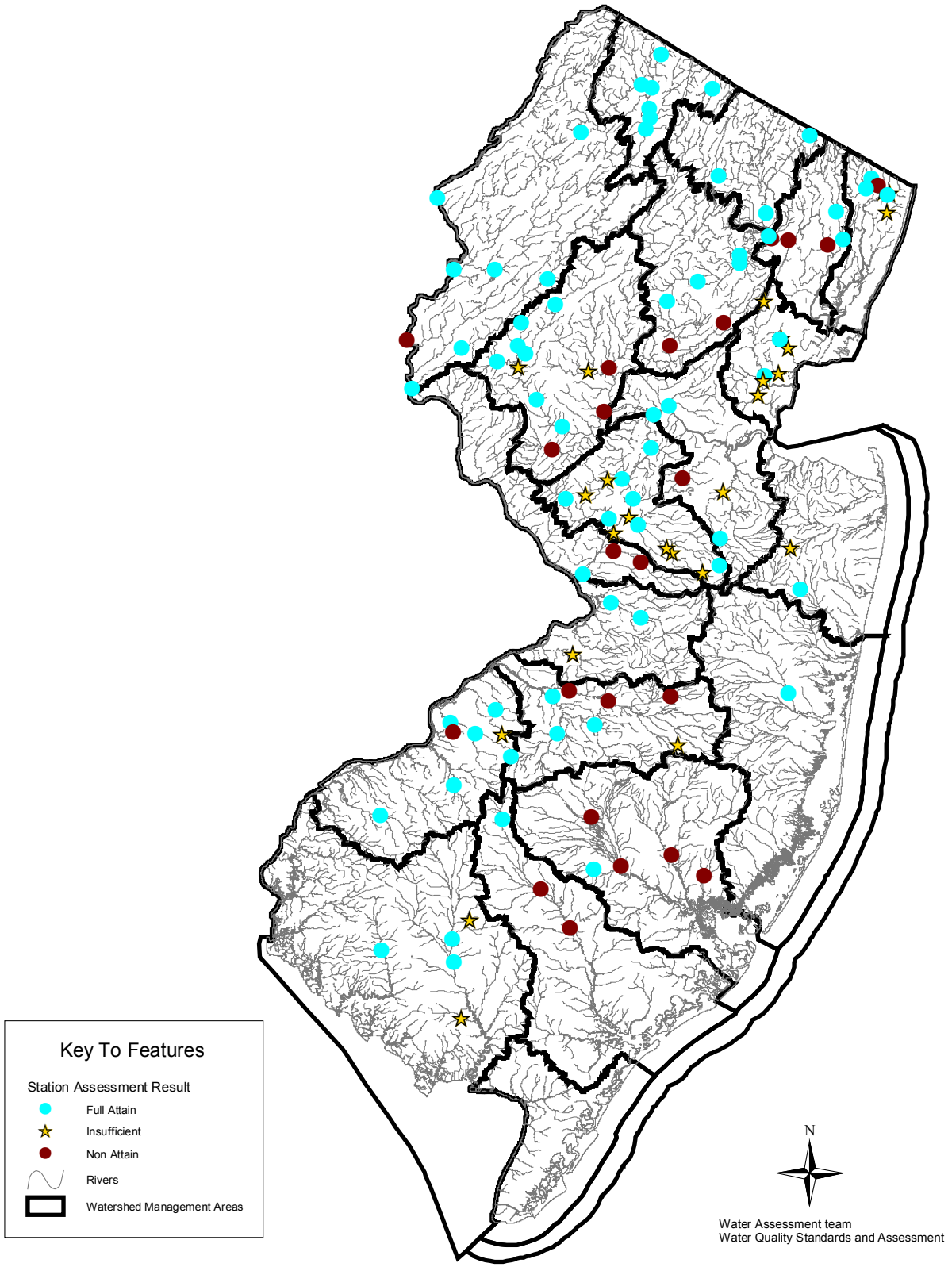
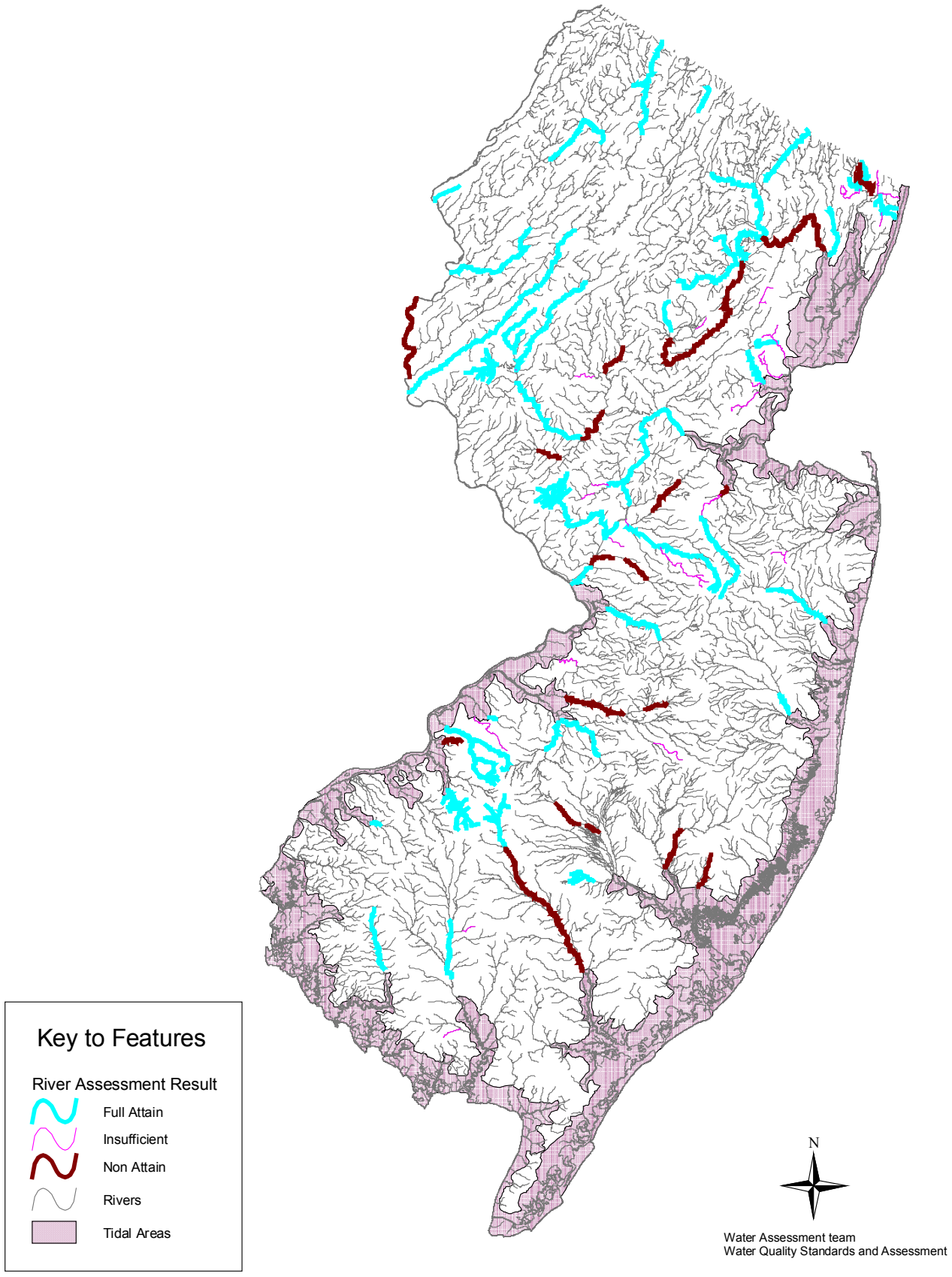


FIGURE 2.1b-9. Assessment Status for Copper in Rivers.



Mercury (Hg)

Description

Mercury occurs naturally in the environment and also has significant anthropogenic sources. Natural sources include terrestrial mercury deposits, volcanoes, and volatilization from the ocean (USGS Mercury Contamination of Aquatic Ecosystems). Anthropogenic sources include combustion sources (coal fired utility and industrial boilers, municipal solid waste incinerators, sewage sludge incinerators), manufacturing sources (secondary iron and steel smelters, chlor-alkai plants), area sources (fluorescent lamp breakage, aqueous discharges from dental offices), and miscellaneous sources. The New Jersey Mercury Task Force found that the largest sources of mercury to New Jersey's environment were air emissions from iron and steel manufacturing plants, coal-burning utilities, miscellaneous releases from products in use or discarded products (e.g. broken fluorescent lamps), and municipal solid waste incineration. The primary source of mercury to most aquatic ecosystems is deposition from the atmosphere, although point source discharges of wastewater and indirect nonpoint sources to water bodies such as septic tank leachate may be important. The predominant form of mercury in the atmosphere is the elemental form, although it can be converted to more soluble oxidized forms (inorganic mercury) by atmospheric processes.

In the environment, mercury exists in three basic forms: inorganic, elemental, and organic mercury (methyl mercury and related compounds). Once in the water, mercury enters a complex cycle in which one form can be converted to another. In freshwater habitats, it is common for mercury compounds to be sorbed to particulate matter and to sediment. Inorganic mercury's sorption onto sediments is probably the most important process for determining its fate in the aquatic environment. Elemental mercury, being volatile, may be transferred to the atmosphere. Even though inorganic mercury is predominate in the water column, the methylated form constitutes most of the mercury residue in the tissue of aquatic organisms. The concentration of dissolved organic carbon (DOC) and pH are believed to often have a strong effect on the fate of mercury in the ecosystem. Increasing the acidity of water (i.e., decreasing the pH) has been found to result in higher methyl mercury levels in fish. Many scientists believe that lower pH enhances the mobility of mercury in the aqueous environment, thus making it more likely to enter the food chain Canadian Council of Resource and Environment Ministers, 1987).

The conversion of elemental and inorganic mercury to methyl mercury is important for two reasons: 1) methyl mercury is much more toxic than inorganic mercury, and 2) methyl mercury bioaccumulates. Mercury is recognized as one of the most toxic metals, but only recently was it identified as a serious pollutant in the aquatic environment. Elemental mercury is oxidized to inorganic mercury under natural conditions, furthermore, inorganic mercury can be methylated by aerobic and anaerobic bacteria. Inorganic mercury can also be methylated in the slime coat, liver, and intestines of fish. (EPA Water Criteria).

Inorganic mercury is generally not a health concern as it is poorly absorbed by the digestive tract. Also, health effects from exposures to elemental mercury are relatively rare. However, methyl mercury is highly toxic to the central nervous system and more than 95 percent of all mercury in fish is methyl mercury which is highly bioaccumulative and biomagnifies.

Ingested inorganic mercury is only 0.01% absorbed but methyl mercury is nearly 100% absorbed from the gastrointestinal tract. The primary route of methyl mercury exposure for humans and wildlife such as predator birds is consumption of mercury-contaminated fish. Mercury accumulates in the liver, kidney, brain, and blood. Acute exposure includes severe gastrointestinal damage, cardiovascular collapse, or kidney failure. Chronic effects include the central nervous system, kidney damage and birth defects. Genetic damage is also suspected.

Assessment

A total of 117 sites representing 758 river miles were assessed for mercury. Because the chronic aquatic life criteria is below the method detection level (MDL), no sites were placed on sublist 1 as "Full Attainment." (see the Methods Document, Section 4.2.2 for an explanation of MDLs for metals). If the data showed no exceedances, the waterbody was listed under sublist 3 as "Insufficient Data." Of the 92 sites on sublist 3, 67 sites (73% of sublist 3 sites) had no exceedances, but were assessed as "Insufficient Data." Only 25 sites were assessed as "Non Attainment," of which 16 sites were carried over from the 1998 303(d) List due to insufficient data available for new assessments (see Table 2.1b-14b).

Recent sampling detected 9 sites with exceedances throughout the state except for the Northwest portion (see Table 2.1b-14). All sites exceeded the aquatic life criteria. Although inorganic mercury levels in the state are relatively low and exceedances of the criteria are not common, mercury is commonly found in the tissue of fish and other aquatic life throughout the state. The assessed data only measures inorganic mercury and not methyl mercury. As mentioned above in the description section, inorganic mercury is converted by bacteria to methyl mercury. Although inorganic concentrations may be low, methyl mercury concentrations can still pose a danger to the aquatic life. Nationwide, mercury is responsible for almost 80% of fish advisories (Brigham and others, 2003).

Results of the mercury assessment are summarized below in Table 2.1b-13. Results for individual stations are depicted in Figure 2.1b-10 and in Tables II-15 through 18 in the Appendix.

Table 2.1-13: Mercury Status

Mercury Status	Number of Stations	Percent of Stations	Number of Assessed River Miles		Percent of Assessed River Miles	
			Monitor	Estimate	Monitor	Estimate
Sublist 1	0	NA	0	0	NA	NA
Sublist 3	92	79%	571	0	75%	NA
Sublist 4	0	NA	0	0	NA	NA
Sublist 5	25	21%	187	0	25%	NA
Totals	117	100%	758	0	100%	NA

Table 2.1-14: Mercury Exceeding the Criteria (based on most recent sampling)

WMA	Station Number	Station Name	WMA	Station Number	Station Name
18	18-CO-1	Cooper River at Rte 130, Camden	14	14-HAM-2, 14-HAM-1	Hammonton Creek at Westcoatville
5	5-DOR-1	Dorotockys Run on Old Tappan Rd, Old Tappan	9	9-LAW-1	Lawrence Brook on Davidson's Mill Rd, Black Horse
5	5-DWA-1	Dwars Kill on Blanch Ave., Norwood	5	5-PAS-1	Pascack Brook on Harrington Ave., Westwood
15	15-GEH-1	Great Egg Harbor River @ Sicklerville (Winslow)	6	6-SITE-3	Passaic at Two Bridges
5	5-HAC-3	Hackensack River on Westwood Ave., Rivervale			

Table 2.1b-14b: Mercury Sites Carried Over From 1998 303(d) List

WMA	Station Number	Station Name	WMA	Station Number	Station Name
20	20-AS-1	Assiscunk Creek at Cedar Lane in Springfield	04	01389500, 4-PAS-3, 4-SITE-6	Passaic River at Little Falls
11	01463620, 11-AS-2	Assunpink Creek near Clarksville	04	01389880, 4-SITE-5	Passaic River at Elmwood Park
11	11-AS-4	Assunpink Creek @ Route 535	01	01446400, 1-PEQ-3	Pequest River at Belvidere
01	01447000	Delaware River at Easton	19	01465950, 19-RA-1N	NB Rancocas Creek at Hanover Furnace
09	9-LAW-1	Lawrence Brook at Davidsons Mill Rd in Black Horse	19	01465970	NB Rancocas Creek at Browns Mills
10	01401440, 10-MIL-2	Millstone River at Kingston	08	01399700, 8-RO-1	Rockaway Creek at Whitehouse
06	01379500, 6-PAS-2, 6-SITE-1	Passaic River near Chatham	06	01380500, 6-SITE-11	Rockaway River at Boonton
06	01379000, 6-PAS-1, 6-SITE-2	Passaic River near Millington	10	10-STO-3	Stony Brook on Mine Rd in Hopewell Twp.
04	01389130, 4-PAS-4	Passaic River at Sigac			

FIGURE 2.1b-10. Assessment Status of Sites Monitored for Mercury. Includes sites delisted and carried over from the 1998 303(d) List.

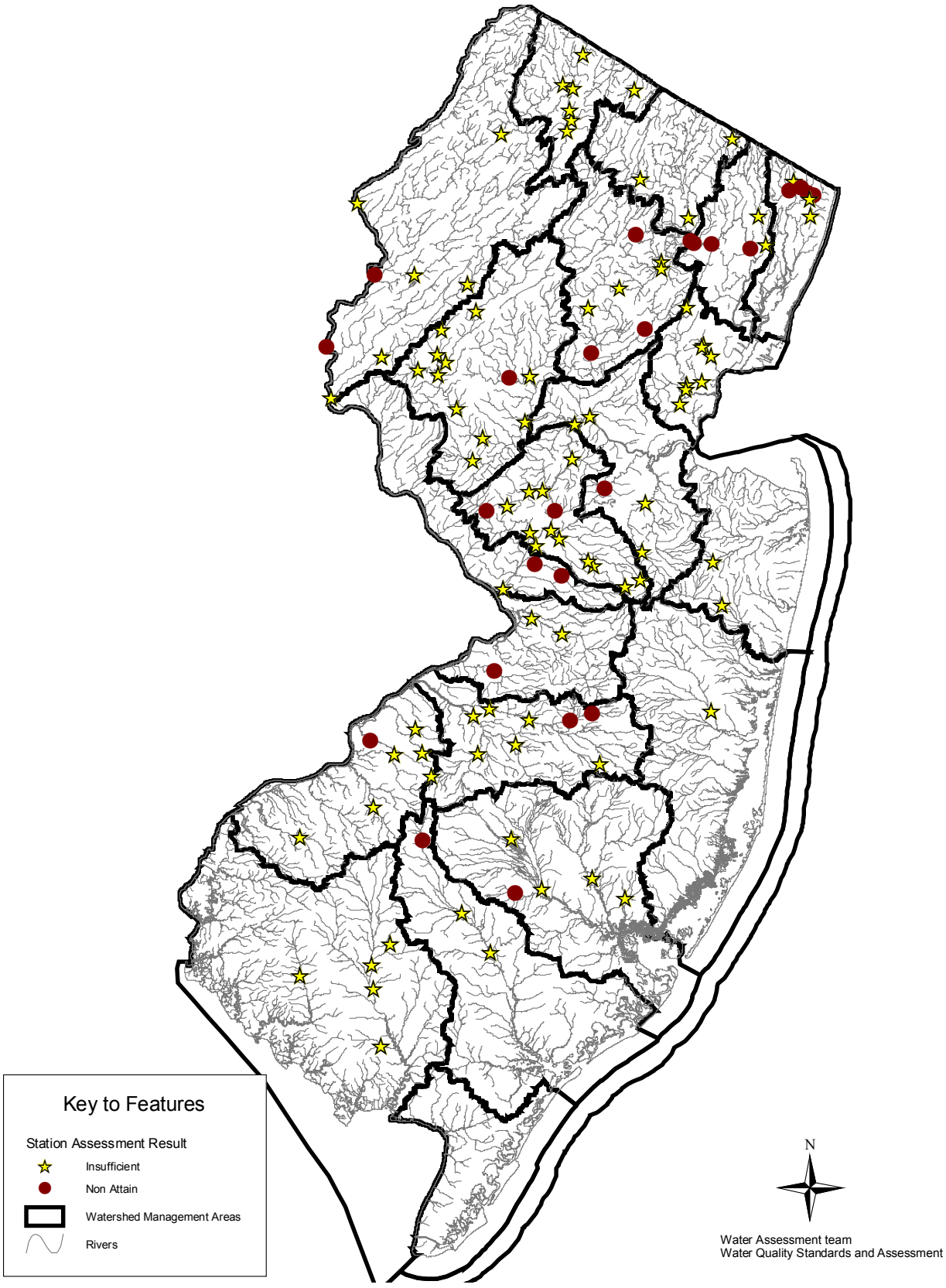
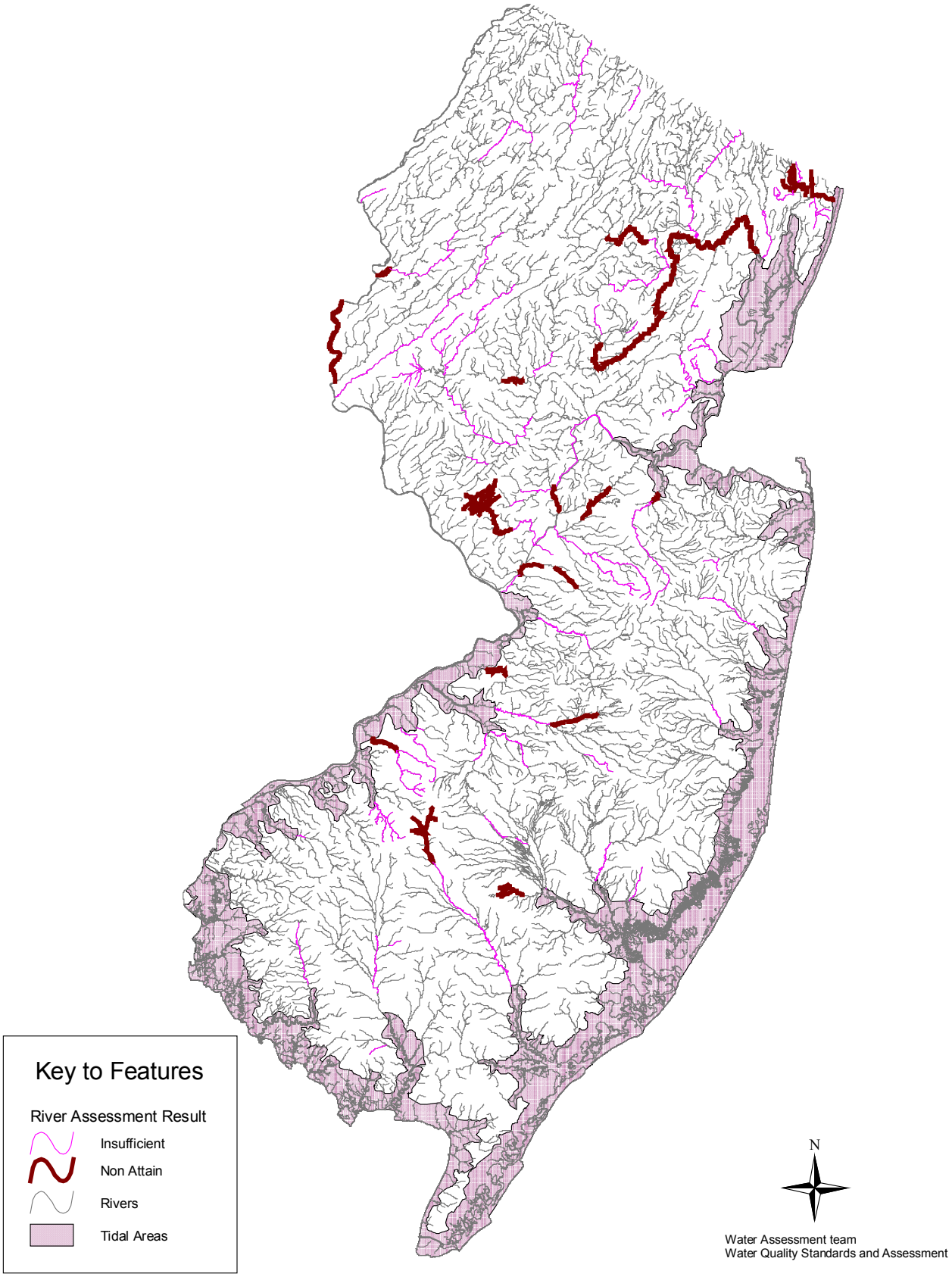


FIGURE 2.1b-11. Assessment Status for Mercury in Rivers.



Lead (Pb)

Description

Lead is a bluish-white lustrous metal that is very soft, highly malleable, ductile, and a relatively poor conductor of electricity. The principal natural pathway by which lead is released into the environment is through the weathering of sulfide ores. Anthropogenic input includes precipitation, fallout of lead dust, street runoff, and industrial and municipal wastewater discharges. Mining, milling and smelting of lead and metals associated with lead such as zinc, copper, silver, arsenic, and antimony are sources as well. By the early 2000's, the total demand for lead in lead-acid storage batteries represented 88% of U.S. lead consumption (Canadian Council of Resource and Environment Ministers, 1987). Other significant uses included ammunition (3%), oxides in glass and ceramics (3%), casting metals (2%), and sheet lead (1%). The remainder was consumed in solders, bearing metals, brass and bronze billets, covering for cable, caulking lead, and extruded products (USGS 2002).

In the environment, the most stable oxidation state of lead is the divalent form, Pb(II). Soluble lead is removed from the water column by association with sediments and suspended particulates such as organic matter, hydrous oxides and clays (Canadian Council of Resource and Environment Ministers, 1987).

Lead can cause a variety of adverse health effects in humans. At low levels of exposure, effects include interference in red blood cell chemistry, delays in normal physical and mental development in babies and young children, slight deficits in the attention span, hearing, and learning abilities of children. In addition, it may cause slight increases in the blood pressure of adults. Lead is bioaccumulated by aquatic organisms including benthic bacteria, plants, invertebrates, and fish.

Assessment

A total of 116 sites representing 755 river miles were assessed for lead. All of the listings on sublist 3 have insufficient data to make an assessment. Only 34 sites were assessed as "Non Attainment" of which 23 sites were carried over from the 1998 303(d) List due to insufficient data available for new assessments (see Table 2.1b-16b).

Recent sampling detected 13 sites (14% of new sampling) that were exceeding the criteria. Lead had the second most river miles impacted by a metal with 246 miles present on sublist 5. As with mercury, the Northwest portion of the state was the only area with no new exceedances of the lead criteria. Of the 13 exceedances, two sites exceeded the human health criteria, 4 sites exceeded the aquatic life criteria, and 7 sites exceeded both criteria (see Table 2.1b-16).

Since sediment is a major sink for lead, the analysis of lake sediment cores are an effective method for evaluating water quality trends for these compound. In a study conducted by the USGS in the late 1990's, cores taken from three northern NJ lakes and one Long Island lake showed that lead concentrations increased dramatically in lake

sediments until peaking in the 1970's. Since then lead levels have been decreasing at a steady rate. Much of this shift was a result of the compliance with environmental regulations that significantly reduced or eliminated the use of lead in non-battery products, including gasoline, paints, solders, and water systems. The most significant impact was the removal of lead from gasoline by the Clean Air Act resulting in a general decrease in sediments of lead since the mid 70's phase-out (Ayers et others, 2000).

Results of the lead assessment are summarized below in Table 2.1b-15. Results for individual stations are depicted in Figure 2.1b-12 and in Tables II-15 through 18 in the Appendix.

Table 2.1b-15: Lead Status

Lead Status	Number of Stations	Percent of Stations	Number of Assessed River Miles		Percent of Assessed River Miles	
			Monitor	Estimate	Monitor	Estimate
Sublist 1	46	40%	349	0	46%	NA
Sublist 3	34	29%	160	0	21%	NA
Sublist 4	0	0%	0	0	NA	NA
Sublist 5	36	31%	246	0	33%	NA
Totals	116	100%	755	0	100%	NA

Table 2.1b-16: Lead Sites Exceeding Criteria (based on most recent sampling)

WMA	Station Number	Station Name	Criteria Exceeded
11	01464020, 01464000, DRBCNJ1338, 11-AS-3	Assunpink Creek at Peace Street at Trenton	HH
18	18-CO-1	Cooper River at Rte 130, Camden	AQLc
15	01411000, 15-GEH-2	Great Egg Harbor River at Folsom	AQLc
19	01465950, 19-RA-1N	Rancocas Creek N Br at Hanover Furnace	HH, AQLa, AQLc
19	01467000, 19-RA-3N	Rancocas Creek N Br at Pemberton	HH, AQLc
19	01467005, 01467006, 01467003, 19-RA-4N	Rancocas Creek N Br at Iron Works Park at Mt Holly	AQLa, AQLc
6	01379500, 6-SITE-1, 6-PAS-2	Passaic River near Chatham	HH, AQLc
3	01382500, PQ8, 3-SITE-8, 3-PEQ-1	Pequannock River at Macopin Intake Dam	HH, AQLc
3	01388500, 3-SITE-7	Pompton River at Pompton Plains	HH, AQLc
18	01467150, 01467140, 18-CO-4	Cooper River at Haddonfield	HH, AQLc
19	01465850, 19-RA-3S	Rancocas Creek S Br at Vincentown	AQLc
13	01408500, 01408300, 13-TOM-1	Toms River near Toms River	HH, AQLc
6	01381800, 6-WHI-2	Whippany River near Pine Brook	HH

Table 2.1b-16b: Lead Sites Carried Over From 1998 303(d) List

WMA	Station Number	Station Name	WMA	Station Number	Station Name
20	20-AS-1	Assiscunk Creek at Cedar Lane in Springfield	04	01389880, 4-SITE-5	Passaic River at Elmwood Park
11	01463620, 11-AS-2	Assunpink Creek near Clarksville	04	01389500, 4-PAS-3, 4-SITE-6	Passaic River at Little Falls
11	11-AS-4	Assunpink Creek at Route 535	06	01379000, 6-PAS-1, 6-SITE-2	Passaic River near Millington
14	01410150, 14-EBR-1	East Branch Bass River near New Gretna	04	01389130, 4-PAS-4	Passaic River at Sigac
10	10-BED-2, 10-BED-3	Bedens Brook on Rt 206 , Rocky Hill	01	01446400, 1-PEQ-3	Pequest River at Belvidere
17	01412800, 17-COH-1	Cohansey River at Seeley	08	01398102, 8-SB-6	SB Raritan River at South Branch
01	01447000,	Delaware River at Easton	08	01399700, 8-RO-1	Rockaway Creek at Whitehouse
05	01377000, 5-HAC-3	Hackensack River at Rivervale	06	01380500, 6-SITE-11	Rockaway River at Boonton
09	9-LAW-1	Lawrence Bk at Davidsons Mill Rd in Black Horse	10	10-ROC-1	Rocky Brook on Rte 33 in Hightstown
09	01405340, 9-MAN-1	Manalapan Brook at Federal Rd near Manalapan	10	10-ROC-2	Rocky Brook, Rocky Bk Rd and Rte 130 in Hightstown
09	01405440, 9-MAN-2	Manalapan Brook near Spotswood	10	01400585,	Rocky Brook at Perrineville
14	01409387, 14-MUL-2	Mullica River at Outlet Of Atsion Lake at Atsion			

FIGURE 2.1b-12. Assessment Status of Sites Monitored for Lead. Includes sites delisted and carried over from the 1998 303(d) List.

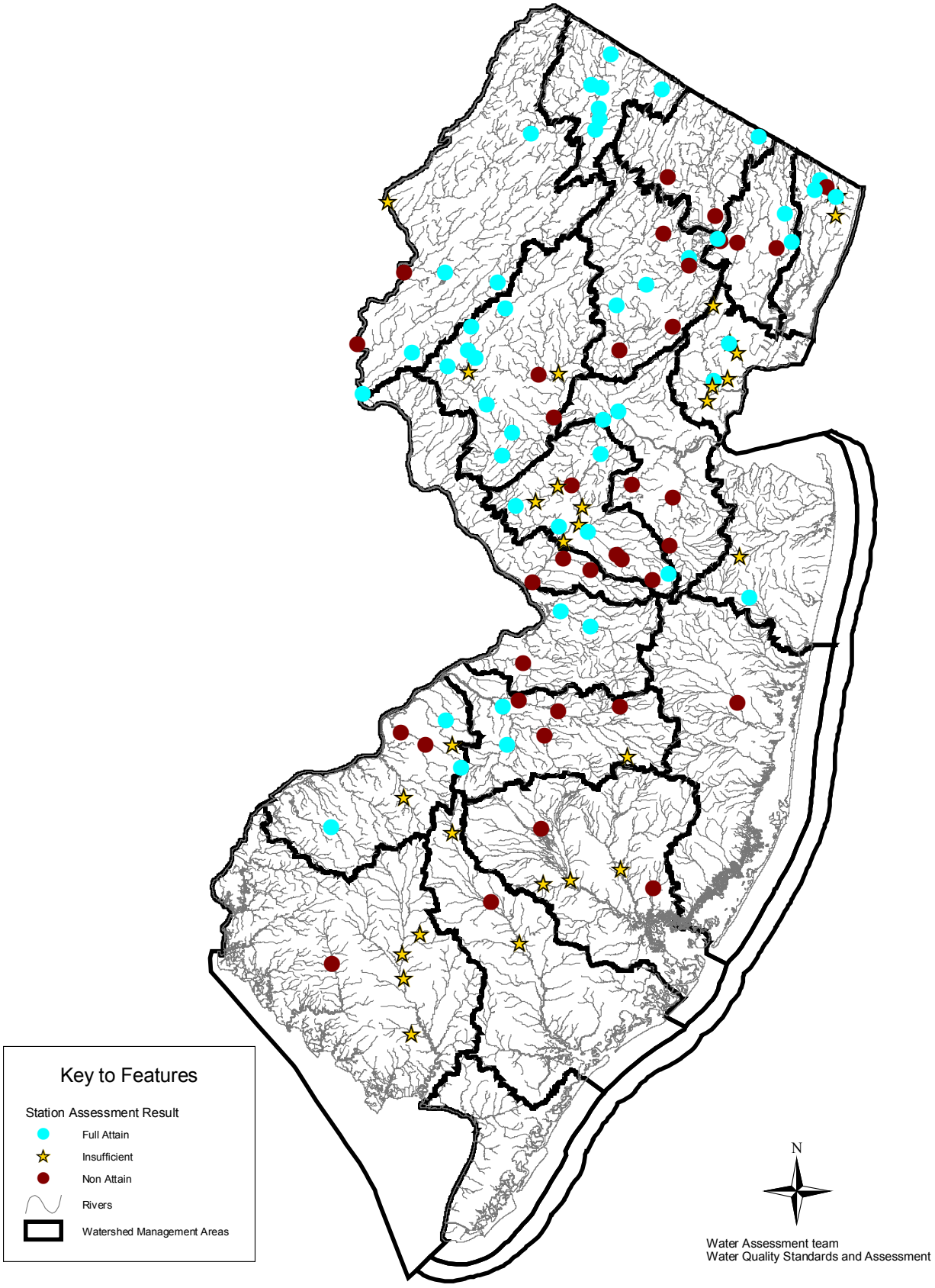
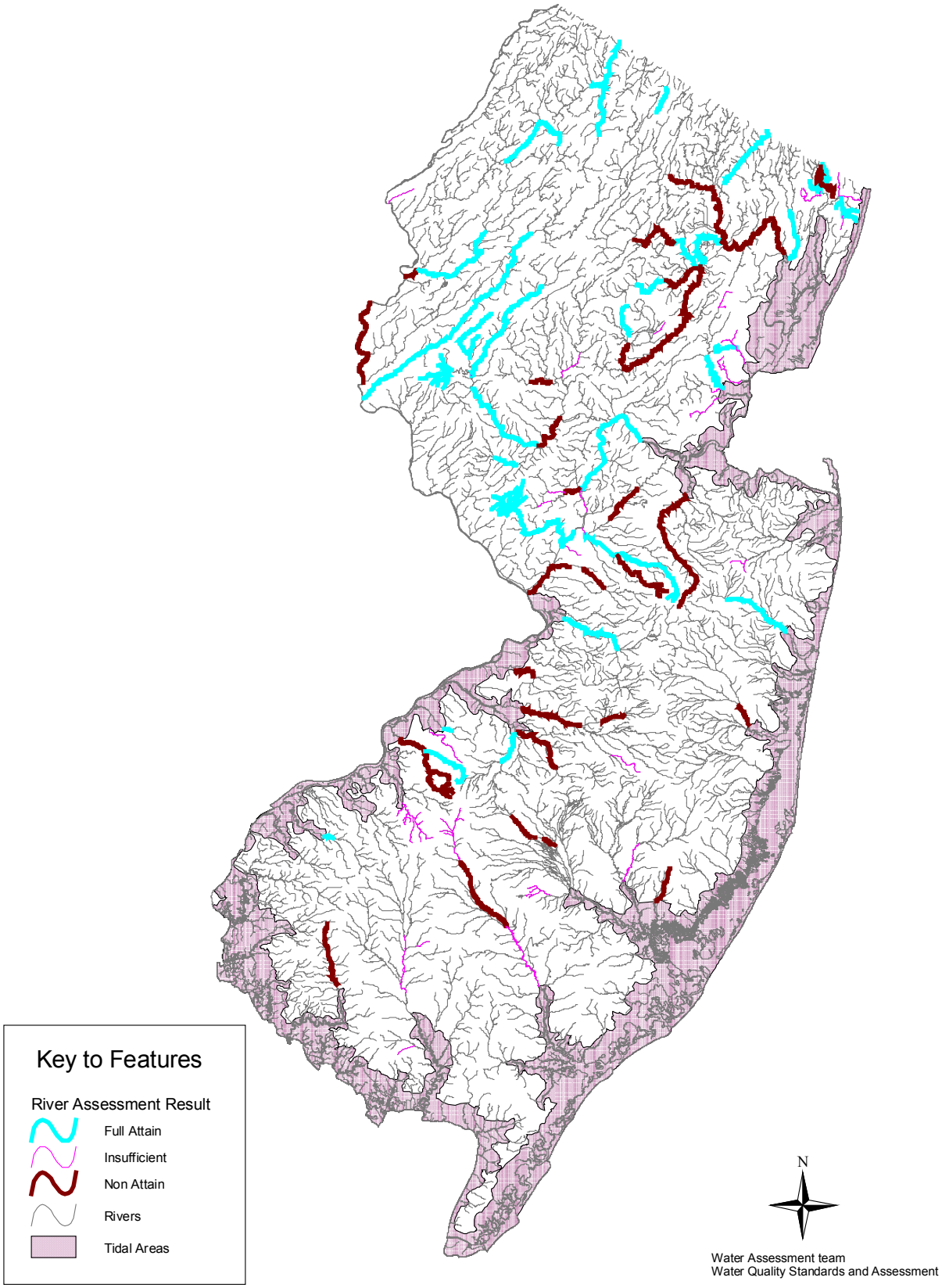


FIGURE 2.1b-13. Assessment Status for Lead in Rivers.



Nickel (Ni)

Description
Nickel is a lustrous, white, hard, ferromagnetic metal. Much of the nickel in the environment is found with soil and sediments because nickel attaches to particles that contain iron or manganese, which are often present in soil and sediments (ATSDR, 1997d). Nickel is released to the atmosphere by soil erosion, windblown dust, volcanoes, combustion of fuel oil, municipal incineration, and industries involved in nickel refining, steel production and other nickel alloy production. The majority of all nickel (80%) is used in alloys because it imparts such properties as corrosion resistance, heat resistance, hardness, and strength. Uses include stainless steel (65%), other steel alloys (10%), non-ferrous alloys (12%), electroplating (8%), and other incompassing chemicals (5%) (Tenth Report on Carcinogens available at http://ehp.niehs.nih.gov/roc/toc10.html). Elevated levels of nickel may also exist as a result of the corrosion and leaching of nickel alloys used in valves and faucets.

In the environment, nickel occurs in oxidation states ranging from –1 to +4 in aqueous systems, however, it occurs predominately in the divalent (+2) state. Nickel occurs in aqueous systems as relatively soluble salts associated with suspended solids and organic material. Above pH of 6.0, nickel is adsorbed to iron and maganese, while below 6.0 pH, nickel is considered to be highly mobile with sorption playing a relatively minor role. Under anaerobic conditions and in the presence of sulfur, insoluble sulfides are formed. Under aerobic conditions and in the presence of microorganisms, nickel can be remobilized from sediments (Canadian Council of Resource and Environment Ministers, 1987).

Nickel is an essential trace element, but like other metals, elevated concentrations are toxic. The Department of Health and Human Services has determined that metallic nickel may reasonably be anticipated to be a human carcinogen, while nickel compounds are known to be a human carcinogen (ATSDR, 1997d). The primary targets are: the respiratory tract following inhalation exposure; the reproductive system and the developing organism following inhalation and oral exposure; and, the immune system following inhalation, oral, or dermal exposure. Chronic exposure of nickel to animals has shown effects on the renal, cardiovascular, reproductive, and immunological systems. However, it does not show bioaccumulative effects in animals.

Assessment
A total of 117 sites representing 747 river miles were assessed for nickel. Only one site, carried over from the 1998 303(d) list, located on the Hackensack River exceeded the standards for nickel. However, a TMDL was implemented for the river, therefore the site was placed on sublist 4. All of the listings on sublist 3 have insufficient data to make an assessment. Recent sampling shows that nickel concentrations throughout the state are well below its criteria. There were no exceedances of the criteria, and recent data do not indicate any threat to human health or aquatic life in any areas of the state.

Results of the nickel assessment are summarized below in Table 2.1b-17. Results for individual stations are depicted in Figure 2.1b-14 and in Tables II-15 through 18 in the Appendix.

Table 2.1b-17: Nickel Status

Nickel Status	Number of Stations	Percent of Stations	Number of Assessed River Miles		Percent of Assessed River Miles	
			Monitor	Estimate	Monitor	Estimate
Sublist 1	78	67%	560	0	75%	NA
Sublist 3	38	33%	177	0	24%	NA
Sublist 4	1	<1%	10	0	1%	NA
Sublist 5	0	NA	0	0	NA	NA
Totals	117	100%	747	0	100%	NA

FIGURE 2.1b-14. Assessment Status of Sites Monitored for Nickel. Includes sites delisted and carried over from the 1998 303(d) List.

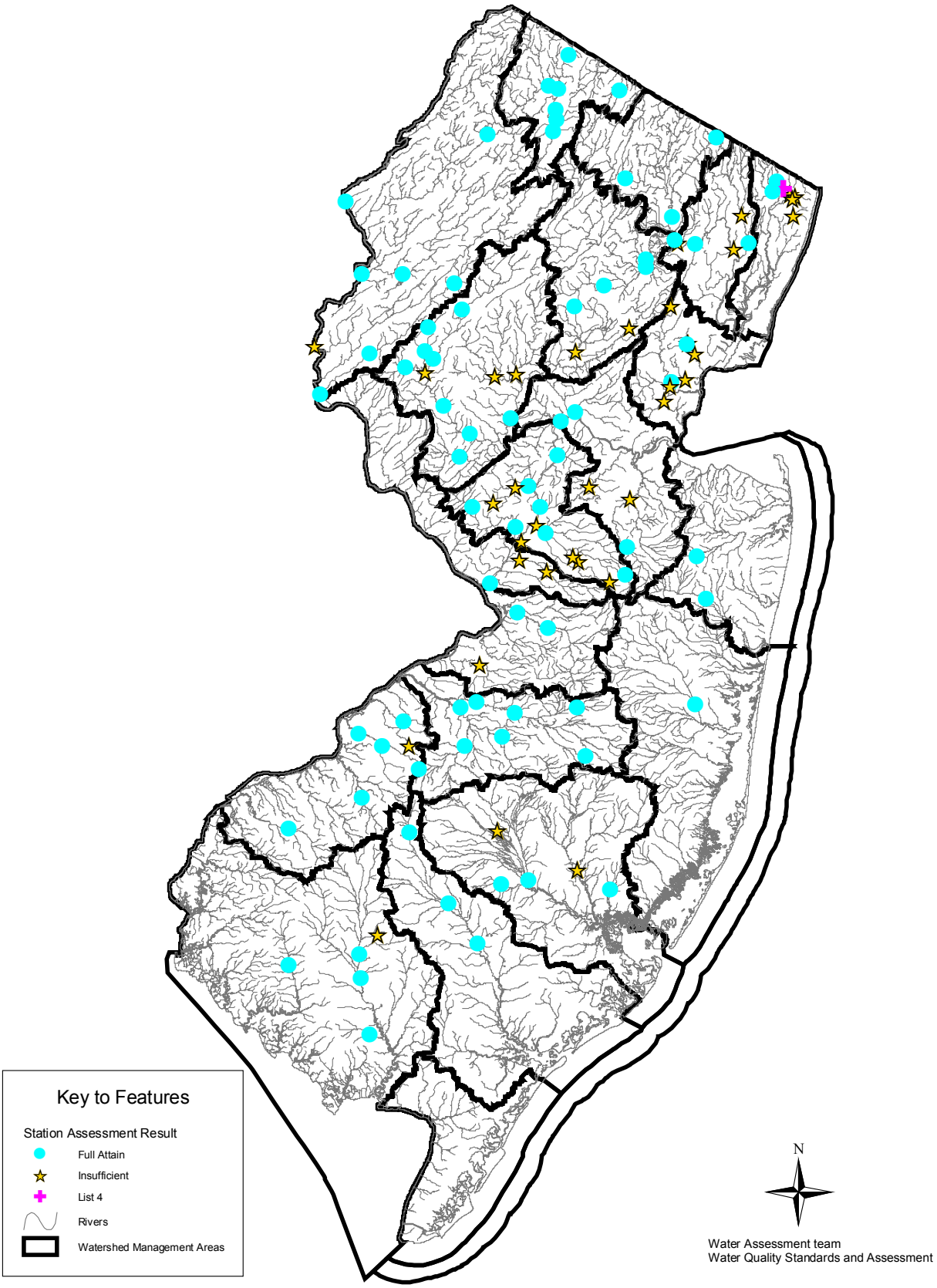
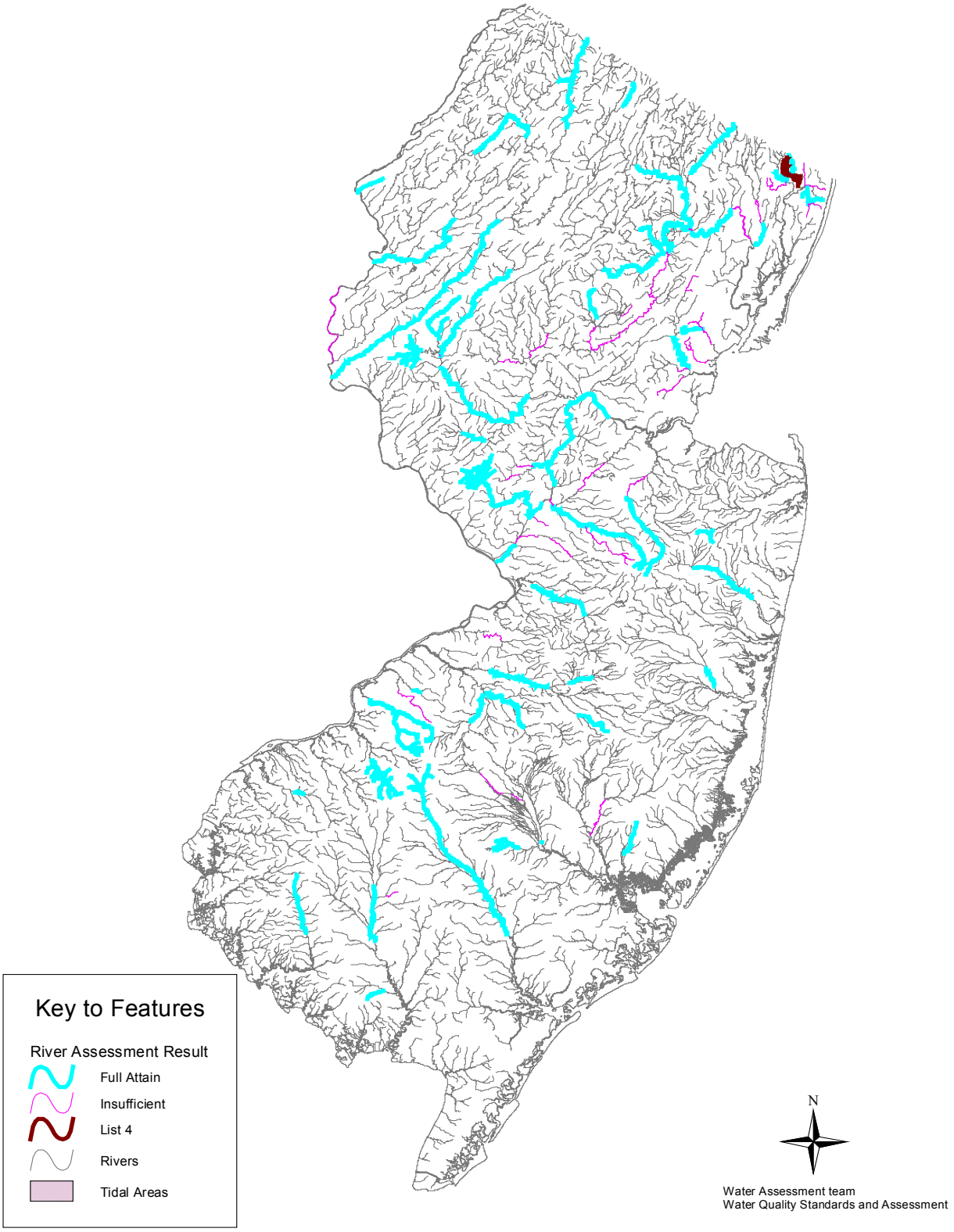


FIGURE 2.1b-15. Assessment Status for Nickel in Rivers.



Zinc (Zn)

Description
Pure zinc is a bluish-white shiny metal. Zinc is released into the environment by natural processes, but most zinc comes from activities such as mining, steel production, coal burning, and burning of waste. Zinc has many commercial uses such as coating to prevent rust, in dry cell batteries, and mixed with other metals to make alloys like brass and bronze. Zinc compounds are widely used in industry to make paint, rubber, dye, wood preservatives and ointments. An alloy of zinc and copper is used to make pennies (www.zinc.org).

In the environment, zinc is normally found in the inorganic or organic forms. In the inorganic form it is usually in the divalent (+2) state. The presence of organic material can have a dominating effect on the form of zinc in waters of high organic content. The greatest dissolved zinc concentrations are found at low pH, low alkalinity and high ionic strength. Sorption of zinc by hydrous metal oxides, clay minerals and organic materials appears to be an important process in the aquatic environment. In the presence of suspended solids, much of the zinc will be sorbed to suspended and colloidal particles. Below a pH of 6.0, zinc adsorption is not anticipated, although some clays will still adsorb the metal (Canadian Council of Resource and Environment Ministers, 1987).

Zinc is another essential micronutrient. However, too much zinc can cause anemia, pancreas damage, reduced immune function, and lower levels of high density lipoprotein cholesterol (good form) (ATSDR, 1997h). Zinc has been found to be bioaccumulative (Canadian Council of Resource and Environment Ministers, 1987).

Assessment
A total of 117 sites representing 757 river miles were assessed for zinc. Only 14 sites were listed on sublist 5, with all of them being carried over from the 1998 303(d) List due to insufficient data to make assessments (see Table 2.1b-19). All of the listings on sublist 3 have insufficient data to make an assessment. Recent sampling shows that statewide-average zinc concentrations were similar to concentrations at background sites. However, recent high flow sampling also detected zinc levels above the criteria along the Great Egg Harbor, Hammonton Creek, and Millstone River. Since only one sample showed an exceedance, none of these sites were placed on sublist 5. These sites will be targeted for any future high flow sampling when resources become available.

Results of the zinc assessment are summarized below in Table 2.1b-18. Results for individual stations are depicted in Figure 2.1b-16 and in Tables II-15 through 18 in the Appendix.

Table 2.1b-18: Zinc Status

Zinc Status	Number of Stations	Percent of Stations	Number of Assessed River Miles		Percent of Assessed River Miles	
			Monitor	Estimate	Monitor	Estimate
Sublist 1	75	64%	544	0	72%	NA
Sublist 3	28	24%	123	0	16%	NA
Sublist 4	0	NA	0	0	NA	NA
Sublist 5	14	12%	90	0	12%	NA
Totals	117	100%	757	0	100%	NA

Table 2.1b-25: Zinc Sites Carried Over From 1998 303(d) List

WMA	Station Number	Station Name	WMA	Station Number	Station Name
14	14-EBR-1	East Branch Bass River by 654, Bass River SF	06	6-SITE-1; 6-PAS-2	Passaic River near Chatham
09	9-LAW-1	Lawrence Brook on Davidson's Mill Rd, Black Horse	06	6-SITE-2; 6-PAS-1	Passaic River near Millington
09	9-MAN-2	Manalapan Brook at Spotswood	06	6-SITE-11	Rockaway River at Boonton
14	14-MUL-2	Mullica River at Outlet of Atsion Lake	10	10-ROC-1	Rocky Brook on Rte 33 in Hightstown
04	4-SITE-5	Passaic River at Elmwood Park	10	10-ROC-2	Rocky Brook, Rte 130, Hightstown
04	4-SITE-6; 4-PAS-3	Passaic River at Little Falls	10	01400585	Rocky Brook at Perrinville
04	4-SITE-4; 4-PAS-4	Passaic River at Singac	18	Newtown Creek	Newtown Creek

FIGURE 2.1b-16. Assessment Status of Sites Monitored for Zinc. Includes sites delisted and carried over from the 1998 303(d) List

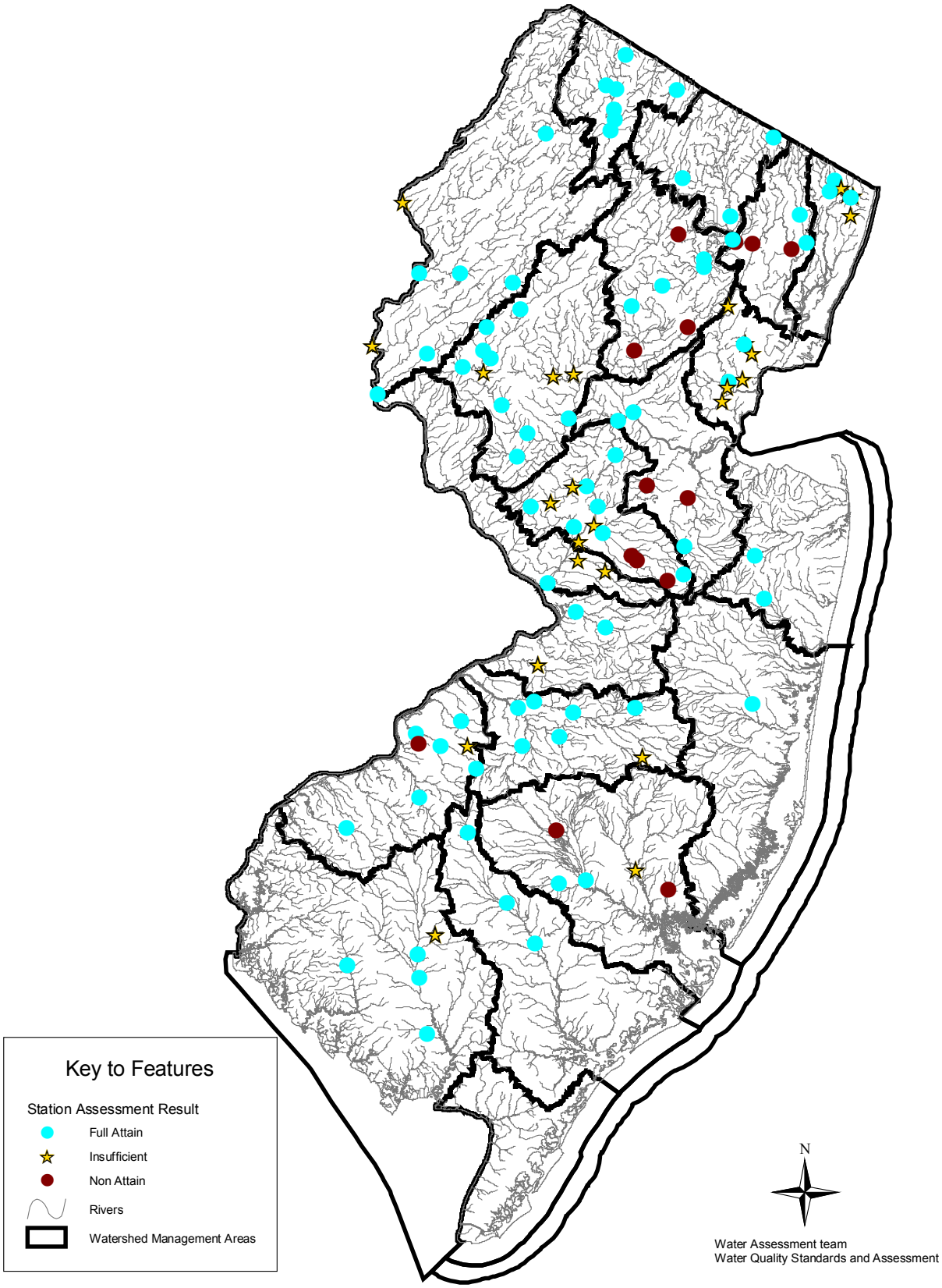
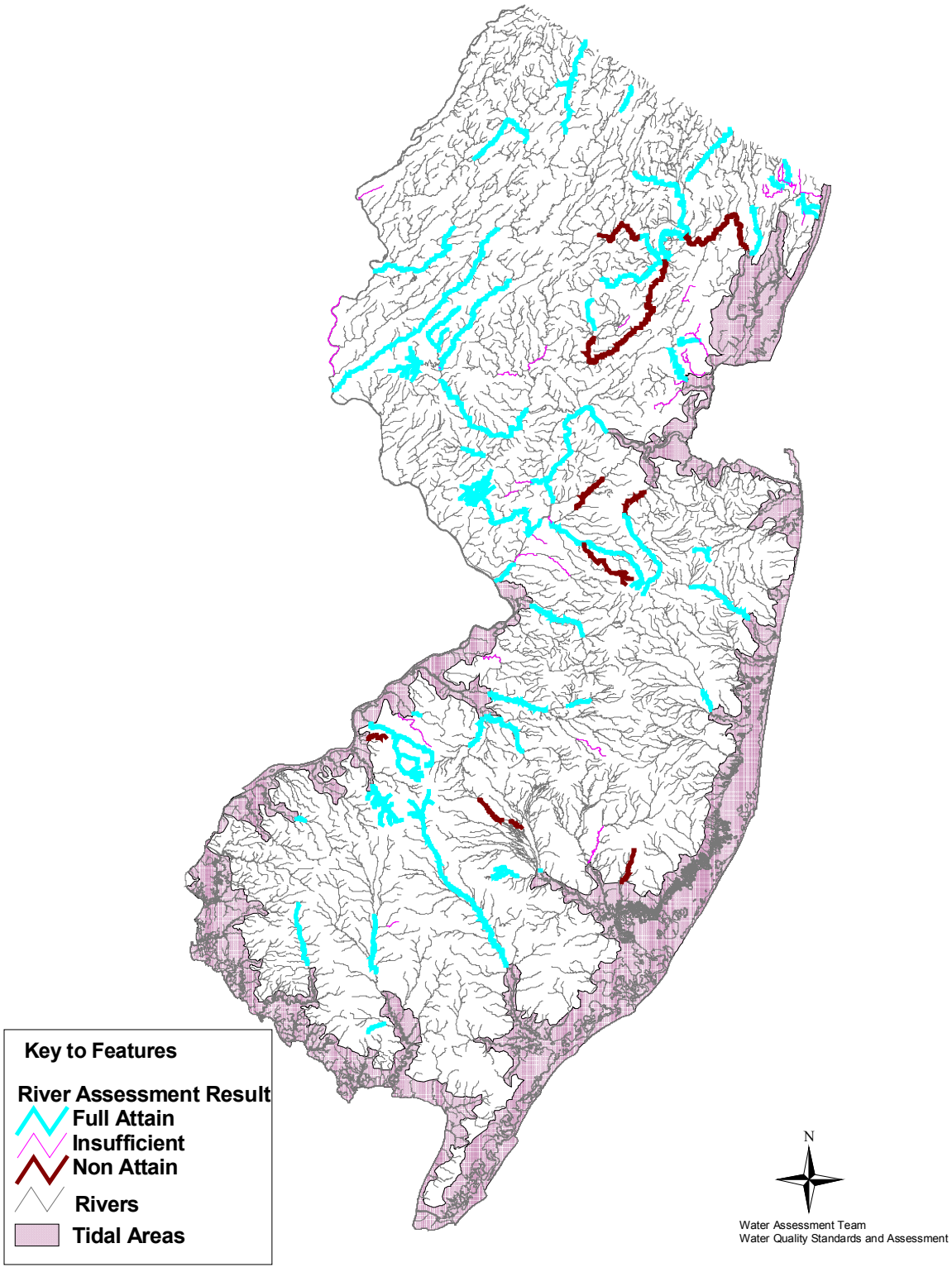


FIGURE 2.1b-17. Assessment Status for Zinc in Rivers.



Selenium (Se)

Description

In its pure form, selenium is a metallic gray to black hexagonal crystals, but is seldom found in its elemental form in the environment. It is usually combined with sulfide minerals or with silver, copper, lead, and nickel minerals. Natural sources include weathering of rocks and erosion of soils. Anthropogenic sources include releases to the air during the combustion of coal and petroleum fuels, and during the smelting and refining of other metals. Almost all selenium is obtained as a byproduct from copper refining. Most processed selenium is used in the electronics industry. Its semiconductor and photoelectric properties make it useful in "electric eyes," photographic exposure meters, and rectifiers for home entertainment equipment. It is also used to coat the metal cylinders from which a photographic image is transferred in xerography. Selenium is used in the glass industry, as pigments in plastics, paints, enamels, inks, and rubber; as a catalyst in the preparation of pharmaceuticals; as a nutritional feed additive; in pesticide formulations; and as a fungicide. In the western United States, selenium is found in high concentrations in the soil.

Dissolved selenium species in the aquatic environment are predominantly in the form of selenites and selenates. Most selenites are less soluble than are selenates and are removed from the water column. Under acidic and reducing conditions, selenites are reduced to elemental selenium and removed from the water column. Alkaline and oxidizing conditions favor the formation and stability of the selenates which are soluble and are readily available for uptake by aquatic organisms (Canadian Council of Resource and Environment Ministers, 1987). The compounds selenide and elemental selenium are insoluble in water. In general, elemental selenium is stable in soils and is found at low levels in water because of its affinity to co-precipitate with sediments. Selenides are either insoluble or rapidly decompose, under aerobic conditions to form elemental selenium which is insoluble in water. This form of selenium is considered to be inert, and appears to be a major sink for selenium in the aquatic environment.

Selenium is a micronutrient required in trace amounts for human and animal health. Its compounds are very toxic. Selenium sulfide is the only compound that has shown carcinogenicity in experimental animals. This compound is only used by the pharmaceutical and cosmetic industry as an antifungal and antiseborrheic agent. Selenium can potentially cause the following health effects when people are exposed to it at levels above the MCl for short periods of time: hair and fingernail changes, damage to the peripheral nervous system, fatigue, and irritability. The health effects of long term exposure include: hair and fingernail loss, and damage to kidney and liver tissue and the nervous and circulatory systems. Toxicity affects the cardiovascular, hepatic, nervous, and renal organs. Chronic oral exposure can produce selenosis, the major effects of which are dermal and neurological (ATSDR, 1997e). In addition to the health affects, selenium is bioaccumulated by aquatic organisms.

Assessment
A total of 116 sites, representing 755 river miles, were assessed for selenium. Only 1 site, Rockaway River at Boonton, was listed on sublist 5 which was carried over from the 1998 303(d) List due to insufficient data to make an assessment. All of the listings on sublist 3 have insufficient data to make an assessment. Recent sampling shows that statewide average selenium concentrations were similar to concentrations at background site. The concentrations throughout the state are well below criteria and recent data do not indicate a threat to human health or aquatic life in any areas of the state.

Results of the selenium assessment are summarized below in Table 2.1b-19. Results for individual stations are depicted in Figure 2.1b-18 and in Tables II-15 through 18 in the Appendix.

Table 2.1b-19: Selenium Status

Selenium Status	Number of Stations	Percent of Stations	Number of Assessed River Miles		Percent of Assessed River Miles	
			Monitor	Estimate	Monitor	Estimate
Sublist 1	78	67%	558	0	74%	NA
Sublist 3	37	32%	188	0	25%	NA
Sublist 4	0	NA	0	0	NA	NA
Sublist 5	1	1%	9	0	1%	NA
Totals	116	100%	755	0	100%	NA

FIGURE 2.1b-18. Assessment Status of Sites Monitored for Selenium. Includes sites delisted and carried over from the 1998 303(d) List.

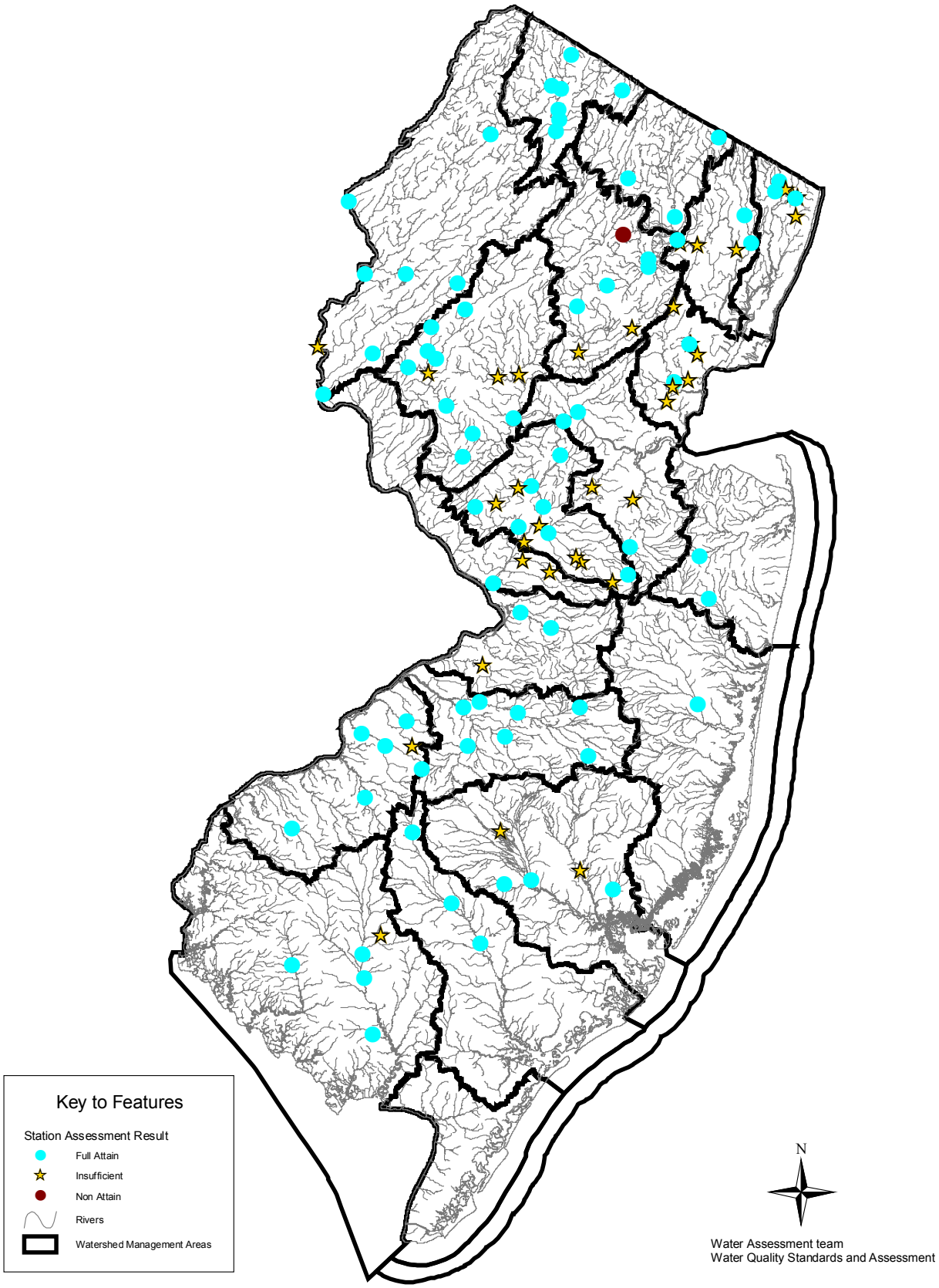
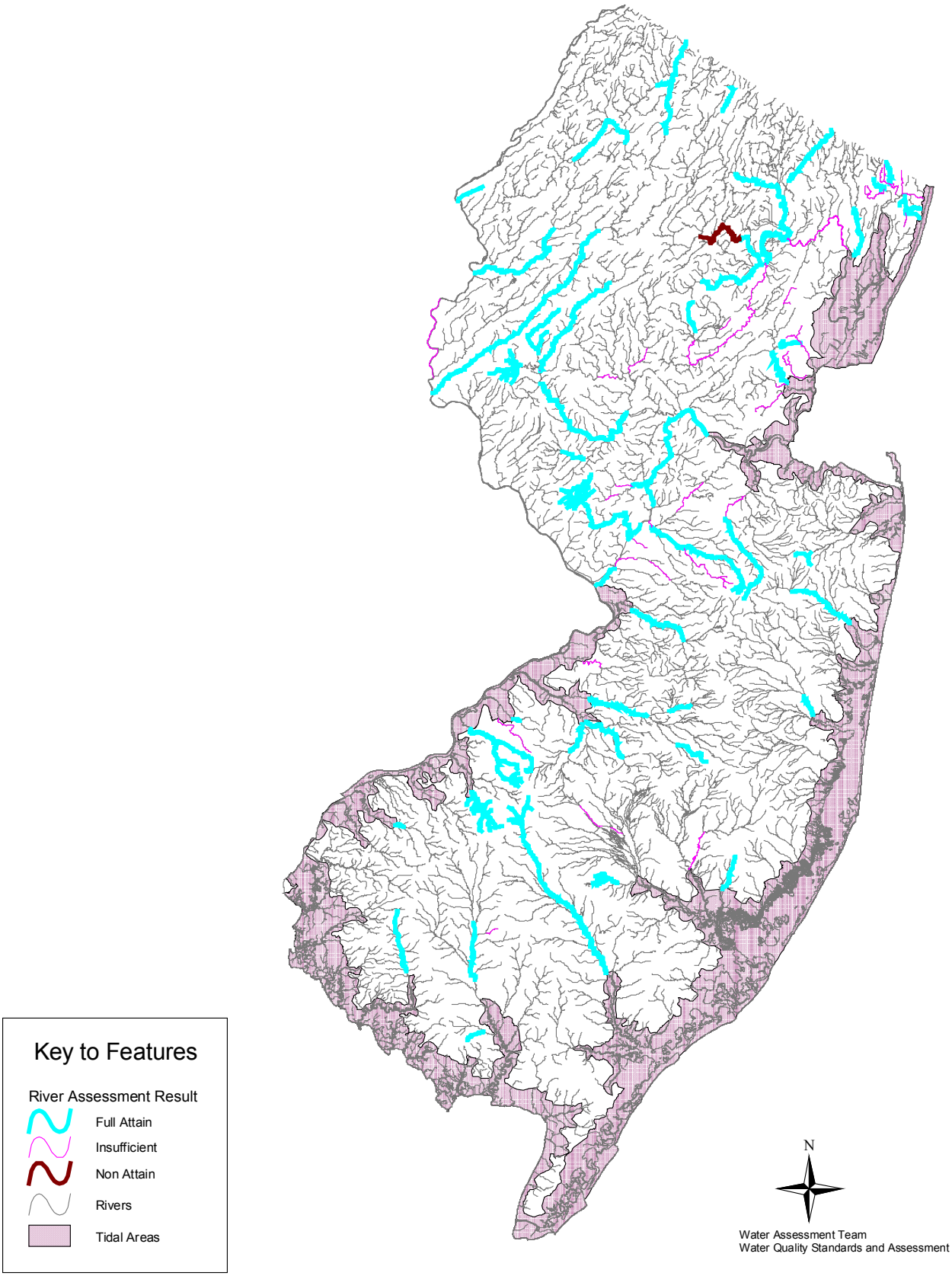


FIGURE 2.1b-19. Assessment Status for Selenium in Rivers.



Silver (Ag)

Description
Silver is released into the environment by natural processes such as weathering of rock and volcanic activity. A large portion of silver consumption is for photographic materials, as well as use in batteries, making jewelry, silverware, electronic equipment, and dental fillings. Other uses include brazing alloys and solders, to disinfect drinking water and water in swimming pools, and as an antibacterial agent.

In the environment, silver exists in oxidation states of 0, +1, +2 and in aqueous systems silver is primarily in the univalent state. Metallic silver (+1) is stable over much of the pH and redox range found in natural waters, but has a very low water solubility. Sorption and precipitation are the dominant mechanisms controlling the transport of silver in the aquatic environment. Organic material may also adsorb silver. Field studies have shown that the silver content of sediments is correlated with organic content. Bioconcentration factors for silver are relatively low (Canadian Council of Resource and Environment Ministers, 1987).

Exposure to high levels of silver over an extended period may result in a condition called arygria, a blue-gray discoloration of the skin and other body tissues. Exposure to high levels of silver in the air has resulted in breathing problems, lung and throat irritation, and stomach pains. In animal studies, oral exposure resulted in deposits of silver in the skin and less activity than in unexposed animals (ATSDR. 1997f).

Assessment
A total of 38 sites representing 220 river miles were assessed for silver. Only 6 sites were listed on sublist 5, with all of the sites being carried over from the 1998 303(d) List due to insufficient data to make an assessment (see Table 2.1b-21). All of the sites on sublist 3 had insufficient data to make an assessment. Although only limited data are available, none of the data showed any exceedance of the criteria for silver.

Results of the silver assessment are summarized below in Table 2.1b-20. Results for individual stations are depicted in Figure 2.1b-20 and in Tables II-15 through 18 in the Appendix.

Table 2.1b-20: Silver Status

Silver Status	Number of Stations	Percent of Stations	Number of Assessed River Miles		Percent of Assessed River Miles	
			Monitor	Estimate	Monitor	Estimate
Sublist 1	8	21%	53	0	24%	NA
Sublist 3	24	63%	119	0	54%	NA
Sublist 4	0	NA	0	0	NA	NA
Sublist 5	6	16%	48	0	22%	NA
Totals	38	100%	220	0	100%	NA

Table 2.1b-21: Silver Sites Carried Over From 1998 303(d) List

WMA	Station Number	Station Name	WMA	Station Number	Station Name
18	01477120, 18-RAC-1	Raccoon Creek near Swedesboro	04	01389500, 4-PAS-3, 4-SITE-6	Passaic River at Little Falls
06	01379000, 6-PAS-1, 6-SITE-2	Passaic River near Millington	04	01389130, 4-PAS-4	Passaic River at Sigac
06	01379500, 6-PAS-2, 6-SITE-1	Passaic River near Chatham	04	01389880, 4-SITE-5	Passaic River at Elmwood Park

FIGURE 2.1b-20. Assessment Status of Sites Monitored for Silver.

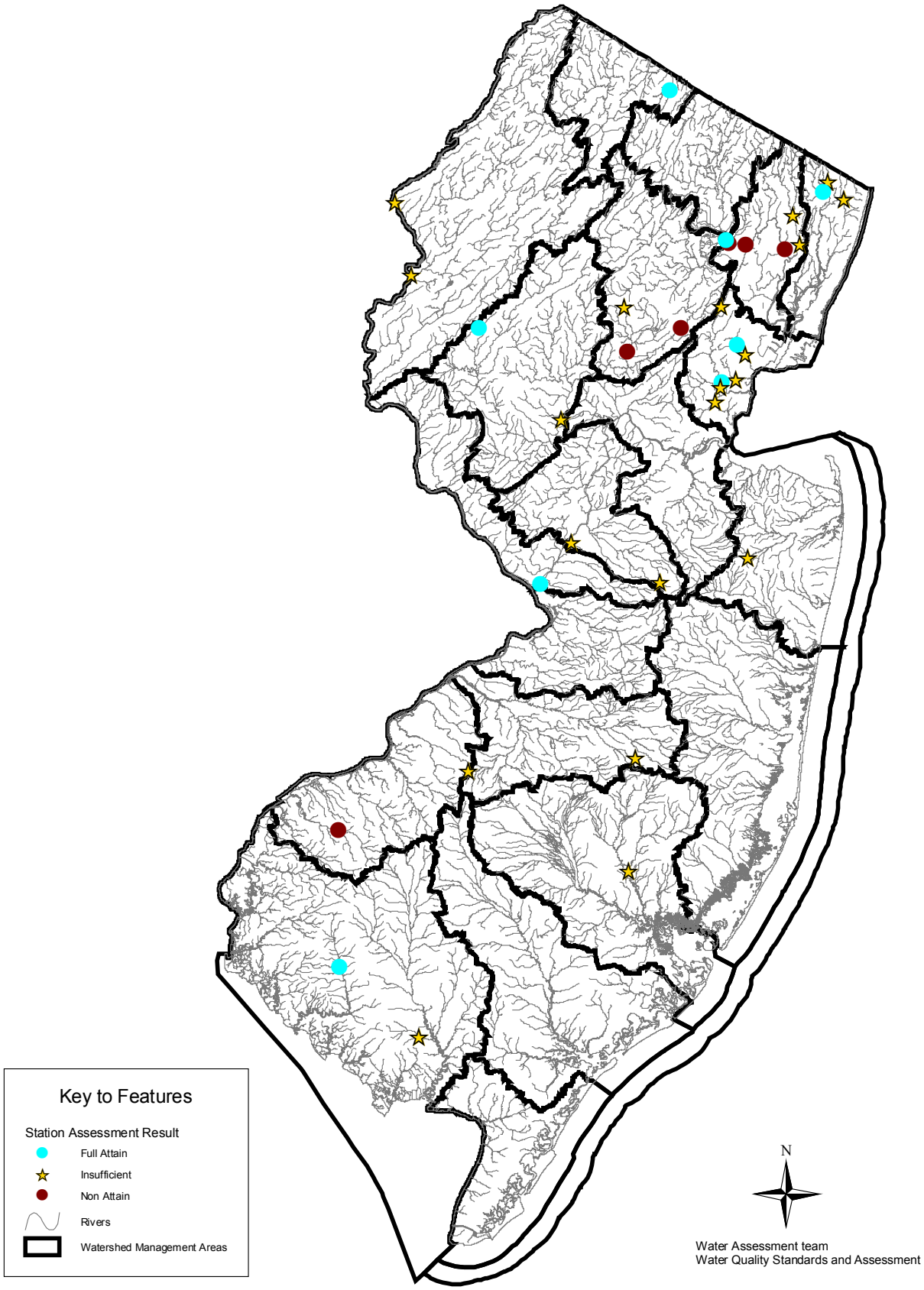
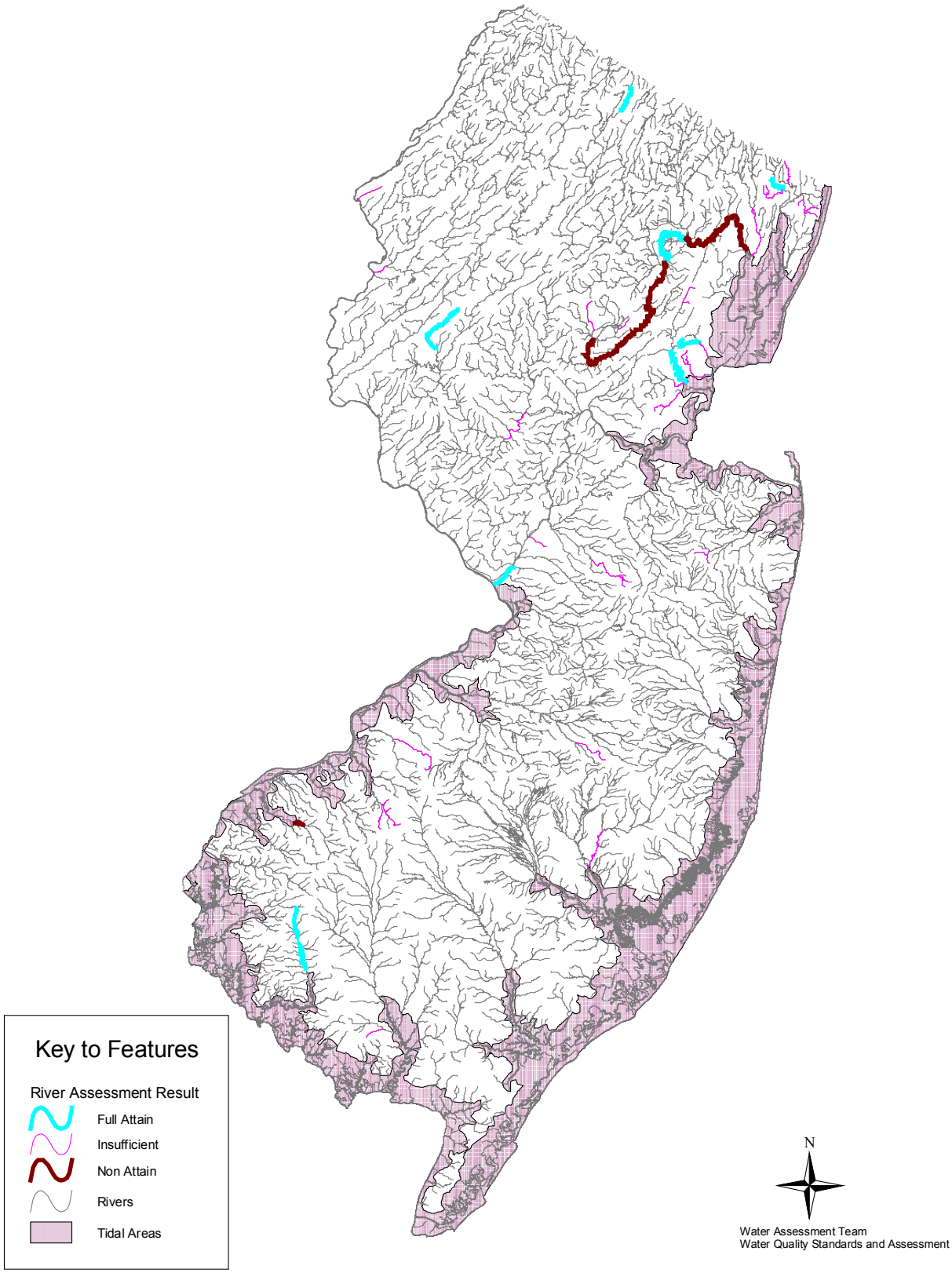


FIGURE 2.1b-21. Assessment Status for Silver in Rivers.



Thallium (Th)

Description
Thallium, a soft, bluish-gray metal, is used mostly in manufacturing electronic devices, switches, and closures, primarily for the semiconductor industry. It also has limited use in the manufacture of special glass and for certain medical procedures. Anthropogenic sources are primarily from coal-burning and smelting. In the environment, thallium is usually found in the monovaliant (+1) and trivalent (+3) states. It is not very soluble and usually found in sediments (Canadian Council of Resource and Environment Ministers, 1987).

Thallium is toxic and effects the respiratory, nervous, cardiovascular systems as well as the liver, kidney, and muscles. All studies on the effects of thallium are from acute exposure.

Assessment
Only 9 sites representing 46 river miles were assessed for thallium. All new assessments did not have sufficient data to complete an assessment, while the 3 sites on sublist 5 were carried over from the 1998 303(d) List due to insufficient data to make an assessment (see Table 2.1b-23).

Results of the thallium assessment are summarized below in Table 2.1b-22. Results for individual stations are depicted in Figure 2.1b-22 and in Tables II-15 through 18 in the Appendix.

Table 2.1b-22: Thallium Status

Thallium Status	Number of Stations	Percent of Stations	Number of Assessed River Miles		Percent of Assessed River Miles	
			Monitor	Estimate	Monitor	Estimate
Sublist 1	0	NA	0	0	NA	NA
Sublist 3	6	67%	29	0	63%	NA
Sublist 4	0	NA	0	0	NA	NA
Sublist 5	3	33%	17	0	37%	NA
Totals	9	100%	46	0	100%	NA

Table 2.1b-23: Thallium Sites Carried Over From 1998 303(d) List

WMA	Station Number	Station Name
06	01389130, 4-PAS-4	Passaic River at Sigac
06	01389500, 4-PAS-3, 4-SITE-6	Passaic River at Little Falls
06	01389880, 4-SITE-5	Passaic River at Elmwood Park

FIGURE 2.1b-22. Assessment Status of Sites Monitored for Thallium. Includes sites carried over from the 1998 303(d) List.

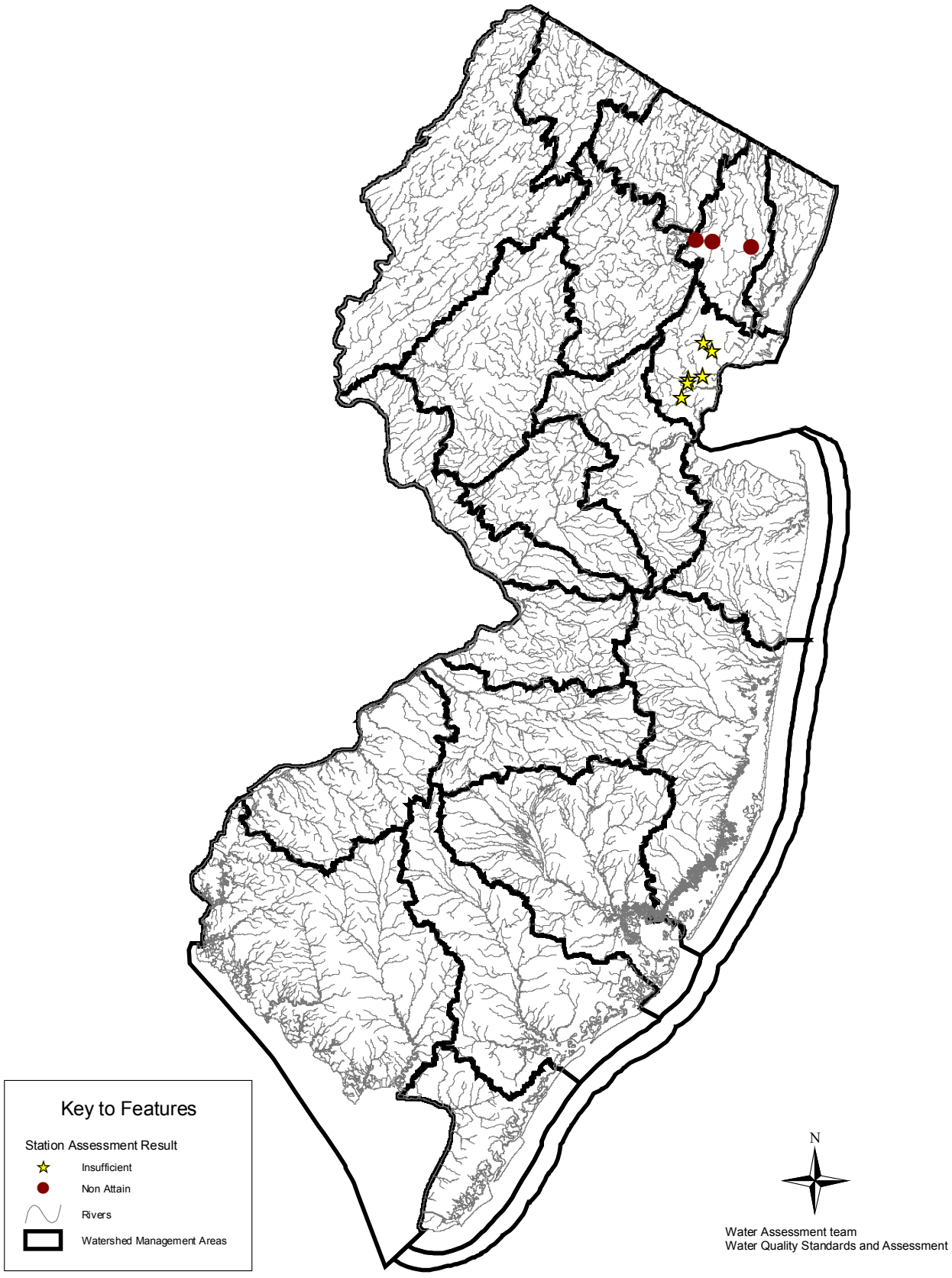
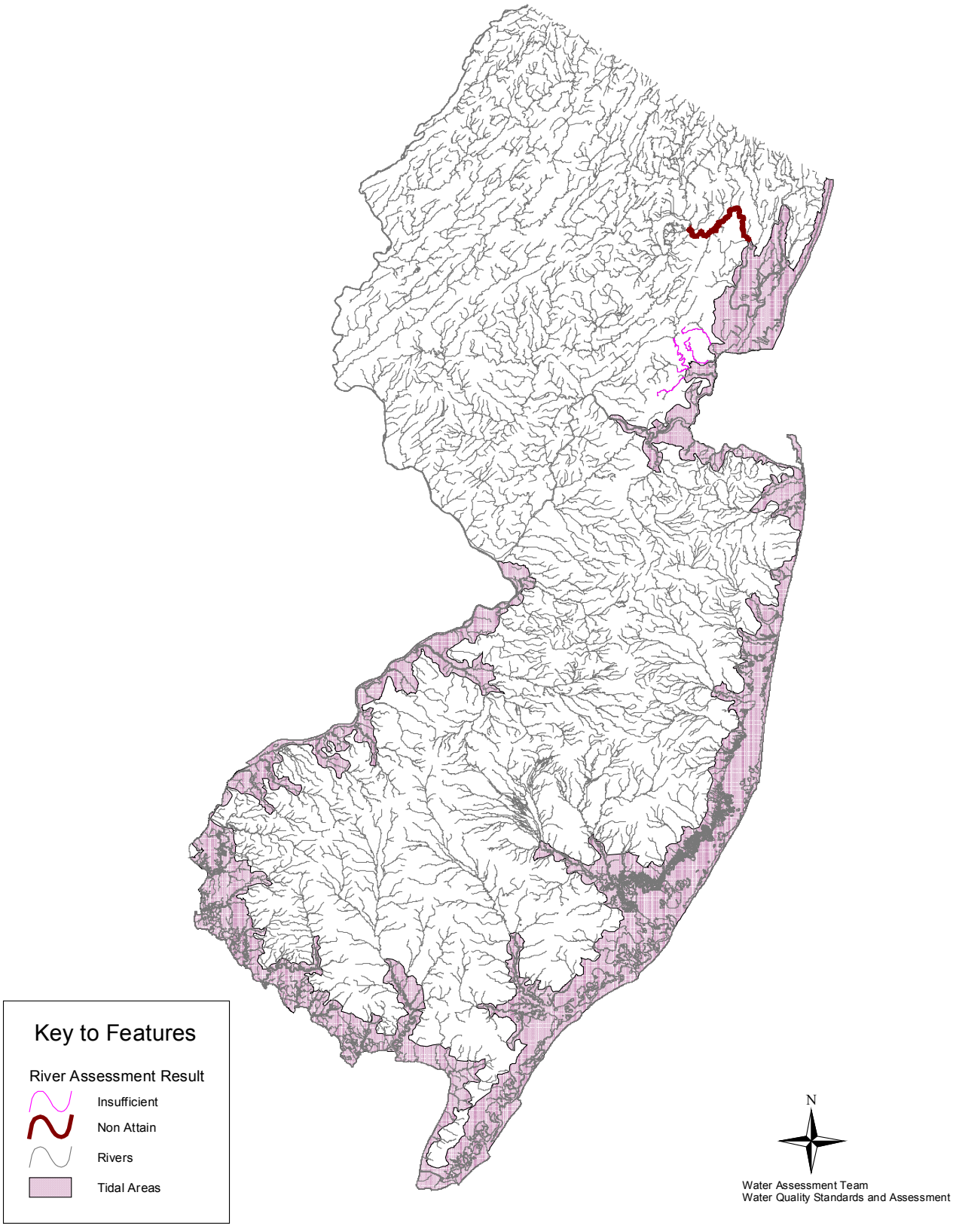


FIGURE 2.1b-23. Assessment Status for Thallium in Rivers.



Other Metals/Toxics

Description

Benzene – Benzene is a colorless, clear liquid with a strong odor and highly flammable. Benzene is found in crude oil and natural gas. Gasoline contains an average of 0.8% benzene. It is widely used throughout the United States including the production of plastics, resins, nylon, synthetic fibers, rubbers, lubricants, dyes, detergents, drugs, and pesticides. It is moderately soluble and highly volatile.

Cyanide - Cyanide can be produced by certain bacteria, fungi, and algae, and is found in a number of foods and plants. It can exist as a gas (i.e. hydrogen cyanide) or in a crystal form (i.e. sodium cyanide). Cyanide is used to make paper, textiles, and plastics. It may also be found in chemicals used for photography, electroplating, metal cleaning, and removing gold from its ore. Cyanide gas is used to exterminate pests as well. Most cyanide in surface water will form hydrogen cyanide and end up in the air.

DDT (dichlorodiphenyltrichloroethane) – DDT is an insecticide that was commonly used prior to its ban in 1972. Although banned in the US, other countries continue to use the insecticide and atmospheric deposition does occur in this country. DDT is very persistent in the environment and its break-down products, DDE and DDD, are toxic as well. It is not very soluble and bioaccumulates in plants, animals, birds, and fish. It is a probable human carcinogen.

PCE (tetrachloroethene) – PCE is a colorless, heavy liquid. It is the most widely used dry cleaning chemical in the US. It is found in spot removers, rug and upholstery cleaners, and paint strippers. Additionally, PCE is used during the manufacture of clothing and other fabric goods, to remove grease and dirt from metal, and in the manufacturing of CFC-113. It is moderately soluble and is nonpersistant in water (99.8% is released to the air).

TCE (trichloroethene) – TCE is a colorless, volatile, nonflammable liquid. It is one of the most frequently found toxic chemical in water in the US. TCE is a solvent used as a metal degreaser and in a wide variety of products including dyes, printing inks, correction fluid, spot removers, rug cleaners, and disinfectants. It is also used in the manufacture of polyvinyl chloride, varnishes, adhesives, paints and lacquers. It was once used as a dry cleaning solvent but is discontinued now. It is highly soluble in water and nonpersistant (99.6% is released to the air).

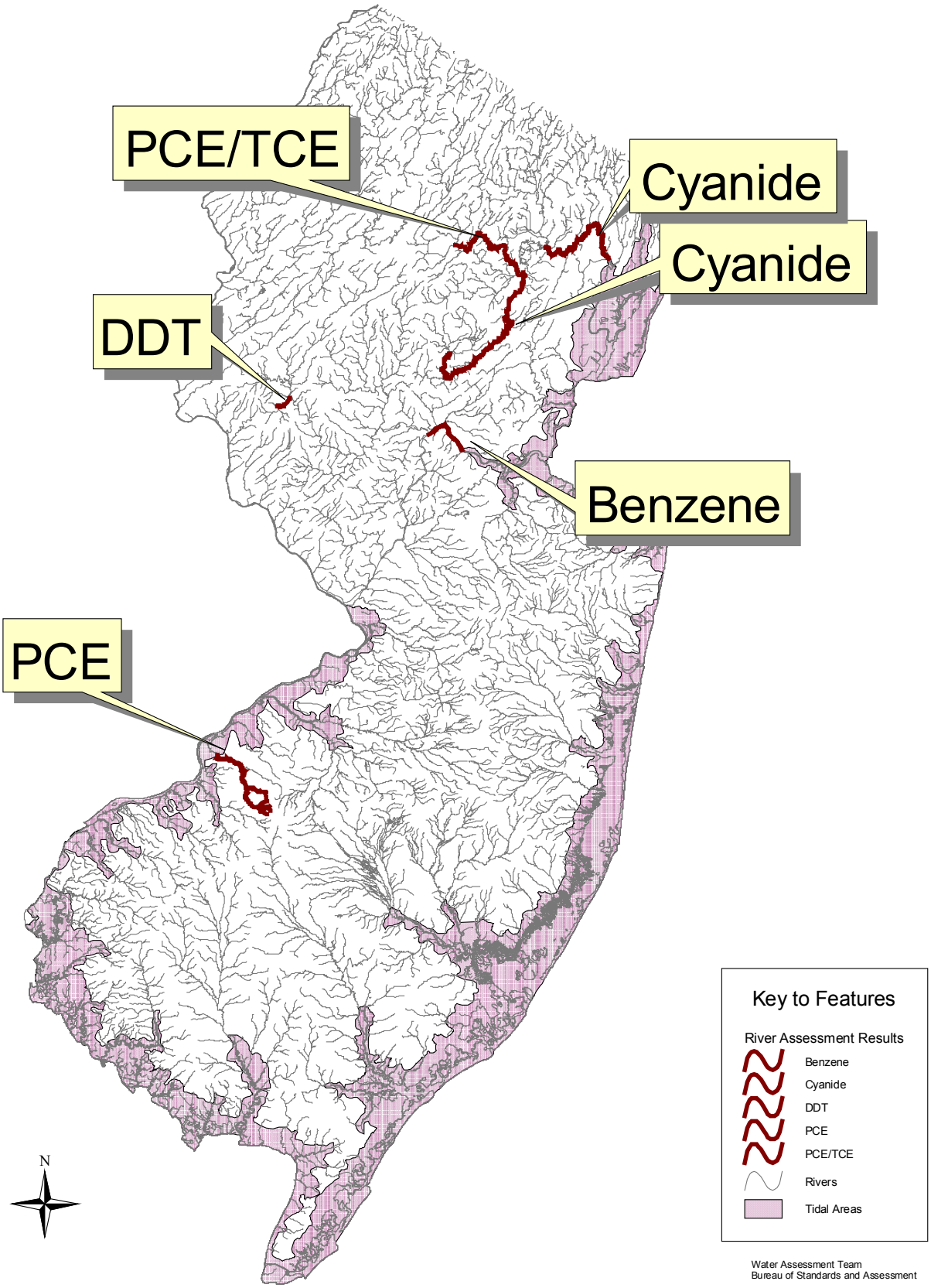
Assessment

Other toxic substances, not covered in the metals section, had exceedances of their criteria that caused them to be listed on the 1998 303(d) List. These sites have no recent additional data to re-assess their status and are listed on sublist 5 of the 2004 Integrated List. The only exception is benzene found in the Raritan River in Bound Brook. Recent sampling showed multiple exceedances of the criteria and follow-up sampling will be conducted. A total of 86 river miles are impacted by these toxics.

Table 2.1b-24: Toxics Listed on Sublist 5

WMA	Station Number	Station Name	Organic Compound
08		Cakepoulin Creek Reach 02030105-043-0.00	DDT
18	01467150, 18-CO-4	Cooper River at Haddonfield	PCE
18	18-CO-1	Cooper River at Rte 130 in Camden	PCE
06	01379000, 6-PAS-1, 6-SITE-2	Passaic River near Millington	Cyanide
06	01379500, 6-PAS-2, 6-SITE-1	Passaic River near Chatham	Cyanide
06	01389130, 4-PAS-4	Passaic River at Sigac	Cyanide
06	01389500, 4-PAS-3, 4-SITE-6	Passaic River at Little Falls	Cyanide
06	01389880, 4-SITE-5	Passaic River at Elmwood Park	Cyanide
09	01403300	Raritan River at Queens Bridge	Benzene
06	01380500, 6-SITE-11	Rockaway River at Boonton	PCE, TCE
06	01381200, 6-ROC-1, 6-SITE-10	Rockaway River at Pine Brook	PCE, TCE

FIGURE 2-1b-24. Other Toxics Listed on Sublist 5.



Unknown Toxics

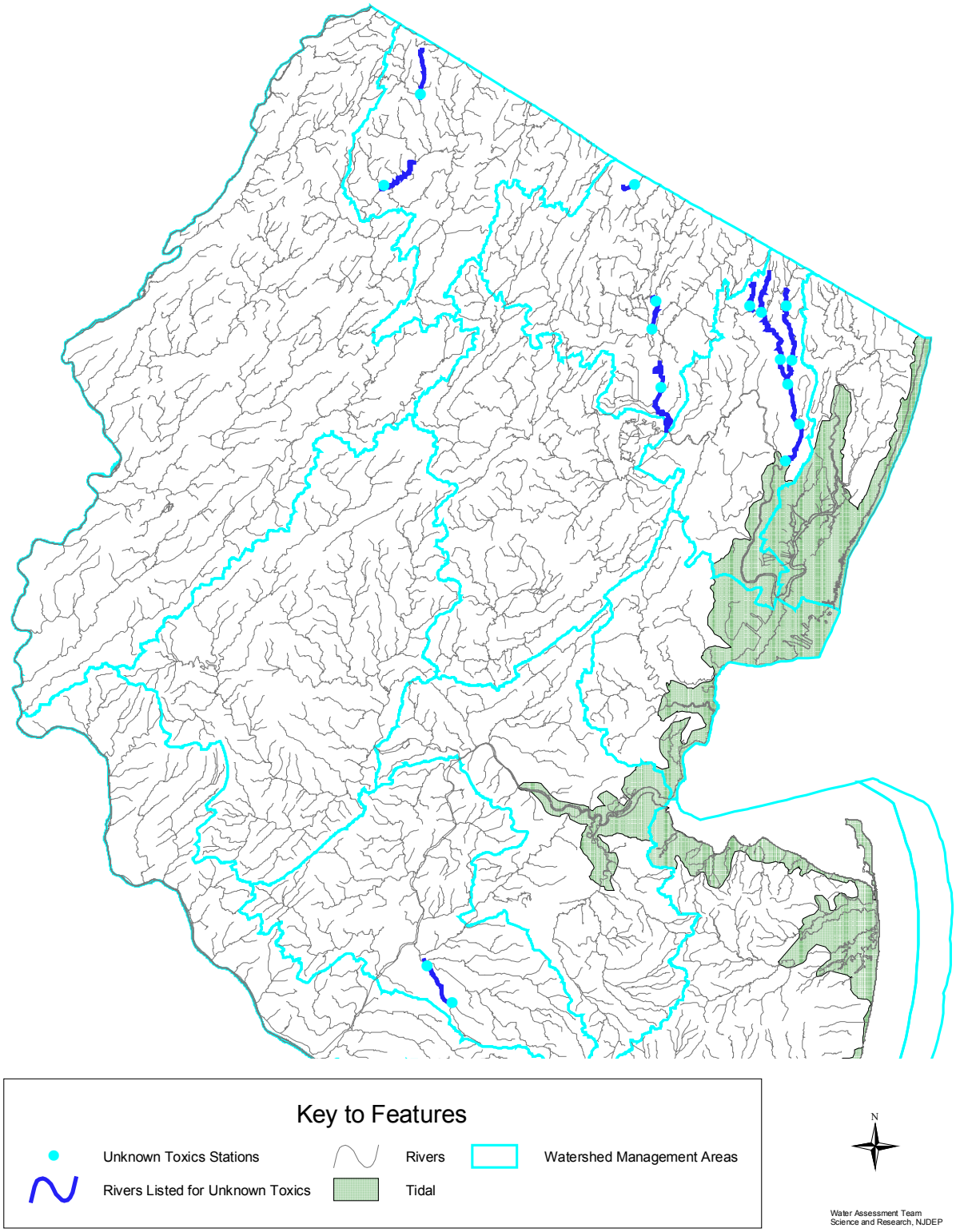
On the 1998 303(d) List, 9 sites representing 54 river miles were listed for unknown toxics (see Table 2.1b-25 and Figure 2-1b-25). These sites were listed as a result of a study that found unusually high abnormalities with macroinvertebrates at NJDEP Ambient Biological Monitoring Network (AMNET) sites. Since the study was conducted, no additional sampling has occurred at these sites and therefore, they remain on sublist 5 for the 2002 Integrated List. The 9 original sites are now represented by 17 sites, but the river miles remain the same.

An individual site, Kings Creek, was also listed on the 1998 303(d) List, but was excluded from the assessments since the site could not be located on GIS maps, and river miles could not be calculated.

Table 2.1b-25: Sites with Unknown Toxicity

WMA	Station Number	Station Name
03	AN0255	Wanaque River at E Shore Dr in West Milford Twp
03	AN0256, AN0257	Wanaque River at Highland Ave (blw STP) in Wanaque, Wanaque River at Wanaque Ave in Pompton Lakes
03	AN0268, AN0268A	Pompton R at Newark Pompton Tnpk in Pequannock Twp, Pompton River at Pompton Plains Cross Rd in Pequannock Twp
04	AN0281, AN0282, AN0283, AN0290, AN0291	Saddle R at E Allendale Ave in Saddle River, Saddle R at E Ridgewood Ave in Paramus, Saddle R at Dunkerhook Rd in Fair Lawn, Saddle R at Railroad Ave in Rochelle Park Twp, Saddle R at Marcellus Pl in Garfield,
04	AN0284	Valentine Brook at Forest Ave in Allendale
04	AN0287, AN0288	Ramsey Brook at Park Ave in Allendale, Hohokus Brook at Spring St in Ridgewood Village
02	AN0304	Papakating Creek at Rt 565 in Frankford Twp
02	AN0308	Clove Brook UNK Trib at Rose Marrow Ave in Wantage Twp
20	AN0383 AN0384	Bear Brook at Old Trenton Rd in West Windsor Bear Brook at Stobbe Ln in West Windsor

FIGURE 2.1b-25. Unknown Toxic Sites.



Section 2.2 Tidal Rivers and Coastal Waters

Section 2.2a Conventional Assessments

Of the 1,510 tidal river miles, 460 river miles were assessed for conventional water quality. Of the 460 miles assessed, 167 miles (36% of assessed tidal river miles) exceeded a criteria for at least one parameter. The sites sampled along tidal rivers included: Passaic River, Hackensack River, Raritan River, South River, Hudson River, Delaware River, and several Delaware Tributaries (Rancocas Creek, Pennsauken Creek, Cooper River, Newtown Creek, Big Timber Creek, Raccoon Creek, Mantua Creek, and Oldsman Creek). Dissolved oxygen and fecal coliform were also sampled along various rivers draining into the Delaware Bay, Raritan Bay, and back bays along the Atlantic Ocean. These assessment results are discussed in Chapter 3, Section 3, under Aquatic Life and Recreational Designated Uses, respectively.

All waterbodies evaluated for phosphorus exceeded the criteria with impairments found in the tributaries along the Delaware River, portions of the Passaic River, and Raritan River. On the other hand, nitrate and unionized ammonia were found to be in compliance along the same river reaches. The pH criterion is exceeded along the Cooper River and Newton Creek (carry over from 1998 303(d) List), but within compliance along the Delaware River, its other tributaries, the Passaic River, and Hackensack River. For temperature, the Delaware River exceeded its criteria from Riverton south to the Delaware state border. The tributaries to the Delaware River, Raritan River, Passaic River, and Hackensack River all met the criteria for temperature. Total suspended solids exceeded the criterion in the Raritan River, Oldsman Creek, and Raccoon Creek, while the remaining Delaware River tributaries and South River had no observed exceedances. Total dissolved solids were not an issue in any of the assessed tidal rivers. See Tables 2.2a-1 and 2.2a-2 for summarized results.

Table 2.2a-1: Overall Conventional Status in Tidal Rivers

Conventionals Status	Number of Stations	Percent of Stations	Number of Assessed River Miles		Percent of Assessed River Miles	
			Monitor	Estimate	Monitor	Estimate
Sublist 1	44	57%	276	0	60%	NA
Sublist 3	3	4%	17	0	4%	NA
Sublist 4	0	0%	0	0	NA	NA
Sublist 5	30	39%	167	0	36%	**NA**
Totals	77	100%	460	0	100%	NA

Table 2.2a-2: Tidal Rivers Conventional Assessments

Metal	Sublist 1 River Miles	Sublist 3 River Miles	Sublist 4 River Miles	Sublist 5 River Miles	Sublist 1 Percent	Sublist 3 Percent	Sublist 4 Percent	Sublist 5 Percent
Phosphorus	0	0	0	54	0%	0%	0%	100%
Nitrate	52	0	0	0	100%	0%	0%	0%
Fecal Coliform	112	22	0	58	58%	11%	0%	31%
Dissolved Oxygen	378	11	0	52	86%	2%	0%	12%
pH	115	11	0	3	88%	8%	0%	4%
Temperature	13	9	0	31	25%	17%	0%	58%
Total Dissolved Solids	68	21	0	0	76%	24%	0%	0%
Total Suspended Solids	35	3	0	24	56%	5%	0%	39%
Unionized Ammonia	77	0	0	0	100%	0%	0%	0%

The primary sources for conventional water quality data include the following networks: Delaware River Basin Commission - Delaware River monitoring; the Interstate Environmental Commission - Hudson River monitoring; NJDEP Marine and Estuarine Water Quality Network- targets mostly coastal waters, but some sites are located in tidal rivers; NJDEP EWQ Network – targets mostly non-tidal rivers but several located in tidal rivers as well; Monmouth County Health Department - 23 sites located in tidal rivers with limited data; and Passaic Valley Sewer Commission - 7 sites located in the tidal Passaic and Hackensack Rivers. See Appendix II, Data Sources for the 2004 NJ Integrated Report, for details on the above monitoring networks.

FIGURE 2.2a-1. Tidal Rivers Assessed for Conventional Water Quality. Conventionals on sublist 5 depicted in boxes.

Section 2.2b Metal and Toxic Assessments

In tidal rivers, 23 sites representing 269 miles were assessed for metals with all of the rivers having at least one metal or toxic exceeding its criteria. Several sites had metals placed on sublist 4 because of a TMDL or other metal reduction management plans. The sites listed on sublist 4 include: Delaware River Zones 2, 3, and 4 – Tetrachloroethene, 1,2 Dichlorethane, and PCBs; Tidal Hackensack River – Nickel; and Hudson River – Mercury. The Hudson River was the only tidal river not listed in sublist 5. A limited amount of new metal data exists in tidal rivers. Only DRBC provided recent metal data, for the Delaware River, resulting in copper being placed on sublist 5 in Zone 4. Many of the sites have been carried over from the 1998 303(d) List because recent sampling had not been initiated which prevented the assessment of current conditions. A summary of metal and toxic assessment results are shown in Table 2.2b-1 and Table 2.2b-2, as well as the listing of sites on sublist 5 in Table 2.2b-3.

Table 2.2b-1: Overall Metal and Toxic Status in Tidal Rivers

Metal and Toxic Status	Number of Stations	Percent of Stations	Number of Assessed River Miles		Percent of Assessed River Miles	
			Monitor	Estimate	Monitor	Estimate
Sublist 1	0	0%	0	0	0%	NA
Sublist 3	0	0%	0	0	0%	NA
Sublist 4	5	5%	110	0	41%	NA
Sublist 5	18	95%	159	0	59%	**NA**
Totals	23	100%	269	0	100%	NA

Table 2.2b-2: Tidal Rivers Metal and Toxic Assessments

Metal	Sublist 1 River Miles	Sublist 3 River Miles	Sublist 4 River Miles	Sublist 5 River Miles	Sublist 1 Percent	Sublist 3 Percent	Sublist 4 Percent	Sublist 5 Percent
Arsenic	0	18	0	56	0%	24%	0%	76**%**
Cadmium	0	7	0	73	0%	9%	0%	91**%**
Chromium	62	0	0	30	67%	0%	0%	33**%**
Mercury	16	7	22	98	11%	4%	16%	69**%**
Copper	100	6	0	43	67**%**	4%	0%	29%
Lead	100	0	0	38	72**%**	0%	0%	28%
Nickel	40	0	34	18	43**%**	0%	37%	20%
Zinc	62	6	0	30	63%	6%	0%	31%
Selenium	7	0	0	0	100**%**	0%	0%	0%
Silver	18	0	0	0	100**%**	0%	0%	0%

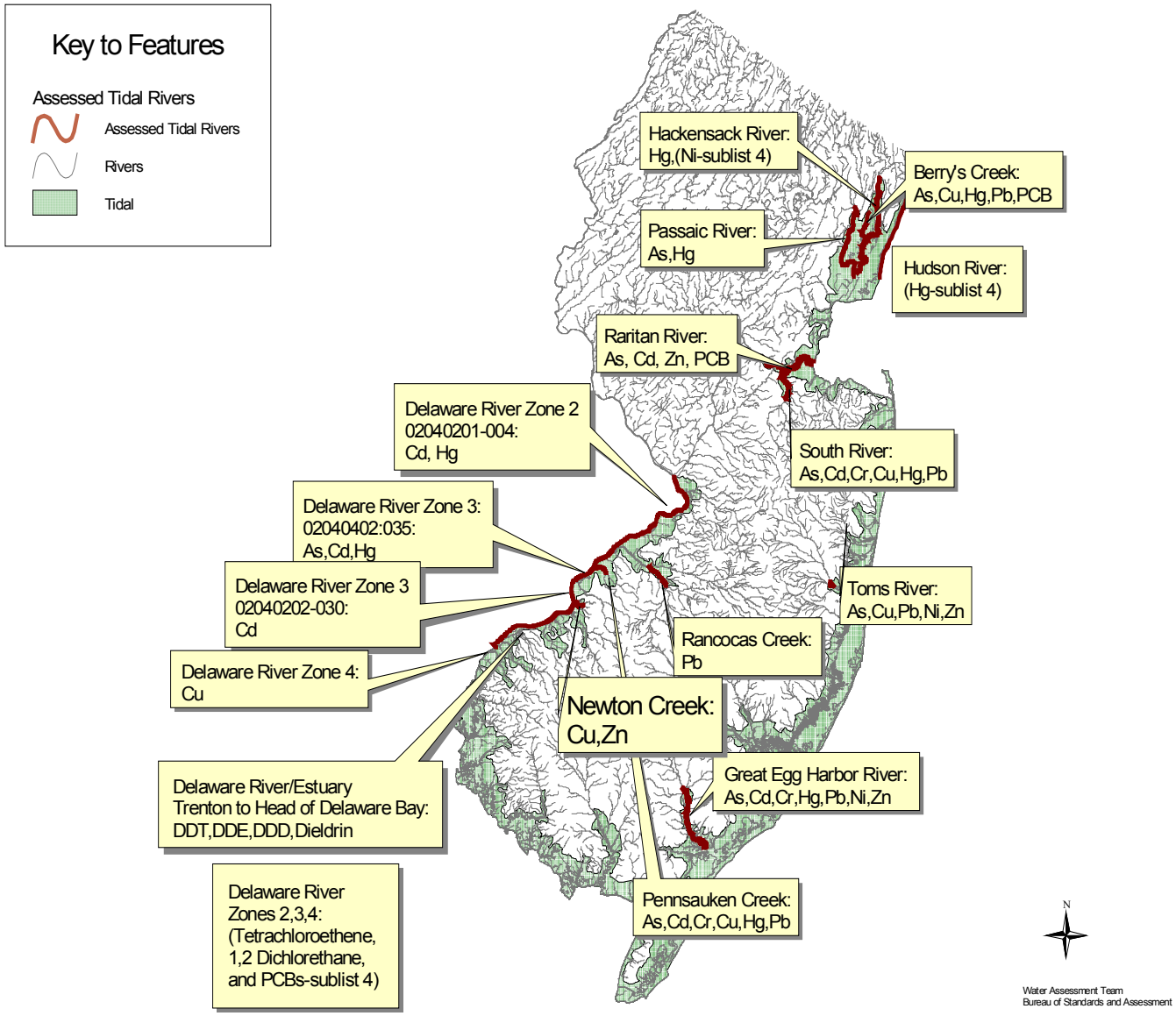
Table 2.2b-2 continued:

Metal	Sublist 1 River Miles	Sublist 3 River Miles	Sublist 4 River Miles	Sublist 5 River Miles	Sublist 1 Percent	Sublist 3 Percent	Sublist 4 Percent	Sublist 5 Percent
PCB	0	0	55	13	0%	0%	0%	100**%**
1,2-Dichloroethane, PCE, PCB	0	0	55	0	0%	0%	100**%**	0%
DDT, DDE, DDD, Dieldren,	0	0	0	55	0%	0%	0%	100**%**

Table 2.2b-3: Tidal Rivers with Metal and Toxic Exceedances

WMA	Waterbody Name	Metals Listed on Sublist 5 of 2004 Integrated List
05	Berry's Creek Reach 02030103-034	Arsenic, Copper, Lead, Mercury, PCB
19	Delaware River Zone 2, 02040201-004	Cadmium, Mercury
18	Delaware River Zone 3 Reach 02040202-030	Cadmium
18	Delaware River Zone 3, 02040402-035	Arsenic, Cadmium, Mercury
18	Delaware River Zone 4	Copper
17-20	Delaware River/Estuary (Trenton to head of Delaware Bay) Zones 2-4	DDT, DDE, DDD, Dieldrin
15	Great Egg Harbor River Estuary	Arsenic, Cadmium, Chromium, Lead, Mercury, Nickel, Zinc
05	Hackensack River – Tidal	Mercury
18	Newton Creek	Copper, Zinc
04	Passaic River – Tidal	Arsenic, Mercury
18	Pennsauken Creek - Mainstem	Arsenic, Cadmium, Chromium, Copper, Lead, Mercury
09	Raritan River Estuary, 02030105-001	Arsenic, Cadmium, Zinc
09	Raritan River Estuary, 02030105-002	Arsenic, Cadmium, Zinc, PCB
19	Rancocas Creek at Hainsport	Lead
10	South River	Arsenic, Cadmium, Chromium. Copper, Lead, Mercury
13	Toms River - Tidal	Arsenic, Copper, Lead, Nickel, Zinc

FIGURE 2.2b-1. Tidal Rivers Assessed for Metals. Metals on sublist 5 depicted in text boxes.



Coastal Waters

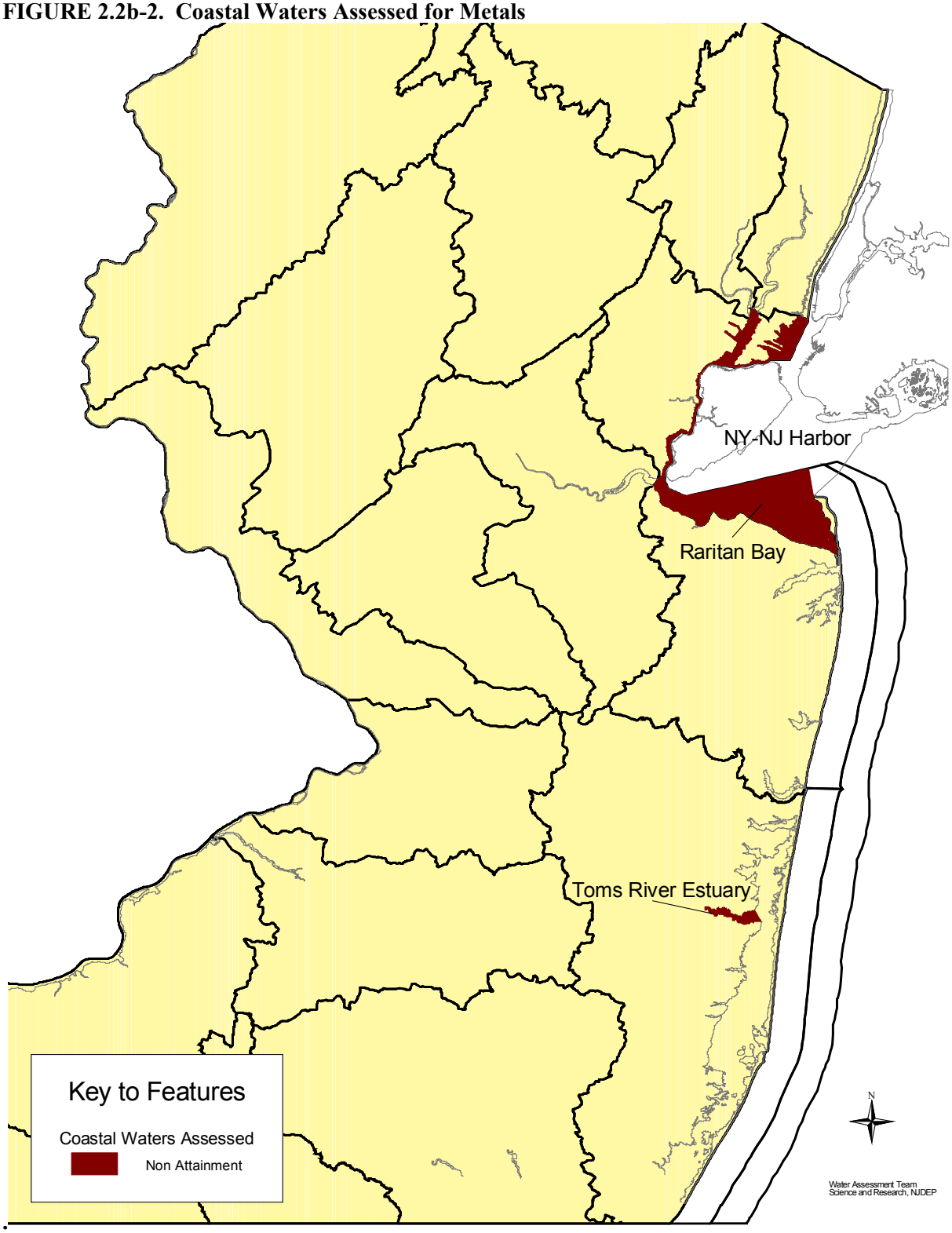
Of the 1,069 square miles of coastal waters, only 68 square miles were assessed for metals. The only two coastal areas assessed were: Toms River Estuary; and the NY-NJ Harbor comprising of the Upper New York Harbor, Kill Van Kull, Newark Bay, Arthur Kill, and Raritan Bay (see Figure 2.2b-2). In the Toms River Estuary, 6 metals were originally listed on the 1998 303(d) list: arsenic, copper, lead, iron, nickel, and zinc. All of these elements have no new data to reassess their attainment status, however, iron was taken off the 2004 Integrated List since there is no SWQS for this metal. See Chapter 4, Section 4.2b for a detailed description of the status of metals in the NY-NJ Harbor. No other metal sampling occurred in other coastal waters.

Below is the summary of coastal waters assessed for metals.

Table 2.2b-3. Coastal Waters Metal Assessments

Metal	Sublist 1 Square Miles	Sublist 3 Square Miles	Sublist 4 Square Miles	Sublist 5 Square Miles
Arsenic	0	0	0	3 (Toms R Estuary)
Mercury	50 (Raritan Bay)	0	2 (Arthur Kill)	13 (NY-NJ Harbor)
Copper	65 (entire NY-NJ Harbor	0	0	3 (Toms R Estuary)
Lead	65 (entire NY-NJ Harbor	0	0	3 (Toms R Estuary)
Nickel	65 (entire NY-NJ Harbor	0	0	3 (Toms R Estuary)
Zinc	0	0	0	3 (Toms R Estuary)
PCB, Dioxin, PAH, Pesticides	0	0	0	65 (entire NY-NJ Harbor

FIGURE 2.2b-2. Coastal Waters Assessed for Metals



Chapter 3: Designated Use Assessment

Section 3.1a River and Stream Aquatic Life Designated Use Assessment

Assessments of biological status evaluate the attainment of federal and state Surface Water Quality Standards provisions for the protection and propagation of fish, shellfish, and wildlife in accordance with the Clean Water Act. In addition, these assessments examine the degree to which the Department has restored, enhanced and maintained the biological integrity of the State's waters and safeguarded its fish, aquatic life and ecological value as required by the New Jersey Water Pollution Control Act. The specific designated uses for freshwater rivers and streams delineated in the New Jersey Surface Water Quality Standards (see 7:9B-1.12) whose degree of support are assessed by means of biological assessments are as follows:

- FW1 waters: set aside for posterity to represent the natural aquatic environment and its associated biota;
- FW2 waters: maintenance, migration and propagation of the natural and established biota;
- PL waters: maintenance, migration and propagation of the natural and established biota indigenous to this unique ecosystem.

The NJDEP has a wide range of data available including chemical, habitat, and biological information for assessing biological status. USEPA guidance for the Preparation of Water Quality Inventory Reports strongly emphasizes the use of biological data as the basis for assessing wadable streams and rivers especially when the data quality is high, as in New Jersey. Therefore, NJDEP evaluates biological status in non-tidal rivers and streams outside the Pinelands region of the State using benthic macroinvertebrate monitoring. Within the Pinelands, NJDEP uses stream vegetation and fish populations to monitor the biological status of that region. Descriptions of the macroinvertebrate monitoring program are in the Methods Document (NJDEP, 2003) located in the beginning of Appendix I. Biological monitoring in the Pinelands is described in Zampella, R.A., et al. 2001 and Zampella, R.A., et al. 2003. The methods used to assess both Pinelands and non-Pinelands streams and rivers by the Department are located in Section 6.0 in the Methods Document.

Currently, New Jersey streams outside the Pinelands protection and preservation area are monitored for biological use support status through the Ambient Biological Monitoring Network (AMNET) at 750 locations statewide on a 5-year rotating schedule. Round 1 sampling was completed in the mid-1990's and the resulting designated use assessment results were reported in the 1992, 1994, 1996 and 1998 305(b) Reports. Round 2 sampling began in 1997 and was completed in 2001, the results of which form the basis for the assessment presented in the previous 2002 Integrated Report as well as this report. Round III assessments have begun but data is not available for use in this 2004 report. Preliminary results for round III will be published in the 2006 Integrated Report. Readers are referred to the 1996 or 1998 305(b) Reports (NJDEP, 1996; NJDEP, 1998) for the status of statewide aquatic life assessment results based upon the first round of sampling. These reports are available at:
http://www.state.nj.us/dep/watershedmgt/bfbm/downloads.html.

Supplementing the Department's own biological monitoring are 23 benthic macroinvertebrate sites monitored by Monmouth County which meet the Department's QA/QC requirements for biological monitoring and assessments. These assessments were utilized in the 2002 Integrated Report and have been carried over into this 2004 Report. Newer assessments were supplied to the Department by Monmouth County. however, they were not received in time to be incorporated into this Report.

Because of the close proximity of some Monmouth County biological sites with those maintained by the NJDEP, some site assessments were combined into a single assessment within the Integrated List. If a Monmouth County and a NJDEP site were co-located within the same spatial extent (as reflected in RF3) and exhibited the same assessment, their assessments were treated as based upon a single location within the Integrated List. By doing so, what began as a total of 773 benthic sites was reduced to 756 sites. It is this compressed list of 756 sites that forms the basis for Table 3.1a-1 below.

In addition to direct biological assessments, the current round of field work by the Department includes a qualitative assessment of stream habitat quality at each monitoring location, the results of which are used to compute a Habitat Assessment Score. Various components of the habitat are examined such as the amount of available cover along the stream bottom, amount of sediment deposition, bank stability, frequency of riffles, presence and amount of riparian vegetative cover, etc.

Note that all assessment units presented in this section (linear river/stream miles), are calculated from a computerized mapping system (GIS) which operates on a 1:100,000 scale. These coverages are such because they represent a national level assessment employed by USEPA. Scales representing higher levels of resolution would, due to their greater detail, generate somewhat larger numbers of assessed waters.

Biological Assessments of Pinelands Streams

Because of their unique nature, streams within the Pinelands region of New Jersey (both Preservation and Protection Areas) are assessed separately from non-Pinelands streams using unique indicators recommended by and data supplied by the New Jersey Pinelands Commission (Zampella, R.A., et al. 2001, 2003 and written communication). In the 2002 Integrated List, the Department had placed benthic macroinvertebrate assessments taken from streams within the Pinelands area on sublist 3 (Insufficient Data) because the existing protocols would not apply to these waters. The Pinelands Commission (Commission) has developed an extensive biological database which the Department has now used to assess the biological condition for selected wadable streams in the Rancocas and Mullica watersheds (Watershed Management Areas 19 and 14, respectively). The basis for these assessments are extensive studies performed by the Commission of stream vegetation, finfish and anuran assemblages (in lakes) along anthropogenic disturbance gradients. For both the Mullica (Zampella, R.A., et al. 2001 and written communication) and the Rancocas (Zampella, R.A., et al. 2003 and written communication) drainages, stream vegetation and finfish assemblages are employed as the basis for the stream assessments contained in the Integrated List. In contrast, for Pinelands lake assessments, fish and anuran assemblages are employed.

River and Stream Aquatic Life Use Assessment Results (Non-Pinelands)
Due to slight corrections to the data that have occurred over the intervening 2 years, the numbers reported in this 2004 Integrated Report will differ slightly from those reported in the 2002 Integrated Report. For the purposes of this Integrated Report, a total of 756 biological monitoring sites were sampled by either the NJDEP or Monmouth County (all outside the Pinelands Region). Of these, 223 stations (30% of the 756 sites) were rated as non-impaired and listed on sublist 1, 314 stations (42%) were rated as in non-support of the designated use and assigned to sublist 5. Of the total on sublist 5; 55 stations were assessed as severely impaired and 259 were assessed as moderately impaired (see Table 3.1a-1). Thirty-one sites (4% of the total sites monitored) were found to be located below the head of tide and are unassessed. When translated into river miles the results are as follows: of a total of 1,893 miles assessed; 644 miles (34%) fully support the use (sublist 1), 516 miles (27%) represent insufficient data (sublist 3) and 733 miles (39%) do not support the use (sublist 5). See Table 3.1a-1.

Table 3.1a-1: Results of Integrated Assessment of Ambient Biological Monitoring Network (Excluding all sites contained within the Pinelands region). Modified from 2002

Assessment Category	Number of Sites	Equivalent River Miles	
		Monitored	Estimated
Full Support	223 (30% of all 756 sites monitored)	644 (34%)	44 (35%)
Insufficient Data	185 (24% of all 756 sites monitored)	516 (27%)	0
Non-support	314* (42% of all 756 sites monitored)	733*** (39%)	82 (65%)
Unassessed**	31 (4% of all 756 sites monitored)		
Total Sites Assessed	756	1,893	126

* Of this total; 259 sites are assessed as moderately impaired and 55 are severely impaired.

** This category represents sited located below head of tide.

*** Miles based upon sites located in GIS only. Sixty-two sites were not located in GIS and do not contribute to the calculation of river miles.

Results from Pinelands Data
Of a total of 46 sites (representing 95 linear river miles) assessed within the Rancocas Watershed, 11 sites (38 miles) were assessed as in full support and placed on sublist 1 while 9 sites (13 miles) were assessed as being in non-support and listed on sublist 5. The remaining 26 sites (44 miles) were placed on sublist 3 until refinements can be made regarding thresholds between acceptable and unacceptable biological communities within the Pinelands.

Within the Mullica Watershed, of 72 sites assessed (183 miles); 16 sites (47 miles) were assessed as in full support and placed on sublist 1, 17 sites (49 miles) were assessed as being in non-support and placed on sublist 5, and 39 sites (87 miles) were placed on sublist 3, again until assessment thresholds can be clarified.

Table 3.1a-2: Results of Biological Monitoring Performed in the New Jersey Pinelands region based upon Pinelands Commission Data

Watershed	Assessment Category	Number of Sites	Equivalent River Miles	
			Monitored	Estimated
Rancocas	**Full Support**	11 (24 % of all 46 sites monitored)	38	0
	Insufficient Data*	26** (57 % of all 46 sites monitored)	44	0
	Non-support	9 (19 % of all 46 sites monitored)	13	0
	Total Assessed	46	95	0

Table 3.1a-2: continued

Watershed	Assessment Category	Number of Sites	Equivalent River Miles	
			Monitored	Estimated
Mullica	**Full Support**	16 (22 % of all 72 sites monitored)	47	0
	Insufficient Data*	39** (54 % of all 72 sites monitored)	87	0
	Non-support	17 (24 % of all 72 sites monitored)	49	0
	Total Assessed	72	183	0

* For the sake of consistency with USEPA terminology, the Department used the term "Insufficient Data" for sublist 3 throughout this report, however, with regards to Pinelands biological data and assessments; it would be more accurate to apply the term "assessment unclear pending refinements regarding thresholds between impaired and unimpaired communities."

** These values are based solely upon Pinelands Commission biological assessments. There are also 147 AMNET benthic sites contained within the Pinelands region that still remain on sublist 3.

When assessments of Pinelands and non-Pinelands assessments are combined, the results are as follows:

Of a total of 2,580 river miles assessed for aquatic life designated use support status (Pineland and non-Pineland waterbodies): thirty percent (773 miles) fully support the designated use, 34% (877 miles) do not support the use, and 36% (930 miles) are designated as having insufficient data with which to make an assessment.

Figure 3.1a-1. Assessment Status of Pineland Aquatic Life Sites

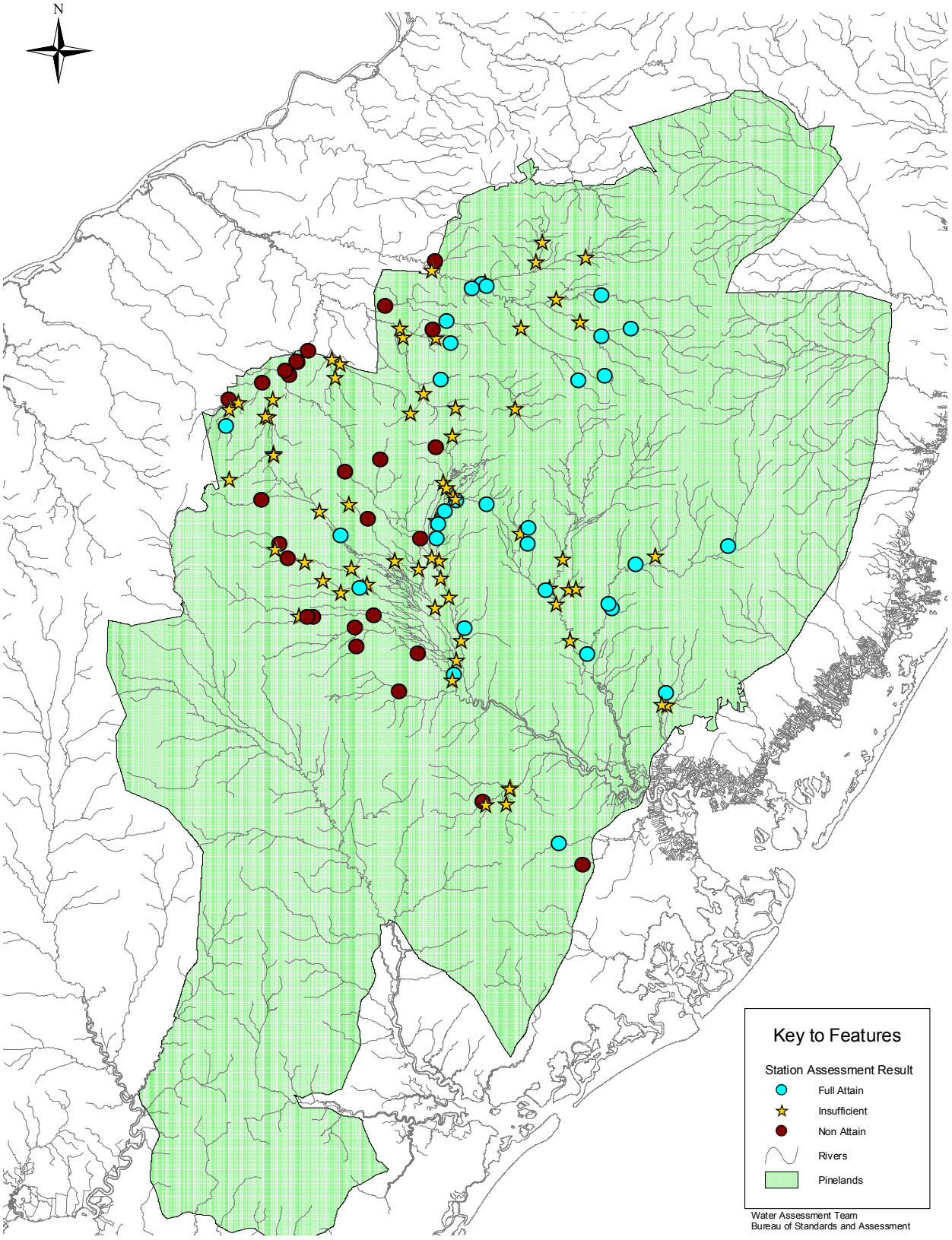
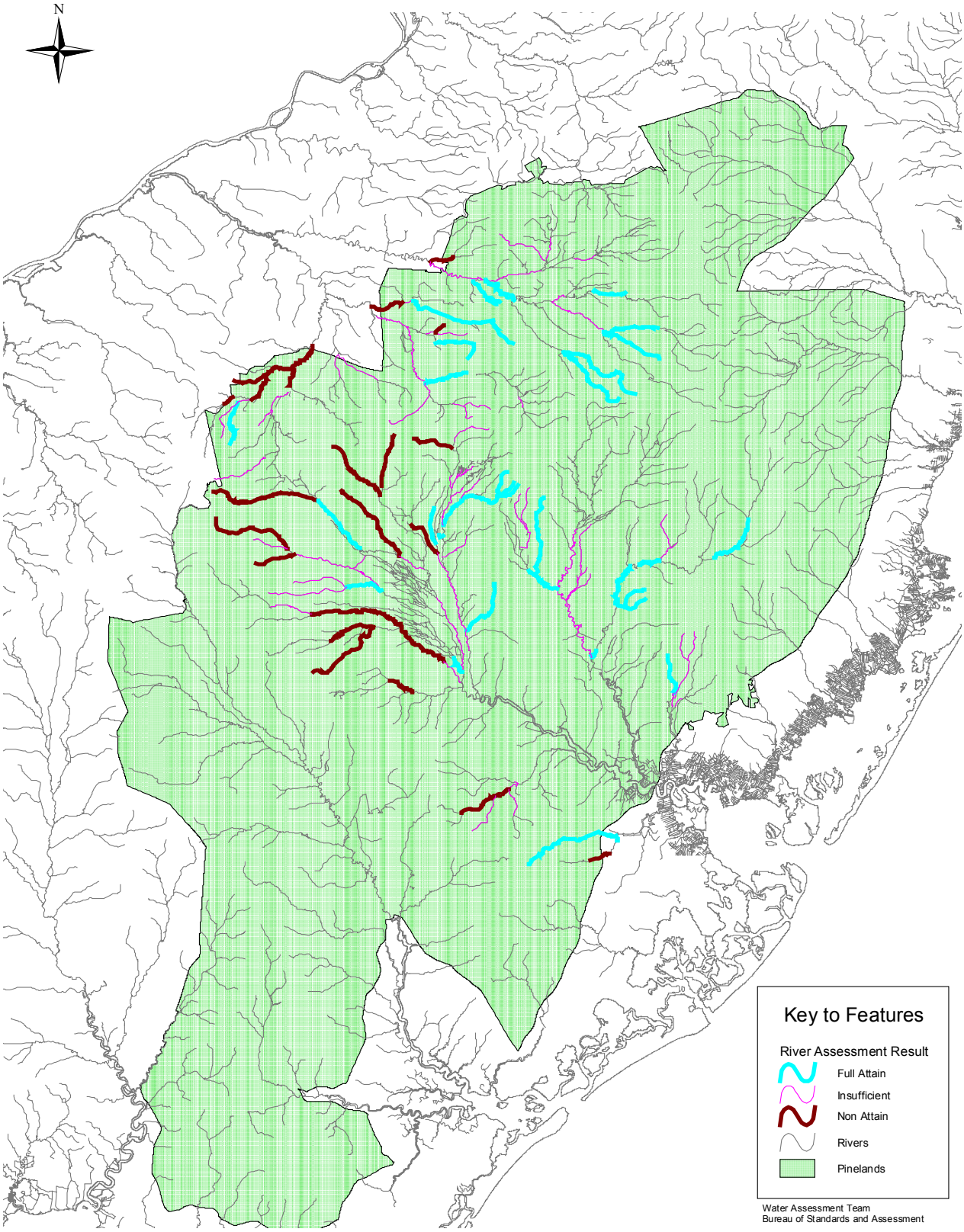


Figure 3.1a-2. Aquatic life Assessment Status for River Segments in the Pinelands



Comparison with AMNET Results from the early 1990's

Evaluating the second round of data against the first round of assessments is difficult due the large number of sites which have been assigned to sublist 3 (insufficient data) in the 2002 and 2004 Integrated List. The best comparison would be to enumerate the number of sites listed in the New Jersey 1998 303(d) list (representing Round I sampling) which have been delisted and moved to sublist 1 (sites now in full attainment). Of the 590 AMNET sites originally listed in 1998, sixty-nine were assessed in 2002 and 2004 as fully supporting the use and delisted (moved to sublist 1) (see Table 3.1a-3). Two hundred and fifty-six sites are still assessed as being in non-support and remain on sublist 5 of the 2002 and 2004 Lists.

Twenty-six sites listed on the 1998 List were found to be located at or beyond the head of tide and are not assessed in 2002 as the current assessment methods are inappropriate for tidal conditions. These locations are also delisted from the 303(d) List (sublist 5) and are regarded as "unassessed." Four sites from the 1998 List could not be located in the AMNET database and are assumed to represent transcription errors in the 1998 List.

Table 3.1a-3: 2002 and 2004 Assessment Status of Sites Previously Listed on NJ's 1998 303(d) List

Assessment Category in 2002	Number of Sites from the 1998 303(d) List
Full Support	69
Insufficient Data	235
Non-support	256
Not Assessed: Tidal Sites	26
Not Assessed*	4
Total Assessed	590

* Sites which could not be located in the AMNET database and are assumed to represent transcription errors in the 1998 List.

Other Indicators of Aquatic Life Use Attainment

As discussed in Chapter 2, dissolved oxygen (DO) and unionized ammonia are relevant to aquatic life uses: DO is required for most forms of aquatic life and unionized ammonia is toxic to aquatic life in elevated concentrations. Based on data collected between 1998 and 2002 in the Ambient Stream Monitoring Network (ASMN), with few exceptions, monitored rivers attain these SWQS criteria or have water quality better than required by the SWQS.

Fin Fish Index of Biotic Integrity (IBI).

The Department initiated a fish IBI monitoring program in the summer of 2000. This is a joint effort between the Bureau of Freshwater and Biological Monitoring and the Bureau of Freshwater Fisheries. An IBI is an index that measures the biological health of a stream by measuring multiple attributes of a fish assemblage similar to the way the macroinvertebrate populations are assessed by the Department. The fish IBI uses ten

individual metrics such as total number of species, number of intolerant species, number of tolerant species, etc. In contrast, five individual metrics are employed in the macroinvertebrate assessments. As of 2004, the Bureau of Freshwater and Biological monitoring has sampled 78 high gradient sites in northern New Jersey (above the fall line). These assessments have most recently provided important stream quality information to support the Department's upgrade of five stream segments in northern New Jersey to Category One (C1) protection. Concurrent to this northern New Jersey effort, the Bureau of Freshwater Fisheries is developing a fish IBI applicable to the low gradient streams of the lower Delaware Drainage so as to supplement the current methods applicable only to high gradient streams. A total of 97 stations in low gradient streams have been sampled since 2000.

The Bureau of Water Monitoring and Standards is currently meeting with fishery biologists to discuss how best to apply the IBI information in the Integrated Listing process. The fish IBI and the macroinvertebrate New Jersey Impairment Score (NJIS) differ significantly in spatial and temporal scale. These differences must be accounted for when combining these two assessments together, particularly when the assessments conflict. Fish assessments, for example, reflect broad watershed scale conditions while macroinvertebrate communities can reflect conditions that are much more local in character. The Department anticipates developing an assessment methodology that uses the results from the Fish IBI. The results of these discussions will be reflected in the 2006 Methods Document which will be used to prepare the 2006 Integrated List and Report.

Source and Cause Assessment

Extensive research has pointed to four general factors which have been associated with the impairment of benthic communities. These factors are:

- habitat alterations (e.g., erosion, sedimentation),
- flow alterations (decreasing base flow, flashiness),
- natural factors (drought, population fluctuations), and
- water and sediment quality degradation.

Often, multiple factors play a role in observed impairments such as multiple ongoing anthropogenic activities in concert with residual contamination from historical point and/ or non-point sources.

Using NJDEP data collected at over 700 sites, USGS evaluated the relationships between watershed characteristics and benthic status (USGS, 1998) and found the following:

- the total area of forest and wetlands in a basin were a good predictor of an unimpaired benthic community,
- the amount of urban land in close proximity to a sampling site was a good predictor of an impaired benthic community,
- distance from pollution sources to sampling sites was a significant factor.

Through the Long Island - New Jersey National Ambient Water Quality Assessment (LI-NJ NAWQA) program, an extensive data collection was conducted at 36 sites, primarily

in the Piedmont region of New Jersey (Kennen, 1999). Concentrations of conventionals, volatile organic contaminants, pesticides in water and sediment, fish, algae and benthic populations, and habitat quality data were collected. Advanced multi-variate statistics were used to identify factors that may contribute to benthic impairment. Results indicate that hydrologic instability (high and frequent peak flows and low base flows), substrate quality (low percent cobble in the substrate), the density and percent of impervious surface cover in the upstream watershed, and total annual flow of municipal effluent were important factors that contribute to benthic impairment.

Biological impairment in Pinelands waters appear to be related to anthropogenic disturbance through agriculture and suburban development within the region. Alterations in the biological condition have been associated with non-point sources of nutrients and other dissolved solids which in turn are associated with the percentage of developed land within a watershed (Zampella, R.A., et al. 2001, 2003, and Dow and Zampella, 2000.

Figure 3.1a-3. Assessment Status of Stations for Aquatic Life

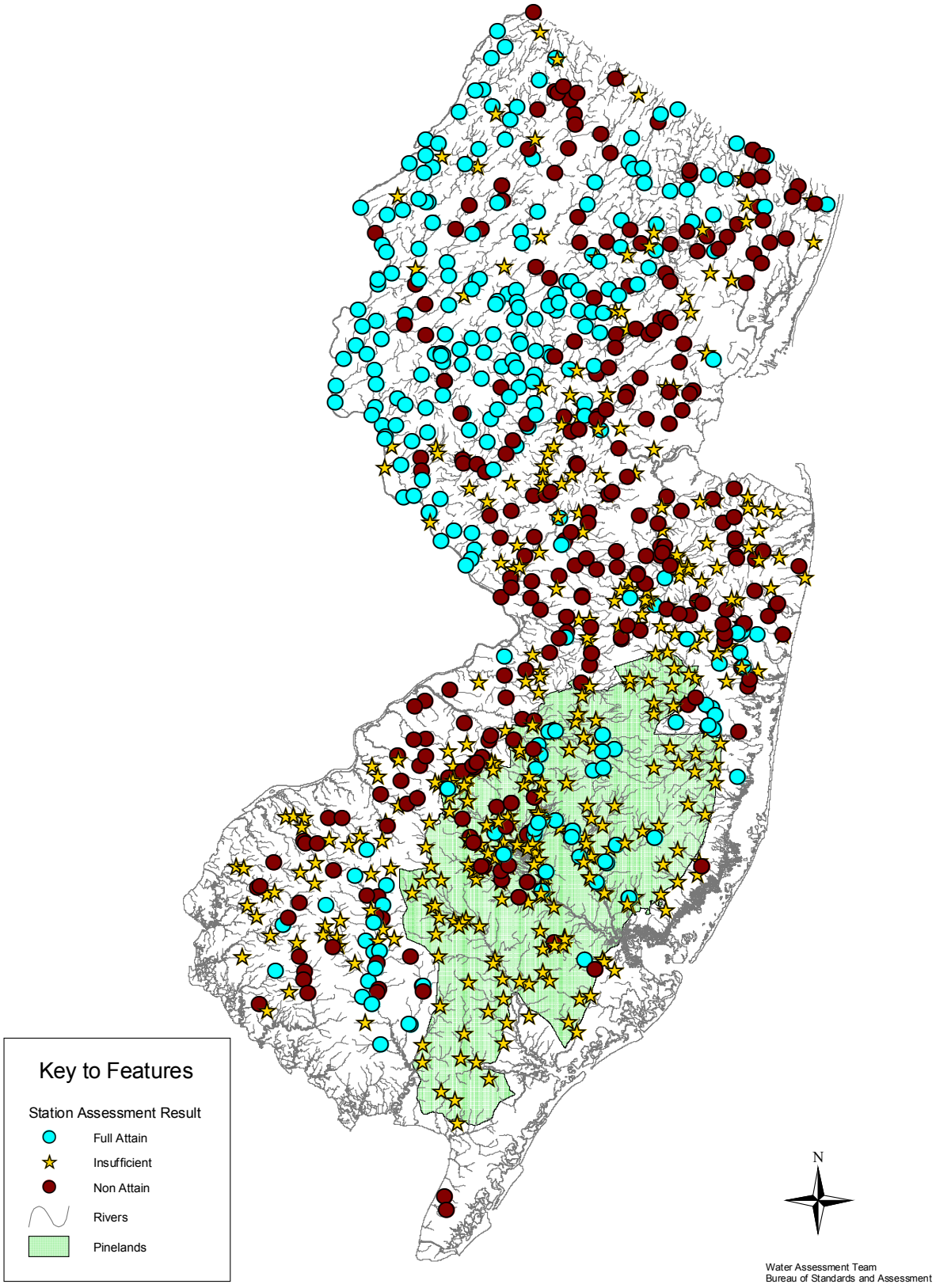
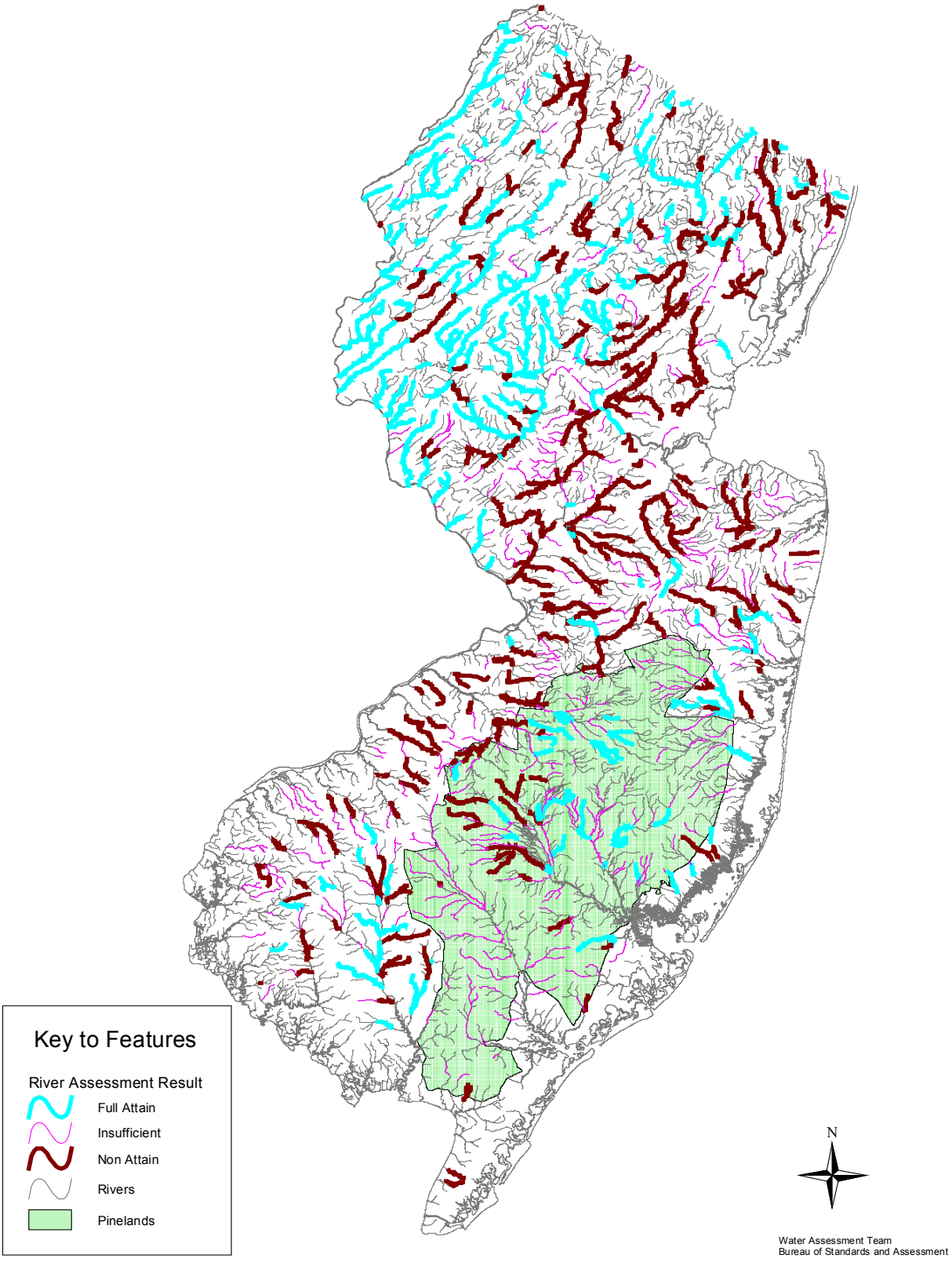


Figure 3.1a-4. Aquatic Life Assessment Status for River Segments. Includes monitored and estimated rivers.



Section 3.1b River and Stream Recreational Designated Use Assessment

All waters in New Jersey are designated for primary contact recreation (i.e., swimming) and secondary contact recreation (e.g., wading and boating). In order to protect human health, fecal coliform bacteria criteria were established in New Jersey Surface Water Quality Standards (SWQS). Fecal coliform bacteria levels in water provide an indication of pollution from human or animal fecal material and is an indicator organism that reveals the possible presence of pathogenic bacteria. Fecal coliform is usually not pathogenic, but pathogens are usually found in such minute concentrations that it is impracticable to monitor them.

High concentrations of fecal coliform are often associated with high suspended solid loads. Since bacteria is much more abundant on soils than in water, runoff from storm events can introduce high bacteria loads attached to the suspended solids washed into the streams. The concentration of bacteria is also increased by the sediment particles aiding the attached bacteria in escaping from invertebrate predators. In addition, the growth rate for bacteria is increased in high water temperatures as well as high nutrient levels. These factors help explain why fecal coliform concentrations are usually found higher during high flow than base flow and higher during the summer months than the winter months.

Some of New Jersey's rivers and streams, particularly those in the Pinelands, are used for swimming and secondary contact recreational activities, such as canoeing. Other rivers are not accessible or safe for these activities (e.g., steep banks, rapids, and private property). This assessment considers the sanitary quality of rivers and does not consider recreational beach amenities or access to the stream.

River and Stream Recreational Designated Use Assessment

Approximately 2,423 miles of rivers represented by 290 monitoring stations were assessed for recreational designated use attainment. Only 26% of the assessed sites were fully attaining and 74% did not meet the standards for recreational activity when excluding sites with insufficient data. The median fecal coliform geometric mean for all of the sites was 399 MPN/100 ml. As one of the first priorities for TMDL development, the Department has developed over 165 TMDLs for fecal coliform as of March 2003. See NJDEP Watershed Management website for a complete listing of TMDLs proposed by the Department and approved by EPA (http://www.nj.gov/dep/watershedmgt/tmdl.htm).

The assessment results for fecal coliform show that concentrations exceeded standards throughout the state. Impaired sites listed may be found in urban, agricultural, and forested areas. The only region in the state without widespread impairments was the Pinelands. However, even these waterways had impairments such as along Hospitality Branch, Hammonton Creek, and the lower stretch of the Great Egg Harbor River.

Results are summarized in Table 3.1b-1 below and for individual stations are provided in Figure 3.1b-1-and Table II-9 and Table II-14 in the Appendix. Table 3.1b-2 summarizes the stations that meet the recreational designated use standards.

Table 3.1b-1: Fecal Coliform Attainment Status

FC Status	Number of Stations	Percent of Stations	Number of Assessed River Miles		Percent of Assessed River Miles	
			Monitor	Estimate	Monitor	Estimate
Sub-List 1	72	25%	499	152	25%	34%
Sub-List 3	17	6%	127	36	6%	8%
Sub-List 4	165	57%	1,138	213	58%	48%
Sub-List 5	36	12%	211	47	11%	10%
Totals	290	100%	1,975	448	100%	100%

Table 3.1b-2: Fecal Coliform Stations Meeting SWQS

Station Name	Station Number	Number of Samples	Geomean
Doctors Creek at Route 539 in Upper Freehold	3	18	82.0
Assunpink Creek at Route 539 in Upper Freehold	4	18	49.5
Yellow Brook at Elton-Adelphia Rd in Howell	15	18	13.4
Gravelly Brook at Lloyd Rd in Marlboro	20	18	6.4
Mingomohone Brook at Belmar Blvd in Farmingdale	23	18	54.5
Shark River Brook at Shark River Station Rd in Tinton Falls	30	16	29.0
Mine Brook at Mercer Rd in Colts Neck	58	17	29.3
Echo Lake at Maxim-Southard Rd in Howell	67	18	40.5
Primrose Brook at Morristown National Park	01378780	25	169.6
Rockaway River at Boonton	01380500, 01380450, 6-SITE-11	13	
Crooked Brook near Towaco	01381050	5	44.1
Macopin River at Echo Lake	01382410	17	16.6
Pequannock River at Macopin Intake Dam	01382500, PQ8, 3-SITE-8, 3-PEQ-1	29	56.0
Wanaque River near Awosting	01383505	4	22.1
Wanaque River at Highland Avenue at Wanaque	01387010	5	112.0
Pompton River at Pompton Plains	01388500, 3-SITE-7	12	186.7
Spruce Run at Newport	01396550	24	49.1
Rocky Brook at Perrineville	01400585	10	71.8
Matchaponix Brook at Spotswood	01405302, EWQ0451	14	45.1
Jumping Brook at Green Grove	01407720	5	183.8
Shannoc Brook Trib at Colliers Mills	01408480	5	38.4
Jakes Branch at Dover Rd near Double Trouble	01408702	10	37.0
Cedar Brook at Cedar Crest	01408830	23	51.7
Forked River N Br near Forked River	01409050	5	62.0
Mullica River at Outlet Of Atsion Lake at Atsion	01409387, 14-MUL-2	18	59.9
Mullica River near Batsto	0140940050	23	18.8
Pump Branch near Waterford Works	01409408	5	20.0
Blue Anchor Brook at Elm	0140940950	23	18.8
Great Swamp Branch Below Rt 206 near Hammonton	0140941070	5	38.3
Skit Branch near Hampton Gate	01409435	8	27.5
Batsto River at Batsto	01409500, 14-BAT-1	20	17.9
Wading River W Br at Maxwell	01409815	18	116.8
Papoose Branch near Sim Place	01409960	5	22.2
Oswego River at Harrisville	01410000, 14-OSW-1	4	10.0
Bass River E Br near New Gretna	01410150, 14-EBR-1	18	56.5

Table 3.1b-2: Fecal Coliform Stations Meeting SWQS (cont.)

Station Name	Station Number	Number of Samples	Geomean
Absecon Creek S Br near Pomona	01410455	5	26.0
Great Egg Harbor River near Sicklerville	01410784, 15-GEH-1	13	18.9
Great Egg Harbor River near Blue Anchor	01410820		
Great Egg Harbor River at Folsom	01411000, 15-GEH-2	14	15.1
Hospitality Branch near Cecil	01411050	5	57.9
Babcock Creek near Mays Landing	01411196	5	106.4
South River near Belcoville	01411220	5	114.6
Gibson Creek at Rt 50 near Carbon	01411241	5	27.0
Tuckahoe River at head of river	01411300	5	20.0
Fishing Creek at Rio Grande	01411400	9	100.8
West Creek at Leesburg	01411444	19	85.8
Still Run at Little Mill Rd near Clayton	01411452	10	146.0
Still Run near Malaga	01411453	5	108.0
Indian Branch near Malaga	01411466	25	61.0
Gravelly Run at Laurel Lake	01411955	24	78.3
Pages Run at Newport	01412200	4	48.4
Cohansey River at Seeley	01412800, 17-COH-1	23	123.4
Barrett Run at Bridgeton	01413013	10	85.0
Canton Drain at Maskell Mill	01413065	5	10.0
Big Flat Brook at Tuttles Corner	01439830	5	20.9
Flat Brook near Flatbrookville	01440000, DRBC/NPS32	23	68.9
Dunnfield Creek at Dunnfield	01442760	25	20.0
Pequest River at Huntsville	01445000	4	186.9
Bear Creek at Dark Moon Rd	01445160	10	69.0
Assunpink Creek near Clarksville	01463620, 11-AS-2	14	57.0
Crosswicks Creek near New Egypt	01464420	10	132.0
Lahaway Creek At Rt 537 At Mercerville	01464440	5	17.4
Rancocas Creek S Br at VIncentown	01465850, 19-RA-3S	14	30.1
McDonalds Branch in Lebanon State Forest	01466500	15	21.3
Rancocas Creek N Br at Pemberton	01467000, 19-RA-3N	13	8.4
Big Timber Creek S Br at Turnersville	01467325	5	51.2
Delaware River Zone 1	1C2, 1D1, 1D2, 1D3, 1E4		
Van Campens Brook at Old Mine Rd Bridge	DRBC/NPS31	6	57.8
Shimers Brook	DRBC/NPS47	6	31.2
Lockatong Creek at Rosemont-Raven Rock Rd Bridge	DRBCNJ0013	29	54.8
Paulins Kill at Rt 46 Bridge near I-80	DRBCNJ0036	28	208.0
Little Flat Brook at Rt 615 in Sandyston	EWQ0005A, DRBC/NPS2251	5	145.6

It is noteworthy to mention that New Jersey proactively adopted EPA's guidance as the basis for New Jersey's SWQS criteria. Adoption of this guidance into states' SWQS was encouraged but not mandated. Some states may report comparatively higher attainment of recreational designated uses than New Jersey, however, this may be a function of less stringent SWQS criteria in that state.

Recreational Designated Use Source and Cause Assessment
It is important to consider the source of fecal coliform pollution since specific sources of fecal coliform pollution have not yet been identified. With compliance of permit limits for fecal coliform at wastewater treatment plants high and incidence of treatment plant failures low, it is suspected that most fecal coliform pollution in freshwater rivers and streams is derived from animal wastes.

Fecal coliform pollution is suspected to occur primarily from domestic pets, livestock and wild animal wastes which are transported to rivers and streams by municipal and industrial stormwater, overland runoff, and by direct contact with water. Although Canada Geese population data are not readily available, significant populations of these birds occur in and around many New Jersey waterways. In developed areas, domestic pet and bird wastes (e.g., pigeons) contribute to fecal coliform in stormwater. In agricultural areas, animal manure piles and access of livestock to streams can contribute to fecal coliform pollution.

In localized instances, fecal coliform pollution may be attributed to human wastes from combined sewer overflows, failing sanitary sewer infrastructure, failing or inappropriately located septic systems, and occasionally from wastewater treatment plant failures. Compliance with permit limits for fecal coliform at wastewater treatment plants is very high.

Combined sewer overflows (CSOs) are pipes that discharge combined sanitary and stormwater under wet weather conditions. In New Jersey, there are approximately 300 CSO discharge points located primarily in older cities in northeastern New Jersey, and in Trenton and Camden. Most CSOs discharge to tidal waters, except those located in Patterson. As first shown in the 2000 305(b) Report, levels of fecal coliform are higher downstream of the Patterson CSOs (i.e., at the Passaic River at Elmwood Park - station # 01389880) than upstream (i.e., Passaic River at Little Falls – station # 01389500). This assessment was conducted to support the CSO Program Memorandum of Agreement with EPA Region II.

Improving Stream Sanitary Quality
The following programs and activities are intended to improve the sanitary quality of New Jersey streams:

TMDL Development: Areas that exhibit contravention of SWQS, with respect to fecal coliform, will be evaluated as TMDLs are planned and developed. As of March 2003, 165 TMDLs have been developed by the Department and approved by EPA.

Source Identification: As TMDLs are developed, sources of fecal pollution will be identified. Sanitary surveys will be conducted to identify failing or inappropriately placed septic systems, cross-connections and interconnections between sanitary and storm sewer infrastructure, livestock waste, pets and wildlife, etc. Sanitary surveys were successfully used in the Whippany

River watershed to identify an area affected by failing septic systems. Sanitary surveys have been a significant component of source identification in New Jersey's coastal waters to protect shellfish beds and bathing beaches.

Source Management: As Municipal Stormwater Planning and Permitting programs are implemented, connections between sanitary and storm sewers will be corrected. NJDEP is working with the New Jersey Department of Agriculture to identify and map confined animal feeding operations to ensure proper management of these facilities. Through Watershed Management and TMDL development, geese management strategies, pet waste ordinances, and storm sewer and septic system maintenance will be developed. In addition, siting and as appropriate, removal will be explored and implemented on a watershed specific basis. The Environmental Infrastructure Trust's State Revolving Fund and Nonpoint Source Grants can provide low interest loans and grants to address sanitary water quality problems.

Evaluate Human Health Risk: Currently, most fecal coliform monitoring occurs at locations that are sampled as part of the ASMN. According to field sampling personnel, these locations are not widely used for swimming or boating in rivers. Through the Watershed Management process, the Department plans to identify river locations used for swimming and boating and explore cooperative monitoring at these locations. Fecal coliform data collected at locations used for swimming and boating will provide more relevant information regarding potential exposure to pathogens. Since exposure to human waste poses a greater health risk than exposure to animal waste, it may also be important to conduct additional testing to evaluate human and animal sources of pathogens. For example, using bacteriopahge assays may assist in distinguishing between both types of waste.

FIGURE 3.1b-1. **Recreational Designated Use Assessment Status of Stations.** Includes delisted sites and sites carried over from the 1998 303(d) List.

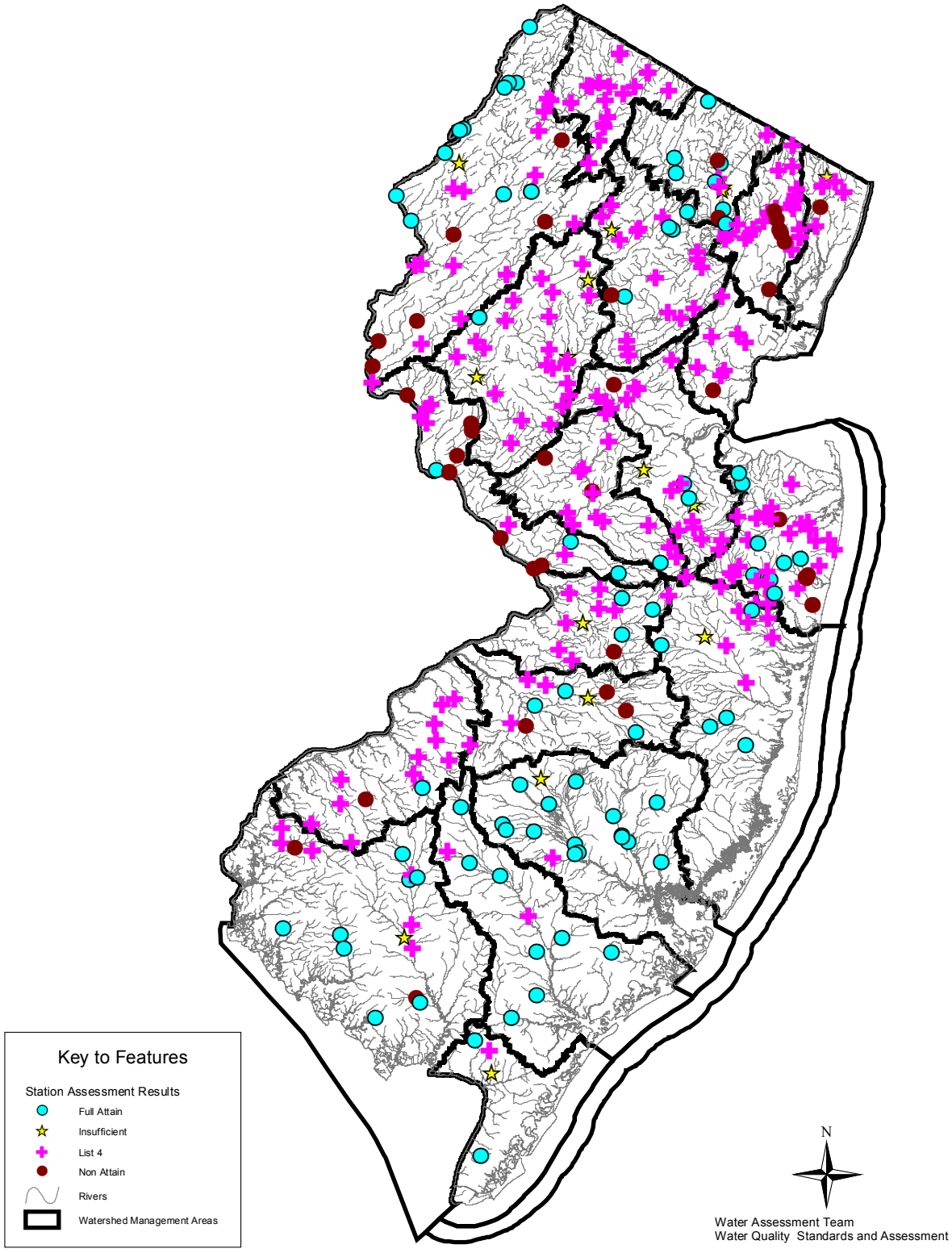
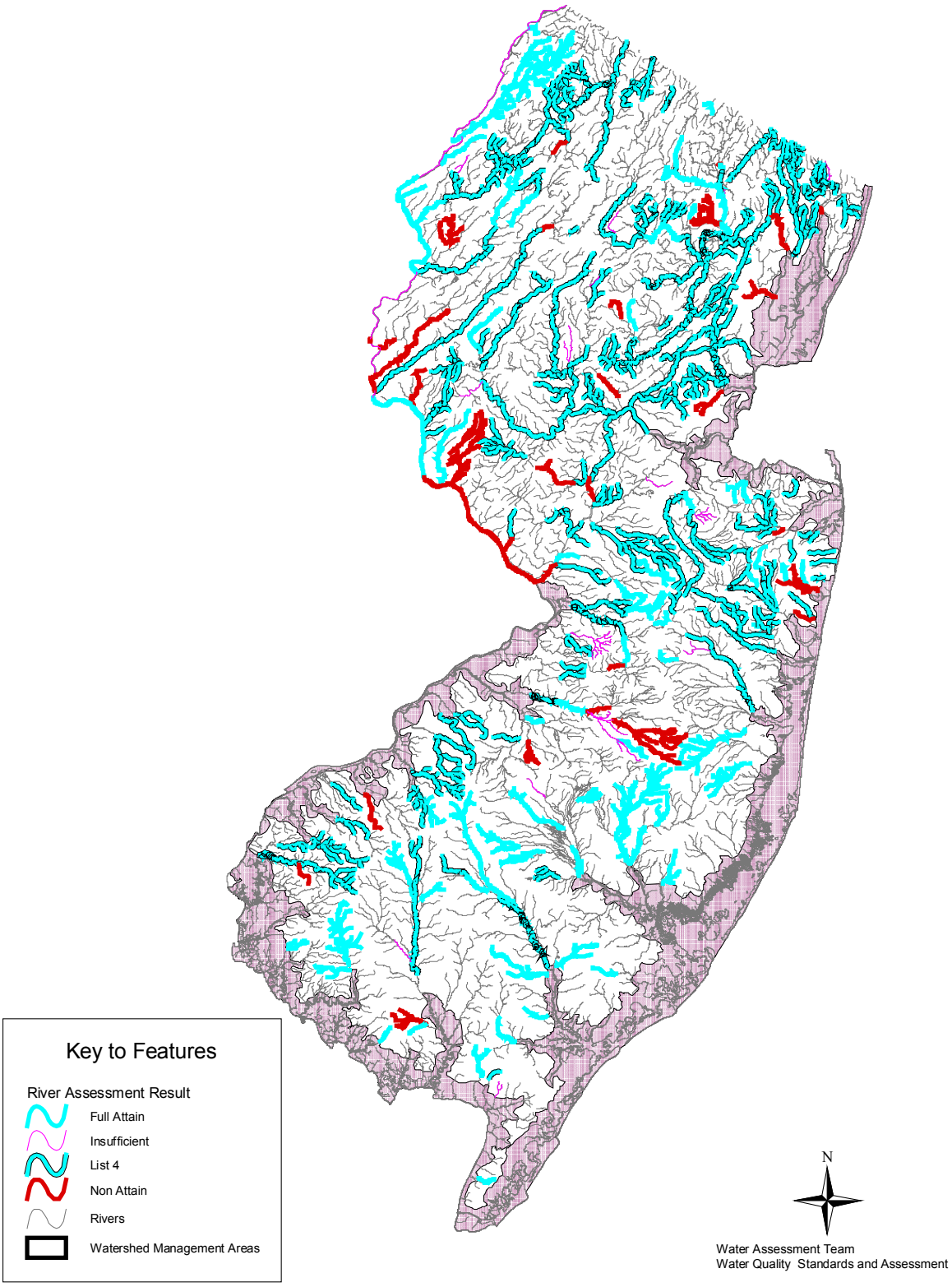


FIGURE 3.1b-2. **Recreational Designated Use Assessment Status of River Segments.** Includes monitored and estimated rivers.



Section 3.1c River and Stream Drinking Water Designated Use Assessment

All surface waters in New Jersey are designated as drinking water supplies under the state's Surface Water Quality Standards (SWQS). Currently, there are 54 potable surface water supply intakes in the state, mostly clustered in northern New Jersey with many of them located on reservoirs. (See Figure 3.4-1). These waters presently being used for public drinking water supplies are only a small portion of the total surface water in the state, however, all waters are evaluated for their potential to be drinking water supplies. This assessment provides an overview of finished drinking water quality, water quality in current source waters, and water quality in surface waters that are designated as potable supplies but are not currently used for that purpose.

Source Water Assessment Program (SWAP) Under SWAP, New Jersey will delineate areas which have the potential to influence waters (surface and ground) serving as public drinking water sources (NJDEP, 1998). Within these areas, the state will identify the origins of a wide range of contaminants and identify the vulnerability of the water systems to these contaminants. The SWAP will delineate waters requiring only conventional treatment (coagulation, sedimentation and filtration,) and those requiring additional treatment methods. The program will also delineate sources at risk in the future.

River and Stream Drinking Water Designated Use Assessment Results

Drinking Water Quality

Drinking water quality provided by water purveyors provides excellent information regarding the quality of finished drinking waters that are regulated for many constituents under Federal and State Safe Drinking Water Acts. In addition, New Jersey's Safe Drinking Water Act provides additional protection through the regulation of 28 constituents that are either not regulated under the Federal Safe Drinking Water Act or are regulated at lower concentrations in New Jersey.

Finished water from public water systems in this state is of high quality. The number of community water systems in New Jersey that have met all safety standards has remained consistently high - 99% (NJDEP, 2003).

Water Quality Indicators

Nitrate was chosen as one indicator of Drinking Water Designated Use Attainment because it is difficult and expensive to remove from potable supplies. To protect against adverse health effects, nitrate is regulated at 10 ppm in the Federal and State Safe Drinking Water Act regulations and New Jersey Surface Water Quality Standards (SWQS). The SWQS in the Pinelands was set at 2 ppm to protect the unique ecology of this area. The other primary indicator for drinking water are metals and toxics. The human health criteria for these compounds was used to indicate if water sources were potable. Additionally, information regarding supplemental treatment to remove chemicals in surface water supplies to protect human health was also included as an indicator.

Water Quality in Current Source Waters

Of the 54 surface water potable intakes in the state, only 17 had monitoring stations located nearby (see Figure 3.1c-3). For nitrate, average concentrations were significantly below the SWQS and drinking water MCL for nitrate. None of the stations had any exceedances of the criteria, and only one station, Passaic River at Little Falls, had any nitrate concentration even close to the criteria. It seems the only significant concern is the increasing trend for nitrate at several sites that may become an issue to the purveyors in the future. However, nine water intakes had issues with metals or toxics exceeding the human health criteria in the following rivers: Delaware River, Millstone/Raritan Rivers, Passaic River, Pompton River, Rahway River, South River, and Wallkill River.

Although arsenic and lead exceeded a human health criteria, the drinking water maximum contaminant level (MCL) were not exceeded except on the Wallkill River. The human health criteria for arsenic is 0.0178 ug/l and the drinking water MCL is 5 ug/l. The reason drinking water MCLs are higher than surface water quality standards for human health is that the drinking water MCLs incorporate economic, political, and social considerations when establishing standards. In addition, the lead MCL, 15 ug/l, is higher than the human health criteria which is calculated by using hardness levels in the water. The one site listed on the Pompton River did not exceed the MCL. This assessment does not incorporate the same considerations as drinking water MCLs, therefore the final assessment results for the above waters are not attaining drinking water designated uses.

For toxics, the Rahway River was listed as not attaining drinking water designated use because the Rahway Water Department has to treat their drinking water for TCE before distribution to customers. Benzene exceeded both the human health criteria and MCL on the Raritan River at Queens Bridge, and toxics in the Rockaway River and Delaware River were carried over from the 1998 303(d) List with no recent new data available. Results are summarized for the 17 monitoring stations located near potable supplies in Table 3.1c-1 below.

Table 3.1c-1: Water Quality Near 17 Public Surface Water Intakes

Public SW Intake	Site Number	Site Name	Metal/Toxic Exceeding HH	Maximum Metal/Toxic (ug/l)	Average NO_3	Maximum NO_3
NJ American WC	01379530	Canoe Brook near Summit	NA	NA	0.34	0.55
NJ American WC	Delaware River Zone 3	Delaware River Zone 3	PCB, PCE, 12-Dicloroethane	Carry over from 1998 303(d) List	NA	NA
US Army Fort Dix	01466900	Greenwood Branch at New Lisbon Rd	NA	NA	0.03	0.048
NJ American WC	01407760	Jumping Brook near Neptune	NA	NA	0.23	0.436
United Water	01405195	Matchaponix Brook at Englishtown	NA	NA	0.75	0.99
Elizabethtown WC	01402540, 10-MIL-3	Millstone River at Weston	Arsenic	Carry over from 1998 303(d) List	NA	NA
Passaic Valley WC	01379500, 6-SITE-1, 6-PAS-2	Passaic River near Chatham	Arsenic, Lead	4.1 (As), 8.2 (Pb)	1.22	3.10
NJ American WC	01389500, Passaic-11, Passaic-12, 4-SITE-6, 4-PAS-3	Passaic River at Little Falls	Arsenic	1.1	2.74	7.90
Passaic Valley WC	01388500, 3-SITE-7	Pompton River at Pompton Plains	Lead	5.5	0.90	2.29

Table 3.1c-1: Water Quality Near 17 Public Surface Water Intakes (cont.)

Public SW Intake	Site Number	Site Name	Metal/Toxic Exceeding HH	Maximum Metal/Toxic (ug/l)	Average NO_3	Maximum NO_3
Jersey City WD	01380500	Rockaway River at Boonton	PCE, TCE	Carry over from 1998 303(d) List	0.40	0.76
Orange WD	01393960	WB Rahway River at Northfield Ave. at West Orange	NA	NA	0.89	1.74
Rahway WD	01395000, 7-RAH-1	Rahway River at Rahway	Arsenic, TCE	2 (As)	1.27	2.02
Elizabethtown WC	01400500	Raritan River at Manville	NA	NA	1.27	2.30
Elizabethtown WC	01403300	Raritan River at Queens Bridge	Benzene	1.58	2.00	3.85
NJ American WC	01407750, EWQ0482	Shark River near Neptune	NA	NA	0.26	0.73
Sayreville Water Department	South River	South River	Arsenic	Carry over from 1998 303(d) List	NA	NA
Franklin PWW	01367715, Wallkill D, 2-WAL-2	Wallkill River at Scott Rd. at Franklin	Arsenic	6.0	0.34	0.57

Water quality in surface waters that may be used as drinking water sources
Nitrate levels throughout the state are well below the criteria for drinking water designated uses. The average concentrations of sites sampled for nitrate throughout the state is 0.95 mg/l. Only 4 waterbodies exceeded the standards for nitrate: Dead River, Great Swamp Branch, Hammonton Creek, and Matchopnoix Brook (see Table 3.1c-3). Both sites in the Pinelands, Hammonton Creek and Great Swamp Branch, exceed the Pinelands criteria of 2 mg/l which is not exceeding the drinking water standard of 10 mg/l. Dead River, Hammonton Creek, and Matchaponix Brook have at least one wastewater treatment plant upstream that may be impacting these sites. Further investigations into sources impacting these rivers will be conducted in the future.

Several sites that fully attained standards did have elevated nitrate concentrations as seen in Table 3.1c-4. The data shows the watershed of highest concern is the Passaic River Basin where nitrate is elevated along a large portion of its waterways. The nitrate data correlates with the total phosphorus data in showing elevated nutrient levels throughout the basin. Currently, the Department is studying the Passaic River Basin and will establish TMDLs in the near future.

A total of 60 stations representing 396 river miles did not meet the criteria for drinking water designated uses due to exceedances of metal criteria (see table 3.1c-5). All of the stations that exceeded the criteria for arsenic exceeded the human health criteria. The exceedance of the human health criteria for arsenic occurred at 54 stations representing 356 river miles. In addition, 8 stations representing 81 river miles exceeded the human health criteria for lead. Exceedances of the human health criteria for both metals occurred throughout the state.

Results of the nitrate assessment are summarized below in Table 3,1c-2. Results for individual stations are depicted in Figure 3.1c-1, Table II-7 and Table II-13 in the Appendix.

Table 3.1c-2: Nitrate Status (tidal and nontidal rivers)

Nitrate Status	Number of Stations	Percent of Stations	Number of Assessed River Miles		Percent of Assessed River Miles	
			Monitor	Estimate	Monitor	Estimate
Sub-List 1	299	94%	1,853	477	94%	97%
Sub-List 3	16	5%	93	2	5%	<1%
Sub-List 4	0	0%	0	0	0	0%
Sub-List 5	4	1%	29	14	1%	3%
Totals	319	100%	1,975	493	100%	100%

Table 3.1c-3: Nitrate Sites Exceeding SWQS

Station Number	Station Name	Number of Samples	Percent Exceed	Exceedance Status
01379200	Dead River near Millington	24	13%	Drinking Water Criteria
0140941070	Great Swamp Branch below Rt. 206 near Hammonton	23	57%	Pineland Criteria
01409416	Hammonton Creek at Westcoatville	20	15%	Pineland Criteria
01405302, EWQ0451	Matchaponix Brook at Spotswood	7	57%	Drinking Water Criteria

Table 3.1c-4: Nitrate Sites With Elevated Samples or Median Concentrations

Station Number	Station Name	Number of Samples	Maximum Nitrate	Median Nitrate
01464020, 01464000, DRBCNJ1338	Assunpink Creek at Peace Street at Trenton	20	9.77	4.69
01412800	Cohansey River at Seeley	20	6.19	4.80
EWQ0454	Deep Run at Rt 516 in Old Bridge	7	11.9	8.29
01409402	Hays Mill Creek near Chesilhurst (Pinelands)	21	1.60	1.07
01411035	Hospitality Branch at Blue Bell Road near Cecil (Pinelands)	12	1.80	1.21
01401400	Heathcote Brook at Kingston	20	7.9	2.74
01465847	Jade Run at Rt 206 in Vincentown	8	8.32	6.48
EWQ0005A, DRBC/NPS2251	Little Flat Brook at Rt 615 in Sandyston	8	43.7	6.22
01400640	Millstone River near Grovers Mills	16	6.00	4.03
01377499	Musquapsink Brook at River Vale	8	7.60	2.15
01477440	Oldmans Creek at Jessups Mill	4	5.25	4.45
EWQ0231	Passaic River at Eagle Rock Ave in East Hanover	8	8.26	4.32
01389500, Passaic-11, Passaic-12,	Passaic River at Little Falls	26	7.90	2.20
01382000	Passaic River at Two Bridges	31	6.60	2.39
01367909, 01367910	Papakating Creek at Sussex	8	39.5	5.55
01467081	SB Pennsauken Creek at Cherry Hill	15	13.02	2.59
01401700	Pike Run near Rocky Hill	20	5.9	3.20

Table 3.1c-4: Nitrate Sites With Elevated Samples or Median Concentrations (cont.)

Station Number	Station Name	Number of Samples	Maximum Nitrate	Median Nitrate
01381200	Rockaway River at Pine Brook	24	13	4.99
01391500, 01391200, 01391490, 01391550, Passaic-7	Saddle River at Lodi	20	9.28	5.50
01411441	Savages Run in Belleplain State Forest (Pinelands)	4	1.60	1.40
01367770	Wallkill River near Sussex	20	9.00	1.97
01367735	Wallkill River at Rt 23 in Hamburg	8	39.4	5.19
01381800	Whippany River near Pine Brook	8	6.24	2.18

Table 3.1c-5: Stations with Metals Exceeding the Human Health Criteria

Station Number	Station Name	Metal	Station Number	Station Name	Metal
20-AS-1	Assicunk Creek, Cedar Lane, Springfield	Arsenic	4-SITE-4; 4-PAS-4	Passaic River at Singac	Arsenic
11-AS-4	Assunpink Creek at Route 535, Edinburg	Arsenic	1-PAU-1	Paulins Kill on Route 626 in Balesville	Arsenic
11-AS-2	Assunpink Creek near Clarksville	Arsenic	Pennsauken Creek, Mainstem	Pennsauken Creek	Arsenic
11-AS-3	Assunpink Creek on Peace St., Trenton	Arsenic, Lead	18-PE-1, 18-PE-2	Pennsauken Creek N Br near Morrestown	Arsenic
10-BED-2; 10-BED-3	Bedens Brook on Rte 206, Rocky Hill	Arsenic	18-PE-3	South Br Pennsauken Creek, Greentree Rd, Cherry Hi	Arsenic
01378855	Black Brook at Madison	Arsenic	1-PEQ-3	Pequest River on Water St in Belvidere	Arsenic
01467150, 18-CO-4	Cooper River at Haddenfield	Arsenic, Lead	3-SITE-8; 3-PEQ-1	Pequannock River at Macopin Intake Dam	Lead
18-CO-1	Cooper River at Rte 130, Camden	Arsenic	3-SITE-7	Pompton River at Pompton Plains	Lead
18-CO-2	North Br Cooper R, Kresson Rd, Kresson	Arsenic	01403300	Raritan River at Queens Bridge	Arsenic
01447000	Delaware River at Easton	Arsenic	8-SB-3	S Br Raritan River on Stanton Station Rd @ Stanton	Arsenic
Delaware River Zone 3, Reach 02040202-035	Delaware River Zone 3	Arsenic	8-SB-6	S Br Raritan River on Studdiford Dr - South Branch	Arsenic
5-DOR-1	Dorotockys Run on Old Tappan Rd, Old Tappan	Arsenic	19-RA-1N	Rancocas Creek N Br at Hanover Furnace	Lead
5-HAC-2	Hackensack River on Old Tappan Rd., Rivervale	Arsenic	19-RA-3N	Rancocas Creek N Br at Pemberton	Lead
5-HAC-3	Hackensack River on Westwood Ave., Rivervale	Arsenic	19-RA-4N	North Br Rancocas Creek, off Pine St, Mt. Holly	Arsenic

Table 3.1c-5: Stations with Metals Exceeding the Human Health Criteria (cont.)

Station Number	Station Name	Metal	Station Number	Station Name	Metal
14-HAM-2, 14-HAM-1	Hammonton Creek at Westcoatville	Arsenic	19-RA-1S	South Br Rancocas Creek, Rte 38, Hainsport	Arsenic
17-HUD-1	Hudson Branch @ Vineland	Arsenic	19-RA-2S	South West Br Rancocas Creek, Rte 70, Medford	Arsenic
9-LAW-1	Lawrence Brook on Davidson's Mill Rd, Black Horse	Arsenic	7-ROB-1	Robinson's Br. @ Central Ave, Rahway	Arsenic
01411500	Maurice River at Norma	Arsenic	6-SITE-11	Rockaway River at Boonton	Arsenic
17-MAU-1	Maurice River nr Millville	Arsenic	01400585	Rocky Brook at Perrineville	Arsenic
10-MIL-3	Millstone River above Raritan River confl. in Manv	Arsenic	10-ROC-1	Rocky Brook on Rte 33 in Hightstown	Arsenic
01400650	Millstone River at Grovers Mills	Arsenic	4-SITE-12, 4-SITE-13; 4-SAD-1	Saddle River at Lodi	Arsenic
10-MIL-7	Millstone River off Rte 1, Plainsboro	Arsenic	10-STO-1; 10-STO-4	Stony Brook on Rte 206, Princeton	Arsenic
10-MIL-2	Millstone River off Rte 27 in Kingston	Arsenic	5-TEN-2	Tenakill Brook on Cedar Lane, Closter	Arsenic
10-MIL-1	Millstone River on Baird Rd, Millstone Twp.	Arsenic	13-TOM-1	Toms River near Toms River	Lead
10-MIL-5, 10-MIL-6	Millstone River at Blackwells Mills	Arsenic	2-WAL-3	Wallkill River on Ames Blvd (Rte 94), Hamburg	Arsenic
1-MUS-3	Musconetcong River on Kings Hwy in Beattystown	Arsenic	2-WAL-5	Wallkill River on Bassets & Owen Sta. Rds. Nr Owen	Arsenic
01377499	Musquapsink Brook at Rivervale	Arsenic	2-WAL-4	Wallkill River on Glenwood Rd off Rte 23 nr Martin	Arsenic
2-PAP-1	Papakating Creek on Rte 23 nr Lower Unionville Rd	Arsenic	2-WAL-1	Wallkill River on Maple St nr Police Sta. nr Frank	Arsenic
5-PAS-1	Pascack Brook on Harrington Ave., Westwood	Arsenic	6-WHI-2	Whippany River near Pine Brook	Lead
4-SITE-5	Passaic River at Elmwood Park	Arsenic	Delaware River	Delaware River Zone 2	PCB, PCE, 12-Dichlorothane
6-SITE-2; 6-PAS-1	Passaic River nr Millington	Arsenic			
6-SITE-3	Passaic at Two Bridges	Arsenic			

Overall, results show 496 river miles, combining both nontidal and tidal river miles (18% of assessed rivers) do not meet drinking water uses in rivers in the state designated as either a current or possible drinking water source. The majority of the rivers do not meet the criteria for either a metal or toxic. Of the 496 miles not supporting the use, 461 miles are due to a metal or toxic exceedance. The only rivers to exceed drinking water criteria for nitrate were Dead River and Matchaponix Brook. The remaining stations that do not support drinking water use include: 56 stations exceeding an arsenic criteria, 7 stations exceeding a lead criteria, 3 stations exceeding an arsenic and lead criteria, and 4 stations exceeding a toxic criteria. It should be noted that of the 60 stations not supporting drinking water uses because of arsenic, only 4 stations representing 14 miles actually exceeded a drinking water MCL. The sites with higher concentrations than the MCL include two sites on the Wallkill River at Franklin and two sites on the Maurice River at Norma and Millville. Rivers not meeting the criteria for lead had three sites representing 13 miles exceeding the MCL and included: Assunpink Creek at Trenton, Pequannock River at Macopin Dam, and North Branch Rancocas Creek at Hanover Furnace.

Table 3.1c-6: Drinking Water Designated Use Status (Nontidal and Tidal Rivers Combined)

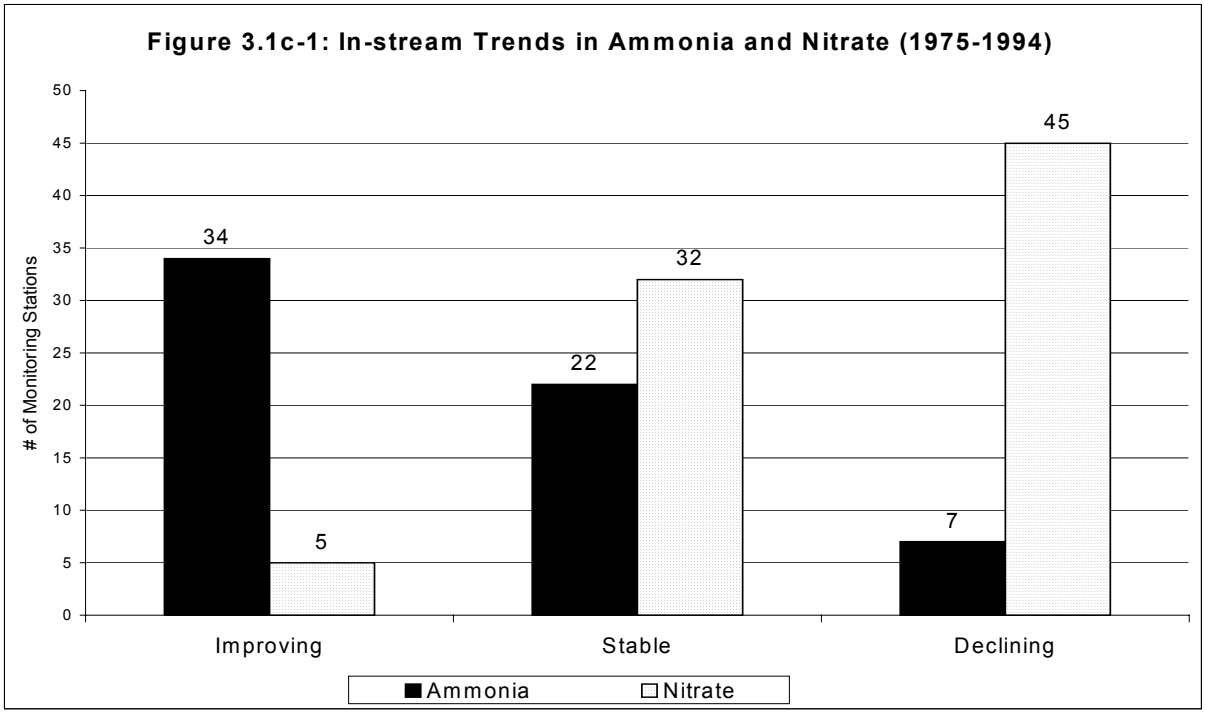
Overall Status	Number of Stations	Percent of Stations	Number of Assessed River Miles		Percent of Assessed River Miles	
			Monitor	Estimate	Monitor	Estimate
Sublist 1	284	75%	1,686	493	74%	97%
Sublist 3	18	5%	108	2	5%	<1%
Sublist 4	0	0%	0	0	0	0%
Sublist 5	73	20%	482	14	21%	3%
Totals	375	100%	1,876	509	100%	100%

Drinking Water Designated Use Source and Cause Assessment

Both point and nonpoint sources contribute to rising levels of nitrate. Point sources contribute nitrate through secondary treated effluent while nonpoint sources primarily contribute through the application of fertilizers to lawns and farms, animal waste, failing septics, and atmospheric deposition.

Point Source Assessment: Upgrades of wastewater treatment plants to secondary treatment resulted in statewide compliance with unionized ammonia, which is toxic to aquatic life and elevated in primary treated sewage. However, secondary treated sewage contains elevated nitrate, as a result of converting the toxic unionized ammonia to nitrate. A comparison of trends in total ammonia and nitrate between 1975 and 1994 using data from the Department's ambient monitoring network illustrates the transition to secondary treatment.

During this time period, concentrations of unionized ammonia decreased at 34 stations (54%), while concentrations of nitrate increased at 47 stations (55%). See Figure 3.1c-1 below.



Nonpoint Source Assessment: Nitrates have been applied to land surfaces as fertilizers for agricultural purposes and lawns. Low concentrations of nitrate also arise from forests. Nitrates that are not used by plants (crops or lawns) travel through the soil to surficial aquifers, deeper ground water and streams. In the sandy NJ coastal plain, these fate and transport processes are well understood and can be modeled. Predictive modeling provides a useful tool when estimating future surface and ground water quality under various management scenarios.

Strategies to Protect Potable Supplies: **Nitrate**

The status and trends in nitrate concentrations will continue to be examined in detail in the Safe Drinking Water Program. In addition, sources of nitrate that may affect potable supplies will be identified and targeted for management in the Source Water Assessment Program.

See Metals in Section 2.1b for description and source and cause assessments for metals and toxics.

FIGURE 3.1c-2. Drinking Water Assessment Status by Stations.

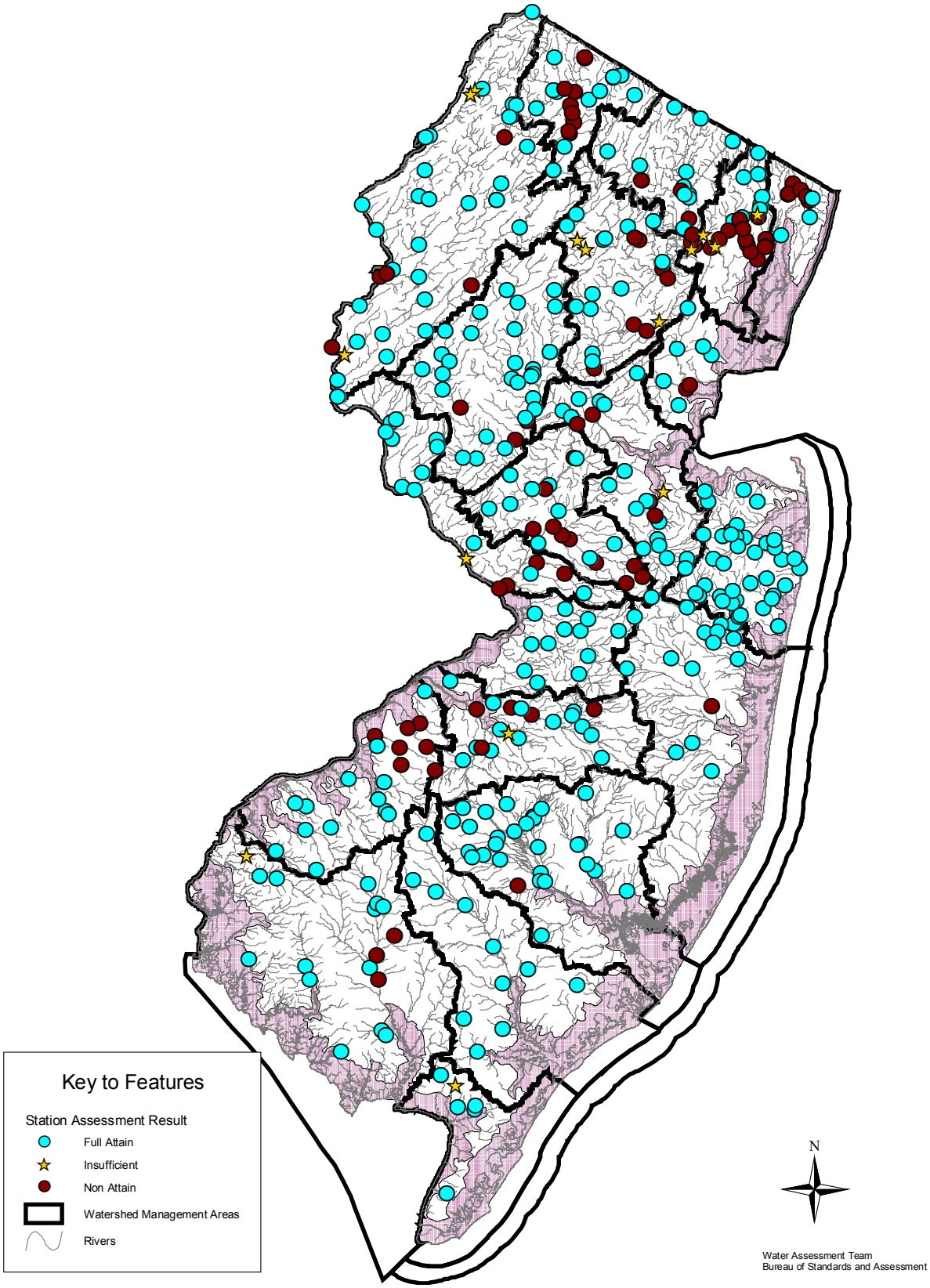


FIGURE 3.1c-3. Drinking Water Assessment Status for River Segments. Includes monitored and estimated rivers.

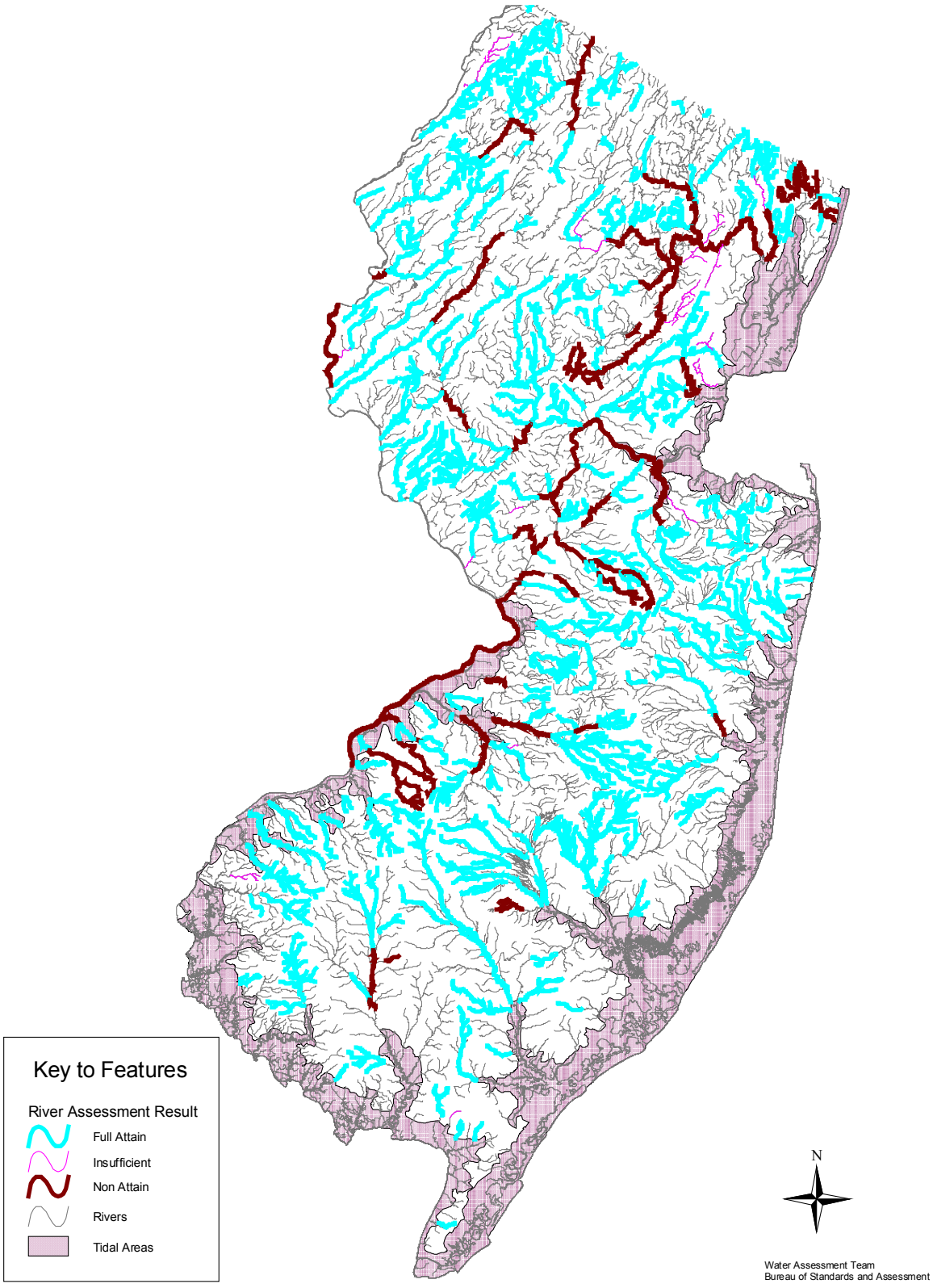
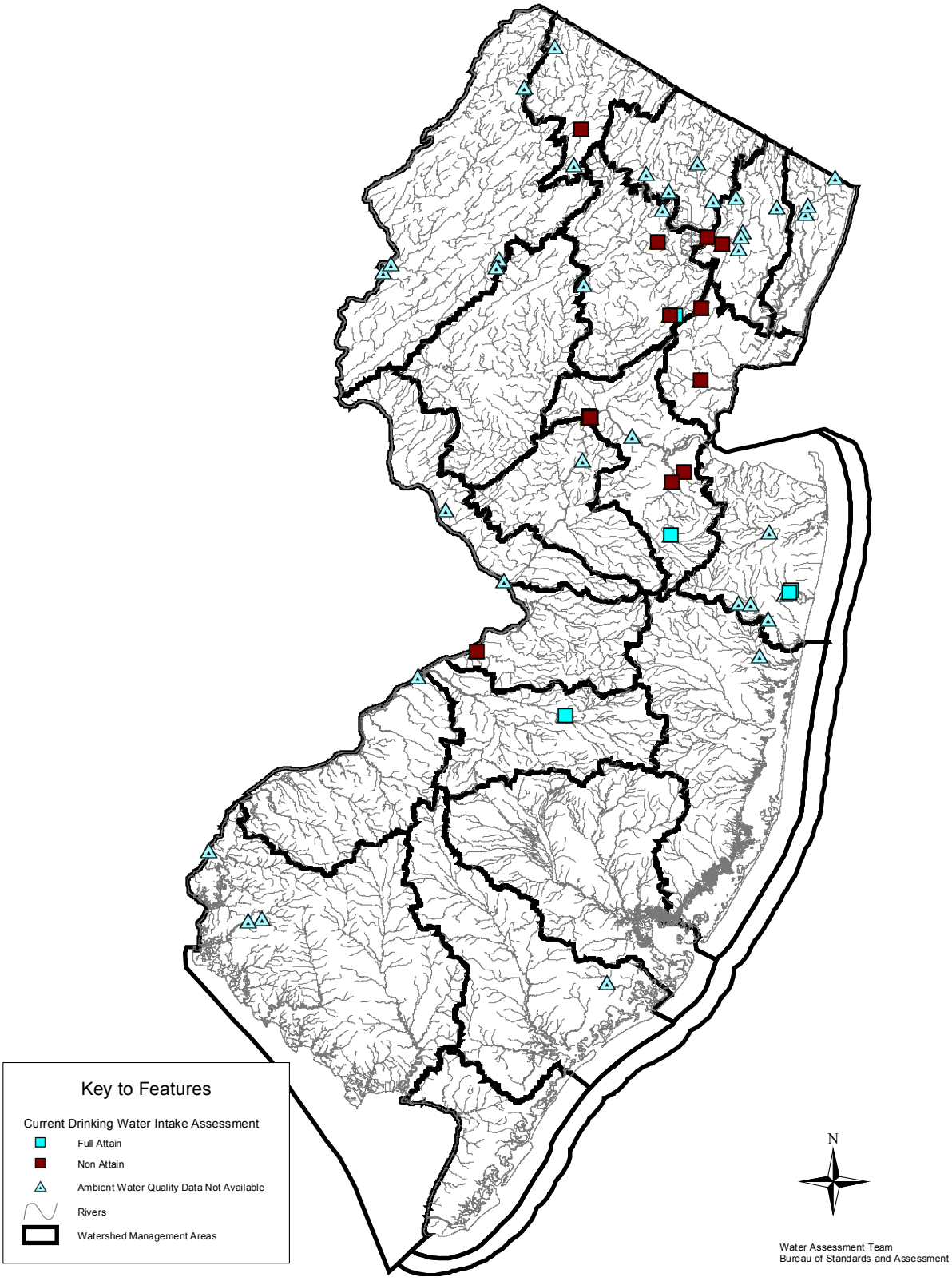


FIGURE 3.1c-4. Potable Surface Water Supply Intakes.



Section 3.1d River and Stream Agricultural Designated Use Assessment

River and Stream Agricultural Designated Use Assessment Results

At the present time, New Jersey's SWQS do not address agricultural designated use. Although designated uses such as human health, ecosystem protection, drinking water supply, and fishing have standards established that are applicable to agriculture, the water-quality standards suitable for agriculture are normally higher, precluding the need for criteria specific to agricultural uses. To evaluate water supplies that support agriculture in New Jersey, total dissolved solids (TDS) and salinity were selected as the determining parameters. For this report, only TDS was used as the standard since salinity data was not available for the waterways in this assessment. Currently, the SWQS for total dissolved solids is 500 mg/l, however, criteria for TDS applied to agricultural use is 2,000 mg/l. The criteria of 500 mg/l was established for aquatic life protection and secondary drinking water standards.

Assessment results for TDS indicate five sites exceeding the criteria, however, none of these sites had maximum values exceeding the criteria applicable to agricultural designated use. There are no confirmed waterways that do not support agricultural designated uses. A summary of agricultural designated use assessment results are summarized in Table 3.1d-1 below.

Table 3.1d-1: Agricultural Designated Use Status (Nontidal and Tidal Rivers Combined)

TDS Status for Agricultural Use	Number of Stations	Percent of Stations	Number of Assessed River Miles		Percent of Assessed River Miles	
			Monitor	Estimate	Monitor	Estimate
Sublist 1	278	90%	1,889	462	89%	94%
Sublist 3	32	10%	247	32	11%	6%
Sublist 4	0	0%	0	0	0%	0%
Sublist 5	0	0%	0	0	0%	0%
Totals	310	100%	2,136	494	100%	100%

Section 3.1e River and Stream Industrial Designated Use Assessment

The industrial designated use assessment evaluates attainment of the Surface Water Quality Standards (SWQS) for the protection of waters used for processing or cooling. The methodology incorporates pH and total suspended solids (TSS) as the determining parameters if a waterbody is suitable for industrial use. These indicators were selected to protect equipment and piping from corrosion caused by low pH levels or blocking and impeding the equipment from sediments. Because these standards are protective of the most sensitive use, protecting aquatic life, the SWQS should ensure protection of the waterbody for industrial water supply. However, water quality needs of industry vary significantly and exceeding the standards may not necessarily indicate the source waters are unsuitable for the industries in that particular location.

River and Stream Industrial Designated Use Assessment Results

A summary of pH and TSS assessments are shown in Tables 3.1e-1 and 3.1e-2, respectively. For pH, waters originally listed as impaired due to high pH levels, greater than 8.5, are considered meeting the industrial designated uses. It is the corrosive effect of low pH levels that make waters unsuitable for industrial use. In addition, Pinelands waters were not included in the assessment since such waters are not designated as supporting industrial uses. A total of 292 stations representing 2,324 river miles were assessed for industrial designated uses. The assessment included nontidal as well as FW-2 tidal waters. Although the results indicates 499 river miles (21% of assessed rivers) do not meet the criteria for pH or TSS, there are no areas in the state where a water supply is confirmed to be unsuitable for industrial use. Of the impaired pH and TSS sites, only five sites did not meet the criteria for both parameters, Neshanic River at Reaville, Millstone River near Manalapan, Mingamahone Brook Near Earle, Pequest River at Pequest, and Stony Brook at Princeton. The conditions at these sites are most susceptible to not meeting industrial designated uses since both parameters were exceeded. A summary of industrial designated uses is in Table 3.1e-3.

Table 3.1e-1: pH Status (tidal and nontidal rivers)

pH Status	Number of Stations	Percent of Stations	Number of Assessed River Miles		Percent of Assessed River Miles	
			Monitor	Estimate	Monitor	Estimate
Sublist 1	174	55%	1,279	289	65%	84%
Sublist 3	66	21%	373	11	19%	3%
Sublist 4	0	0%	0	0	0%	0%
Sublist 5	77	24%	322	46	16%	13%
Totals	317	100%	1,974	346	100%	100%

Table 3.1e-2: Total Suspended Solids Status (tidal and nontidal rivers)

TSS Status	Number of Stations	Percent of Stations	Number of Assessed River Miles		Percent of Assessed River Miles	
			Monitor	Estimate	Monitor	Estimate
Sublist 1	189	68%	1,269	276	73%	76%
Sublist 3	77	27%	345	31	20%	16%
Sublist 4	0	0%	0	0	0%	0%
Sublist 5	14	5%	128	34	7%	8%
Totals	280	100%	1,742	449	100%	100%

Table 3.1e-3: Industrial Designated Use Status (Nontidal and Tidal Rivers Combined)

	Number of Stations	Percent of Stations	Number of Assessed River Miles		Percent of Assessed River Miles	
			Monitor	Estimate	Monitor	Estimate
Sublist 1	184	63%	1,298	268	66%	75%
Sublist 3	47	16%	258	0	13%	0%
Sublist 4	0	0%	0	0	0%	0%
Sublist 5	61	21%	421	78	21%	25%
Totals	292	100%	1,977	346	100%	100%

Maintaining and Improving Industrial Use Assessment

Clarify needed water quality: The use of pH and TSS assessments to determine the suitability of industrial source waters represents the Department's first attempt to assess industrial uses. As discussed previously, needs of industrial water users may vary significantly. In addition. ambient water monitoring networks are not designed to assess water quality at industrial intakes. Industrial users may have additional data regarding water quality and use attainment relevant to their intakes. Comments from industrial users are sought to improve this assessment.

FIGURE 3.1e-1. Industrial Designated Use Assessment Status of Stations.

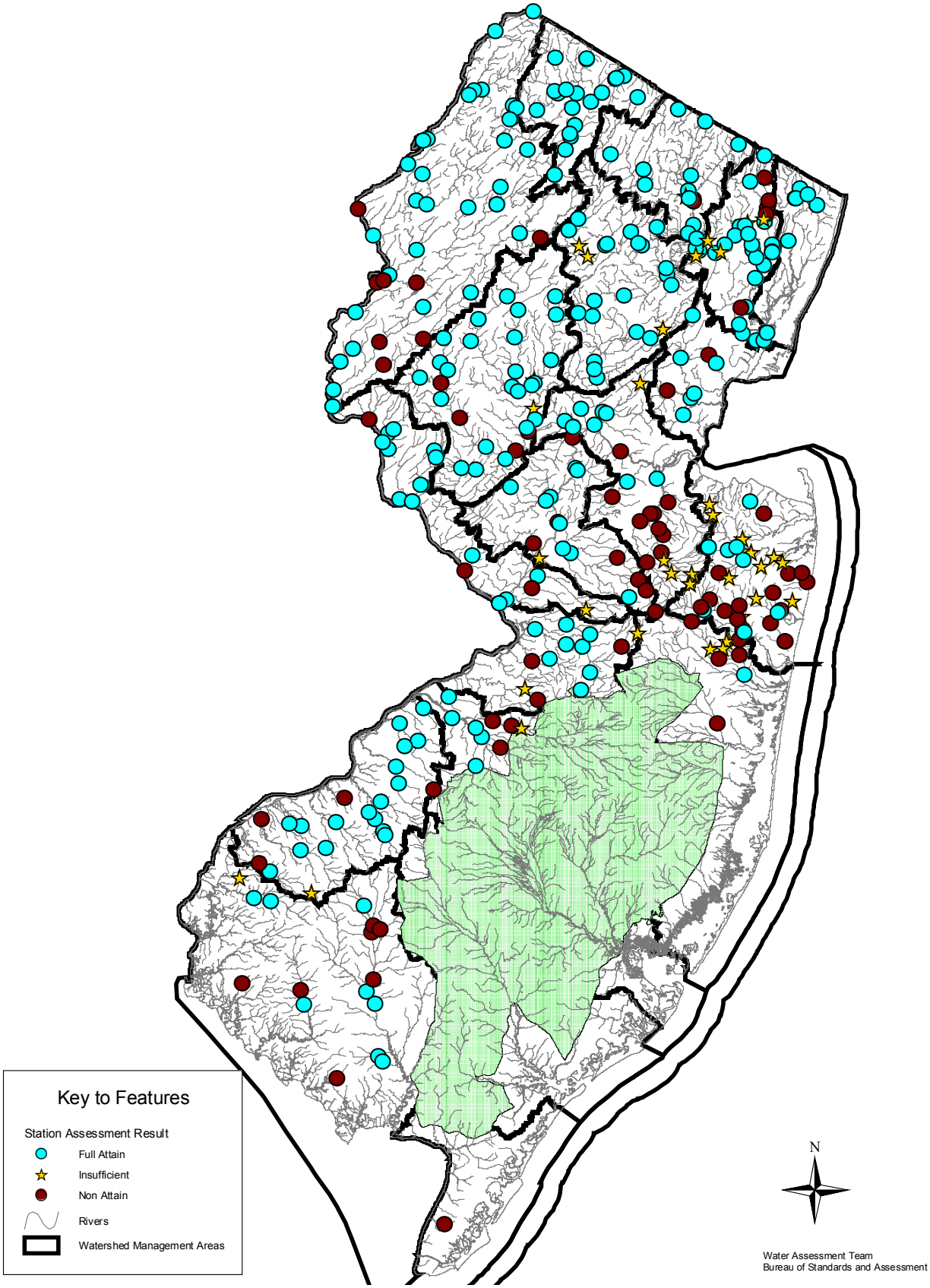
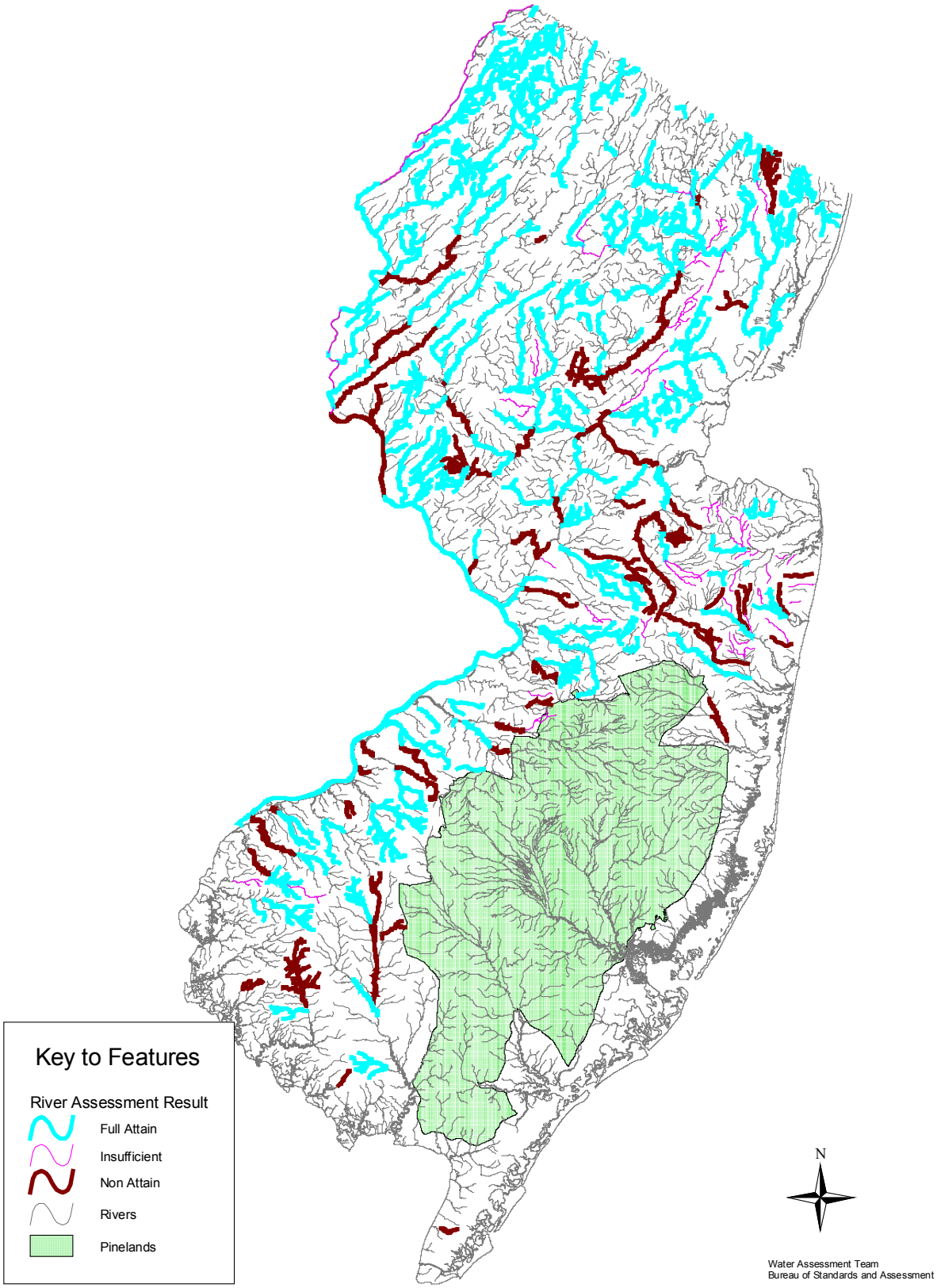


FIGURE 3.1e-2. Industrial Designated Use Assessment Status for River Segments. Includes monitored and estimated rivers.



Section 3.2 Lake Water Quality Assessment

Introduction

In New Jersey, there are approximately 3,268 lakes, reservoirs and ponds over 2 acres in size, but of these, only about 60 are natural. The remainder are constructed impoundments. There are 380 public lakes (24,000 acres) and 64 reservoirs. Thus far, 480 lake bathing beaches at 319 lakes have been identified; some lakes have multiple beaches. Uses of New Jersey's lakes, reservoirs and ponds vary and can include potable water supply, water storage, recreational boating, fishing and swimming. These waterbodies also provide habitat for a variety of aquatic life and wildlife.

This section focuses on aquatic life and recreational designated use attainments for lakes. This section also discusses eutrophication and its impact on the recreational quality of lakes. Fish consumption advisories for lakes are discussed in section 3.4 of this Chapter.

3.2a Lake Aquatic Life Designated Use Assessment Method

As stated earlier when discussing river and stream biological assessments, lake biological assessments are used to evaluate attainment of federal and state Surface Water Quality Standards provisions for the protection and propagation of fish, shellfish, and wildlife pursuant to the federal Clean Water Act. The assessments also evaluate the degree to which the Department has restored, enhanced and maintained the biological integrity of the State's waters and safeguarded its fish, aquatic life and ecological value in accordance with the New Jersey Water Pollution Control Act. The specific designated uses for freshwater lakes delineated in the New Jersey Surface Water Quality Standards (see 7:9B-1.12) whose degree of support are assessed by means of biological assessments are as follows:

- FW1 waters: waters set aside for posterity to represent the natural aquatic environment and its associated biota;
- FW2 waters: maintenance, migration and propagation of the natural and established biota;
- PL waters: maintenance, migration and propagation of the natural and established biota indigenous to this unique ecosystem.

Lake biological assessment are currently based upon either warm water fishery assessments supplied by the Department's Bureau of Freshwater Fisheries (BFF) (for non-Pinelands lakes) or by finfish and anuran (frog) population data supplied by the New Jersey Pinelands Commission for Pinelands lakes. Consistent with the previous Integrated Report, this assessment provides a direct indicator of biological condition. Prior to the 2000 Inventory Report, aquatic life assessments for lakes were based on lake trophic status, an indirect indicator of biological condition.

Assessments of lake fisheries in non-Pinelands waters are based upon a priority list provided in the Division of Fish and Wildlife's *Warmwater Fisheries Management Plan* (NJDEP, 1998) which serves as the primary guidance for warmwater fisheries management for the Department. This 2004 New Jersey Integrated Report, has expanded the use of these fishery assessments supplied by the Bureau of Freshwater Fisheries. This

report presents the assessment results of fish inventories of over 40 lakes and reservoirs all of which possess public access for recreational fishing. With the exception of one lake, assessment dates range from 1990 to 2003. The one exception is New Market Lake in Middlesex County, a lake contaminated with PCBs from an upstream industrial source which has resulted in a consumption advisory on the entire lake. As a result of and in addition to the poor quality of the lake fishery, the Division of Fish and Wildlife no longer manages the fishery and this precludes more up-to-date fish assessments.

Lakes contained within the Pinelands region of New Jersey (both Preservation and Protection Areas) are assessed separately using indicators recommended and data supplied by the New Jersey Pinelands Commission (Zampella, R.A., et al. 2001, 2003 and written communication). The Pinelands Commission (Commission) has developed an extensive biological database which the Department has now used to assess the biological condition for selected impoundments in the Rancocas and Mullica watersheds (Watershed Management Areas 19 and 14, respectively). The basis for these assessments are extensive studies performed by the Commission of finfish and anuran (frog) assemblages along anthropogenic disturbance gradients. For both the Mullica (Zampella, R.A., et al. 2001 and written communication) and the Rancocas (Zampella, R.A., et al. 2003 and written communication) drainages, finfish and stream vegetation assemblages are also employed as the basis for the stream assessments contained in the Integrated List.

Lake Aquatic Life (Biological) Assessment Results

Of the 108 lakes assessed by the Division of Fish and Wildlife and the New Jersey Pinelands Commission totaling 14,547 acres, 61 lakes fully support the use (one lake is fully supporting but threatened) and 21 lakes do not support the use. Twenty-six lakes (all Pinelands Lakes) were classified as not being able to assess because clear thresholds for biological status have not been established for Pinelands lakes (see Methods Manual, page 24). When categorized according to the Integrated List categories, the classifications are displayed on Table 3.2a-1. Summary results of non-Pinelands lakes are displayed on Table 3.2a-2; those of Pinelands lakes are on 3.2a-3. The results of individual lake assessments are summarized below on Table 3.2a-4 and Table 3.2a-5.

Table 3.2a-1: Lake Biological Status (Aquatic Life Designated Use Assessment) Summary for both non-Pinelands and Pinelands lakes combined (in acres)

Use Support Category	Number of Lakes	Acres	Integrated List
Full Attainment	61	8,781**	Sublist 1
Non Attainment*	21	4,815**	Sublist 5
Insufficient data	26	951	Sublist 3
Total Assessed	**108**	**14,547****	

*This category includes lakes assessed as threatened, partially supporting and not supporting the Aquatic Life Use.

** Acreage does not include 2 lakes (Wilson Park Lake: full support and North Community Lake: non support) which are currently not indexed on the Department's GIS system.

Table 3.2a-2: Lake Biological Status (Aquatic Life Designated Use Assessment) Summary for non-Pinelands lakes only (in acres)

Use Support Category	Number of Lakes	Acres	Integrated List
Full Attainment	41	8,024**	Sublist 1
Non Attainment*	7	4,470**	Sublist 5
Insufficient data	0	0	Sublist 3
Total Assessed	**48**	**12,494****	

*This category includes lakes assessed as threatened, partially supporting and not supporting the Aquatic Life Use.

** Acreage does not include 2 lakes (Wilson Park Lake - full support; and North Community Lake - non support) which are currently not indexed on the Department GIS system.

Table 3.2a-3: Lake Biological Status (Aquatic Life Designated Use Assessment) Summary for Pinelands lakes only (in acres)

Use Support Category	Number of Lakes	Acres	Integrated List
Full Attainment	20	757	Sublist 1
Non Attainment*	14	345	Sublist 5
Insufficient data	26	951	Sublist 3
Total Assessed	**60**	**2,053**	

*This category includes lakes assessed as threatened, partially supporting and not supporting the Aquatic Life Use.

Table 3.2a-4: Individual Lake and Reservoir Assessment Results Using Bureau of Freshwater Fisheries Data

Lake Name	Use Assessment	Latest Assessment Date	Reason for Less Than Full Support
Lake Aeroflex*	Full Support	2003	
Brainerd	Full Support	1996	
Budd Lake	Full Support	1997	
Canistear Reservoir	Full Support	1993	
Clinton Reservoir	Full Support	1990	
Davidson's Mill	Partial Support	1997	Sedimentation/water quality
Davis Mill Pond	Full Support	2000	
Demott Pond	Full Support	1997	
DOD Lake	Full Support	2003	
East Brunswick Lake	Full Support	1996	
Echo Lake Reservoir	Full Support	1991	
Elmer Lake	Full Support	1995	
Farrington	Full Support	1999	
Hopatcong	Threatened	1996	Accelerated eutrophication
Jefferson	Full Support	1997	
Kennedy Lake	Full Support	2003	
Lefferts	Partial Support	1998	pH
Lenape Lake	Full Support	1993	
Manasquan Res.	Full Support	1996	
Maple Lake	Full Support	1996	
Maskells Millpond	Full Support	1997	
Menantico Pond	Full Support	1997	
Merrill Creek Res.	Full Support	2000	
Monksville Res.	Full Support	2000	
New Market	No Support**	1987	Fishery dominated by carp & goldfish.
North Community	Partial Support	1997	Sedimentation
Parvin	Full Support	1992	
Peddie	Full Support	1997	
Pemberton Lake	Full Support	1996	
Prospertown	Full Support	1997	
Ramapo Lake	Full Support	2000	
Round Valley Res.	Full Support	1996	
Ryker Lake	Full Support	1997	
Salem Canal	Full Support	2000	
Scarlet Oak Pond	Full Support	1994	
Shadow	Full Support	1994	
Shanock Pond	Full Support	2003	
Shaws Mill Pond	Full Support	2003	
Shepherd	Full Support	1999	

Table 3.2a-4 continued: Individual Lake and Reservoir Assessment Results Using Fisheries Data

Silver Lake	assessment pending	2003	assessment pending: report not complete
Spruce Run Res.	Partial Support	1997	Frequent and significant water withdrawls
Success Lake	Full Support	2003	
Sunset	Full Support	1998	
Swartswood Lake	Partial Support	2003	Lake has water quality issues related to eutrophication
Turnmill Pond	Full Support	1994	
Union Lake	Full Support	1993	
Washington Valley Res.	Full Support	1997	
White Lake	Full Support	1998	
Wilson	Full Support	1993	
Wilson Park	Full Support	1997	

* Lakes in **bold** denote new assessments for 2004.

**PCBs in fish tissue resulting in Total Consumption Advisory. Lake is no longer managed by the Division of Fish and Wildlife.

Table 3.2a-5a: Lakes Assessments in the Rancocas Watershed Based upon Pinelands Commission Data

Lake Site Description	Stream	Assessment Status	*sublist #*
Barton Run impoundment above Tuckerton Road	Barton Run	No Support	5
Taunton Lake	Haynes Creek	No Support	5
Haynes Creek tributary impoundment below Jackson - Medford Road	Haynes Creek Tributary	No Support	5
Southwest Branch Rancocas Creek impoundment at Medford Park	Southwest Branch Rancocas Creek	No Support	5
Jennings Lake	Barton Run	No Support	5
Big Pine Lake above Hanover Boulevard	Jacks Run	status not determined	3
Old Forge Lake	Friendship Creek	status not determined	3
Lake Pine	Haynes Creek	status not determined	3
Presidential Lakes	Bisphams Mill Creek	status not determined	3
Bread and Cheese Run impoundment at Camp Inawendiwin	Bread and Cheese Run	status not determined	3
Haynes Creek tributary above Kettle Run Road	Haynes Creek Tributary	status not determined	3
Kettle Run above Hopewell Road	Kettle Run	status not determined	3
Kettle Run at camp Kettle Run	Kettle Run	status not determined	3
Black Run bog	Black Run	Full Support	1
Cedar Run Lake	Cedar Run	Full Support	1
Burrs Mill Brook bog above Sooy Place Road	Burrs Mill Brook		3
Friendship Creek impoundment at Camp Inawendiwin	Friendship Creek		3
Pakim Pond	Cooper Branch	Full Support	1
Mount Misery Brook impoundment at Mount Misery	Mount Misery Brook	Full Support	1
Pole Bridge Branch impoundment below Route 70	Pole Bridge Branch	Full Support	1
South Branch Burrs Mill Brook impoundment above Sooy Place Road	South Branch Burrs Mill Brook	Full Support	1
Squaw Lake	Haynes Creek Tributary	No Support	5
Hanover Lake	North Branch Rancocas Creek		3
Greenwood Branch impoundment above New Lisbon-Four Mile Road	Greenwood Branch	Full Support	1

Table 3.2a-5b: Lakes Assessments in the Mullica Watershed

Lake Site Description	Stream	Assessment Status	*sublist #*
Hammonton Lake	Hammonton Creek	No Support	5
Great Swamp Branch impoundment above Route 30	Great Swamp Branch	No Support	5
Atco Lake	Hays Mill Creek	No Support	5
Springers Brook impoundment on northern side of Indian Ann Trail	Springers Brook	No Support	5
Beaverdam Lake	Wildcat Branch	No Support	5
Blue Anchor Brook impoundment above Route 30	Blue Anchor Brook	No Support	5
Great Swamp Branch impoundment above Myrtle Street	Great Swamp Branch	No Support	5
Indian Mills Lake at dam	Muskingum Brook	No Support	5
Blue Anchor Brook impoundment above Spring Garden-Winslow Road	Blue Anchor Brook	No Support	5
Pump Branch impoundment at Ha-Lu-Wa-Sa	Pump Branch	No Support	5
Indian Mills Brook impoundment above Old Schoolhouse Road	Indian Mill Brook	status not determined	3
Indian Mills Brook impoundment above Oakshade Road (Shadow Lake)	Indian Mill Brook	status not determined	3
Lake Fred	Morses Mill Stream	status not determined	3
Mullica River impoundment at Jackson-Medford Road (Lady's Lake)	Mullica River	status not determined	3
Horse Pond Stream below Butterworth's Bogs Road	Horse Pond Stream	status not determined	3
Wesickaman Creek impoundment at Atsion Road	Wesickaman Creek	status not determined	3
Pump Branch impoundment near Cedar Avenue	Pump Branch	status not determined	3
Albertson Brook impoundment below Route 206 (Paradise Lakes)	Albertson Brook	status not determined	3
Egg Harbor City Lake below Route 563	Indian Cabin Creek	status not determined	3
Cooper Branch impoundment near Tremont Avenue and Burnt Mill Road	Cooper Branch	status not determined	3
Harrisville Pond	Oswego River	status not determined	3
Goshen Pond	Mullica River	status not determined	3
Sleeper Branch bogs at Route 206	Sleeper Branch	status not determined	3
Deep Run impoundment below Hampton Road	Deep Run	status not determined	3
Oswego Lake	Oswego River	status not determined	3
Lake Absegami	East Branch Bass River	status not determined	3
Oswego River impoundment at Howardsville	Oswego River	Full Support	1
Bulls Branch impoundment (Otter Pond)	Bulls Branch	Full Support	1
Featherbed Branch impoundment below Carranza Road	Featherbed Branch	Full Support	1
Boy Scout impoundment	Alquatka Branch	status not determined	3

Table 3.2a-5b: Lakes Assessments in the Mullica Watershed (cont.)

Lake Site Description	Stream	Assessment Status	sublist #
Batsto Lake	Batsto River	status not determined	3
West Branch Bass River impoundment above Stage Road (Pilgrim Lake)	West Branch Bass River	Full Support	1
Skit Branch beaver pond above Carranza Road	Skit Branch	Full Support	1
Roberts (Tom Roberts) Branch beaver pond above Carranza Road	Tom Roberts Branch	Full Support	1
Batsto River headwater impoundment below Route 532	Batsto River	Full Support	1
Oswego River impoundment above Old Cedar Bridge-Barnegat Road	Oswego River	Full Support	1
Skit Branch beaver impoundment between Hampton and Carranza Roads	Skit Branch	Full Support	1
Clark Branch impoundment above Johnson Road	Clark Branch	Full Support	1
Plains Branch impoundment above Beaver Dam Road	Plains Branch	Full Support	1
Shane Branch above Carranza Road	Shane Branch	Full Support	1
Atsion Lake	Mullica River	status not determined	3

Source and Cause Assessment

Spruce Run Reservoir in Hunterdon County was classified as partially supporting aquatic life designated uses. This impairment has been attributed to frequent and significant water withdrawals which cause significant oscillations in water levels. This has eliminated all vegetation within the reservoir, a critical component of fish cover. The lack of adequate cover within the reservoir has affected the recruitment of a number of game species. "Recruitment" here refers to the number of young fish which survive to ultimately become large enough to reproduce and/or become harvestable. In addition the reservoir receives nutrient laden runoff during storm events from the upstream watershed and exhibits dense algal blooms during the summer months. The Bureau of Freshwater Fisheries has found dissolved oxygen (DO) levels from approximately 12 feet down to the lake bottom (70 ft.) that are routinely reduced to 0 mg/l DO during the summer months.

Lake Hopatcong was classified as fully supporting aquatic life uses but threatened due to accelerated eutrophication. The acceleration is brought about by nonpoint source pollution from the communities immediately surrounding the lake, especially from septic systems.

Biological impairment in Pinelands lakes appear to be related to anthropogenic disturbance through agriculture and suburban development within the Pinelands region. Alterations in the biological condition have been associated with nonpoint sources of nutrients and other dissolved solids which in turn are associated with the percentage of developed land within a watershed (Zampella, R.A., et al. 2001, 2003, and Dow and Zampella, 2000.)

Strategies to Protect and Enhance the Biological Condition in Lakes

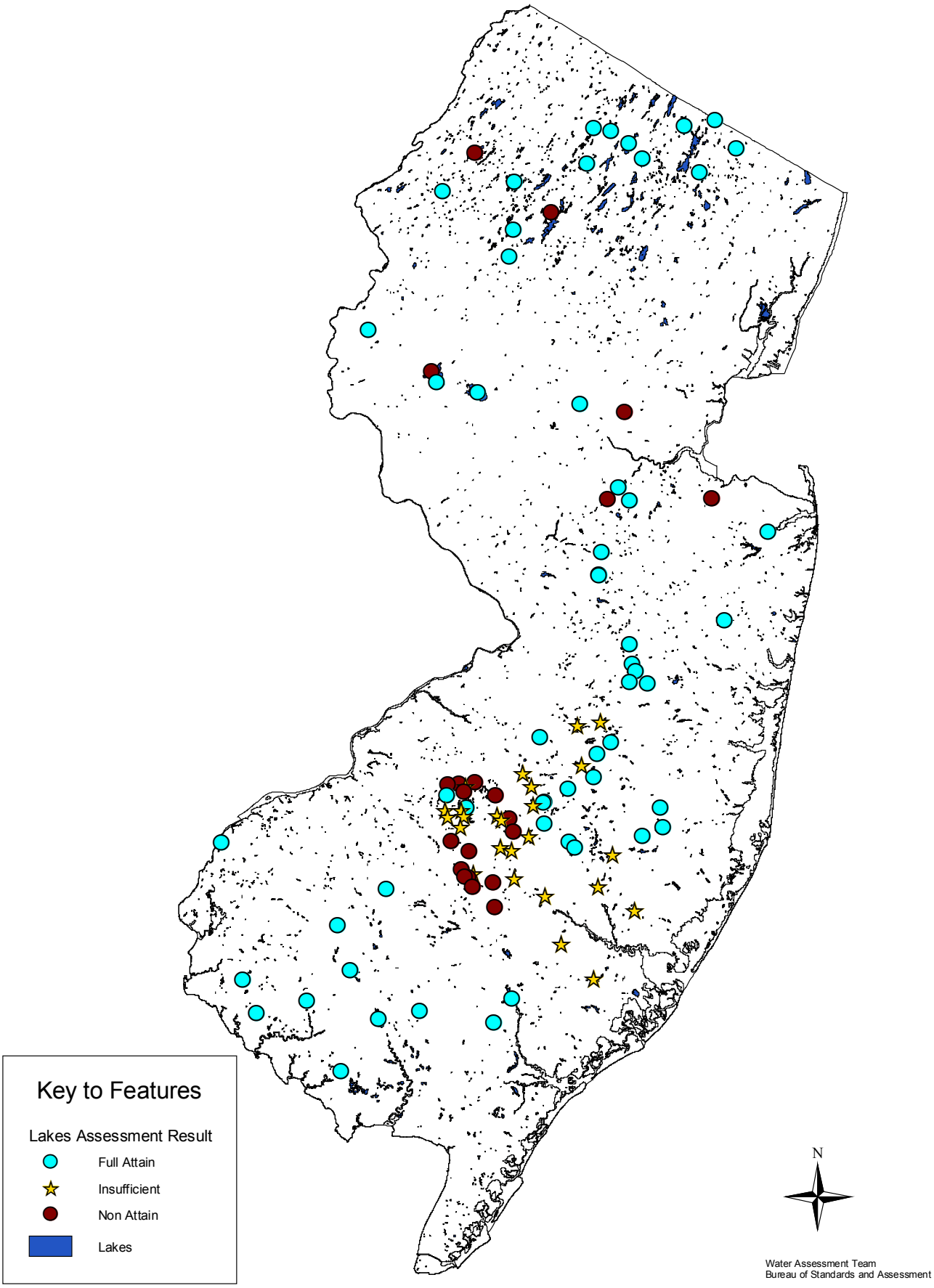
Implement management measures for fisheries: Numerous management measures are identified in the Warmwater Fisheries Management Plan such as lake dredging when needed, aquatic vegetation control and angler education.

Expand the use of direct measures of the biological condition: NJDEP plans to make wider use of fishery inventories provided by the Department's Bureau of Freshwater Fisheries. In addition, NJDEP and USEPA Region II have developed draft rapid bioassessment protocols for lakes. The Department is currently evaluating whether these protocols need additional verification and how best to integrate these assessments with the existing finfish assessments. Once these efforts are completed and sufficient data are available, these new data will be integrated into the Aquatic Life Use support status of public lakes for future Integrated Reports.

Improve the assessment thresholds for Pinelands assessments: Work with the New Jersey Pinelands Commission to develop clearer thresholds to differentiate nonimpaired from impaired aquatic biological communities thereby reducing the number of Pinelands sites listed on sublist 3.

Additional lake management strategies to control eutrophication are discussed under Section 3.2c, Lake Recreational Designated Use: Aesthetics.

FIGURE 3.2a-1. Aquatic Life Designated Use Status for Lakes.



Section 3.2b Lake Recreational Designated Use Assessment: Sanitary Quality
Lake bathing beaches are monitored for sanitary quality by county and local health departments with oversight and program coordination from the New Jersey Department of Health and Senior Services (NJDHSS). NJDEP's Cooperative Coastal Monitoring Program compiles NJDHSS data so that a more comprehensive picture of the quality of all NJ bathing beaches can be provided. In addition, many of the environmental programs available to maintain and improve lake water quality are operated through NJDEP. The Division of Watershed Management cooperatively prioritizes and implements projects needed to protect and improve lake bathing beaches.

Lake Recreational Designated Use Assessment Method
The assessment methods for Recreational Designated Use Assessment are delineated in Section 5.2 of the Methods Manual. Some lakes included in this assessment are privately owned and operated, including camps, private schools, or lake associations. NJDHSS regulations govern the collection of these data and beach closures based on elevated levels of fecal coliform (FC).

Levels of fecal coliform bacteria are used to indicate the presence of pathogens that may be harmful to human health. Sanitary surveys are performed to identify and address bacterial pollution sources. Data for this assessment were provided by the NJDHSS and subsequently compiled by NJDEP's Cooperative Coastal Monitoring Program.

Currently, 480 lake bathing beaches located on 321 lakes have been identified with some lakes having more than one beach. Recreational designated use attainment was assessed separately at each beach. Out of 321 lakes, 283 are recorded within the Department's Geographical Informational System (GIS), and 38 are not yet located within the system (see Table 3.2b-2). The following summaries are based only on lakes in the GIS system given that use attainment results must be reported to USEPA as lake acres. Lake acreages are not readily available for many of these small lakes not recorded in the GIS system. The Department is working to correct this deficiency and it is hoped to have all recreational lakes contained within the system in the near future.

Lake Recreational Designated Use Assessment Results
As shown in Table 3.2b-1, 211 lakes (75% of assessed lakes) provided bathing beaches of excellent recreational swimming quality (full attainment of the use). Seventy lakes (25%) showed non attainment of the primary contact use based upon the sanitary quality of their bathing beaches. Two lakes (<1%), Wood Lake in Medford Township and Gorden Lake in West Millford, were listed on sublist 3 due to insufficient data needed to make an assessment (the beach was either closed or data were not provided).

Expressed as lake acres, the information above for the 283 lakes located on GIS is as follows: 12,531 acres (66%) fully support recreational uses; 6,400 acres (34%) do not support recreational uses; and 17 acres (<1%) were assessed as not possessing sufficient data to make an assessment. As discussed above, efforts are underway to locate the remaining lakes on GIS, to facilitate a comprehensive spatial assessment of lake bathing beaches.

Table 3.2b-1: Lake Beach Recreational Designated Use Support

Recreational Lakes	Number of Lakes Assessed	Percent of Lakes Assessed	Number of Acres Assessed	Percent of Acres Assessed
Sublist 1	211	75%	12,531	66%
Sublist 3	2	<1%	17	<1%
Sublist 4	0	0%	0	0%
Sublist 5	70	25%	6,400	34%
Totals	283	100%	18,948	100%

*Lake acres are based upon lakes indexed within the Department's Geographic Information System (GIS) only. An additional 35 lakes were reported to the Department; however, because they are not indexed within the GIS system, their acreage are currently unknown and they are not included in the calculations of acres within each of the use support categories. A list of lake names of the 38 lakes belonging to this subset is contained in Table 3.2b-2 below.

Table 3.2b-2. 38 Lakes Reported to the Department and Not Indexed Within the GIS System. The lakes' size are currently unknown and are not included in the calculations of acres within each of the use support categories displayed on Table 3.2b-1 above.

WMA	Beach Name	Status on Integrated List	WMA	Beach Name	Status on Integrated List
03	Awosting Association	1	08	Pax Amicus Beach	1
08	Baptist Camp and Conf. Ctr.	1	17	Pickle Factory Dock	1
06	Belmont Left and Right	1	17	Rabins Beach	1
08	Camp Bernie	1	17	Southern NJ Council	1
17	Camp Grice	1	02	Toyes Recreation	1
01	Camp Lou Henry Hoover	1	06	Village Left and Right	1
09	Carroll's Garden Lake	1	17	Vineland YMCA	1
17	Double A Marina	1	08	Pavillion Beach	5
02	Glen Harbor HOA	1	19	Camp Darkwaters	5
06	Glen Lake	1	06	Community Assoc. of Prospect Point	5
09	Hercules Pond	1	06	Conference Center Left and Right	5
03	Highlands/Weis	1	08	Cross Roads Outdoor Ministries (Camp Beisler)	5
06	Hilltop Left and Right	1	17	Gandy's Beach	5
18	Hurff Lake	1		Green Valley Beach Campground	5
06	Inlet Left and Right	1	01	Lake Edenwold	5
19	Lakeside	1	03	Lake Silvestro	5
19	Lion Tamers Club	1	18	Manor House Outlet	5
03	Middle Lake Village	1	08	Morris Cty Park Lake, Beach, Inlet, Outlet,	5
03	Montclair YMCA Near Beach and Far Beach	1	06	Tall Timbers POA	5

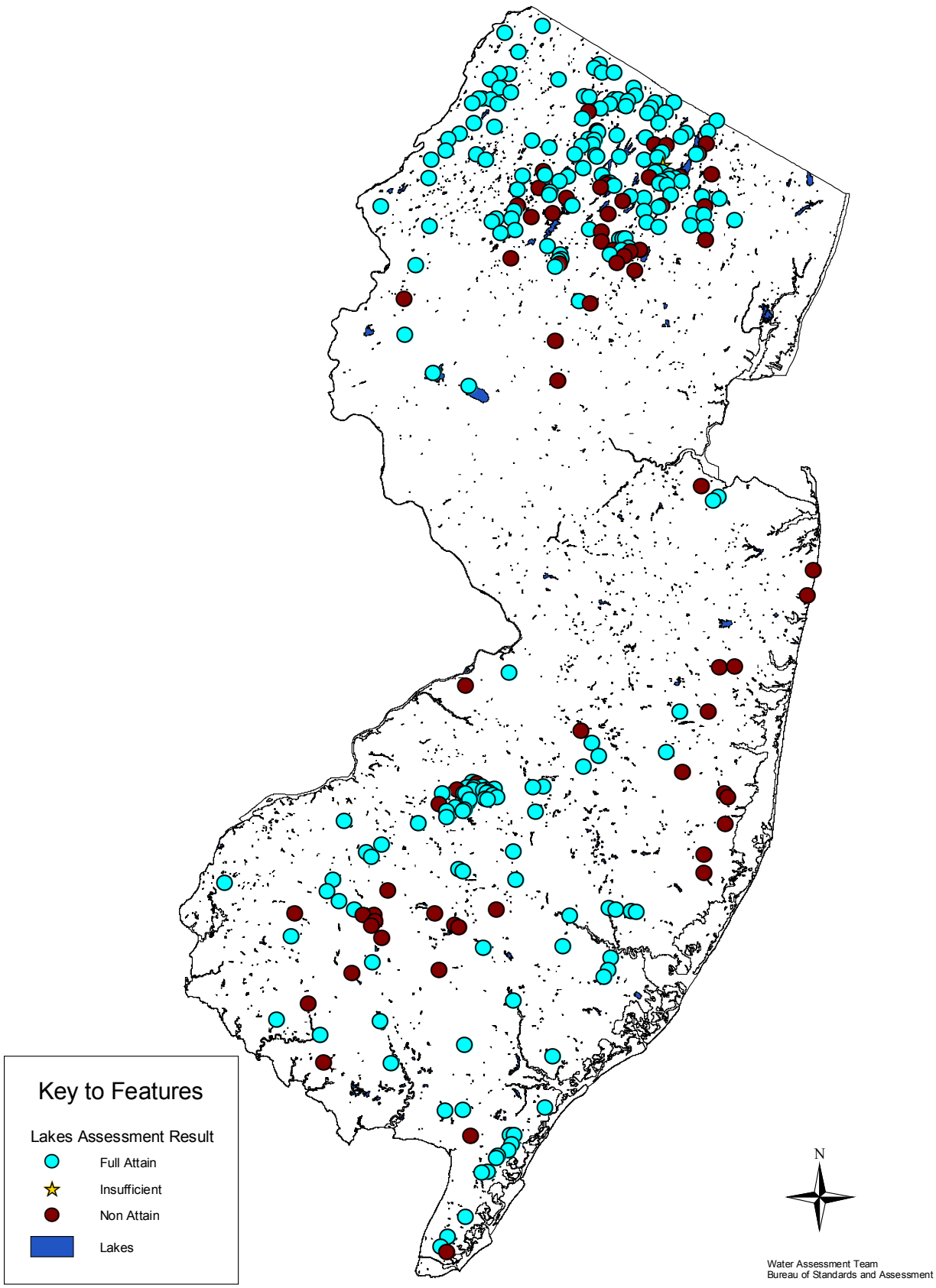
Lake Recreational Designated Use Source and Cause Assessment
In general, the sources and causes of fecal contamination that bring about lake bathing beach closures are very similar to those affecting rivers and streams. Additional site specific information regarding sources of fecal coliform pollution at lake bathing beaches is expected to become available in the near future through the Watershed Management Program.

Maintaining and Improving Lake Recreational Designated Uses
Continue remediation efforts for eutrophic conditions at lakes with beaches: TMDL efforts for eutrophic conditions are planned for several lakes with a bathing beach. These lakes include: Bell Lake-18, Cranberry Lake-01, Hammonton Lake-14, Lake Hopatcong-01, Round Valley Reservoir Recreational Area-08, and Sunset Lake-17. These TMDLs have been approved by EPA, and once implemented, will improve conditions at the beaches although they are not specifically targeting fecal coliform.

Continue and expand cooperative assessments with NJDHSS: The lake bathing beach data for this assessment were provided through the cooperative efforts of the Cooperative Coastal Monitoring Program and the NJDHSS. This initial effort made the lake bathing beach assessment possible. Future cooperative efforts should explore the exchange of lake beach closure data with NJDEP.

Improve spatial assessment: NJDEP and NJDHSS are working cooperatively to locate the remaining 38 lakes on GIS. The results will be used to complete the comprehensive assessment of lake bathing beaches for the next Water Quality Inventory Report.

FIGURE 3.2b-1. Recreational Designated Use Status for Lakes.



3.2c Lake Recreational Designated Use: Eutrophication and Aesthetics

Many of the lakes in New Jersey are constructed impoundments which are highly prone to eutrophication. Eutrophication occurs naturally as lakes age; however, this process can be accelerated with excessive input of nutrients and suspended sediments from the surrounding watershed. Eutrophic lakes are characterized by excessive growth of aquatic weeds and algae, shallow depths as sediments fill the lake, elevated temperatures, and low dissolved oxygen. The excessive algal growth, be it planktonic or rooted, often create aesthetically unpleasant conditions for swimming and difficult conditions for boating.

Details regarding the assessment methods applied to lakes experiencing nuisance algal growth in the context of the Integrated List are contained in section 6.3 of the Methods Manual. The Clean Lakes Program was originally designed by USEPA to facilitate identification and remediation of impaired lakes. Much of the impairments brought to the Department's attention through the Clean Lakes Program centered around nuisance algal growth impairing swimming and in some cases boating. The Program assessed a total of 119 public lakes, representing 10,263 acres. Many Clean Lakes assessments were performed in the 1980s and early 1990s.

Clean Lakes Program Eutrophication Assessment Results

Table 3.2c-1 correlates the Clean Lakes Program Eutrophication Assessment results with its respective sublist designation on the Integrated List. Of 119 public lakes assessed by the Program, all but 2 are located on the Department's GIS system. The 2 lakes not on the system (Foxmill Lake in Salem County and Mac's Pond in Monmouth County) were reported to the Department; however, not being within the GIS, their acreages are not known and they are not included in the calculations of acres within each of the use support categories.

Of the 119 lakes on the GIS system, 6 lakes (320 acres) were assessed as mesotrophic: Lake Atsion, Tuckahoe Lake, Manahawken Lake, Lake Matawan, Lake Absegami and Turnmill Lake. Sixteen lakes were assessed as eutrophic. Sixty two lakes are listed under Insufficient Data and 34 lakes have undergone TMDLs that have been approved by EPA. Within the context of the 2004 Integrated List, the results are delineated on Table 3.2c-1 below.

Table 3.2c-1: Eutrophication Assessment Results Applied to the Integrated List

Assessment Use Support Status	Number of Lakes*	Lake Acres*	Sublist
Full Support	6	320	Sublist 1
Insufficient Data**	62**	4,087**	Sublist 3**
TMDL Completed	34	4055	Sublist 4
Non Support	16	1801	Sublist 5
Total Assessed	**119**	**10,263**	

* Lake numbers and acres tabled above are based upon lakes indexed within the Department's Geographic Information System (GIS) only. An additional 2 lakes were reported to the Department, however, because they are not indexed within the GIS system, their acreages are currently unknown and they are not included in the calculations of acres within each of the use support categories. These lakes are Foxmill Lake in Salem County and Mac's Pond in Monmouth County.

**Lakes assigned to sublist 3 represent lakes assessed as eutrophic, however no recreational use impairment has been reported to the Department. See section 6.8 of the Methods Manual.

In 2003, 34 lakes originally listed on New Jersey's 1998 303(d) List underwent TMDLs (see Table 3.2c-2) for total phosphorus and have received EPA approval. These lakes have been moved to sublist 4a (TMDL completed). As reported in the 2002 Integrated list, extensive remediation and a TMDL were completed for Lower Sylvan Lake and Strawbridge Lake (both in Burlington County) resulting in these lakes being listed on sublist 4a as well. Upper Sylvan Lake remains on sublist 5 for total phosphorus.

Lake Absegami, located within Bass River State Park in New Gretna, was originally placed on sublist 5 based upon a Phase I Diagnostic/Feasibility Study (Princeton Hydro, 2002). The issue of concern was macrophytes. It was later learned that the lake was the subject of a Phase I assessment initiated by the Bass River State Park. The assessment was commenced by the Park personnel because they wanted to know how to best manage the lake through time and had concerns regarding the abundant shoreline vegetation that line portions of the lake. The Phase I report described Lake Absegami as mesotrophic with a total phosphorous level that approaches oligotrophy. The report makes clear that the lake is not impaired. The lake has abundant shoreline vegetation which is regarded as natural for a shallow Pinelands lake (Pinelands Commission, written communication). The Commission's comments mirrored the Phase I report, indicating that nutrient levels within Absegami Lake are very low based upon their studies.

The initial listing of Absegami Lake on 303(d) is regarded to be in error; and based upon a review of the Phase I report and comments received from the NJ Pinelands Commission, is removing Absegami Lake from sublist 5 (non attainment) and assigning it to sublist 1 (full attainment).

Lake Eutrophication Source and Cause Assessment
Initially much of the Department's information regarding lake eutrophication came from the Clean Lakes Program. Recently, pollution source assessments have been performed by the Division of Watershed Management as part of a series of lake TMDLs. These assessments have indicated that runoff from urban, suburban and agricultural nonpoint sources are the principal sources of pollution and causes of impairment in New Jersey lakes. The relative importance of each pollution source varies with the lake assessed. These TMDLs indicate that point sources are either absent or of little consequence within the context of overall pollution loading in the lakes assessed.

An important factor to consider regarding lake eutrophication in New Jersey is that most New Jersey lakes are shallow stream impoundments constructed for such purposes as flood and sediment control making these shallow impoundments highly prone to eutrophication.

As reported in earlier Water Quality Inventory Reports, lake eutrophication is a widespread issue in New Jersey and is characterized by elevated levels of suspended sediment, nutrient and algal concentrations. Aquatic life may be stressed due to dissolved oxygen fluctuations and in extreme situations, fish kills may occur. Eutrophic conditions generally lower the aesthetic and recreational value of the lake. Although all lakes naturally progress to eutrophic conditions, then become wetlands (especially those created as stream impoundments), this process is being accelerated by excessive input of nutrients and suspended sediments from largely nonpoint sources.

Strategies to Protect and Enhance the Aesthetic Aspects of Swimming and Boating
Implement improvement projects in impaired lakes: In the recent past, New Jersey used Clean Lakes Program funds to address eutrophication in lakes. However, USEPA no longer funds the Clean Lakes Program and is recommending that states use section 319(h) funds for lake remediation, with the assumption that the impairments are due (largely if not exclusively) to non point sources. More recently, a $200 million Lakes Bond Act has been approved by New Jersey voters of which $15 million is targeted for the support of lake projects.

In response to a clear need, the Department will initiate a lakes monitoring program in the spring of 2004 designed to assess the eutrophic status of lakes in the State. The effort is currently funded to assess 200 lakes; 40 per year for 5 years. The program will employ probabilistic sampling methods thereby providing estimates that can be extrapolated to all state lakes. In addtion, approximately 4 lakes per year will be assessed in detail for the purpose of TMDL support.

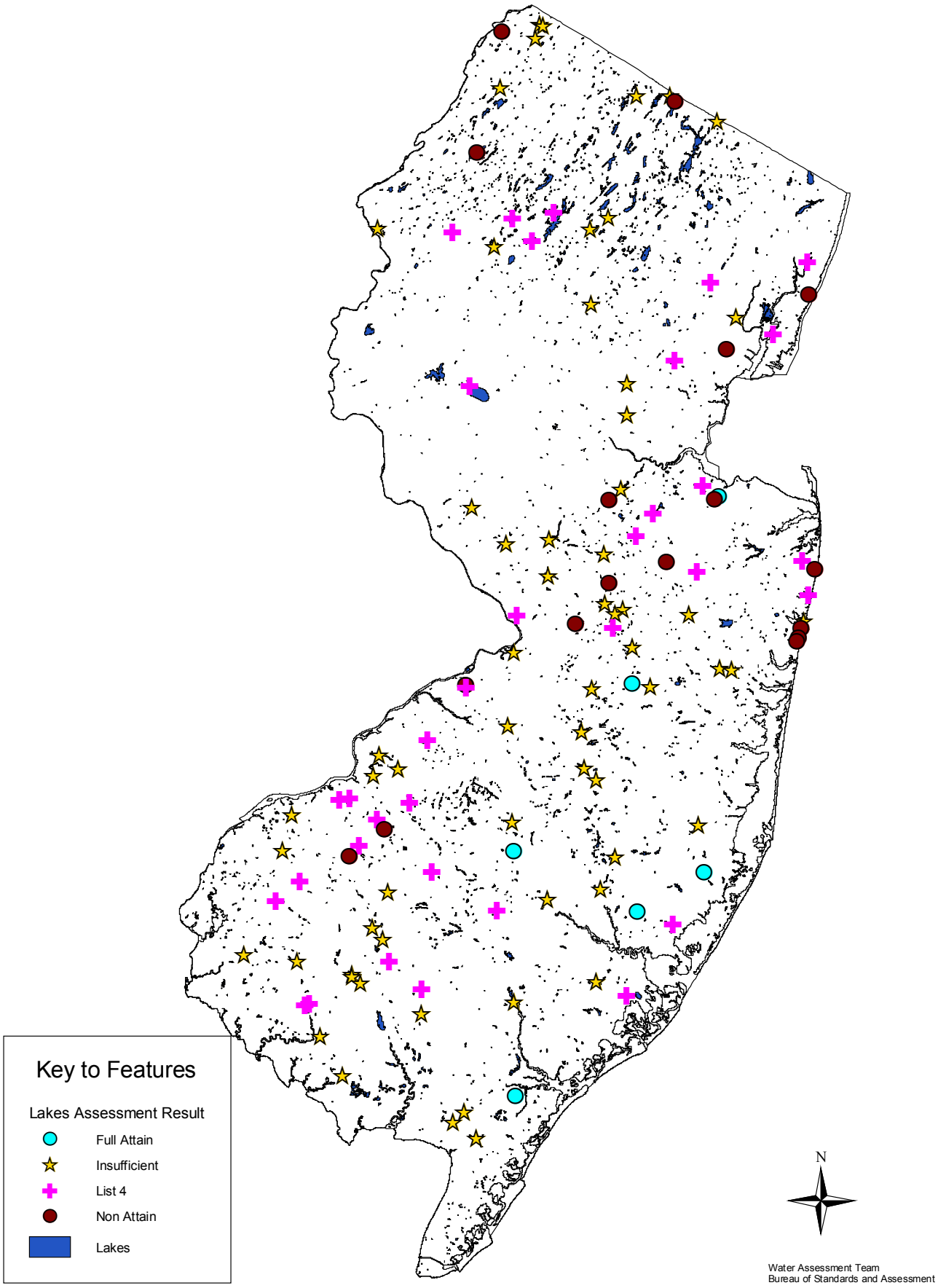
Continue to develop TMDLs for impaired lakes: In addition to the over 30 lakes having undergone TMDLs to date, a significant number of eutrophic lakes initially identified by the Clean Lakes Program remain on sublist 5 of the current Integrated List. Of the remaining lakes originally listed on the 1998 303(d) List for eutrophic conditions, 28 are priority lakes for TMDLs through 2006. As TMDLs are developed, nutrient and

sediment loads and cycling in the lakes will be assessed and management measures will be prioritized and implemented.

Table 3.2c-2: Recently completed TMDLs for lakes

Lake Name	Municipality	County
Bell Lake	Woodbury City	Gloucester
Bethel Lake	Mantua, Washington Twps	Gloucester
Blackwood Lake	Washington Twp (Glou Co), Gloucester Twp. (Cam Co)	Camden & Gloucester
Burnt Mill Lake (Pond)	Vineland City	Cumberland
Cranberry Lake	Byram Township	Sussex
Davidson's Mill Lake	South Brunswick	Middlesex
Deal Lake	Ocean Twp	Monmouth
Dennisville Lake	Dennis Twp	Cape May
Devoe Lake	Spotswood Boro	Middlesex
Echo Lakes	Mountainside	Union
Franklin Lake	West Long Branch Boro	Monmouth
Ghost Lake	Independence Township	Warren
Giampietro Lake	Vineland City	Cumberland
Hammonton Lake	Hammonton Twp	Atlantic
Harrisonville Lake	So Harrison Twp (Glou Co), Pilesgrove Twp (Sal Co)	Gloucester & Salem
Hooks Creek	Old Bridge Twp	Middlesex
Imlaystown Lake	Upper Freehold Twp.	Monmouth
Kirkwood Lake	Voorhees Twp.	Camden
Lake Hopatcong	Hopatcong & Mount Arlington Boros; Jefferson & Roxbury Townships	Sussex
Lake Musconetcong	Stanhope, Byram, Netcong and Roxbury Townships	Sussex
Lily Lake	Cape May Point Boro	Cape May
Lincoln Park Lakes	Jersey City	Hudson
Manalapan Lake	Monroe	Middlesex
Mary Elmer Lake	Hopewell Twp.	Cumberland
Memorial Lake	Woodstown Boro	Salem
New Brooklyn Lake	Winslow Twp	Camden
Overpeck Lake	Teaneck	Bergen
Pohatcong(Tuckerton) Lake	Little Egg Harbor Twp	Ocean
Round Valley Recreational Area	Clinton	Hunterdon
Spring Lake	Hamilton Twp	Mercer
Sunset Lake	Hopewell, Upper Deerfield Twps	Cumberland
Topanemus Lake	Freehold	Monmouth
Verona Park Lake	Verona	Essex
Woodbury Lake	Deptford Twp.	Gloucester

FIGURE 3.2c-1. Aesthetic Designated Use Status for Lakes.



Section 3.3 Coastal (Estuary and Ocean) Designated Use Assessment

Section 3.3a Estuary and Ocean Aquatic Life Designated Use Assessment

New Jersey's estuaries provide a rich spawning ground for many aquatic species. These species are important for recreational and commercial fishing and shellfishing, as well as important components of the aquatic ecosystem.

Various programs within the New Jersey Department of Environmental Protection (NJDEP) have oversight for protecting coastal environments (e.g., water quality, finfish, shellfish, bathing beaches, land use permitting, etc.); management planning (e.g., Coastal Zone and Wastewater Management) and public policy implementation (e.g., Coastal Areas Facility Review Act). These programs and descriptions of their activities can be found at NJDEP's Website (www.state.nj.us/dep/). In addition, NJDEP participates in a number of multi-state, estuarine management programs such as the Interstate Environmental Commission (IEC) formerly the Interstate Sanitation Commission, the Delaware River Basin Commission (DRBC) and three National Estuary Programs (i.e., NY/NJ Harbor Estuary and NY Bight Restoration Plan, Delaware Estuary Program, and Barnegat Bay Estuary Program).

New Jersey's estuarine waters are assessed in conjunction with two interstate agencies, the Interstate Environmental Commission (IEC) and the Delaware River Basin Commission (DRBC). New Jersey assesses and reports on the estuarine waters within the southern half of Raritan Bay, Sandy Hook Bay and the back-bay waters from the Navesink estuary south to the eastern tip of Cape May. The IEC assesses and reports on the waters in the New York/New Jersey Harbor, specifically the northern portion of Raritan Bay, Newark Bay, the Arthur Kill and Kill Van Kull, Upper New York Bay and the Lower Hudson River. The DRBC assesses and reports on the Delaware River and Bay. This Integrated Report includes assessments based upon data published by the IEC for waters under New Jersey's jurisdiction. Assessments performed by DRBC are also presented in this report in order to list Delaware River and Bay waters on New Jersey's 303(d) List (sublist 5).

For more detailed information regarding waters overseen by these two interstate agencies, refer to the corresponding addresses provided on the front of this report.

Note that all assessment units presented in this section including linear miles, acres, and square miles are calculated from a computerized mapping system (GIS) which operates on a 1:100,000 scale. These coverages are such because they represent a national level assessment employed by USEPA. Scales representing higher levels of resolution would, due to their greater detail, generate somewhat larger numbers of assessed waters.

Estuarine Aquatic Life Designated Use (Biological Status) Assessment Method

The Department does not currently directly assess the condition of the coastal marine biota in order to assess the biological status (Aquatic Life Designated Use Attainment) in these waters. Instead, the Department uses dissolved oxygen (DO) measurements as an indicator for the biological condition. Dissolved oxygen is necessary for almost all forms of aquatic life and monitoring data are readily available. There are limitations to this assessment tool, however, because many open water aquatic species are mobile and/or naturally tolerant of

transient low DO occurrences. In order to obtain a clearer assessment of coastal biotic communities, additional data and assessments will be needed in the future to improve this assessment.

Methods employed by the Department in assessing biological status in both estuary and ocean waters are described in section 6.0 of the Methods Document. The monitoring programs supplying data employed in these assessments are described at the following websites: http://www.nj.gov/dep/wmm for NJDEP sponsored monitoring; and http://www.epa.gov/Region2/desa/nybight/02nyb.pdf for ocean monitoring sponsored by USEPA, Region II. Estuarine waters are reported separately as open estuarine water (sq. mi.) and as tidal river miles (linear miles) in this report.

Estuary Aquatic Life Assessment Results

Of the 616 square miles of open estuarine waters assessed, 294 square miles (48%) had sufficient dissolved oxygen levels to support a healthy biota (see Table 3.3a-1.) The area assessed extends from Newark Bay south to Cape May and around to those portions of Delaware Bay under New Jersey's jurisdiction. The remaining 322 square miles (52%) were assessed as being in non attainment status due to periodic drops in DO levels to unacceptable levels. Locations where DO violations were observed centered around the Shark River, Lower Manasquan River, and Great Egg Harbor.

Of the 441 miles of tidal rivers assessed (see Table 3.3a-2), 378 miles (86%) were assessed to be in full attainment and 52 miles were in non attainment (12%). Areas of non-support included tidal portions of the Matawan Creek, Shark River, tidal Oyster Creek, the Middle River (trib. to the Great Egg Harbor River), Bidwell Ditch, Dennis and Dividing Creeks. Eleven miles (2%) were assessed as having insufficient data necessary to make an assessment.

Table 3.3a-1: Open Water Estuary Biological Status (Aquatic Life Assessment) Results (includes portions of Delaware Bay under New Jersey's Jurisdiction)

Use Support Category	Monitored Square Miles	Percent	Integrated List
Full Support	294	48 %	Sublist 1
Insufficient Data	0		Sublist 3
No Support	322	52 %	Sublist 5
Total	**616**	**100%**	

Table 3.3a-2: Tidal River Biological Status (Aquatic Life Assessment) Results

Use Support Category	Monitored River Miles	Percent	Integrated List
Full Support	378	86 %	Sublist 1
Insufficient Data	11	2 %	Sublist 3
No Support	52	12 %	Sublist 5
Total	**441**	**100%**	

Estuary Aquatic Life Source and Cause Assessment

Factors contributing to low dissolved oxygen concentrations in New Jersey estuaries are discussed in Zimmer and Groppenbacher (1999) and are both natural and anthropogenic. Estuarine DO levels are characteristically lowest in summer, when water is warm and biological activity is at its highest. Many of the estuaries along the New Jersey coast are shallow waterbodies, often with poor mixing which contributes to the warming of the waters in summer that in turn contribute to low oxygen levels. An additional contributing factor to low DO is the input of naturally oxygen depleted waters from adjacent wetlands especially during ebb tides.

Recorded low DO conditions have often been found to coincide with phytoplankton bloom die-off, the resulting decay of which contributes to water column oxygen consumption during the bloom die-off phase. The anthropogenic input of nutrients has contributed to elevated nutrient levels that may encourage periodic phytoplankton blooms. Anthropogenic inputs include nonpoint sources such as:

- surface runoff from agricultural and developed lands, transported by direct stormwater discharges and tributary inputs;
- direct ground water inputs of nitrogen from historical deposition;
- wet and dry atmospheric deposition of nitrogen oxide emissions, primarily from fossil fuel combustion (Jaworski, et. al. 1997) which in the Barnegat Bay has been estimated to represent a substantial nitrogen load (USGS, written communication, 8 August 2000); and
- other sources such as large waterfowl populations and sediment resuspension through boat-created turbulence.

In addition, NJDEP recognizes that multi-media approaches to environmental assessment and management are best when dealing with contaminants that may be transported through differing media. Understanding the effects of air deposition and other nonpoint sources of pollution, including contaminant composition and magnitude of potential load, is critical to scientists and policy makers in formulating watershed-based management strategies and regional solutions to environmental issues. Past investigations (Jaworski et. al. 1997) have estimated that for ten benchmark watersheds in the United States, including the Hudson and Delaware Basins on either side of New Jersey, the riverine nitrogen fluxes were highly correlated with atmospheric deposition onto their landscapes and also with nitrogen oxide emissions from their airsheds. More locally, a study of Barnegat Bay in New Jersey, a typical shallow Atlantic coast embayment, indicated that over 75% of the nitrogen input to the bay is from atmospheric deposition (Seitzinger and Sanders 1999).

To address these multi-media concerns, NJDEP established the statewide New Jersey Atmospheric Deposition Network (NJADN) which samples gaseous, particulate, and precipitation concentrations of a number of contaminants at nine sites throughout the State. The NJADN, through the collection of data that address wet and dry deposition and air-water exchange of atmospheric pollutants, will provide estimates of direct loadings to surface waters. Such data will be especially important for aquatic systems that have large surface areas relative to watershed areas, such as coastal areas. Preliminary findings of the NJADN are available for a number of pollutants. Findings for nitrate confirm earlier estimates that air deposition of nitrogen may be significant for some watersheds. The annual wet deposition of nitrate throughout the State, as measured by the NJADN, ranged from 22 to 30 mmol/m^2/yr (Eisenreich & Reinfelder, 2001). With the assumption that nitrate represents roughly half of the total dissolved nitrogen in rain (with the remainder either ammonium or dissolved organic nitrogen), average total nitrogen fluxes to terrestrial areas and coastal waters of the State are approximately 0.7 gram/m^2/yr.

Ocean Water Aquatic Life Designated Use (Biological Status) Assessment Methods

As stated previously, methods employed by the Department in assessing biological status in both estuary and ocean waters are described in section 6.1 of the Methods Document. The monitoring programs supplying data employed in these assessments are described at the following websites: http://www.nj.gov/dep/wmm for DEP sponsored monitoring; and, http://www.epa.gov/Region2/desa/nybight/02nyb.pdf for ocean monitoring sponsored by USEPA, Region II.

Aquatic life assessment for ocean waters in New Jersey is based upon water column dissolved oxygen (DO) levels recorded by the USEPA helicopter during June through September, 1996 through 2001. Samples are taken at one meter below the water surface (terminated in 1999) and one meter off the ocean bottom, with depths ranging from 20 to 75 meters. EPA terminated surface water sampling for DO in 1999 when historic records showed surface DO to be consistently acceptable in the locations sampled. Because the data supporting the Aquatic Life Designated use assessment here are 5 years old or less, they are regarded as monitored (as opposed to estimated).

Ocean Water Biological Status Results

Of 454 square (statute*) miles assessed (Sandy Hook south to Cape May and out 3 nautical* miles) 100 percent of the surface waters have historically had adequate dissolved oxygen to support a healthy biota (see Table 3.3a-3). In contrast, surface water monitoring by NJDEP has found violations of DO criterion near the inlets of some south Jersey embayments.

Bottom waters, however, show a much different condition. All 454 assessed square miles of ocean bottom are in non attainment (sublist 5) due to a benthic low DO cell. This low DO cell forms off the coast during the summer months and breaks up in the fall. In contrast, the ocean assessment results presented in the last Integrated Report listed 30 percent of the waters in full attainment. Overall dissolved oxygen condition were worse in

* Statute mile equals 5280 feet; a nautical mile is 6080 feet.

this ’04 assessment, especially in the more southern waters of the State. The reason for the difference in conditions is not clear. The 2001 sampling period showed especially poor conditions in the frequency of criteria violations, much worse than prior years or that seen in 2002. This year was not in the computations of the 2002 Report.

The reasons for this the decline in DO levels in 2001 are not currently clear. One possibility suggested by the Bureau of Marine Water Monitoring was the die-off of mild to moderate algal blooms that occurred in early August of that year, just before the time frame when the lowest DO data were recorded. Contravening this argument, they indicated, is the observation that a more intensive (albeit still moderate) bloom was evident in the middle of the month with no corresponding decline in subsequent measurements. Examinations of the monthly mean precipitation for New Jersey fail to reveal clear cut relationships between drought or exceptional wet conditions and criterion violation frequency.

Although these short-term assessments appear to suggest worsening benthic conditions, data viewed over the long term reveal just the opposite (see figure 3.3). An assessment of EPA’s historical data by the Department’s Bureau of Marine Water Monitoring indicate that when viewed from the late 1970s to the present, there has been an observable reduction in these low DO conditions. The variability exhibited by the recent data dating back to the latter half of the 1990s (discussed previously) seem to fall within the variance of the data when observed in the short term. This improving trend is evident only when current data are compared with data collected from the late 1970s and early 1980s.

It is important to note that surface DO based upon historic monitoring by the EPA helicopter has found the DO in the surface regions of the waters listed on sublist 5 to be consistently acceptable.

Table 3.3a-3: Ocean Biological Status (Aquatic Life Assessment) Results Based Upon EPA Helicopter Sampling - Ocean Floor Only

Use Support Status	Square Miles	Percent of Assessed Waters	Integrated List
Full Attainment	0*****	0*****%	Sublist 1
Insufficient Data	0		Sublist 3
Non Attainment	454*****	100*****%	Sublist 5
Total	**454***	**100%**	

***** Applies to ocean floor only. Surface Waters have historically been in Full Attainment.

Some important considerations associated with these assessment results include:
Low DO generally occurs on the ocean bottom: When assessing data for the 2000 Inventory Report NJDEP observed that EPA data reveal that DO readings collected at one meter below the surface indicate acceptable DO. Almost all exceedances of criteria were recorded on the ocean bottom (one meter off the bottom). A subsequent review of historical data by EPA Region II has confirmed this. This is not consistent with samples collected by this Department of some near shore surface waters for NJDEP's Estuarine Monitoring Program. These samples showed that subsurface DO violations in near shore waters were occurring within the last 5 years[1]. Additional data within the water column are needed to characterize the volume of the low DO cells.

Low DO occurrences in the ocean were transient: USEPA personnel indicated that based on experience, the regions exhibiting low DO are transient, forming during the summer months and disappearing during the fall turnover and not forming again until the following summer when the waters re-stratify. (Randy Braun, USEPA, Region II; personal communication).

The biological impacts on the ocean floor are not known: DO concentrations provide a surrogate indicator of aquatic life designated use attainment and does not provide an assessment of actual biological conditions. In open waters, fish can avoid areas with low DO, and many crustaceans and other benthic inhabitants are naturally tolerant of temporary low DO conditions. The Department does not have data to characterize the status of the benthic community in these waters, therefore, the significance of temporary DO conditions below 5 mg/l to aquatic life uses is unclear.

The Department has observed evidence of extensive benthic mortality (e.g. shellfish) following the die-off of a massive region-wide marine algae (dinoflagellate) bloom in 1976. Other than this single isolated event, evidence of extensive benthic mortality has not been observed by the Department or EPA since EPA began monitoring ocean DO in the mid-1970's.
Biological data such as assessments of benthic invertebrate populations and the presence of recorded fish-kills would enhance this assessment. The Department is currently examining some potential assessment methods for near-shore benthic communities.

The Department lacks both annual and diurnal data: USEPA data used for this assessment were collected during the most stressful period of the year (June through August) when DO levels are lowest. Such data are not gathered to specifically assess the attainment of aquatic life designated uses year-round. In addition, night-time DO data would show how low DO declines, indicating how stressful the 24-hour cycle might be in these waters. Currently these data are not gathered.

Additional information that will aid in clarifying the aquatic life status and better characterize the DO status in the benthic waters are listed below:

- A characterization of the benthic biota (direct biological monitoring) for indications of impairment from inadequate DO.

[1] Dataset available at www.state.nj.us/dep/wmm/bmw

- Additional DO data to characterize diurnal and seasonal fluxes as well as vertical DO conditions within the water column. Characterization of diurnal DO fluxes could be accomplished through deployment of continuous water quality monitoring equipment.
- Nutrient data, concentrating on nitrogen and oxidation-demanding substances both within and flowing into the ocean area in question to characterize the sources of loadings to these waters.
- Water quality modeling to determine the significance of anthropogenic loading to coastal waters and their contributions to benthic DO recordings below 5 mg/l.

For additional recommendations and information regarding the management of coastal waters see "Maintaining and Improving Aquatic Life in Coastal Waters," below.

Coastal Aquatic Life Source and Cause Assessment Summary

Occurrences of low DO in the ocean has been attributed to a combination of natural processes and the anthropogenic input of nutrients. Ocean waters naturally stratify as they warm in the summer. As phytoplankton bloom and die during the summer, natural biological activity decomposes the algae which in turn reduces DO levels near the ocean floor. The rate, timing, and extent of phytoplankton cycles may be worsened by nutrient inputs from near shore waters.

USEPA (1999) attributed the low DO in the near shore waters to the oxygen demand created by river inputs, offshore sewerage treatment plant inputs (there are 15 outfalls in the New Jersey coastal waters), stormwater runoff and the influence of the plume from the Hudson/Raritan River estuary system. Atmospheric contributions to nutrient enrichment occur in the ocean but, in contrast to estuaries, their relative significance appears to be minor when contrasted to other inputs (NY-NJ Harbor Estuary Program, 1996).

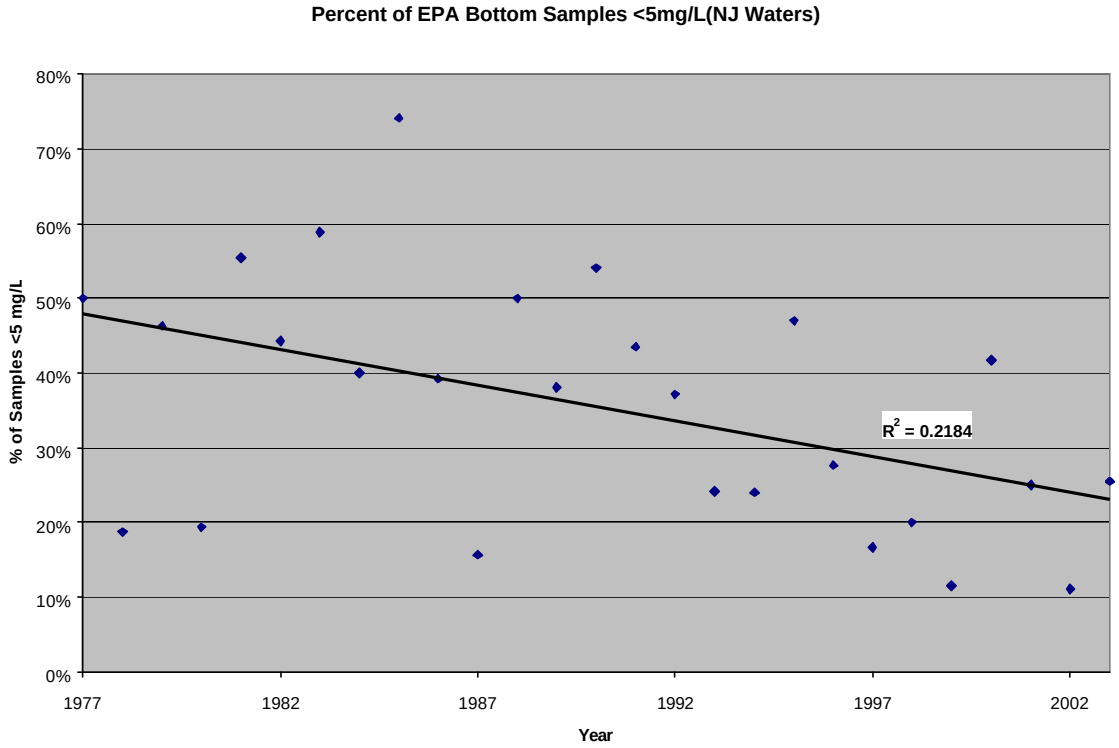
Maintaining and Improving Aquatic Life in Coastal Waters

Improve the basis for aquatic life assessments: Additional biological datasets will be explored and, as appropriate, integrated into future assessments of aquatic life in coastal waters.

Continue to monitor and assess air deposition of nutrients to coastal waters: NJDEP operates an Air Deposition Monitoring Network that includes nutrient data collection. This network is expected to provide important data related to nutrient fluxes to estuarine and ocean waters from air deposition. These nutrient fluxes, in addition to land based sources, may play an important role in algal blooms in these waters that contribute to episodes of low DO.

Manage nutrient loads to coastal waters: As appropriate, based on the assessments above, additional measures to manage nutrient loads to coastal waters may be needed. It is important to observe that pollution sources influencing ocean impairment and their remediation are interstate in nature. Management measures within the waters discussed here must be the responsibility of New Jersey, New York City and New York State. A nutrient Total Maximum Daily Load (TMDL) analysis is being planned through the New York-New Jersey Harbor Estuary Program to address the contributions from the Hudson-Raritan River Estuary system.

Figure 3.3:


Percent of EPA Bottom Samples <5mg/L(NJ Waters)
% of Samples <5 mg/L
80%
70%
60%
50%
40%
30%
20%
10%
0%
1977
1982
1987
1992
1997
2002
Year
R2 = 0.2184

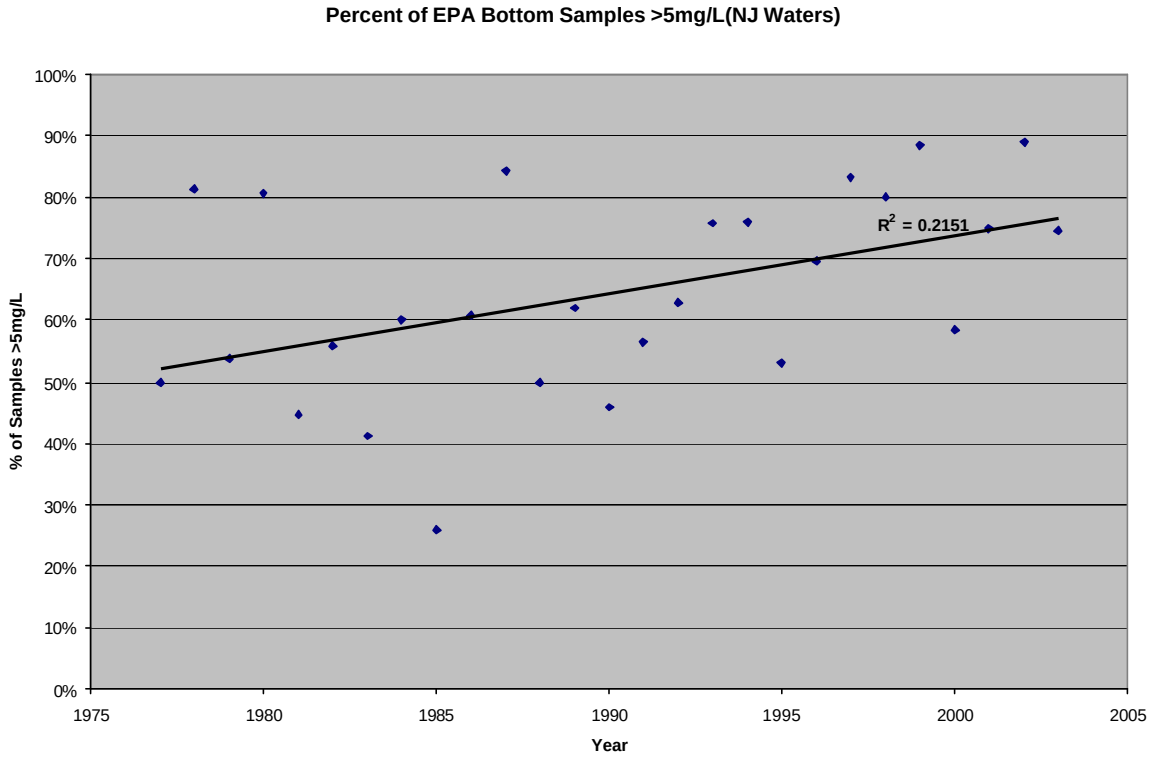

Percent of EPA Bottom Samples >5mg/L(NJ Waters)
% of Samples >5mg/L
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
1975
1980
1985
1990
1995
2000
2005
Year
R2 = 0.2151

FIGURE 3.3a-1. Monitoring Network for Aquatic Life Designated Use.

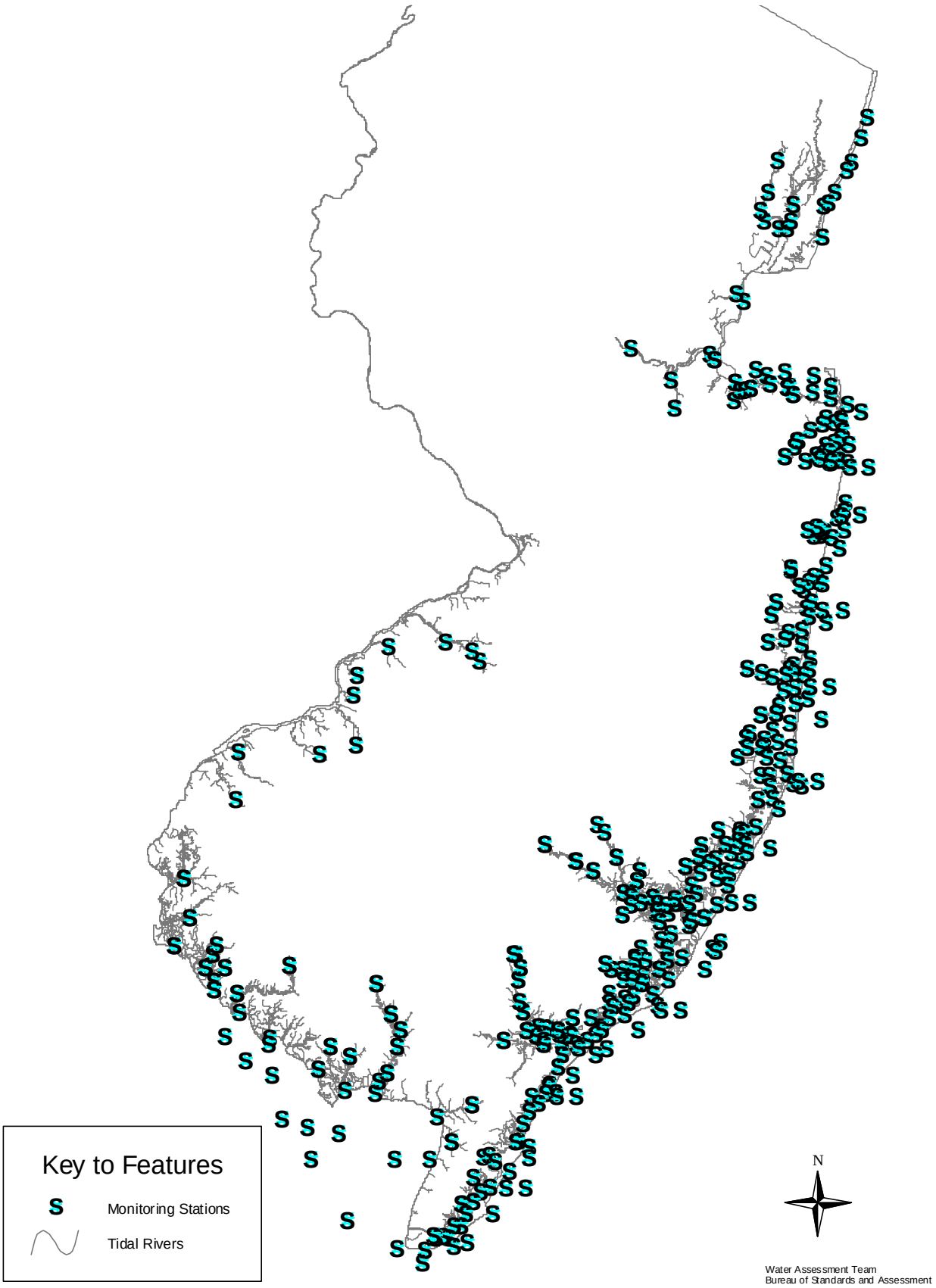
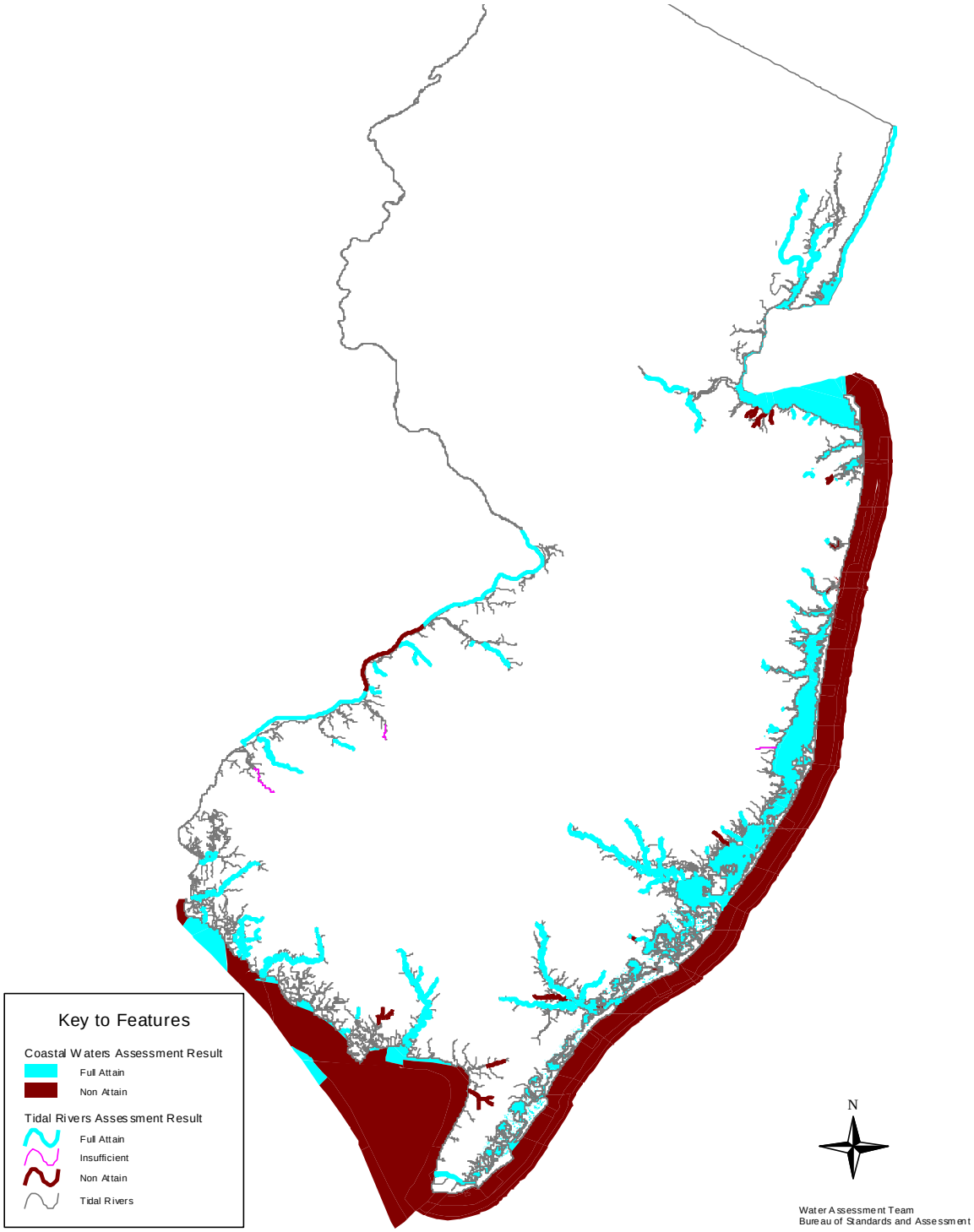


FIGURE3.3a-2. Aquatic Life Assessment for Coastal Waters and Tidal Rivers.



Section 3.3b Coastal (Estuarine and Ocean) Recreational Designated Use Assessment

New Jersey's coastal beaches and waterways are intensely used for recreational purposes. This resource includes 138 bay monitoring stations covering about 4 miles and 179 ocean stations covering 127 miles. In addition, over 800 square miles of tidal estuarine rivers, shallow back bays, and larger bays such as the Delaware Bay form an inner-coastal estuarine network (Fig. 3.3b-1). New Jersey's ocean jurisdiction extends to 3 nautical miles off-shore equating to 454 square miles. Ocean and bay resources are widely used for swimming, boating, commercial and recreational fishing and shellfish harvest. Thus, there are ample opportunities for direct contact with these waters and high sanitary quality is very important for the protection of public health, New Jersey's economy which relies on this resource, and public enjoyment of this valuable resource.

Coastal Recreational Designated Use Assessment Method

Descriptions regarding the assessments of recreational designated use supports for coastal waters are contained in section 6.2 of the Methods Manual.

Recreational designated use attainment was assessed using several datasets:

- Cooperative Coastal Monitoring Program obtained beach closure data from over 6000 samples collected between 1999 and 2002. The data were used to assess recreational uses at designated ocean and bay bathing beaches. Data are managed in an in-house database.

- Marine and Coastal Water Quality Monitoring Program examined fecal coliform data from over 600 samples collected between 1995 and 1997 and these were used to assess recreational use attainment in tidal rivers and estuaries. Data are managed in USEPA's STORET database. This report is available on the NJDEP website: www.state.nj.us/dep.

- USEPA Beach Station Network collects enterroccoci and fecal coliform data once a week from forty-four stations from Sandy Hook to Cape May. Samples are collected just offshore in the surf zone at one-meter depth (USEPA, 2003). (See Figure 3.3b-1)

These data and an assessment of ocean pollution sources were used to assess recreational use attainment in the ocean.

Spatial Extent of Assessment of Ocean and Estuarine Waters: 138 back bay beaches estimated to be 150 feet long (beachfront) x 100 feet wide (3.9 square miles); 127 miles of ocean beaches estimated to be 150 feet wide.


Figure 3.3b-1
New Jersey Coast Station Locations
New Jersey
Sandy Hook (JC01A)
Sandy Hook (JC03)
Sandy Hook (JC05)
Sea Bright (JC08)
Monmouth Beach (JC11)
Long Branch (JC13)
Long Branch (JC14)
Asbury Park (JC21)
Bradley Beach (JC24)
Shark River Inlet (JC26)
Belmar (JC27)
Spring Lake (JC30)
Spring Lake (JC33)
North Manasquan Inlet (JC35)
South Manasquan Inlet (JC37)
Bay Head (JC41)
Mantoloking (JC44)
Silver Beach (JC47A)
Lavallette (JC49)
Seaside Heights (JC53)
Island Beach State Park (JC55)
Island Beach State Park (JC57)
Island Beach State Park (JC59)
Barnegat (JC61)
Harvey Cedars (JC63)
Ship Bottom (JC65)
Beach Haven Terrace (JC67)
Beach Haven Heights (JC69)
Brigantine (JC73)
Absecon Inlet (JC74)
Atlantic City (JC75)
Ventnor City (JC77)
Longport (JC79)
Ocean City (JC81)
Peck Beach (JC83)
Strathmere (JC85)
Sea Isle City (JC87)
Avalon (JC89)
Hereford Inlet (JC92)
Wildwood (JC93)
Two Mile Beach (JC95)
Cape May Inlet (JC96)
Cape May (JC97)
Cape May Point (JC00)
Beach Sampling Locations
0 10 20 Miles
N
-4-

Coastal Recreational Designated Use Assessment Result

*Estuarine Water*s

As with the Aquatic Life Designated Use results reported above, estuarine waters are reported separately as open estuarine water and as tidal river miles in this section. Of 616 square miles assessed of open estuarine waters (from the Raritan Bay to the tip of Delaware bay), 309 sq. miles (50%) fully met recreational uses and 2 sq. miles (0.3%) did not support recreational uses. (Table 3.3b-1). The region of nonsupport was in the Maurice River and Cove. The remaining 305 sq. miles (49.7%) of estuary designated as having insufficient data necessary to make an assessment are located in the vicinity of Delaware Bay (Sublist 3).

Of the 192 miles of tidal rivers assessed (Table 3.3b-2), 112 miles (59%) were assessed to be in full attainment, and 58 miles were in non attainment (30%). Areas of nonsupport included: Matawan, Waackaack, Chingarora and Luppatatong Creeks, all tributaries to the Raritan Bay; and the lower Maurice River (see Fig. 3.3b-1). Insufficient data was available for 22 miles (11%).

Table 3.3b-1: Open Water Estuary Recreational Use Assessment Results

Use Support Status	Monitored Square Miles	Percent	Integrated List
Full Attainment	309	50%	Sublist 1
Insufficient Data	305	49.7%	Sublist 3
Non Attainment	2	0.3%	Sublist 5
Total	**616**	**100%**	

Table 3.3b-2: Tidal River Recreational Use Assessment Results

Use Support Status	Monitored River Miles	Percent	Integrated List
Full Attainment	112	59%	Sublist 1
Insufficient Data	22	11%	Sublist 3
Non Attainment	58	30%	Sublist 5
Total	**192**	**100%**	

Spatial Extent of Assessment for Estuarine Waters: Tidal rivers and back bays from Raritan Bay to and including, Delaware Bay (807 square miles).

Ocean Waters

An assessment of USEPA's Beach Station Network found the geometric mean for fecal coliform counts for the New Jersey coastal stations were below the SWQS (geometric mean of 50/100ml). Two enterococcus counts exceeded the SWQS sample maximum of 104 enterococci per ml. The exceedances, 115 and 240 enterococci per 100 ml, occurred at Long Branch (JC14) on July 24 and Mantoloking (JC44) on August 28, respectively. The geometric mean of 35 enterococci per ml was not exceeded. Data collected by the Department's Coastal Cooperative Monitoring assessed two coastal beaches as impaired (York Street and Brown Street, both in Monmouth County).

The recreational designated use assessment results in all ocean waters are shown on Table 3.3b-2. Of 454 square miles assessed, greater than 99% fully met recreational designated uses.

Table 3.3b-2: Ocean Recreational Use Assessment Results

Use Support Status	Monitored Square Miles*	Percent	Integrated List
Full Attainment	454	100%	Sublist 1
Insufficient Data	0	NA	Sublist 3
Non Attainment	<1	<1	Sublist 5
Total	**454**	**100%**	

* Square miles are based upon the miles of linear coast line (Sandy Hook to Cape May) and out 3 nautical miles off-shore.

Estuarine and Coastal Recreational Designated Use Source and Cause Assessment
Although recreational designated uses were largely met in NJ's estuarine and ocean waters, localized problems occur. The following provides a qualitative assessment of the sources of fecal coliform where levels are above background levels.

Sources of fecal coliform that may affect NJ's estuarine and ocean waters include:

- Municipal Stormwater and Runoff – there are over 7000 storm drains that discharge to river and bay estuarine waters. Stormdrains and overland runoff can be a source of fecal coliform pollution from pets and other wildlife. More stormdrains are installed each year as coastal areas are developed; runoff increases as impervious areas increase. Through NJ's Sewage Infrastructure Improvement Act Program, cross-connections and inter-connections with sanitary sewer lines have been investigated and largely corrected.

- Wildlife – congregations of seagulls are a suspected source of fecal coliform pollution in some areas.

- Sanitary Discharges from Boats – although boaters are encouraged to use pump-out stations and No Discharge Zones have been established in some areas, some sanitary discharge from boats still occurs.

- Municipal Sewage Treatment Plants (STPs) – There are 15 municipal STPs that discharge to the ocean in NJ. Improvements in estuarine water quality occurred as coastal STPs were regionalized and upgraded in the 1980's. Although compliance with fecal coliform limits is generally very good, localized problems still occur. For example, sewer line blockage closed beaches in Atlantic City six times in 1999.

- Transport from Non-tidal Rivers - The sanitary quality of nontidal rivers is poor, and recreational designated uses are largely not met in these rivers. Sources of fecal

coliform pollution to non-tidal rivers include municipal stormwater and runoff, combined sewer overflows, sanitary sewer overflows, and wildlife (primarily geese).

- Transport from Lakes – Field investigations have revealed that lake outlets have lead to bathing beach closures.

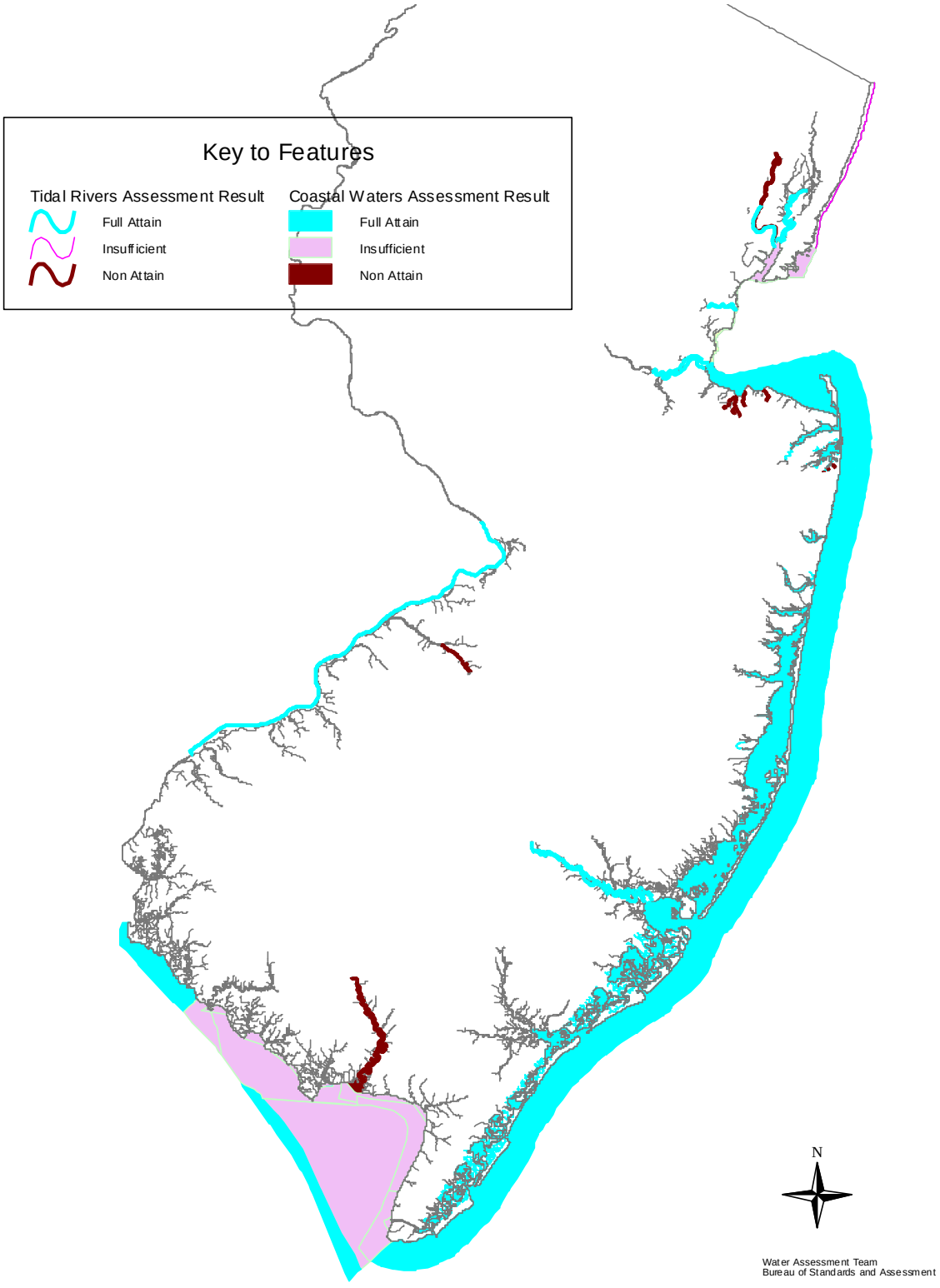
Maintaining and Improving Recreational Designated Use Attainment in Coastal Waters

- The Department will continue to perform aerial surveillance of nearshore coastal waters. This enables the routine evaluation of coastal water quality and the assessment of the nature and extent of ocean pollution. Six flights per week, excluding Wednesdays, include surveillance of Raritan Bay, the Lower New York Bay, and the Atlantic coast from Sandy Hook to Barnegat Inlet. Flights on Thursdays and Sundays are extended to include the area from Barnegat Inlet to Cape May Point.

- As part of the New York-New Jersey Harbor Estuary Program Floatables Action Plan, flight activities are coordinated with the United States Environmental Protection Agency (USEPA) and the United States Army Corps of Engineers' effort to capture floating solid waste and debris, also known as floatables, with water-skimming vessels. Sources of floatables that have affected the State's coastal shores include stormwater outfalls, combined sewer overflows, operational landfills, and illegal dump sites. Surveillance flights continue to record a decrease in the quantity of floatables in the coastal waterways compared to the years prior to 1990.

- A reduction of fecal coliform from freshwaters is expected through the development and implementation of TMDLs for fecal coliform pollution in rivers that flow to estuaries. This reduction is expected to have a positive influence on fecal coliform concentrations in coastal waters.

FIGURE 3.3b-1. Recreational Designated Use Attainment Status in Coastal Waters and Tidal Rivers.



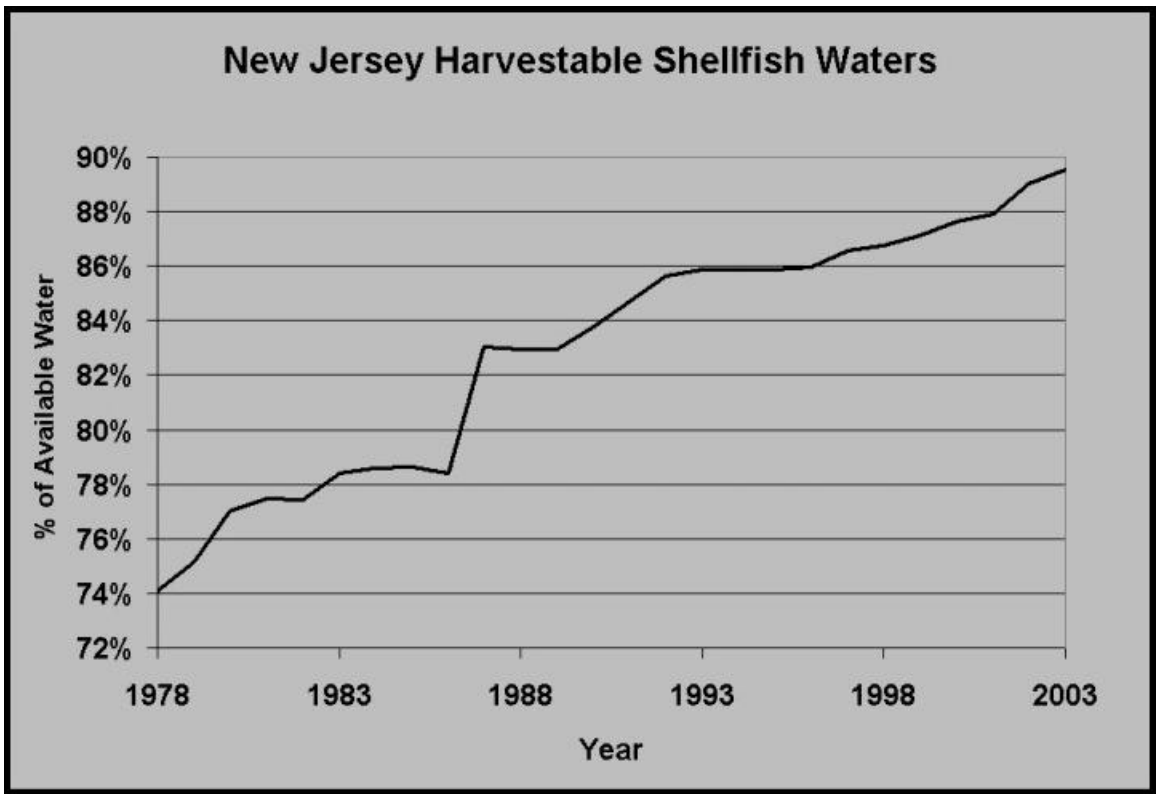
Section 3.3c Shellfish Consumption Designated Use Assessment

The National Shellfish Sanitation Program (NSSP) collects data on the levels of total coliform in shellfish and waters that are harvested for shellfish. These data were used to develop the shellfish consumption portion of the fish and shellfish consumption designated use assessment. This network has not changed since the 1996 Water Quality Inventory Report.

The Department monitors the sanitary quality of estuarine and ocean waters by observing measurements of coliform bacterial concentrations (indicators of the presence of pathogens) in the water column. The results are used to classify bay, estuarine, and ocean waters for shellfish harvesting and analyze for compliance with federal standards. In addition, shoreline surveys and hydrographic tracing are performed to identify pollution sources. Monitoring is focused on areas with the potential for a harvestable shellfish resource. Details of the assessment methodology are outlined in Section 6.5 of the Methods Document.

New Jersey has been a national leader in maintaining and enhancing waters available for shellfish harvest. The shellfish waters that support harvesting have increased from 74% in 1978, to 89% in 2003. (See Figure 3.3c-1).

Figure 3.3c-1. New Jersey Harvestable Shellfish Waters.



Waterbodies designated as prohibited solely for administrative purposes are not automatically labeled impaired. Where existing surface water quality data exists, the actual water quality is used for the assessment. If no data exists then the waterbody is unassessed. Areas around sewage treatment plants discharging to the ocean and designated as areas prohibited for the harvest of shellfish as a precautionary measure are listed as Full Attainment based on existing water quality.
Other administratively closed areas such as lagoons and docks have been placed on sublists 1 or 5 if data exists. If data are not available, the waterbodies are placed on sublist 3. Tables 3.3c-1, 3.3c-2 and 3.3c-3 below summarize the assessment results for open water (ocean), back bay and tidal rivers, respectively. It should be noted that the results for the ocean and back bay areas are calculated in square miles while the tidal river assessment is calculated in river miles.

Table 3.3c-1: Ocean Water Shellfish Consumption Designated Use Results

NSSP Classification	**Monitored Square Miles**	**Percent**	**Integrated List**
Approved or Administratively Prohibited with data showing compliance with SWQS	416	92%	Sublist 1
Non attaining, no TMDL needed	<1	<1%	Sublist 4
Prohibited with data showing non compliance with SWQS or Special Restricted or Seasonal	37	8%	Sublist 5
Prohibited with no data	<1	<1%	Sublist 3
Total Miles	453		

Table 3.3c-2: Open Estuary Shellfish Consumption Designated Use Results

NSSP Classification	**Monitored Square Miles**	**Percent**	**Integrated List**
Approved or Administratively Prohibited with data showing compliance with SWQS	455	76%	Sublist 1
Prohibited with data showing non compliance with SWQS or Special Restricted or Seasonal	145	24%	Sublist 5
Prohibited with no data	<1	<1%	Sublist 3
Total Miles	600		

Table 3.3c-3: Tidal River Shellfish Consumption Designated Use Results

NSSP Classification	Monitored River Miles	Percent	Integrated List
Approved or Administratively Prohibited with data showing compliance with SWQS	30	3%	Sublist 1
Prohibited with data showing non compliance with SWQS or Special Restricted or Seasonal	880	97%	Sublist 5
Prohibited with no data	0		Sublist 3
Total	910	100%	

Overall, waters meeting full attainment for the Shellfish Designated Use improved since the 2002 Report. Areas designated as Full Attainment in the open ocean and back bays increased from 86% to 92% and 73% to 76%, respectively. The status in the tidal rivers stayed the same.

Shellfish Consumption Source and Cause Assessment

As part of *The 1995 National Shellfish Register* (NOAA 1997) NJDEP's Bureau of Marine Water Monitoring supplied information to NOAA on individual shellfish growing areas within state jurisdictional waters. They were also asked to identify the presence of twelve different sources of pollution including agricultural feedlots and Marinas grouped into three broader categories: point, nonpoint and upstream sources. In estuarine waters, marinas, boating, urban runoff and stormwater were identified as major contributing factors impacting shellfish. In offshore/ocean waters, nonpoint source urban runoff continues to have a negative impact.

There has been a trend toward general improvement in water quality in the estuaries since domestic waste discharges were relocated to offshore areas. In addition, many previously unsewered areas have become sewered. There are still a few isolated instances where water quality is still adversely affected by input of inadequately treated domestic waste.

Marinas have been identified as potentially affecting the suitability of shellfish growing areas. All confines of a marina are automatically designated as *Prohibited*. A buffer area may also be included in the *Prohibited* classification accounting for the size of the marina and the size of boats. This is a precautionary measure similar to the buffer around sewage outfalls.

Recreational activities may also have a seasonal impact on these waters. In 1997, "No Discharge Zones" under the Clean Vessels Act were instituted in some areas such as the Manasquan River, Shark River, Shrewsbury and Navisink Rivers. The discharging of human waste from boats into the estuary/bays in these areas is prohibited. These requirements are expected to facilitate further improvements in water quality in the estuaries.

FIGURE 3.3c-1. Shellfish Monitoring Network.

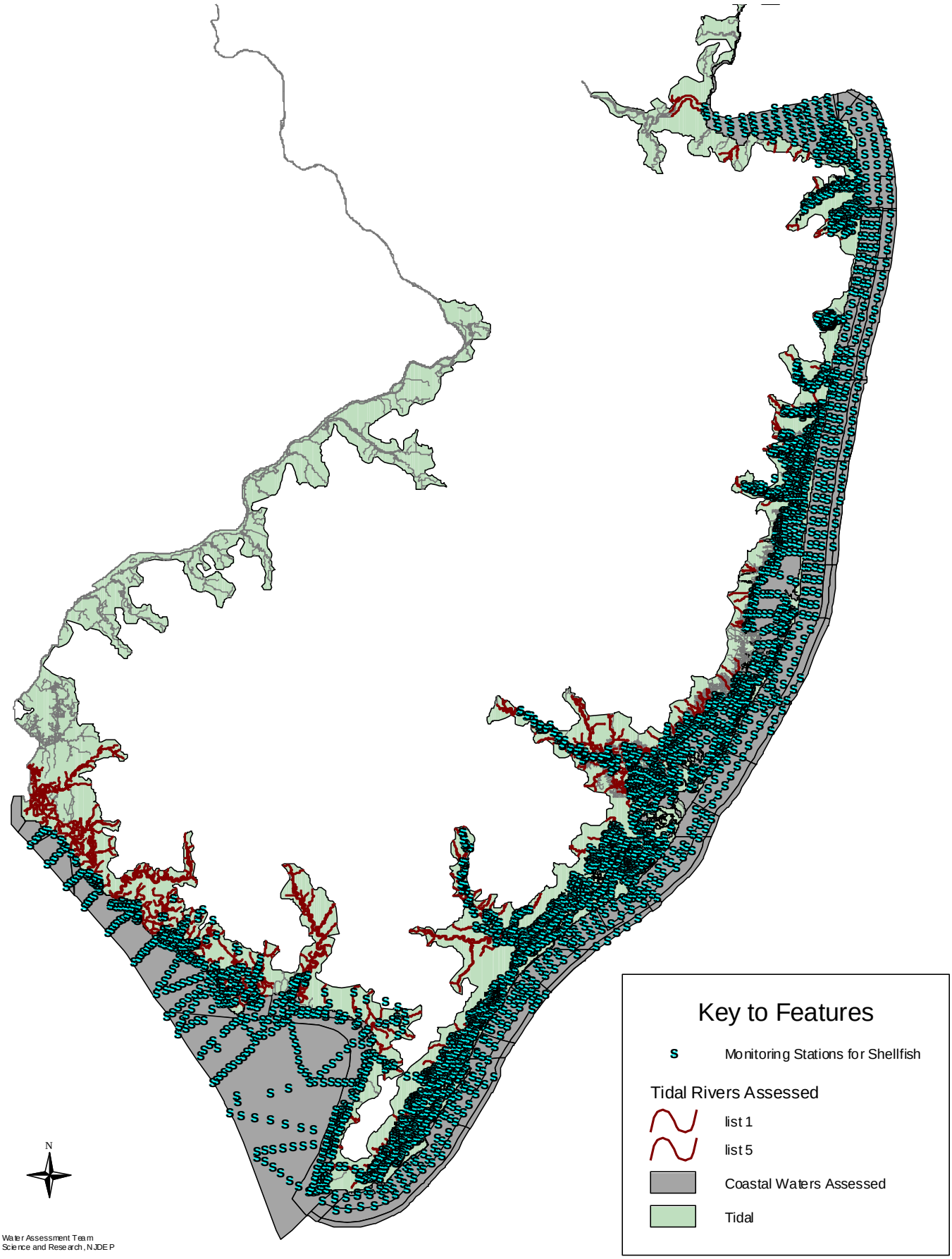
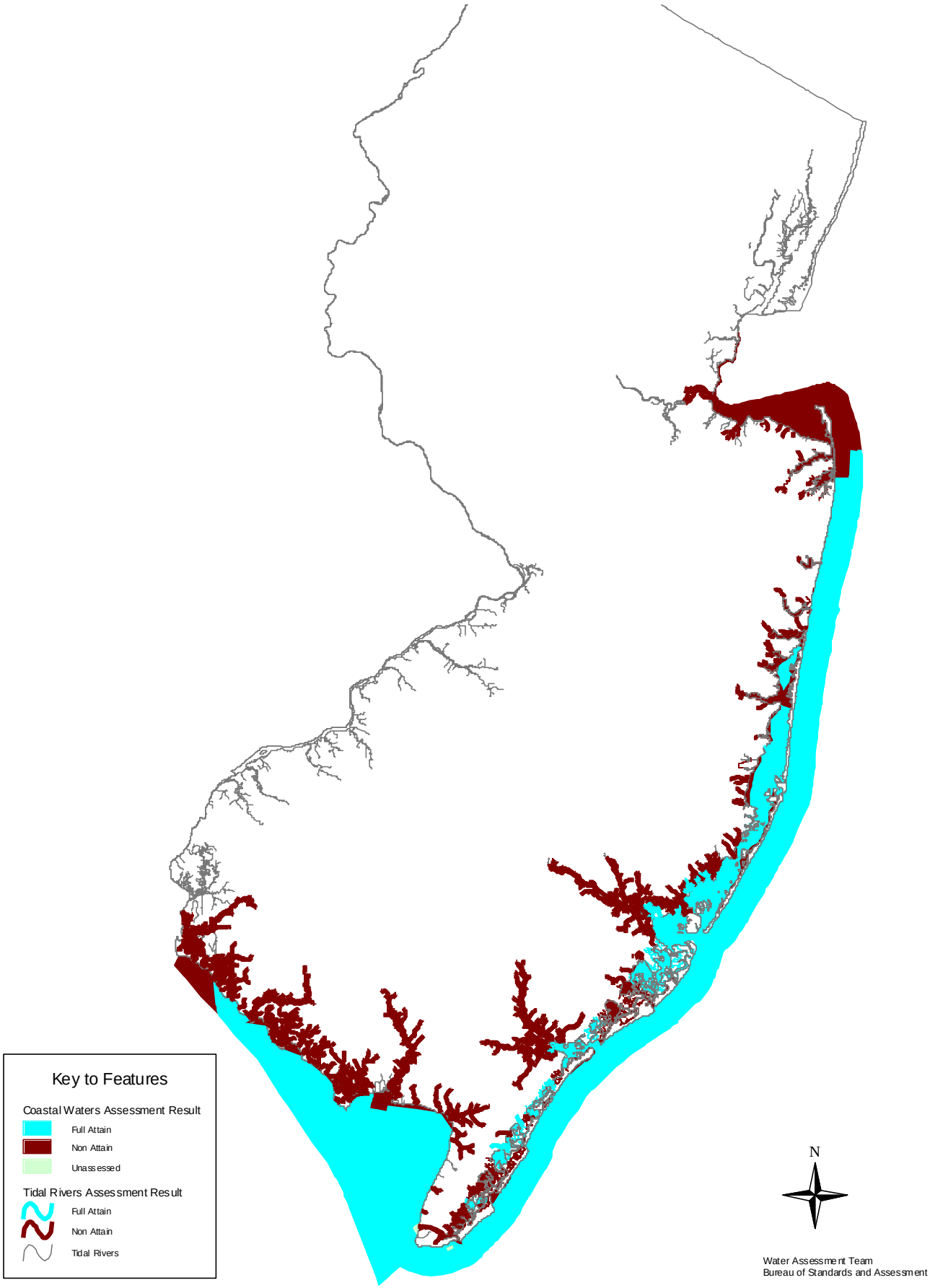


FIGURE 3.3c-2. Shellfish Assessment Status for Coastal Waters and Tidal Rivers.



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3.3d New York/New Jersey Harbor Water Quality

Background

Based upon historical data assessments for metals, NJDEP originally had concerns that metal levels in the NY-NJ Harbor water column were exceeding surface water quality standards (SWQS) due to point source discharges. An initial assessment of historical data indicated exceedances of SWQS for silver (Ag), mercury (Hg), arsenic (As), cadmium (Cd), lead (Pb), zinc (Zn), nickel (Ni), and copper (Cu) concentrations throughout the Harbor. In 1991 and 1992, additional ambient and point source data were collected using the latest trace metal sampling techniques. The results of the sampling indicated significantly lower metal concentrations compared to the historical data. Exceedances of metal criteria were found only for mercury. The conflicting results were mostly attributed to sample contamination and lower laboratory procedure precision used in collecting and analyzing the historical data.

Additional water quality assessments in the Harbor included the development of a water quality model that predicted possible exceedances of chronic water quality criteria for three metals: copper, nickel, and lead (Hydroqual, 1994). However, it was noted that the data collected for the water quality model focused on New York's waters, but was used to predict water quality exceedances in New Jersey's waterbodies. While the model projected exceedances in these waterbodies, the available ambient data indicated that existing loads were adequate to meet applicable water quality standards. As a result of the various assessments, NJDEP concluded additional sampling of metal data were required to provide conclusive evidence of the current conditions of the water column in the Harbor.

Phase I TMDL

As part of the Phase I TMDL for the NY-NJ Harbor, municipal and industrial loads to the Hackensack River, Passaic River, Raritan River, Newark Bay, and Raritan Bay were limited to their existing loads (also known as existing effluent quality or EEQs) (see Federal Register Notice 59FR41293)**.** In addition to establishing these EEQs, additional data collection and modeling for copper, nickel, and lead were required for these waters. The New Jersey Harbor Discharge Group (NJHDG) agreed to conduct the necessary monitoring and modeling.

The monitoring and analysis was conducted by the Great Lakes Environmental Center (GLEC), on behalf of the NJHDG, to determine whether Cu, Ni, Pb, and Hg were present at levels exceeding the SWQS. Data collection was conducted on the Hackensack River, Passaic River, Raritan River, Newark Bay, and Raritan Bay for the four metals of concern.

Although numerous water quality criteria exceedances were projected for New Jersey tributaries, Raritan Bay, and Newark Bay based upon modeling using the 1991 data; the more comprehensive data set collected in 1995 resulted in few potential water quality exceedances predicted with the exception of mercury. Copper and lead concentrations at all sites were below the SWQS, and nickel concentrations were below the criterion in Raritan Bay, Newark Bay, Raritan River, and Passaic River. However, statistical analysis of nickel concentrations in the Hackensack River predicted exceedances of the criterion. In addition, mercury was predicted to exceed in all waters with the exception of Raritan Bay (Great Lakes Environmental Center, 1996).

Phase II Arthur Kill and Kill Van Kull

The 1991 statistical data evaluations for copper in the Arthur Kill and Kill Van Kull did not show potential exceedances, however, model projections did predict exceedances. No actual measurements exceeded the criterion. As a result of the findings made under Phase I, NJHDG, NJDEP, and EPA developed a Phase II Metals TMDL Monitoring and Modeling Program that focused on copper, nickel and lead in the Arthur Kill and Kill Van Kull. In addition, sampling of nickel in the Hackensack and Passaic Rivers were performed. Additional copper data were collected in 1997 during wet and dry conditions over a ten month period at four stations, two in the Arthur Kill and two in the Kill Van Kull. Data were also collected for combined sewer overflows (CSO), stormwater outfalls (SWO), and point source discharges. The model was re-applied using the more recent ambient data and New Jersey specific discharge data. A statistical projection of the ambient data and the model results both support the conclusion that the copper criterion was not likely to be exceeded in either the Arthur Kill or the Kill Van Kull (GLEC, 1998).

The 1991 model projected SWQS exceedances in the Arthur Kill and Kill Van Kull for nickel and lead based on the *total recoverable* form of the metal. Since that time, the water quality standards for nickel and lead in New Jersey changed to the *dissolved* form of the metal. As a result of this change in the standards, the potential for SWQS exceedances was re-evaluated based on the *dissolved* form. The probability distributions for ambient dissolved lead and nickel were re-analyzed and there were no projected exceedances. The water quality model was then revised to reflect the new dissolved criteria and also did not project any exceedances of criteria for lead or nickel in the Arthur Kill or Kill Van Kull (GLEC, 1998, Locicero, 1997).

Results

Nickel

The nickel criterion was not exceeded in the Raritan River/Bay and Newark Bay (GLEC, 1996). No exceedences of criteria for nickel were projected in the Arthur Kill or Kill Van Kull (GLEC, 1998); (Locicero, 1997). EPA also determined that the Passaic River did not exceed the criterion for nickel thus no TMDL was needed (USEPA, 1999). Furthermore, EPA is establishing the TMDL for nickel in the Hackensack River at the request of NJDEP.

Lead

The lead criterion was not exceeded in the Hackensack River, Passaic River, Newark Bay, and Raritan River/Bay (GLEC, 1996). No exceedence of criteria for lead were projected in the Arthur Kill or Kill Van Kull (GLEC, 1998); (Locicero, 1997).

Copper

Based on the report submitted by the NJHDG (GLEC, 1996), USEPA agreed that Newark Bay, Hackensack River below the Oradell Dam, Passaic River below the Dundee Dam, Raritan River below Fieldsville Dam, and Raritan Bay were not exceeding the criteria for copper, therefore, no TMDL is required (USEPA 1999). EPA withdrew the copper TMDLs for these waters (FR 49226, September 19, 1997), and also acknowledged that data analysis and modeling projections

(GLEC, 1998) supported delisting the Kill Van Kull and the Arthur Kill from the 303(d) List (USEPA, 1999).

Mercury

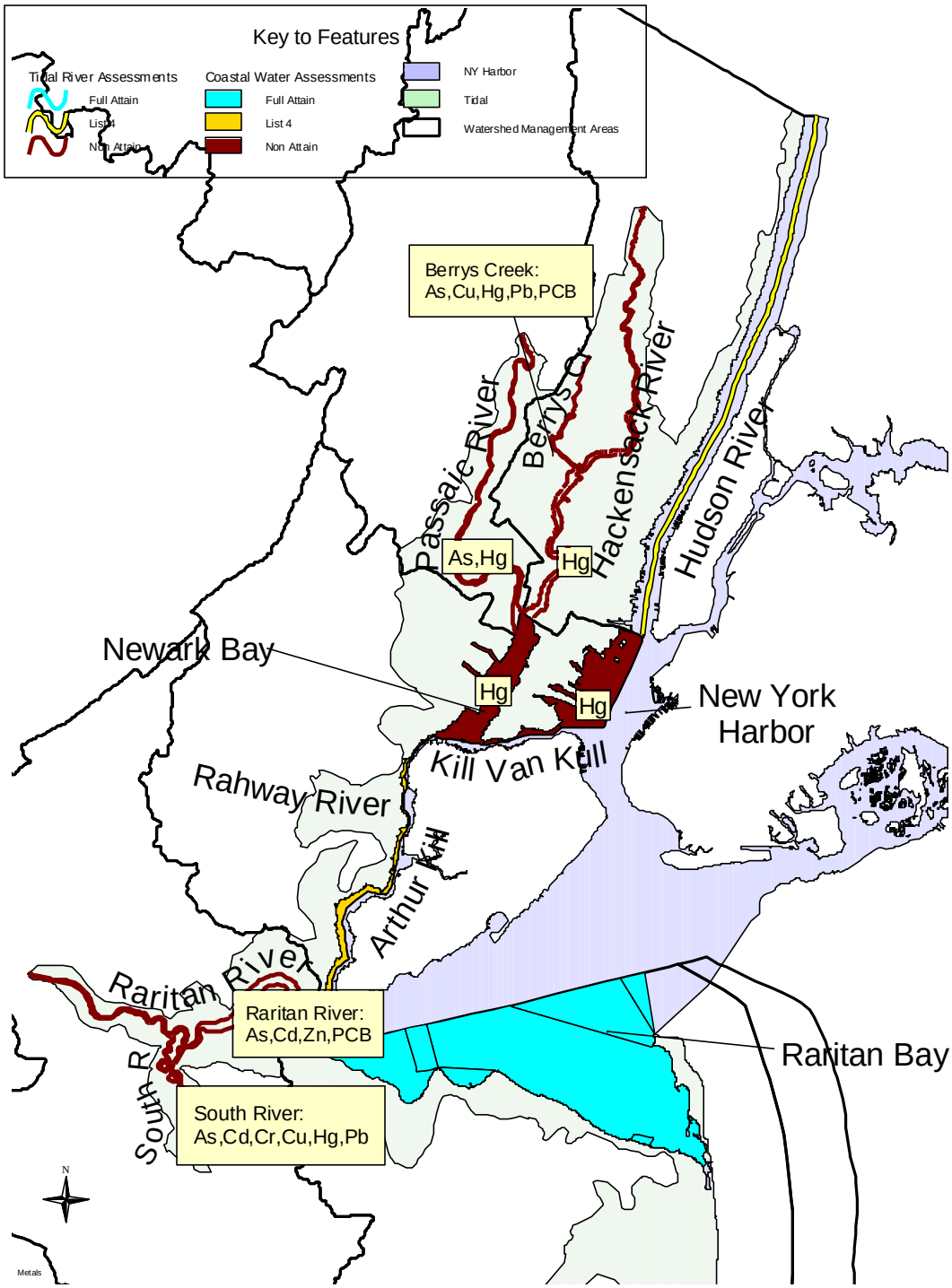
Mercury is exceeded everywhere except in Raritan Bay (GLEC, 1996).

Table 3.3d-1 2002 Metal Assessment Results for the NY-NJ Harbor Estuary

WATERBODY	***METAL RESULTS*** **1991 MODEL RUN**				***METAL RESULTS*** **1995 NJHDG Data**				**2002 303(d) List**
	Ni	**Cu**	**Pb**	**Hg**	**Ni**	**Cu**	**Pb**	**Hg**	
Passaic R	X	X	X	X				X	Sublist 4 Hg TMDL completed by EPA
Hackensack R	X	X	X	X	X			X	Sublist 4 Hg and Ni TMDL completed by EPA
Raritan R	X	X	X	X				X	Sublist 4 Hg TMDL completed by EPA
Raritan Bay	X	X	X	X					Attaining
Newark Bay	X	X	X	X				X	Sublist 4 Hg TMDL completed by EPA
Kill Van Kull	X	X	X	X				X	Sublist 4 Hg TMDL completed by EPA
Arthur Kill	X	X	X	X				X	Sublist 4 Hg TMDL completed by EPA

Note: In a Memorandum of Agreement (May 13, 1999), NJDEP and EPA established a schedule for development of TMDLs in New Jersey. Under this agreement, EPA committed to completing TMDLs for metals in New Jersey.

FIGURE 3.3d-1. Metals Status in the NY-NJ Harbor. The toxins PCB, Dioxin, PAH, and Pesticides are on sublist 5 for the entire Harbor.



Fecal Coliform and Dissolved Oxygen

Sampling of the interstate waters is conducted by the Interstate Environmental Commission (IEC) at the request of USEPA, Region II under the auspices of the New York- New Jersey Harbor Estuary Program (HEP). The network consists of 42 stations throughout the harbor complex. Some of these stations historically were monitored on the New York edge of the waterbody but were relocated to the mid channel to represent the interstate characteristics of the waterbody.

Overall, the harbor water quality from 1991-2001 is significantly better than pre-1990 conditions. This is the result of:

- construction and upgrading of water pollution control plants;
- increased maintenance of the sewage system (including over 6,000 miles of sewer main);
- increased management of combined sewer overflows;
- the ongoing abatement of illegal discharges; and,
- an enhanced Industrial Pretreatment Program that controls commercial discharges by requiring targeted industries to treat and remove toxics from their wastewater.

The sampling survey consisted of two runs per week for five weeks. The survey included wet and dry weather data. See Figure 3.3d-2 for station locations.

Fecal Coliform

The data met the requirements outlined in the Methods Document, i.e., 2 or more years of data, minimum 10 samples, and 5 samples within 30 days for geometric mean calculations. Samples were collected during the time of year when recreation is more prevalent and is considered representative of the waterbody with regards to the recreation designated use. The harbor area is primarily designated for secondary contact recreation (activities where the probability of ingestion is minimal, including boating and fishing). Data collected over the past five years were used to assess the fecal coliform levels in the harbor area (see Figure 3.3d-2 for station locations).

The most recent 5 years of IEC data (approximately 50 data points for each station) reveal violations of SWQS in less than 10% of samples (see Figure 3.3d-3 and Table 3.3d-2 for assessment results). This was expected as there has been much improvement in the sewerage infrastructure since these waterbodies were listed in the 1980's. In consideration of recent data, the Department has delisted the harbor waters for fecal coliform from Sublist 5. Normally waterbodies delisted by recent data showing compliance with SWQS would be placed on sublist 1 (Full Attainment). In this case, however, the Department placed these waterbodies on Sublist 3 (Insufficient Data for an Assessment) for recreational use. The reason for this is that although locating the stations in the mid-channel of the waterbody provides an adequate overview of the waterbody, the Department recognized that a majority of secondary recreation occurs closer to the shoreline rather than mid-channel. Hence, the Department questioned whether the mid channel stations would accurately reflect water quality near the shoreline which may be influenced by flows from CSOs. By placing these waterbodies on sublist 3, the Department is acknowledging the possibility of near shore impairments. Additional monitoring and modeling being conducted under the auspices of the NY-NJ Harbor Estuary Program will identify potential designated use impairments. In the meantime, the Department is working with IEC to reevaluate the location of sampling stations to better assess all impacts.

Dissolved Oxygen

Dissolved oxygen samples were collected at the surface and near the bottom of the water column monthly during the winter and weekly during the summer months. The assessment was based on approximately 90 samples collected from 1997 to 2001. All stations were assessed as fully attaining (see Figure 3.3d-4). The assessment results are summarized in Table 3.3d-3.

Table 3.3d-2. Assessment Results for Fecal Coliform in the NY-NJ Harbor Estuary

Station	Waterbody	SW Class	Years	FC SWQS (geomean/100ml)	FC (Top) Geomean (per 100ml)	Sample Number	FC (bottom) Geomean (per 100ml)	Sample Number	FC Assessment
KI	Kill Van Kull	SE2/SE3	1997-2001	770/1500	48	68	25	42	Attain
K2	Kill Van Kull	SE3	1997-2001	1500	45	62	9	41	Attain
K3	Arthur Kill	SE3	1997-2001	1500	11	63	110	39	Attain
K4	Arthur Kill	SE3	1997-2001	1500	55	67	53	41	Attain
K5	Arthur Kill	SE2	1997-2001	770	19	68	8	42	Attain
K5A	Raritan Bay	SE1	1997-2001	200(400)	10 (2%)	63	6 (0%)	40	Attain
K6	Raritan Bay	SE1	1997-2001	200(400)	2 (0%)	63	3 (0%)	40	Attain
N1	Hudson River	SE1	1997-2001	200(400)	29 (8%)	66	25 (3%)	36	Attain
N2	Hudson River	SE1/SE2	1997-2001	200(400)/770	34 (8%)	40	33(0%)	36	Attain
N3	Hudson River	SE2	1997-2001	770	47	40	46	35	Attain
N3A	Hudson River	SE2	1997-2001	770	48	41	42	35	Attain
N3B	Hudson River	SE2	1997-2001	770	46	67	37	36	Attain
N4	Hudson River	SE2	1997-2001	770	71	66	42	36	Attain
N5	Hudson River	SE2	1997-2001	770	45	66	17	37	Attain
N6	Hudson River	SE2	1997-2001	770	44	66	0	37	Attain
Location A –	Hackensack River, Secaucus	SE2	summer 2001	770	105	18			Attain
Location B –	Hudson River, Weehawken	SE2	summer 2001	770	115	18			Attain
Location C –	Upper NY Bay, Jersey City	SE2	summer 2001	770	16	18			Attain
Location D –	Newark Bay Hudson County Park;	SE3	summer 2001	1500	52	18			Attain
Location E –	Upper NY Bay, Jersey City	SE2	summer 2001	770	47	13			Attain

Table 3.3d-3. Assessment Results for Dissolved Oxygen in the NY-NJ Harbor Estuary

Station	Waterbody	SW Class	SWQS (not less than)	SWQS (24 hr avg.)	Years	DO: % violations Surface	DO: % violations Bottom	AL Use Attainment
KI	Kill Van Kull	SE2/SE3	4/3 mg/l	NA	1997-2001	0	0	Attain
K2	Kill Van Kull	SE3	4mg/l	NA	1997-2001	0	0	Attain
K3	Arthur Kill	SE3	4mg/l	NA	1997-2001	0	0	Attain
K4	Arthur Kill	SE3	4mg/l	NA	1997-2001	0	0	Attain
K5	Arthur Kill	SE2	3mg/l	NA	1997-2001	2	9	Attain
K5A	Raritan Bay	SE1	4mg/l	5mg/l	1997-2001	2	7	Attain
K6	Raritan Bay	SE1	4mg/l	5mg/l	1997-2001	0	0	Attain
N1	Hudson River	SE1	4mg/l	5mg/l	1997-2001	0	3	Attain
N2	Hudson River	SE1/SE2	4mg/l	5mg/l	1997-2001	0	2	Attain
N3	Hudson River	SE2	3mg/l	NA	1997-2001	0	0	Attain
N3A	Hudson River	SE2	3mg/l	NA	1997-2001	0	2	Attain
N3B	Hudson River	SE2	3mg/l	NA	1997-2001	1	1	Attain
N4	Hudson River	SE2	3mg/l	NA	1997-2001	0	6	Attain
N5	Hudson River	SE2	3mg/l	NA	1997-2001	0	3	Attain
N6	Hudson River	SE2	3mg/l	NA	1997-2001	0	1	Attain

FIGURE 3.3d-2. Station Locations for Dissolved Oxygen and Fecal Coliform Monitoring in the NY-NJ Harbor.

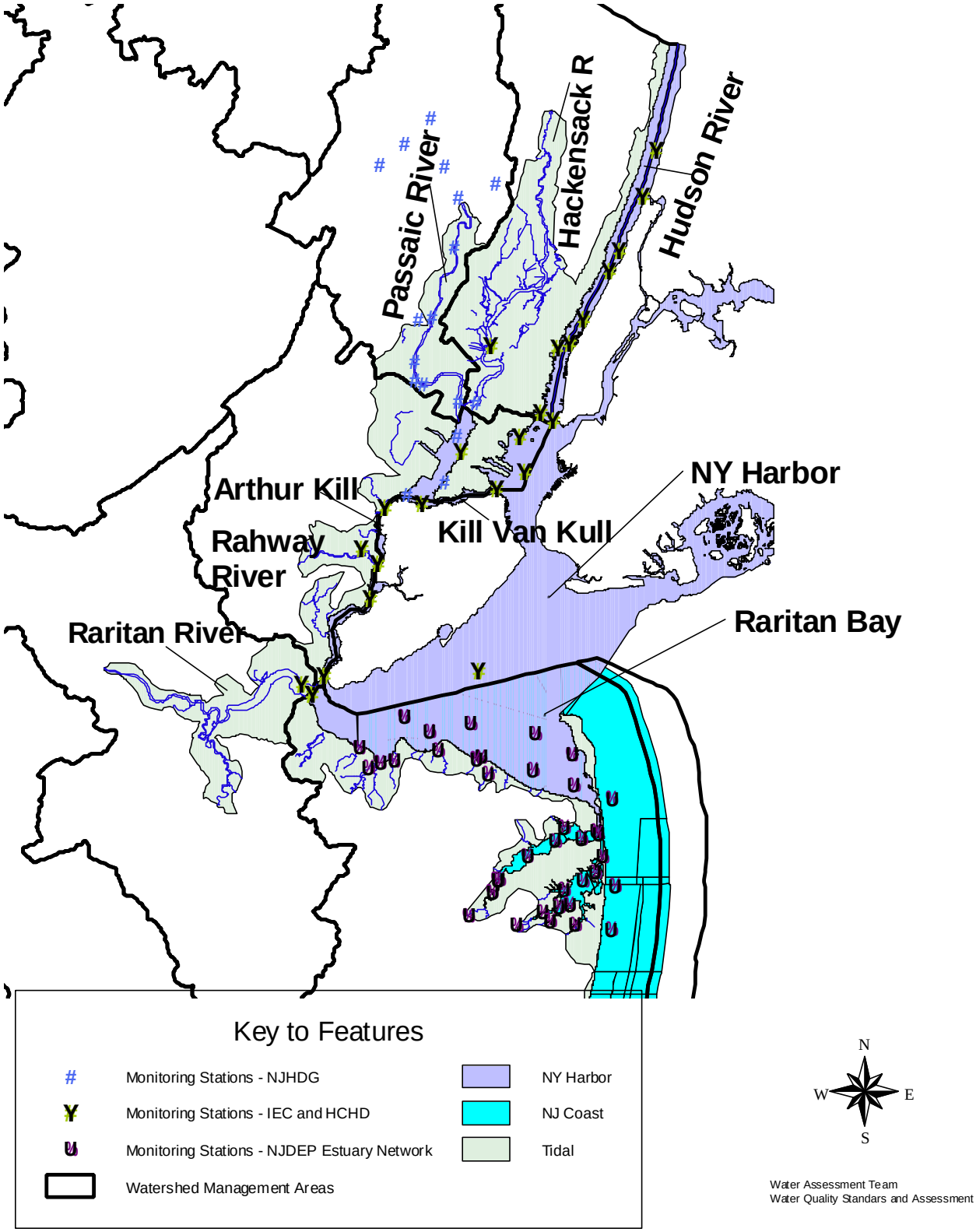


FIGURE 3.3d-3. Fecal Coliform Assessment Results.

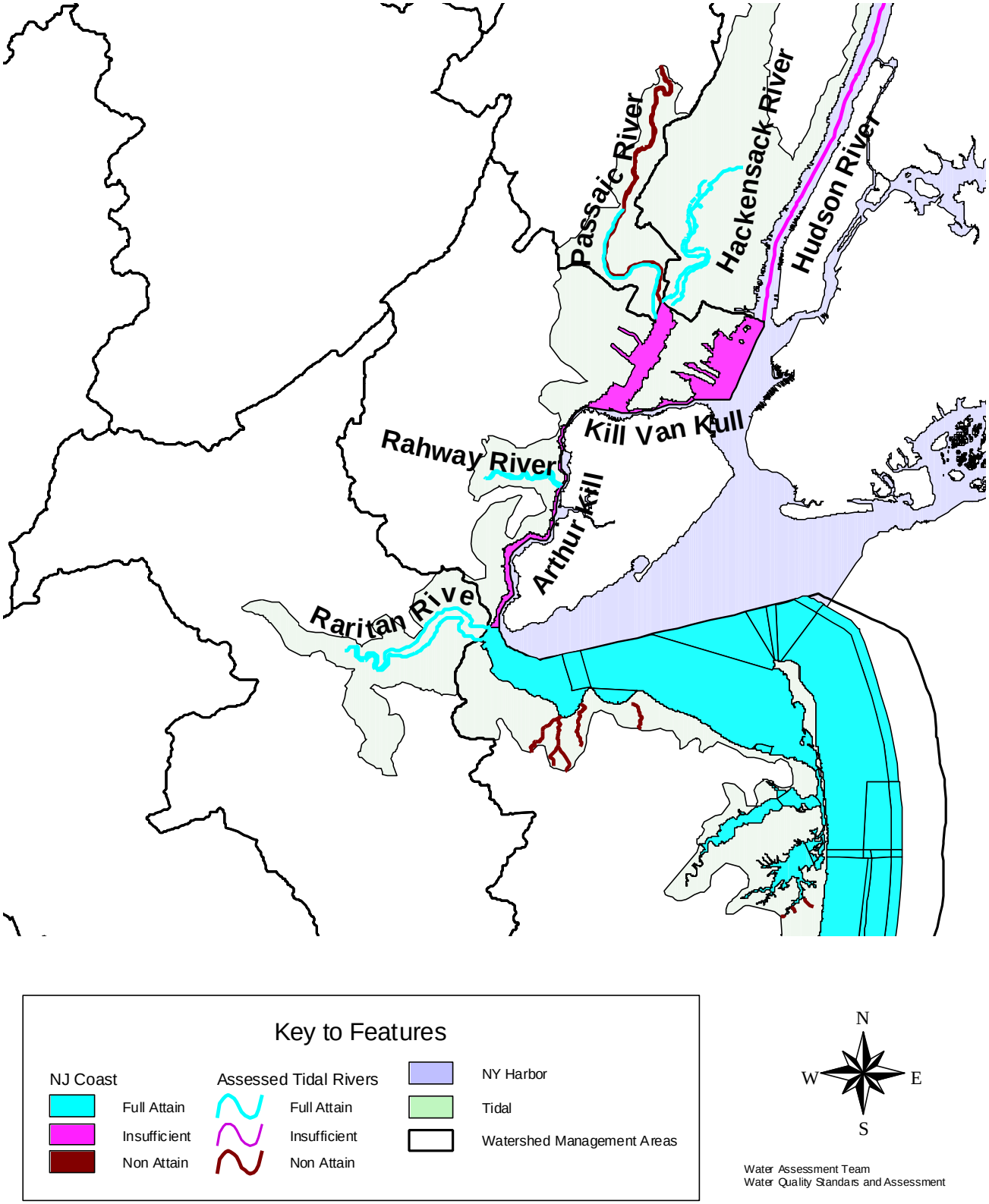
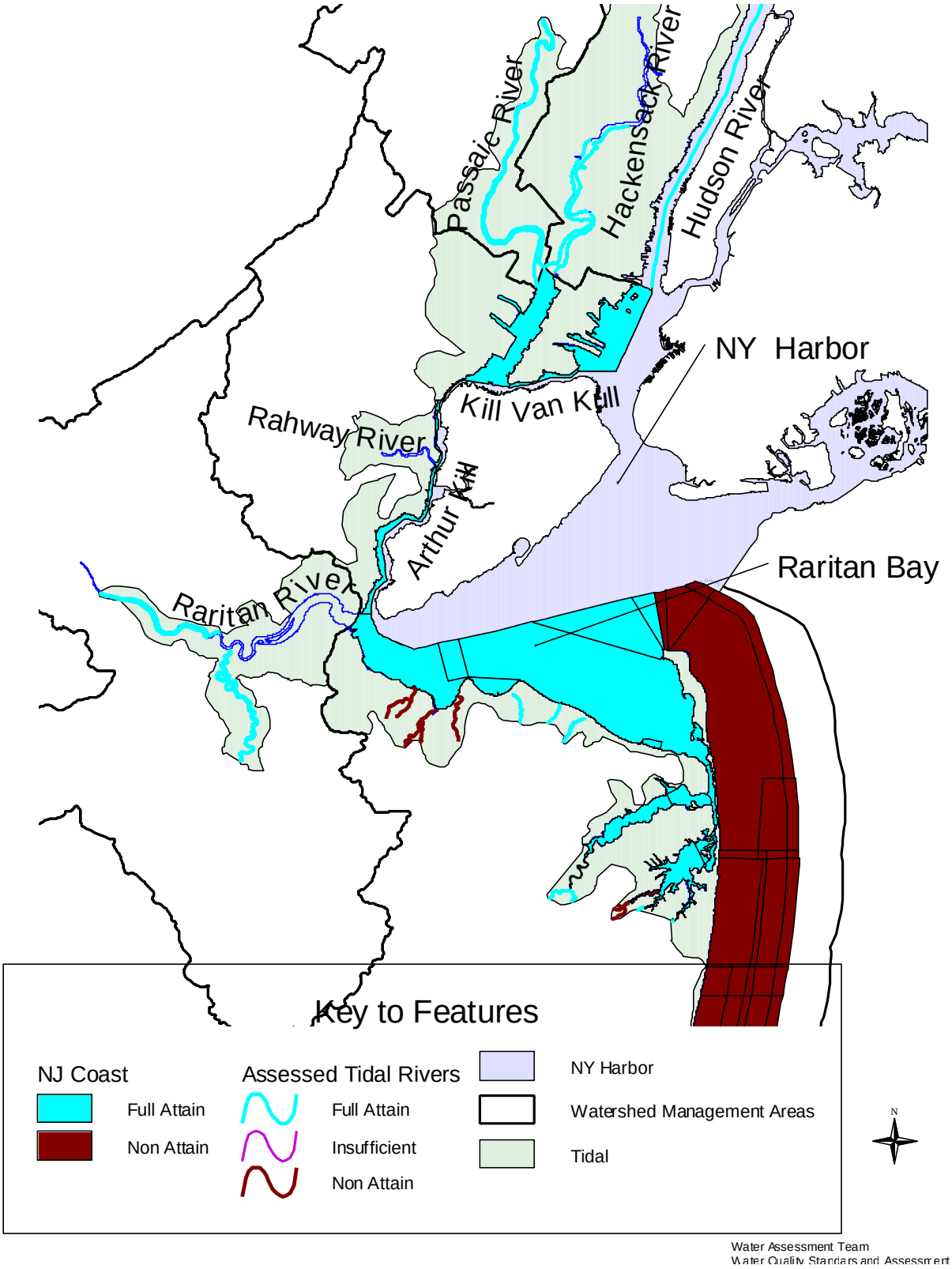


FIGURE 3.3d-4. Dissolved Oxygen Assessment Results.



Section 3.4: Fish Consumption Advisories

As far back as 1976, NJDEP instituted a comprehensive program to survey possible contamination of fish and shellfish in New Jersey waters. Several fish and shellfish species have been identified as having contaminants in excess of advisory levels (See Table 3.4-1 for PCB and Dioxin advisories and Table 3.4-2 for Mercury advisories, both located later in this section). In general, concentrations of various persistent chemical contaminants are often highest in animals at the top of the food chain (e.g., apex fish and wildlife species). Futher, fish from a number of sites around the state have been shown to contain contaminant concentrations above both federal and/or state thresholds. Identification of these findings prompted NJDEP and the Department of Health and Senior Services to issue health advisories on the consumption of several species of fish throughout the state targeted at specific waterways.

It must be recognized that using fish consumption advisories as indicators of local water quality is somewhat problematic. Some species which are migratory (e.g., American eel) that pick up contaminants downstream in urban areas and then migrate upstream were given "statewide" consumption advisories (i.e., even though these fish were primarily analyzed from the estuaries). The advisories were to conservatively protect fishermen/consumers upstream even though the contamination did not necessarily reflect local sources or conditions of water quality. Thus, assigning a waterway advisory where contaminated fish may have been caught (using a sampling/assessment methodology designed to evaluate impacts to consumers) may not be directly correlated with water quality degradation in a specific stream reach. In other words, migratory finfish are extremely mobile which makes associations between a contaminated fish and the actual location of contamination within the fishes' environment very tenuous. However, other species and locations (e.g., sunfish in a lake) can be representative of the water quality and contaminant exposure. Differing specie physiology and contaminant properties (e.g., organochlorides accumulating in fatty tissue) may result in only certain fish within a waterway presenting public health concerns whereas other fish are safe to eat.

Fish advisories are routinely listed at the NJDEP website (www.state.nj.us/dep/dsr/njmainfish.htm). Advisories for PCBs issued in January 2003 were based upon the EPA guidance document (USEPA November 2000; EPA 823-B-00-008). The Department sets consumption advisories through clearly defined risk assessments, although such assessments vary depending on the contaminant, because the risk they pose differ (i.e., cancer vs. non-cancer, etc). For example, for PCBs the Department uses a 10^{-4} (1 in 10,000) and 10^{-5} (1 in 100,000) lifetime cancer risk. In contrast, the mercury advisory is based upon neurologic development (i.e., non-cancer risk). Currently, New Jersey uses advisories for dioxin based upon recommendations by the FDA, however, the Department is reviewing the risk basis for this contaminant.

New Jersey shares jurisdictional waters with New York in the northern watersheds and Delaware/Pennsylvania in the south and west. Extensive cooperation and peer-reviews between states occurs in data analysis and in the formulation of each state's fish consumption advisories. These primarily affect national estuarine areas (NY-NJ Harbor Estuary and Delaware Estuary). For example in March 2004, New Jersey and Delaware announced consistent fish consumption advisories for the shared waters of the Delaware Estuary.

In marine waters NJDEP has been instrumental in developing coastwide fish-consumption advisories for bluefish an important recreational/commercial species, which is migratory from Florida to Maine. In 1986, after announcing NJ consumption advisories, NJDEP in conjunction with all the Atlantic States environmental and health departments organized, designed and successfully sought federal funding for a coastwide bluefish study. The study performed by NOAA and EPA showed that contaminated bluefish posed the same consumer risk no matter where they were caught in any Atlantic State jurisdiction. Individual states followed with regulatory risk analyses and consumption advisories consistent with New Jersey's analyses.

Prior to 1998, the most recent monitoring for organic contaminants and mercury in fish from New Jersey's coastal waters was in 1991. To assess the possible temporal and spatial changes in contamination since that time, and to provide more up-to-date and extensive monitoring data regarding contaminant levels in New Jersey fishes, the Department implemented additional monitoring in 1998. Over 300 samples were analyzed for polychlorinated biphenyls, organochlorine pesticides (e.g., DDT and its metabolites, and chlordanes) and mercury from locations extending from the Raritan Bay to the Delaware River and its tributaries. Comparisons with historical data sets were also examined. For most species and regions, concentrations of PCBs and chlordanes have decreased markedly compared to evaluations made a decade ago. Changes in DDX are more equivocal, with some groups showing decreases, but with little evidence of change for other comparisons. The observed decreases could be due to environmental cleanup, pollution prevention programs, degradation, or changes in the bioavailability of contaminants. The Department continues to conduct monitoring of contaminants in fish and crustaceans and resultant data will be used to periodically update the state's advisories.

Details concerning individual fish consumption advisories are listed on the following website maintained by the Department's Division of Science, Research and Technology: www.state.nj.us/dep/dsr/njmainfish.htm and may be viewed as well in Tables 3.4-1 and 3.4-2 below.

Mercury in Fish Tissue

Recent research on a variety of freshwater game fish in New Jersey has prompted the Department of Environmental Protection and Department of Health and Senior Services to update consumption advisories due to elevated levels of mercury found in these species. Mercury, a toxic metal, accumulates in fish tissue through the aquatic food chain. Larger fish at the top of the food chain (e.g., chain pickerel) are more likely to have the highest levels of mercury. These advisories also cover other fish species lower on the food chain, as these species can also accumulate elevated levels of mercury in their tissue.

It is very unlikely that the level of mercury found in these fish would cause noticeable health effects in adults with short-term consumption. However, consumption of contaminated fish poses potential effects on the nervous system of developing fetuses. In addition, long-term consumption by adults and older children of fish with elevated levels of mercury may result in adverse health effects, including neurological damage. Although data show elevated levels of mercury in certain fish, the quality of the waters used for drinking and bathing are not affected.

Table 3.4-2 later in this section provides statewide, regional, and water body-specific advisory information for various fish species. The Pinelands area covers portions of the following counties in the southern half of the state: Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, and Ocean counties (see map). Some, but not all, of the water bodies covered under these general advisories have been tested. Water body-specific information includes the county in which the lake, pond or river is located, and the fish species tested. Not all fish species were found in all water bodies, or in some cases available data were insufficient to list a species for a specific water body.

The public is encouraged to periodically check the following web site for advisory updates and additional information concerning consumption of fish, shellfish, and crustaceans (e.g., crabs) caught in New Jersey waters: http://www.state.nj.us/dep/dsr/njmainfish.htm

Federal Advice on Fish Consumption

The USEPA and FDA provide advice for fish consumption for high-risk individuals. In the absence of NJ data on freshwater fish, it is recommended that the public follow the EPA's national advice as outlined below.

USEPA Consumption Advisory: "National Advice on Mercury in Fish Caught by Family and Friends" and "For Women Who Are Pregnant or May Become Pregnant, Nursing Mothers, and Young Children:" To protect against the risks of mercury in fish caught in freshwaters, EPA recommends that these groups limit fish consumption to one meal per week. For more information on freshwater fish consumption advisories, go to http://www.epa.gov/ost/fish/
FDA Consumption Advisory: Additional information on mercury in seafood can be found at the FDA's web site: http://www.cfsan.fda.gov/~dms/admehg.html

Tables 3.4-1 and 3.4-2: 2004 Fish Consumption Advisories For PCBs, Dioxin And Mercury

The advisory tables below provide statewide, regional, and water body-specific advisory information for various fish species. The tables list the recommended fish consumption frequencies for the **General Population** and **High-risk Individuals** for waters statewide and for specific water bodies.

General Population: PCB advisories for the General Population are presented as a range **of meal frequencies (for example: one meal per month** *or* **four meals per year).** This range is based on an estimated 1 in 100,000 (lower risk) to 1 in 10,000 (higher risk) of cancer during your lifetime from eating fish at the advisory level. For example, 1 in 10,000 risk means that one additional cancer may occur in 10,000 people eating fish at the advisory level for a lifetime. By using this advisory, you have the necessary information to make an informed choice on the number of meals of fish to consume. In this manner, you can decide how much risk is acceptable when you consider consuming the species listed in this advisory.

High Risk Individuals: Includes infants, children, *pregnant* women, nursing mothers and women of childbearing age.

If your specific fishing site is not mentioned within the advisories on the following pages, this does not mean the fish are free of contamination. Not all New Jersey waters have been tested, and not all fish species were found in all water bodies, or in some cases available data were insufficient to list a species for a specific water body. Follow the **statewide advisory** for the listed species if your fishing area is not mentioned in the guidelines.

TABLE 3.4-1: 2004 PCB & DIOXIN FISH CONSUMPTION ADVISORIES

PCB /DIOXIN STATEWIDE ADVISORIES (All coastal waters except those under Water Body Specific Advisories)		GENERAL POPULATION [1,2]		HIGH-RISK INDIVIDUALS [2, 3]
		LIFETIME CANCER RISK		BASED ON A NON-CANCER RISK
		1 in 10,000	1 in 100,000	
		DO NOT EAT MORE THAN:	DO NOT EAT MORE THAN:	DO NOT EAT MORE THAN:
STRIPED BASS*		One meal per Month	One meal per Year	Do Not Eat
BLUEFISH	(greater than 6 lbs/24 inches)	Four meals per Year	Do Not Eat	Do Not Eat
	(less than 6lbs/24 inches)	One meal per Month	One meal per Year	Do Not Eat
AMERICAN EEL		Four meals per Year	One meal per Year	Do Not Eat
AMERICAN LOBSTER		Do Not Eat the Green Gland, (i.e., Tomalley or Hepatopancreas)		

PCB/DIOXIN WATERBODY SPECIFIC ADVISORIES		GENERAL POPULATION		HIGH-RISK INDIVIDUALS
		LIFETIME CANCER RISK		BASED ON A NON-CANCER RISK
		1 in 10,000	1 in 100,000	
		DO NOT EAT MORE THAN:	DO NOT EAT MORE THAN:	DO NOT EAT MORE THAN:
NEWARK BAY COMPLEX Including Newark Bay, tidal Hackensack River, Arthur Kill, Kill Van Kull and tidal tributaries.	Blue Crab*	Do not eat or harvest[4]		
	Striped Bass*	Do not eat		Do not eat
	American Eel*	One meal per year	Do not eat	Do not eat
	White Perch			
	White Catfish			

PCB/DIOXIN WATERBODY SPECIFIC ADVISORIES		GENERAL POPULATION		HIGH-RISK INDIVIDUALS
		LIFETIME CANCER RISK		BASED ON A NON-CANCER RISK
		1 in 10,000	1 in 100,000	
		DO NOT EAT MORE THAN:	DO NOT EAT MORE THAN:	DO NOT EAT MORE THAN:
TIDAL PASSAIC RIVER Dundee Dam to Newark Bay and tributaries.	All Fish & Shellfish*	Do not eat		Do not eat
	Blue Crab *	Do not eat or harvest[4]		
HUDSON RIVER Downstream of NY-NJ border and Upper New York Bay	Striped bass*	Four meals per year	Do not eat	Do not eat
	American eel*	One meal per year		
	White perch			
	White catfish	Do not eat		Do not eat
	Blue crab	Six crabs per week	Three crabs per Month	Three crabs per month
		Do not eat green gland (hepatopancreas); Discard cooking liquid		
RARITAN BAY COMPLEX Includes the Raritan Bay, tidal Raritan River (from the Rte. 1 bridge) and the tidal Portions of all tributaries.	American eel	One meal per year	Do not eat	Do not eat
	White perch	Four meals per year	Do not eat	Do not eat
	White catfish			
	Blue crab	Six crabs per week	Three crabs per month	Three crabs per month
		Do not eat green gland (hepatopancreas); Discard cooking liquid		
COASTAL TRIBUTARIES Including the Navesink River, Shrewsbury River, Shark River, Toms River and Mullica River.	American Eel	Once a month	Once a year	Do not eat

PCB/DIOXIN WATERBODY SPECIFIC ADVISORIES		GENERAL POPULATION		HIGH-RISK INDIVIDUALS
		LIFETIME CANCER RISK		BASED ON A NON-CANCER RISK
		1 in 10,000	1 in 100,000	
		DO NOT EAT MORE THAN:	DO NOT EAT MORE THAN:	DO NOT EAT MORE THAN:
LOWER DELAWARE RIVER **Phillipsburg, NJ to PA/DE line, including all tributaries to the head of tide.**	**American eel**	**Four meals per year**	**Do not eat**	**Do not eat**
	Striped bass		**Do not eat**	
	Channel catfish	**One meal every two months**		
DELAWARE RIVER ESTUARY **DE/NJ/PA border to C&D Canal**	**All Finfish**	**Do not eat**		**Do not eat**
DELAWARE ESTUARY & BAY **C&D canal to the mouth of Delaware Bay**	**Bluefish**	**Do not eat fish larger than 6 lbs or 24 inches**		**Do not eat**
		No more than one meal per year for fish less than 6 lbs or less than 24 inches		
	Striped Bass White perch American eel Channel catfish White catfish	**No more than one meal per year**		**Do not eat**
DELAWARE BAY TRIBUTARIES **All Delaware Bay Tributaries**	**American Eel**	**One meal per month**	**Four meals per year**	**Four meals per year**

PCB/DIOXIN WATERBODY SPECIFIC ADVISORIES		GENERAL POPULATION		HIGH-RISK INDIVIDUALS
		LIFETIME CANCER RISK		BASED ON A NON-CANCER RISK
		1 in 10,000	1 in 100,000	
		DO NOT EAT MORE THAN:	DO NOT EAT MORE THAN:	DO NOT EAT MORE THAN:
Pennsauken Creek, Forked Landing (Camden Co.)	Common Carp	Four meals per year	Do not eat	Do not eat
	Largemouth Bass	One meal per month	Four meals per year	Do not eat
	Pumpkinseed Sunfish			Four meals per year
	White Catfish		One meal per year	One meal per year
Evans Pond (Camden Co.)	Brown Bullhead	One meal per week	One meal per month	One meal per month
Cooper River, below Evans Pond (Camden Co.)	Common Carp	One meal per month	One meal per year	Do not eat
	Bluegill Sunfish	One meal per week	One meal per month	One meal per month
Cooper River, Hopkins Pond (Camden Co.)	Brown Bullhead	One meal per month	Four meals per year	Four meals per year
Cooper River Lake (Camden Co.)	Largemouth Bass	Four meals per year	Do not eat	Do not eat
	Common Carp			
	Brown Bullhead	One meal per week	One meal per month	One meal per month
	Bluegill Sunfish			
Newton Lake (Camden Co.)	Bluegill Sunfish	One meal per week	One meal per month	One meal per month
	Brown Bullhead			
	Largemouth Bass	One meal per month	Four meals per year	Four meals per year
	Common Carp		One meal per year	Do not eat
Strawbridge Lake (Burlington Co.)	Largemouth Bass	One meal per month	One meal per year	One meal per year
	Bluegill Sunfish			
	Common Carp	Four meals per year	Do not eat	Do not eat
	Brown Bullhead	One meal per week	Four meals per year	Four meals per year

PCB/DIOXIN WATERBODY SPECIFIC ADVISORIES		GENERAL POPULATION		HIGH-RISK INDIVIDUALS
		LIFETIME CANCER RISK		BASED ON A NON-CANCER RISK
		1 in 10,000	1 in 100,000	
		DO NOT EAT MORE THAN:	DO NOT EAT MORE THAN:	DO NOT EAT MORE THAN:
Stewart Lake (Gloucester Co.)	Bluegill Sunfish	One meal per week	One meal per month	One meal per month
	Brown Bullhead			One meal per month
	Largemouth Bass	One meals per week	Four meals per year	Four meals per year
	Common Carp	One meal per month	One meal per year	Do not eat
Passaic River Dundee Lake to Elmwood Park (Passaic Bergen Co.)**	Redbreast Sunfish	One meal per week	Four meals per year	Four meals per year
	Brown Bullhead			
	Largemouth Bass	One meal per month	One meal per year	One meal per year
	Common Carp	Four meals per year	Do not eat	Do not eat
Passaic River – confluence of Pompton R. – two bridges (Passaic Co)**	Redbreast Sunfish	One meal per week	Four meals per year	Four meals per year
	Largemouth Bass			Do not eat
	Common Carp	Four meals per year	Do not eat	Do not eat
Bound Brook (entire length including New Market Pond, Spring Lake; Somerset Co.)	All fish species	Do not eat		

NOTE: * Selling any of these species from designated water bodies is prohibited in New Jersey.

[1] Range of Recommended Meal Frequency corresponds to a cancer risk of 1 in 10,000 to 1 in 100,000 over a lifetime.

[2] Eat only the fillet portions of the fish. Use proper trimming techniques to remove fat, and cooking methods that allow juices to drain from the fish (e.g., baking, broiling, frying, grilling, and steaming). One meal is defined as an eight-ounce serving.

[3] High-risk individuals include infants, children, pregnant women, nursing mothers and women of childbearing age.

[4] No harvest means no taking or attempting to take any blue crabs from these waters.

**** Supercedes the mercury advisory for listed species in these waters.**

TABLE 3.4-2: 2004 MERCURY FRESHWATER FISH CONSUMPTION ADVISORIES

The advisory table below provides statewide, regional, and water body-specific advisory information for various fish species for mercury. The Pinelands area covers portions of the following counties in the southern half of the state: Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, and Ocean counties.

MERCURY STATEWIDE & REGIONAL ADVISORIES	SPECIES[1]	GENERAL POPULATION	HIGH-RISK INDIVIDUAL[3]
		EAT NO MORE THAN:	EAT NO MORE THAN:
STATEWIDE: (All water bodies of the State except those in the Pinelands Region and those listed below	Largemouth Bass Smallmouth Bass Chain Pickerel	One meal per week[2]	One meal per month[2]
	Yellow Bullhead Sunfish[4]	No restrictions	One meal per month
	Brown Bullhead	No restrictions	One meal per week
PINELANDS REGION: (All water bodies of the Pinelands including those listed below with a P notation)	Largemouth Bass Chain Pickerel	One meal per month	Do not eat
	Brown Bullhead Yellow Bullhead	One meal per week	Do not eat
	Sunfish [4]	One meal per week	One meal per month

MERCURY WATERBODY SPECIFIC ADVISORIES		SPECIES	GENERAL POPULATION	HIGH-RISK INDIVIDUAL
			EAT NO MORE THAN:	EAT NO MORE THAN:
Alycon Lake (Gloucester Co.)	P	Black Crappie	No restrictions	One meal per month
Assunpink Creek (Mercer/Monmouth Co.)		Largemouth Bass	No restrictions	One meal per week
Assunpink Lake (Monmouth Co.)		Chain Pickerel Largemouth Bass	One meal per week	One meal per month
Atlantic City Reservoir - (Atlantic Co.)	P	Chain Pickerel Largemouth Bass Yellow Perch	Do not eat	Do not eat

MERCURY WATERBODY SPECIFIC ADVISORIES		SPECIES	GENERAL POPULATION	HIGH-RISK INDIVIDUAL
			EAT NO MORE THAN:	EAT NO MORE THAN:
No Fishing Allowed				
Atsion Lake (Burlington Co.)	P	Yellow Bullhead	One meal per week	Do not eat
Batsto Lake (Burlington Co.)	P	Chain Pickerel Largemouth Bass	One meal per week	Do not eat
		Bluegill Sunfish	One meal per week	One meal per month
		Brown Bullhead Yellow Bullhead	No restrictions	
Big Timber Creek (Gloucester Co.)		Channel Catfish Largemouth Bass White Catfish	No restrictions	One meal per week
		Brown Bullhead	No restrictions	No restrictions
Boonton Reservoir (Morris Co.)		Largemouth Bass White Catfish	One meal per week	Do not eat
				One meal per month
		Brown Bullhead	No restrictions	No restrictions
Budd Lake (Morris Co.)		Northern Pike White Catfish	No restrictions	One meal per week
Butterfly Bogs Pond (Ocean Co.)	P	Chain Pickerel	One meal per week	Do not eat
		Brown Bullhead	No restrictions	One meal per week
Canistear Reservoir (Sussex Co.)		Largemouth Bass	One meal per week	Do not eat
Carnegie Lake (Mercer Co.)		Largemouth Bass	One meal per week	Do not eat
		Channel Catfish White Perch	No restrictions	One meal per month
		Brown Bullhead		One meal per week
		Bluegill Sunfish		No restrictions
Cedar Lake (Cumberland Co.)	P	Chain Pickerel Largemouth Bass	One meal per week	Do not eat
Clementon Lake (Camden Co.)	P	Chain Pickerel Largemouth Bass	One meal per week	One meal per month
Clinton Reservoir (Passaic Co.)		Largemouth Bass	One meal per week	Do not eat
Cranberry Lake (Sussex Co.)		Chain Pickerel Hybrid Striped Bass	One meal per week	One meal per month
Crater Lake (Sussex Co.)		Yellow Perch	One meal per week	Do not eat
		Brown Bullhead		One meal per month
Crosswicks Creek (Mercer Co.)		Largemouth Bass White Catfish	No restrictions	One meal per week
Crystal Lake (Burlington Co.)		Largemouth Bass	No restrictions	One meal per month
		Black Crappie		One meal per week
		Brown Bullhead		No restrictions

MERCURY WATERBODY SPECIFIC ADVISORIES		SPECIES	GENERAL POPULATION	HIGH-RISK INDIVIDUAL
			EAT NO MORE THAN:	EAT NO MORE THAN:
DeVoe Lake (Middlesex Co.)		Chain Pickerel Largemouth Bass	No restrictions	One meal per month
		Brown Bullhead		One meal per week
Delaware & Raritan Canal @ Bound Brook (Somerset Co.)		Channel Catfish	One meal per week	Do not eat
Delaware River Upstream Watergap (Warren/Sussex Co)		Smallmouth Bass	One meal per week	One meal per month
		Channel Catfish Muskellunge	No restrictions	
Delaware River - Watergap to Phillipsburg (Warren Co.)		White Catfish	One meal per week	Do not eat
		Channel Catfish Smallmouth Bass	No restrictions	One meal per month
		Walleye		One meal per week
Delaware River- Phillipsburg to Trenton (Hunterdon/Mercer Co.)		Channel Catfish	One meal per week	One meal per month
		Largemouth Bass	No restrictions	
		Smallmouth Bass	No restrictions	One meal per week
Delaware River - Trenton to Camden (Burlington Co.)		Largemouth Bass White Catfish	No restrictions	One meal per week
Delaware River - Camden to Delaware State line (Camden/Gloucester Co.)		Hybrid Striped Bass	No restrictions	One meal per week
Double Trouble Lake (Ocean Co.)	P	Chain Pickerel Yellow Bullhead	One meal per month	Do not eat
East Creek Lake (Cape May Co.)	P	Chain Pickerel Largemouth Bass Brown Bullhead Yellow Bullhead Yellow Perch	One meal per month	Do not eat
		Pumpkinseed Sunfish	One meal per week	One meal per month
Echo Lake Reservoir (Passaic Co.)		Largemouth Bass	No restrictions	One meal per week
Green Turtle Lake (Passaic Co.)		Largemouth Bass	No restrictions	One meal per month
		Chain Pickerel Yellow Perch		One meal per week

MERCURY WATERBODY SPECIFIC ADVISORIES		SPECIES	GENERAL POPULATION	HIGH-RISK INDIVIDUAL
			EAT NO MORE THAN:	EAT NO MORE THAN:
Greenwood Lake (Passaic Co.)		Largemouth Bass	No restrictions	One meal per month
		White Perch		No restrictions
Grovers Mill Pond (Mercer Co.)		Brown Bullhead Largemouth Bass	One meal per week	One meal per month
		Chain Pickerel	No restrictions	One meal per week
Hainesville Pond (Sussex Co.)		Largemouth Bass	No restrictions	One meal per month
		Chain Pickerel		One meal per week
Harrisville Lake (Burlington Co.)	P	Chain Pickerel Mud Sunfish Yellow Bullhead	One meal per month	Do not eat
Lake Carasaljo (Ocean Co.)	P	Largemouth Bass	One meal per week	Do not eat
		Chain Pickerel		One meal per month
Lake Hopatcong (Morris/Sussex Co.)		Chain Pickerel	One meal per week	One meal per month
		Largemouth Bass	No restrictions	
Lake Nummy (Cape May Co.)	P	Chain Pickerel Yellow Perch	One meal per week	Do not eat
		Yellow Bullhead	No restrictions	One meal per month
Lake Tappan (Bergen Co.)		Common Carp Smallmouth Bass Yellow Bullhead	No restrictions	One meal per week
Lenape Lake (Atlantic Co.)	P	Chain Pickerel	One meal per week	Do not eat
Linden Lake (Camden Co.)	P	Largemouth Bass	No restrictions	One meal per month
Little Timber Creek (Camden Co.)		Brown Bullhead	No restrictions	No restrictions
Malaga Lake (Gloucester Co.)	P	Chain Pickerel Largemouth Bass	One meal per month	Do not eat
Manasquan Reservoir (Monmouth Co.)		Largemouth Bass	One meal per month	Do not eat
		Black Crappie Bluegill Sunfish Chain Pickerel	One meal per week No restrictions No restrictions	One meal per month
		Brown Bullhead Yellow Perch	No restrictions	One meal per week
Marlton Lake (Burlington Co.)	P	Largemouth Bass	One meal per month	Do not eat
Maskells Mill Lake (Salem Co.)	P	Brown Bullhead Chain Pickerel Largemouth Bass	One meal per week	One meal per month
		Black Crappie	No restrictions	

MERCURY WATERBODY SPECIFIC ADVISORIES		SPECIES	GENERAL POPULATION	HIGH-RISK INDIVIDUAL
			EAT NO MORE THAN:	EAT NO MORE THAN:
Merrill Creek Reservoir (Warren Co.)		Largemouth Bass	One meal per month	Do not eat
		Smallmouth Bass Lake Trout	One meal per week	
		Yellow Perch	No restrictions	One meal per month
		Black Crappie Bluegill Sunfish Brown Bullhead	No restrictions	One meal per week
Mirror Lake (Burlington Co.)	P	Largemouth Bass	One meal per week	One meal per month
		Brown Bullhead	No restrictions	One meal per week
Monksville Reservoir (Passaic Co.)		Chain Pickerel Walleye	One meal per month	Do not eat
		Largemouth Bass White Perch	One meal per week	
		Pumpkinseed Sunfish Smallmouth Bass	No restrictions	One meal per month
		Brown Bullhead	No restrictions	One meal per week
Mountain Lake (Warren Co.)		Largemouth Bass	One meal per week	Do not eat
Mullica River (Burlington/Atlantic Co.)	P	Chain Pickerel	One meal per month	Do not eat
		Brown Bullhead White Perch Pumpkinseed Sunfish	One meal per week	One meal per month
		White Catfish	No restrictions	
New Brooklyn Lake (Camden Co.)	P	Chain Pickerel	One meal per week	Do not eat
		Largemouth Bass	One meal per week	One meal per month
		Pumpkinseed Sunfish Black Crappie	No restrictions	
		Yellow Bullhead	No restrictions	One meal per week
Newton Creek, North (Camden Co.)		Brown Bullhead	No restrictions	No restrictions
Newton Creek, South (Camden Co.)		Largemouth Bass	One meal per month	Do not eat
		Brown Bullhead	No restrictions	One meal per week
Oak Ridge Reservoir (Passaic Co.)		Largemouth Bass	One meal per week	Do not eat
		Smallmouth Bass	One meal per week	One meal per month
		Chain Pickerel Yellow Bullhead	No restrictions	
		Brown Bullhead	No restrictions	No restrictions
Oradell Reservoir (Bergen Co.)		Largemouth Bass	No restrictions	One meal per month
		Yellow Bullhead Common Carp		No restrictions

MERCURY WATERBODY SPECIFIC ADVISORIES		SPECIES	GENERAL POPULATION	HIGH-RISK INDIVIDUAL
			EAT NO MORE THAN:	EAT NO MORE THAN:
Passaic River from Rt. 280 - confluence of Pompton R. -Two Bridges (Morris/Essex/ Passaic Co.)*		Black Crappie Bluegill Sunfish	No restrictions	One meal per month
		Yellow Bullhead Pumpkinseed Sunfish		One meal per week
Pompton Lake (Passaic Co.)		Largemouth Bass	One meal per week	One meal per month
Pompton River at Lincoln Park (Passaic/Morris Co.)		Largemouth Bass Northern Pike	One meal per week	Do not eat
		Yellow Perch	No restrictions	One meal per month
Pompton River at Pequannock River (Passaic/Morris Co.)		Largemouth Bass Smallmouth Bass	One meal per month	Do not eat
		Rock Bass Yellow Bullhead Pumpkinseed Sunfish	One meal per week	Do not eat
		Redbreast Sunfish Black Crappie		One meal per month
Raritan River at Neshanic Station (Somerset Co.)		Largemouth Bass Smallmouth Bass Redbreast Sunfish Brown Bullhead Rock Bass	No restrictions	One meal per week
Raritan River at Millstone River (Somerset Co.)		Largemouth Bass	One meal per week	One meal per month
		Channel Catfish	No restrictions	One meal per week
		Brown Bullhead		No restrictions
Raritan River at Route 1 (Middlesex Co.)		White Perch	No restrictions	One meal per week
Ridgeway Branch of Toms River (Ocean Co.)	P	Brown Bullhead Chain Pickerel	One meal per month	Do not eat
Rockaway River (Morris Co.)		Largemouth Bass	One meal per week	Do not eat
		Chain Pickerel	No restrictions	One meal per month
		Brown Bullhead Yellow Bullhead		One meal per week
Rockaway River at Whippany (Morris Co.)		Largemouth Bass	One meal per week	Do not eat
		Black Crappie	No restrictions	One meal per month
		Bluegill Sunfish		One meal per week

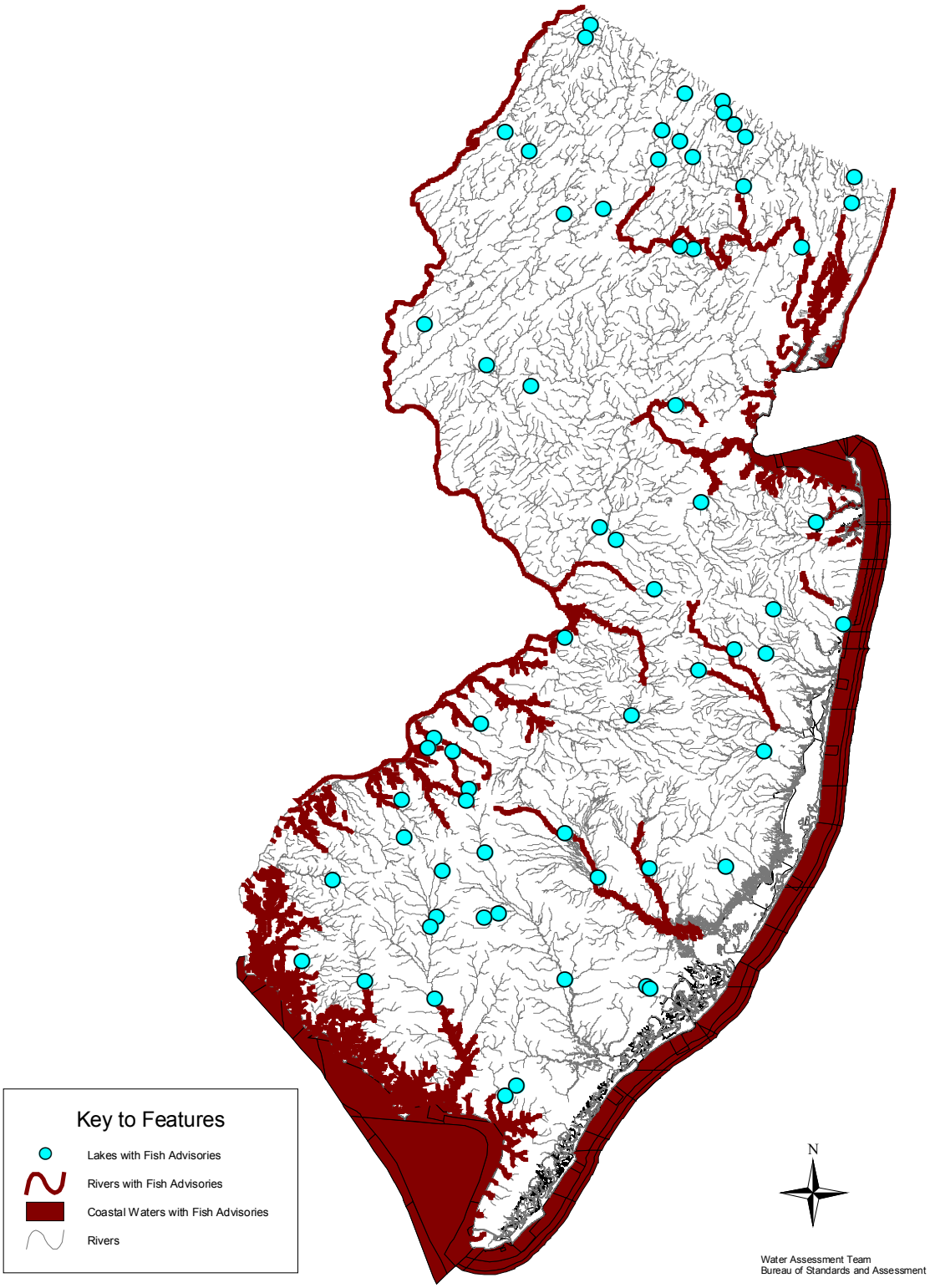
MERCURY WATERBODY SPECIFIC ADVISORIES		SPECIES	GENERAL POPULATION	HIGH-RISK INDIVIDUAL
			EAT NO MORE THAN:	EAT NO MORE THAN:
Round Valley Reservoir (Hunterdon Co.)		Largemouth Bass	No restrictions	One meal per month
		Lake Trout		One meal per week
Saw Mill Lake (Sussex Co.)		Northern Pike	No restrictions	One meal per month
		Brown Bullhead		No restrictions
Shadow Lake (Monmouth Co.)		Largemouth Bass	No restrictions	One meal per week
Speedwell Lake (Morris Co.)		Largemouth Bass	One meal per week	One meal per month
		Bluegill Sunfish	No restrictions	One meal per week
Spring Lake (Monmouth Co.)	P	Largemouth Bass	One meal per week	Do not eat
Spruce Run Reservoir (Hunterdon Co.)		Largemouth Bass Smallmouth Bass	One meal per week	One meal per month
		Hybrid Striped Bass	No restrictions	
Stafford Forge Main Line (Ocean Co.)	P	Chain Pickerel	One meal per week	Do not eat
Steenykill Lake (Sussex Co.)		Largemouth Bass	No restrictions	One meal per week
Success Lake (Ocean Co.)	P	Chain Pickerel	One meal per month	Do not eat
Sunset Lake (Cumberland Co.)	P	Largemouth Bass	One meal per week	One meal per month
Swartswood Lake (Sussex Co.)		Smallmouth Bass	No restrictions	One meal per month
		Chain Pickerel		One meal per week
Union Lake (Cumberland Co.)	P	Chain Pickerel Largemouth Bass	One meal per month	Do not eat
		White Perch	One meal per week	
		Bluegill Sunfish	One meal per week	One meal per month
Wading River (Burlington Co.)	P	Yellow Bullhead	One meal per month	Do not eat
		Brown Bullhead Chain Pickerel White Catfish	One meal per week	
Wanaque Reservoir (Passaic Co.)		Largemouth Bass White Perch	One meal per week	Do not eat
		Chain Pickerel Smallmouth Bass	One meal per week	One meal per month
		White Catfish	No restrictions	
		Brown Bullhead	No restrictions	No restrictions
Wawayanda Lake (Sussex Co.)		Chain Pickerel	No restrictions	One meal per month

MERCURY WATERBODY SPECIFIC ADVISORIES		SPECIES	GENERAL POPULATION	HIGH-RISK INDIVIDUAL
			EAT NO MORE THAN:	EAT NO MORE THAN:
Whitesbog Pond (Ocean Co.)	P	Chain Pickerel	One meal per week	Do not eat
Willow Grove Lake (Cumberland Co.)	P	Chain Pickerel Largemouth Bass	One meal per month	Do not eat
		Yellow Bullhead	One meal per week	
		Brown Bullhead	No restrictions	One meal per month
Wilson Lake (Gloucester Co.)	P	Chain Pickerel Pumpkinseed Sunfish Yellow Perch	One meal per month	Do not eat
		Largemouth Bass	One meal per week	
Woodstown Memorial Lake (Salem Co.)		Black Crappie Largemouth Bass	No restrictions	One meal per month

(1) Not all species were found or analyzed in all water bodies, or inadequate data were available to list some species.
(2) One meal is defined as an eight-ounce serving.
(3) High-risk individuals are pregnant women, women planning pregnancy within one year, nursing mothers and children under five years old.
(4) Sunfish includes bluegill, pumpkinseed, and redbreast sunfish.
* Region: P = Pinelands Area

The NJDEP and NJ Department of Health and Senior Services can provide more information on the advisories and the health effects of chemical contaminants in the fish. To stay current with advisory updates and to request additional information, please contact the NJDEP Division of Science, Research and Technology at 1-609-984-6070 or check the website www.state.nj.us/dep/dsr/njmainfish.htm or the NJDHSS at 1-609-588-3123 or www.state.nj.us/health/eoh/foodweb.

Figure 4-1.1 **Fish Consumption Advisories**



CHAPTER 4: SURFACE WATER QUALITY MANAGEMENT PROGRAM UPDATES AND MONITORING SHEDULE

The following section provides updates to surface water quality management programs most of which focus on controlling land use as a vehicle to protect and improve water quality. Most of these programs are either newly developed within the last five to seven years, or have been well established but have recently undergone significant changes within the said time period.

Contained here are descriptions of the NJDEP's Source Water Assessment Program (SWAP), the Surface Water Quality Standards Program (SWQS) and the expansions of C1 designations. Included are the Watershed Management Program and associated activities such as the new Stormwater Rules, the Nonpoint Source Control Program, and the Barnegat Bay Program. Also included are the Wetlands Protection Program, the Environmental Infrastructure Program and Green Acres Program. The section outlines New Jersey's efforts to reduce environmental mercury and control floatables in coastal waters as well as the implementation of water quality-based effluent limits for Total Phosphorus by the Division of Water Quality. The chapter closes with an outline of the Department's surface water monitoring schedule indicating current and future monitoring priorities of the Department's Bureau of Freshwater and Biological Monitoring.

4.1 New Jersey Source Water Assessment Program

Approximately 90 percent of New Jersey's population is served by public water systems. A public water system is defined as "a system for the provision to the public of water for human consumption through pipes or other constructed conveyances, if such system has at least fifteen service connections or regularly serves at least twenty-five individuals." In 2002, 606 community[1] water systems serving a residential population delivered drinking water to citizens and visitors in New Jersey. These 606 community water systems utilized water from over 2400 wells and 59 surface water intakes. In addition, approximately 3545 noncommunity[2] water systems (serving a non-residential population) with approximately 3900 wells and 3 surface water intakes also serve water to residents and visitors in New Jersey.

The 1996 Amendments to the Federal Safe Drinking Water Act required all states to establish a Source Water Assessment Program (SWAP) to determine the public water systems' susceptibility to potential contamination. The U.S. Environmental Protection Agency approved New Jersey's SWAP plan in November of 1999, which is available at www.state.nj.us/dep/watersupply/swap1.pdf. Through the program, the New Jersey Department of Environmental Protection (NJDEP) determined the susceptibility of public water systems to eight categories of contamination: pathogens, nutrients, volatile organic compounds, synthetic organic compounds, pesticides, inorganics, radionuclides, and disinfection byproduct precursors.

More specifically the Source Water Assessment Program will:

1. Facilitate the risk management and protection of drinking water sources. The source water assessments will provide susceptibility rating for each source of drinking water, which will supply information on how vulnerable the source is to potential contamination. The information obtained from the SWAP will provide communities and decision-makers with the tools necessary to protect their drinking water source(s). The 1996 Federal Amendments do not require the development of a source water protection plan, but the NJDEP strongly encourages source water protection. NJDEP is going beyond the Federal requirements and is developing protection strategies for drinking water sources that are identified as highly susceptible.

2. Provide for public education and participation in the risk management and protection efforts. The information gained from the source water assessments will make the public more aware of the source of their drinking water and the potential contaminants that could impair the water's quality. This information will encourage

[1] Community water system is "a public water system that pipes water for human consumption to at least 15 service connections used by year-around residents, or one that regularly serves at least 25 year-around residents (e.g. municipality, subdivisions, mobile home parks).

[2] Noncommunity water system is "a public water system that pipes water for human consumption to at least 15 service connections used by individuals other than year-around residents for at least 60 days a year, or serves 25 or more people at least 60 days a year (e.g. schools, factories, rest stops, interstate carrier conveyances).

protection of the water sources, provide information for watershed assessment and planning, direct additional water studies, and improve land use planning.

3. Establish a customized monitoring schedule for public water systems. In addition, the source water assessments will assist the State in improving current monitoring requirements for individual public water systems.

In order to accomplish these goals, the NJDEP's SWAP consists of four steps:

Step 1: Delineate the source water assessment area for each ground and surface water source of public drinking water. A source water assessment area for a ground water source in New Jersey is the area from which water flows to a well within a twelve year period. This area is also known as a well head protection area. Before a well is delineated, location and attribute data must be gathered. The NJDEP delineated the community public water systems using an approved delineation method known as the Combined Model/Calculated Fixed Radius (CFR) Method. For noncommunity public water systems, source water assessment areas were determined using the Calculated Fixed Radius Method only. These delineation methods are explained in detail in New Jersey Geological Survey's "Guidelines for Delineation of Well Head Protection Areas in New Jersey" available at www.state.nj.us/dep/njgs/whpaguide.pdf

For each source water assessment area three tiers are calculated and labeled based upon the time of travel to a well (Tier 1 for 2 year time of travel, Tier 2 for 5 year time of travel, and Tier 3 for 12 year time of travel). NJDEP utilizes three tiers in the source water assessment area for determining different risks of contamination.

Under Tier 1, the two-year time of travel targets potential microbiological contamination. Studies show on average, bacteria can survive in ground water for almost 200 days and viruses can survive for almost 300 days. The 2 year time of travel provides assurance that sources of potential microbiological contamination located outside of this tier are unlikely to reach the well.

The 5 year time of travel within Tier 2, addresses contamination from known sources such as accidental discharges. This area is delineated so that if point pollution occurs within the source water assessment area, a regulatory agency or responsible party will likely have time to respond and control the discharge before the contamination reaches the drinking water well.

The third time of travel portion of the source water assessment area, 12 years under Tier 3, is designed to monitor the known contaminant sources. This tier delineation allows enough time for necessary, and possibly more complex management responses. Studies show that 10 to 15 years time of travel covers the full length of a contaminant plume (the delineated ground water and source water assessment areas are available on the internet and in the final source water assessment documents).

A source water assessment area for surface waters includes the area upstream of the intake, tributaries and headwaters. The NJDEP assesses all of the surface water intakes using the U.S. Geological Survey's hydrological unit code (HUC) at the 14 digit level.

Approximately 50 wells in New Jersey are classified as “ground water under the direct influence of surface water” (GUDI). If the well is classified as GUDI, the NJDEP performs two delineations: one for the well itself and another as if an intake was located on the adjacent water body. For the few GUDI wells not in close proximity to a water body, NJDEP delineates only the well.

Step 2: Inventory of the potential contamination sources within the source water assessment area. The NJDEP developed a list of potential contaminant sources for the eight-contaminant categories mentioned earlier. The potential contaminant list focuses on both nonpoint and point source contaminants. Point source contaminants may be traced to a single source, such as known contaminated sites, industrial and commercial surface and ground water discharges, and sewage treatment discharges. Nonpoint source contaminants, in contrast, may not be traced to one single source because they come from several individual sources within a large area. Land use activities such as salting and runoff from roads and the application of pesticides and herbicides are examples of nonpoint sources. Nonpoint and point sources can have a significant impact on both surface water and ground water.

The NJDEP utilizes Geographic Information System (GIS) coverages to compose an inventory of potential contaminant sources. Potential sources include: land uses, roadways, known contaminated sites, erosion, landfills, runoff, recreational areas, and naturally occurring contaminants. For land use coverages, NJDEP uses data for the years 1970, 1986, and 1995 to account for the changes in land use over the years.

Step 3: Determine the public water system's susceptibility to regulated and unregulated contaminants. Susceptibility of a water source depends on two factors: the sensitivity of the water to contaminants and the intensity of use of the contaminants within the source water assessment area.

To determine the public water systems' susceptibility, the NJDEP contracts with the U.S. Geological Survey (USGS) to develop a susceptibility model for each of the eight contaminant groups for ground water and surface water sources. The models determine susceptibility based on the intake's location, use, amount and form of contamination within its source water assessment area. The models are created using a selected set of public water system ground water and surface water intakes selected from various locations throughout New Jersey to take all geological conditions and other influential characteristics into account. USGS develops summary reports for each susceptibility model, explaining how the model is developed and the variables which USGS finds to be significant in determining susceptibility.

Following the models' completion, additional public water systems are selected and used to confirm the models' validity. Once the models are found to be accurate, the USGS

applies the models to the remaining public water systems. Each water system's intake or well is rated high, medium, or low susceptibility for each potential contaminant source category, thus allowing NJDEP to determine which systems are most susceptible to contamination. Determining the contamination potential assists in determining the frequency of monitoring and the treatment needs for each public water system.

Step 4: Incorporate public education and participation. The Amendments to the Safe Drinking Water Act placed a strong emphasis on public education. As a result, the NJDEP developed a Source Water Assessment Advisory Committee to provide the NJDEP with the necessary advice throughout the SWAP. The Source Water Assessment Advisory Committee meets on an as need basis to discuss the status of the SWAP and other related topics of concern. The committee provides NJDEP with advice on the content of the source water assessment documents and how to make this information meaningful and understandable to the public

The NJDEP developed three source water assessment documents: a Community Source Water Assessment Report, a Community Source Water Assessment Summary and a Noncommunity Source Water Assessment Report. The Community Source Water Assessment Report contains two sections. The first section provides general SWAP information. The second section provides system specific information about the system such as the address, population served, and number of wells and surface water intakes. This portion of the report also contains the susceptibility ratings for each source and each entry point to the distribution system. Each of these sources and entry points receive a susceptibility rating for each of the eight contaminant categories. The Community Source Water Assessment Report also contains several attachments, including a map of the source water assessment areas. When completed, the reports will be mailed to the appropriate public water systems and municipalities.

The Community Source Water Assessment Summary is designed for the general public and contains general information such as the definition of susceptibility, sources of drinking water, and a brief description of the SWAP. A second section of the summary contains water system specific information such as the number of wells and surface water intakes serving each water system, the population served, and the system's address. The document also contains the susceptibility ratings for the sources for each of the contaminant categories. Upon completion, NJDEP will provide the summary to each water system and will request that the water systems mail the summary document to their respective customers.

The third source water assessment document, the Noncommunity Source Water Assessment Report, is similar to the Community Source Water Assessment Summary and contains both general and specific information. NJDEP will send the Noncommunity Source Water Assessment Report to the noncommunity water systems and the respective county health departments upon completion.

The anticipated completion date for the community water system source water assessments is in the Spring of 2004. The noncommunity water system's source water

assessments are expected to be completed by the end of the year. An assessment is considered complete once the source water assessment document is written and made available to the public. As stated earlier, the source water assessment reports and summaries will be sent to the public water systems, and will also be available on the internet at www.state.nj.us/dep/swap.

4.2 Surface Water Quality Standards And Recent Water Quality Classification Upgrades

The Water Quality Planning Act requires the State to maintain water quality in existing high quality waters and to restore impaired waters. The Department accomplishes this by developing and implementing Surface Water Quality Standards (SWQS). These standards establish the designated uses to be achieved for individual water bodies and specify the water quality criteria necessary to achieve these uses. Designated uses include potable water, propagation of fish and wildlife, recreation, agricultural and industrial supplies, and navigation. As part of this process, the Department establishes stream classifications and an antidegradation designation for each waterbody.

New Jersey has three levels of antidegradation protection in its Surface Water Quality Standards. The highest tier is assigned to waterbodies that qualify as Outstanding National Resource Waters (ONRW). ONRW waters are maintained in their natural state and are protected from manmade activities that might cause a change in water quality. ONRW waters include freshwater in preserved open space (FW1) and Pinelands waters (PL). The next tier is Category One. These waters are protected from measurable changes in water quality. The lowest tier is Category Two where water quality can be lowered to levels that still support all existing uses based upon a social and/or economic justification. The antidegradation designation for all waterbodies is Category Two, unless specifically identified in the Surface Water Quality Standards as ONRW or Category One.

The Department has embarked on an initiative to review data and information to identify waters that qualify for additional protection as provided in the State's Surface Water Quality Standards. The Department is designating the Category One level of protection for a number of waterways in New Jersey. This protection targets waterbodies that provide drinking water, habitat for Endangered and Threatened species, and popular recreational and/or commercial species, such as trout or shellfish. Waterways can be designated Category One because of exceptional ecological significance, exceptional water supply significance, exceptional recreational significance, exceptional shellfish resource, or exceptional fisheries resource. The Department uses a variety of water quality, biological survey, and environmental indicator information to perform an integrated ecological assessment. This information allows the Department to determine if a stream segment exhibits characteristics that are of "exceptional ecological significance." More information on the data requirements for "exceptional ecological significance is available at: http://www.nj.gov/dep/cleanwater/c1data.html.

The Category One designation provides additional protections to waterbodies that help prevent water quality degradation and discourage development where it would impair or destroy natural resources and environmental quality. The Department adopted new Stormwater Management Rules on February 2, 2004 which require 300 foot buffers for Category One streams and tributaries upstream in the same subwatershed (see "New Stormwater Rules"). The antidegradation provisions of the Surface Water Quality Standards are triggered when an applicant proposes an activity that has the potential to

lower water quality. Previously approved wastewater discharges authorized through the New Jersey Pollution Discharge Elimination System (NJPDES) program, previously approved water transfers and withdrawals authorized through a Water Allocation Permit and existing development and its associated nonpoint source pollution are not subjected to an antidegradation review unless a new or expanded activity is proposed.

All reclassification and Category One designations occur through an administrative rulemaking process, affording the public an opportunity to provide comment and input to these decisions. The proposal must include a justification on why the waterway is exceptional. The rule proposal is published in the New Jersey Register with a 60-day public comment period. During the public comment period a public hearing is scheduled to provide an opportunity for the public to present oral testimony. After the close of the public comment period, the Department evaluates the comments received and proceeds to adoption. The upgraded antidegradation designation is published as an adopted rule in the New Jersey Register along with the Department's responses to the public comments received. The new designation is effective when the rule appears in the New Jersey Register. This process takes approximately six to nine months.

On November 18, 2002 the Department proposed amendments to upgrade the antidegradation designations for fifteen waterbodies. These amendments were adopted on May 19, 2003. Of the fifteen, six waterbodies were upgraded to Category One based on an integrated ecological assessment conducted by the Department to determine "exceptional ecological significance", while nine water supply reservoirs were designated as Category One based on their "exceptional water supply significance. The USEPA approved these amendments on October 1, 2003.

On January 6, 2003 the Department proposed amendments to reclassify nine stream segments and to confirm the current stream classification of three stream segments on the basis of fish assemblage information. The Department also proposed to upgrade the antidegradation designation for a section of the Paulins Kill from Category Two (C2) to Category One (C1) on the basis of "exceptional ecological significance," including the need to protect the dwarf wedgemussel, a Federal and State designated endangered species. On November 3, 2003, the Department adopted new stream classifications for all but one stream segment.

On November 3, 2003, the Department proposed another round of amendments to the SWQS at N.J.A.C. 7:9B-1.15, to upgrade the antidegradation designation for seven streams including both named and unnamed tributaries based upon "exceptional ecological significance." Significant drainage areas of the Manasquan River, Metedeconk River and natural drainage to the Oradell Reservoir are also being proposed for upgrade in antidegradation designation based upon "exceptional water supply significance." In addition, the designated use for two streams segments (Lopatcong Creek and Pohatcong Creek) will be upgraded to trout production (FW2-TP). Category One antidegradation designation is automatically applied to the stream segments reclassified as FW2-TP.

Prior to the three rulemakings listed above, the Department had designated 3,200 stream miles and 2,354 lake acres as Category One. The first rulemaking upgraded 82 river

miles and 7,865 lake acres to Category One. The second rulemaking upgraded an additional 14 stream miles to Category One. The November 2003 proposal, which is expected to be adopted in the spring of 2004, will increase the total river miles designated as Category One by an additional 500 river miles.

In addition to moving forward with individual rulemaking on Category One designations, the Department issued a preliminary list of candidate waterbodies statewide for consideration. The public was invited to nominate waters they believed qualified for Category 1 protection. As of March 2003, the Department received over 47 public nominations from individuals, groups and public entities for Category One designations. These public nominations include approximately 337 named rivers and streams equaling 7,655 linear waterbody miles and 23 reservoirs, lakes and ponds representing 6,593 surface acres. This information will be used by the NJDEP to identify additional candidates to include in future rule proposals.

4.3. Watershed Management Program

The goal of the Division of Watershed Management (Division) is comprehensive water resource management on a watershed basis. Towards that end, the Division follows two paths: a rules-based (Stormwater Management Rule and Water Quality Management Planning Rules) approach for preventing water quality degradation and an action approach (TMDLs, 319 projects, and stream restoration efforts) to remedy existing water quality problems. In the short term, the Division is implementing its Executive Order 109[1] guidance to protect water quality under the authority of the Water Quality Management Planning Rules. Ultimately, a new Water Quality Management Planning Rule will be adopted in order to improve our ability to protect waterways from impairment. This new rule will prescribe acceptable development based on the carrying capacity of the State's water resources.

In order to remedy existing problems, water quality impaired stream segments are being addressed through an aggressive schedule for developing total maximum daily loads (TMDLs). Each TMDL will have an accompanying implementation plan designed to control the sources of pollution. Depending on the pollutant, that action plan may involve any combination of the following: local ordinance adoption, wildlife control, engineered retrofits, enforcement and restoration projects.

The Division is comprised of the **Northern Watershed Planning Bureau** and the **Southern Watershed Planning Bureau**, which implement the water quality management planning process and other regional programs. In addition, the **Bureau of Environmental Analysis and Restoration** develops TMDLs and the technical and scientific basis for decision-making in the Division. The **Bureau of Evaluation and Management** ensures that fund expenditures are consistent with the goals of the Division and meet federal reporting requirements. The **Office of Outreach and Education** was created in order to meet the outreach and educational needs of both staff and the public.

Division Programs

The **TMDL program** is charged with establishing Total Maximum Daily Loads (TMDLs) for these impaired waterbodies. TMDLs represent the assimilative or carrying capacity of the receiving water taking into consideration point and nonpoint sources of pollution, natural background, and surface water withdrawals. A TMDL is developed as a mechanism for identifying all the contributors to surface water quality impacts and setting goals for load reductions for specific pollutants as necessary to meet surface water quality standards. TMDLs are required, under Section 303(d) of the Federal Clean Water Act, to be developed for the pollutant(s) of concern in waterbodies that cannot meet surface water quality standards after the implementation of technology-based effluent limitations. TMDLs may also be established to help maintain or improve water quality in waters that are not impaired. In September 2002, NJDEP and EPA signed a

[1] An executive order requiring additional analyses to be performed prior to the Department's making a final decision on an application for approval of a wastewater management plan or amendment thereto.

memorandum of agreement establishing a timeline for NJDEP to establish the required TMDLs. In 2003, the Division established 203 TMDLs for fecal coliform and eutrophic lakes.

The next step in the TMDL program is to follow up on the implementation plans for approved TMDLs, including bacterial source trackdown and development of lake restoration plans, and to continue with development of the next set of TMDLs. The Department is operating on the second year of a two year schedule and has identified the subsequent two year schedule, along with a pace to complete all TMDLs for impairments listed in 1998 by 2011. Each TMDL is first proposed in the New Jersey Register and subject to public comment. The TMDL is then established by adopting it as part of the appropriate Water Quality Management Plan. EPA then approves the established TMDL.

The **Statewide Nonpoint Source (NPS) Pollution Control Program** consists of the Statewide NPS Strategy and annual report to USEPA, the 319(h) grant program, and the 6217 Coastal NPS Best Management Practice Implementation Program. Current efforts are targeted at funding implementation of nonpoint source pollution control projects and application of Stormwater and Nonpoint Source Control Best Management Practices that are consistent with state priorities such as TMDL implementation, protection of Category One Waters, attainment of designated and existing uses of the states waters, municipal stormwater permitting, and Regional Stormwater Management Plan Development.

As part of the Division's Coastal Programs, **Clean Shores** is a statewide effort to remove floatables such as wood, garbage, medical waste and recyclables from tidal shorelines with the use of inmate labor. The **Cooperative Coastal Monitoring Program (CCMP)** with the participation of local environmental health agencies, assesses coastal water quality and investigates sources of water pollution. During the summer season, local health agencies collect and analyze water samples each week for fecal coliform concentrations from 179 ocean and 138 bay monitoring stations. The **Adopt A Beach** volunteers clean beaches of litter and debris on two designated clean-up days.

The **New Jersey Statewide Water Supply Plan (NJSWSP)** provides a framework to guide the management of potable, industrial, recreational and ecological uses, initiate water conservation strategies, and develop the State's water supply resources to ensure that a safe and adequate water supply will be available into the foreseeable future, including during times of drought. In 1982, NJDEP adopted the first New Jersey Statewide Water Supply Master Plan. The first revision was completed in 1996. The next iteration of the New Jersey Statewide Water Supply Plan is underway and tentatively planned to be released at the end of 2005.

Water Quality Management Plans (WQM Plans) examine all potential sources and types of water pollution within a particular geographic area, and seek to develop mechanisms for controlling those pollutant sources. For the purpose of area wide planning, the State was divided into twelve study areas and an area wide WQM Plan has been completed for each by either the Department or by sub-state agencies (termed "designated agencies"). One component of the WQM Plans is the **Wastewater**

Management Plans that have been adopted as amendments to the WQM Plan. The Wastewater Management Plan contains written and graphic descriptions of existing and future wastewater-related jurisdictions, wastewater service areas, and selected environmental features and treatment works. According to these rules, the NJDEP shall not undertake, or authorize through the issuance of a permit, any project or activity that affects water quality and conflicts with the applicable sections of adopted WQM Plans or the Statewide WQM Planning rules. However, TMDLs are established as amendments to this program.

Recognizing the need to promote stewardship toward state waterways, the **Office of Outreach and Education** has many programs and materials for stormwater, nonpoint source pollution or watershed education and outreach. The **NJ Watershed Ambassadors Program** is a community-oriented AmeriCorps program, which places a member in each of the twenty watershed management areas across the state. These Watershed Ambassadors monitor local rivers through Visual Assessment and Biological Assessment protocols. They also train community volunteers in these two protocols and make watershed presentations to community organizations and schools. The **Watershed Watch Network** for state volunteer water monitors provides a tiered approach, which recognizes the different purposes and data quality needs (hence, different tiers) for collecting volunteer data. With the assistance of the Watershed Watch Network Council, comprised of volunteer monitoring organizations and an Internal Advisory group, the Division is working to better coordinate volunteer water monitoring programs across the state and to provide a forum for discussion of pertinent topics. The Division also provides training on its biological assessment and visual assessment protocols.

The **Clean Water Raingers program** offers educators a number of teaching materials for their students as well as background information on watersheds and nonpoint source pollution. Educators who participate are provided with free booklets and associated materials for their elementary school age students. Project WET (Water Education for Teachers) is a nationally renowned program that offers teachers a better understanding about the world's water resources through hands-on, multi-disciplinary lessons. Project WET is the only program that teaches about the importance and value of water in our every day life with formal and non-formal educators while offering specialized programs about New Jersey's water resources and watersheds. Educators who attend Project WET training are eligible to participate in the Water Festivals mini-grant program held in the May and September. The Watershed Stewards Program offers high school students an opportunity to focus on a watershed service project that addresses an environmental concerns. The Harbor Watershed Urban Fishing Program educates young students living in the Newark Bay Complex about the hazards of eating contaminated fish and helps them to discover the beauty of this great natural resource. This intensive four-day program gives students the opportunity to experience the estuary first-hand through storm drain marking and fishing activities.

The recently adopted **Stormwater Management Rules** stress new performance standards for ground water recharge, including both water quality and quantity controls,

and promote the integrity of the state's surface and ground water resources. See "Stormwater Program" immediately below for a detailed description of the program.

For additional information, the **Division of Watershed Management (within the NJ Department of Environmental Protection) may be contacted at**

PO Box 418
Trenton NJ 08625
609-984-0058
www.nj.gov/dep/watershedmgt

4.4. Nonpoint Source Pollution Control Program: Section 319(h)

In 1987, Congress enacted Section 319 of the Clean Water Act (CWA) which established a national program to control nonpoint sources (NPS) of water pollution. NPS pollution is caused by precipitation moving over and through the land and carrying natural and anthropogenic pollutants into surface and ground water. NPS pollution continues to be the largest remaining source of water quality impairments in the nation (Federal Register, 2003). Since 1990, Congress has annually appropriated monetary grants to states under Section 319(h) to assist states in implementing management programs to control NPS pollution.

The Department's Division of Watershed Management (DWM) administers New Jersey's NPS Program. New Jersey has been awarding Section 319(h) grant funds to eligible entities throughout the state since 1995. While early projects have focused on streambank restorations, more recent projects focused on addressing total maximum daily load (TMDL) implementation. Beginning in State Fiscal Year (SFY) 2002 and ending in SFY 04, the Department developed the following funding priorities for 319(h) grants:

- Reduction of NPS Pollution in sublist 5 impaired waters (as per the current Integrated List) and/or implementation of an established Total Maximum Daily Load;
- Restoration, maintenance or enhancement of Category 1 waters or ambient biological monitoring locations;
- Implementation of stormwater management or other water quality management measures identified in previous assessment projects;
    - The development of Regional Stormwater Management Plans

For SFY 2004, federal regulations were revised to allow states to use Section 319(h) funds to implement requirements of Phase II Stormwater Permitting regulations[2]. (see *Stormwater Permitting Rule* under New Stormwater Management and Permitting Rules, elsewhere in this section for a description of the Phase II regulations) For SFY 2004, New Jersey approved $2.2 million in Section 319(h) funds to implement Phase II permit requirements. The Department will be awarding money from SFY 04 Section 319(h) base funds and from other funding sources to selected municipalities (Tier A municipalities) as defined in the stormwater regulations to develop municipal Stormwater Pollution Prevention Plans and implement other stormwater permit requirements. Approximately $1.6 million dollars of incremental Section 319(h) funds will be disseminated by the Department in SFY 04 as part of a competitive grant award process.

The Department has begun the SFY 2005 Section 319(h) funding cycle. For new projects commencing in June 2004, the Department has developed the following funding priorities, amended from those delineated above:

1) Watershed Restoration and Protection Plans: Funding priority will be given to projects that develop Watershed Restoration Plans in watersheds where:

[2] On November 27, 2002, Congress enacted the Great Lakes Legacy Act of 2002, Public Law 107-303. This law includes a section that authorizes the use of Section 319(h) funds in FFY 2003 to carry out projects and activities that relate to the development or implementation of Phase II NPDES programs.

a) A TMDL has been proposed, established, or adopted for an impaired water(s) within that watershed;
b) Impaired waters that are found on sublist 5 of the *New Jersey 2004 Integrated List*; or
c) Priority stream segment(s) identified by the DWM.

Note: Funding priority will be given to projects that propose the development of Watershed Protection Plans in watersheds containing designated Category One waters. The highest priority will be given to protection plans for Category One waters that are also identified as priority stream segments by the DWM.

2) TMDL Implementation Projects: Funding priority will be given to projects that include activities identified in a proposed, established, or adopted TMDL implementation plan. Highest priority will be given to implementation of TMDLs adopted for waters also identified as priority stream segments by the DWM, as well as the implementation of TMDLs that require riparian restoration and/or a reduction of waterfowl populations.

Table 4.4 lists projects funded in State fiscal years 2001 through 2003. For more information, please see http://www.state.nj.us/dep/watershedmgt/nps_program.htm.

Table 4.4: Water Quality Projects funded with Section 319(h) Funds in State Fiscal Years 2001 through 2003

FY	RECIPIENT	PROJECT DESCRIPTION	GRANT AMOUNT	WMA
2001	Hudson-Essex-Passaic SCD	Pequannock River; channelized stream renaturalization, Route 23-West Milford/Jefferson Townships.	$78,680	3
2001	Gloucester Soil Conservation District	Time of concentration calculations in Coastal Plain Watersheds	$40,000	
2001	Ramapo College	Riparian restoration for Ramapo Reservation Lake Mahwah Twp.	$64,500	3
2001	Upper Raritan Watershed Association	Assess causes of the current quality of the Peapack Brook in Chester Borough, Chester Twp, Boro of Peapack-Gladstone, and Bedminster Twp, and develop management strategies to protect & restore those areas.	$83,980	8
2001	NY/NJ Baykeeper, City of Rahway	To restore flood plain habitat and improve water quality of the Rahway River watershed at Union & Allen Streets.	$147,500	7
2001	Hudson-Essex-Passaic SCD c/o Ramapo Council	WMA 3 Watershed Restoration Master Plan and Streambank Restoration will address all 3 AMNET mod impaired sites.	$268,750	3
2001	Middletown Township Environmental Commission	To perform an assessment of McClees Brook for a wetland restoration project.	$34,000	12
2001	Hopewell Township (Mercer)	Woolsey Brook watershed improvement project; construction of 2 parking areas on the Hopewell Twp Mun facility utilizing porous paving.	$141,780	11
2001	ANJAC	To perform a reforestation project in the headwaters of East Creek in Dennis Twp and perform monitoring.	$57,480	16
2001	City of Woodbury	Stabilize & restore eroded portion of Woodbury Creek.	$59,900	18
2001	County of Gloucester	Repair sedimentation & erosion problems along Rowan University stream corridor (Chestnut Branch, Mantua Creek)	$120,315	18

Table 4.4 continued:

FY	RECIPIENT	PROJECT DESCRIPTION	GRANT AMOUNT	WMA
2001	Dover Township	To develop a multi-phase development & implementation plan designed to coordinate NPS strategies throughout the Long Swamp Creek watershed.	$190,000	13
2001	Marine Trades Association of New Jersey	Proposes to increase awareness & encourage implementation of innovative pollution control measures by NJ Marinas.	$65,601	13
2001	Delaware Riverkeeper Network (American Littoral Society)	Riparian buffer completion along Cooper River Lake in Collingswood	$8,450	18
2001	Fairleigh Dickinson University	Proposes to plant eelgrass & widgeon grass as a technique for increasing water quality & reducing nonpoint source pollution in Barnegat Bay; to perform additional monitoring.	$311,249	13
2001	Township of Riverside	Stormwater Inventory and Management Plan	$70,000	19
2001	County of Camden	To construct a biofilter wetland on the north side of Cooper River Lake in Collingswood.	$159,450	18
2001	Pompeston Creek Watershed Association	Retrofit 2 detention basins and stabilize eroding stream banks along Pompeston Creek.	$80,000	18
2001	Mount Holly Township	To construct a biofilter wetland complex at the edge of Woolman Lake, Mount Holly to purify turbid stormwater runoff.	$145,215	19
2001	City of Linwood	To restore Mary Jane Pond and retrofit the stormwater drainage system that feeds into it. There is also an education & outreach component for local schools.	$100,000	15
2001	Whippany River Watershed Action Committee Inc.	Continuation of a streambank restoration (Phase II Burnham Park, Atno Brook) previously funded to address fecal impairment.	$31,480	6
2001	Sylvan Lake Commission	Proposes to construct a concrete containment area to capture sediment & debris from the stormwater trunk line serving portions of Neptune City & Neptune Twp.	$40,000	12

Table 4.4 continued:

FY	RECIPIENT	PROJECT DESCRIPTION	GRANT AMOUNT	WMA
2001	Hackensack Riverkeeper Inc.	Addresses a biologically impaired site (Cole's Brook in Staib Park) on the VanSaun Brook—which is a tributary to the Hackensack River.	$100,000	5
2001	Township of Bloomfield	Addresses a biologically impaired site (Clark's Pond) on the Third River thru streambank restoration.	$100,000	4
2001	Hudson County, Office of Strategic Revitalization	Will demonstrate the applicability & utility of urban stormwater best management practices.	$40,000	7
2001	Lawrence Township (Mercer)	Restore & stabilize 450 linear feet of bank along Colonial Lake thru wetland plantings.	$19,550	11
2001	Hamilton Township (Mercer)	Restore Robert L. Martin Lake and Pond Run areas by reducing pollutant load, and install an aquatic shelf to increase riparian zone for geese.	$70,000	11
2001	North Jersey Resource Conservation & Development Council	Implement a comprehensive watershed restoration strategy to improve water quality in the Upper Delaware.	$412,000	1
2001	Philadelphia Academy of Natural Sciences	Rapid bioassessment protocol for algae.	$53,354	Statewide
2001	NJ Department of Agriculture	Provide support to NJDEP Watershed Mgt Program and Nonpoint Source Implementation Program	$175,000	Statewide
2001	Rutgers University, Office of Continuing Professional Education	Develop & promote best mgt. practices in stormwater mgt. and nonpoint source pollution control in NJ through electronic outreach & training.	$18,445	Statewide
2002	Rutgers	Project WET	$94,849	
2002	Rahway River Association	Cedar Brook stream stabilization and buffer enhancement	$100,000	9
2002	New York/New Jersey Baykeeper	Robinson's Branch stream stabilization and rehabilitation	$110,000	7
2002	Liberty Township	Mountain Lake and Mountain Lake Brook NPS Control Project	$117,000	1

Table 4.4 continued:

FY	RECIPIENT	PROJECT DESCRIPTION	GRANT AMOUNT	WMA
2002	Somerset County Park Commission	Riparian Buffer Restoration of Pond	$47,225	10
2002	Fairleigh Dickinson University (w/RP01-089)	Mapping of SAV in Barnegat Bay	$155,000	13
2002	Willingboro Township	Implementation of water quality BMPs in Willingboro Twp. In the Rancocas Creek Watershed	$91,064	19
2002	Vernon Township	Highland Lakes Regional NPS Project	$45,000	2
2002	Hamilton Township	Shady Brook Pond wetlands buffer restoration for water quality improvement	$79,500	20
2002	Gloucester City Sewer & Water Department	Municipal lake water quality management - Newton Creek Watershed	$50,000	18
2002	Plumsted Township	Crosswicks Creek - Oakford Lake and Paradise Park Streambank Restoration for Water Quality Improvement	$96,925	20
2002	Citizens United to Protect the Maurice River and its Tributaries	Parvin Branch and Tarklin Brook Assessment and Monitoring	$56,450	17
2002	Roosevelt Borough	Siltation Abatement and Restoration of Wetlands	$106,000	11
2002	Friends of Monmouth County Parks System	Riparian Restoration in the Manasquan Watershed	$100,000	12
2002	Lakewood Township	Lake Carasaljo Diagnostic/Feasibility Study	$100,000	13
2002	Sparta Township	Wallkill River - Glen Brook Restoration	$62,440	2
2002	Folsom Boro	Clean out of existing stormwater collection system in Folsom Boro	$52,440	15
2002	Delaware River Basin Commission	Fluvial Geomorphology Technical Assistance for Stream Assessment and Restoration	$73,000	Statewide
2002	Camden County Department of Parks	Biofilter Wetlands/Sediment Trap for Stormwater Treatment in the Watershed of Newton Lake	$129,500	18
2002	Cinnaminson Twp Public Schools	Retrofit of a stormwater outfall and stream bank restoration of the Pompeston Creek	$85,000	18
2002	Moorestown Board of Education	Retrofitting stormwater management facilities of the public schools in Moorestown	$64,000	18

Table 4.4 continued:

FY	RECIPIENT	PROJECT DESCRIPTION	GRANT AMOUNT	WMA
2002	Cape May County	Cox Hall Creek feasibility study and restoration plan	$100,000	16
2002	Union County	Warinaco Park Lake and Lagoon Restoration Project	$99,000	7
2002	North Jersey RC&D	Walkill River Agricultural BMP Project/ NPS Intervention Project	$122,000	2
2002	Trout Unlimited	Bear Swamp Brook Restoration	$3,750	3
2002	New Jersey Water Supply Authority	Delaware and Raritan Canal Tributary Assessment and NPS Management	$61,215	9
2002	New Jersey Water Supply Authority	Mulhockaway Creek Watershed Study	$235,000	8
2002	Bergen County Dept of Parks	Van Saun Mill Brook Erosion Control	$100,000	5
2002	Tuckerton Boro	Lake Pohatcong Restoration	$145,000	13
2002	City of Trenton	Assunpink Creek Greenway Restoration Project	$100,000	11
2002	Passaic County	Goffle Brook, Goffle Brook Park Restoration of Riparian Corridor, Phase 2 and 3	$192,500	4
2002	Essex County Dept of Public Works	Verona Park Lake Bioengineering Shoreline Restoration Project	$40,000	4
2002	Clifton City Health Department	Race Track Pond at Memorial Park Restoration and Shoreline Stabilization	$68,000	4
2002	Whippany River Watershed Action Committee	Speedwell Lake at the Whippany River - Phases 1-4	$146,350	6
2002	Whippany River Watershed Action Committee	Whippany River Watershed Detension basin retrofit in Mendham Township	$27,000	6
2002	Morris County Planning Department	Beaver Brook/Hibernia Brook Stormwater Management Plan	$74,840	6
2002	Swartswood Lakes & Watershed Association (Amendment RP)	Swartswood Lake Restoration & WMP and Stormwater Management Program	$100,000	1
2003	Borough of Avon by the Sea	Removing Siltation and Debris in Sylvan Lake	$230,000	12
2003	Monmouth County Planning Board	Ramenessin Brook NPS Pollution Source Assessment and Stormwater Impact Study	$177,500	12
2003	Township of Neptune	The Implementation of Stormwater BMPs at Lake Alberta	$195,400	12

Table 4.4 continued:

FY	RECIPIENT	PROJECT DESCRIPTION	GRANT AMOUNT	WMA
2003	City of Trenton	Urban Stormwater Retrofit in the City of Trenton	$75,000	11
2003	Township of Franklin and NJ Water Supply Authority	Stormwater Management Plan for the Cedar Grove (Al's) Brook Watershed	$150,000	9
2003	Rutgers, the State University	Regional Stormwater Management Plan for Robinson's Branch	$291,124	7
2003	Township of Sparta	Lake Mohawk Stormwater Basin Alum Injection System	$98,200	2
2003	Camden and Gloucester County Soil Conservation Districts	Development of a Regional Stormwater Management Plan for the Racoon Creek	$637,174	18
2003	Monmouth University School of Science, Technology and Engineering	Innovative Assessment of Sources of Fecal E Coli in Pathogen Impaired Waterbodies of the Monmouth Coastal Watersheds Region	$124,762	12
2003	Rutgers	Bee Meadow Pond Shoreline Restoration Project	$126,940	6
2003	Rutgers	Regional Stormwater Management Plan for Troy Brook	$213,400	6
2003	Borough of Demarest	Demarest Park Shoreline Restoration and Stormwater BMP Project	$179,500	5
2003	Pequannock River Coalition	Pequannock River Thermal Mitigation, Monitoring and Assessment	$23,105	3
2003	Wallkill River National Wildlife Refuge	Streambank Restoration along the Wallkill River at Route 565 within the Wallkill River National Wildlife Refuge	$167,400	2
2003	Swartswood Lakes and Watershed Association	Swartswood Lakes and Watershed Diagnostic Assessment	$65,000	1
2003	Rutgers Office of Cont. & Prod Ed	NPS Pollution Workshops	$50,000	State

4.5. New Stormwater Management And Permitting Rules

The Department has adopted two new stormwater rules: Stormwater Management (at N.J.A.C. 7:8) and Stormwater Permitting (at N.J.A.C. 7:14A).

Stormwater Management Rule

The new Stormwater Management Rules (N.J.A.C. 7:8) are the first major update to the Stormwater Management rules since they were first adopted in 1983. The Stormwater Management Rules govern the development of standards for State, municipal and regional stormwater management requirements, plans and ordinances. Pursuant to the Stormwater Management Act, N.J.S.A. 40:55D - 93 to 99, every municipality in the State is required to prepare a stormwater management plan and a stormwater management ordinance(s) to implement that plan.

In addition, the Department has promulgated amendments to the stormwater management provisions of other rules in order to coordinate with and cross-reference the new Stormwater Management rules. The rules with new amendments that make reference to the Stormwater Rule are the Freshwater Wetlands Protection Act Rules at N.J.A.C. 7:7A; the Coastal Zone Management Rules at N.J.A.C. 7:7E; the Flood Hazard Area Control rules at N.J.A.C. 7:13; the Water Quality Management Planning Rules at N.J.A.C. 7:15; and the Dam Safety Standards at N.J.A.C. 7:20.

The link between anthropogenic disturbance and changes in aquatic community structure has been consistently documented over the past decade. Land use alterations may result in an increase in impervious surfaces, runoff, suspended sediments and pollutant loading. These changes directly affect the hydrology, geomorphology, and water quality of streams, rivers, lakes and marine waters, and alter the aquatic communities that inhabit these systems. Moreover, studies of New Jersey watersheds suggest that forest and wetlands play a major role in maintaining a healthy supply of water, food, and habitat for intolerant and highly desirable species. Simultaneously, forests and wetlands mitigate the undesirable affects of human-induced landscape alterations. Further, urban land use, in particular, has been directly linked to communities that shift to species more tolerant of hydrology, chemical, organic, and habitat changes brought on by increases in chemical use, impervious surface area, surface runoff, and instability of stream habitat. Thus the pressures of urban development on aquatic communities have been and will continue to present many challenges in New Jersey's efforts to meet the goals of the Federal Clean Water Act, the New Jersey Water Pollution Control Act and the Water Quality Planning Act.

The Department's approach to protecting and restoring water resource health focuses on protecting environmentally sensitive and critical areas while encouraging continued growth elsewhere in the State. The Department intends to prevent loss and encourage restoration of environmentally critical areas such as forests and stream corridors to moderate the effects of development and provide improved habitat for plants and animals. While the major emphasis of this Rule improves minimum statewide runoff

techniques, it also addresses the need for special protection of environmentally sensitive waters.

An objective of these new stormwater rules is to significantly reduce the adverse impacts of post-construction stormwater runoff in New Jersey. The new rules requiring stormwater runoff control techniques will accomplish the following:

- Provide a framework and incentives for managing runoff and resolving nonpoint source impairment on a drainage area basis for new and existing development.
- Establish a hierarchy for measures: first, integrate low impact site design techniques to maintain natural vegetation and drainage, next evaluate if performance standards are met, then incorporate structural best management practices as necessary.
- Establish new runoff control performance standards for ground water recharge, water quality and quantity.
- Establish special area protection measures for exceptional value waters.
- Provide an updated New Jersey Stormwater Best Management Practices (BMP) Manual to provide guidance on how to meet the performance standards. The manual is available on the Department's web page at http://www.njstormwater.org or in hard copy by calling (609) 984-0058.
- Provide regulatory consistency among regulatory agencies at the local and state level.
- Provide safety standards for stormwater management basins.

The performance standards in this rule are intended to improve runoff management in New Jersey by recognizing that stormwater should be managed by techniques that mimic nature and avoid the concentration of runoff from impervious surfaces. Traditionally, stormwater management has focused on removing stormwater as quickly as possible to avoid flooding and ponding. Traditional methods of managing runoff often lead to detrimental impacts to ground water, surface water, habitat and public and private property. The intent of this rule proposal is to require implementation, where development of land is to occur, of the best currently available methods for preventing hydrologic and water quality impacts of stormwater on streams and other waters including negative impacts on ecological functions and wildlife. The new rules promote better site design techniques that prevent disturbances. Such is accomplished through the use of nonstructural stormwater strategies or low impact site designs to minimize modification to hydrologic conditions.

The design and performance standards contained in the Rule are intended to reduce stormwater runoff volume, reduce erosion, and maintain infiltration and ground water recharge. The design and performance standards require site designs, to the extent practical, maintain or closely reproduce natural drainage systems, vegetation and hydrologic response, and/or eliminate or minimize the discharge of stormwater-related pollutants. The new ground water recharge performance standard is intended to protect baseflow, stream ecology, and geomorphology while encouraging the preservation and

enhancement of environmentally beneficial areas. These protections are to be achieved by maintaining or mimicking existing hydrologic conditions.

The Department asserts that, in many instances, stormwater measures for specific drainage areas are best developed through regional stormwater management plans and for waterbody specific impairments or objectives. The Department posits that in the long term, targeted stormwater controls on a regional or drainage area basis will result in more effective management of stormwater runoff from new and existing development. Additionally, targeted controls are more cost efficient than implementing standard statewide site-specific stormwater controls alone. The Department is providing the public with an array of stormwater management techniques through this rule and the New Jersey Best Management Practice (BMP) Manual.

One of the most significant provisions of the new rules is the requirement of a 300-foot buffer minimizing new development to protect Category One (C1) waterbodies. C1 protection is one of the highest forms of water quality protection in the state, which is designed to prevent any measurable deterioration in the existing water quality. These buffers will significantly protect critical drinking water and sensitive ecological resources from degradation. The rules provide for some flexibility on the size of the buffers in areas where stormwater management plans have been approved. The rules also apply the buffer to tributaries of C1 waterbodies within the immediate watershed boundary that are not themselves designated C1 waterbodies.

The Stormwater Management Rules also have mandatory performance standards for ground water recharge to maintain the integrity of the state's aquifers. They establish a minimum requirement to maintain 100 percent of the average annual ground water recharge for new development projects, a major initiative toward mitigating future droughts.

In addition to recharge standards, the regulations also stress water quality controls, such as best management practices to reduce runoff of total suspended solids (TSS) by 80 percent and other pollutants up to the maximum extent feasible. The rules stress low impact site designs for stormwater management systems that maintain natural vegetation and drainage and reduce clear-cutting and the unnecessary loss of trees. Some of the rules are waived and streamlined in urban areas to promote urban redevelopment while still protecting the environment.

Stormwater Permitting Rule

Amendments to the NJ Pollution Discharge Elimination System (NJPDES) rules (N.J.A.C. 7:14A) are also part of the Department's Statewide Stormwater Regulation Program designed to implement stormwater requirements under the Federal National Pollution Discharge Elimination System, Phase II Stormwater Permit rules. Under 40 CFR 122.34(b)(5) and the NJPDES rules, owners or operators of "regulated small municipal separate storm sewer systems" are required to obtain permit authorization and

under the permit, develop, implement, and enforce a program to address stormwater runoff from new and existing development and redevelopment.

Under this set of rules, the NJDEP will issue the new NJDPES permits for all municipalities; large public complexes such as colleges, prisons, and hospitals. The permit will also be issued for highway systems operated by counties and other government agencies, such as the NJ Department of Transportation and the South Jersey Transportation Authority. The permits address stormwater quality issues related to new and existing development and redevelopment by requiring the development of a stormwater program and implementation of specific permit requirements referred to as Statewide Basic Requirements (SBRs). SBRs may also require the permittee to implement related best management practices (BMPs). New development and redevelopment are addressed in part by requiring municipalities to adopt and enforce a stormwater management plan and ordinance in accordance with the Stormwater Management Rules discussed previously, thereby linking the two programs into an effective whole addressing many sources contributing to water quality issues. Stormwater from existing development is addressed through SBRs including: Local Public Education, Improper Disposal of Waste, Solids and Floatable Controls, Maintenance Yard Operations and Employee Training.

The goal of this aspect of the Stormwater program is to develop Pollution Prevention Plans that remove pollutants from contact with stormwater. This goal is achieved through such activities as public education programs regarding the proper use and disposal of potential pollutants, storm sewer stenciling; litter control and pollination prevention at municipal maintenance facilities. These regulations affecting existing development address a significant oversight in current regulations that only focus on new development. Additional information on this program is available on the Department's website at www.njstormwater.org.

4.6. Delaware Estuary Program

The Delaware Estuary Program (DELEP), one of 28 National Estuary Programs in the United States, was established in 1988 to develop a Comprehensive Conservation and Management Plan (CCMP) to protect and enhance the natural resources of the Estuary. DELEP is a partnership of the U. S. Environmental Protection Agency, the states of Delaware, New Jersey and Pennsylvania, the Delaware River Basin Commission, the Partnership for the Delaware Estuary, other non-profit organizations and governmental agencies, the private sector and citizens, all working together to restore and protect the Delaware Estuary (Estuary).

The Estuary is located in the Mid-Atlantic region of the United States, and includes portions of Pennsylvania, New Jersey and Delaware, through which the Delaware River flows. It stretches approximately 133 miles, from the falls of the Delaware River at Trenton, New Jersey and Morrisville, Pennsylvania, south to the mouth of the Delaware Bay between Cape May, New Jersey and Cape Henlopen, Delaware.

The Estuary is home to the largest population of horse shoe crabs in the world, and is an integral link in the migratory path of numerous species of birds, including shorebirds and waterfowl. The Estuary provides vital spawning, nursery, and feeding grounds for fish, shellfish, and marine mammals. It supports wading and migratory birds, reptiles, and mammals, and serves as a source of drinking water. The Estuary filters pollutants and sediments from the land and acts as a buffer that provides protection from flooding and erosion. The Estuary supports a diverse natural environment, as well as a vital industrial base. The Estuary contributes significantly to the economic, recreational, and cultural resources of the region.

In addition to its natural beauty and habitat value, the Estuary maintains the world's largest fresh water port, the second largest refining-petrochemical center in the nation, and one of the world's greatest concentrations of heavy industry. These diverse uses require a delicate balance of protection measures. DELEP is committed to improving and maintaining the state of the environment in the Delaware Estuary.

New Jersey continues its active role on the DELEP Steering Committee (SC) with the Commissioner of the New Jersey Department of Environmental Protection (NJDEP) or his representative by participating in bi-annual meetings and/or conference calls. Representatives from NJDEP are also on the Estuary Implementation Committee (EIC), attend EIC meetings on a bimonthly basis, and on the EIC Workgroup, participate in meetings held on a monthly basis.

In addition, New Jersey is an active participant in DELEP's implementation teams and advisory committees. New Jersey participates in several meetings held within the Estuary including the Information Management Advisory Committee (IMAC), the Public Participation Implementation Team (PPIT), the Habitat and Living Resources Implementation Team (HLRIT), the Toxics Advisory Committee (TAC), and the Monitoring Advisory Committee (MAC).

One of the principal activities of the DELEP is to pursue the implementation of some 77 CCMP Actions Items (see Table 4.6 below). To date, a total of 64 Actions (83%) have been implemented or initiated. This along with the development of a broad sweep on environmental indicators (discussed in detail below) has lead to the release of a State of The Estuary Report, published and distributed in September 2002.

Monitoring Advisory Committee

The Monitoring Advisory Committee (MAC) is advisory committee to both the Delaware River Basin Commission (DRBC) and DELEP. A key agenda item for the MAC is to provide input into the DELEP Environmental Indicators development process and Delaware River Basin Comprehensive Management Plan. The MAC released a Monitoring Report in July 2000 which integrated data collected prior to 1999. The MAC has proposed moving from a yearly monitoring cycle for the Monitoring Report to a five year cycle to provide for greater data synthesis and evaluation over the current yearly time frame. This new cycle will also enhance coordination with State programs and reduce redundancy.

Chlorinated Organic Pollutants

Chlorinated organic compounds, such as PCBs, chlordane and DDT have been found in the tissue of fish and shellfish in the Delaware Estuary which has resulted in fish consumption advisories for the entire Estuary. In addition to the human health risks posed to individuals who consume contaminated fish, PCBs also represent an ecological risk to wildlife and aquatic biota in the Estuary, particularly sediment-dwelling organisms. Chlorinated pesticides appear to adversely affect populations of birds of prey (raptors) in the Estuary. For example, elevated levels of PCBs, DDT and its metabolites, and chlordane have been detected in peregrine falcon eggs from the Estuary. Although more study is needed, there is evidence that eggshell thinning due to toxic substances is continuing to affect the stability of raptor populations.

In order to address the issue of PCBs in the Estuary, the Delaware Estuary Program has drafted a PCB Strategy, the goal of which is to ensure that the Delaware River Basin Commission's water quality standards for Total PCBs for Zones 2, 3, 4 and 5 of the tidal Delaware River (the Estuary) are achieved. Achieving these standards will ensure that the health of humans and living resources using the Estuary are protected and eliminate the necessity for advisories limiting consumption of fish and shellfish caught in the Estuary. This strategy is designed to establish Total Maximum Daily Loads (TMDLs) for Total PCBs including allocations for point and non-point sources.

The DELEP's Habitat and Living Resources Implementation Team is working with the US Fish and Wildlife Service (USFWS), USGS, and the states of Delaware and New Jersey to provide a horseshoe crab indicator to depict the status and trend in the horseshoe crab population. The Delaware Division of Fish and Wildlife funded a volunteer coordinator's position in 2001. The coordinator schedules, trains and recruits volunteers to conduct annual counts of spawning horseshoe crabs using the Estuary. The New Jersey Division of Fish and Wildlife currently enters all data in an electronic format

and the US Geological Survey - Biological Resources Division calculates the annual index of spawner abundance. This long term monitoring data will provide critical information to help manage the resource. In addition, New Jersey funded an additional $200,000 toward the study of horseshoe crabs and shorebirds in the Estuary in 2003.

Fish Consumption Advisories

The CCMP identified the need to establish uniform or compatible fish collection and analysis procedures, devise a compatible fish assessment and reporting system and develop consistent fish consumption advisories for the Delaware Estuary. DELEP convened the first meeting of Fish Consumption Advisory Team (FCAT) in April 2002 to begin addressing this matter. FCAT consists of fisheries and health experts from the States of Delaware, Pennsylvania and New Jersey along with representatives from EPA and the USFWS. A draft advisory has been prepared and is anticipated to be released shortly (as of Jan'04).

Environmental Indicators

Environmental indicators are tools to assess and communicate the state of the environment and measure the success of environmental programs. To measure progress towards enhancing and preserving the estuarine ecosystem, DELEP developed and published a 2001 report concerning an initial set of nine land and water environmental indicators. This first suite of indicators was limited to those for which data was readily available. It also examined economic, environmental and social impacts and information gaps. The report was widely circulated and informed the public and environmental managers about the health of the Estuary.

Since the publication of the initial suite of indicators, DELEP has embarked on the task of developing additional measurable goals along with their respective indicators. The establishment of these goals will act as a management tool through which many other organizations within the Estuary can set standards. As part of the overall development process, DELEP held an Estuary Indicators' Workshop on January 22 and 23, 2002 which addressed indicators development as well as additional monitoring needs.

Programmatic accomplishments within the Delaware Estuary Program over the past two years include the following items listed below:

a) New Program and Habitat Directors were hired to increase the capacity for new partnerships and more tangible improvements throughout the Estuary.

b. The Implementation Advisory Committee for PCB remediation was charged with developing proposed strategies for reducing active and potential PCB sources and developing a comprehensive strategy for achieving the TMDLs.

c. Stormwater protection ads were placed on cable channels and transit posters were posted in PA and NJ.

d. A volunteer storm-drain marking project was completed that involved hundreds of local residents.

e. The Estuary Program supported more than 55 habitat improvement projects. The effort was supported by grants from Minigrant, the Corporate Environmental Stewardship Program, the Sense of Place and the National Fish and Wildlife Foundation. In so doing, the program accomplished the following:
   - improved more than 550 acres of wetlands, riparian forest, grassland and other habitat;
   - protected over 4½ miles of stream buffer;
   - removed at least 5 unneeded dams that impede fish passage to over 20 miles of stream habitat;
   - implemented BMPs in several farm yards to reduce nutrient-laden runoff to impaired streams.

f. A Stage 1 TMDL for PCBs was developed.

g. The list of measurable goals and indicators was expanded to include shad, oyster, horseshoe crab, habitat restoration, ecotourism and cultural resources.

h. The sampling plan was expanded to get monthly samples from all available boat run sites. Thus, a total of over 2900 samples were collected and almost 16,000 analyses were performed to characterize water quality of the estuary.

i. Both the Monitoring Advisory Committee and the Delaware River Fish and Wildlife Cooperative were enlisted in plans to develop a 5-Year Monitoring Report.

For additional information regarding the Delaware Estuary Program, contact the Estuary Program at

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Table 4.6: Seventy Seven Comprehensive Conservation And Management Plan (CCMP) Action Items For The Delaware Estuary Program

LAND MANAGEMENT

Develop a Comprehensive Sustainable Development Strategy for the Delaware Estuary

Support Watershed-Based Planning

Table 4.6 continued:

Support the Implementation of Coastal Zone Act Management Measures

Support the Establishment of Riparian Corridor Protection Programs

Support the Implementation of Urban Best Management Practices

Identify and Support Greenspace Program Plans to Protect Natural Resource Areas Related to the Estuary

Support Environmental Agreements among Municipalities and Counties

Develop Environmental Guidelines for County Master Plans and Encourage and Provide Incentives for Municipal Conformance

Expand State and/or Regional Planning and Technical Guidance to Local Governments

Establish a Land Use Planner Circuit Rider

Continue or Expand Municipal Planning Grants Program

Conduct Training and Workshops

Establish and/or Increase Support for Mapping/GIS Activities

Develop Sustainable Development Business/Industry Incentive Programs

Encourage and Support Compact Development as an Element of Comprehensive Planning for Communities

Develop Policies and Incentives to Encourage Redevelopment in Previously Developed Areas

Develop Policy Options to Address the Tax Revenue Impact of Conservation Lands on Municipalities

Develop Self-Assessment Techniques and an Awards Program to Encourage Municipalities to Adopt Environmentally Sensitive Planning, Zoning, and Site Development Practices

WATER USE MANAGEMENT

Promote Implementation of Water Conservation Rate Structures/Conservation Retrofitting Programs by Water/Wastewater Utilities

Conduct Studies for Tributary Watersheds Experiencing Stream Diminution Problems

Encourage Water Utilities to Utilize Water Conservation Techniques and Conjunctive Use Methods to Prevent Long-term Lowering of Ground water Levels

Encourage the Reuse of Wastewater for Nonpotable Purposes

Encourage Water and Wastewater Utilities to Conduct Integrated Resource Plans

Support Efforts to Ensure Freshwater Flows to the Estuary to Meet Water Supply Needs to the Year 2020

Table 4.6 continued:

Encourage Coordination of Dredging Activities and Priorities and the Management of Dredged Material Within the Region

Utilize RIMS for Information Management that Facilitates Port Operations and Safety

Support Private Sector Efforts on Oil Spill Response and Pollution Prevention

Develop, Publish, and Implement a Comprehensive Public Access Management Strategy

Inventory Available Pump-Out Stations and Address Any Identified Deficiencies

Develop and Implement Strategies to Achieve the "Fishable/Swimmable" Goals of the Clean Water Act

HABITAT AND LIVING RESOURCES

Assure Compliance with Existing Interstate Species Management Plans and Prepare Plans for Additional Appropriate Species

Establish a Procedure for Enhancing Compatibility among Species Management Plans

Develop a Natural Community Classification System to Assist in the Protection of these Communities

Coordinate and Enhance Wetlands Management within the Estuary

Target Habitat Enhancement Opportunities for Present and Future Action

Develop and Implement an Estuary-wide Policy to Evaluate Proposed Intentional Introductions of Exotic Species and Prevent Unintentional Ones

Develop Measures to Protect Shoreline and Littoral Habitats that are Threatened by Sea Level Change

Facilitate Coordination among the States to Update and Improve Environmental Sensitivity Index Mapping for Hazardous Spill Response Information

Consider Priority Species in Regulatory Reviews and Environmental Impact Statements

Protect Rare Species through a Landscape Approach

TOXICS

Implement a Toxics Management Strategy to Assist Environmental Managers in Developing Regional Prevention and Control Strategies

Assist Residents in the Proper Use and Disposal of Chemicals

Develop and Adopt Uniform Water Quality Criteria for Toxic Pollutants Which Will Be Used by Regulatory Agencies to Regulate Point and Nonpoint Sources

Implement Phased Limits on Toxic Pollutants Using the TMDL Concept

Identify the Sources of Contaminated Sediments and Identify Control Strategies and Mitigation Alternatives

Develop a Uniform Program for Issuing Fish/Shellfish Consumption Advisories

Table 4.6 continued:

EDUCATION AND INVOLVEMENT
Continue Existing Public Participation Program
Hold and Attend Public Meetings and Workshops
Continue Holding Annual Events to Raise Public Awareness of the Estuary
Develop Educational Initiatives in Support of the Land Management Action Plan
Develop Educational Initiatives in Support of the Water Use Action Plan
Develop Educational Initiatives in Support of the Habitat and Living Resources Action Plan
Develop Educational Initiatives in Support of the Toxics Action Plan
Conduct and Publish Public Attitude Surveys
Determine Priority Educational Messages and Targeted Audiences
Promote Ecotourism in the Estuarine Region
Encourage Use of Citizen Monitoring Activities and Best Available Technology for Monitoring
Promote "Hands-On" Educational Activities and Volunteer Stewardship Opportunities
Support Floating Classrooms
Develop and Publish Outreach Articles in Trade Magazines and Journals
Meet the Demand for Existing and New Publications that will Increase Public Awareness
Utilize Electronic Bulletin Boards to Disseminate Information
Establish Estuarine Resource Sections Within Existing Libraries and Environmental Centers
Organize and Implement Storm Drain Stenciling Programs
Urge School Administrators to Incorporate Estuary Education in Curricula and Establish Challenge Grants
Develop and Place Permanent Estuary Displays
Develop a Mascot for the Estuary
Establish a Delaware Estuary Environmental Badge
Develop and Place Watershed Signs on Roadways and Promote Watershed Education

Table 4.6 continued:

Establish an Interim Monitoring Advisory Group
Establish a Permanent Monitoring Implementation Team
Establish the Office of Monitoring and Mapping Coordination
Implement the Minimal Monitoring Program
Implement the Expanded Monitoring Program
Evaluate and Report Monitoring Information
Implement RIMS on a Pilot Scale for One Year
Implement RIMS in Expanded Form

4.7 New York – New Jersey Harbor Program

The comprehensive introduction to the New York – New Jersey Harbor Estuary Program provided in the New York – New Jersey Harbor Estuary Program Final Comprehensive Conservation and Management Plan issued in March 1996 states:

> Congress recognized the significance of preserving and enhancing coastal environments with the establishment of the National Estuary Program in the 1987 amendments to the Clean Water Act. The purpose of the National Estuary Program is to promote the development of comprehensive management plans for estuaries of national significance threatened by pollution, development, or overuse. At the request of the Governors of New York and New Jersey, the Harbor was accepted into the program in 1988. In 1987, Congress also required USEPA to prepare a restoration plan for the Bight. Because the Harbor and Bight are linked in so many ways, USEPA and the Management Conference agreed to make the Bight Restoration Plan a product of the Harbor Estuary Program (HEP).
>
> The New York-New Jersey Harbor Estuary encompasses the waters of New York Harbor and the tidally influenced portions of all rivers and streams which empty in the Harbor. There is a core area which includes the tidal waters of the Hudson-Raritan Estuary from Piermont Marsh in New York State to an imaginary line at the mouth of the Harbor which connects Sandy Hook, New Jersey and Rockaway Point, New York. This imaginary line is known as the Harbor Transect. The core area also includes the bi-state waters of the Hudson River, Upper and Lower Bay, Arthur Kill, Kill Van Kull, and Raritan Bay. In New York, it includes the East and Harlem Rivers and Jamaica Bay, and in New Jersey, it includes the Hackensack, Passaic, Raritan, Shrewsbury, Navesink, and Rahway Rivers, and Newark and Sandy Hook Bays.

Currently the Harbor Program is active on seven fronts. In addition to the mitigation of toxic substances partially discussed in the Coastal section of this Report, the program's activities are focused on Watershed Planning, Public Involvement and Education Initiates, Nutrient Reduction Initiatives, Habitat Restoration, the Management of Floatable Debris and Combined Sewer Overflow Abatement. Following is a status report of the current highlights of these efforts.

Watershed Planning Initiatives

- Portions of New Jersey's Watershed Management Areas were expanded to include the estuary core area.
- NJDEP has initiated in cooperation with local towns in the estuary core area the implementation of Regional Stormwater Management Plans (RSWMP). These RSWMPs will examine stormwater on a regional scale and how to minimize the stormwater's impact on the waterbodies in that region.

- NJDEP Division of Watershed Management (DWM) through the Total Maximum Daily Load (TMDL) process has identified three priority segments in the estuary core area. These three segments will be restored via the TMDL process.

3 Public Involvement and Educational Initiatives

- Public access guides to the Harbor Estuary Region have been published by NJDEP for the New Jersey waterfront.

- NJDEP's DWM continues to use the Fish Consumption Advisories published in 2003 to post signs in and around the Harbor Estuary area advising the public regarding the status of fish tissue consumption for species caught in and around the Harbor Estuary. The NJDEP in 2004 will be reviewing fish tissue data to update the Fish Advisory.

- NJDEP's Division of Science, Research and Technology and Division of Fish, Game and Wildlife, in conjunction with the Hackensack RiverKeeper and the Greater Newark Conservancy has offered a watershed education/urban fishing program for the past several years. The program began in 1996 as an outgrowth of a Community-based Outreach to Urban anglers in the Newark Bay Complex. The program was suggested by a group of citizens who believed that educating youth through the use of local natural resources would create a greater awareness of their watershed and instill a sense of stewardship. This program has produced a teacher's guide, video, posters, and brochures.

- The NJDEP provided the Passaic Valley Sewerage Commission with an educational grant to perform public outreach for their Passaic River/Newark Bay Restoration Program: Shoreline Cleanup Element.

- NJDEP funded the New Jersey Marine Science Consortium (NJMSC) for work on a grant titled "No Discharge Area Application for the Hudson River Region" The goal is to make the NJ portion of the NJ/NY Harbor a "No discharge Zone".

- NJDEP DWM Education and Outreach Bureau along with the Office of Environmental education are both actively involved with reaching out to grass roots organizations such as local water/river keepers, stream organizations and teachers.

- A significant development in 2004, with respect to NJDEP's effort in the Harbor, is the development of a volunteer monitoring program in the region. Many small groups have become involved and are currently being trained by NJDEP. Also through this program, Project WET (Water Education for Teachers) and Americorp are developing education and monitoring programs for the New Jersey stakeholders in the Harbor Estuary area.

- NJDEP conducted angler surveys to determine the amount of local fish and shellfish consumed and to gage the public's comprehension of fish consumption advisories.

NJDEP has used this information to produce and provide educational materials on fish contamination for high-risk groups, particularly women of child-bearing age.

- NJDEP, with EPA funding, has printed fish consumption health advisory signs for the NY/NJ Harbor Estuary Core and Raritan River Estuary. These signs are posted by local governments. The NJDEP has also continued the Toxic Crab Outreach Grant Program to inform inhabitants of the NY/NJ Harbor Estuary Core Area of the dangers of eating contaminated crabs and fish.

4 Nutrient Reduction Initiatives

- In March 2001, the State of New Jersey and the Passaic Valley Sewage Commission signed a contract with HydroQual, Inc. to enhance their System-Wide Eutrophication Model (SWEM) to better represent the New Jersey tributaries. Contaminant loadings, fate and transport models will be developed by Hydroqual as part of the Contaminant Assessment and Reduction Program (CARP) model. The objective of CARP is to identify the sources, transport, and fate of the polluting organic chemicals discharged to the NY-NJ Harbor. In 2003, new and improved low-level sampling and analytical methods were developed and implemented. The target date for completion of the Hydroqual model is December 31, 2004.

Habitat Restoration Initiatives

- Over the last two years (2001-2002) NJDEP has spent over $10 Million to acquire and restore 243 acres including the Meadowlands, Haworth Borough, Edison Township and more.

5 Management of Floatable Debris

- NJDEP continues to work in coordination with the EPA and US Coast Guard to conduct helicopter surveillance of beaches for floatables and slicks during summer months.

- The NJDEP continues to remove floatable debris from the shorelines of the Hudson, Raritan, and Delaware estuaries and barrier island beaches. Non-recreational shorelines that have been left unattended serve as reservoirs for floatable debris that can be refloated during extreme high tides. The debris may subsequently wash up on recreational beaches and become floating hazards to navigation, or negatively impact marine life. The Clean Shores Program conducts shoreline cleanups year-round. In the years 1998, 1999, and 2000, the Clean Shores Program removed 4.9, 4.8, and 5.1 million pounds of debris from 138, 183, and 115 miles of shoreline, respectively.

- The NJDEP is currently implementing a more aggressive long term floatable control action plan in which NJ plans to have 100% floatable controls on all combined sewer outfall (CSO) discharge points. New Jersey has 121 CSOs in the Harbor Estuary Area and as of January 2004, 118 of those have floatable controls on them. New Jersey is currently at 50% implementation of their long term floatable control action plan and aims for 100% implementation by the close of 2004.

- The NJDEP's "Clean Shores" program plans to operate in at least 45 municipalities statewide in 2004 and surpass their current goal for 2003 which resulted in 5,047,900 lbs. of waste removal over 107.8 miles of shoreline.

- NJDEP runs the "Adopt-a-Beach" program, in partnership with volunteers who "adopt" a stretch of beach. Data collected from this program are sent to the Center for Marine Conservation for their national and international database on marine debris. There are two yearly statewide cleanup events that NJDEP sponsors, one in the spring and one in the fall. On average, 60 to 70 public and private groups participate yearly with a total removal of 815,000 pieces of litter per year. These groups also continue to cleanup their own local beaches year round.

- NJDEP's Americorp program currently is active in storm drain stenciling with students and local volunteer groups. New Stormwater Regulations require that all stormwater drains in NJ that are on a street and next to a sidewalk must have a storm drain stencil.

6 Initiatives on Combined Sewer Overflow Abatement

- NJDEP has undertaken timely and complete regulatory actions to implement a statewide CSO Control Program in conformance with the National CSO Control Policy. The EPA has approved New Jersey's CSO Control Strategy. New Jersey is implementing the most aggressive strategy in the nation to control the discharge of solids/floatables and elimination of Dry Weather Overflows. All CSO Points will be controlled or eliminated. The total cost to implement CSO Long-term Control Plans is estimated at $3.1 billion. The Department has awarded $21 million in planning and design grants, $122 million in construction loans through the State Revolving Fund to address the Phase I Solids/Floatables Control Measures needs.

- The Department's Bureau of Non Point Pollution Control Region I & II have implemented a plan, through NJ's new Stormwater Regulations, requiring every municipality to obtain a municipal stormwater permit in the Harbor Estuary Area and all its tributaries within one year of the Stormwater adoption.

- The NJDEP is in the process of implementing the Coastal Nonpoint Pollution Control Program which has 13 subsections of water quality improvements from floatables, hydromodification restrictions, agriculture regulation and urban center stormwater management plans.

- NJDEP requires all discharge permittees to install bar screens that capture a certain minimum size of solids and floatables at all CSOs.

- NJ is coordinating the Combined Sewer Overflow Long Term Control Planning with Watershed Management Planning and various sewer system owners and/or operators. CSO permittees have begun land-side monitoring and development of a Storm Water Management Model as the first phase of the Long Term Control Planning.

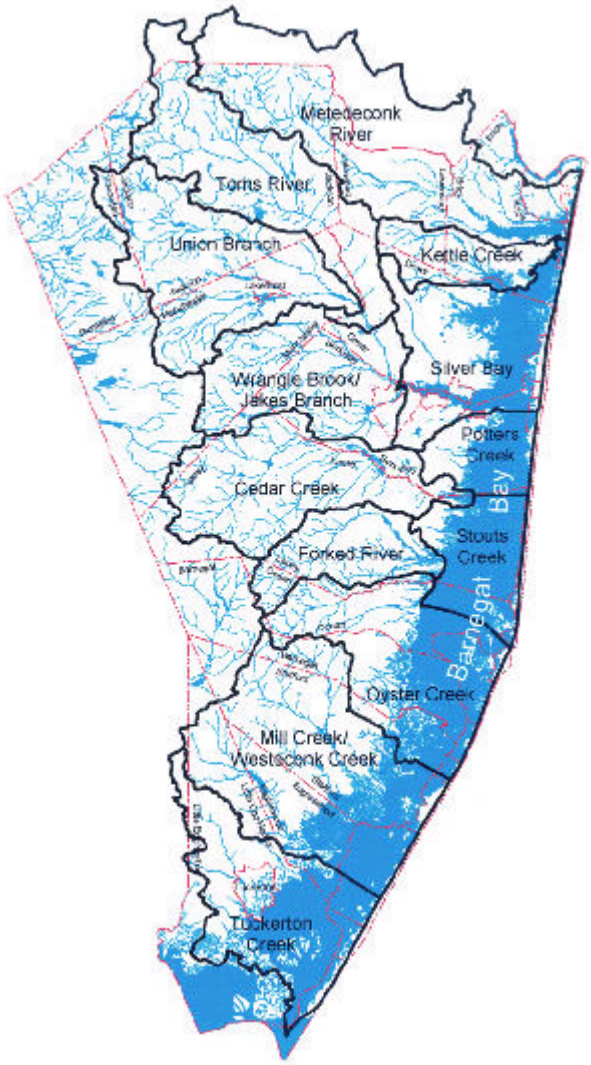
New Jersey Toxics Reduction Workplan

The Hudson-Raritan Estuary comprises portions of some of the most heavily urbanized and industrialized waterbodies in the United States. As a result, the water column, sediments, and biota of these waterbodies are contaminated by a variety of historical and ongoing discharges of toxic organic chemicals. Of particular concern is contamination of the estuarine sediments, resulting in increased dredging costs and contributing to the imposition of numerous fishing advisories and restrictions by the States of New Jersey and New York.

The two States, in cooperation with the Port Authority of New York and New Jersey and the Hudson River Foundation, while under the auspices of the NY-NJ Harbor Estuary Program, have developed and implemented the Contaminant Assessment and Reduction Program (CARP). The primary objectives of CARP are to identify the sources, transport, and fate of the polluting organic chemicals discharged to NY-NJ Harbor. Phase One of the New Jersey component of the CARP includes ambient water quality sampling of the five major New Jersey tributaries to, and three major estuarine waterbodies within the NY-NJ Harbor. In addition, discharges from all twelve of the municipal wastewater treatment plants, and twenty selected combined sewer and stormwater systems are sampled. The toxic contaminants of concern include dioxins/furans, PCBs, pesticides, PAHs, and metals. In addition, hydrodynamic measurements of tidal elevation, current velocities, suspended sediment levels, and particle size distributions are collected synoptically with the ambient water quality sampling, and at fixed stations over longer periods of time. The data collected by the CARP will be used to develop a system-wide contaminant fate and transport model that will provide for the development of Total Maximum Daily Loads (TMDLs), as well as guide source trackdown efforts.

4.8. Barnegat Bay Estuary Program

The Barnegat Bay – Little Egg Harbor Estuary is located along the central New Jersey coastline within the Atlantic Coastal Plain physiographic province. Its watershed encompasses most of the 33 municipalities in Ocean County as well as four municipalities in Monmouth County. Although long recognized for its great aesthetic, economic, and recreational value, this backbay system is now affected by an array of



human impacts that potentially threaten its ecological integrity.

The Barnegat Bay Estuary is a 75-square-mile environmentally sensitive estuarine system, consisting of aquatic vegetation, shellfish beds, finfish habitats, waterfowl nesting grounds, and spectacular vistas. This 660-square-mile watershed is now home for approximately 500,000 people, a population which more than doubles during the summer season. Moreover, the entire watershed has undergone dramatic growth since 1950. During the 1990s the municipalities surrounding the bay reported population expansions that on average exceeded 20 percent. The development accompanying the increasing

population growth has resulted in land use changing from principally undeveloped and agricultural to suburban. Boat traffic, including personal watercraft, has also significantly grown on the bay, raising concerns with respect to both use conflicts and the cumulative impacts on the bay's water quality.

The magnitude and intensity of different land uses in the Barnegat Bay watershed are having significant, and often degrading, effects. Surface and ground water quality in the watershed are being degraded by nonpoint sources of pollution. The relationship between land use and water quality and quantity has been clearly established. It is generally recognized that the increase in impervious surfaces associated with development exacerbates this situation by reducing the opportunities for infiltration of water into the ground. Development also impacts the estuary's fisheries and other biological resources through nonpoint source pollution and habitat loss.

It is the cumulative impacts of everyday activities in the Barnegat Bay watershed that are slowly degrading the environmental quality of this sensitive ecosystem. An assessment of the estuary indicates that human activities in the watershed and estuary have led to measurable degradation of water quality, destruction of natural habitats, and reduction of living resources in the system.

The Barnegat Bay National Estuary Program (BBNEP) is "a partnership of federal, state, and local interests" overseeing the development and implementation of a management plan for the entire Barnegat Bay Watershed. The BBNEP is made up of subcommittees who oversee the various aspects of the management plan: the Science and Technical Advisory Committee (STAC), the Barnegat Bay National Estuary Program Advisory Committee, and the Policy Committee. The Division of Watershed Management participates in each of these various BBNEP committees and coordinates with certain watershed management planning activities through the Barnegat Bay National Estuary Program (BBNEP).

The BBNEP has completed a characterization report for the Barnegat Bay-Little Egg Harbor estuary and watershed. The Comprehensive Conservation and Management (CCMP) for the estuary and watershed were prepared and approved by the Policy Committee on January 16, 2001. The document was transmitted to USEPA Headquarters in Washington D.C. in February 2001 for technical internal review. The final CCMP was completed and approved by the Governor of New Jersey in November 2001 and was received by USEPA Headquarters, Washington D.C. on January 8, 2002. USEPA formally approved the Final CCMP on May 15, 2002. The CCMP is divided into four major action plans: Water Quality/Water Supply; Habitat and Living Resources; Human Activities and Competing Uses; and Public Participation and Education. The plan also identifies and prioritizes action items for each of the four action plans that are needed to protect the Barnegat Bay Estuary.

The BBNEP originally operated from within the Ocean County Department of Planning but is now operating out of the Ocean County College. The BBNEP web address is www.BBEP.org. A copy of the final CCMP, the characterization report and information

on current events and activities associated with the program are available on the above website.

4.9. Wetlands Program

Regulatory Basis of Wetland Protection in New Jersey – An Overview

In New Jersey the chemical, physical, and biological integrity of wetlands are protected under both federal and state laws. Federal protection is provided under sections 303, 401, and 404 of the Federal Clean Water Act (the Act). Section 303 provides protection through the antidegradation provisions of the Surface Water Quality Standards. The State includes wetlands in the definition of "surface waters". Section 401 is designed to allow the State to control any discharges to its waters, which may result from the issuance of a federal permit or license, through a certification process. Section 404 addresses and regulates the discharge of dredge and/or fill material into wetlands and other waters of the state. In 1994, New Jersey began implementing its State program in place of the Section 404 program after being granted the authority by the EPA pursuant to Section 404(g) of the Act.

Several New Jersey statutes provide various levels of protection to wetlands including the New Jersey Water Quality Planning Act (N.J.S.A. 588:11A-1), the Flood Hazard Area Control Act (N.J.S.A. 58:16A-50 et seq.) and the New Jersey Water Pollution Control Act (N.J.S.A. 58:10A-1). Specific protection is provided for New Jersey tidal wetlands through the Wetlands Act of 1970. In addition, since July 1,1988, the State has protected its "inland" wetlands through the Freshwater Wetlands Protection Act (FWPA) (N.J.S.A. 13:9B-1 et seq.). Prior to enactment of the FWPA, several different state laws afforded various levels of protection to "inland" wetlands. One of the goals of the Act was to consolidate the protection of wetlands into one program. It should be noted, however, that the FWPA does not affect wetlands previously regulated under the Wetlands Act of 1970. In addition, the FWPA exempted areas under the jurisdiction of the Hackensack Meadowlands Development Commission. Therefore, activities in the Hackensack area do not require a State freshwater wetlands permit nor are they subject to transition area requirements. However, in areas under the regulation of the Pinelands Commission, freshwater wetland requirements are implemented, but applicants must also comply with the Pinelands Comprehensive Management Plan.

New Jersey protects coastal waters and the land adjacent to them under a variety of laws, including the Waterfront Development Law (N.J.S.A. 12:5-3), the Coastal Area Facility Review Act (N.J.S.A. 13:19), and the Wetlands Act of 1970 (N.J.S.A. 13:9A). The Department of Environmental Protection (NJDEP) applies the New Jersey Coastal Permit Program Rules (N.J.A.C. 7:7) and the Coastal Zone Management Rules (N.J.A.C. 7:7E) to determine what may or may not be built pursuant to the above laws.

Extent of Wetland Resources

Based upon the GIS coverage from 1995 Land Use/Land Cover data set, NJDEP estimates there are 1,033,471 acres of wetlands in New Jersey comprising approximately 21% of the total NJ land base of 4,986,205 acres (NJDEP Bureau of Geographic Information and Analysis). This represents a loss of 15,798 acres from 1986.

More recent data regarding the amount of freshwater wetlands in New Jersey is not yet available. At this time, the Department is in the process of updating its GIS data based upon 2002 aerial photography. Orthophotos for the entire State will be available in the fall of 2004. Portions of the State have been completed at this time, but are not available for distribution. The resolution of the 2002 imagery is much finer (one foot pixels as compared with one meter in 1995/97) and the photos will be color infrared. From this updated aerial photography, an updated Land Use/Land Cover coverage is being developed. This Land Use/Land Cover data set will contain updated information that should reflect an estimate of the amount of wetlands that have been lost within this time frame as a result of permitted losses as well as non-permitted losses from 1995/1997 to 2002.

For more information regarding the extent of permitted losses of wetlands in the State of New Jersey, please refer to the "State of New Jersey Annual Reports to the United States Environmental Protection Agency (USEPA), Region II for State-Assumed Freshwater Wetlands Regulatory Program." These reports are available from USEPA, the address is: U.S. EPA, Region II, Division of Environmental Planning and Protection, Water Programs Branch, 290 Broadway, New York, NY 10007-1866. These reports have been submitted to USEPA for the past 10 years since the State has assumed authority for the implementation of the 404 Program of the Federal Clean Water Act (1993) pursuant to the Memorandum of Agreement (MOA), 40 CFR Part 233.13, with the Regional Administrator of the USEPA.

Table 4.9-1: New Jersey Wetlands Acres (Freshwater and Tidal) by County (NJDEP, Land Use/Land Cover, Bureau of Geographic Information and Analysis)

County	Acres based upon 1986 Data	Acres based upon 1995 Data	Net Change
Atlantic	124,113	123,729	-385
Bergen	10,626	10,311	-316
Burlington	162,368	160,765	-1,603
Camden	21,141	20,881	-260
Cape May	84,202	83,601	-601
Cumberland	101,185	99,667	-1,517
Essex	6,892	6,734	-158
Gloucester	37,339	36,878	-461
Hudson	2,210	2,157	-52
Hunterdon	25,581	25,240	-341
Mercer	25,495	24,737	-758
Middlesex	45,784	43,895	-1,889
Monmouth	73,266	70,083	-3,182
Morris	45,945	44,980	-964
Ocean	103,719	102,980	-739
Passaic	9,386	9,012	-373
Salem	67,347	67,019	-328
Somerset	28,944	27,693	-1,251
Sussex	48,035	47,670	366
Union	3,352	3,198	-154
Warren	22,339	22,240	-99
State Total:	**1,049,269**	**1,033,471**	**-15,798**

Table 4.9-2: New Jersey Wetlands Acres (Freshwater and Tidal) by Watershed Management Area (NJDEP, Land Use/Land Cover, Bureau of Geographic Information and Analysis)

Watershed Management Area	Acres based upon 1986 Data	Acres based upon 1995 Data	Net Change
1: Upper Delaware	49,437	49,109	-327
2: Wallkill	22,740	22,541	-198
3: Pompton, Wanaque, Ramapo	15,065	14,535	-531
4: Lower Passaic & Saddle	4,830	4,558	-272
5: Hackensack & Pascack	7,942	7,828	-115
6: Upper Passaic, Whippany, & Rockaway	40,779	39,975	-804
7: Arthur Kill	5,332	4,999	-333
8: No. & So. Branch Raritan	27,692	27,291	-401
9: Lower Raritan, South River, Lawrence	47,027	44,233	-2,794
10: Millstone	37,188	36,158	-1,031
11: Central Delaware	25,702	25,102	-600
12: Monmouth	46,532	44,336	-2,196
13: Barnegat Bay	92,141	91,338	-803
14: Mullica	135,353	135,173	-180
15: Great Egg Harbor	111,047	110,748	-299
16: Cape May	75,921	75,318	-603
17: Maurice, Salem & Cohansey	163,135	161,207	-1,928
18: Lower Delaware	34,064	33,165	-899
19: Rancocas	65,856	64,973	-884
20: Assicunk, Crosswicks & Doctors	41,485	40,885	-600
State Total:	**1,049,269**	**1,033,471**	**-15,798**

Regulatory Basis of Wetland Protection in New Jersey – Statute Specific

The Coastal Area Facility Review Act (CAFRA) (N.J.S.A. 13:19)

CAFRA applies to projects near coastal waters in the southern part of the State. The CAFRA area begins where the Cheesequake Creek enters Raritan Bay in Old Bridge, Middlesex County. It extends south along the coast around Cape May, and then north along the Delaware Bay ending at the Kilcohook National Wildlife Refuge in Salem County. The inland limit of the CAFRA area follows an irregular line drawn along public roads, railroad tracks, and other features. The CAFRA area varies in width from a few thousand feet to 24 miles, measured straight inland from the shoreline.

CAFRA divides the land into zones, and regulates different types of development in each zone.

CAFRA regulates almost all development activities involved in residential, commercial, and industrial development, including construction, relocation, and enlargement of buildings or structures; and all related work, such as excavation, grading, shore protection structures, and site preparation.

Exemptions: CAFRA contains exemptions for certain minor activities such as maintenance, plantings, decks or similar structures at a residence. Activities involving rebuilding a damaged structure on the same building footprint (if it was damaged after 7/19/94), and enlarging a dwelling without increasing its footprint or number of units may also qualify for an exemption under CAFRA.

The Waterfront Development Law (N.J.S.A. 12:5-3)

The Waterfront Development Law is a very old law, passed in 1914, that seeks to limit problems that new development could cause for existing navigation channels, marinas, moorings, other existing uses, and the environment.

If development is proposed within a tidally flowed waterway anywhere in New Jersey, it requires a Waterfront Development Permit. Examples of projects that need a Waterfront Development Permit include docks, piers, pilings, bulkheads, marinas, bridges, pipelines, cables, and dredging.

For development outside of the CAFRA area, the Waterfront Development Law regulates not only activities in tidal waters, but also the area adjacent to the water, extending from the mean high water line to the first paved public road, railroad or surveyable property line. At a minimum, the zone extends at least 100 feet but no more than 500 feet inland from the tidal water body. Within this zone, NJDEP must review construction, reconstruction, alteration, expansion or enlargement of structures, excavation, and filling. However, this section of the law does not apply to the Hackensack Meadowlands Development District.

Exemptions: The Waterfront Development Program exempts the repair, replacement or reconstruction of some legally existing docks, piers, bulkheads and buildings, if the structure existed before 1978 and if other conditions are met. Also, there are exemptions for single family homes or structures (including additions up to 5,000 square feet to existing structures); if they are located more than 100 feet inland from the mean high water line.

Wetlands Act Of 1970 (N.J.S.A. 13:9A)

The land immediately adjacent to a tidal water often contains coastal wetlands. These wetland areas are a vital coastal resource serving as habitat for many creatures. The wetlands also serve as buffers that protect upland areas from the flooding and damage caused by storms.

The Wetlands Act of 1970 requires the NJDEP to regulate development in coastal wetlands. Any time land is located near tidal water, there is a good possibility of coastal wetlands on the property. The regulated coastal wetlands are shown on maps prepared by the NJDEP. Unlike NJDEP's freshwater wetlands maps, the coastal wetlands maps are

used to determine jurisdiction. These maps are available for public inspection at each county clerks office.

It is required that a coastal wetlands permit be obtained to excavate, dredge, fill or place a structure on any coastal wetland shown on the maps.

The Freshwater Wetlands Protection Act Rules (N.J.A.C. 7:7A)

The Freshwater Wetlands Protection Act sets the standards and procedures the NJDEP uses to issue permits allowing, among other activities:

- Filling, construction, paving, destruction of vegetation in freshwater wetlands;
- Filling, construction, paving, destruction of vegetation in transition areas or "buffers" surrounding wetlands; and
- Placement of fill in open waters.

The Department also uses the rules to implement the Federal Wetlands Program in non-tidal wetlands and waters in New Jersey.

The Freshwater Wetlands rules provide for three basic types of approvals:

- *Individual permits*
  - No acreage limit
  - Require a finding that there is no practicable alternative to disturbing the wetland
  - High standard to meet - about 50 are issued per year, totaling about 50 acres of impact;
- *General permits*
  - Activity specific
  - Each general permit includes limits specific to the activity (e.g., length of road crossing)
  - Most are limited to one acre of impact
  - Combined general permits are generally limited to one acre of impact
  - This is the most common type of approval – about 125 acres of impacts per year; and
- *Transition area waivers*

  Note: Transition areas are areas of uplands adjacent to a freshwater wetland that minimize adverse impacts to the wetland or serve as an integral component of the wetland ecosystem. Permits for activities within a transition area are only issued if it is determined that the activity will not impair the transition area's ability to protect adjacent freshwater wetlands**.**
  - Most general permit activities may be done in a transition area under a transition area waiver
  - Also may "average" the transition area, increasing it in one place and decreasing it in another
  - Standard is whether the development will impair the transition area's ability to protect adjacent freshwater wetlands

Tidelands Act (N.J.S.A. 12:3)

Tidelands, also known as "riparian lands" are lands now or formerly flowed by the tide of a natural waterway. This includes lands that were previously flowed by the tide but have been filled and are no longer flowed by the tide. These lands are owned by the people of the State of New Jersey. Permission is required from the State to use these lands, in the form of a tidelands license, lease or grant, and a fee is also required

Changes to Coastal Program Protection Rules

Several changes to the regulations that protect tidal wetlands have been made recently that further protect the State's coastal wetlands.

The Department adopted amendments to the Shellfish Habitat rule within the Coastal Zone Management Rules (Rules) [N.J.A.C. 7:7E-3.2(d)]. Under the adopted amendments, the revised Shellfish Habitat rule aims to protect the marine ecosystem while accommodating the recreational needs of waterfront property owners. The amendments are intended to ensure that the contribution of pollutants to the State's waters associated with docks, piers and boat moorings constructed under the Shellfish Habitat rule are significantly reduced or eliminated. As amended, the Shellfish Habitat rule requires that non-polluting materials must be utilized for all docks, piers and boat moorings constructed under section 7:7E-3.2(d) of the Rules. It also requires that the size and location of the structure minimize, to the extent practicable, the area of shellfish habitat condemned and adverse impacts to the marine ecosystem, and that compensatory mitigation be performed. Required mitigation consists of restrictions governing existing and new shoreline protection structures as well as the payment of a mandatory monetary contribution to a dedicated account for Shellfish Habitat Mitigation.

In addition, the Rules at N.J.A.C. 7:7E-3.3 have been updated to include more stringent criteria for sand mining and beach replenishment that further protect surf clams (*Spisula solidissima*).

The Coastal Zone Management Rules have also been updated to include new standards for dredging and mitigation within intertidal and subtidal shallows at N.J.A.C. 7:7E-3.15. The mitigation requirements for impacts to intertidal and subtidal shallows have been expanded to include the requirement of financial assurance and monitoring of the project to ensure the successful completion of the project. In addition, there are requirements that tie the location of the mitigation closer to the impacted area. All proposed intertidal and subtidal shallows mitigation projects are also subject to more stringent design requirements.

The Rules have also been updated to include new standards for mitigating the impacts to coastal wetlands at N.J.A.C. 7:7E-3B. The mitigation requirements for impacts to coastal wetlands have been expanded to include the submittal of a water budget, goal statement, detailed landscape plans and financial assurance. The Rules also now include performance standards for each year of monitoring. With these changes the quality of the coastal wetland mitigation will improve.

The Coastal Zone Management rules at N.J.A.C. 7:7E-3.38 and N.J.A.C. 7:7E-3C regarding endangered or threatened wildlife habitat were revised to require the consultation of the Department's "Landscape Maps." Standards for habitat impact assessments have also been added to this rule. The Landscape mapping is designed to delineate critical habitats for imperiled species within New Jersey. These maps show the location of critical habitat for species that are listed as threatened or endangered at the State or Federal level as well as habitat for populations of species that are not listed but have experienced a declining population trend. The Department has revised and updated the "Landscape Maps of Habitat for Endangered, Threatened and Other Priority Wildlife" (also known as "Landscape Maps" and "Landscape Project Maps"). Based upon the revisions and updates, the Department is replacing Version 1.0 with Version 2.0 of the Landscape Maps. Version 2.0 includes new GIS coverages of bald eagle foraging habitat, wood turtle habitat and urban peregrine falcon nest locations. In addition, more species-specific habitat data is available for species that are not listed as threatened or endangered at the State and Federal levels.

The Coastal Zone Management rules at N.J.A.C. 7:7E-3.46 regarding Wild and Scenic River Corridors have been updated to provide standards for development within these corridors where there is no adopted management plan. In addition, standards regarding the construction of docks, piers, moorings, shore stabilization, linear development, cell towers, bridges and culverts have been added.

The Coastal Zone Management rules at N.J.A.C. 7:7E-4.2(f) - (g) relating to maintenance and new dredging have been revised to further protect coastal wetland resources. For example, the definition of maintenance dredging has been narrowed to further limit such dredging to areas that are actively used for navigation or mooring of vessels and the area must have been dredged within the past ten years. New dredging now requires chemical and physical analysis of the proposed dredge material prior to commencement and bioassay and bioaccumulation testing may also be required depending upon the results of the pre-dredging analysis. Standards for reprofiling and propwash dredging have also been incorporated into the maintenance and new dredging rules.

The Coastal Zone Management rules at N.J.A.C. 7:7E-4.21 encompasing Artificial Reefs have been revised to incorporate standards for the siting of reefs, the materials used, deployment and maintenance of these artificial reefs. A management plan for each artificial reef must be developed and all reefs must be incorporated into nautical charts.

The Coastal Zone Management rules at N.J.A.C. 7:7E-8.2 regarding Marine Fish and Fisheries have been revised to set standards for the construction of submarine cables and sand mining for beach nourishment. This rule change also establishes "Aquaculture Development Zones".

The Coastal Zone Management rules at N.J.A.C. 7:7E-8.22 now requires coastal development to comply with applicable State and Federal regulations, standards and guidelines for handling and disposal of solid and hazardous waste materials.

Changes to the Freshwater Wetlands Regulatory Program

The Freshwater Wetlands Rules were modified significantly on September 4, 2001 with the adoption of amendments that further protect New Jersey's freshwater wetlands. Conditions for some Statewide General Permits have been tightened to allow less impact to freshwater wetlands than was previously allowed. In addition, mitigation requirements for certain types of permitted activities have been considerably strengthened and are described in more detail in the following section of this report. Some of the significant changes to the Freshwater Wetlands Protection Act rules are summarized below. Following this brief description of significant changes to the rule are two tables: Table of Significant Changes to the Freshwater Wetlands Protection Rules (Table 4.9-3) and Table of Less Significant Changes to the Freshwater Wetlands Protection Rules (Table 4.9-4). A summary of rule changes made subsequent to the September 4, 2001 rule adoption follows the two tables.

A summary of the September 4, 2001 Rule Adoption Resulting in Significant Changes to the Freshwater Wetlands Rules are as follows:

Combined freshwater wetlands and floodplain permits: The adoption provides for a combined freshwater wetlands general permit and floodplain (a.k.a. stream encroachment) permit for five activities – utility lines, road crossings, outfalls, streambank stabilization, and stream cleaning. Previously, a separate permit was required under each program. This makes it easier and faster to get a permit for an activity located in a freshwater wetland in a floodplain, while ensuring environmental protection under both programs.

New general permits: The adoption introduces new general permits for six activities. These activities all have environmental or safety benefits that compensate for any wetlands disturbance involved:

- Landfill closure and maintenance, to reduce dangerous conditions at uncontrolled landfills;
- Movement of livestock watering areas away from streams in order to prevent trampling of streambanks;
- Stream cleaning, for removal of debris and sediment, and flooding reduction;
- Redevelopment of one extra acre of significantly degraded brownfield areas, to reduce development pressure on pristine areas; and
- Tree cutting around public airports to comply with FAA and NJDOT airport safety rules.

Amendments to existing general permits: The adoption amended several general permits in the following ways:

- Allows underground utility lines in exceptional resource value wetlands, if threatened or endangered species habitat will not be impacted;
- Allows longer road crossings, if impact is 1/8 acre or less, and requires an onsite alternatives analysis for many road crossings;

- Allows NJPDES permitted outfalls (former general permit only allowed stormwater outfalls);
- Restricts the types of wetlands that may be destroyed during lake dredging;
- Encourages participation in federal wetlands restoration programs;
- Allows trails and boardwalks on private property, adds ¼ acre limit on total disturbance;
- Allows removal of unsafe dams; and
- Requires use of environmentally beneficial bioengineering techniques when possible, in order to control stream bank erosion.

Backyard transition areas: The adoption limits the placement of new home lots in transition areas, by including in the definition of the "project" not only the home's footprint but also 20 feet surrounding the house This is intended to prevent the situation where a new home owner buys a house, only to find that they may not cut trees, build a deck or pool, or pursue other normal activities in the backyard because it is a transition area.

Mitigation: The adoption replaces the existing mitigation provisions with a simpler, more predictable mitigation system. The new system incorporates more mitigation options, including 1) the purchase of mitigation credits from a mitigation bank (see note below) and 2) the preservation (via donation to either the State or a nonprofit agency) of wetlands and adjacent uplands. The new system also adds an automatic increase in the mitigation obligation if the mitigator fails to comply with deadlines for performing their mitigation.

Note: A mitigation bank has been defined in the March 6, 1995 notice entitled, "Federal Guidance for the Establishment , Use and Operation of Mitigation Banks" as a site where wetlands and/or other aquatic resources are restored, created, enhanced, or in exceptional circumstances, preserved expressly for the purpose of providing compensatory mitigation in advance of authorized impacts to similar resources. Mitigation banks are privately owned, State-regulated entities that create, enhance or restore wetlands for the purpose of providing permittees who are unable to mitigate for wetland impacts on-site an alternate method of mitigating for those wetland losses. Mitigation banks receive a certain amount of credits as they achieve pre-determined goals that they can sell to permittees. Permittees must be within the pre-determined service area of the mitigation bank and the same type of wetland that was impacted must be available for purchase (e.g. if a forested wetland was impacted, then credits for forested wetland must be purchased at varying ratios).

Table 4.9-3: Table of Significant Changes to Freshwater Wetlands Rules

Formerly existing provision	Adopted new provision	Notes, affected parties
N.J.A.C. 7:7A-1.4: definition of "residential development project"	Defines "residential development project" to include a 20-foot area surrounding the house.	- Prevents building a house that runs right up against the transition area or wetlands. - Protects against the gradual encroachment caused by a development plan that places houses with backyards in transition areas. - Reduces the number of small, difficult and single family homeowner enforcement cases.
N.J.A.C. 7:7A-4.3(b)11: conditions that apply to all general permits: Former rule only allowed NJDEP to require soil contaminant testing for general permit 13 (lake dredging).	Adoption allows the NJDEP to require soil testing for any general permit if there is reason to suspect contaminants.	- More protective and consistent with developing sediment technology policy. - No existing NJDEP program routinely handles the analysis of these samples, so this responsibility will have to be assigned.
N.J.A.C. 7:7A-2.8(b): farming exemption allows minor drainage, thus permitting applicants to claim drained field is no longer wetland.	Continues to allow farmers to drain already-farmed wetlands, but when farming stops, wetland hydrology is presumed unless applicant provides extensive data showing it's not there, or block drainage structures for a normal rainfall year and show it's still not wet.	- Protects against using a farming exemption to reduce or eliminate wetlands through drainage, then using the property for means other than farming. - NJDEP has briefed NJ Dept. of Agriculture (NJDA) and Farm Bureau.
N.J.A.C. 7:7A-4.6: combined general permit and flood hazard area permits. Former rules required separate stream encroachment and freshwater wetlands permits for an activity in floodplain wetlands.	Adoption provides for combined freshwater wetlands and stream encroachment permits for activities covered by five general permits (underground utility lines, minor road crossings, outfalls and intakes, stream bank stabilization, and watercourse cleaning).	- Procedural improvement. - Better overall NJDEP control of the site.

Table 4.9-3 continued:

Formerly existing provision	Adopted new provision	Notes, affected parties
General permit 5- Landfill closures (New general permit).	- No acreage limit. - Mitigation required except for wetlands on top of landfill or its cap. - No extra disturbance to facilitate redevelopment is allowed.	- Positive environmental impact by assisting in getting landfills closed. - Carefully limited to prevent more disturbance than necessary for closure.
General permit 9 – airport clearing (New general permit).	- Allows cutting of vegetation around public airports to comply with FAA airport runway sight line requirements. - May not be used to increase size of paving or buildings.	- Removes a regulatory barrier to activities required for safety. - Cutting of trees is not regulated under the Federal wetlands program. - Limits will ensure minimal impact.
General permit 10 – minor road crossings Prior to this, a road crossing could not exceed 100 feet long, total disturbance was ¼ acre or less	- General permit is divided into two options: 10A and 10B: - 10A for crossings up to 100 feet long, or 1/8 acre or less. - 10B for crossings over 100 feet, but still only a quarter acre, AND must do onsite alternatives analysis.	- Does not increase total acreage of disturbance allowed. - Decreases total acreage allowed if State open waters are disturbed. - Allows smaller impacts more easily than former general permits, but requires more scrutiny for larger impacts, thus focusing staff time on high impact activities.
General permit 11 – stormwater outfalls and intakes	- Added outfalls for NJPDES permitted discharges (formerly only stormwater outfalls) - Added intakes including private drinking water wells, if they do not drain the wetlands.	- NJPDES outfalls are already reviewed by Department. - Wells are a small disturbance, and permit limits prevent them from draining wetlands.
General permit 20 – bank stabilization	- Requires vegetative methods unless demonstration that other methods are required by NJ Department of Agriculture standards. - Allows more than 150 foot length of disturbance if the project is on the NJDEP watershed mgmt. action list, or if using bioengineering techniques. - Replaces limit of one cubic yard of riprap per running foot, with "the smallest amount possible under NJ Department of Ag. standards."	- More practical because larger streams require more than 150 feet of stabilization, so individual permits are usually issued. - Provides strong incentives to use bioengineering over less environmentally friendly options, and to coordinate with NJDEP's Div. Of Watershed Management. - Ties amount of rip-rap to existing NJ Dept. of Agriculture standards.

Table 4.9-3 continued:

Formerly existing provision	Adopted new provision	Notes, affected parties
General permit 24 – spring developments (New general permit)	- Allows placement of walls or pipes in farmed wetlands to move water into a watering trough for livestock. - Must be part of a farm plan approved by USDA's Natural Resources Conservation Service. - One quarter acre limit.	- Reduces livestock trampling of stream-side wetlands. - Not a big environmental impact because it only applies in wetlands already farmed. - Creates an incentive for farmers to get NRCS farm plans. - Provision was requested by NJDA.
General permit for watercourse cleaning (New general permit)	Divides stream cleaning projects into two general permits: - One for minor municipal or county stream cleaning, which matches stream cleaning bill and has a default issuance mechanism.	- Minor permit matches stream cleaning statute amendments. - Combined freshwater wetlands and floodplain permit is available.
General permit 27 – redevelopment (New general permit, revised in 2002)	Allows one extra acre of disturbance (over and above other general permit disturbances) of degraded wetlands formerly used for industrial or commercial purposes, if the area meets one of the following: - Is listed by the Brownfields Redevelopment Task Force - Is subject of a redevelopment agreement entered into under the State's brownfields law - Is identified as an environmental opportunity zone	- Sends a clear message that we want to encourage redevelopment to preserve open space, but includes limits to ensure that it won't be abused.
N.J.A.C. 7:7A-7.2: practicable alternatives test.	Creates a presumption that offsite alternatives are not practicable for a 1/8 acre disturbance for a single family home on land owned by the applicant since July 1, 1988; provided applicant has not improved any part of the property since July 1, 1988.	- Alleviates burden of buying other land for single family home builder. - Parallels Army Corps guidance. - Requires applicant to make similar demonstration to takings claims – i.e., try to sell the land, etc.

Table 4.9-3 continued:

Formerly existing provision	Adopted new provision	Notes, affected parties
N.J.A.C. 7:7A-15: mitigation.	Whole new mitigation system - Adds new mitigation options created by 1993 FWPA amendments (upland preservation, etc.). - Divides mitigation projects into smaller and larger. - Encourages buying credits for smaller projects, onsite mitigation for larger ones. - Requires mitigation in same watershed as disturbance if possible, and in same watershed management area if not. - Adds rules for Mitigation Council review of money and land donations.	- Systematizes and explains mitigation. - Aggregates small projects by encouraging credit purchase. - Coordinates with NJDEP's Watershed Management program. - Encourages public involvement with the Mitigation Council.

Table 4.9-4: Table of Less Significant Changes to Freshwater Wetlands Rules

Formerly existing provision	Adopted provision	Notes, affected parties
N.J.A.C. 7:7A-1.4: - Definition of "state open water" formerly meant all "waters of the US" except freshwater wetlands. - Since "waters of the US" requires waters to be navigable, NJDEP had to prove potential for navigability before it could take jurisdiction.	- Adoption defines "state open water" to mean all "waters of the State" (rather than "waters of the US"), except for ground water, freshwater wetlands, and waters excluded from the definition of "waters of the US." - This presumes a water is in NJDEP's jurisdiction unless excluded. - Broader, shifts the presumption from "it's not regulated unless NJDEP shows it is" to "it is regulated unless applicant shows it's not."	- Strengthened open water fill enforcement by shifting burden of proving jurisdiction. - Conforms with NJDEP's statutory authority (NJ Water Pollution Control Act) for regulating state open waters, since the WPCA regulates "waters of the state" and not "waters of the US." - Violators can't quibble over the federal concept of navigability. - Retains the exclusion of areas NJDEP wishes not to regulate.
N.J.A.C. 7:7A-1.4: definition of "state open water"	Excludes stormwater management facilities created in uplands from being called State open waters.	- Reduces confusion over whether these facilities (which we want to encourage) may be maintained w/o an open water fill permit.
N.J.A.C. 7:7A-2.2(c): unregulated activities.	Deregulates placement of small guy anchors that screw into the ground to anchor the wires that steady and stabilize utility poles. Anchors must be no larger than 20 by 3 inches.	- Applies where a utility pole is in upland but the guy anchor is in a wetland ditch, often by a road. Very small impact. - If utility pole is in wetlands, utility must get general permit 21 anyway, which would cover the guy anchors.
N.J.A.C. 7:7A-2.2(c): unregulated activities.	Deregulates driving of pilings in State open water. This is not regulated under the Federal wetlands program. The NJDEP doesn't regulate it.	Clarifies existing rule interpretation.
N.J.A.C. 7:7A-2.2(c): unregulated activities.	Clarifies that hand trimming of trees or vegetation, which does not alter character, is not regulated.	- Clarifies former rule interpretation. - Requested by utilities. - Reduces complaints from landowners near utilities, who think the utility is violating when they are not.
N.J.A.C.7:7A-2.4(d): resource value classification: Former rule classified all detention facilities as ordinary.	Adoption narrows the class of detention facilities classified as ordinary to those manmade in uplands. Detention basins built in wetlands are now intermediate resource value wetlands.	- Provides transition areas on detention facilities created in wetlands prior to FWPA enactment (because after FWPA, they may not be placed in wetlands).

Table 4.9-4 continued:

Formerly existing provision	Adopted provision	Notes, affected parties
N.J.A.C. 7:7A-3.1: Letter of Interpretation. Former rule only required a Letter of interpretation applicant to provide a survey of the wetlands line if the site was over five acres.	Adoption requires all Letter of Interpretation applicants to survey the wetland boundary so the NJDEP can incorporate the surveyed line into the Letter of Interpretation when issued.	- Enables NJDEP and people in the future to accurately identify the delineated wetlands line.
N.J.A.C. 7:7A-4.3(b): general provisions for general permits. Former rule prohibited two general permits in exceptional resource value wetlands. (general permit 2 (underground utilities), and general permit 15 (mosquito control).	- Adoption removes this prohibition. - Instead, these general permits are subject to the standard requirement for all general permits in exceptional resource value wetlands – may not jeopardize T&E species habitat.	- Environmental affect is generally slight, because utilities and mosquito controllers usually can justify an individual permit. - More consistent. There is no rationale for these two general permits to have this special limit when no other general permits do.
N.J.A.C. 7:7A-4.3(b)4: general provisions for general permits. Former general permit activities were barred in Wild and Scenic Rivers.	The adoption allows general permit activities in a Wild and Scenic River if the National Park Service approves the activities.	- Still requires written approval from the Park Service. - Corresponds to an identical change in federal rules. - Affects only three rivers in NJ.
N.J.A.C. 7:7A-4.3(b)12: general provisions for general permits. Previous general permits had very restrictive limits on rip-rap. Others had no limit.	Adoption limits rip-rap used under any general permit to the minimum necessary to comply with the Standards for Soil Erosion and Sediment Control in New Jersey at N.J.A.C. 2:90.	- Makes rule more reasonable, consistent internally and with other agencies, and maintains appropriate protection.

Table 4.9-4 continued:

Formerly existing provision	Adopted provision	Notes, affected parties
General permit 1: maintenance of existing features.	Adoption one maintenance activity that will be processed as 30-day default issuances: - Ongoing maintenance of stormwater facilities in wetlands.	- Stormwater management facility maintenance is necessary and will help water quality. NJDEP mainly needs to see application to ensure that proposed activities are really all that are being done.
General permit 2—underground utility lines.	Adoption made several changes: - Adds authorization for a 400 square foot pump station on a sewage line. - Allows access road on top of line, but requires mitigation for road disturbance. - Expands amount of temporary disturbance to minimum necessary to comply with all laws (currently limited to 20 foot width). - Trench may be as wide as OSHA requires for safety. - Expands permanent clearing over 20 feet if required by other laws.	- Eases restrictions that conflict with other laws. - Pump station needs to be at low point for gravity feed systems (sewage). - Requires mitigation for permanent access roads. - Pump stations on all utility lines were proposed in 1996 and drew resistance. This adoption limits them to sewage lines only, since sewage lines are gravity fed while most other utility lines are not.
General permit 4- hazardous cleanups	- Deletes the requirement for a cleanup in exceptional resource value wetlands to have an alternatives analysis. - Deletes the mitigation requirement for any wetlands formed as a direct result of the cleanup activities.	- Alternatives analysis caused delays without noticeable environmental benefit, since cleanups rarely have alternatives. - Department did not want to require mitigation for wetlands created by the cleanup.
General permit 12 – surveying	Allows digging of exploratory pits and/or other temporary activities necessary for a geo-technical or archaeological investigation.	- Small expansion to allow temporary impacts similar to those already allowed.

Table 4.9-4 continued:

Formerly existing provision	Adopted provision	Notes, affected parties
General permit 13 – lake dredging	- Limits wetland disturbances to palustrine emergent. Former rule applied to any wetland. - Cuts limit on disturbance for access to one eighth acre. Former rule says one quarter. - Requires submittal of information to assess and correct sediment problems.	- Reduces disturbance. - Information on sediment source will form basis for future actions to reduce sediment, likewise reducing the need for dredging in the future.
General permit 14 – water monitoring devices.	Allows a "blanket" authorization for multiple monitoring wells in cases where applicant can not predict how many monitoring wells will be needed, e.g., ground water cleanups.	- Helps ground water cleanup sites where applicant can't know how many or where the monitoring wells should go until sink the first wells.
General permit 15 – mosquito management.	Adds easier notice requirements, as required by amendments to the FWPA.	- Required by statute.
General permit 16 – habitat creation and enhancement.	- Adoption shifts focus from what activities are allowed, to allowing activities if they are necessary to implement an approved plan sponsored or funded by various federal and/or state agencies. - No application fee.	- Encourages habitat creation, but ensures that it is supervised by a government agency. - Recognizes other agencies' existing wetlands restoration/enhancement programs.
General permit 17 – trails and boardwalks.	- Allows construction of trails and boardwalks on private land. - Adds a ¼ acre limit on total disturbance. - Clarifies that they are not for vehicles. - Adds plastic lumber and other inert materials as acceptable building materials. - Requires that the trail or boardwalk educate users, e.g., through educational signs.	- Makes it easier to build trails and boardwalks in more places. - Limits total acreage to ensure minimal impact. - Strictly limits them to pedestrian orientation. - Requires environmental education aspects.

Table 4.9-4 continued:

Formerly existing provision	- Adopted provision	- Notes, affected parties
General permit 18 – dam repair and removal.	- Allows removal of a dam as an authorized activity. - If dam owner owns lake bed, NJDEP requires the lake bed to be deed restricted for five years to allow wetlands to re-form. After the five year waiting period, anything unregulated may be developed.	- Helps dam owners remove unsafe dams. - Preserves pre-existing wetlands when possible. - Reduces third party appeals of a dam removal when lakefront property owners don't want to let the dam owner remove the dam.
General permit 19 – docks and piers.	- Allows more than one dock per lot for public docks. - Allows a public dock wider than six feet if necessary for barrier-free subcode or for educational purposes.	- Reduces micro-management of dock construction. - Removes conflict with barrier free subcode. - Encourages public and educational use.
N.J.A.C. 7:7A-13.3: permit extensions. Formerly, no provision existed for this.	Allows one five-year extension to any kind of permit/waiver if the project, rules, and site conditions have not changed.	- Helps approved projects that are delayed by third party problems or local approvals. - Consistent with federal rule
N.J.A.C. 7:7A-14.3: permit modifications.	- Adds one to the list of "minor" modifications (minor modifications don't require public notice): a change in materials, construction techniques, or project location onsite, if required by another permitting agency and does not increase impacts.	- Implicates assumption, since EPA is the source of the Department's current list of minor modifications.
N.J.A.C. 7:7A-6.2(c): transition area averaging plan waivers.	- Averaging allowed within wetlands adjacent to trout production waters only if at least 150 feet of riparian corridor is left on the TP water, even if 150 feet is not left on the adjacent freshwater wetland.	- Provides more protection for trout production waters.

Table 4.9-4 continued:

Formerly existing provision	- Adopted provision	- Notes, affected parties
N.J.A.C. 7:7A-14.4: general permit modifications.	- Allows modification of a general permit authorization once issued, without public notice, if the modified project is still within the general permit conditions and there is no significant change in the scale, use, or environmental impact of the project.	- Process improvement.
General permit 21 – above ground utility lines.	- Allows placement of above ground pipeline. - Permanent disturbance may be wider than 20 feet to comply with other laws. - Allows area to revert to natural conditions rather than requiring replanting.	- Eases pipeline construction. - Removes conflicts with other laws.

Rule Adoptions Subsequent to the September 4, 2001 Significant Changes to the Freshwater Wetlands Rules

On October 7, 2002, the Department adopted amendments to the Freshwater Wetlands Protection Act rules for conditions that apply to all general permit authorizations (N.J.A.C. 7:7A-4.3(b)16) and for authorization under Statewide General Permit Number 6 for non-tributary wetlands (N.J.A.C. 7:7A-5.6) and at N.J.A.C. 7:7A-5.27 (redevelopment of previously disturbed areas). Under the adopted amendment at 4.3(b)16, the Department prohibits the use of any general permit in a vernal habitat, as defined at N.J.A.C. 7:7A-1.4, or in a transition area adjacent to a vernal habitat. In addition, the Department adopted amendments to the rules at N.J.A.C. 7:7A-5.6 and 5.27 that reduce the acreage of disturbance authorized under a Statewide General Permit Number 6 and Number 27, respectively, from one acre to one half acre in waters of the United States.

The Freshwater Wetlands Protection Act rules at N.J.A.C. 7:7A-4.3(b)5 were amended to include conditions that apply to all general permit authorizations and at N.J.A.C. 7:7A-12.2(l) for USEPA review. The adopted rules and amendments relate to the identification and consideration of historic resources in the Freshwater Wetlands Protection Act program permitting process. These include: amendments to the standard conditions for general and individual permits to reflect the current procedures for freshwater wetlands permits that will adversely affect historic resources; new rules establishing a checklist of wetlands permit application categories presenting a high probability of the presence of historic and archaeological resources; and new procedures for coordinating with the freshwater wetlands review process with Federal Section 106 review, or the State's review procedures for projects encroaching upon New Jersey Register properties.

As mentioned previously, the Department has revised and updated the “Landscape Maps of Habitat for Endangered, Threatened and Other Priority Wildlife” (also known as “Landscape Maps” and “Landscape Project Maps”). These maps show the location of critical habitat for species that are listed as threatened or endangered at the State of Federal level as well as habitat for populations of species that are not listed but have experienced a declining population trend. The revisions are contained within the portion of the Freshwater Wetlands Technical Manual entitled "Protocols for the establishment of exceptional resource wetlands pursuant to the Freshwater Wetlands Protection Act (N.J.S.A. 13:9B-1 et seq.) based on documentation of state or Federal endangered or threatened species." Based upon the revisions and updates, the Department is replacing Version 1.0 with Version 2.0 of the Landscape Maps. The Freshwater Wetland Protection Act rules at N.J.A.C. 7:7A-2.4 (c) (Classification of freshwater wetlands by resource value) reference the Landscape Project Method and the technical manual.

Mitigation

NJDEP requires compensatory mitigation for activities in wetlands that involve investigation, cleanup, or removal of hazardous materials. In addition, such mitigation is required for the installation of underground utility lines, the closing of landfills, redevelopment projects and activities requiring individual permits (activities that exceed

the requirements of general permits). Mitigation of wetlands can be achieved through wetland creation, restoration and/or wetland enhancement. NJDEP is establishing performance standards for various types of wetland mitigation to inform applicants of the criteria they need to meet.

Other forms of mitigation include: upland preservation to benefit a freshwater wetland ecosystem; purchase of mitigation credits from a wetland banker who has performed wetland creation, restoration, and/or enhancement; or monetary contribution to the Wetland Mitigation Fund for wetland restoration or land donation to the Freshwater Wetland Mitigation Council, which is a valuable component of a wetland or surface water ecosystem.

The mitigation section of the Freshwater Wetlands Protection Act rules has been updated since the last annual report to EPA. The rules now state that in order for a mitigation project to be approved it must have a high probability of long-term success and at a minimum this requires the following: adequate dedicated financial resources to complete the project; a design that takes advantage of and fits into the watershed; adequate hydrology; adequate soils to support a hydric community; and long term stewardship to maintain the mitigation area.

The mitigation section of the rules has also been updated to increase by 20% the amount of mitigation required each year after the date that mitigation was to begin. The goal of this rule change is to gain compliance with the requirement that mitigation be performed prior to or concurrent with the wetland disturbance.

Another change that has occurred since the last report is NJDEP's requirement for wetland mitigation construction meetings to be held to ensure that the approved plan is being properly executed. Also following completion of construction the wetland mitigation designer must sign a "Construction Completion Form" which holds the designer responsible for ensuring the plan was properly followed. Once again, the goal of these changes is to improve the success of the quantity and quality of wetland mitigation in the State.

NJDEP has also established a Wetland Mitigation Unit. The Unit is responsible for overseeing the development of rules related to mitigation; the management of the wetland mitigation database; the establishment of consistent wetland mitigation conditions which are attached to permits; mitigation permit compliance; and the review of wetland restoration grants from the wetland mitigation fund.

The State's wetland mitigation database contains information on over 500 wetland mitigation sites. The database includes a detailed assessment of the quality of the mitigated wetland acreage that was achieved following completion of monitoring. The Department is in the process of updating that information and performing assessments to ensure that the State is successfully achieving the functional equivalent of wetlands lost in the State.

Department personnel serve on the State's Freshwater Wetlands Mitigation Council. Over the past few years the Council awarded over $600,000 in wetland mitigation grants from the Wetland Mitigation Fund. The grants have been used to preserve land and restore as well as enhance wetland ecosystems throughout New Jersey.

The Wetlands Mitigation Council (Council) is responsible for the management and disbursement of dollars from the Wetland Mitigation Fund to finance mitigation projects. The Council has the power to purchase land to provide areas for enhancement or restoration of degraded freshwater wetlands, to engage in the enhancement or restoration of degraded freshwater wetlands on any public lands, including public lands other than those acquired by the Council, and to preserve freshwater wetlands and transition areas determined to be of critical importance in protecting freshwater wetlands. The Freshwater Wetlands Protection Act establishes the Council. The Council is compromised of seven members as follows: the Commissioner of Environmental Protection, who shall serve ex officio, or his designee; six members from the general public to be appointed by the Governor, two of whom are appointed persons recommended by recognized building and development organizations; two are appointed from persons recommended by recognized environmental and conservation organizations; and two are appointed from institutions of higher learning in the State.

Development of a Wetland Monitoring and Assessment Program

The State of New Jersey is currently developing a wetland monitoring and assessment program per USEPA's mandate to implement a program by the Year 2014 for all Waters of the United States, including wetlands, under the provisions of the Clean Water Act. As an active participant in the National Environmental Performance Partnership System (NEPPS) the State has established the following goal for New Jersey's wetlands: "Improve quality and function and achieve no net loss. Explore innovative techniques for creation enhancement and maintenance of New Jersey wetlands."

The Department has established a Wetlands Monitoring Steering Group coordinated through the Office of Policy, Planning and Science and the Land Use Regulation Program. The steering group includes scientists and staff from the wetlands regulatory program, surface and ground water monitoring programs, surface and ground water standards and criteria programs, Natural Heritage program and Rutgers, the State University of New Jersey. This steering group meets every four to six weeks to develop and refine the wetland monitoring and assessment program strategy. The Department has also developed a Wetlands Research Advisors Group to help provide scientific and program peer review to assist in guiding the wetland monitoring and assessment program's development. The State of New Jersey also participates in the National Wetlands Workgroup (NWW) and the Mid-Atlantic Wetlands Workgroup (MAWWG).

Wetlands Research

The State is currently conducting research and assessment of discrete wetland types through the Natural Heritage Program under a Wetlands Protection Development Grant

from USEPA [Section 104(B)(3)]. Each of the five research projects include Level 3 Intensive Site Assessments and have components of inventory, vegetation community classification, baseline monitoring of vegetation as well as associated hydrology flora and fauna.

The State is developing an indicator of wetland mitigation status to evaluate current conditions of mitigation sites in relation to NEPPS goals. The indicators of wetland mitigation status include: 1) the extent to which mitigation conforms with approved plans, 2) the amount of wetland achieved through mitigation, and 3) the probability that the wetland will function as a natural wetland system. The Freshwater Wetland Mitigation Quality Assessment Procedure (WMQA) was developed as an interim assessment tool to evaluate the relative probability that a constructed wetland will develop into a natural wetland system over time. The standardized rating index can be used in combination with professional judgement to provide a consistent measure of relative mitigation success. This procedure does not allow direct measurement of wetland functions and it is not intended to provide a numerical value that can be used to establish absolute quality of an individual wetland mitigation project. Nor is the rating index to be used as a surrogate for more quantitative procedures that evaluate mitigation success. Currently, this method is being used to provide the Department with some relative indicators of a constructed mitigation's potential to establish a new wetland that is properly functional as a wetland. The Department is presently conducting research in collaboration with Rutgers University to review wetland quality assessment methods and tests at reference New Jersey wetlands.

The goals of the State wetlands monitoring and assessment program are to achieve no net loss of wetland function and no net loss of wetland acreage. The purpose of monitoring and assessing wetlands in New Jersey is to increase wetland quantity, quality and function and to assess the State's wetland resources in relation to water quality. The assessment of cumulative impacts within a watershed and determination of maximum sustainable impacts is important to maintaining and improving wetland and water quality. The assessment program being developed will be structured to improve regulatory and non-regulatory decision-making processes and to further protect the State's wetland and water resources as well as integrate protection for rare plant and animal species. Integrating a wetland monitoring and assessment program into the State's existing surface and ground water monitoring programs and existing programmatic framework is important in building a comprehensive, sustainable and holistically informative monitoring program. In addition, monitoring and assessing the State's wetland mitigation enhancement, restoration and creation projects is crucial to ensuring that the values and functions of wetlands being lost through permit decisions are being achieved and improved. Standards for the assessment of the State's wetland resources will be developed under the requirements of the Clean Water Act.

New Jersey is continuing to refine the goals and objectives of a wetlands monitoring and assessment program to achieve not only the NEPPS goal of no net loss of wetland function or acreage, but to also achieve an increase in the acreage of wetlands in New Jersey. The State's goal is to develop an implementable, meaningful, and comprehensive

wetland monitoring and assessment program that will improve upon the existing protection afforded wetlands in the State of New Jersey though the mitigation program, the natural resource restoration program, and the several land preservation programs that currently operate within the State.

Described below are additional research activities performed by the Endangered and Nongame Species Program (ENSP) that impact directly or indirectly the Department's efforts to preserve wetlands in New Jersey.

Endangered and Nongame Species Program (ENSP) Research

Landscape Project. NJDEP's Endangered and Nongame Species Program (ENSP) in collaboration with multiple partners, has developed a landscape level approach to protect imperiled species and critical wildlife habitat. The Landscape Project has been designed to provide users with peer reviewed, scientifically sound information that is easily accessible. The project can be integrated with planning, protection and land management programs at every level of government, non-governmental organizations and private landowners. The ENSP has developed maps that identify critical areas for imperiled species by landscape (Skylands, Delaware Bay, Piedmont Plains, Pinelands and Coastal) based on their habitat and land-use classification. Landscape internet-based and hardcopy mapping products provide a basis for proactive planning, such as the development of local habitat protection ordinances, zoning to protect critical wildlife areas, management guidelines for imperiled species conservation on public and private lands, and land acquisition projects. The critical area information that Landscape Project products provide can be used for planning purposes before any actions such as proposed development, resource extraction, or conservation measures occur.

Herpetofauna Projects. NJDEP's ENSP has three citizen-science based herpetofauna conservation projects to identify wetlands-associated species. Herpetofauna serve as surrogates for water quality. Through peer-review journal publications, it is quite clear that most amphibians and some reptiles are excellent bio-indicators for water quality.

- The ***New Jersey Herptile Atlas***, through the efforts of ENSP and many volunteers, is collecting data on the specific location and abundance of all reptile and amphibian species throughout the state. These data will be used to map the critical habitat, abundance and distribution of our state's herptile species. These maps will provide ENSP with the necessary information to inform planning agencies statewide of the status of NJ's native herptile species, thus allowing all agencies to better plan for our state's wildlife conservation.

- The ***Calling Amphibian Monitoring Program*** uses volunteers to survey for frogs and toads along 53 transects throughout the state. Each transect consists of 10 georeferenced survey points and the data collected allows for trend analysis of New Jersey's frog and toad populations.

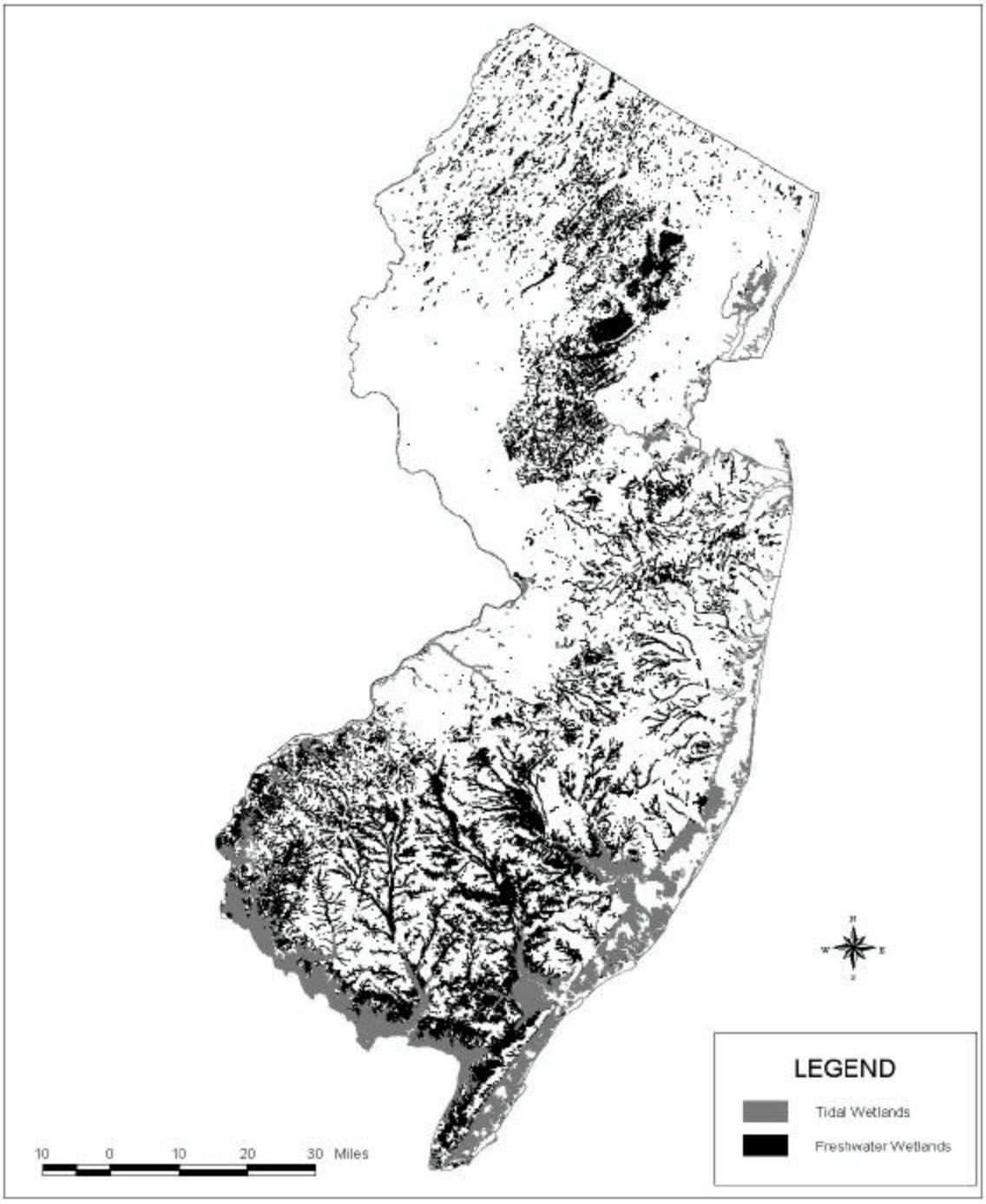
- The ***Vernal Pool Protection Project*** uses trained volunteers to confirm locations of vernal ponds and survey these locations for herpetofauna. ENSP staff and volunteers

have collected data on approximately 3,800 and have increased the number of certified vernal pools from 341 in 2002 to 715 to date. In addition, Rutgers University's Center for Remote Sensing and Spatial Analysis (CRSSA) has identified over 13,580 potential vernal pools throughout the state and has developed an interactive website featuring downloadable aerial photographs with potential vernal pool data layers.

See www.njfishandwildlife.com/ensphome.htm for more information on these ENSP initiatives.

Described in the next sections of this Chapter are two additional programs; the *Green Acres Program* and land acquisitions through the *New Jersey Environmental Infrastructure Financing Program*. These programs further the Department's aim of protecting and preserving wetlands as well as natural lands in general via land acquisition and preservation.

Figure 6.1 Tidal and Freshwater Wetlands in New Jersey



4.10. The Green Acres Program

The Green Acres Program (Green Acres) was created in 1961 to meet New Jersey's growing recreational and conservation needs. As the principal land acquisition agent for the Department of Environmental Protection, Green Acres acquires land for state parks, forests, natural areas and wildlife management areas. To date, Green Acres has protected more than 508,663 acres of open space and developed hundreds of public parks, bringing the state-wide system of preserved open space to more than 1,199,763 acres.

Green Acres administers funds provided by the Garden State Preservation Trust. Green Acres works with landowners, municipal and county governments, nonprofit agencies and other conservation partners to protect land through direct purchase or conservation easement. The program provides low interest (2%) loans and partial grants to municipal and county governments to acquire open space and develop outdoor recreation facilities. Green Acres also purchases land for the Pinelands National Reserve and administers the "Limited Practical Use" initiative to purchase land in the Pinelands from owners of less than 50 acres, whose land use is restricted due to current land use restrictions.

Green Acres also administers the "Tax Exemption Program," which provides exemption from local property taxes to eligible nonprofit organizations that own recreation or conservation lands and allow for public access. More than 38,000 acres of privately owned lands have been opened to the public for a variety of conservation and recreational uses.

The program monitors municipal and county sites acquired and developed with Green Acres funds and sites acquired by nonprofit organizations with Green Acres matching grants. Stewardship officers inspect these sites to ensure that they are well-maintained, open, and accessible for recreation and conservation purposes.

Green Acres also provides environmental planning and technical assistance for municipal, county, nonprofit and state open space acquisition and recreational development. In addition, Green Acres administers the "Payment in Lieu of Taxes Program" to municipalities in which lands are purchased by the NJDEP or nonprofit organizations for recreational or conservation purposes. This ensures that municipalities do not suffer a loss of taxes due to acquisition of lands.

To learn more about protecting your land or partnering with Green Acres to protect land in your region, visit their website at www.state.nj.us/dep/greenacres or call their office at 609-984-0500.

Table 4.10-1: Purchases in State Fiscal Year 2000, 2001 and 2002 by the Green Acres Program by Watershed Management Area.

Watershed Management Area	Acres
No Watershed - Statewide	17,778
Upper Delaware River	6,207
Walkill, Pochuck, Papakating	1,008
Pompton, Pequannock, Wanaque, Ramapo	10,205
Upper Passaic, Whippany, Rockaway	325
North & South Branch Raritan	270
Lower Raritan, South River, Lawrence Brook	5
Millstone River	31
Central Delaware Tributaries	580
Monmouth Watersheds	171
Barnegat Bay Watersheds	1,582
Mullica, Wading River	2,070
Great Egg Harbor, Tuckahoe	6,865
Cape May Watersheds	2,930
Maurice, Salem, Cohansey	7,175
Lower Delaware Tributaries	225
Rancocas Creek	1,133
Crosswicks Creek	90

Table 4.10-2: Purchases in State Fiscal Year 2000, 2001 and 2002 by the Green Acres Program by County and Municipality

County	Municipality	Acreage
ATLANTIC	BUENA VISTA TWP	689.65
ATLANTIC	EGG HARBOR TWP	1105.67
ATLANTIC	ESTELL MANOR	0.47
ATLANTIC	ESTELL MANOR CITY	700.95
ATLANTIC	FOLSOM BORO	250.62
ATLANTIC	GALLOWAY TWP	201.95
ATLANTIC	HAMILTON TWP	3455.99
ATLANTIC	HAMMONTON TOWN	664.36
ATLANTIC	MULLICA TWP	2451.537
ATLANTIC	NORTHFIELD CITY	4
ATLANTIC	PLEASANTVILLE CITY	71.89
ATLANTIC	WEYMOUTH TWP	828.405
BERGEN	NEW MILFORD BORO	0.25
BERGEN	RIVER EDGE BORO	0.76
BURLINGTON	BASS RIVER TWP	181.21
BURLINGTON	BORDENTOWN TWP	11.2
BURLINGTON	EVESHAM TWP	342.35
BURLINGTON	HAINESPORT TWP	0.76
BURLINGTON	MEDFORD TWP	815.18
BURLINGTON	PEMBERTON TWP	3.24
BURLINGTON	SHAMONG TWP	20.14
BURLINGTON	SOUTHAMPTON TWP	374.17
BURLINGTON	TABERNACLE TWP	206.98
BURLINGTON	WASHINGTON TWP	454.34
BURLINGTON	WOODLAND TWP	190.18
CAMDEN	WATERFORD TWP	143.73
CAMDEN	WINSLOW TWP	101
CAPE MAY	CAPE MAY CITY	2.362
CAPE MAY	DENNIS TWP	1533.163
CAPE MAY	LOWER TWP	147.771
CAPE MAY	MIDDLE TWP	242.235
CAPE MAY	SEA ISLE CITY	0.17
CAPE MAY	UPPER TWP	464.29
CUMBERLAND	COMMERCIAL TWP	367.966
CUMBERLAND	DEERFIELD TWP	7.38
CUMBERLAND	DOWNE TWP	255.35
CUMBERLAND	FAIRFIELD TWP	481.584
CUMBERLAND	GREENWICH TWP	22.804
CUMBERLAND	HOPEWELL TWP	268.662
CUMBERLAND	LAWRENCE TWP	679.59
CUMBERLAND	MAURICE RIVER TWP	1724.49

Table 4.10-2 continued

County	Municipality	Acreage
CUMBERLAND	MILLVILLE CITY	807.8
CUMBERLAND	STOW CREEK TWP	512.178
CUMBERLAND	VINELAND CITY	2361.344
ESSEX	CEDAR GROVE TWP	240
ESSEX	FAIRFIELD TWP	9.7908
ESSEX	NORTH CALDWELL TWP	0
ESSEX	VERONA TWP	0
GLOUCESTER	DEPTFORD TWP	4.09
GLOUCESTER	FRANKLIN TWP	621.93
GLOUCESTER	MONROE TWP	734.98
GLOUCESTER	WOOLWICH TWP	100.11
HUNTERDON	ALEXANDRIA TWP	29.581
HUNTERDON	BETHLEHEM TWP	150.151
HUNTERDON	EAST AMWELL TWP	70.7615
HUNTERDON	FRANKLIN TWP	1.77
HUNTERDON	FRENCHTOWN BORO	12.03
HUNTERDON	GLEN GARDNER BORO	37.47
HUNTERDON	HIGH BRIDGE BORO	48.5
HUNTERDON	HOLLAND TWP	245.58
HUNTERDON	KINGWOOD TWP	274.547
HUNTERDON	LEBANON TWP	123.22
HUNTERDON	RARITAN TWP	347.33
HUNTERDON	READINGTON TWP	10.15
HUNTERDON	UNION TWP	94.18
HUNTERDON	WEST AMWELL TWP	522.81
MERCER	EWING TWP	9.8
MERCER	HOPEWELL TWP	453.522
MERCER	WASHINGTON TWP	33.94
MERCER	WEST WINDSOR TWP	48.77
MIDDLESEX	CRANBURY TWP	31.24
MIDDLESEX	MONROE TWP	334.994
MIDDLESEX	OLD BRIDGE TWP	8.5
MIDDLESEX	SOUTH BRUNSWICK TWP	4.164
MONMOUTH	FREEHOLD TWP	1393.863
MONMOUTH	HOLMDEL TWP	40.37
MONMOUTH	MANALAPAN TWP	169.09
MONMOUTH	MIDDLETOWN TWP	0.11
MONMOUTH	ROOSEVELT BORO	110.01
MORRIS	DENVILLE TWP	169.4
MORRIS	EAST HANOVER TWP	5.07
MORRIS	JEFFERSON TWP	2462.536
MORRIS	LINCOLN PARK BORO	4.197
MORRIS	MT OLIVE TWP	75.29
MORRIS	ROCKAWAY TWP	2759.84
MORRIS	ROXBURY TWP	32.02
MORRIS	WASHINGTON TWP	221.511

Table 4.10-2 continued

County	Municipality	Acreage
OCEAN	BARNEGAT LIGHT BORO	0.826
OCEAN	BERKELEY TWP	2730.187
OCEAN	EAGLESWOOD TWP	7.8
OCEAN	JACKSON TWP	810.212
OCEAN	LACEY TWP	416.443
OCEAN	LITTLE EGG HARBOR TWP	174.099
OCEAN	MANCHESTER TWP	521.63
OCEAN	OCEAN TWP	396.35
OCEAN	PLUMSTED TWP	240.34
OCEAN	STAFFORD TWP	507.51
PASSAIC	LITTLE FALLS TWP	0.582
PASSAIC	NORTH HALEDON BORO	40.42
PASSAIC	POMPTON LAKES BORO	5.426
PASSAIC	WAYNE TWP	4.657
PASSAIC	WEST MILFORD TWP	1673.563
SALEM	ALLOWAY TWP	471.347
SALEM	CARNEYS POINT TWP	36.69
SALEM	ELSINBORO TWP	46.23
SALEM	LOWER ALLOWAYS CREEK TWP	1068.853
SALEM	MANNINGTON TWP	129.62
SALEM	PENNSVILLE TWP	61
SALEM	PILESGROVE TWP	161.27
SALEM	PITTSGROVE TWP	127.72
SALEM	QUINTON TWP	208.7
SOMERSET	FRANKLIN TWP	81.055
SOMERSET	HILLSBOROUGH TWP	188.27
SUSSEX	ANDOVER TWP	80.127
SUSSEX	BYRAM TWP	46.04
SUSSEX	FRANKFORD TWP	162.83
SUSSEX	FRANKLIN BORO	10.502
SUSSEX	FREDON TWP	101.67
SUSSEX	HAMBURG BORO	39.832
SUSSEX	HAMPTON TWP	229.26
SUSSEX	HARDYSTON TWP	531.651
SUSSEX	LAFAYETTE TWP	7
SUSSEX	MONTAGUE TWP	577.22
SUSSEX	OGDENSBURG BORO	131.41
SUSSEX	SANDYSTON TWP	31.994
SUSSEX	SPARTA TWP	910.517
SUSSEX	STILLWATER TWP	871.047
SUSSEX	VERNON TWP	5032.0592
SUSSEX	WANTAGE TWP	308.716
WARREN	ALLAMUCHY TWP	936.96
WARREN	BELVIDERE TOWN	28.61
WARREN	BLAIRSTOWN TWP	309.58

Table 4.10-2 continued

County	Municipality	Acreage
WARREN	FRANKLIN TWP	0.87
WARREN	FRELINGHUYSEN TWP	197.51
WARREN	HACKETTSTOWN TWP	30.94
WARREN	HARDWICK TWP	706.782
WARREN	HARMONY TWP	270.98
WARREN	HOPE TWP	350.66
WARREN	INDEPENDENCE TWP	5.33
WARREN	KNOWLTON TWP	207.89
WARREN	LIBERTY TWP	539.3199
WARREN	LOPATCONG TWP	22.15
WARREN	MANSFIELD TWP	269.11
WARREN	PHILLIPSBURG TOWN	7.54
WARREN	POHATCONG TWP	129.539
WARREN	WASHINGTON TWP	96.82
WARREN	WHITE TWP	159.043

4.11. New Jersey Environmental Infrastructure Financing Program (Land Acquisitions)

The New Jersey Environmental Infrastructure Financing Program (EIFP) provides low-cost loans to municipalities, sewerage and utility authorities and other local government units for the purpose of land acquisition and conservation. "Land acquisition and conservation" means the fee simple purchase or easement acquisition by a local government. Such land purchased or acquired is deemed by the Department as appropriate for water quality protection. The EIFP loans can cover up to the certified market value of the parcel, as well as costs related to the recipient's administration of the project (up to 3% of land costs) and an allowance for planning and design (generally 10 to 15% of land costs).

Financing is provided from two sources, the Wastewater Treatment Fund (Fund) is administered by the New Jersey Department of Environmental Protection) and the New Jersey Environmental Infrastructure Trust (Trust). Traditionally the Fund has provided loans at 0% interest for approximately 20 years for one-half of the allowable project costs. The Trust offers loans at about the market rate or less for the remaining allowable project costs, also for a 20 year term. Between the two funding sources, in 2001 and 2002 the blended rate on loans was less than half of the market rate obtainable by a local government unit. In 2001, the Program's interest rate was 2.2% and in 2002 the rate was 2.15 %. Starting in 2003 (Federal Fiscal Year 2004) the EIFP launched an initiative to ensure consistency with the Department’s land use priorities. The EIFP now includes a lower-interest rate program with a 75/25 split of the Department/Trust shares for projects that promote the Department’s land use priorities.

Each project is evaluated and point scores assigned in accordance with the ranking criteria of the Federal Priority System which is developed each year by the Department. Land acquisition projects are included in the Nonpoint Source Pollution Management category. Projects are certified for funding based on list rank, the amount of available funds, and compliance with the Program's requirements and deadlines. Sufficient funds are anticipated to be available to cover projects in 2004 regardless of project rank.

Projects need to demonstrate a water quality benefit. Therefore, when dividing up a parcel for funding purposes, the project sponsor needs to look at planned or potential uses of the parcel in order to develop combinations that maximize and assure water quality protection. Detailed information regarding the program can be obtained by contacting Scott Shymon by e-mail at scott.shymon@dep.state.nj.us or at (609) 292-3859.

The following (Table 4.11) is a listing of land acquisitions made under the EIFP in Federal FY 2002, 2003 and 2004.

Table 4.11-1: Land Acquisitions under the NJ Environmental Infrastructure Financing Program for Federal Fiscal Year 2002.

Municipality	Acres	Description
Allamuchy Township	328.86	The parcels drain to the Pequest River. The proposed acquisition and preservation of the land will result in the protection and maintenance of water quality of the surface water, ground water and wetland resources of the area on a long-term basis. In addition to protection of these water resources and the prevention of flooding and streambank erosion, valuable plant and wildlife habitat will be protected.
Brick Township	87	The project will be part of the Midstreams Greenway and protects the ground water recharge in the South Branch of Beaver Dam Creek, a tributary to the Metedeconk River.
Bridgewater Township	30.4	The site is forested and has steep topography that slopes down towards Echo Lake. Chambers Brook flows through Echo Lake and is tributary to the Raritan River.
Edgewater Borough	3.37	The land is characterized by steep slopes and wooded areas located along the Palisades.
Evesham Township	691	The site is located in the Pinelands Protection Area and is adjacent to an existing Township recreation area that is comprised of woods, wetlands and abandoned cranberry bogs.
Holmdel Township	417	The parcel is the largest undeveloped property in Holmdel and includes a 1.5 mile stretch of the Ramanessin Brook, four of its tributaries and two ponds. The parcel consists mainly of cleared land, with several large areas of mature forest. Extensive wetlands, floodplains, steep slopes and wooded areas are located along the Brook.
East Windsor Township	68	Acquires land for Bear Brook Greenway which consists of upland forests, forested wetlands, agricultural fields and meadows.
Hamilton Township	16	Hamilton/Trenton Marsh is a freshwater tidal wetlands that supports several species of flora and fauna and is located along the Delaware River. The parcel is a sparsely wooded lowland to upland forest.
Montville Township	4.26	Open space preservation for the Passaic River watershed.
Readington Township	47.743	The parcel is bounded on two sides by tributaries that join together on the parcel to form the main stem of the Holland Brook. The property is presently open agricultural fields with forested areas along the stream corridors.
Roxbury Township	24	The parcel is located on the slope of Mooney Mountain. The lot is forested and gently sloped and contains about one acre of wetlands at the bottom of the slope. The wetlands area is adjacent to a tributary to Flanders Brook which flows to the South Branch of the Raritan River.
Washington Township	109	The parcel is located within the Assunpink Watershed Area and consists of mixed vegetation and sparsely wooded areas.
West Windsor	202	The land is located in the Duck Pond Run and Little Bear Brook watersheds and consist of mixed-forest area, shrubby areas, farm field and lowland forest vegetation.

Table 4.11-2: Land Acquisitions under the NJ Environmental Infrastructure Financing Program for Federal Fiscal Year 2003 (actual year 2002 in November).

Municipality	Total Acres	Description
Dover Township	9.93	The parcel contains a mix of pine, cedar and oak trees, as well as areas of clearing and sparse underbrush. The land slopes gently to the southeast towards the Long Swamp Creek and an area of wetlands.
Edison Township	5.2	The parcel includes a man-made pond that occupies approximately 40% of the total property and a small area of wooded wetlands located around its periphery. The wetlands onsite are of intermediate resource value and drains to the Robinson's Branch of the Rahway River and subsequently into the South Branch Rahway River.
East Windsor Township	2.33	The parcel is part of the "Bear Brook Greenway" and consists of upland forests, forested wetlands, agricultural fields and meadows. The south branch of Bear Brook flows through an adjacent lot. Bear Brook is a tributary of the Millstone River and is located in the Raritan Watershed.
East Windsor Township	3.93	The parcel is part of the "Bear Brook Greenway" and consists of upland forests, forested wetlands, agricultural fields and meadows. The south branch of Bear Brook flows through this lot. Bear Brook is a tributary of the Millstone River and is located in the Raritan Watershed.
Hopewell Township	13.96	The parcel is located on Baldpate Mountain which is over 400 feet above sea level and includes over 1300 acres of lands that has already been preserved. This parcel includes lowland and upland forests, forested wetlands and a fallow field. The property drains into Fiddlers Creek, which is located just southeast of the property. Fiddlers Creek is a part of the Delaware River Watershed. The acquisition of this property will increase the size of the Baldpate Mountain open space area.
Hopewell Township	28.70	This parcel, known as the Mercer County Park Northwest Connector, is located next to Mercer County's Rosedale Park. The park consists of 1600 acres of county parkland and includes three lakes and the Stony Brook. The parcel is located adjacent to an intermittent tributary of the Stony Brook, which is tributary to the Millstone River. Along the edge of the property, adjacent to the waterway, is a small wooded area. However, most of the property consists of upland fields. The acquisition of this property will enable other parts of the park to be connected together and extend the Stony Brook Greenway.
Middle Township	81.66	The parcel consists of an upland area that is mainly an overgrown field and an area mixed with upland forest and shrub wetlands. These wetlands are particularly important in their function of aquifer recharge, as the parcel is located in close proximity to the Wildwood Water Pumping Station and pond. Also included on the property are two man-made ponds and a tributary to Fishing Creek. In addition, the Department of Environmental Protection's Office of Natural Lands Management has record of several threatened/endangered animal species on or in the vicinity of the site. The site also lies within a migratory raptor concentration area.

Table 4.11-2 continued:

Montville Township	45.84	The parcel is wooded and contains steep slopes. This property is located in the Towaco Valley Aquifer and the Passaic River Basin.
Montville Township	0.70	To the north of this wooded parcel is Pyramid Mountain, a large County/Municipal preserved open space. Preservation of these lots would provide an effective buffer zone between the residential area of Lake Valhalla to the south, and the open space region of Pyramid Mountain to the north.
Montville Township	0.54	To the north of this wooded parcel is Pyramid Mountain, a large County/Municipal preserved open space. Preservation of these lots would provide an effective buffer zone between the residential area of Lake Valhalla to the south, and the open space region of Pyramid Mountain to the north.
Old Bridge Township	197.00	The parcel is characterized by a rolling topography and includes mixed Oak Forest, open fields and significant areas of freshwater wetlands in the northern portion of the property. The northern part of the property drains towards Lake Lefferts and the Matawan Creek and the southern part drains to Deep Run. The property lies above a portion of the Englishtown Sand Formation, an important aquifer in parts of Middlesex and Monmouth Counties.

Table 4.11-3: Land Acquisitions under the NJ Environmental Infrastructure Financing Program for Federal Fiscal Year 2004 (actual year 2003 in November).

Municipality	**Total Acres**	**Description**
Montville Township	42.20	The generally wooded property is characterized as lightly rolling topography. One third of the property is within the floodway of the Rockaway River. The majority of the western and southern portions of the property are wetlands. The property drains to the Rockaway River.
Lebanon Township	256	Spruce Run goes through this property and wetlands are located in the vicinity of the stream. Two ponds are also located on the property. The property contains wooded areas and agricultural fields.
Lebanon Township	58	The property contains many natural springs that are headwaters to Spruce Run. The property is wooded and slopes down towards another parcel that is slated for acquisition.
Lebanon Township	25	The parcel has its western boundary along the Spruce Run. The property is predominately wooded and wet.
Readington Township	19.94	The parcel has its southern boundary at the centerline of the Holland Brook. The entire parcel is 61 acres. The northern 41 acres will be preserved through Farmland Preservation. The parcel is wooded with hardwoods and eastern red cedars. Wetlands are found along the southern part of the parcel in the vicinity of the floodplain of the Holland Brook.

4.12 New Jersey Mercury Reduction Activities

In 1993 the Department convened a Mercury Task Force. This Task Force recommended a stringent reduction in mercury emissions from municipal solid waste (MSW) incinerators, which was subsequently implemented by NJDEP. This resulted in a greater than 90 percent reduction from this source category. A second Task Force convened in 1998, triggered by a concern that additional significant sources existed and that energy deregulation would increase mercury emissions from Midwestern power plants. The task force subsequently reported that air deposition (wet and dry) was the most significant source of environmental mercury followed by water-borne and potentially water-borne sources. Such potentially water-bore sources include point source discharges of wastewater, nonpoint sources such as septic tank leachate, and sludge application.

The 1998 Mercury Task Force advocated a long range goal of the virtual elimination of anthropogenic sources of mercury. Towards this goal, a two step milestone of a 75% reduction in air emissions below 1990 levels by 2006 and an 85% reduction below 1990 levels by 2011 was recommended. The Task Force reviewed all local and regional mercury sources and recommended reductions in all sources as practicable. New Jersey expects this effort to eventually result in the attainment of water quality standards given the scientific and quantitative basis of the current recommendations combined with the successful track record of the first Mercury Task Force. The Report of the Mercury Task Force can be viewed on the web at http://www.state.nj.us/dep/dsr/mercury_task_force.htm

In an effort to carry out the recommendations of the Task Force, the Department is engaged in the following activities:

Task Force Recommendation: Participate in and support regional, national, and global efforts to reduce mercury uses, releases, and exposures

NJDEP contributed significantly to a recent effort coordinated by the Northeast States for Coordinated Air Use Management (NESCAUM), an interstate association of air quality control divisions in the northeast, to advocate strong standards for coal combustion at the national level. NESCAUM released a report in October 2003, *Mercury Emissions from Coal-Fired Power Plants: The Case for Regulatory Action*. The report showed that a 90% average reduction of mercury emissions from coal combustion at the national level is clearly possible.

Other recent actions include a letter sent from Commissioner Campbell to USEPA on November 13, 2003 urging expansion of recently promulgated maximum achievable control technology (MACT) standards[3] to include additional iron and steel manufacturers such as electric arc furnaces. The letter also encouraged EPA to require stack testing and set an emission limit for iron and steel manufacturers that becomes effective after a specified period of time.

[3] which require source reduction of mercury in scrap metal feedstock by certain iron foundries.

Task Force Recommendation: Remove mercury from products

The Department has been working to develop legislation that would encourage the sound management of mercury-containing products throughout their lifecycles. This includes mercury-containing switches used in motor vehicles and mercury-containing dental amalgams. In November of this year, the Department was awarded a grant from USEPA for a pilot project to replace mercury-containing switches in the State vehicle fleet with non-mercury switches, and to develop training materials to assist other fleet operators in similar actions.

Task Force Recommendation: Reduce emissions of mercury from the production of electricity

The Department, through its Greenhouse Gas Sustainability Action Plan and its involvement in the implementation of the New Jersey Electric Discount and Energy Competition Act, is involved in the promotion of renewable energy sources. Renewable energy sources do not involve consumption of fossil fuels, especially coal, which helps to minimize mercury emissions. The Department is also taking an active role in the development of the Regional Greenhouse Gas Initiative, which is expected to lead to a cap and trade program that will reduce greenhouse gas emissions from the electricity generation sector. This program is also expected to lead to some reduction in mercury emissions due to the reduction of coal combustion in the production of electricity.

Task Force Recommendation: Significantly reduce air emissions from coal combustion, iron, steel, and secondary smelting industries, or other sources

The NJDEP is proposing rules to reduce emissions of mercury. The proposal advocates the reduction of mercury emissions from the following sources:

> Coal-fired power plants. The standards in the NJDEP's proposed rules are similar to legislation recently enacted by Connecticut and regulations proposed by Massachusetts. New Jersey's proposal requires that the seven coal-fired facilities in the State comply with the new limits by December 2007 (the same compliance deadline as in the USEPA proposal). However, the compliance deadline could be extended to December 2012 for a company that commits to major reductions in emissions of NOx, SO2, and mercury, to levels significantly below, and sooner than, deadlines the Bush Administration's Clear Skies Initiative and recently proposed federal regulations would attain.
>
> Iron or Steel. The six iron or steel scrap smelters in New Jersey are collectively the largest source of mercury emissions to the air in the State. The proposal would first allow these facilities time to reduce mercury emissions through programs to remove mercury switches from the scrap they process. Efforts to develop those programs are already in progress with the NJDEP's solid waste and science and research programs. Additional air pollution control technology would be required only if the mercury switch separation program proves insufficient to meet emission limits.

Municipal Solid Waste (MSW) Incinerators. Current mercury emission limits on MSW incinerators have significantly reduced emissions from that sector, but emissions from this source category remain relatively large. The proposal includes stricter limits that would take effect seven years after the rule is promulgated. Three of the five affected facilities, Gloucester, Warren, and Union, should be able to meet the stricter limits with little difficulty. The other two facilities, Essex and Camden, may have to install additional pollution controls to capture enough mercury to meet the proposed standard. The proposal would allow those facilities an alternative that would potentially allow them to avoid major capital expenditures for pollution control upgrades, yet still deliver significant reductions in mercury emissions quickly.

Hospital/Medical/Infectious Waste (HMIW) Incinerators. The mercury limits to be proposed for HMIW incinerators are consistent with recommendations of other northeastern states and are already being achieved by the few remaining New Jersey facilities that incinerate medical waste.

Task Force Recommendation: Expand and institutionalize routine monitoring for mercury in fish

NJDEP/DSRT is currently carrying out the second year of a planned five-year monitoring program to assess mercury levels in fish in New Jersey's waters. Additional funding will be needed to continue the program for a full five years.

Task Force Recommendation: Actively encourage the federal government to initiate and maintain comprehensive monitoring and surveillance for mercury in commercial fish

NJDEP/DSRT is supervising a research project to survey commercial fish for mercury content. One of the goals of this project is to spur action at the national level.

Task Force Recommendation: Expand and periodically evaluate the effectiveness of current outreach, advisories and education efforts

Mercury Outreach/Pollution Prevention: The Department will develop a "Mercury in Products" brochure. This EPA funded project targets the general population and aims to alert citizens about the dangers of mercury and identifies household and consumer products that may contain mercury. In addition, the project alerts the public to mercury free or low mercury alternatives. The brochure will also provide information on how to properly dispose of products containing mercury. The Department plans to disseminate the brochures sometime in the near future. Brochures will be distributed in doctors' offices, NJDEP Fish & Wildlife facilities and other locations.

Persistent Bioaccumulative Toxics (PBT) - Free Purchasing for State Contracts: The office of Pollution Prevention And Right-To-Know (P2RTK) is working with INFORM,

Inc., a public-interest oriented research organization, on an EPA grant to eliminate or reduce the amount of PBT purchased by State of New Jersey Departments. INFORM has examined State contract lists and identified products which contain PBT. The scope of the project has since narrowed to focus almost exclusively on mercury in products. The project hopes to have PBT-Free purchasing specifications and PBT disclosure information included as part of the requirements for bidding on State contracts. Commissioner Campbell sent a draft Executive Order on PBT-Free purchasing to the Governor's Office in late November 2003. It is hoped the Governor will sign the Executive Order in the near future. INFORM has also approached several private sector companies in an effort to promote PBT-Free purchasing to NJ businesses. PSE&G, DuPont Deepwater, BMW's NJ Headquarters, Philips Lighting and Hackensack University Medical Center have all expressed interest in participating in a PBT-free purchasing program.

Pollution Prevention and Occupational Health Project at Hospitals and Health Care Facilities: P2RTK is working with the Occupational Training and Educational Consortium (OTEC) at Rutgers University to promote pollution prevention and occupational health at hospitals and healthcare facilities in NJ. P2RTK and OTEC had initial discussions with union representatives from Health Professionals and Allied Employees (HPAE) earlier this fall. P2RTK, OTEC and HPAE are scheduled to meet with EPA Region 2 staff in mid December 2003 to explore potential collaboration and funding.

Appliance and Vehicle Mercury Switch Removal (AVMSR) project: P2RTK staff continue to participate in the AVMSR pilot project to eliminate or reduce mercury from recycled automobiles used as a raw material at NJ steel mills.

Provide Technical Assistance to US Postal Service's Negative Exposure Assessment Project: P2RTK staff, have been assisting members of the US Postal Service (USPS) develop a research project designed to evaluate employee's exposure to mercury released from broken fluorescent lamps. USPS has had a number of incidence where the accidental breakage of fluorescent lamps led to the closure and expensive cleanup of postal facilities. The project aims to quantify the release of mercury and resulting airborne concentration from the breaking and cleanup of several fluorescent lamps. If warranted, USPS hopes to develop standard cleanup procedures for handling broken fluorescent lamps or procedures for isolation and containment while waiting for cleanup contractors to perform the abatement. The NJDEP hopes to use this exposure data to develop future fact sheets, to be available on the web, to help homeowners evaluate potential mercury exposures resulting from accidental breakage of fluorescent tubes in the home.

Release Of Mercury From Broken Fluorescent Bulbs publication: DSRT and P2RTK staff published an article in the February 2003 edition of the Journal of Air and Waste Management. Results indicated that previous estimates underestimated the amount of mercury released from broken fluorescent tubes. Results from this article have lead to additional research by the US Postal Service (see above).

Mercury Pollution Prevention Auditing: In an effort to reduce or eliminate mercury use, P2RTK has targeted, for pollution prevention audits, NJ manufacturing facilities that report using mercury at their facility. Approximately twenty facilities have either had a pollution prevention audit or have had discussions with P2RTK to address reporting discrepancies. Over the next year or so, the Office of P2RTK hopes to refine the mercury data and track the amount of mercury used, shipped in products and generated as waste at New Jersey facilities.

Task Force Recommendation: Reduce exposures from cultural uses of mercury

NJDEP/DSRT has coordinated a study to investigate possible exposures from cultural uses of mercury. Initial results indicate that mercury concentrations in indoor air in some households may be problematic. An additional study is planned to better characterize populations potentially at risk from indoor mercury exposures, including those that may be associated with cultural uses[4] of mercury.

Additional Activities

The Department is overseeing the completion of the NJ Atmospheric Deposition Network project, and has funded a two-year project to investigate historic and current trends in mercury deposition in water bodies as reflected in sediment concentrations. Each of these projects will address portions of these recommendations. The Department has also contributed to the development of an environmental impact statement outlining plans for the long-term storage of stockpiled mercury by the U.S. Department of Defense's National Stockpile Center.[5] Other Department actions addressing aspects of these recommendations, including possible rule proposals to tighten mercury limits for wastewater dischargers, are under consideration.

[4] Of concern here is Santeria, a cultural/religious practice of some Hispanic peoples mostly of Caribbean Island origin. Some of the practices include sprinkling mercury on the floor, wearing amulets that contain mercury, exposing liquid mercury to a candle flame, etc.

[5] There are several centers in the U.S., one of which is in NJ, where they stockpile mercury. In the past, mercury was used in the defense industry to make explosives, as a result significant quantities were stockpiled. Now the problem is proper storage and/or disposal.

4.13. Floatables Control Activities

Sewer systems in and around the New York/New Jersey Harbor are designed so that during periods of wet weather, excess flows are discharged to the Harbor waters. These excess flows contain floating debris ("floatables") including both street litter (paper, plastics, bottles, etc.) and toilet-generated waste such as hygiene products. When discharged to the Harbor waters, floatables tend to congregate in large groupings, or slicks, that can exit the Harbor and wash up on beaches depending on wind and tidal conditions.

In the late 1980s floatables that included medical debris (syringes, vials, etc.) washed ashore on ocean beaches in New Jersey and Long Island. This resulted in beach closures and in multi-billion dollar revenue losses by beach communities.

In response, EPA Region II initiated the multi-agency Floatables Action Plan (FAP), designed to capture slicks of floatables before they exit the Harbor, thus protecting ocean beaches. The Plan involves several means of controlling floatables, such as:

- skimmer vessels – specialized boats fitted with nets that can collect floating groups of debris;
- floating booms – floating barriers strewn across waterways near sewer-system discharge points from area sewer systems to trap debris for later collection; and
- sewer-system improvements to maximize their ability to retain floatables.

These methods have minimized beach closings resulting from floatables washing ashore, and they have prevented tons of floatables from reaching the Harbor. EPA prepares an annual assessment of the FAP which provides details on the cause of floatables slicks, on current collection programs, and on sewer system work under way to address floatables.

Initiatives to Control Floatables

Clean Shores Program: Beginning in 1989, the Department began a program called "Operation Clean Shores", designed to collect shoreline floatable debris before it became re-suspended due to tidal influences. This program has used New Jersey inmates to collect floatable debris, comprised mainly of landed drift wood, on non-recreational shorelines in order to prevent floatable debris from being re-floated during extreme high tides and washing up on recreational beaches, and/or becoming hazards to navigation and impacting marine life. The program, now called the "Clean Shores Program", is conducted throughout the State of New Jersey, in the Hudson, Raritan and Delaware estuaries and barrier island bays.

In 1993, the Clean Shores Program began to be implemented on a year-round basis whereas formerly it was only implemented during the bathing season. The Program is funded by the sale of Shore Protection license plates. Collection totals are presented in Table 4.13a.

Table 4.13a: NJDEP's Clean Shores Program Data

Year	New Jersey Shore Miles Addressed	Tons of Floatable Debris Collected
1989	24	3000
1990	48	4800
1991	74	4900
1992	85	5800
1993	71	5750
1994	62	3700
1995	80	2050
1996	103	2650
1997	146	2953
1998	138	2400
1999	182.4	2400
2000	114.9	2563
2001	172.3	2352
2002	151.2	2080
TOTAL		**45,318**

Adopt-A-Beach Program: The State of New Jersey enacted a law on January 7, 1993 which authorized the Department to administer an "Adopt-A-Beach" program, fostering volunteer stewardship of coastal beaches. The Department is required to sponsor two statewide beach clean-ups each year. Volunteers select (adopt) a beach for these clean-ups. Results of the Adopt-A-Beach Program are forwarded to the Ocean Conservancy ("OC") in order to be included in the OC's national and international marine debris database. Data are presented in Table 4.13b.

Table 4.13b: NJDEP's Adopt-A-Beach Program Data

Year	Number of Debris Items Collected
1993	36,122
1994	69,221
1995	93,016
1996	78,282
1997	84,433
1998	120,307
1999	59,247
2000	64,696
2001	79,670
2002	80,205
TOTAL	**765,199**

Passaic Valley Sewerage Commissioners (PVSC): In 1999, PVSC purchased a 50- foot surface skimmer vessel – the S.V. Newark Bay. This skimmer vessel initiated its operation in 2000 and conducts daily patrols of the Passaic River and Newark Bay removing floating debris and litter. In 2001, PVSC purchased a second, smaller trash skimmer vessel (the SV Passaic Valley) which was placed into operation in the Spring of 2002. This smaller boat was purchased to operate in the upper reaches of the Passaic River where the larger vessel cannot reach, due to shallow waters and low bridges. Data from 2000 to 2002 are presented in table 4.23c.

4.13c: PVSC Skimmer Vessels Collection Data (2000 - Present)

Year	Tons of Floatable Debris Collected
2000	68
2001	86
2002	248
TOTAL	**402**

Beginning in 1998, PVSC established a program to aid in removing trash along the riverbanks of the Passaic River. The program provides coordination and support to municipalities, counties, citizens, service groups, and local businesses to conduct shoreline clean-ups along the river and in their communities. This program is entitled the Passaic River/Newark Bay Restoration Program: Shoreline Clean-up Element. Gloves, trash bags, trash disposal, and other supplies as requested are arranged for and provided by PVSC to the volunteers. In addition to the sponsorship of voluntary efforts, PVSC has implemented an extensive clean-up of the river's shoreline by creating a River Restoration Department, consisting of 15 full time employees dedicated to the removal of trash and debris from the Passaic River and Newark Bay. Additionally, during the summer months, PVSC's part time employees remove trash on a daily basis in urban parks along the River. Data collected between 1998 to 2002 are presented in table 4.13d.

4.13d: Passaic River/Newark Bay Restoration Program: Shoreline Clean-up Element (1998 - Present)

Year	Tons of Shoreline Debris Collected
1998	85.6
1999	88.7
2000	203
2001	451
2002	895
TOTAL	**1723.3**

Floatables Action Plan Slick Reports: The maintaining of an effective communication network has remained a key element of the implementation of the Floatables Action Plan (FAP). EPA has remained the hub of the communication network, with its Floatables Coordinator as the link with the United States Army Corps of Engineers (USACOE), the United States Coast Guard (USCG), the NYCDEP, this Department, the NYSDEC, the National Oceanic and Atmospheric Administration (NOAA) and the public. The two main contributors of slick sightings are the EPA helicopter which routinely patrols the Harbor, southern Long Island and the New Jersey coast and the Department plane which routinely patrols the New Jersey coast. As reports of Harbor Complex slicks (floatable debris or oil) are received by the EPA Floatables Coordinator, the reports are evaluated to determine appropriate action. Appropriate actions include the reporting of the slick information to the USACOE or the USCG (for oil slicks). For cases in which a report identifies a slick not large enough or too disperse to warrant the deployment of a USACOE skimmer vessel, no action is taken. Table 4.13e lists the 2002 slick sightings

(all by the EPA helicopter) that resulted in the contact of either the USACOE or the USCG by the EPA Floatables Coordinator:

Table 4.13e: 2002 Floatables Action Plan Slick Reports

DATE	TIME	REPORT	ACTIONTAKEN
5/28	10:00 AM	Three floatables slicks observed: 1. Arthur Kill, light scattered debris extending from mouth of Arthur Kill connection to Raritan Bay; 2. Newark Bay. Hudson River, 3. 1 mile north of Verrazano Bridge	Reported slicks to USACOE
5/29	12:10 PM	Floatables slick observed in Newark Bay, moderate density, ¼ mile long	Reported slick to USACOE
5/30	10:44 AM	Floatables slick observed in Newark Bay 1000' long, medium density, largely wood.	Reported slick to USACOE
6/1	9:50 AM	a) Oil slick observed in Kill van Kull, from Bayonne Bridge and going north, 1/4 mile long, 20' wide; rainbow sheen	Reported oil slick to USCG. Reported slick to USACOE
6/8	8:30 AM	Floatable slick observed under the Goethals's Bridge, extending into the Arthur Kill, 1500 feet, wood and plastic.	Reported slick to USACOE
6/20	3:07 PM	NJDEP's surveillance flight was performed from Raritan Bay south to Cape May Point. A large (1.5 mile long) slick of trash was observed in the surf and extending 50 yards offshore from Harvey Cedars south to North Beach.	County and local health officers were notified.
6/25	8:32 AM	a) 300 yard floatables slick observed in the Arthur Kill under the Goethals Bridge. b)a half mile long floatables slick, medium density was observed in Newark Bay	Reported slicks to USACOE
6/29	8:00 AM	Oil slick ½ mile north of Verrazano Bridge mid-channel. Black oil, possibly emulsified, covered about 1 acre (30-50 feet by 12 feet). Thinner sheen oil covered a couple of acres.	Reported oil slick to USCG
7/22	9:45 AM	A half mile long floatables slick, mostly paper was observed in Newark Bay	Reported slick to USACOE
7/29	9:20 AM	Floatables slick observed in Gravesend Bay, ¼ mile long, Rainbow sheen oils slick observed, ½ mile long, northwest of the Marine Parkway Bridge.	Reported floatables slick to the USACOE. Reported oil slick to the USCG.
8/5	1:30PM	A large floatable slick was observed approximately 2 3 miles long from the Verrazano Bridge running west along SouthBeach Staten Island. The slick consisted of paper and plastic. The slick was spotted in the surf zone and up to 500 feet off shore.	Reported slick to both the USACOE and NYCDEP
8/7	11:00AM	¾ mile floatables slick observed in Hudson River; paper and wood	Reported floatables slick to the USACOE.

Following the floatable debris washups in New Jersey in 1987, the Department's Cooperative Coastal Monitoring Program began tracking beach closures due to floatable debris washups in terms of closures of designated bathing areas. A designated bathing area is typically a stretch of beach patrolled by a lifeguard. A closure of such an area must last for a minimum of one day in order to be counted as an official closure. The FAP has been very successful in minimizing beach closures as evidenced by the fact that

there were no beach closures incidents in New jersey since before 1993 due to floatable debris.

NJDEP Long-Term Floatable Debris Control (Solids and Floatables Controls on Combined Sewer Systems): New Jersey has adopted and is implementing a comprehensive solids and floatables control program supported with state financial assistance in the form of planning and design grants and low-interest construction loans. New Jersey requires all owners and/or operators of Combined Sewer Overflow Points (CSO Points) to implement controls that will capture and remove solids and floatable materials that capture and remove Solids and Floatables materials which cannot pass through a bar screen having a bar spacing of a 0.5 inches (13.0 mm). This requirement is an enforceable commitment under the New Jersey Pollutant Discharge Elimination System Permit Program.

To assist communities in their efforts, the Department has provided planning and design grants for up to 90% of the eligible project cost through provisions of the New Jersey Sewerage Infrastructure Improvement Act (SIIA). To date, the Department has awarded over $8.9 million in planning grants and $18.2 million in design grants. The Department has also awarded $132 million in State Revolving Fund (SRF) loans for the construction of the required Solids and Floatables control facilities. An additional $200 million in SRF loans will be required to complete the construction of all control facilities.

The planning studies were completed for all Combined Sewer Overflow Points. The designs have been completed for 86% of the required control facilities. As of December 2003, 52% of the planned Solids and Floatables control facilities are constructed and operating. As December 2003 the operating control facilities have captured and removed over 354 tons of solids and floatables materials during the calendar year 2003.

4.14. Point Source Permitting: Implementation of Water Quality-based Effluent Limits for Total Phosphorus.

Phosphorus is a required nutrient for plants and algae but is considered a pollutant when it stimulates excessive primary production in waterbodies. Excessive phosphorus is a significant cause of use impairment in many waterbodies in the State. Of the 2,187 river miles listed as impaired for conventional pollutants in New Jersey's 2004 303(d) List, 915 miles (45%) have exceedances of total phosphorus. From another perspective, of the 2,634 river miles assessed for Total Phosphorus, 915 (35%) are in violation of the phosphorus criterion and are listed on the State's 303(d) List.

In order to better control the discharge of phosphorus to the State's freshwater streams and lakes and to better comply with the requirements contained within federal Clean Water Act, the Department is implementing the numeric water quality criteria for total phosphorus as necessary to insure that surface water quality standards are achieved. This process began in the fall of 2003 when the Commissioner announced the imposition of appropriate water quality based effluent limits in New Jersey Pollutant Discharge Elimination System (NJPDES) discharge to surface water permits.

The Department is imposing water quality based effluent limitations for phosphorus in NJPDES permits to comply with the numeric water quality criteria. The discharger must either comply with the new effluent limitation or perform a water quality study to demonstrate that the existing concentrations of phosphorus does not render the waterbody unsuitable for their designated uses. The Department may modify the effluent limitation for phosphorus if the study demonstrates that phosphorus is not the limiting nutrient and the waters are not rendered unsuitable for their designated uses due to an excess discharge of nutrients. More information is available at http://www.state.nj.us/dep/dwq/techmans/phostcml.pdf

The limiting nutrient concept refers to the reduction of the growth rate of primary producers (i.e. algae) due to the limited supply of one or more of their required nutrients. The study must also demonstrate that concentrations of phosphorus do not impact on aquatic life, recreation or water supply. The focus of tests to determine whether use impairment exists are based upon response indicators (diurnal DO, chlorophyll a, etc.).

It is expected that this initiative will provide additional information for the assessment process and result in significant reductions of nutrients into state surface waters and a reduction in eutrophication statewide.

4.15. Surface Water Quality Monitoring Schedule

Introduction

This section delineates the Department's current surface water monitoring activities and indicates how they relate to the various listings contained within the 2004 Integrated List. Also in this section is a monitoring and assessment plan and schedule for waterbodies currently listed on sublist 3 of the Integrated List.

The Department's monitoring schedule is presented on Table 4.15. The table describes the activities, indicates the scope of the effort, denotes the nature of the funding and shows how the monitoring effort is linked to the 2004 Integrated List. The table also presents a timeline if the monitoring is multi-year.

Sublist 3 represents waters for which data are currently insufficient to properly assess the use support status. In many of these cases, new or additional data must be collected. In other instances, new assessment methods must be developed and these are discussed in this section. This section presents the status of sublist 3 reassessments as of February of 2004. The Department is continually developing additional workplans and schedules through time to provide the necessary assessments to re-list these waters off of sublist 3, hence, additional progress will most likely occur as this report is being finalized.

Table 4.15: Surface Water Quality Monitoring Schedule

I. ROUTINE/ONGOING

MONITORING PROGRAM	DESCRIPTION	SCOPE	FUNDED TO	LINKAGE TO INTEGRATED LIST	COMMENTS	TIME LINE:				
Ambient Biomonitoring Network (AMNET)	single sampling performed on 5-yr rotating basis for benthic macroinvertebrates	freshwater, nontidal stream/rivers, 822 sites	funding based upon consistent ongoing commitment	Provides Aquatic Life Designated Use assessments for rivers and streams	Future modifications to protocol may reclassify AMNET sites on sublist 3	Round III: 7/02-11/02, 4/03-6/03: Upper Del Basin	7/03-11/03: North East Basin	4/04-11/04: Raritan Basin	4/05-11/05, 4/06-11/06, 4/07-6/07: Atlantic and Low Del Basins	7/07: Upper Del Basin - Round 4 sampling
Warmwater Lake Fisheries Assessments	assessments of lake fisheries by Div. Of Fish Game and Wildlife.	fresh water lakes	funding based upon consistent ongoing commitment	provided assessments of Aquatic Life Designated Use attainment for lakes		2002: 3 lakes scheduled for assessment: Monksville Reservoir, DOD Lake, Shawsville Pond. Fieldwork to be completed by 11/02.	2003: 5 to 7 lakes will be assessed, to be selected from the "Warmwater Fisheries Management Plan"			
Fin-fish Integrated Biotic Assessment (IBI)	Assessment of fin-fish community structure	freshwater, nontidal stream/rivers in Northern NJ, aprox. 20 sites sampled per calendar year. Application to southern New Jersey under development.	funding based upon consistent ongoing commitment	currently not linked to 303d. See "Comments" Field	NJDEP is currently investigating how to integrate multiple biotic indicators	2000 - 2002 monitoring completed and reports generated	2003 Monitoring completed with 23 stations sampled.	2004 – Final 22 stations for round 1 projected to be sampled	2005 - Second round of monitoring will be initiated.	
NJDEP/USGS Cooperative Ambient Network	Cooperative program between NJDEP and USGS. Quarterly sampling of physical/chemical parameters plus chl'a'. Sanitary sampling performed during swimming season – 5 samples in a 1 mo. period.	freshwater, nontidal stream/rivers, 116 sites for FY03 and 04.	funding based upon consistent ongoing commitment	general stream physical & sanitary quality	note: Sanitary monitoring = 5X in 30 days during May 1-Sept 30	Quarterly ea. yr.: Nov 1-Dec 15, Feb 1-Mar 15, May 1-June 15, Aug 1-Sept 15				

Table 4.15 continued

MONITORING PROGRAM	DESCRIPTION	SCOPE	FUNDED TO	LINKAGE TO INTEGRATED LIST	COMMENTS	TIME LINE:				
Supplemental Ambient Surface water Monitoring	Approximately 200 sites. Each site sampled quarterly for 2 years for physical/chemical parameters. Flow is measured for each non-tidal sample.	Freshwater, largely nontidal stream/rivers, some tidal sites included. Represents supplemental monitoring covering locations not assessed in NJDEP/USGS network	Funded for 4 years, 3rd project yr. completed and 4th yr. begun on 10/03	general stream physical/chemical quality. Majority of sites correlate with AMNET sites.	Formally termed the "Existing Water Quality Network" (EWQ)	Each site sampled quarterly for 2 years: Jan 1-Mar 31, April 1-June 30, July 1-Sept 30, Oct 1 Dec. 31.	Began in 2000. As of 9/04 entire state will have been covered, each site having been sampled for 2 years.	Future of network is currently uncertain.		
Diurnal Dissolved Oxygen/Temperature Monitoring	Summertime temperature and/or diurnal dissolved oxygen monitoring performed on an "as needed" basis.	freshwater, stream/rivers, covers locations assessed in other networks as having known or suspected DO or temperature violations	varies year to year depending on available funding	nutrient enrichment/ elevated temperatures and associated depressed DO in fresh waters	Goal of monitoring 20 stations per fiscal year.	Highly variable				
Watershed "Hot-Spot" Investigations	Quick response sampling to investigate water quality issues raised through one of the other routine monitoring programs	can occur anywhere statewide	No funding during FY03 and 04 for this activity.	used to confirm unusual sampling results or investigate issues raised by the Department or by watershed cooperators						
Shellfish Sanitation Monitoring	Monitoring of over 2,500 sites between 5 & 12 times per yr. in accordance with the National Shellfish Sanitation Program for sanitary quality in support of shellfish consumption	tidal rivers, back bays, estuaries, inlets and open ocean	funding based upon consistent ongoing commitment	provides assessment of shellfish consumption use attainment for coastal waters and source and cause assessments	sanitary surveys are conducted as part of the program to determine sources of bacterial contamination					
Marine and Estuarine Monitoring	quarterly sampling of 260 sanitary/physical/chemical parameters plus chl a	tidal rivers, back bays, estuaries, inlets and open ocean	funding based upon consistent ongoing commitment	provides assessment of Aquatic Life Use attainment (coastal waters)						

Table 4.15 continued

MONITORING PROGRAM	DESCRIPTION	SCOPE	FUNDED TO	LINKAGE TO INTEGRATED LIST	COMMENTS	TIME LINE:				
Cooperative Coastal Monitoring Program	Cooperative program between NJDEP, NJ Dept. of Health and Senior Services and local health agencies. Beaches are monitored for sanitary quality weekly between Memorial Day and Labor Day at 179 ocean beaches and 139 bay beaches	Ocean and bay bathing beaches	funding based upon consistent ongoing commitment	assesses recreational use attainment in ocean and bay bathing beaches	results of monitoring are used to open or close beaches to protect public health	performed annually during bathing beach season				
EPA Region II Helicopter Monitoring	Overflights sample ocean DO and temperature during the critical summer period (May through September).	10 eastward ocean transects from Sandy Hook to Cape May. Samples taken at 1, 3, 5, 7 & 9 mile points. NJ assesses the 1 & 3 mile stations; those within NJ's jurisdictional authority	funding based upon consistent ongoing commitment	provides assessment of Aquatic Life Use attainment for ocean waters based upon DO levels		performed annually during bathing beach season				
Sediment Toxicity Testing	Chronic toxicity test (14 day) performed on sediment from "severely impaired" AMNET sites		5 sites per yr.	Assesses cause of impairment in severely impaired benthic macro-invertebrate sites (sites on sublist 5)		Problems with the Hyallela cultures have curtailed testing for '03 and 04. It is expected that testing will occur on schedule on 5 sites during early '05.				

Table 4.15 continued

II. SPECIAL STUDIES

MONITORING PROGRAM	DESCRIPTION	SCOPE	FUNDED TO	LINKAGE TO INTEGRATED LIST	COMMENTS	TIME LINE:				
Statewide Fecal coliform TMDL monitoring	bacteriological monitoring to support TMDL	Sites Listed in 303(d) (sub-list 5) which have undergone a fecal TMDL	Spring of 06	303(d) Fecal coliform violations		2-year project beginning in spring of 04.				
Rancocas Basin TMDL Monitoring	Sanitary monitoring under both high and low flow conditions to support TMDL	Sites Listed in 303(d) (sub-list 5)		303(d) Fecal coliform violations in the watershed (including the 3 sites currently listed)						
303(d) Heavy Metals Monitoring	High and low flow monitoring of a suite of metals	fresh water rivers and streams previously listed on NJ's 303(d) List for metals	funds currently sufficient to cover only limited high flow monitoring by NJDEP, WM&S. Additional funding needed to complete high flow monitoring at all scheduled sites	Necessary to complete assessment of current ambient status of heavy metal listing in NJ's 303(d) List	Low flow monitoring completed	Low flow monitoring completed. Very limited high flow work ongoing due to lack of funding				
New Fish Tissue Monitoring	Fish and shellfish species currently under consumption advisories will be collected and analyzed for organochlorinated pesticides, dioxin/furan and mercury.	Sampling will be conducted statewide over a period of 5 years and includes freshwater rivers, lakes, estuaries and marine waters.	Funded through 2007.	Updates body burden status of all fish tissue consumption advisories statewide for organo-chlorinated pesticides, dioxin/furan and mercury		2002 (year 1) Passaic River Region. Sampling complete, final report pending	2003: no sampling	2004: Atlantic marine and estuarine regions, Delaware Bay, Newark Bay complex and Raritan Bay	2005: Raritan basin 2006: Atlantic Coastal Region (fresh water portions) 2007: Up and Low Delaware basin	

Table 4.15 continued

MONITORING PROGRAM	DESCRIPTION	SCOPE	FUNDED TO	LINKAGE TO INTEGRATED LIST	COMMENTS	TIME LINE:				
Algal Biostimulation Assessments	Assessment of phosphorus as limiting nutrient at selected sites.	freshwater rivers and streams listed in 303(d) for Total Phosphorus	No current funding.	assess phosphorus as limiting nutrient in waters listed on 303(d) for phosphorus	methodology is still undergoing development	No testing has been requested for either FY03 or 04.				
Lake Characterization TMDL Monitoring	intensive sampling of 7 lakes per year in support of the TMDL process.	7 lakes per year. Sampling will include a wide range of water quality parameters.		The data collected will be used to develop individual lake restoration plans, as called for in the TMDLs.		Sampling will begin in FY04.				
Ambient lake water quality assessment	Assessment of lake water quality for use in Integrated Listing Report	Employing a probabilistic design, approximately 40 lakes (selected state-wide) sampled per yr. For a limited suite of parameters.	Current funding supports 200 site visits, equivalent to 40 sites per year for 5 years.	Will support listing on Integrated List for eutrophic status.						
Round Valley/Spruce Run Monitoring	1. Water quality assessment of the reservoirs in relation to the water withdraws and resulting water level fluctuations 2. To confirm water quality in So. Br. Raritan River when supplemental water from Round Valley Reservoir is released.	Three monitoring sites in the reservoir and 1 site in the So. Br. Raritan River. Three sampling runs per yr.	Funding to be provided by State Treasurer on as need basis.	Spruce Run Reservoir is on the 303(d) List due to an impaired fishery brought about by frequent and significant water withdrawals	Required by State law	Monitoring to be conducted as necessary to establish impacts to both reservoirs from withdrawal and pump-up.				

Monitoring and Assessment Schedule for Waters on Sublist 3 of the 2002 Integrated List

The waterbodies currently listed on sublist 3 of the Integrated List can be subdivided into 8 categories:

1. Benthic macroinvertebrate sites from Pinelands waters and those delineated as "unique."
2. Biological assessments provided by the Pinelands Commission which occupy the more central portions of an anthropogenic disturbance gradient.
3. Eutrophic lakes assessed by *Lake Water Quality Assessment Reports* or *Lake Intensive Surveys* for which the Department has no use impairment information.
4. NJDEP-USGS Ambient Stream Monitoring Network (Statewide Status Sites) possessing insufficient data to support full assessments.
5. Selected metal listings.
6. A limited selection of coastal shellfish sites.
7. Sanitary assessments for the NJ-NY Harbor waters within New Jersey's jurisdiction.
8. Two recreational lakes for which bathing beach status is unclear.

NJDEP's plan to reassess sublist 3 waters for reassignment to one of the other four sublist categories within the Integrated List is as follows.

1 & 2. Reassessment Of Benthic Macroinvertebrate Sites Assigned To Sublist 3 Of The Integrated List

i. <u>Pinelands (PL) Waters</u>

Short-term assessment: NJDEP has used biological community assessments performed by the Pinelands Commission to isolate background (undisturbed) PL sites from sites displaying obvious anthropogenic disturbance. This has allowed the removal of a portion of the AMNET sites (30 sites) from sublist 3 to either sublist 1 or 5. A subset, of sites, however, remained on sublist 3 because we do not have clear thresholds to apply to Pinelands data to list those sites that lie within the central region of a anthropogenic disturbance gradient.

Long-term: use of macroinvertebrates multi-metric assessment methods for Pinelands waters is currently being investigated by the Department. If found to be possible then a suite of metrics will be developed for the region and remaining sites on sublist 3 will be reassessed and re-listed. Metric development (NJDEP in cooperation with EPA Region II) is anticipated to take possibly 2 years. If macroinvertebrate populations are found to be not useful as an indicator then the Department will explore the utility of a fin-fish based metric instead.

ii. "<u>Unique Sites:" Assessment of Headwaters Stream (watershed less than 6 sq. mi.):</u>

EPA Region II is currently investigating the applicability of using the current suite of benthic macroinvertebrates metrics to headwater conditions. Preliminary results indicate that the current metrics can be used but that cutoff points between the various assessment categories may need to be adjusted. This means that a new biotic metric could be in place relatively soon for headwaters.

iii. "Unique Sites:" Sites Immediately Downstream of Impoundments:
Sites will be re sampled either upstream of the impoundment, or further downstream of the lake, out if its zone of influence.

3. Eutrophic lakes assessed by Lake Water Quality Assessment Reports or Lake Intensive surveys for which the Department has no information indicating Use Impairment.

The Department is currently developing a lakes monitoring program intended to assess the eutrophic status of lakes statewide based upon probabilistic statistical methods recommended by EPA. The probabilistic method (strongly supported by EPA) requires lakes to be selected at random. This does not allow for deterministic monitoring whereby specific lakes (such as those on sublist 3 are assessed) would be selected. In addition, there is currently insufficient funding to create a subset of lakes that would be deterministically selected from sublist 3 and monitored. In fact, the number of lakes listed on sublist 3 may grow significantly due the applications of the methodology.

There is the possibility that with additional funding, a monitoring effort targeted to lakes on sublist 3 could be developed that would support the removal of lakes from sublist 3.

4. NJDEP-USGS Ambient Stream Monitoring Network sites (Statewide Status Sites) possessing insufficient data to support full assessment.

Statewide Status Sites are designed to support statewide probabilistic water quality assessments. Annually, 40 stations were selected randomly from a network of over 800 AMNET locations and monitored quarterly for one year. Many of these sites had insufficient data for water quality assessments and were placed on sublist 3. The Department's response to these listings is to continue to amass data from this network in a stratified random manner until enough data is collected sufficient to support a stratified probabilistic assessment. This information will help determine the statistical probability of a particular site being impaired or not impaired.

At this time, NJDEP has many response options that have yet to be discussed. The Department might use the strength of the probabilistic assessment to decide that a location has a high likelihood of being impaired. In this regard, NJDEP will schedule the location (as a high priority) for intensive water quality investigations to confirm their status. Those locations possessing low statistical likelihood of being impaired might be assumed to be unimpaired or perhaps be scheduled for low priority follow-up assessment to confirm their status. These and other possible responses will be discussed within the Department in the forthcoming months.

5. Metal listings:

a. Sites previously listed in 303(d) for which current monitoring (high and low flow) reveals no detection of the metal, however, the metal criterion is below the method detection limit (MDL) for the analysis currently employed.
b. Sites not previously listed in 303(d) for which new data (low and high flow) do not exceed any criteria but the criteria is below the MDL.

Certain metals such as arsenic, mercury, and cadmium have criteria in NJ's Surface Water Quality Standards that are below the method detection limit (MDL) for the laboratory analysis currently employed by NJDEP and USGS. For these sites on sublist 3, current sampling has detected no metals. However, to ensure that there are no exceedances above the criteria, more sensitive analytical methods with lower MDLs (at or below these criteria) will need to be employed. The Department is currently discussing various analytical options with the USGS that could be applied to the Ambient Stream Monitoring Network (ASMN) in order to significantly lower the current levels of detection for these selected metals.

6. Coastal Shellfish Sites

The sanitary fitness of two regions for the support of shellfish harvesting, the Cape May Canal and in a region running from Cherry Tree Creek to Artificial Island, are currently unclear. Cape May Canal was listed based solely on land use and not collected data. The Cherry Tree Creek has not been monitored since the 1970's and has been classified as Special Restricted ever since. The status of both regions is expected to be clarified with new data within the near future.

7. Sanitary assessments for the NJ-NY Harbor waters contained within New Jersey's jurisdiction

The most recent 5 years of Interstate Environmental Commission (IEC) data did not reveal violations of the SWQS for recreation designated use. This was not surprising as there has been considerable improvement to the sewerage infrastructure since the listing of these waterbodies in the 1980's. In consideration of the recent data, the Department contemplated delisting these waterbodies, however, decided to place them on sublist 3 rather than sublist 1. The stations used in the assessment (and to list the waterbodies originally) are located in the mid-channel of the waterbodies in question and these locations, while serving to provide a good overview of general water quality, do not reflect conditions near the shoreline where most secondary recreation occurs. It is questionable whether the mid-channel stations would accurately reflect water quality near the shoreline which may be influenced by CSO flows. In view of this, the waterbodies were placed on sublist 3. NJDEP plans to work with the IEC to modify their sampling plan and conduct additional monitoring to insure that near-shore waters also meet the SWQS for fecal coliform.

8. Two recreational lakes for which bathing beach status is unclear

In these cases there was insufficient data to make a listing decision. This represents Wood Lake in Medford Township and Sachaawea Camp on Gorden Lake in West Millford Township. The Department will work with the New Jersey Department of Health and Senior Services (NJDHSS) and the Department's Cooperative Coastal Monitoring Program to obtain additional data necessary to support a listing decision for the lakes in question.

Literature Cited

Agency for Toxic Substances and Disease Registry (ATSDR). 1997a. Toxicological Profile for Benzene. Atlanta, GA: U.S. Department of Health and Human Services.

Agency for Toxic Substances and Disease Registry (ATSDR). 1997b. Toxicological Profile for Copper. Atlanta, GA: U.S. Department of Health and Human Services.

Agency for Toxic Substances and Disease Registry (ATSDR). 1997c. Toxicological Profile for Lead. Atlanta, GA: U.S. Department of Health and Human Services.

Agency for Toxic Substances and Disease Registry (ATSDR). 1997d. Toxicological Profile for Nickel. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Agency for Toxic Substances and Disease Registry (ATSDR). 1997e. Toxicological Profile for Selenium. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Agency for Toxic Substances and Disease Registry (ATSDR). 1997f. Toxicological Profile for Silver. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Agency for Toxic Substances and Disease Registry (ATSDR). 1997g. Toxicological Profile for Thallium. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Agency for Toxic Substances and Disease Registry (ATSDR). 1997h. Toxicological Profile for Zinc. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Ayers, Mark A., J Kennen, and P Stackelberg. 2000. Water Quality in the Long Island-New Jersey Coastal Drainages, New York and New Jersey, 1996-98. US Geological Survey Circular; 1201.

Bauder, J. 1998. When is Water Good Enough for Livestock. Montana State University. Online. Internet. July 9, 2000.

Belton, T.J. and J. Defina. 2000. Pilot Study: GIS–Based Trackdown of Pollution Sources from Known Contaminated Sites to the NY/NJ Harbor. (Proposal to USEPA Region 2, Harbor estuary Program: Funded FY 2000).

Belton, T.J., Ruppel, B. and K. Lockwood. 1982. PCBs (Aroclor 1256) in Fish Tissues throughout the State of New Jersey: A Comprehensive Survey. Office of Cancer and Toxics Substances Research, New Jersey Department of Environmental Protection. Technical Report. November 1982.

Belton, T.J., R. Hazen, B. Ruppel, K, Lockwood, R. Mueller, E. Stevenson, and J. Post. 1985. A Study of Dioxin (2,3,7,8,-TCDD) Contamination in Select Finfish, Crustaceans and Sediments in New Jersey. Office of Science and Research, New Jersey Department of Environmental Protection. Technical Report. October 1985.

Brighham, Mark E., David P. Krabbenhoft, and Pixie A. Hamilton. 2003. Mercury in Stream Ecosystems-New Studies Initiated by th U.S. Geological Survey. Fact Sheet 016-03. US Geological Survey.

Canadian Council of Resource and Environment Ministers. Canadian Water Quality Guidelines. March 1987.

Committee on Copper in Drinking Water, National Research Council. Copper in Drinking Water. National Academy Press. Washington, DC. 2000.

Dow, C.L. and Zampella, R.A. 2000. Specific Conductance and pH as Indicators of Watershed Disturbance in Streams of the New Jersey Pinelands, USA. Environmental Management Vol. 26, No. 4, pp.437-445.

Eisenreich, Steven J. and John Reinfelder. 2001, Interim Report to the New Jersey Department of Environmental Protection, March 2001, The New Jersey Atmospheric Deposition Network, Department of Environmental Sciences, Rutgers University, New Brunswick, NJ 08901.

Federal Register. 2003. Nonpoint Source Program and Grants Guidelines for States and Territories. Vol. 68, no. 205 / Oct. 23, pg. 60653.

Federal Register. 1994 Establishment of Phased Total Maximum Daily Loads (TMDLs) for Copper, Mercury, Nickel, and Lead in New York-New Jersey Harbor. (59FR41293)

Follet, R.H. and P. Soltanpour. 1999. Irrigation Water Quality Criteria. Colorado State University Cooperative Extension. Online. Internet. July 9, 2000.

Great Lakes Environmental Center and Hydroqual. 1996. Monitoring and Modeling of Nickel in the Hackensack and Passaic Rivers and Newark Bay and Monitoring and Data Analysis for Copper in the Arthur Kill and Kill Van Kull, August 27, 1986. GLEC, Traverse City, MI.

Great Lakes Environmental Center and Hydroqual. 1998. Monitoring and Modeling Work Plan for Nickel in the Hackensack River, September 1996. GLEC, Traverse City, MI.

Hydroqual, Inc. 1994. Development of Total Maximum Daily Loads and Wasteload Allocations (TMDLs/WLAs) Procedure for Toxic Metals in NY/NJ Harbor, Modeling Report. USEPA, Region 2, NY. Report dated February, 1994.

Jaworski, N.A., Howarth, R.W. and L.J. Hetling. 1997. Atmospheric Deposition of Nitrogen Oxides onto Landscape Contributes to Coastal Eutrophication in the Northeast United States, Environ. Sci. Technol. 1997, 31, 1995-2004.

Hickman, R.E. and T.H. Barringer. 1999. Trends in Water Quality of New Jersey Streams, Water Years 1986-95. US Geological Survey Water-Resources Investigations Report 98-4204. West Trenton, New Jersey.

Kennen, J.G. 1999. Relation of Macroinvertebrate Community Impairment to Catchment Characteristics in New Jersey Streams. Journal of the American Water Resources Association. 35 (4): 939-955.

Krabbenhoft, D.P., and D.A. Rickert. 1995. Mercury Contamination of Aquatic Ecosystems. Fact Sheet FS-216-95. US Geological Survey. Madison, WI.

Niles, L., Clark, K., Stansley, W. and T.J. Belton. 2000. Monitoring Contaminants in Raptors in the Lower Delaware River Basin: Bioindicator Development and Source Trackdown. (Proposal to NJDEP/DWM. Funded FY 2000).

N.J.A.C. 7:9B New Jersey Surface Water Quality Standards.

NJDEP. 1990. Development of the Final 304(l) Short List. Division of Water Resources. January, 1989. Trenton, New Jersey.

NJDEP. 1994. Mercury Contamination in New Jersey Freshwater Fish. Report to the Toxics in Biota Committee. July 1994.

NJDEP. 1996. New Jersey 1996 State Water Quality Inventory Report. Office of Environmental Planning, Trenton, New Jersey.

NJDEP. 1998. New Jersey 1998 State Water Quality Inventory Report. Division of Science, Research and Technology. Trenton, New Jersey.

NJDEP., 2001. 2000 New Jersey Water Quality Inventory Report 305(b). Division of Science, Research and Technology. Trenton, New Jersey.

NJDEP. 1998. Warmwater Fisheries Management Plan. January 1998. Division of Fish, Game and Wildlife, Bureau of Freshwater Fisheries, Trenton, NJ.

NJDEP. 2000a. Report on the Establishment of Total Maximum Daily Load (TMDL) for Phosphorus in Lower Sylvan Lake, Burlington Township, Burlington County, NJ, June 12, 2000, Proposed Amendment to the Tri-County Water Quality Management Plan. Division of Watershed Management, Trenton, NJ.

NJDEP. 2000b. Report on the Establishment of Total Maximum Daily Load (TMDL) for Phosphorus in Strawbridge Lake, Moorestown Township, Burlington County, NJ, May 31, 2000, Proposed Amendment to the Tri-County Water Quality Management Plan. Division of Watershed Management, Trenton, NJ.

NJDEP. 2002. Integrated Water Quality Monitoring and assessment Methods. November, 2002. Division of Science, Research and Technology. Trenton, New Jersey.

NJDEP. 2003. Integrated Water Quality Monitoring and Assessment Methods. Division of Science, Research and Technology. Trenton, New Jersey. November, 2003.

NJ Pinelands Commission, written communication. E-mail addressed to Steven Jacobus on or before 12/23/02, commenting on the listing of Lake Absegami on New Jersey's 1998 List of Water Quality Limited Waters (303(d) List).

NOAA. 1997. The 1995 National Shellfish Registry of Classified Growing Waters, Office of Resources conservation and Assessment, National Ocean Service, National Oceanic and Atmospheric Administration, US Dept. Commerce, July 1997.

O Brien, Anne K. 1997. Presence and Distribution of Trace Elements in Streambed Sediments, New Jersey. US Geological Survey Fact Sheet FS-049-97. West Trenton, New Jersey.

Princeton Hydro. 2002. Phase I Diagnostic/ Feasibility Study of Lake Absegami. Prepared for: Bass River State Forest, Box 118, New Gretna, NJ, 08224. Prepared by: Princeton Hydro, LLC. 1108 Old York Rd., Suite 1, Ringoes, NJ, 08551.

Seitzinger, S. P. and R.W. Sanders. 1999. Atmospheric Inputs of Dissolved Organic Nitrogen Stimulate Estuarine bacteria and Phytoplankton. Limnol. Oceanogr. 44:721-730.

Shelton, Theodore B. Interpreting Drinking Water Quality Analysis: What do the Numbers Mean? (5th Edition). Rutgers Cooperative Extension.

U.S. Department of Health and Human Services. Report on Carcinogens, Tenth Edition. Public Health Service, National Toxicology Program. December 2002.

US Environmental Protection Agency (USEPA). 1980. Ambient Water Quality Criteria for Chomium. Office of Water Regulations and Standards, Criteria and Standards Division, Washington, DC. October 1980.

US Environmental Protection Agency (USEPA). 1985. Ambient Water Quality Criteria for Arsenic – 1984. Office of Water Regulations and Standards, Criteria and Standards Division, Washington, DC. January 1985.

US Environmental Protection Agency (USEPA). 1985. Ambient Water Quality Criteria for Cadmium – 1984. Office of Water Regulations and Standards, Criteria and Standards Division, Washington, DC. January 1985.

US Environmental Protection Agency (USEPA). 1985. Ambient Water Quality Criteria for Mercury – 1984. Office of Water Regulations and Standards, Criteria and Standards Division, Washington, DC. January 1985.

US Environmental Protection Agency (USEPA). 1997. Letter from Felix Locicero to Mick DeGraeve of GLEC. Re: Recalculation of Lead and Nickel in the Arthur Kill and Kill Van Kull. Decmber 31, 1997.

US Environmental Protection Agency (USEPA). 1999. Final Withdrawal of Total Maximum Daily Loads (TMDLs) for Copper in the Arthur Kill and Kill Van Kull and Final Establishment of TMDL for Nickel in the Hackensack River. December 1999. Division of Environmental Planning, NY, NY.

US Environmental Protection Agency (USEPA). 2001. Memorandum from Robert H. Wayland III to EPA Regional Water Management Directors, Science and Technology Directors and State, Territory and Authorized Tribe Water Quality Program Directors. Re: 2002 Integrated Water Quality Monitoring and Assessment Report Guidance. November 19, 2001.

US Environmental Protection Agency (USEPA). 2001. Human Health: Methylmercury Fact Sheet. EPA-823-F-01-001. Office of Water. Washington, DC. January 2001.

US Environmental Protection Agency (USEPA). 2002. Consolidated Assessment and Listing Methodology: Toward a Compendium of Best Practices. First Edition. July 2002. U.S. Environmental Protection Agency. Office of Wetlands, Oceans, and Watersheds

US Environmental Protection Agency (USEPA). 2003. The Helicopter Monitoring Report, A Report on the New York Bight Water Quality, 2002. EPA 902/R-03-001, May, 2003.

US Environmental Protection Agency (USEPA). Fact Sheet: Drinking Water Standard for Arsenic. Office of Water. Online, Internet. January 2001.

US Environmental Protection Agency (USEPA). Consumer Factsheet on : Selenium. Online, Internet. January 16, 2004

US Geological Survey (USGS). 1996. Water Resources Data, New Jersey Water Year 1995, Volume 1. Surface-Water Data. USGS Water-Data Report NJ-95-1. West Trenton, New Jersey.

US Geological Survey (USGS). 1997. Water Resources Data, New Jersey Water Year 1996, Volume 1. Surface-Water Data. USGS Water-Data Report NJ-96-1. West Trenton, New Jersey.

US Geological Survey (USGS). 1998. Water Resources Data, New Jersey Water Year 1997, Volume 1. Surface-Water Data. USGS Water-Data Report NJ-97-1. West Trenton, New Jersey.

US Geological Survey (USGS). 1999. Water Resources Data, New Jersey Water Year 1998, Volume 3. Water-Quality Data. USGS Water-Data Report NJ-98-1. West Trenton, New Jersey.

US Geological Survey (USGS). 2000. Water Resources Data, New Jersey Water Year 1999, Volume 3. Water-Quality Data. USGS Water-Data Report NJ-99-1. West Trenton, New Jersey.

US Geological Survey (USGS). 2001. Water Resources Data, New Jersey Water Year 2000, Volume 3. Water-Quality Data. USGS Water-Data Report NJ-00-1. West Trenton, New Jersey.

US Geological Survey (USGS). 2002. Lead Recycling in the United states in 1998. USGS Circular 1196-F. US Geological Survey Reston, Virginia. http://pubs.usgs.gov/circ/c1196f/c1196f.pdf.

Zampella, R.A., et al. 2001. The Mullica River Basin. Pinelands Commission, P.O..Box 7, New Lisbon, NJ. 08064

Zampella, R.A., et al. 2003. The Rancocas Creek Basin. Pinelands Commission, P.O..Box 7, New Lisbon, NJ. 08064

Zimmer, B.J. and S. Groppenbacher. 1999. New Jersey Ambient Monitoring Program Report on Marine and Coastal Water Quality, 1993-1997. NJDEP, Bureau of Marine Water Monitoring, Leeds Point, New Jersey.

Part IV: Ground Water Quality

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Summary

Ground-water quality data from 71 shallow Ambient Ground Water Quality Network wells in the Lower Delaware and Atlantic Coastal Water Regions in the New Jersey Coastal Plain were stratified as a function of undeveloped, urban and agricultural land uses to assess non-point source impacts. Well water quality in undeveloped area's form a good baseline for evaluating anthropogenic contaminant loads in agricultural and urban land uses. Total dissolved solids concentrations as well as the concentration, frequency, and variety of trace elements, nutrients, volatile organic hydrocarbons (VOC) and pesticides are found to be significantly higher in wells from agricultural and urban areas clearly illustrating man's impact. Shallow ground water in agricultural land use areas have the highest frequency of pesticide detection, highest median nitrate concentrations (maximum up to 56 mg/L), gross alpha particle activity and total dissolved solids concentrations likely related to the application of agricultural chemicals. Urban areas generally have lower dissolved oxygen, higher dissolved iron, chloride, and VOC concentrations.

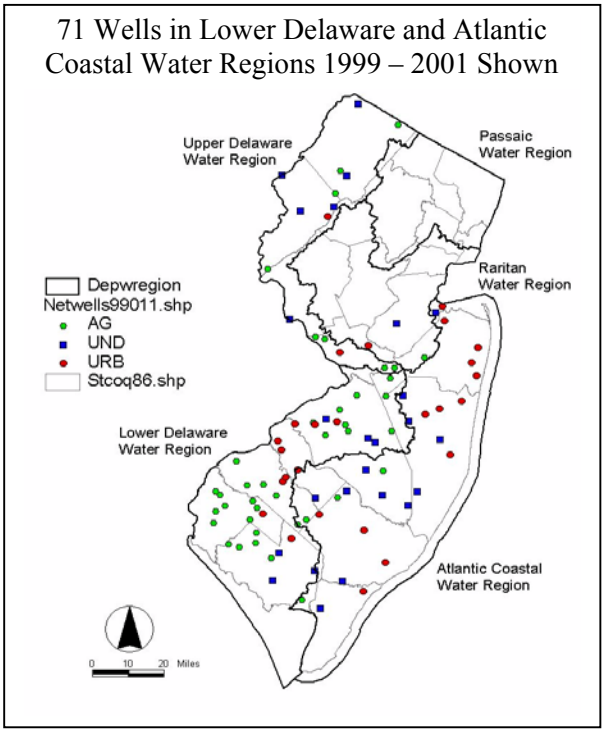

Figure 1. Map shows the 90 network wells sampled during 1999 - 2001and their land use designations.

Introduction

The quality of shallow ground water is important because it is this water that recharges deeper aquifers and provides baseflow to local streams and wetlands. Information in this summary report was compiled from analytical data associated with wells in the redesigned Ambient Ground Water Quality Monitoring Network. This network is an NJDEP and USGS cooperative project that provides information about land use related non-point source pollution impacts to shallow ground-water quality in the state of New Jersey (Serfes, 1998). This 150 well network will be complete with all wells sampled once during 2004. Thereafter, wells will be sampled, 30 per year, on a 5-year cycle. The water-quality data presented here was collected during the first 3 years of the network and is from 71

wells in the Lower Delaware and Atlantic Water Regions (figure 1).

The lower Delaware and Atlantic Coastal Water Regions are in the Coastal Plain Physiographic Province in New Jersey. The Coastal Plain is a southeasterly dipping and thickening wedge of stratified unconsolidated sediments that vary in age from Cretaceous aged 144-66 million years ago (Ma) to Tertiary (1.6 Ma). This wedge of sand, silt, clay and gravel forms a multi-layered aquifer system containing one major unconfined aquifer and 4 major confined aquifer systems (Zapecza, 1984). The network wells are mainly in the unconfined portions of the aquifers and a few are in low yielding semi-confining units.

The water table is the first and most significantly impacted part of the ground-water system. Network wells are screened just below the water table and the sample water is therefore expected to be relatively young ground water. Goals of the redesigned network are: (1) To assess the water-quality status, (2) To assess water-quality trends, (3) To evaluate contaminant transfer relations, and (4) To identify emerging water-quality issues. Wells sites are located using a stratified-random site selection process as outlined by Scott (1990). The final distribution of wells as a function of land use is 60 in agricultural areas, 60 in urban/suburban areas, and 30 in undeveloped land use areas. Land use designations were determined using 1986 and 1995 land use coverage's, 1995 aerial photographs, site visits and estimations of ground-water flow directions based on the geologic framework and site specific topographic relationships. The 1986 and updated 1995 digital land use data categories were interpreted from 1986 and 1995 color infrared aerial photography (NJDEP, 2000).

Data summaries of samples collected and analyzed in 1999, 2000 and 2001 from wells in the redesigned Ambient Ground Water Quality Monitoring Network in the Lower Delaware and Atlantic Water Regions are shown below. Samples from these wells were collected by the NJDEP Bureau of Water Monitoring Management and the USGS and analyzed at the USGS National Water Quality Laboratories in Denver, Colorado. Pesticides and VOCs were analyzed using USGS methods O-1126-95 (Rose and Schroeder, 1995) and O-4127-96 (Zaugg and others, 1995), respectively. Data for water years 1999 to 2001 are reported in their respective USGS Water Resources Data Reports for New Jersey (DeLuca and others, 2000, 2001 and 2002.

General Water Quality Parameters

Table 1. General ground-water quality parameters in the 3 land use areas.

	Agriculture			Urban			Undeveloped		
	Min.	Med.	Max.	Min.	Med.	Max.	Min.	Med.	Max.
T (Celsius)	12	16	22.5	15	18.2	29	12	14.5	18
DO (mg/L)	<0.2	6.4	10.5	<0.2	2.1	10	<0.2	4.6	9.3
pH	4	5.1	7.9	3.8	4.9	7.8	3.7	4.7	6
TDS (mg/L)	35	194	690	57	161	816	15	27	152

Key: T, temperature; DO, dissolved oxygen; TDS, total dissolved solids; Min., minimum; Med., median; Max., maximum.

The water-quality parameters temperature, dissolved oxygen, pH and total dissolved solid concentration values yield information about the general character of shallow ground

water as a function of land use (table 1). For example, the increased water temperature in urban areas is probably reflecting contact with paved surfaces that have a higher average temperature than ambient air. The lower dissolved oxygen concentration in urban areas may result from the large percentage of impervious surface area and resulting poor exchange with atmospheric oxygen, and the higher temperature surface effects on the density of air . The higher dissolved oxygen concentrations in agricultural areas could result from reduced soil organic material and more rapid recharge. Increased total dissolved solids concentrations in agricultural and urban areas are mainly due to the application of agrichemicals and road salt, as most of the agricultural land use wells are near roads.

Trace Elements

Only arsenic and cadmium exceeded the New Jersey Primary drinking water standards (table 2). Two urban wells sampled during the year 2000 contained 112 ug/L and 42 ug/L arsenic. Both are associated with low dissolved oxygen concentrations of less than 0.5 mg/L, relatively high organic carbon concentrations of 4.4 and 3.5 mg/L and high iron concentrations of 29.4 and 22.5 mg/L respectively. Out of the network wells sampled so far in the Coastal Plain, only 18 had detectable arsenic and of those, only the two described here were greater than 3 ug/L. At those two sites it is likely that iron oxy-hydroxides containing arsenic are decomposing under low redox conditions thereby releasing iron, along with arsenic, into the shallow ground-water system. The ultimate source of the arsenic is unknown. It may reflect past agricultural land use where arsenic bearing pesticides were used and adsorbed to iron oxy-hydroxides.

Cadmium was detected in six wells. Four of those wells are in agricultural land use areas and one of the four had a concentration of 16 ug/L. The source of the cadmium is unknown, however, phosphate fertilizers contain from 10 to 200 mg/Kg cadmium and there may be a connection.

Table 2. Trace elements detected from water-table wells in the Lower Delaware and Atlantic Water Regions in the Coastal Plain of Southern New Jersey. Samples were collected in 1999 and 2000.

Detectable Trace Elements	N	Number of Wells in which Trace Elements detected by Land Use			Maximum Value Detected ug/L	NJ Drinking Water MCL ug/L 1996
		Agricultural (N=31)	Urban (N=22)	Undeveloped (N=18)		
Arsenic	70	9	5	7	112	50[1]
Barium	70	30	22	18	1180	2000
Cadmium	69	6	7	1	16	5
Chromium	69	13	10	4	3.6	100
Copper	70	20	14	7	38	1300AL
Lead	70	8	8	2	11	15AL
Mercury	70	2	1	0	1.7	2
Selenium	70	13	10	4	13.1	50
Total Detections	--	101	77	43	--	--

Key: N, number of wells with trace element data; AL, action level related to public drinking water supplies.
[1] The United States Environmental Protection Agency has lowered the arsenic drinking water standard for public water supplies to 10 ug/L effective January 23, 2006. NJ has proposed 5 ug/L.

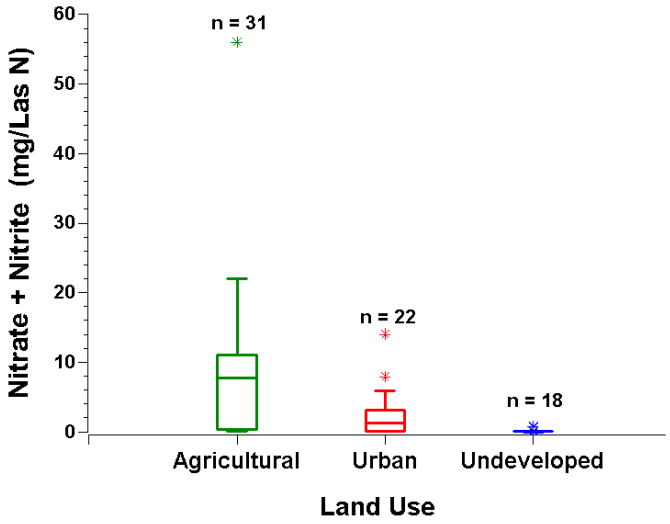

Figure 2. Box and pin diagrams showing the concentration distribution of Nitrate +Nitrite by land use.

Nutrients

Nutrient concentrations are dominated by nitrate and the frequency and concentration by land use are: agricultural; median = 7.8 mg/L > urban; median = 1.3 mg/L > undeveloped; median = .05 mg/L (figure 2). The use of nitrogen-based fertilizers in agricultural and urban areas and possibly septic usage in urban areas are considered the major sources. No sample had an ortho-phosphorous concentration greater than 0.2 mg/L.

Volatile Organic Compounds (VOCs)

Most of the VOCs detected are at very low concentrations (table 3). Chloroform was the most frequently detected VOC at 34 percent and it's relative frequency is the same as that found in a similar but more localized study around Gloucester County by Stackelberg and others, 1997). Fifteen out of the 71 network wells sampled had detectable levels of MTBE. Concentrations of detectable MTBE from smallest to highest are: E.1, E.2, 0.2, 0.2, 0.3, 0.4, 0.4, 0.4, 0.6, 0.6, 0.9, 1.1, 1.6, 8.5, 47 ug/L. The minimum MTBE concentration is <0.17, both the 25th and 50th percentile are <0.2, 75th percentile is <0.4 and the maximum is 47 ug/L. It must be noted that the well with 47 ug/L was within 1000 feet of a BUST pollution case. The percentages of detectable levels of MTBE as a function of land use from the network data are: 50 percent in Urban, 14 percent in Agricultural and 6 percent in Undeveloped. This distribution is not surprising since the density and frequency of reformulated gasoline use would be greatest in urban areas. It is also similar to results from the shallow ground-water study in and around Gloucester County, NJ. The two highest concentrations, 8.5 and 47 ug/L, are from agricultural and urban areas respectively. Low concentrations of chloroform and MTBE have been measured in the atmosphere and related to concentrations in shallow ground water by Baehr and others, 1999. Other non-point sources of chloroform are septic systems, leaking sewers, and the use of chlorinated drinking water for watering lawns and gardens.

Table 3. Shows volatile organic compound (VOC) detects from water-table wells in the Lower Delaware and Atlantic Water Regions in the Coastal Plain of Southern New Jersey. Samples were collected in 1999 and 2000.

Detectable Volatile Organic Compounds	N	Frequency of Detection by Land Use			Maximum Value Detected ug/L	NJ Drinking Water MCL ug/L 1996
		Agricultural (N=31)	Urban (N=22)	Undeveloped (N=18)		
MTBE	71	4	10	1	47.1	70
1,1,1-Trichloroethane	71	1	0	0	E 0.0555	30
1,2, Dichloropropane	71	1	0	0	0.3	5
Acetone	8	1	0	0	E 1.93	NMCL
Benzene-1,2,4-Trimethyl	8	1	0	0	E 0.027	NMCL
Benzene-1,4-Dichloro	71	1	0	0	E 0.00703	NMCL
Chloroform	71	7	8	9	0.395	100[1]
cis-1,2-Dichloroethene	71	0	1	0	0.2	NMCL
Dichlorobromomethane	71	1	0	0	0.3	NMCL
Dichlorodifluoromethane	71	1	0	0	E 0.3	NMCL
Diisopropylether	71	0	1	0	6.3	NMCL
Methylethylketone	8	1	0	0	3	NMCL
Styrene	71	1	0	0	E 0.01	100
tert-pentylmethylether	71	0	1	0	0.105	NMCL
Tetrachloroethylene	71	4	3	0	0.487	1
Toluene	71	4	2	1	0.2	1,000
Trichloroethylene	71	1	0	0	E 0.0382	1
Total Detections	--	29	26	11	--	--

Key: N, number of wells sampled; E, estimated value (number is crude!), NMCL, no MCL.
[1] Annual average of 4 trihalomethanes, which includes chloroform

Pesticides

The frequency of pesticide detection is agricultural > urban > undeveloped. However, the concentration of pesticides is very low in all land use categories (table 4). Atrazine, Deethylatrazine, Metolachlor and Simazine were the most frequently detected compounds. Deethylatrazine is the major metabolite of Atrazine. The others are herbicides used to control grasses and broadleaf leaves.

Table 4. Shows pesticide detects from water-table wells in the Lower Delaware and Atlantic Water Regions in the Coastal Plain of Southern New Jersey. These wells are constructed to draw in newly recharged ground water. Samples were collected in 1999 and 2000.

Detectable Pesticide Compounds	N	Number of Wells in which Compound(s) detected by Land Use			Maximum Value Detected ug/L	NJ Drinking Water MCL ug/L 1996
		Agricultural (N=31)	Urban (N=22)	Undeveloped (N=18)		
Alachlor	71	3	0	0	0.011	2
Atrazine	71	14	5	0	0.299	3
Carbaryl	71	5	1	0	E.47	NMCL
Carbofuran	71	4	0	0	E.0634	40
Dacthal	71	3	0	0	E.0039	NMCL
DCPA	71	1	0	0	E.0017	NMCL
Deethylatrazine	71	15	4	0	E.206	NMCL
Diazinon	71	1	0	1	E.003	NMCL
Dieldrin	71	2	2	0	0.491	NMCL

Table 4 continued:

Detectable Pesticide Compounds	N	Number of Wells in which Compound(s) detected by Land Use			Maximum Value Detected ug/L	NJ Drinking Water MCL ug/L 1996
		Agricultural (N=31)	Urban (N=22)	Undeveloped (N=18)		
EPTC	71	1	0	0	0.031	NMCL
Malathion	71	0	0	1	E.0037	NMCL
Metolachlor	71	16	3	0	1.17	NMCL
Metribuzin	71	2	0	0	0.0128	NMCL
Molinate	71	1	0	0	0.0126	NMCL
Napropamide	71	2	0	0	0.0206	NMCL
Pendimethalin	71	1	0	0	0.0119	NMCL
P, P'-DDE	71	4	1	1	E.0026	NMCL
Pebulate	71	0	1	0	0.0194	NMCL
Prometon	71	4	7	0	0.426	NMCL
Propanil	71	0	0	1	E.0034	NMCL
Tebuthiuron	71	1	1	0	0.138	NMCL
Terbacil	71	3	0	0	E.683	NMCL
Trifluralin	71	2	0	0	E.0031	NMCL
Simazine	71	10	3	0	0.743	4
Total Detections	--	94	27	4	--	--

Key: N, number of wells sampled; E, estimated value (number is crude!), NMCL, no MCL.

Radioactivity

Gross alpha particle activity was analyzed within 48 hours after sample collection. This ensures that the radioactive decay of short-lived radium-224 (half-life of 3.64 days) is measured along with the other alpha emitters. The Federal and New Jersey drinking water standard of 15 pCi/L gross alpha particle activity still applies even though the shorter holding time results in increased activity if significant radium-224 is present. The distribution of gross alpha particle activity as a function of land use is shown in figure 3. Five of the 31 (16 percent) samples from agricultural, 3 of 22 (14 percent) from urban and 1 of 18 (5 percent) from undeveloped land use areas exceeded the standard of 15 pCi/L. Median values of gross alpha are: agricultural (4.2 pCi/L), urban (3.8 pCi/L) and undeveloped (3.1 pCi/L). Gross alpha particle activity is generally higher in agricultural areas. This is consistent with a study by Szabo and others, 1995 that focused on natural radioactivity in the Kirkwood-Cohansey Aquifer System in the Coastal Plain of New Jersey. Increased competition for sorption sites between agricultural chemicals and radium likely increases the concentration of radium in solution.

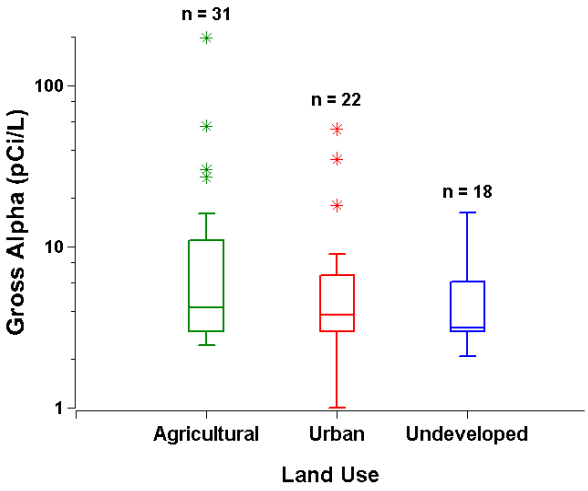

Figure 3. Box and pin diagrams showing the concentration distribution of Gross Alpha Particle Activity by land use. Note that a logarithmic scale is used on the Y-axis. The MDL is 3.0 pCi/L.

Private Well Testing Act

In addition to the monitoring effort described above, the Department expects to obtain additional information regarding ground water quality as well as drinking water quality through the Private Well Testing Act (PWTA). Through this Act, certain wells must be tested before a house can be sold. In addition, landlords of certain properties must test for certain drinking water parameters and provide a written copy of the results to their tenants. Additional information regarding the program may be obtained by visiting the following website: http://www.nj.gov/dep/pwta/.

References

Baehr, A.L., Stackelberg, P.E., and Baker, R.J., 1999, Evaluation of the atmosphere as a source of volatile organic compounds in shallow ground water, Water Resources Research, vol. 35, no. 1, p. 127-136.

DeLuca, M.J., Romanok, K.M., Riskin, M.L., Mattes, G.L., Thomas, A.M., and Gray, B.J., 2000, Water-resources data for New Jersey-water year 1999, Volume 3. Water-quality data: U.S. Geological Survey Water-Data Report NJ-99-3, 517 p.

DeLuca, M.J., Mattes, G.L., Burns, H.L., 2001, Water resources data for New Jersey-water year 2000, Volume 3. Water-quality data: U.S. Geological Survey Water-Data Report NJ-00-3, 618 p.

DeLuca, M.J., Hoppe, H.L., Doyle, H.A., Gray, B.J., 2002, Water resources data for New Jersey-water year 2001, Volume 3. Water-quality data: U.S. Geological Survey Water-Data Report NJ-01-3, 580 p.

NJDEP, 2000, 1995/97 Land use/Land cover Update by Watershed Management Area.

Rose, D.L., and Schroeder, M.P., 1995, Methods of analysis by the U.S. Geological Survey National Water Quality Laboratory--Determination of volatile organic compounds in water by purge and trap capillary gas chromatography/mass spectrometry: U.S. Geological Survey Open-File Report 94-708, 26 p.

Scott, J.C., 1990, Computerized Stratified Random Site-Selection Approaches for Design of a Ground-Water-Quality Sampling Network, U.S. Geological Survey, Water-Resources Investigations Report 90-4101.

Serfes, M.S., 1998, History, Goals and Redesign of New Jersey's Ambient Ground Water Quality Network, Proceedings of the NWQMC National Monitoring Conference on July 7-9, 1998 in Reno, NV, p. III-235.

Stackelberg, P.E., Hopple, J.A., and Kauffman, L.J., 1997, Occurrence of Nitrate, Pesticides and Volatile Organic Compounds in the Kirkwood-Cohansey Aquifer System, Southern New Jersey: WRIR 97-4241.

Szabo, Z., Kozinski, J., and Zapecza, O.S., Natural Radioactivity in, and Inorganic Chemistry of, Ground Water in the Kirkwood-Cohansey Aquifer System, Southern New Jersey, 1983-89, United States Geological Survey WRIR 92-4144.

Zapecza, O.S., 1984, Hydrologic framework of the New Jersey Coastal Plain: U.S. Geological Survey Open-File Report 84-730, 61 p.

Zaugg, S.D., Sandstrom, M.W., Smith, S.G., and Fehlberg, K.M., 1995, Methods of analysis by the U.S. Geological Survey National Water Quality Laboratory--Determination of pesticides in water by C-18 solid-phase extraction and capillary-column gas chromatography/mass spectrometry with selected-ion monitoring: U.S. Geological Survey Open-File Report 95-181, 60 p.

Appendix 1A

New Jersey's 2004 Integrated List (Sublists 1-5)

New Jersey's 2004 Integrated List of Waterbodies

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
5	Lower Delaware	17	4 Seasons Campground Pond-17	Four Seasons	Fecal Coliform	Salem Co HD
1	Atlantic Coast	15	Absecon Bay	Absecon Bay-1 thru 15	Dissolved Oxygen	NJDEP Coastal Monitoring, Shellfish Monitoring
5	Atlantic Coast	15	Absecon Bay	Absecon Bay-1 thru 15	Total Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
5	Atlantic Coast	15	Absecon Creek Estuary	2401	Total Coliform	NJDEP Shellfish Monitoring
3	Atlantic Coast	15	Absecon Creek N Br at Garden St Pkwy in Egg Harbor	AN0616	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	15	Absecon Creek S Br at FAA Facility in Egg Harbor	AN0617	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	15	Absecon Creek S Br near Pomona	01410455	Dissolved Solids	NJDEP/USGS Data
1	Atlantic Coast	15	Absecon Creek S Br near Pomona	01410455	Phosphorus, Fecal Coliform, Temperature, pH, Dissolved Oxygen, Nitrate, Total Suspended Solids, Unionized Ammonia	NJDEP/USGS Data
1	Atlantic Coast	15	Absecon Creek-Tidal	R32, 2401	Dissolved Oxygen	NJDEP Coastal Monitoring
5	Atlantic Coast	15	Absecon Creek-Tidal	R33	Dissolved Oxygen	NJDEP Coastal Monitoring
3	Atlantic Coast	14	Absegami Lake-14	Absegami Lake, Bass River SF (Lake Absegami) Center, Left, Right;	Pineland Biological Community	NJDEP Clean Lakes, Southern Region, Pinelands
1	Atlantic Coast	14	Absegami Lake-14	Absegami Lake, Bass River SF (Lake Absegami) Center, Left, Right;	Phosphorus, Fecal Coliform	NJDEP Clean Lakes, Southern Region, Pinelands
5	Northeast	05	Ackermans Creek	Adjacent to Berry's Creek Reach 02030103-034-0.11	Chromium, Mercury, PCB, Chlorinated Benzenes	Remanded 303d List, (F.R. V.66, #195, 10/9/01)
1	Northwest	11	Airport Branch of Jacobs Creek at Rt 579 in Ewing	AN0103	Benthic Macroinvertebrates	NJDEP AMNET
4	Lower Delaware	17	Albert Giampietro Lake-17	Albert Giampietro Lake	Phosphorus	NJDEP Clean Lakes
5	Atlantic Coast	14	Albertson Branch near Elm	0140940970	pH	USGS/Pinelands Data
1	Atlantic Coast	14	Albertson Branch near Elm	0140940970	Phosphorus, Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids,	USGS/Pinelands Data
5	Atlantic Coast	14	Albertson Brook at Old Bridge Crossing in Hammonton	AN0572, NALDEREL	Pineland Biological Community	NJDEP AMNET, Pinelands
5	Atlantic Coast	14	Albertson Brook at Wharton Ave in Waterford	AN0571, NALBFLEM	Pineland Biological Community	NJDEP AMNET, Pinelands
5	Lower Delaware	18	Alcyon Lake-18	Alcyon Lake	Phosphorus, Fish-Mercury	NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring
1	Northwest	11	Alexauken Creek at Lambertville Rd in Lambertville	AN0096	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	11	Alexauken Creek at Rt 29 in Lambertville	AN0098	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	11	Alexauken Creek Unknown Trib at Queen Rd & Alexauken Creek Rd in West Amwell	AN0097	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	20	Allentown Lake-20	Allentown Lake	Phosphorus	NJDEP Clean Lakes
5	Lower Delaware	17	Alloway Creek at Yorktown - Friesburg Rd in Alloway	AN0699	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	17	Alloway Creek Estuary	Alloway Creek Estuary	Total Coliform	NJDEP Shellfish Monitoring
3	Lower Delaware	17	Alloway Creek UNK Trib at Alloway - Aldine Rd in Alloway	AN0701	Benthic Macroinvertebrates	NJDEP AMNET
1	Lower Delaware	17	Alloway Creek-Tidal	R57	Dissolved Oxygen	NJDEP Coastal Monitoring
3	Raritan	09	Ambrose Brook at Behmer Rd in Piscataway	AN0425A	Benthic Macroinvertebrates	NJDEP AMNET
5	Raritan	09	Ambrose Brook at Raritan Ave in Middlesex	AN0425	Benthic Macroinvertebrates	NJDEP AMNET
5	Raritan	09	Ambrose Brook at School St. in No. Stelton	AN0425B	Benthic Macroinvertebrates	NJDEP AMNET
3	Northeast	06	Ames Lake-06	Ames Lake	Phosphorus	NJDEP Clean Lakes

2004 Integrated List of Waterbodies

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
3	Raritan	10	Amwell Lake-10	Amwell Lake	Phosphorus	NJDEP Clean Lakes
5	Atlantic Coast	14	Anchor Lake One-14	NBLABBOG	Pineland Biological Community	Pinelands
3	Lower Delaware	20	Annaricken Brook at Island Rd in Springfield	AN0139	Benthic Macroinvertebrates	NJDEP AMNET
4	Lower Delaware	20	Annaricken Brook near Jobstown	01464578	Fecal Coliform	NJDEP/USGS Data
5	Lower Delaware	20	Annaricken Brook near Jobstown	01464578	Phosphorus	NJDEP/USGS Data
3	Lower Delaware	20	Annaricken Brook near Jobstown	01464578	pH, Total Suspended Solids	NJDEP/USGS Data
1	Lower Delaware	20	Annaricken Brook near Jobstown	01464578	Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Unionized Ammonia	NJDEP/USGS Data
5	Northeast	03	Apshawa Brook	PQ15	Temperature	Pequannock River Coalition
1	Northwest	02	Arapaho Lake-02	Arapaho Lake	Fecal Coliform	Sparta Twp HD
3	Atlantic Coast	14	Arnold Branch at Spur 563 in Bass River	AN0608	Benthic Macroinvertebrates	NJDEP AMNET
1	Northeast	06	Arrowhead Lake-06	Lake Arrowhead	Fecal Coliform	Denville HD
5	Raritan	07	Arthur Kill	Arthur Kill-4	Total Coliform	NJDEP Shellfish Monitoring
3	Raritan	07	Arthur Kill	K3, K4, K5	Fecal Coliform	IEC, HEP (GLEC)
1	Raritan	07	Arthur Kill	K3, K4, K5	Dissolved Oxygen, Copper, Lead, Nickel	IEC, HEP (GLEC)
4	Raritan	07	Arthur Kill	Arthur Kill	Mercury	EPA, IEC, HEP (GLEC)
5	Raritan	07	Arthur Kill and Tidal Tributaries	Arthur Kill and Tidal Tributaries	Fish-PCB, Fish-Dioxin	NJDEP Fish Tissue Monitoring
1	Raritan	08	Assiscong Creek at River Rd in Raritan	AN0328	Benthic Macroinvertebrates	NJDEP AMNET
3	Lower Delaware	20	Assiscunk Creek at Cedar Lane at Springfield	20-AS-1	Copper, Nickel, Selenium, Zinc	NJDEP Metal Recon
5	Lower Delaware	20	Assiscunk Creek at Cedar Lane at Springfield	20-AS-1	Mercury	NJDEP Metal Recon
3	Lower Delaware	20	Assiscunk Creek at Columbus - Georgetown Rd in Springfield	AN0138	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	20	Assiscunk Creek at Hedding Rd (near Jacksonville) in Mansfield	AN0141	Benthic Macroinvertebrates	NJDEP AMNET
3	Lower Delaware	20	Assiscunk Creek UNK Trib at Oxmead Rd in Burlington	AN0142C	Benthic Macroinvertebrates	NJDEP AMNET
5	Northwest	11	Assunpink Creek	Assunpink Creek	Fish-Mercury	NJDEP Fish Tissue Monitoring
5	Northwest	11	Assunpink Creek at Mulberry St in Trenton	AN0116	Benthic Macroinvertebrates	NJDEP AMNET
5	Northwest	11	Assunpink Creek at Peace Street at Trenton	01464020, 01464000, DRBCNJ1338, 11-AS-3	Phosphorus, Fecal Coliform, Arsenic, Lead	NJDEP/USGS Data, DRBC, Metal Recon
3	Northwest	11	Assunpink Creek at Peace Street at Trenton	01464020, 01464000, DRBCNJ1338, 11-AS-3	Cadmium, Mercury	NJDEP/USGS Data, DRBC, Metal Recon
1	Northwest	11	AssunpInk Creek at Peace Street at Trenton	01464020, 01464000, DRBCNJ1338, 11-AS-3	Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Chromium,	NJDEP/USGS Data, DRBC, Metal Recon
3	Northwest	11	Assunpink Creek at Roosevelt Rd in Roosevelt	AN0108	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	11	AssunpInk Creek at Route 539 in Upper Freehold	4	Fecal Coliform, Nitrate	Monmouth Co HD
5	Northwest	11	Assunpink Creek at Route 539 in Upper Freehold	4	Phosphorus	Monmouth Co HD
3	Northwest	11	Assunpink Creek at Route 539 in Upper Freehold	4	pH, Total Suspended Solids	Monmouth Co HD
5	Northwest	11	Assunpink Creek at Rt 535 in West Windsor	AN0109	Benthic Macroinvertebrates	NJDEP AMNET
5	Northwest	11	Assunpink Creek at Willow St in Trenton	AN0118	Benthic Macroinvertebrates	NJDEP AMNET
5	Northwest	11	Assunpink Creek at Windsor Rd in Washington	AN0109A	Benthic Macroinvertebrates	NJDEP AMNET

New Jersey's 2004 Integrated List of Waterbodies

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
1	Northwest	11	AssunpInk Creek near Clarksville	01463620, 11-AS-2	Phosphorus, Fecal Coliform, Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized	NJDEP/USGS Data, Metal Recon
3	Northwest	11	Assunpink Creek near Clarksville	01463620, 11-AS-2	Chromium, Nickel, Selenium, Zinc	NJDEP/USGS Data, Metal Recon
5	Northwest	11	Assunpink Creek near Clarksville	01463620, 11-AS-2	Arsenic, Cadmium, Copper, Lead, Mercury	NJDEP/USGS Data, Metal Recon
3	Northwest	11	Assunpink Creek near Edinburg	11-AS-4	Chromium, Nickel, Selenium, Zinc	NJDEP Metal Recon
5	Northwest	11	Assunpink Creek near Edinburg	11-AS-4	Arsenic, Cadmium, Copper, Lead, Mercury	NJDEP Metal Recon
5	Northwest	11	Assunpink Creek Trib near Assunpink WMA office in Millstone	AN0109T	Benthic Macroinvertebrates	NJDEP AMNET
3	Northwest	11	Assunpink Lake-11	Assunpink Lake	Phosphorus	NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring
5	Northwest	11	Assunpink Lake-11	Assunpink Lake	Fish-Mercury	NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring
5	Atlantic Coast	14	Atco Lake-14	MHAATCOL	Pineland Biological Community	Pinelands
5	Atlantic Coast	15	Atlantic City Reservoir-15	Atlantic City Reservoir	Fish-Mercury	NJDEP Fish Tissue Monitoring
1	Atlantic Ocean	Atlantic Ocean	Atlantic Ocean	All (Long Branch to Cape May)	Fecal Coliform	NJDEP Shellfish Monitoring, Bureau of Marine Water Monitoring, USEPA-Region II
5	Atlantic Ocean	Atlantic Ocean	Atlantic Ocean	All (Long Branch to Cape May)	Dissolved Oxygen	NJDEP Shellfish Monitoring, Bureau of Marine Water Monitoring, USEPA-Region II
5	Atlantic Ocean	Atlantic Ocean	Atlantic Ocean	Asbury Park Offshore-93,95,97,98,100,102,104; Atlantic Ocean-6,12; Atlantic Ocean Sea Isle-16; NJ Atlantic Ocean-53, 59; Cape May	Total Coliform	NJDEP Shellfish Monitoring, Bureau of Marine Water Monitoring, USEPA-Region II
3	Atlantic Coast	Atlantic Ocean	Atlantic Ocean	Cape May Offshore -2	Total Coliform	NJDEP Shellfish Monitoring, Bureau of Marine Water Monitoring, USEPA-Region II
1	Atlantic Ocean	Atlantic Ocean	Atlantic Ocean	4,5,8,9,10,11,13,15,17,18,19,21,22,23,25,26,31,33,38,,39,40,42,43,44,45,47,48,49,51,67,68,69,70,71,72,74,78,79,80,81,82,86,87,88,89,90,91,92,94,103,105,106,107,108,112,114,115,117,118; AC Offshore-25,32,34,35,37,52,56,58,61,63,65; Asbury Park Offshore-75,78,96,99,100,109,110,111,113,116,119,120; Cape May Beach-4; Del Bay East-122 to 124; Island Beach Offshore-85; Mantoloking Offshore-83,121; Outfall-29; Wildwood Offshore-8	Total Coliform	NJDEP Shellfish Monitoring, Bureau of Marine Water Monitoring, USEPA-Region II
1	Atlantic Coast	14	Atsion Lake-14	Atsion Lake, Atsion Rec. Area; Center, Left, and Right	Phosphorus, Fecal Coliform	NJDEP Clean Lakes, Southern Region,NJDEP Fish Tissue Monitoring, Pinelands
5	Atlantic Coast	14	Atsion Lake-14	Atsion Lake, MMUATSIO	Fish-Mercury	NJDEP Clean Lakes, Southern Region,NJDEP Fish Tissue Monitoring, Pinelands
3	Atlantic Coast	14	Atsion Lake-14	Atsion Lake, MMUATSIO	Pineland Biological Community	NJDEP Clean Lakes, Southern Region, NJDEP Fish Tissue Monitoring, Pinelands
1	Northeast	03	Awosting Association	Awosting Association	Fecal Coliform	Passaic Co HD

2004 Integrated List of Waterbodies

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
3	Atlantic Coast	15	Babcock Creek at Holly St in Hamilton	AN0640A	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	15	Babcock Creek at Rt 322 in Hamilton	AN0640	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	15	Babcock Creek near Mays Landing	01411196	pH	NJDEP/USGS Data
1	Atlantic Coast	15	Babcock Creek near Mays LandIng	01411196	Phosphorus, Fecal Coliform, Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized	NJDEP/USGS Data
3	Raritan	10	Back Brook at Rt 206 in Montgomery	AN0404	Benthic Macroinvertebrates	NJDEP AMNET
5	Raritan	08	Back Brook at Rt 609 in East Amwell	AN0335	Benthic Macroinvertebrates	NJDEP AMNET
3	Raritan	08	Back Brook at Wertsville Rd in East Amwell	AN0334	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	20	Back Creek at Yardville-Hamilton Sq Rd in Hamilton	AN0131A	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	20	Bacon Run at Georgetown - Bordentown Rd in Georgetown	AN0133A	Benthic Macroinvertebrates	NJDEP AMNET
3	Lower Delaware	20	Bacon Run at White Pine Rd in Mansfield	AN0133	Benthic Macroinvertebrates	NJDEP AMNET
1	Lower Delaware	20	Bacons Creek near Mansfield Square	01464529	Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids,	NJDEP/USGS Data
4	Lower Delaware	20	Bacons Creek near Mansfield Square	01464529	Fecal Coliform	NJDEP/USGS Data
5	Lower Delaware	20	Bacons Creek near Mansfield Square	01464529	pH	NJDEP/USGS Data
3	Lower Delaware	20	Bacons Creek near Mansfield Square	01464529	Phosphorus	NJDEP/USGS Data
5	Atlantic Coast	14	Ballanger Creek Estuary	2003D, 2003H	Total Coliform	NJDEP Shellfish Monitoring
5	Atlantic Coast	13	Bamber Lake-13	Bamber Lake - East Lake and West Lake	Fecal Coliform	Ocean Co HD
1	Raritan	08	Baptist Camp and Conf. Ctr.	Baptist Camp and Conf. Ctr.	Fecal Coliform	Hunterdon Co HD
3	Raritan	09	Barclay Brook at Rt 527 in Old Bridge	AN0450	Benthic Macroinvertebrates	NJDEP AMNET
3	Raritan	09	Barclay Brook near Englishtown	01405285	Suspended Solids	NJDEP/USGS Data
1	Raritan	09	Barclay Brook near Englishtown	01405285	Unionized Ammonia	NJDEP/USGS Data
5	Raritan	09	Barclay Brook near Englishtown	01405285	pH	NJDEP/USGS Data
5	Lower Delaware	20	Barkers Brook at Jacksonville-Smithville Rd in Springfield	AN0141O	Benthic Macroinvertebrates	NJDEP AMNET
3	Lower Delaware	20	Barkers Brook N Br at Juliustown Rd in Springfield	AN0140	Benthic Macroinvertebrates	NJDEP AMNET
4	Lower Delaware	20	Barkers Brook N Br near Jobstown	01464583	Phosphorus, pH	NJDEP/USGS Data
5	Lower Delaware	20	Barkers Brook N Br near Jobstown	01464583	Phosphorus, pH	NJDEP/USGS Data
1	Lower Delaware	20	Barkers Brook N Br near Jobstown	01464583	Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Unionized Ammonia	NJDEP/USGS Data
3	Lower Delaware	20	Barkers Brook N Br near Jobstown	01464583	Total Suspended Solids	NJDEP/USGS Data
5	Atlantic Coast	13	Barnegat Bay	Barnegat Bay-1 thru 5, 7 thru 31, 33 thru 41	Total Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
1	Atlantic Coast	13	Barnegat Bay	East Of Clam Island-32, Barnegat Bay/Toms River-6	Total Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
1	Atlantic Coast	13	Barnegat Bay	Barnegat Bay-1 thru 41	Dissolved Oxygen, Fecal Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
1	Atlantic Coast	12	Barren Neck Brook at Long Bridge Rd in Colts Neck	56	Nitrate	Monmouth Co HD
4	Atlantic Coast	12	Barren Neck Brook at Long Bridge Rd in Colts Neck	56	Fecal Coliform	Monmouth Co HD
5	Atlantic Coast	12	Barren Neck Brook at Long Bridge Rd in Colts Neck	56	Phosphorus	Monmouth Co HD

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
3	Atlantic Coast	12	Barren Neck Brook at Long Bridge Rd in Colts Neck	56	pH, Total Suspended Solids	Monmouth Co HD
1	Lower Delaware	17	Barrett Run at Bridgeton	01413013	Fecal Coliform, Temperature, Dissolved Oxygen, pH, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized	NJDEP/USGS Data
5	Lower Delaware	17	Barrett Run at Bridgeton	01413013	Phosphorus	NJDEP/USGS Data
3	Lower Delaware	17	Barrett Run at Maple Ave in Hopewell	AN0713	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	17	Barrett Run at W Ave in Bridgeton	AN0714	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	02	Barry Lakes-02	Barry Lakes	Fecal Coliform	Sussex Co HD
3	Lower Delaware	19	Barton Run at Braddock Mill Rd & Rt 73 in Evesham	AN0163	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	19	Barton Run at Tuckerton Rd in Medford	AN0166, WBATUCKE	Pineland Biological Community	NJDEP AMNET, Pinelands
5	Lower Delaware	19	Barton Run at Tuckerton Rd on Hoot Owl Estate	EWQ0166	pH	EWQ
3	Lower Delaware	19	Barton Run at Tuckerton Rd on Hoot Owl Estate	EWQ0166	Dissolved Oxygen	EWQ
1	Lower Delaware	19	Barton Run at Tuckerton Rd on Hoot Owl Estate	EWQ0166	Phosphorus, Temperature, Nitrate, Dissolved Solids, Total Suspended Solids,	EWQ
5	Lower Delaware	19	Barton Run below Jennings Lake	WBAJENNS	Pineland Biological Community	Pinelands
5	Lower Delaware	19	Barton Run impoundment above Tuckerton Rd (Lake 1523-19)	WBACONDO	Pineland Biological Community	Pinelands
1	Northwest	01	Bass Lake-01	Princeton-Blairstown Lake	Fecal Coliform	Warren Co HD
3	Atlantic Coast	14	Bass River E Br at Stage Rd in Bass River	AN0612, AEASTAGE	Pineland Biological Community	NJDEP AMNET, Pinelands
3	Atlantic Coast	14	Bass River E Br near New Gretna	01410150, 14-EBR-1	Arsenic, Cadmium, Mercury, Silver	NJDEP/USGS Data, Metal Recon
5	Atlantic Coast	14	Bass River E Br near New Gretna	01410150, 14-EBR-1	Copper, Lead, Zinc	NJDEP/USGS Data, Metal Recon
1	Atlantic Coast	14	Bass River E Br near New Gretna	01410150, 14-EBR-1	Phosphorus, Fecal Coliform, Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized	NJDEP/USGS Data, Metal Recon
5	Atlantic Coast	14	Bass River Estuary	2007B, 2007C, 2007D, 2007E	Total Coliform	NJDEP Shellfish Monitoring
1	Atlantic Coast	14	Bass River W Br above Pilgrim Lake-lower	AWEPILGL	Pineland Biological Community	Pinelands
3	Atlantic Coast	14	Bass River W Br at Stage Rd in Bass River	AN0610, AWESTAGE	Pineland Biological Community	NJDEP AMNET, Pinelands
1	Atlantic Coast	14	Bass River-Tidal	R24, R25	Dissolved Oxygen	NJDEP Coastal Monitoring
5	Atlantic Coast	14	Batsto Lake-14	Batsto Lake, BBATLAKE	Fish-Mercury	NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring, Pinelands
3	Atlantic Coast	14	Batsto Lake-14	Batsto Lake, BBATLAKE	Phosphorus, Pineland Biological Community	NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring, Pinelands
3	Atlantic Coast	14	Batsto River at Batsto	01409500, 14-BAT-1	Arsenic, Cadmium, Chromium, Mercury, Nickel, Selenium, Silver, Zinc	NJDEP/USGS Data, Metal Recon
5	Atlantic Coast	14	Batsto River at Batsto	01409500, 14-BAT-1	pH, Copper	NJDEP/USGS Data, Metal Recon
1	Atlantic Coast	14	Batsto River at Batsto	01409500, 14-BAT-1	Phosphorus, Fecal Coliform, Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized	NJDEP/USGS Data, Metal Recon
3	Atlantic Coast	14	Batsto River at Carranza Rd in Shamong	AN0579, BBACARRZ	Pineland Biological Community	NJDEP AMNET, Pinelands
1	Atlantic Coast	14	Batsto River at Hampton Furnace	01409432	Phosphorus, Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids,	USGS/Pinelands Data

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5	Atlantic Coast	14	Batsto River at Hampton Furnace	01409432	pH	USGS/Pinelands Data
3	Atlantic Coast	14	Batsto River at Hampton in Shamong	AN0586A, BBATHAMP	Pineland Biological Community	NJDEP AMNET, Pinelands
1	Atlantic Coast	14	Batsto River at Quaker Bridge	01409470	Phosphorus, Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids,	USGS/Pinelands Data
5	Atlantic Coast	14	Batsto River at Quaker Bridge	01409470	pH	USGS/Pinelands Data
3	Atlantic Coast	14	Batsto River at Quaker Bridge in Washington	AN0586, BBALFORG, BBAQUAKR	Pineland Biological Community	NJDEP AMNET, Pinelands
3	Atlantic Coast	14	Batsto River at Rt 542 in Washington	AN0588	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	14	o River below Central New Jersey/Conrail RR B	BBARRBRG	Pineland Biological Community	Pinelands
3	Atlantic Coast	14	Batsto River below Penn Swamp Branch	BBAPENNS	Pineland Biological Community	Pinelands
3	Atlantic Coast	14	Batsto River below Route 532	BBART532	Pineland Biological Community	Pinelands
1	Atlantic Coast	14	Batsto River headwater impoundment (Lake1606-14)	BBATS532	Pineland Biological Community	Pinelands
3	Atlantic Coast	14	Batsto River Trib below Hay Rd	BBATRMAN	Pineland Biological Community	Pinelands
3	Atlantic Coast	14	Batsto River Trib near Moore's Mea	BBATRMOO	Pineland Biological Community	Pinelands
3	Atlantic Coast	14	Batsto River Triby above Carranza Rd	BBATRCAR	Pineland Biological Community	Pinelands
1	Atlantic Coast	16	Bayberry Cove-16	Bayberry Cove (large) and (small)	Fecal Coliform	Cape May Co HD
1	Atlantic Coast	16	Beachcomer Lake-16	Beachcomer Campground	Fecal Coliform	Cape May Co HD
5	Raritan	10	Bear Brook at Stobbe Ln in West WIndsor	AN0384	Unknown Toxicity	NJDEP AMNET
1	Raritan	10	Bear Brook at Stobbe Ln in West WIndsor	AN0384	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	01	Bear Creek at Dark Moon Rd	01445160	Fecal Coliform, Temperature, Dissolved Oxygen, pH, Nitrate, Dissolved Solids,	NJDEP/USGS Data
3	Northwest	01	Bear Creek at Dark Moon Rd	01445160	Phosphorus, Total Suspended Solids	NJDEP/USGS Data
5	Northwest	01	Bear Creek at Dark Moon Rd in Frelinghuysen	AN0040A	Benthic Macroinvertebrates	NJDEP AMNET
5	Northwest	01	Bear Creek near Alphano in Allamuchy	AN0040	Benthic Macroinvertebrates	NJDEP AMNET
1	Northeast	03	Bear Swamp Lake 2-03	Simplicity Inn at Blueberry Point Lake Beach Area and Area B	Fecal Coliform	Passaic Co HD
3	Lower Delaware	19	Bear Swamp River at Rt 70 in Southampton	AN0159, WBERTE70	Pineland Biological Community	NJDEP AMNET, Pinelands
1	Northwest	01	Beaver Brook above Silver Lk in Hope	AN0045	Benthic Macroinvertebrates	NJDEP AMNET
1	Raritan	08	Beaver Brook at Herman Thau Rd in CIInton	AN0323	Benthic Macroinvertebrates	NJDEP AMNET
5	Raritan	08	Beaver Brook at Lehigh St in Clinton	AN0324	Benthic Macroinvertebrates	NJDEP AMNET
1	Northeast	06	Beaver Brook at Lyonville Rd in Rockaway	AN0245	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	06	Beaver Brook at Morris Ave in Denville	AN0246	Benthic Macroinvertebrates	NJDEP AMNET
4	Northeast	06	Beaver Brook at Rockaway	01380100, 01380098	Fecal Coliform	NJDEP/USGS Data
1	Northeast	06	Beaver Brook at Rockaway	01380100, 01380098	Phosphorus, Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia	NJDEP/USGS Data
1	Northwest	01	Beaver Brook at Rt 618 in Sarepta	EWQ0047	Phosphorus, Temperature, Dissolved Oxygen, pH, Nitrate, Dissolved Solids,	EWQ
3	Northwest	01	Beaver Brook at Rt 618 in Sarepta	EWQ0047	Total Suspended Solids	EWQ
1	Northwest	01	Beaver Brook at Sarepta Rd in White	AN0047	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	02	Beaver Lake-02	Beaver Lake	Fecal Coliform	Sparta Twp HD
5	Northwest	02	Beaver Run at Cemetery Rd in Wantage	AN0301	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	13	Beaverdam Creek at Rt 88 in Brick	AN0513	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	13	Beaverdam Creek Estuary	1401C, 1401D, 1600, 1600A, 1600B	Total Coliform	NJDEP Shellfish Monitoring
5	Atlantic Coast	14	Beaverdam Lake-14	MWIBEAVR	Pineland Biological Community	Pinelands

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
5	Lower Delaware	17	Beck Creek Estuary	3801D-I	Total Coliform	NJDEP Shellfish Monitoring
5	Raritan	10	Beden Brook at Great Rd in Blawenburg	AN0401B	Benthic Macroinvertebrates	NJDEP AMNET
3	Raritan	10	Beden Brook on Aunt Molly Rd (abv STP) in Hopewell	10-BED-1	Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium, Zinc	NJDEP/USGS Data, Metal Recon
5	Raritan	10	Bedens Brook at Aunt Molly Rd (abv STP) in Hopewell	AN0398	Benthic Macroinvertebrates	NJDEP AMNET, Metal Recon
5	Raritan	10	Bedens Brook at Rt 206 in Montgomery	AN0401	Benthic Macroinvertebrates	NJDEP AMNET
4	Raritan	10	Bedens Brook near Rocky Hill	01401600, 10-BED-2, 10-BED-3	Fecal Coliform	NJDEP/USGS Data, EWQ, Metal Recon
5	Raritan	10	Bedens Brook near Rocky Hill	01401600, 10-BED-2, 10-BED-3	Phosphorus, Arsenic, Lead	NJDEP/USGS Data, EWQ, Metal Recon
3	Raritan	10	Bedens Brook near Rocky Hill	01401600, 10-BED-2, 10-BED-3	Cadmium, Mercury	NJDEP/USGS Data, EWQ, Metal Recon
1	Raritan	10	Bedens Brook near Rocky Hill	01401600, 10-BED-2, 10-BED-3	Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Chromium,	NJDEP/USGS Data, EWQ, Metal Recon
5	Northeast	03	Belchers Brook at Union Valley Rd in West Milford	AN0255C	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	14	Belhaven Lake-14	Belhaven Lake	Fecal Coliform	Burlington Co HD
1	Northwest	01	Bell Lake-01	Bell Lake	Fecal Coliform	Sussex Co HD
4	Lower Delaware	18	Bell Lake-18	Bell Lake	Phosphorus	NJDEP Clean Lakes
1	Lower Delaware	18	Bellmawr Lake-18	Bellmawr Lake	Fecal Coliform	Camden Co HD
1	Lower Delaware	18	Bells Lake-18	Greenwood Park Bells Lake	Fecal Coliform	Gloucester Co HD
1	Northeast	06	Belmont Left and Right	Belmont Left and Right	Fecal Coliform	Twp of Pequannock
3	Raritan	10	Bently Brook at Prodelin Way in Millstone	MB-CA, MB-CB	Benthic Macroinvertebrates	Monmouth Co HD
1	Lower Delaware	17	Berryman Branch at Rt 49 in Millville	AN0761	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	05	Berry's Creek	Berry's Creek Reach 02030103-034	Mercury, Arsenic, Lead, Copper, PCB	Remanded 303d List, (F.R. V.66, #195, 10/9/01)
4	Lower Delaware	18	Bethel Lake-18	Bethel Lake	Phosphorus	NJDEP Clean Lakes
5	Atlantic Coast	16	Bidwell Ditch-Tidal	R39, 1890C-M	Dissolved Oxygen, Total Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
5	Raritan	10	Big Bear Brook at Old Trenton Rd (Rt 535) in West Windsor	AN0383	Benthic Macroinvertebrates, Unknown Toxicity	NJDEP AMNET
1	Atlantic Coast	12	Big Brook at Colts Neck	EWQ0470, 21, 57	Temperature, Dissolved Oxygen, pH, Nitrate, Total Suspended Solids, Unionized	EWQ, Monmouth Co HD
4	Atlantic Coast	12	Big Brook at Colts Neck	EWQ0470, 21, 57	Fecal Coliform	EWQ, Monmouth Co HD
5	Atlantic Coast	12	Big Brook at Colts Neck	EWQ0470, 21, 57	Phosphorus	EWQ, Monmouth Co HD
5	Atlantic Coast	12	Big Brook at Cross Rd in Colts Neck	AN0470	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	12	Big Brook at Rt 79 in Marlboro	AN0469	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	14	Big Creek Estuary	1924A, 1924B	Total Coliform	NJDEP Shellfish Monitoring
5	Atlantic Coast	16	Big Elder Creek Estuary	3136	Total Coliform	NJDEP Shellfish Monitoring
1	Northwest	01	Big Flat Brook at Rt 521 in Sandyston	AN0006	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	01	Big Flat Brook at Tuttles Corner	01439830	Phosphorus, Fecal Coliform, Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized	NJDEP/USGS Data, EWQ
3	Lower Delaware	19	Big Pine Lake-14	NJABPHAN	Pineland Biological Community	Pinelands
5	Lower Delaware	18	Big Timber Creek	Big Timber Creek	Fish-Mercury	NJDEP Fish Tissue Monitoring
4	Lower Delaware	18	Big Timber Creek N Br at Glendora	01467359	Fecal Coliform	NJDEP/USGS Data

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
5	Lower Delaware	18	Big Timber Creek N Br at Glendora	01467359	Phosphorus	NJDEP/USGS Data
1	Lower Delaware	18	Big Timber Creek N Br at Glendora	01467359	Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended	NJDEP/USGS Data
5	Lower Delaware	18	Big Timber Creek N Br at Park Ave in Lindenwold	AN0661	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	18	Big Timber Creek N Br at Rt 168 In Gloucester	AN0663	Benthic Macroinvertebrates	NJDEP AMNET
3	Lower Delaware	18	Big Timber Creek S Br at Almonesson Rd in Blenheim	EWQ0659	Dissolved Oxygen, Total Suspended Solids	EWQ
1	Lower Delaware	18	Big Timber Creek S Br at Almonesson Rd in Blenheim	EWQ0659	Temperature, pH, Nitrate, Dissolved Solids, Unionized Ammonia	EWQ
5	Lower Delaware	18	Big Timber Creek S Br at Almonesson Rd in Blenheim	EWQ0659	Phosphorus	EWQ
4	Lower Delaware	18	Big Timber Creek S Br at Blackwood Terrace	01467329, 18-BIG-1	Fecal Coliform	NJDEP/USGS Data, Metal Recon
5	Lower Delaware	18	Big Timber Creek S Br at Blackwood Terrace	01467329, 18-BIG-1	Phosphorus	NJDEP/USGS Data, Metal Recon
3	Lower Delaware	18	Big Timber Creek S Br at Blackwood Terrace	01467329, 18-BIG-1	Arsenic, Cadmium, Lead, Mercury	NJDEP/USGS Data, Metal Recon
1	Lower Delaware	18	Big Timber Creek S Br at Blackwood Terrace	01467329, 18-BIG-1	Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Chromium,	NJDEP/USGS Data, Metal Recon
4	Lower Delaware	18	Big Timber Creek S Br at Glenloch	01467327	Fecal Coliform	NJDEP/USGS Data
3	Lower Delaware	18	Big Timber Creek S Br at Glenloch	01467327	Arsenic, Lead, Mercury, Silver	NJDEP/USGS Data
1	Lower Delaware	18	Big Timber Creek S Br at Glenloch	01467327	Phosphorus, Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Cadmium, Chromium, Copper, Nickel,	NJDEP/USGS Data
1	Lower Delaware	18	Big Timber Creek S Br at Turnersville	01467325	Phosphorus, Fecal Coliform, Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids,	NJDEP/USGS Data
3	Lower Delaware	18	Big Timber Creek S Br at Turnersville	01467325	pH, Unionized Ammonia, Arsenic, Cadmium, Lead, Mercury, Silver	NJDEP/USGS Data
5	Lower Delaware	18	Big Timber Creek S Br at Turnersville - Sicklerville Rd in Washington	AN0658	Benthic Macroinvertebrates	NJDEP AMNET
3	Lower Delaware	18	Big Timber Creek S Br UNK Trib at Ganttown Rd in Washington	AN0656	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	16	Big Timber Lake-16	Big Timber Lake	Fecal Coliform	Cape May Co HD
5	Atlantic Coast	12	Birch Swamp Brook	Adjacent to Matawan Creek Reach 02030104-328-0.42	Arsenic, Lead, Copper, PCB	Remanded 303d List, (F.R. V.66, #195, 10/9/01)
1	Northeast	06	Birchwood Lake-06	Birchwood Lake	Fecal Coliform	Montville Twp HD
1	Lower Delaware	19	Birchwood Lake-19	Birchwood Lakes Beach	Fecal Coliform	Burlington Co HD
3	Lower Delaware	19	Bisphams Mill Creek at New Lisbon Rd in Pemberton	AN0147, GBITURKE	Pineland Biological Community	NJDEP AMNET, Pinelands
4	Northeast	06	Black Brook at Madison	01378855	Fecal Coliform	NJDEP/USGS Data
1	Northeast	06	Black Brook at Madison	01378855	Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended	NJDEP/USGS Data
5	Northeast	06	Black Brook at Madison	01378855	Phosphorus, Arsenic	NJDEP/USGS Data
3	Northeast	06	Black Brook at Madison	01378855	Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium, Zinc	NJDEP/USGS Data
5	Northeast	06	Black Brook at New Vernon Rd in Long Hill	AN0223	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	06	Black Brook at Southern Blvd in Chatham	AN0222	Benthic Macroinvertebrates	NJDEP AMNET

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5	Northwest	02	Black Creek at Marker Rd in Vernon	AN0296	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	02	Black Creek at Rt 94/517 in Vernon	Wallkill F	Dissolved Oxygen, pH, Nitrate, Dissolved Solids, Unionized Ammonia	Sussex MUA
3	Northwest	02	Black Creek at Rt 94/517 in Vernon	Wallkill F	Dissolved Solids	Sussex MUA
5	Northwest	02	Black Creek at Rt 94/517 in Vernon	Wallkill F	Phosphorus, Temperature	Sussex MUA
3	Northwest	02	Black Creek at Sandhill Rd in Vernon	Wallkill G	Phosphorus	Sussex MUA
1	Northwest	02	Black Creek at Sandhill Rd in Vernon	Wallkill G	Temperature, pH, Nitrate, Dissolved Solids, Unionized Ammonia	Sussex MUA
5	Northwest	02	Black Creek at Sandhill Rd in Vernon	Wallkill G	Dissolved Oxygen	Sussex MUA
4	Northwest	02	Black Creek near Vernon	01368950, Wallkill H	Fecal Coliform	NJDEP/USGS Data, EWQ, Sussex MUA
5	Northwest	02	Black Creek near Vernon	01368950, Wallkill H	Phosphorus	NJDEP/USGS Data, EWQ, Sussex MUA
1	Northwest	02	Black Creek near Vernon	01368950, Wallkill H	Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended	NJDEP/USGS Data, EWQ, Sussex MUA
1	Lower Delaware	19	Black Run at Kettle Run Rd in Evesham	AN0164, WBLSPRAY	Pineland Biological Community	NJDEP AMNET, Pinelands
3	Lower Delaware	19	Black Run at Route 544	WBLRT544	Pineland Biological Community	Pinelands
1	Lower Delaware	19	Black Run Bog-19	WBLABBOG	Pineland Biological Community	Pinelands
3	Lower Delaware	19	Black Run trib at Braddock Mill Rd in Evesham	AN0165, WBLTRKET	Pineland Biological Community	NJDEP AMNET, Pinelands
3	Atlantic Coast	13	Blacks Branch at Naval Air Sta boundary in Manchester	AN0529	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	13	Blacks Branch at Rt 70 in Lakehurst	AN0530	Benthic Macroinvertebrates	NJDEP AMNET
3	Lower Delaware	20	Blacks Creek at Chesterfield - Georgetown Rd	01464527	Total Suspended Solids, Fecal Coliform	NJDEP/USGS Data
1	Lower Delaware	20	Blacks Creek at Chesterfield - Georgetown Rd	01464527	Temperature, Dissolved Oxygen, pH, Nitrate, Dissolved Solids, Unionized	NJDEP/USGS Data
5	Lower Delaware	20	Blacks Creek at Chesterfield - Georgetown Rd	01464527	Phosphorus	NJDEP/USGS Data
5	Lower Delaware	20	Blacks Creek at Chesterfield - Georgetown Rd in Chesterfield	AN0132	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	17	Blackwater Branch at Main Rd in Franklin	AN0738	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	17	Blackwater Branch at Maurice River Pkwy in Vineland	AN0739	Benthic Macroinvertebrates	NJDEP AMNET
4	Lower Delaware	18	Blackwood Lake-18	Blackwood Lake	Phosphorus	NJDEP Clean Lakes
3	Northwest	01	Blair Creek at blw Fairview Lk in Stillwater	AN0025A	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	01	Blair Creek at Rt 94 in Blairstown	AN0027	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	01	Blair Creek at Shannon Rd in Hardwick	AN0026	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	14	Blue Anchor Brook above Pump Branch	NBLCONFL	Pineland Biological Community	Pinelands
5	Atlantic Coast	14	Blue Anchor Brook at Elm	0140940950	pH	NJDEP/USGS Data
1	Atlantic Coast	14	Blue Anchor Brook at Elm	0140940950	Phosphorus, Fecal Coliform, Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized	NJDEP/USGS Data
3	Atlantic Coast	14	Blue Anchor Brook at Rt 30 in Winslow	AN0570	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	14	Blue Anchor Brook impoundment above Spring Garden-Winslow Rd (Lake 1950-14)	NBLSPRNG	Pineland Biological Community	Pinelands
1	Lower Delaware	19	Blue Lake-19	Blue Lake Beach	Fecal Coliform	Burlington Co HD
3	Lower Delaware	19	Bobbys Run at Smithville Rd in Southampton	AN0171A	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	06	Boonton Reservoir-06	Boonton Reservoir	Fish-Mercury	NJDEP Fish Tissue Monitoring

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3	Atlantic Coast	13	Bordens Mill Branch at Colliers Mills WMA in Jackson	AN0525	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	12	Bordons Brook at Route 520 in Holmdel	54	Nitrate	Monmouth Co HD
3	Atlantic Coast	12	Bordons Brook at Route 520 In Holmdel	54	pH, Total Suspended Solids	Monmouth Co HD
4	Atlantic Coast	12	Bordons Brook at Rt 520 in Holmdel	54	Fecal Coliform	Monmouth Co HD
5	Atlantic Coast	12	Bordons Brook at Rt 520 in Holmdel	54	Phosphorus	Monmouth Co HD
3	Lower Delaware	17	Bostwick Lake-17	Bostwick Lake	Phosphorus	NJDEP Clean Lakes
5	Raritan	09	Bound Brook	Bound Brook	Fish-PCB, Fish-Dioxin	NJDEP Fish Tissue Monitoring
5	Raritan	09	Bound Brook at Bound Brook Rd in Middlesex	AN0424	Benthic Macroinvertebrates	NJDEP AMNET
4	Raritan	09	Bound Brook at Middlesex	01403900	Fecal Coliform	NJDEP/USGS Data
5	Raritan	09	Bound Brook at Middlesex	01403900	Phosphorus, Total Suspended Solids	NJDEP/USGS Data
1	Raritan	09	Bound Brook at Middlesex	01403900	Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Unionized	NJDEP/USGS Data
4	Raritan	09	Bound Brook at Route 28 at Middlesex	01403385	Fecal Coliform	NJDEP/USGS Data
5	Raritan	09	Bound Brook at Route 28 at Middlesex	01403385	Phosphorus	NJDEP/USGS Data
1	Raritan	09	Bound Brook at Route 28 at Middlesex	01403385	Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended	NJDEP/USGS Data
5	Raritan	09	Bound Brook at Woodbrook Rd in South Plainfield	AN0424B	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	14	Boy Scout impoundment (Lake 1670-14)	MALTRBOY	Pineland Biological Community	Pinelands
5	Atlantic Coast	15	Braddock Lake-15	Collings Lakes #1 (Braddock)	Fecal Coliform	Atlantic Co HD
1	Lower Delaware	19	Braddocks Millpond-19	Braddocks Mill Lake	Fecal Coliform	Burlington Co HD
1	Raritan	10	Brainard Lake-10	Brainerd Lake	Fish Community	NJDEP Freshwater Fisheries
3	Raritan	10	Brainerd Lake-10	Brainerd Lake	Phosphorus	NJDEP Clean Lakes
3	Northeast	04	Branchbrook Park Lake-04	Branchbrook Park Lake	Phosphorus	NJDEP Clean Lakes
1	Atlantic Coast	12	Branchport Creek-Tidal	45, R05	Dissolved Oxygen	Monmouth Co HD, NJDEP Coastal Monitoring
5	Atlantic Coast	12	Branchport Creek-Tidal	45, R05	Fecal Coliform	Monmouth Co HD, NJDEP Coastal Monitoring
1	Northwest	01	Brass Castle Creek at Brass Castle Rd in WashIngton	AN0056	Benthic Macroinvertebrates	NJDEP AMNET
3	Lower Delaware	19	Bread and Cheese Run at New Rd	SBRNEWRD	Pineland Biological Community	Pinelands
5	Atlantic Coast	12	Brown Avenue Beach (Spring Lake)	Brown Avenue Beach (Spring Lake)	Fecal Coliform	Cooperative Coastal Monitoring Program
5	Northeast	03	Bubbling Springs-03	Bubbling Springs	Fecal Coliform	Passaic Co HD
1	Northwest	01	Buck Horn Creek at HutchInson Sta Rd in Harmony	AN0050	Benthic Macroinvertebrates	NJDEP AMNET
3	Northwest	01	Buck Horn Creek at Hutchinson Station Rd in Hutchinso	EWQ0050	Phosphorus, Temperature, Dissolved Oxygen, Total Suspended Solids	EWQ
1	Northwest	01	Buck Horn Creek at Hutchinson Station Rd in Hutchinson	EWQ0050	pH, Nitrate, Dissolved Solids, Unionized Ammonia	EWQ
1	Atlantic Coast	14	Buck Run below Old Martha Rd	OBUCKRUN	Pineland Biological Community	Pinelands
1	Lower Delaware	17	Buckshutem Creek at Rt 555 in Millville	AN0756	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	17	Buckshutem Creek near Laurel Lake	01411950	Fecal Coliform	NJDEP/USGS Data
3	Lower Delaware	17	Buckshutem Creek near Laurel Lake	01411950	Dissolved Oxygen	NJDEP/USGS Data
1	Lower Delaware	17	Buckshutem Creek near Laurel Lake	01411950	Phosphorus, Temperature, pH, Nitrate, Total Suspended Solids, Unionized	NJDEP/USGS Data

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
1	Raritan	08	Budd Lake-08	Budd Lake	Fish Community	NJDEP Freshwater Fisheries
5	Raritan	08	Budd Lake-08	Mt. Olive Municipal Beach, Budd Lake	Fecal Coliform, Fish-Mercury	Mount Olive HD, NJDEP Fish Tissue Monitoring
5	Lower Delaware	19	Budds Run at Main St in Pemberton	AN0150, NBURT616	Pineland Biological Community	NJDEP AMNET, Pinelands
5	Atlantic Coast	15	Buena Vista CG-15	Buena Vista CG	Fecal Coliform	Atlantic Co HD
1	Raritan	08	Burnett Brook at Old Mill Rd in Mendham	AN0348	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	17	Burnt Mill Branch at Forest Grove Rd in Newfield	AN0734A	Benthic Macroinvertebrates	NJDEP AMNET
1	Lower Delaware	17	Burnt Mill Branch at Rt 55 in VIneland	AN0735	Benthic Macroinvertebrates	NJDEP AMNET
3	Lower Delaware	17	Burnt Mill Branch at W Blvd in Newfield	AN0734	Benthic Macroinvertebrates	NJDEP AMNET
4	Lower Delaware	17	Burnt Mill Pond-17	Burnt Mill Pond	Phosphorus	NJDEP Clean Lakes
3	Lower Delaware	19	Burrs Mill Brook at Hedgerhouse Rd in Woodland	AN0153, SSBSOOYS	Pineland Biological Community	NJDEP AMNET, Pinelands
1	Lower Delaware	19	Burrs Mill Brook at Sooy Pl Rd in Southampton	AN0154, SBUSOOYS	Pineland Biological Community	NJDEP AMNET, Pinelands
1	Lower Delaware	19	Burrs Mill Brook S Br impoundment above Sooy Place Rd (Lake 1552-19)	SBUSOOYL	Pineland Biological Community	Pinelands
5	Atlantic Coast	13	Butterfly Pond-13	Butterfly Bogs Pond	Fish-Mercury	NJDEP Fish Tissue Monitoring
5	Raritan	08	Cakepoulin Creek	Cakepoulin Creek Reach 02030105-043-0.00	DDT	Remanded 303d List, (F.R. V.66, #195, 10/9/01)
1	Raritan	08	CakepoulIn Creek at Lansdown Rd in FrankIIn	AN0325	Benthic Macroinvertebrates	NJDEP AMNET
3	Raritan	08	Cakepoulin Creek at Lansdown Rd near Lansdown	01396900	Temperature, Fecal Coliform	NJDEP/USGS Data
1	Raritan	08	Cakepoulin Creek at Lansdown Rd near Lansdown	01396900	Dissolved Oxygen, pH, Nitrate, Dissolved Solids, Unionized Ammonia, Total	NJDEP/USGS Data
5	Raritan	08	Cakepoulin Creek at Lansdown Rd near Lansdown	01396900	Phosphorus	NJDEP/USGS Data
1	Raritan	08	CakepoulIn Creek at Rt 513 in FrankIIn	AN0325B	Benthic Macroinvertebrates	NJDEP AMNET
1	Raritan	08	Camp Bernie	Camp Bernie	Fecal Coliform	Hunterdon Co HD
5	Lower Delaware	19	Camp Darkwaters	Camp Darkwaters	Fecal Coliform	Burlington Co HD
1	Northeast	03	Camp Gigal Pond-03	Solid Rock Day Camp, Camp Gigal	Fecal Coliform	Passaic Co HD
1	Lower Delaware	17	Camp Grice	Camp Grice	Fecal Coliform	Salem Co HD
3	Raritan	10	Camp Harmony Branch of Stony Brook at Van Dyke Rd in Hopewell	AN0390	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	06	Camp Lewis-06	Camp Lewis	Fecal Coliform	Rockaway Twp HD
1	Northwest	01	Camp Lou Henry Hoover	Camp Lou Henry Hoover	Fecal Coliform	Sussex Co HD
1	Lower Delaware	17	Camp Merrywood-17	Camp Merrywood	Fecal Coliform	Salem Co HD
1	Lower Delaware	17	Camp Roosevelt Lake-17	Camp Roosevelt	Fecal Coliform	Salem Co HD
1	Northwest	01	Camp Taylor Lake-01	Camp Taylor Lake	Fecal Coliform	Warren Co HD
1	Northeast	03	Canistear Reservoir-03	Canistear Reservoir	Fish Community	NJDEP Freshwater Fisheries
5	Northeast	03	Cannistear Reservoir-03	Cannistear Reservoir	Fish-Mercury	NJDEP Fish Tissue Monitoring
3	Northeast	06	Canoe Brook at McClellen St in Livingston	AN0231E	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	06	Canoe Brook at Parsonage Hill Rd in Millburn	AN0231D	Benthic Macroinvertebrates	NJDEP AMNET
4	Northeast	06	Canoe Brook near Summit	01379530	Fecal Coliform	NJDEP/USGS Data
3	Northeast	06	Canoe Brook near Summit	01379530	Phosphorus, Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia	NJDEP/USGS Data

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Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
1	Lower Delaware	17	Canton DraIn at Maskell Mill	01413065	Phosphorus, Fecal Coliform, Temperature, Nitrate, Dissolved Solids, Unionized	NJDEP/USGS Data
3	Lower Delaware	17	Canton Drain at Maskell Mill	01413065	Dissolved Oxygen, Total Suspended Solids	NJDEP/USGS Data
5	Lower Delaware	17	Canton Drain at Maskell Mill	01413065	pH	NJDEP/USGS Data
5	Lower Delaware	17	Canton Drain Estuary	Canton Drain Estuary	Total Coliform	NJDEP Shellfish Monitoring
1	Lower Delaware	17	Canton Drain-Tidal	R52	Dissolved Oxygen	NJDEP Coastal Monitoring
5	Atlantic Coast	16	Cape May Canal	1319B-D	Total Coliform	NJDEP Shellfish Monitoring
5	Atlantic Coast	13	Carasaljo Lake-13	Lake Carasaljo North Beach and South Beach	Fecal Coliform	Ocean Co HD, NJDEP Clean Lakes
3	Atlantic Coast	13	Carasaljo Lake-13	Carasaljo Lake	Phosphorus	Ocean Co HD, NJDEP Clean Lakes
1	Lower Delaware	19	Cardinal Ridge-19	Cardinal Ridge Condos	Fecal Coliform	Burlington Co HD
3	Raritan	10	Carnegie Lake-10	Carnegie Lake	Phosphorus	NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring
5	Raritan	10	Carnegie Lake-10	Carnegie Lake	Fish-Mercury	NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring
1	Raritan	09	Carroll's Garden Lake	Carroll's Garden Lake	Fecal Coliform	Middlesex Co Public HD
5	Lower Delaware	17	Cedar Branch at Italia Ave in Vineland	AN0757	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	13	Cedar Bridge Branch at Moore Rd in Brick	AN0514	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	13	Cedar Brook at Cedar Crest	01408830	Phosphorus, Fecal Coliform, Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized	NJDEP/USGS Data
5	Raritan	09	Cedar Brook at Cedarbook Ave. in So. Plainfield	AN0424A	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	14	Cedar Brook at Myrtle Ave in Hammonton	AN0575, NCEAIRPO	Pineland Biological Community	NJDEP AMNET, Pinelands
3	Atlantic Coast	13	Cedar Creek at Double Trouble St Pk in Berkeley	AN0548	Benthic Macroinvertebrates	NJDEP AMNET
3	Lower Delaware	17	Cedar Creek at Main St in Lawrence	AN0718	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	13	Cedar Creek at Rt 9 in Lacey	AN0549	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	13	Cedar Creek at Whiting Lacey Rd in Lacey	AN0546	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	17	Cedar Creek Estuary	3805C, 3805J, 3805L, 3805M	Total Coliform	NJDEP Shellfish Monitoring
1	Atlantic Coast	13	Cedar Creek Estuary	R12, Cedar Creek-1	Dissolved Oxygen	NJDEP Coastal Monitoring, Shellfish Monitoring
5	Atlantic Coast	13	Cedar Creek Estuary	R12, Cedar Creek-1	Total Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
1	Northeast	06	Cedar Lake-06	Cedar/1 (East), Cedar/2 (West)	Fecal Coliform	Denville HD
5	Atlantic Coast	15	Cedar Lake-15	Cedar Lake	Fish-Mercury	NJDEP Fish Tissue Monitoring
5	Lower Delaware	17	Cedar Lake-17	Cedar Lake	Fecal Coliform	Cumberland Co HD
1	Lower Delaware	19	Cedar Run at Burr's Mill Rd	SCEBURRS	Pineland Biological Community	Pinelands
5	Atlantic Coast	13	Cedar Run at Rt 9 in Stafford	AN0556	Benthic Macroinvertebrates	NJDEP AMNET
3	Lower Delaware	19	Cedar Run below Cedar Run Lake	WCEREFUG	Pineland Biological Community	Pinelands
1	Lower Delaware	19	Cedar Run Lake-19	WCEDARLK	Pineland Biological Community	Pinelands
1	Atlantic Coast	13	Cedar Run-Tidal	R17	Dissolved Oxygen	NJDEP Coastal Monitoring, Shellfish Monitoring
5	Atlantic Coast	13	Cedar Run-Tidal	R17	Total Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
5	Atlantic Coast	13	Ceder Creek Estuary	1702	Total Coliform	NJDEP Shellfish Monitoring

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
1	Lower Delaware	19	Centennial Lake-19	Centennial Lake	Fecal Coliform	Burlington Co HD
1	Raritan	08	Chambers Brook A at Coddington Rd in Readington	AN0372	Benthic Macroinvertebrates	NJDEP AMNET
1	Raritan	08	Chambers Brook A at Station Rd in Brburg	AN0373	Benthic Macroinvertebrates	NJDEP AMNET
4	Raritan	08	Chambers Brook at North Branch Depot	01399900	Fecal Coliform	NJDEP/USGS Data
3	Raritan	08	Chambers Brook at North Branch Depot	01399900	Phosphorus, pH, Total Suspended Solids	NJDEP/USGS Data
1	Raritan	08	Chambers Brook at North Branch Depot	01399900	Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Unionized Ammonia	NJDEP/USGS Data
3	Raritan	08	Chambers Brook B at Love Rd in Bedminster	AN0371	Benthic Macroinvertebrates	NJDEP AMNET
3	Lower Delaware	18	Chestnut Branch at Lambs Rd in Mantua	AN0670	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	18	Chestnut Branch at Mantua Blvd in Mantua	AN0671	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	12	Chingarora Creek-Tidal	36, R64	Fecal Coliform, Dissolved Oxygen	Monmouth Co HD, NJDEP Coastal Monitoring
1	Atlantic Coast	14	Chips Folly-14	Chips Folly	Fecal Coliform	Burlington Co HD
3	Atlantic Coast	14	Clark Branch at Burnt Mill Road in Waterford	AN0567, MCLBURNT	Pineland Biological Community	NJDEP AMNET, Pinelands
3	Atlantic Coast	14	Clark Branch at Parkdale	MCLJOHNS	Pineland Biological Community	Pinelands
1	Atlantic Coast	14	Clark Branch impoundment above Johnson Road	MCLIMPNT	Pineland Biological Community	Pinelands
1	Atlantic Coast	14	Clark Branch near Atsion	0140940480	Phosphorus, Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids,	USGS/Pinelands Data
1	Atlantic Coast	14	Clarks Mill Stream at Rt 575 in Port Republic	AN0613, LCLODESS	Pineland Biological Community	NJDEP AMNET, Pinelands
3	Lower Delaware	17	Clark's Pond Lake-17	Clark's Pond Lake	Phosphorus	NJDEP Clean Lakes
1	Lower Delaware	17	Clarks Pond-17	Clarks Pond Capps Day Camp Beach	Fecal Coliform	Cumberland Co HD
5	Lower Delaware	18	Clementon Lake-18	Clementon Lake	Fish-Mercury	NJDEP Fish Tissue Monitoring
1	Northeast	03	Cliffwood Lake-03	Cliffwood Lake	Fecal Coliform	Sussex Co HD
1	Northeast	03	CIInton Brook at LaRue Rd in West Milford	AN0261	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	03	Clinton Brook below Clinton Reservoir	PQ16	Temperature	Pequannock River Coalition
1	Northeast	03	Clinton Reservoir-03	Clinton Reservoir	Fish Community	NJDEP Freshwater Fisheries, NJDEP Fish Tissue Monitoring
5	Northeast	03	Clinton Reservoir-03	Clinton Reservoir	Fish-Mercury	NJDEP Freshwater Fisheries, NJDEP Fish Tissue Monitoring
5	Northwest	02	Clove Brook at Loomis Ave in Sussex	AN0309	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	01	Clove Brook at Rt 23 in Duttonville	EWQ0002	Phosphorus, Dissolved Oxygen, pH, Nitrate, Dissolved Solids, Total Suspended	EWQ
3	Northwest	01	Clove Brook at Rt 23 in Duttonville	EWQ0002	Temperature	EWQ
5	Northwest	01	Clove Brook at Rt 23 in Montague	AN0002	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	02	Clove Brook at Unionville Rd (Rt 651) in Wantage	AN0309A	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	02	Clove Brook at Unionville Rd (Rt 651) in Wantage	EWQ0309A	Phosphorus, Dissolved Oxygen, pH, Nitrate, Dissolved Solids, Total Suspended	EWQ
3	Northwest	02	Clove Brook at Unionville Rd (Rt 651) in Wantage	EWQ0309A	Temperature	EWQ
5	Northwest	02	Clove Brook UNK Trib at Rose Marrow Ave in Wantage	AN0308	Unknown Toxicity	NJDEP AMNET
3	Northwest	02	Clove Brook UNK Trib at Rose Marrow Ave in Wantage	AN0308	Benthic Macroinvertebrates	NJDEP AMNET
5	Northwest	02	Clove Lake-02	Clove Lake	Phosphorus	NJDEP Clean Lakes
5	Atlantic Coast	13	Coastal Tributaries-Tidal	1378	Total Coliform	NJDEP Shellfish Monitoring

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1	Atlantic Coast	13	Coastal Tributaries-Tidal	1806E, 1835A, 1835B	Total Coliform	NJDEP Shellfish Monitoring
3	Lower Delaware	17	Cohansey River at Beal Rd in Alloway	AN0709	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	17	Cohansey River at Rt 540 in Upper Deerfield	AN0710	Benthic Macroinvertebrates	NJDEP AMNET
1	Lower Delaware	17	Cohansey River at Seeley	01412800, 17-COH-1	Fecal Coliform, Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Cadmium, Chromium, Copper, Nickel,	NJDEP/USGS Data, Metal Recon
3	Lower Delaware	17	Cohansey River at Seeley	01412800, 17-COH-1	Arsenic, Mercury	NJDEP/USGS Data, Metal Recon
5	Lower Delaware	17	Cohansey River at Seeley	01412800, 17-COH-1	Phosphorus, pH, Lead	NJDEP/USGS Data, Metal Recon
5	Lower Delaware	17	Cohansey River at Silver Lk Rd in Upper Deerfield	AN0712	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	17	Cohansey River Estuary	Cohansey River Estuary	Total Coliform	NJDEP Shellfish Monitoring
1	Lower Delaware	17	Cohansey River-Tidal	R47, R48	Dissolved Oxygen	NJDEP Coastal Monitoring
1	Raritan	08	Cold Brook at Vliettown Rd in Tewksbury	AN0362	Benthic Macroinvertebrates	NJDEP AMNET
1	Northeast	03	Cold Spring Lake-03	Cold Spring Lake Conference Center	Fecal Coliform	Passaic Co HD
4	Northeast	05	Coles Brook at Hackensack	01378560	Fecal Coliform	NJDEP/USGS Data
1	Northeast	05	Coles Brook at Hackensack	01378560	Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended	NJDEP/USGS Data
5	Northeast	05	Coles Brook at Hackensack	01378560	Phosphorus	NJDEP/USGS Data
3	Northwest	01	Columbia Lake-01	Columbia Lake	Phosphorus	NJDEP Clean Lakes
5	Northeast	06	Community Assoc. of Prospect Point	Community Assoc. of Prospect Point	Fecal Coliform	Jefferson Twp HD
5	Atlantic Coast	12	Como Lake-12	Como Lake	Phosphorus	NJDEP Clean Lakes
5	Northeast	06	Conference Center Left and Right	Conference Center Left and Right	Fecal Coliform	Twp of Pequannock
1	Northeast	06	Cooks Pond-06	Cooks Lake Main Beach, Small Beach(1), and Cooks (2),	Fecal Coliform	Denville HD
1	Lower Delaware	17	Cool Run at Stockington - Pleasant Hill Rd in Alloway	AN0700	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	14	Cooper Branch above Burnt Mill Rd	MCOBURNT	Pineland Biological Community	Pinelands
1	Lower Delaware	19	Cooper Branch below Pakim Pond	GCOPAKIS	Pineland Biological Community	Pinelands
3	Atlantic Coast	14	Av	MCOIMPNT	Pineland Biological Community	Pinelands
4	Lower Delaware	18	Cooper River at Haddonfield	01467150, 01467140, 18-CO-4	Fecal Coliform	NJDEP/USGS Data, Metal Recon
5	Lower Delaware	18	Cooper River at Haddonfield	01467150, 01467140, 18-CO-4	Phosphorus, Arsenic, Lead, Tetrachloroethylene	NJDEP/USGS Data, Metal Recon
3	Lower Delaware	18	Cooper River at Haddonfield	01467150, 01467140, 18-CO-4	Cadmium, Mercury	NJDEP/USGS Data, Metal Recon
1	Lower Delaware	18	Cooper River at Haddonfield	01467150, 01467140, 18-CO-4	Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Chromium,	NJDEP/USGS Data, Metal Recon
5	Lower Delaware	18	Cooper River at Hopkins Pond	Cooper River at Hopkins Pond	Fish-PCB, Fish-Dioxin	NJDEP Fish Tissue Monitoring
5	Lower Delaware	18	Cooper River at Kaighn Ave in Camden	1467191	Phosphorus, pH	EWQ
1	Lower Delaware	18	Cooper River at Kaighn Ave in Camden	01467191	Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids,	EWQ
4	Lower Delaware	18	Cooper River at Lindenwold	01467120	Fecal Coliform	NJDEP/USGS Data
5	Lower Delaware	18	Cooper River at Lindenwold	01467120	Phosphorus	NJDEP/USGS Data
5	Lower Delaware	18	Cooper River at Rt 130 at Camden	18-CO-1	Tetrachloroethylene	NJDEP Metal Recon

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
3	Lower Delaware	18	Cooper River at Rt 130 at Camden	18-CO-1	Cadmium, Mercury	NJDEP Metal Recon
1	Lower Delaware	18	Cooper River at Rt 130 at Camden	18-CO-1	Chromium, Copper, Nickel, Selenium, Zinc	NJDEP Metal Recon
3	Lower Delaware	18	Cooper River Lake-18	Cooper River Lake	Phosphorus	NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring
5	Lower Delaware	18	Cooper River Lake-18	Cooper River Lake	Fish-PCB, Fish-Dioxin	NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring
4	Lower Delaware	18	Cooper River N Br at Kresson	01467155, 18-CO-2	Fecal Coliform	NJDEP/USGS Data, Metal Recon
5	Lower Delaware	18	Cooper River N Br at Kresson	01467155, 18-CO-2	Phosphorus, Dissolved Oxygen, pH, Arsenic	NJDEP/USGS Data, Metal Recon
3	Lower Delaware	18	Cooper River N Br at Kresson	01467155, 18-CO-2	Cadmium, Mercury	NJDEP/USGS Data, Metal Recon
1	Lower Delaware	18	Cooper River N Br at Kresson	01467155, 18-CO-2	Temperature, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Chromium, Copper, Lead,	NJDEP/USGS Data, Metal Recon
3	Lower Delaware	18	Cooper River N Br at Kresson Rd in Voorhees	AN0186	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	18	Cooper River N Br at River Dr in Cherry Hill	AN0188	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	18	Cooper River N Br at Springdale Rd in Cherry Hill	AN0187	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	18	Cooper River S Br at Evesham Rd in Cherry Hill	AN0190	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	18	Cooper River S Br at Gibbsboro Rd in Gibbsboro	AN0189	Benthic Macroinvertebrates	NJDEP AMNET
3	Lower Delaware	18	Cooper River S Br at Rt 41 in Cherry Hill	AN0191	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	18	Cooper River, spillway below Evans Pond	Cooper River, spillway below Evans Pond	Fish-PCB, Fish-Dioxin	NJDEP Fish Tissue Monitoring
3	Northwest	11	Copper Creek at Horseshoe Bend Rd in Kingwood	AN0084	Benthic Macroinvertebrates	NJDEP AMNET
4	Northwest	11	Copper Creek near Frenchtown	01458710	Fecal Coliform	NJDEP/USGS Data
3	Northwest	11	Copper Creek near Frenchtown	01458710	Phosphorus, Total Suspended Solids	NJDEP/USGS Data
1	Northwest	11	Copper Creek near Frenchtown	01458710	Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Unionized	NJDEP/USGS Data
5	Atlantic Coast	16	Cordery Creek Estuary	2308	Total Coliform	NJDEP Shellfish Monitoring
1	Atlantic Coast	16	Corson Sound	Corson Sound-1 thru 13	Dissolved Oxygen, Fecal Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
5	Atlantic Coast	16	Corson Sound	Crook Horn Creek-1,2; Corson Sound-6,9; Whale Creek-10,11; Ludlam Bay-7; Unnamed Creek-13	Total Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
1	Atlantic Coast	16	Corson Sound	Crook Horn Creek-3; Unnamed Creek-4; Corson Sound-5; Corson Inlet-8; Ludlam Bay-12	Total Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
1	Lower Delaware	19	Country Lake-19	Country Lakes	Fecal Coliform	Burlington Co HD
5	Northeast	06	Cozy Lake-06	Cozy Lakers	Fecal Coliform	Jefferson Twp HD
3	Lower Delaware	20	Crafts Creek at Gaunts Bridge Rd in Mansfield	AN0135	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	20	Crafts Creek at Island Rd in Mansfield	AN0136	Benthic Macroinvertebrates	NJDEP AMNET
1	Lower Delaware	20	Crafts Creek at Old York Rd in Mansfield	AN0137	Benthic Macroinvertebrates	NJDEP AMNET
4	Northwest	01	Cranberry Lake-01	Cranberry Lake	Phosphorus, Fish-Mercury	Sussex Co HD, NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
1	Northwest	01	Cranberry Lake-01	Cranberry Lake Club House and Rose Beach	Fecal Coliform	Sussex Co HD, NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring
4	Raritan	10	Cranbury Book near Prospect Plains	01400690	Fecal Coliform	NJDEP/USGS Data, EWQ
5	Raritan	10	Cranbury Book near Prospect Plains	01400690	pH	NJDEP/USGS Data, EWQ
1	Raritan	10	Cranbury Book near Prospect PlaIns	01400690	Phosphorus, Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia	NJDEP/USGS Data, EWQ
5	Raritan	10	Cranbury Brook at Applegarth Rd in Monearoe	AN0385	Benthic Macroinvertebrates	NJDEP AMNET
5	Raritan	10	Plainsboro	AN0386	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	01	Crandon Lakes-01	Crandon Lakes East and West	Fecal Coliform	Hunterdon Co HD
5	Atlantic Coast	15	Cranes Lake-15	Hospitality Creek Campground	Fecal Coliform	Gloucester Co HD
5	Northwest	01	Crater Lake-01	Crater Lake	Fish-Mercury	NJDEP Fish Tissue Monitoring
5	Atlantic Coast	16	Creesse Creek Estuary	3413A, 3500B, 3500C	Total Coliform	NJDEP Shellfish Monitoring
1	Northeast	06	Crooked Brook at Hemlock Rd in Montville	AN0252	Benthic Macroinvertebrates	NJDEP AMNET
1	Northeast	06	Crooked Brook at River Rd in Montville	AN0254	Benthic Macroinvertebrates	NJDEP AMNET
3	Northeast	06	Crooked Brook at Vista Rd in Montville	AN0253	Benthic Macroinvertebrates	NJDEP AMNET
1	Northeast	06	Crooked Brook near Towaco	01381050	Phosphorus, Fecal Coliform, Temperature, pH, Dissolved Oxygen, Nitrate, Unionized	NJDEP/USGS Data
3	Northeast	06	Crooked Brook near Towaco	01381050	Dissolved Solids, Total Suspended Solids	NJDEP/USGS Data
5	Raritan	08	Cross Roads Outdoor Ministries (Camp Beisler)	Cross Roads Outdoor Ministries (Camp Beisler)	Fecal Coliform	Bergen Co HD
5	Lower Delaware	20	Crosswicks Creek	Crosswicks Creek	Fish-Mercury	NJDEP Fish Tissue Monitoring
5	Lower Delaware	20	Crosswicks Creek at Extonville	01464500, 20-CRO-1	Phosphorus, Fecal Coliform	NJDEP/USGS Data, Metal Recon
3	Lower Delaware	20	Crosswicks Creek at Extonville	01464500, 20-CRO-1	Arsenic, Cadmium, Copper, Mercury	NJDEP/USGS Data, Metal Recon
1	Lower Delaware	20	Crosswicks Creek at Extonville	01464500, 20-CRO-1	Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Chromium,	NJDEP/USGS Data, Metal Recon
1	Lower Delaware	20	Crosswicks Creek at Extonville Rd in Hamilton	AN0125	Benthic Macroinvertebrates	NJDEP AMNET
4	Lower Delaware	20	Crosswicks Creek at Groveville Rd at Groveville	01464504, 20-CRO-2	Fecal Coliform	NJDEP/USGS Data, Metal Recon
5	Lower Delaware	20	Crosswicks Creek at Groveville Rd at Groveville	01464504, 20-CRO-2	Phosphorus	NJDEP/USGS Data, Metal Recon
1	Lower Delaware	20	Crosswicks Creek at Groveville Rd at Groveville	01464504, 20-CRO-2	Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Chromium,	NJDEP/USGS Data, Metal Recon
3	Lower Delaware	20	Crosswicks Creek at Groveville Rd at Groveville	01464504, 20-CRO-2	Arsenic, Cadmium, Mercury	NJDEP/USGS Data, Metal Recon
5	Lower Delaware	20	Crosswicks Creek at Main St in Hamilton	AN0126	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	20	Crosswicks Creek at Rt 528 (blw Oakford Lk) in New Egypt	AN0121D	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	20	Crosswicks Creek at Rt 537 in Plumsted	AN0121	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	20	Crosswicks Creek at Walnford Rd in Upper Freehold	2	Phosphorus	Monmouth Co HD
4	Lower Delaware	20	Crosswicks Creek at Walnford Rd in Upper Freehold	2	Fecal Coliform	Monmouth Co HD

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Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
3	Lower Delaware	20	Crosswicks Creek at Walnford Rd in Upper Freehold	2	pH, Total Suspended Solids	Monmouth Co HD
1	Lower Delaware	20	Crosswicks Creek at Walnford Rd in Upper Freehold	2	Nitrate	Monmouth Co HD
1	Lower Delaware	20	Crosswicks Creek near New Egypt	01464420	Fecal Coliform, Temperature, pH, Nitrate, Dissolved Solids, Unionized Ammonia	NJDEP/USGS Data
5	Lower Delaware	20	Crosswicks Creek near New Egypt	01464420	Phosphorus	NJDEP/USGS Data
3	Lower Delaware	20	Crosswicks Creek near New Egypt	01464420	Total Suspended Solids	NJDEP/USGS Data
5	Lower Delaware	20	Crosswicks Creek Trib S at Cookstown - New Egypt Rd in Cookstown	AN0121B	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	20	Crosswicks Creek UNK Trib at Iron Bridge Rd in Chesterfield	AN0126A	Benthic Macroinvertebrates	NJDEP AMNET
3	Raritan	10	Cruser Brook at Rt 206 in Montgomery	AN0403	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	03	Crystal Lake-03	Crystal Lake (Ramapo Mountain Lakes, Inc.)	Fecal Coliform	Bergen Co HD
3	Lower Delaware	20	Crystal Lake-20	Crystal Lake	Phosphorus	NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring
5	Lower Delaware	20	Crystal Lake-20	Crystal Lake	Fish-Mercury	NJDEP Fish Tissue Monitoring
5	Northwest	02	Crystal Springs-02	Crystal Springs: The Quarry	Fecal Coliform	Sussex Co HD
3	Raritan	09	Cuckels Brook at Rt 28 in Bridgewater	AN0415	Benthic Macroinvertebrates	NJDEP AMNET
3	Lower Delaware	17	Culliers Run UNK Trib at Bassett Rd in Mannington	AN0697	Benthic Macroinvertebrates	NJDEP AMNET
3	Northwest	01	Culvers Creek at Long Bridge Rd in Frankford	AN0018	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	01	Culvers Creek at Rt 206 in Frankford	AN0017	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	01	Culvers Lake-01	Culvers Lake	Fecal Coliform	Passaic Co HD
1	Northeast	03	Cupsaw Lake-03	Cupsaw Lake	Fecal Coliform	Ocean Co HD
5	Atlantic Coast	15	Cushman Lake-15	Collings Lakes #2 (Jays Lake North), Collings Lakes #3 (Jays Lake South)	Fecal Coliform	Atlantic Co HD
5	Northeast	03	Dam Brook Trib to Pompton River at Ryerson Rd in Lincoln Park	AN0269	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	14	Dans Bridge Branch at Dan Bridge Rd in Bass River	AN0611	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	13	Davenport Branch at Lacey Rd in Lacey	AN0540	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	13	Davenport Branch at Mule Rd in Berkeley	AN0541	Benthic Macroinvertebrates	NJDEP AMNET
5	Raritan	09	Davidsons Mill Pond-09	Davidsons Mill Pond	Fish Community	NJDEP Clean Lakes, Freshwater Fisheries
4	Raritan	09	Davidsons Mill Pond-09	Davidsons Mill Pond	Phosphorus	NJDEP Clean Lakes, Freshwater Fisheries
1	Lower Delaware	17	Davis Mill Pond-17	Davis Mill Pond	Fish Community	NJDEP Freshwater Fisheries
1	Raritan	08	Dawsons Brook at S Rd & Ironia Rd in Mendham	AN0347	Benthic Macroinvertebrates	NJDEP AMNET
3	Raritan	08	Dawsons Brook near Ironia	01398300	Oxygen	NJDEP/USGS Data
1	Raritan	08	Dawsons Brook near Ironia	01398300	Phosphorus, pH, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized	NJDEP/USGS Data
5	Northeast	06	Dead River at King George Rd in Bernards	AN0227	Benthic Macroinvertebrates	NJDEP AMNET
1	Northeast	06	Dead River at Somerville Rd (Liberty Cor) in Bernards	AN0226	Benthic Macroinvertebrates	NJDEP AMNET
4	Northeast	06	Dead River near Millington	01379200	Fecal Coliform	NJDEP/USGS Data

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Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
1	Northeast	06	Dead River near MillIngton	01379200	Temperature, pH, Dissolved Oxygen, Dissolved Solids, Unionized Ammonia	NJDEP/USGS Data
5	Northeast	06	Dead River near Millington	01379200	Solids	NJDEP/USGS Data
3	Northeast	06	Dead River UNK Trib at Somerville Rd (Liberty Cor) in Bernards	AN0225	Benthic Macroinvertebrates	NJDEP AMNET
4	Atlantic Coast	12	Deal Lake-12	1, Deal Lake	Phosphorus	NJDEP Clean Lakes, Monmouth Co HD
5	Atlantic Coast	12	Deal Lake-12	1, Deal Lake	Fecal Coliform	NJDEP Clean Lakes, Monmouth Co HD
3	Atlantic Coast	12	Debois Creek at Rt 33 in Freehold	AN0486	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	12	Debois Creek at Strickland Rd in Freehold	AN0487	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	16	Deep Creek Estuary	3300A, 3300B, 3300C	Total Coliform	NJDEP Shellfish Monitoring
5	Raritan	09	Deep Run at Rt 516 in Old Bridge	AN0454	Benthic Macroinvertebrates	NJDEP AMNET
3	Raritan	09	Deep Run at Rt 516 in Old Bridge	EWQ0454	Solids	EWQ
1	Raritan	09	Deep Run at Rt 516 in Old Bridge	EWQ0454	Temperature, Dissolved Oxygen, Dissolved Solids, Unionized Ammonia	EWQ
5	Raritan	09	Deep Run at Rt 516 in Old Bridge	EWQ0454	pH	EWQ
3	Atlantic Coast	15	Deep Run at Rt 559 in Hamilton	AN0637	Benthic Macroinvertebrates	NJDEP AMNET
5	Raritan	09	Deep Run at Rt 9 in Old Bridge	AN0453	Benthic Macroinvertebrates	NJDEP AMNET
3	Lower Delaware	17	Deep Run at Waterworks Rd in Alloway	AN0703	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	14	Deep Run below Hampton Rd	BDEEPDKE	Pineland Biological Community	Pinelands
3	Atlantic Coast	14	Deep Run impoundment below Hampton Rd (Lake 1741-14)	BDEEPIMP	Pineland Biological Community	Pinelands
3	Atlantic Coast	15	Deep Run UNK Trib at Rt 54 in Buena	AN0636	Benthic Macroinvertebrates	NJDEP AMNET
4	Northeast	04	Deepavaal Brook at Fairfield	01389138	Fecal Coliform	NJDEP/USGS Data
3	Northeast	04	Deepavaal Brook at Fairfield	01389138	Phosphorus, Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia	NJDEP/USGS Data
5	Northeast	04	Deepavaal Brook at Ltl Falls Ave in Fairfield	AN0271	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	13	Deer Head Lake-13	Deer Head - Upper Beach	Fecal Coliform	Sussex Co HD
1	Northwest	01	Deer Lake-01	Deer Lake	Fecal Coliform	Lincoln Park HD
1	Northeast	06	Deer Pond-06	Deer Lake Club (deep water/swim lanes) and (shallow water)	Fecal Coliform	Burlington Co HD
5	Northwest	02	Deer Trail Lake-02	Deer Trail Lake	Fecal Coliform	Sparta Twp HD
1	Lower Delaware	19	Delanco Camp Lake-19	Delanco Camp Meeting	Fecal Coliform	Cumberland Co HD
1	Northwest	01	Delawanna Creek at Rt 46 in Knowlton	AN0033	Benthic Macroinvertebrates	NJDEP AMNET
3	Delaware	16	Delaware Bay	Cape May Canal-9	Total Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring, Fish Tissue Monitoring, DRBC
5	Delaware	17	Delaware Bay	Cherry Tree Ck to Artificial Island-2,3,4; Cohansey Cove-6; Back Ck-7; Dyer Cove 8; Delaware Bay Inshore-10; Lower Maurice R-11; Dennis Ck-12; Delaware	Total Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring, Fish Tissue Monitoring, DRBC
3	Delaware	17	Delaware Bay	Delaware Bay East-5,14,15,16,17,19; Cohansey Cove-6, Back Ck-7, Dyer Cove 8, Cape May Canal-9, Delaware Bay Inshore-10, Lower Maurice R-11, Dennis	Fecal Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring, Fish Tissue Monitoring, DRBC

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
5	Delaware	17	Delaware Bay	Delaware Bay East-5,16,17; Delaware Bay Offshore-13; Delaware Bay Channel-21	Temperature	NJDEP Coastal Monitoring, Shellfish Monitoring, Fish Tissue Monitoring, DRBC
5	Delaware	17	Delaware Bay	Delaware Bay East-5,16,17; Dennis Ck-12; Delaware Bay Offshore-13; Cherry Tree Ck to Artificial Island-18; Delaware Bay Channel-22	Dissolved Oxygen	NJDEP Coastal Monitoring, Shellfish Monitoring, Fish Tissue Monitoring, DRBC
1	Delaware	17	Delaware Bay	Delaware Bay East-5; Delaware Bay Offshore-13; Delaware Bay East-16,17,19; Cherry Tree Ck to Artificial Island-18, Delaware Bay Channel-	Total Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring, Fish Tissue Monitoring, DRBC
1	Delaware	17	Delaware Bay	Delaware Bay-1, Cherry Tree Ck to Artificial Island-2,4,18; Delaware Bay Channel-20,21,22	Fecal Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring, Fish Tissue Monitoring, DRBC
1	Delaware	17	Delaware Bay	Delaware Bay-1, Cherry Tree Ck to Artificial Island-2,3,4; Cohansey Cove-6; Back Ck-7; Delaware Bay East-18; Delaware Bay Channel-20,22	Temperature	NJDEP Coastal Monitoring, Shellfish Monitoring, Fish Tissue Monitoring, DRBC
1	Delaware	17	Delaware Bay	Delaware Bay-1, Cherry Tree Ck to Artificial Island-2,3,4; Cohansey Cove-6; Back Ck-7; Dyer Cove-8; Cape May Canal-9; Delaware Bay Inshore-10; Lower Maurice R-11; Delaware Bay East-14,15,19; Delaware Bay Channel-	Dissolved Oxygen	NJDEP Coastal Monitoring, Shellfish Monitoring, Fish Tissue Monitoring, DRBC
1	Delaware	17	Delaware Bay	Delaware Bay-1; Cherry Tree Ck to Artificial Island-2,3,4; Delaware Bay East-18, Delaware Bay Channel-20,21,22	pH, Turbidity	NJDEP Coastal Monitoring, Shellfish Monitoring, Fish Tissue Monitoring, DRBC
5	Delaware	17	Delaware Bay	Delaware Bay-all	Fish-PCB	NJDEP Coastal Monitoring, Shellfish Monitoring, Fish Tissue Monitoring, DRBC
5	Delaware	17	Delaware Bay	Lower Maurice R-11	Fecal Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring, Fish Tissue Monitoring, DRBC
5	Delaware	17	Delaware Bay Tribs	Delaware River Tribs- All Tidal Portions	Fish-PCB, Fish-Dioxin	NJDEP Fish Tissue Monitoring
5	Delaware	17	Delaware Bay Tribs-Tidal	3841I-M, 3860B/C. 3862C/D,3884C/D	Total Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
1	Delaware	17	Delaware Bay Tribs-Tidal	R45, R46, R55	Dissolved Oxygen	NJDEP Coastal Monitoring, Shellfish Monitoring
3	Delaware	01	Delaware River Zone 1	1C1, 1C2, 1C3, 1D1, 1D5, 1E1, 1E3	Aquatic Life)	DRBC
3	Delaware	01	Delaware River Zone 1	1C1, 1C3, 1D4, 1D5, 1E1, 1E3	Fecal Coliform, Turbidity	DRBC
3	Delaware	01	Delaware River Zone 1	1C1, 1C3, 1D5, 1E1, 1E3	Dissolved Oxygen, pH	DRBC
1	Delaware	01	Delaware River Zone 1	1C2, 1D1, 1D2, 1D3, 1D4, 1D6, 1E2, 1E4, 1E5	Dissolved Oxygen, pH(except 1E4)	DRBC
5	Delaware	01	Delaware River Zone 1	1E4	pH	DRBC
1	Delaware	01	Delaware River Zone 1	1C2, 1D1, 1D2, 1D3, 1E4	Fecal Coliform	DRBC
5	Delaware	01	Delaware River Zone 1	1D2, 1D3, 1D4, 1D6	Total Dissolved Solids (Aquatic Life)	DRBC
1	Delaware	01	Delaware River Zone 1	1D2, 1D3, 1D4, 1D6, 1E2, 1E4, 1E5	Total Dissolved Solids (Drinking Water)	DRBC
5	Delaware	01	Delaware River Zone 1	1D6, 1E2, 1E5	Fecal Coliform	DRBC
1	Delaware	01	Delaware River Zone 1	1E2, 1E4, 1E5	Total Dissolved Solids (Aquatic Life)	DRBC
5	Delaware	01	Delaware River Zone 1	Delaware River at Easton PA	Lead, Mercury	304(l)
5	Delaware	01	Delaware River Zone 1	Delaware River Zone 1	Fish-Mercury	NJDEP Fish Tissue Monitoring

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1	Delaware	20	Delaware River Zone 2	Delaware River Zone 2, Delaware River 02040202-053	Dissolved Oxygen, Temperature, Fecal Coliform, pH, Turbidity, Total Dissolved Solids, Chloride, Toxicity, Chormium,	DRBC
3	Delaware	20	Delaware River Zone 2	Delaware River Zone 2, Reach 02040201 004	Arsenic	304(l), DRBC
1	Delaware	20	Delaware River Zone 2	Delaware River Zone 2, Reach 02040201 004	Chromium, Copper, Lead, Silver, Zinc	304(l), DRBC
5	Delaware	20	Delaware River Zone 2	Delaware River Zone 2, Reach 02040201 004	Cadmium, Mercury	304(l), DRBC
4	Delaware	18	Delaware River Zone 2	Delaware River Zone 2	PCBs	DRBC
1	Delaware	20	Delaware River Zone 3	Delaware River Zone 3, Delaware River 02040202-043	Fecal Coliform, pH, Turbidity, Total Dissolved Solids, Chloride, Toxicity,	DRBC
5	Delaware	20	Delaware River Zone 3	Delaware River Zone 3	Dissolved Oxygen, Temperatue	DRBC
5	Delaware	20	Delaware River Zone 3	Delaware River Zone 3, Reach 02040202 030	Cadmium	304(l)
5	Delaware	20	Delaware River Zone 3	Delaware River Zone 3, Reach 02040202 035	Arsenic, Cadmium, Mercury	304(l)
4	Delaware	18	Delaware River Zone 3	Delaware River Zone 3	PCBs	DRBC
1	Delaware	18	Delaware River Zone 4	Delaware River Zone 4	Dissolved Oxygen, Fecal Coliform, pH, Turbidity, Chloride, Toxicity, Chormium,	DRBC
5	Delaware	18	Delaware River Zone 4	Delaware River Zone 4	Temperature, Copper	DRBC
4	Delaware	18	Delaware River Zone 4	Delaware River Zone 4	PCBs	DRBC
5	Delaware	18	Delaware River, Lower	Delaware River (Camden to Delaware State Line)	Fish-Mercury	NJDEP Fish Tissue Monitoring
5	Delaware	20	Delaware River/Estuary	Delaware River/Estuary (Easton, PA to Delaware Bay and Tidal Tribs)	Fish-PCB, Fish-Dioxin	NJDEP Fish Tissue Monitoring
5	Delaware	20	Delaware River/Estuary	Delaware River/Estuary (Trenton to Delaware Bay)	DDT, DDE, DDD, Dieldrin; Fish-Mercury, Fish-DDT, Fish-DDE, Fish-DDD, Shellfish-	DRBC, NJDEP Fish Tissue Monitoring
1	Delaware	20	Delaware River/Estuary	Delaware River/Estuary (Trenton to head of Delaware Bay)	PAH	DRBC
1	Northeast	06	Den Brook at Mt Pleasant Tnpk in Denville	AN0247	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	16	Dennis Creek Estuary	1888M-V	Total Coliform	NJDEP Shellfish Monitoring
1	Atlantic Coast	16	Dennis Creek Trib 2 above Lake at Dennisville	01411427	Phosphorus, Temperature, Dissolved Oxygen, pH, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized	NJDEP/USGS Data
5	Atlantic Coast	16	Dennis Creek Trib 2 at Dennisville	01411428	pH	NJDEP/USGS Data
1	Atlantic Coast	16	Dennis Creek Trib 2 at Dennisville	01411428	Phosphorus, Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia	NJDEP/USGS Data
5	Atlantic Coast	16	Dennis Creek-Tidal	R38	Dissolved Oxygen	NJDEP Coastal Monitoring
3	Atlantic Coast	16	Dennisville Lake-16	Dennisville Lake	Phosphorus	NJDEP Clean Lakes
1	Atlantic Coast	16	Devauls Creek Estuary	3132	Total Coliform	NJDEP Shellfish Monitoring
5	Raritan	10	Devils Brook at New Rd in South Brunswick	AN0387	Benthic Macroinvertebrates	NJDEP AMNET
5	Raritan	10	Devils Brook at Schalk's Rd in Plainsboro	AN0389	Benthic Macroinvertebrates	NJDEP AMNET
5	Raritan	09	Devoe Lake-09	Devoe Lake	Fish-Mercury	NJDEP Clean Lakes,
4	Raritan	09	Devoe Lake-09	Devoe Lake	Phosphorus	NJDEP Clean Lakes,
4	Northeast	04	Diamond Brook at Fair Lawn	01389860	Fecal Coliform	NJDEP/USGS Data
3	Northeast	04	Diamond Brook at Fair Lawn	01389860	Suspended Solids	NJDEP/USGS Data

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
1	Northeast	04	Diamond Brook at Fair Lawn	01389860	Temperature, Dissolved Oxygen, Nitrate, Unionized Ammonia	NJDEP/USGS Data
3	Northeast	04	Diamond Brook at Hemlock St in Fair Lawn	AN0278	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	13	Dinner Point Creek Estuary	1713, 1713A, 1713B	Total Coliform	NJDEP Shellfish Monitoring
5	Lower Delaware	17	Dividing Creek Estuary	3840B, 3840C, 3840D, 3840E, 3840F, R44	Dissolved Oxygen, Total Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
4	Lower Delaware	20	Doctors Creek at Allentown	01464515	Fecal Coliform	NJDEP/USGS Data
5	Lower Delaware	20	Doctors Creek at Allentown	01464515	Phosphorus	NJDEP/USGS Data
1	Lower Delaware	20	Doctors Creek At Allentown	01464515	Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended	NJDEP/USGS Data
5	Lower Delaware	20	Doctors Creek at Breza Rd in Upper Freehold	AN0129, MB-123	Benthic Macroinvertebrates	NJDEP AMNET, Monmouth Co HD
3	Lower Delaware	20	Doctors Creek at Red Valley Rd in Upper Freehold	AN0127	Benthic Macroinvertebrates	NJDEP AMNET
1	Lower Delaware	20	Doctors Creek at Route 539 in Upper Freehold	3	Fecal Coliform, Nitrate	Monmouth Co HD
5	Lower Delaware	20	Doctors Creek at Route 539 in Upper Freehold	3	Phosphorus	Monmouth Co HD
3	Lower Delaware	20	Doctors Creek at Route 539 in Upper Freehold	3	pH, Total Suspended Solids	Monmouth Co HD
5	Lower Delaware	20	Doctors Creek at Rt 130 in Hamilton	AN0130	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	20	Doctors Creek at Sharon Station Rd in Upper Freehold	MB-PARK1	Benthic Macroinvertebrates	Monmouth Co HD
5	Lower Delaware	20	Doctors Creek at Spring Rd in Millstone	AN0127A	Benthic Macroinvertebrates	NJDEP AMNET
1	Lower Delaware	17	DOD Lake-17	DOD Lake	Fish Community	NJDEP Freshwater Fisheries
3	Northeast	05	Dorotockeys Run at Tappan Rd in Harrington Park	AN0210	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	05	Dorotockys Run on Old Tappan Rd, Old Tappan	5-DOR-1	Arsenic, Mercury	NJDEP Metal Recon
1	Lower Delaware	17	Double A Marina	Double A Marina	Fecal Coliform	Cape May Co HD
5	Atlantic Coast	13	Double Creek Estuary	1672, 1672A, 1673, 1673A	Total Coliform	NJDEP Shellfish Monitoring
4	Northwest	02	Double Kill at Waywayanda	01368820	Fecal Coliform	NJDEP/USGS Data
1	Northwest	02	Double Kill at Waywayanda	01368820	Phosphorus, Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Chromium, Copper, Lead, Nickel,	NJDEP/USGS Data
3	Northwest	02	Double Kill at Waywayanda	01368820	Arsenic, Cadmium, Mercury	NJDEP/USGS Data
5	Atlantic Coast	13	Double Trouble Lake-13	Double Trouble Lake	Fish-Mercury	NJDEP Fish Tissue Monitoring
3	Atlantic Coast	13	Dove Mill Branch at Grawtown Rd in Jackson	AN0522	Benthic Macroinvertebrates	NJDEP AMNET
1	Raritan	08	Drakes Brook at Bartley Long Valley Rd in WashIngton	AN0312	Benthic Macroinvertebrates	NJDEP AMNET
5	Raritan	08	Drakes Brook at Emans Rd in Roxbury	AN0311	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	16	Driftwood Camping Resorts Lake-16	Driftwood Camping Resorts	Fecal Coliform	Rockaway Twp HD
1	Northwest	01	Dry Brook at Mill Rd in Branchville	AN0020	Benthic Macroinvertebrates	NJDEP AMNET
3	Northwest	01	Dry Brook at Rt 519 in Frankford	AN0019	Benthic Macroinvertebrates	NJDEP AMNET
4	Northwest	01	Dry Brook at Rt 519 near Branchville	01443370, EWQ0020	Fecal Coliform	NJDEP/USGS Data, EWQ
1	Northwest	01	Dry Brook at Rt 519 near Branchville	01443370, EWQ0020	Phosphorus, Temperature, pH, Nitrate, Dissolved Oxygen,Dissolved Solids, Total Suspended Solids, Unionized Ammonia	NJDEP/USGS Data, EWQ
4	Raritan	10	Duck Pond Run at Clarksville	01401200	Fecal Coliform	Monmouth Co HD, NJDEP/USGS Data

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
3	Raritan	10	Duck Pond Run at Clarksville	01401200	Phosphorus, pH, Dissolved Oxygen, Dissolved Solids, Total Suspended Solids, Arsenic, Cadmium, Chromium,Copper,	Monmouth Co HD, NJDEP/USGS Data
1	Raritan	10	Duck Pond Run at Clarksville	01401200	Temperature, Nitrate, Unionized Ammonia	Monmouth Co HD, NJDEP/USGS Data
3	Raritan	10	Duck Pond Run at Rt 1 in West Windsor	AN0394	Benthic Macroinvertebrates	NJDEP AMNET
3	Raritan	09	Dukes Brook at Dukes Pkwy in Hillsborough	AN0375	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	04	Dundee Lake-04	Dundee Lake	Fish-Mercury	NJDEP Fish Tissue Monitoring
1	Northwest	01	Dunnfield Creek at Dunnfield	01442760	Phosphorus, Fecal Coliform, Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Chromium, Copper, Nickel,	NJDEP/USGS Data
5	Northwest	01	Dunnfield Creek at Dunnfield	01442760	pH	NJDEP/USGS Data
3	Northwest	01	Dunnfield Creek at Dunnfield	01442760	Zinc	NJDEP/USGS Data
1	Northwest	01	Dunnfield Creek at River Rd (off Rt 80) in Hardwick	AN0012	Benthic Macroinvertebrates	NJDEP AMNET
1	Northeast	06	Durham Pond-06	Camp Winnebago	Fecal Coliform	Sussex Co HD
1	Northeast	05	Dwars Kill at End of Anderson Ave in Alpine	AN0208	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	05	Dwars Kill on Blanch Ave., Norwood	5-DWA-1	Mercury	NJDEP Metal Recon
1	Raritan	09	East Brunswick Community Lake-09	East Brunswick Community Lake	Fish Community	NJDEP Freshwater Fisheries
5	Atlantic Coast	16	East Creek Lake-16	East Creek Lake	Fish-Mercury	NJDEP Fish Tissue Monitoring
3	Atlantic Coast	16	East Creek Pond-16	East Creek Pond	Phosphorus	NJDEP Clean Lakes
1	Northwest	02	East Highland Lake-02	Highland Lake, Lake 3 Beach 6	Fecal Coliform	Passaic Co HD
5	Lower Delaware	17	Eastern Gate Lake-17	Eastern Gate Lake	Fecal Coliform	Gloucester Co HD
3	Atlantic Coast	13	Echo Lake at Maxim-Southard Rd In Howell	67	pH, Total Suspended Solids	Monmouth Co HD
1	Atlantic Coast	13	Echo Lake at Maxim-Southard Rd in Howell	67	Phosphorus, Fecal Coliform, Nitrate	Monmouth Co HD
1	Northeast	03	Echo Lake-03	Echo Lake	Fecal Coliform, Fish Community	NJDEP Freshwater Fisheries, Atlantic Co HD, NJDEP Fish Tissue Monitoring
5	Northeast	03	Echo Lake-03	Echo Lake Reservoir	Fish-Mercury	NJDEP Freshwater Fisheries, Atlantic Co HD, NJDEP Fish Tissue Monitoring
4	Raritan	07	Echo Lake-07	Echo Lake	Phosphorus	NJDEP Clean Lakes
5	Raritan	09	Edmunds Creek	Adjacent to Mill Brook at 02030105-059-0.00; Trib to Lower Raritan River	PCB	Remanded 303d List, (F.R. V.66, #195, 10/9/01)
1	Atlantic Coast	16	Edward Creek Estuary	3011c	Total Coliform	NJDEP Shellfish Monitoring
5	Lower Delaware	18	Edwards Run at Jefferson	01475090	Phosphorus , Fecal Coliform	NJDEP/USGS Data
1	Lower Delaware	18	Edwards Run at Jefferson	01475090	Temperature, Dissolved Oxygen, pH, Nitrate, Dissolved Solids, Total Suspended	NJDEP/USGS Data
5	Lower Delaware	18	Edwards Run at Jessups Mill Rd in Mantua	AN0674	Benthic Macroinvertebrates	NJDEP AMNET
3	Lower Delaware	18	Edwards Run at Pitman - Jefferson Rd in Harrison	AN0673	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	14	Egg Harbor City Lake-14	Egg Harbor City Lake (Eastside) and (Westside), LINLAKED	Pineland Biological Community	Denville HD, Pinelands
1	Atlantic Coast	14	Egg Harbor City Lake-14	Egg Harbor City Lake (Eastside) and (Westside), LINLAKED	Fecal Coliform	Denville HD, Pinelands
1	Raritan	08	Electric Brook at Fairview Ave in Washington	AN0314	Benthic Macroinvertebrates	NJDEP AMNET

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
5	Raritan	07	Elizabeth River at Lakeview Rd & Maple Terr in Union	AN0202X	Benthic Macroinvertebrates	NJDEP AMNET
1	Raritan	07	Elizabeth River at North Ave in Hillside	AN0204	Benthic Macroinvertebrates	NJDEP AMNET
5	Raritan	07	Elizabeth River at Summer St in Hillside	AN0204X	Benthic Macroinvertebrates	NJDEP AMNET
1	Raritan	07	Elizabeth River at Ursino Lake in Elizabeth	01393450	Temperature, pH, Dissolved Oxygen, Nitrate, Total Suspended Solids, Unionized	NJDEP/USGS Data, Metal Recon
4	Raritan	07	Elizabeth River at Ursino Lake in Elizabeth	01393450, 7-ELI-2	Fecal Coliform,	NJDEP/USGS Data, Metal Recon
5	Raritan	07	Elizabeth River at Ursino Lake in Elizabeth	01393450, 7-ELI-2	Phosphorus, Dissolved Solids	NJDEP/USGS Data, Metal Recon
3	Raritan	07	Elizabeth River at Ursino Lake in Elizabeth	01393450, 7-ELI-2	Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium, Silver,	NJDEP/USGS Data, Metal Recon
3	Raritan	07	Elizabeth River on Columbia Ave in Hillside	7-ELI-1	Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium, Silver,	NJDEP Metal Recon
3	Raritan	07	Elizabeth River W Br at Vaux Hall Rd in Union	AN0202	Benthic Macroinvertebrates	NJDEP AMNET
4	Raritan	07	Elizabeth River W Br near Union	01393350, 7-WBE-1	Fecal Coliform	NJDEP/USGS Data, Metal Recon
5	Raritan	07	Elizabeth River W Br near Union	01393350, 7-WBE-1	Phosphorus	NJDEP/USGS Data, Metal Recon
3	Raritan	07	Elizabeth River W Br near Union	01393350, 7-WBE-1	pH, Dissolved Oxygen, Dissolved Solids, Arsenic, Thallium	NJDEP/USGS Data, Metal Recon
1	Raritan	07	Elizabeth River W Br near Union	01393350, 7-WBE-1	Temperature, Nitrate, Total Suspended Solids, Unionized Ammonia, Cadmium, Chromium, Copper, Lead, Mercury, Nickel,	NJDEP/USGS Data, Metal Recon
3	Atlantic Coast	14	Elliots Creek at Bremen Ave in Galloway	AN0591, LELIOBRE	Pineland Biological Community	NJDEP AMNET, Pinelands
5	Atlantic Coast	14	Elm(James) Lake-14	NGREAR30	Pineland Biological Community	Pinelands
1	Lower Delaware	17	Elmer Lake-17	Elmer Lake	Fish Community	NJDEP Freshwater Fisheries
5	Northeast	03	Erskine Lake-03	Erskine Little Beach, Main Beach, and Upper Beach	Fecal Coliform	Passaic Co HD
1	Northeast	06	Estling Lake-06	Estling Lake	Fecal Coliform	Sussex Co HD
5	Raritan	10	Etra Lake-10	Etra Lake	Phosphorus	NJDEP Clean Lakes
3	Lower Delaware	18	Evans Lake-18	Evans Lake	Phosphorus	NJDEP Clean Lakes
5	Lower Delaware	18	Evans Pond-18	Evans Pond	Fish-PCB, Fish-Dioxin	NJDEP Fish Tissue Monitoring
3	Atlantic Coast	13	Factory Branch at Whiting Lacey Rd in Lacey	AN0547	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	01	Fairview Lake-01	Fairview Lake YMCA, Fairview Lake: Blue Mt. Day Camp	Fecal Coliform	Passaic Co HD
3	Atlantic Coast	15	Faraway Branch at Jackson Rd in Monroe	AN0629	Benthic Macroinvertebrates	NJDEP AMNET
1	Northeast	03	Farm Crest Acres-03	Farm Crest Acres Assoc.	Fecal Coliform	Sparta Twp HD
3	Raritan	09	Farrington Lake-09	Farrington Lake	Phosphorus	NJDEP Clean Lakes, NJDEP Freshwater Fisheries
1	Raritan	09	Farrington Lake-09	Lake Farrington	Fish Community	NJDEP Clean Lakes, NJDEP Freshwater Fisheries
1	Northwest	02	Fawn Lake-02	Fawn Lake	Fecal Coliform	Burlington Co HD
3	Atlantic Coast	14	Featherbed Branch below Carranza Rd	WFEACARR	Pineland Biological Community	Pinelands
1	Atlantic Coast	14	Featherbed Branch impoundment below Carranza Rd (Lake 1768-14)	WFEIMPD1	Pineland Biological Community	Pinelands
3	Raritan	08	First Neshanic River at Rt 31 in Raritan	AN0330	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	16	FishIng Creek at Rio Grande	01411400	pH	NJDEP/USGS Data

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Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
1	Atlantic Coast	16	FishIng Creek at Rio Grande	01411400	Phosphorus, Fecal Coliform, Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized	NJDEP/USGS Data
5	Atlantic Coast	16	Fishing Creek at Rt 47 in Middle	AN0771	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	16	Fishing Creek Estuary	Fishing Creek Estuary	Total Coliform	NJDEP Shellfish Monitoring
1	Lower Delaware	19	Flamingo Lake-19	Clubhouse Marlton Lake Civic Assn., East Lake Marlton Lake Civic Assn.	Fecal Coliform	Sussex Co HD
1	Northwest	01	Flat Brook at Rt 615 in Walpack	AN0007, AN0008	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	01	Flat Brook near Flatbrookville	01440000, DRBC/NPS32	Phosphorus, Fecal Coliform, Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized	NJDEP/USGS Data, DRBC
5	Atlantic Coast	12	Flat Creek at Middle Rd in Hazlet	AN0459	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	03	Forest Hill Lake-03	Forest Hill Park Beach, Forest Hill Park Inlet	Fecal Coliform	Passaic Co HD
5	Northwest	01	Forest Lake-01	Forest Lake: Boardwalk Beach, Cove Beach, Harbor View Beach, Main Beach	Fecal Coliform	Sussex Co HD
5	Atlantic Coast	13	Forked River Estuary	1661	Total Coliform	NJDEP Shellfish Monitoring
3	Atlantic Coast	13	Forked River N Br at powerlines in Lacey	AN0551	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	13	Forked River N Br near Forked River	01409050	Phosphorus, Fecal Coliform, Temperature, pH, Dissolved Oxygen, Nitrate, Disolved Solids, Total Suspended Solids, Unionized	NJDEP/USGS Data
1	Atlantic Coast	13	Forked River N Br-Tidal	R13	Dissolved Oxygen	NJDEP Coastal Monitoring
1	Atlantic Coast	13	Forked River S Br-Tidal	R14	Dissolved Oxygen	NJDEP Coastal Monitoring
5	Lower Delaware	17	Fortescue Creek Estuary	3840L, 3862E, 3862G, 3862H, 3841K, 3841L, 3841M	Total Coliform	NJDEP Shellfish Monitoring
3			Foulers Brook	Foulers Brook	Benthic Macroinvertebrates	NJDEP AMNET
3			Foulertons Brook	Foulertons Brook	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	15	Four Mile Branch at Malaga Rd (Rt 536) in Monroe	AN0622	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	13	Four Mile Branch at Oxycocus St in Stafford	AN0554	Benthic Macroinvertebrates	NJDEP AMNET
5	Northwest	01	Fox Hollow Lake-01	Fox Hollow Lake	Fecal Coliform	Sparta Twp HD
3	Lower Delaware	17	Foxmill Lake-17	Foxmill Lake	Phosphorus	NJDEP Clean Lakes
5	Northeast	06	Foxs Pond-06	Park Lake Beach, Inlet, and Swim Lanes	Fecal Coliform	Randoph Twp HD
1	Northeast	03	Franklin Lake-03	Indian Trail Club Lakes 1 through 12	Fecal Coliform	Bergen Co HD
4	Atlantic Coast	12	Franklin Lake-12	Franklin Lake	Phosphorus	NJDEP Clean Lakes
5	Lower Delaware	17	Franklinville Lake-17	Franklinville Lake	Fecal Coliform	Gloucester Co HD
1	Northwest	01	Frenches Pond-01	Mt Allamuchy Scout Reservation	Fecal Coliform	Sussex Co HD
3	Lower Delaware	19	Friendship Creek at Friendship Rd in Tabernacle	AN0152, SFRPOWEL	Pineland Biological Community	NJDEP AMNET, Pinelands
3	Lower Delaware	19	Friendship Creek at Irick's Causeway	SFRIRICK	Pineland Biological Community	Pinelands
3	Lower Delaware	19	Friendship Creek at Retreat Rd in Southampton	AN0155, SFRRETRE	Pineland Biological Community	NJDEP AMNET, Pinelands
1	Raritan	08	Furmans Brook at Welisewitz Rd in East Amwell	AN0336	Benthic Macroinvertebrates	NJDEP AMNET
5	Northwest	01	Furnace Brook at Pequest Rd in White	AN0042	Benthic Macroinvertebrates	NJDEP AMNET
5	Northwest	01	Furnace Lake-01	Furnace Lake Beach	Fecal Coliform	Warren Co HD
3	Lower Delaware	17	Game Creek at Rt 48 in Carneys Point	AN0696	Benthic Macroinvertebrates	NJDEP AMNET

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Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
5	Lower Delaware	17	Gandy's Beach	Gandy's Beach	Fecal Coliform	Cumberland Co HD
1	Atlantic Coast	16	Garden Park Lake-16	Garden Park Lake	Fecal Coliform	Cape May Co HD
1	Northwest	01	Garden State Academy Pond-01	Garden State Academy Pond	Fecal Coliform	Sussex Co HD
1	Lower Delaware	17	Garrison Lake-17	Lake Garrison North and South	Fecal Coliform	Gloucester Co HD
1	Northwest	02	Gerard Lake-02	Lake Gerard	Fecal Coliform	Sparta Twp HD
4	Northwest	01	Ghost Lake-01	Ghost Lake	Phosphorus	NJDEP Clean Lakes
3	Atlantic Coast	15	Gibson Creek at Rt 50 in Estell Manor	AN0647	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	15	Gibson Creek at Rt 50 near Corbin	01411241	Dissolved Oxygen	NJDEP/USGS Data
1	Atlantic Coast	15	Gibson Creek at Rt 50 near CorbIn	01411241	Phosphorus, Fecal Coliform, Temperature, pH, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia	NJDEP/USGS Data
1	Lower Delaware	18	Gilman Lake-18	Lake Gilman	Fecal Coliform	Gloucester Co HD
1	Northwest	02	Glen Harbor HOA	Glen Harbor HOA	Fecal Coliform	Sussex Co HD
1	Northwest	02	Glen Lake	Glen Lake	Fecal Coliform	Sparta Twp HD
1	Northeast	03	Glen Wild Lake-03	Glen Wild Lake, Glenwild Lake	Fecal Coliform	Passaic Co HD
1	Northwest	02	Glenwood Lake-02	Lake Glenwood	Fecal Coliform	Sussex Co HD
4	Northeast	04	Goffle Brook at Hawthorne	01389850	Fecal Coliform	NJDEP/USGS Data
1	Northeast	04	Goffle Brook at Hawthorne	01389850	Phosphorus, Temperature, pH, Dissolved Oxygen, Nitrate, Total Suspended Solids,	NJDEP/USGS Data
3	Northeast	04	Goffle Brook at Hawthorne	01389850	Dissolved Solids	NJDEP/USGS Data
5	Northeast	04	Goffle Brook at Wagaraw Rd in Hawthorne	AN0277	Benthic Macroinvertebrates	NJDEP AMNET
3	Northeast	04	Goffle Brook at Wyckoff Ave in Midland Park	AN0277A	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	11	Gold Run at Rt 29 & L Ferry Rd in Ewlng	AN0107	Benthic Macroinvertebrates	NJDEP AMNET
3	Northeast	03	Gordon Lakes-03	Gordon Lake	Fecal Coliform	Passaic County HD
3	Atlantic Coast	14	Goshen Pond-14	MMUGOSHN	Pineland Biological Community	Pinelands
5	Atlantic Coast	12	Gravelly Brook at Church St in Aberdeen	AN0457	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	12	Gravelly Brook at Lloyd Rd in Marlboro	20	Phosphorus	Monmouth Co HD
1	Atlantic Coast	12	Gravelly Brook at Lloyd Rd in Marlboro	20	Fecal Coliform, Nitrate	Monmouth Co HD
3	Atlantic Coast	12	Gravelly Brook at Lloyd Rd in Marlboro	20	pH, Total Suspended Solids	Monmouth Co HD
1	Lower Delaware	17	Gravelly Run at Laurel Lake	01411955	Phosphorus, Fecal Coliform, Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia,Chromium, Nickel, Selenium,	NJDEP/USGS Data
3	Lower Delaware	17	Gravelly Run at Laurel Lake	01411955	Mercury, Silver	NJDEP/USGS Data
3	Atlantic Coast	15	Gravelly Run at Rt 559 in Hamilton	AN0641	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	14	Great Bay	Great Bay-1 thru 6	Dissolved Oxygen, Fecal Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
5	Atlantic Coast	14	Great Bay	Great Bay-1,2,3	Total Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
1	Atlantic Coast	14	Great Bay	Great Bay-4; Broad Creek-5; Main Marsh Creek-6	Total Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
3	Northeast	06	Great Brook at Blackberry Ln in Morris	AN0218	Benthic Macroinvertebrates	NJDEP AMNET
1	Northeast	06	Great Brook at Blackwells Pl in HardIng	AN0217	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	06	Great Brook at Woodland Rd (Gr Swamp WMA) in Harding	AN0219	Benthic Macroinvertebrates	NJDEP AMNET

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
5	Atlantic Coast	15	Great Egg Harbor	Great Egg Harbor-1, 4 thru 11, and 13 thru 14	Total Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
1	Atlantic Coast	15	Great Egg Harbor	Steelman Bay-2; Ship Channel-3,12	Total Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
1	Atlantic Coast	15	Great Egg Harbor	Great Egg Harbor-1 thru 11 and 13	Dissolved Oxygen	NJDEP Coastal Monitoring, Shellfish Monitoring
1	Atlantic Coast	15	Great Egg Harbor	Great Egg Harbor-1 thru 14	Fecal Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
5	Atlantic Coast	15	Great Egg Harbor	Ship Channel-12; Ocean City Bay-14	Dissolved Oxygen	NJDEP Coastal Monitoring, Shellfish Monitoring
5	Atlantic Coast	15	Great Egg Harbor River at Camden Co. Park in Berlin	AN0620A	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	15	Great Egg Harbor River at Folsom	01411000, 15-GEH-2	pH, Copper, Lead	NJDEP/USGS Data, Metal Recon
3	Atlantic Coast	15	Great Egg Harbor River at Folsom	01411000, 15-GEH-2	Arsenic, Cadmium, Mercury	NJDEP/USGS Data, Metal Recon
1	Atlantic Coast	15	Great Egg Harbor River at Folsom	01411000, 15-GEH-2	Phosphorus, Fecal Coliform, Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Chromium, Nickel, Selinium,	NJDEP/USGS Data, Metal Recon
3	Atlantic Coast	15	Great Egg Harbor River at Rt 54 in Folsom	AN0625	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	15	Great Egg Harbor River at Rt 559 in Hamilton	AN0635	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	15	Great Egg Harbor River at Watsontown-New Freedom Rd in Berlin	AN0620	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	15	Great Egg Harbor River at Weymouth	01411110, 15-GEH-3	Arsenic, Cadmium, Mercury	NJDEP/USGS Data, Metal Recon
1	Atlantic Coast	15	Great Egg Harbor River at Weymouth	01411110, 15-GEH-3	Phosphorus, Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia,	NJDEP/USGS Data, Metal Recon
4	Atlantic Coast	15	Great Egg Harbor River at Weymouth	01411110, 15-GEH-3	Fecal Coliform	NJDEP/USGS Data, Metal Recon
5	Atlantic Coast	15	Great Egg Harbor River at Weymouth	01411110, 15-GEH-3	pH, Copper	NJDEP/USGS Data, Metal Recon
3	Atlantic Coast	15	Great Egg Harbor River at Williamstown - New Freedom Rd in Winslow	AN0621	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	15	Great Egg Harbor River at Williamstown - Winslow Rd in Monroe	AN0623	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	15	Great Egg Harbor River Estuary	Great Egg Harbor River Estuary	Arsenic, Cadmium, Chromium, Lead, Mercury, Nickel, Zinc	304(l), NJDEP Coastal Monitoring, Shellfish Monitoring
1	Atlantic Coast	15	Great Egg Harbor River Estuary	R36, 2801, 2801A, 2804, 2812, 2814, 2814A, 2821B, 2822A, 2827A	Dissolved Oxygen	304(l), NJDEP Coastal Monitoring, Shellfish Monitoring
5	Atlantic Coast	15	Great Egg Harbor River Middle Estuary	2807A, 2807B, 2810, 2810A, 2812, 2805, 2806, 2808, 2808A	Total Coliform	NJDEP Shellfish Monitoring
1	Atlantic Coast	15	Great Egg Harbor River near Blue Anchor	01410820	Total Phosphorus, Fecal Coliform	NJDEP/USGS Data
5	Atlantic Coast	15	Great Egg Harbor River near Sicklerville	01410784, 15-GEH-1	pH, Mercury	NJDEP/USGS Data, NAWQA, Metal Recon
3	Atlantic Coast	15	Great Egg Harbor River near Sicklerville	01410784, 15-GEH-1	Arsenic, Cadmium, Lead	NJDEP/USGS Data, NAWQA, Metal Recon
1	Atlantic Coast	15	Great Egg Harbor River near Sicklerville	01410784, 15-GEH-1	Phosphorus, Fecal Coliform, Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Chromium, Copper, Nickel,	NJDEP/USGS Data, NAWQA, Metal Recon

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
5	Atlantic Coast	15	Great Egg Harbor River Trib at 2nd Ave in Hammonton	AN0635H	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	15	Great Egg Harbor River Upper Estuary	2812B, 2814,2814A, 2816,2816A, 2816B, 2818, 2818A, 2819, 2821,2821A, 2821B, 2821C, 2821D, 2822A, 2823A,2824A, 2824B, 2825, 2826,2826A, 2827,2827A	Total Coliform	NJDEP Shellfish Monitoring
1	Northwest	02	Great Gorge-02	The Resorts Club Lake (Spa at Great Gorge Lake)	Fecal Coliform	Sussex Co HD
1	Atlantic Coast	16	Great Sound	Great Sound-1 thru 6	Dissolved Oxygen, Fecal Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
5	Atlantic Coast	16	Great Sound	Gravens Thorofare-1; Long Reach-5; Holmes Cove-6	Total Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
1	Atlantic Coast	16	Great Sound	Great Sound-2; Ingram Thorofare-3; Long Reach-4	Total Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
5	Atlantic Coast	14	Great Swamp Branch at Rt 206 in Hammonton	AN0574, NGRMIDDL	Pineland Biological Community	NJDEP AMNET, Pinelands
3	Atlantic Coast	14	Great Swamp Branch at Rt 30 in Winslow	AN0573	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	14	Great Swamp Branch Below Rt 206 near Hammonton	0140941070	pH, Nitrate	NJDEP/USGS Data
1	Atlantic Coast	14	Great Swamp Branch Below Rt 206 near Hammonton	0140941070	Phosphorus, Fecal Coliform, Temperature, Dissolved Oxygen, Dissolved Solids, Total Suspended Solids, Unionized Ammonia	NJDEP/USGS Data
5	Atlantic Coast	14	Great Swamp Branch Impoundment above Myrtle Street (Lake 1970-14)	NGRMYRTL	Pineland Biological Community	Pinelands
1	Lower Delaware	17	Green Branch at Crow Pond Rd in Pittsgrove	AN0736	Benthic Macroinvertebrates	NJDEP AMNET
1	Lower Delaware	17	Green Branch at Jesse Bridge Rd in Pittsgrove	AN0737	Benthic Macroinvertebrates	NJDEP AMNET
5	Raritan	09	Green Brook at Apple Tree Rd in Watchung.	AN0421B	Benthic Macroinvertebrates	NJDEP AMNET
5	Raritan	09	Green Brook at Clinton Ave in North Plainfield	AN0423	Benthic Macroinvertebrates	NJDEP AMNET
3	Raritan	09	Green Brook at Green Brook Park, Park Dr. in Raritan R	Green Brook at Green Brook Park, Park Dr. in Raritan R	Benthic Macroinvertebrates	NJDEP AMNET
5	Raritan	09	Green Brook at Main St in Bound Brook	AN0426	Benthic Macroinvertebrates	NJDEP AMNET
5	Raritan	09	Green Brook at New Providence Rd in Seeleys Mill	AN0421A	Benthic Macroinvertebrates	NJDEP AMNET
4	Raritan	09	Green Brook at North Plainfield	01403470	Fecal Coliform	NJDEP/USGS Data
3	Raritan	09	Green Brook at North Plainfield	01403470	pH, Temperature, Dissolved Oxygen, Dissolved Solids, Total Suspended Solids	NJDEP/USGS Data
1	Raritan	09	Green Brook at North PlaInfield	01403470	Phosphorus, Nitrate, Unionized Ammonia	NJDEP/USGS Data
5	Raritan	09	Green Brook at off Mill Rd in Sebrings Mill	AN0426A	Benthic Macroinvertebrates	NJDEP AMNET
5	Raritan	09	Green Brook at Raymond Ave in Plainfield	AN0421	Benthic Macroinvertebrates	NJDEP AMNET
1	Northeast	03	Green Brook at Union Valley Rd in West Milford	AN0255D	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	16	Green Creek at Rt 47 in Middle	AN0770	Benthic Macroinvertebrates	NJDEP AMNET
3	Northeast	06	Green Pond Brook at Dover	01379800	Phosphorus, Fecal Coliform, pH, Dissolved Oxygen, Temperature, Nitrate, Total Dissolved Solids, Total Suspended Solids	NJDEP/USGS Data
5	Northeast	06	Green Pond Brook at Mt Pleasant Tnpk in Wharton	AN0242	Benthic Macroinvertebrates	NJDEP AMNET
1	Northeast	06	Green Pond-06	Green Pond 1, 2, and D	Fecal Coliform	Rockaway Twp HD
5	Northeast	03	Green Turtle Lake-03	Green Turtle Lake	Fish-Mercury	NJDEP Fish Tissue Monitoring
5	Northwest	01	Green Valley Beach Campground	Green Valley Beach Campground	Fecal Coliform	Sussex Co HD

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1	Northeast	03	Greenbrook Lake-03	Greenbrook POA	Fecal Coliform	Passaic Co HD
3	Lower Delaware	18	Greenwich Lake-18	Greenwich Lake	Phosphorus	NJDEP Clean Lakes
3	Lower Delaware	19	Greenwood Branch at New Lisbon Rd	01466900	Fecal Coliform	NJDEP/USGS Data
1	Lower Delaware	19	Greenwood Branch at New Lisbon Rd	01466900	Phosphorus, Temperature, Dissolved Oxygen, pH, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized	NJDEP/USGS Data
1	Lower Delaware	19	Greenwood Branch at New Lisbon Rd in Pemberton	AN0148, GGRMEADO, GGRIMPNT	Pineland Biological Community	NJDEP AMNET, Pinelands
5	Northeast	03	Greenwood Lake-03	Greenwood Lake	Phosphorus, Sedimentation, Dissolved Oxygen	Passaic Co HD, NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring
			Greenwood Lake-03	Greenwood Lake Beach Assoc, Lakeside Community Club	Fecal Coliform	Passaic Co HD, NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring
5	Lower Delaware	18	Grenloch Lake-18	Grenloch Lake	Phosphorus	NJDEP Clean Lakes
5	Atlantic Coast	13	Ground Hog Brook at Locust Ave in Howell	MB-139	Benthic Macroinvertebrates	Monmouth Co HD
5	Raritan	10	Grove Mill Pond-10	Grovers Mill Pond	Fish-Mercury	NJDEP Fish Tissue Monitoring
3	Atlantic Coast	14	Gun Branch at Rt 206 in Hammonton	AN0568G	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	05	Hackensack River - Tidal	Hackensack River - Tidal	Mercury, Fish-PCB, Fish-Dioxin	NJDEP Metal Recon, HEP (GLEC), EPA, 1999; NJDEP Fish Tissue Monitoring
1	Northeast	05	Hackensack River - Tidal	Hackensack River - Tidal	Copper, Lead	NJDEP Metal Recon, HEP (GLEC), EPA, 1999; NJDEP Fish Tissue Monitoring
4	Northeast	05	Hackensack River - Tidal	Hackensack River - Tidal	Nickel	NJDEP Metal Recon, HEP (GLEC), EPA, 1999; NJDEP Fish Tissue Monitoring
3	Northeast	05	Hackensack River - Tidal (Pulaski Skyway)	Passaic-H1, Passaic-H2	Fecal Coliform	PVSC
1	Northeast	05	Hackensack River - Tidal (Pulaski Skyway)	Passaic-H1, Passaic-H2	Unionized Ammonia	PVSC
3	Northeast	05	Hackensack River - Tidal at Secaucus	Location A	Fecal Coliform	Hudson Co HD
5	Northeast	05	Hackensack River at New Milford	01378500	Phosphorus, Fecal Coliform	NJDEP/USGS Data
1	Northeast	05	Hackensack River at Old Tappan	01376970	Phosphorus, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Cadmium, Chromium, Copper, Lead, Nickel,	NJDEP/USGS Data
3	Northeast	05	Hackensack River at Old Tappan	01376970, 5-HAC-2	Fecal Coliform, Temperature	NJDEP/USGS Data, Metal Recon
5	Northeast	05	Hackensack River at Old Tappan	01376970, 5-HAC-2	Arsenic	NJDEP/USGS Data, Metal Recon
5	Northeast	05	Hackensack River at Old Tappan Rd in Old Tappan	AN0205	Benthic Macroinvertebrates	NJDEP AMNET
4	Northeast	05	Hackensack River at Rivervale	01377000, 5-HAC-3	Fecal Coliform	NJDEP/USGS Data, Metal Recon
5	Northeast	05	Hackensack River at Rivervale	01377000, 5-HAC-3	Arsenic, Chromium, Copper, Lead, Mercury	NJDEP/USGS Data, Metal Recon
3	Northeast	05	Hackensack River at Rivervale	01377000, 5-HAC-3	Cadmium, Selenium, Zinc	NJDEP/USGS Data, Metal Recon
4	Northeast	05	Hackensack River at Rivervale	01377000, 5-HAC-3	Nickel	NJDEP/USGS Data, Metal Recon

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1	Northeast	05	Hackensack River at Rivervale	01377000, 5-HAC-3	Phosphorus, Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia	NJDEP/USGS Data, Metal Recon
3	Lower Delaware	18	Haddon Lake-18	Haddon Lake	Phosphorus	NJDEP Clean Lakes
5	Northwest	01	Hainesville Pond-01	Hainesville Pond	Fish-Mercury	NJDEP Fish Tissue Monitoring
5	Northwest	11	Hakihokake Creek at Bridge St Bridge in Milford	DRBCNJ0023	Temperature, pH, Fecal Coliform	DRBC
1	Northwest	11	Hakihokake Creek at Bridge St Bridge in Milford	DRBCNJ0023	Dissolved Oxygen, Dissolved Solids, Total Suspended Solids	DRBC
3	Northwest	11	Hakihokake Creek at Bridge St Bridge in Milford	DRBCNJ0023	Phosphorus, Unionized Ammonia	DRBC
1	Northwest	11	Hakihokake Creek at Bridge St in Milford	AN0077	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	11	Hakihokake Creek at Miller Park Rd in Holland	AN0076	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	11	Hakihokake Creek at Myler Rd in Holland	AN0075	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	16	Hall Creek Estuary	Hall Creek Estuary	Total Coliform	NJDEP Shellfish Monitoring
5	Atlantic Coast	14	Hammonton Creek above Chestnut Avenue	LHACHEST	Pineland Biological Community	Pinelands
3	Atlantic Coast	14	Hammonton Creek at Boyer Rd (blw STP) in Hammonton	AN0577	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	14	Hammonton Creek at Columbia Rd in Mullica	AN0578	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	14	Hammonton Creek at Rt. 542 in Hammonton	AN0577A	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	14	Hammonton Creek at Westcoatville	01409416, 14-HAM-2, 14-HAM-1	Cadmium, Lead	NJDEP/USGS Data, Metal Recon
1	Atlantic Coast	14	Hammonton Creek at Westcoatville	01409416, 14-HAM-2, 14-HAM-1	Temperature, Dissolved Oxygen, Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Chromium, Copper, Nickel,	NJDEP/USGS Data, Metal Recon
4	Atlantic Coast	14	Hammonton Creek at Westcoatville	01409416, 14-HAM-2, 14-HAM-1	Fecal Coliform	NJDEP/USGS Data, Metal Recon
5	Atlantic Coast	14	Hammonton Creek at Westcoatville	01409416, 14-HAM-2, 14-HAM-1	Phosphorus, pH, Nitrate, Arsenic, Mercury	NJDEP/USGS Data, Metal Recon
4	Atlantic Coast	14	Hammonton Lake-14	Hammonton Lake, Hammonton Bathing Beach (Center), (Left), and (Right); LHAMLAKE	Phosphorus	NJDEP Clean Lakes, Atlantic Co HD, Pinelands
5	Atlantic Coast	14	Hammonton Lake-14	Hammonton Lake, Hammonton Bathing Beach (Center), (Left), and (Right); LHAMLAKE	Fecal Coliform, Pineland Biological Community	NJDEP Clean Lakes, Atlantic Co HD, Pinelands
3	Northwest	01	Hances Brook at Rt 57 in Mansfield	AN0070	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	16	Hands Millpond-16	Hands Mill Pond Bathing Area	Fecal Coliform	Cumberland Co HD
3	Atlantic Coast	12	Hannabrand Brook at Old Mill Rd in Wall	AN0484	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	12	nabrand Brook at Old Mill Rd near Sprink Lk He	01407806, EWQ0484	Phosphorus, Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia	NJDEP/USGS Data, EWQ
5	Atlantic Coast	12	nabrand Brook at Old Mill Rd near Sprink Lk He	01407806, EWQ0484	pH, Fecal Coliform	NJDEP/USGS Data, EWQ
3	Lower Delaware	19	Hanover Lake-19	NNOHANOV	Pineland Biological Community	Pinelands
1	Northwest	11	Harihokake Creek at Hartpence Rd in Alexandria	AN0078	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	11	Harihokake Creek at River Rd in Alexandria	AN0079	Benthic Macroinvertebrates	NJDEP AMNET
1	Lower Delaware	19	Harmony Lake-19	Harmony Lake	Fecal Coliform	Burlington Co HD
1	Northwest	01	Harmony Ridge Large Lake-01	Harmony Ridge Beach at Large Lake	Fecal Coliform	Sussex Co HD
1	Northwest	02	Harmony Ridge Small Lake-01	Harmony Ridge Beach at Small Lake	Fecal Coliform	Sussex Co HD

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3	Northeast	06	Harrison Brook at Valley Rd in Bernards	AN0227A	Benthic Macroinvertebrates	NJDEP AMNET
1	Northeast	03	Harrison Mountain Lake-03	Harrison Mountain Lake	Fecal Coliform	Passaic Co HD
4	Lower Delaware	18	Harrisonville Lake-18	Harrisonville Lake	Phosphorus	NJDEP Clean Lakes
5	Atlantic Coast	14	Harrisville Lake-14	Harrisville Lake	Fish-Mercury	NJDEP Fish Tissue Monitoring
3	Atlantic Coast	14	Harrisville Pond-14	Harrisville Pond, OOSHARLK	Community	NJDEP Clean Lakes, Pinelands
1	Atlantic Coast	13	Harry Wrights Lake-13	Harry Wright Lake High Beach and Low Beach	Fecal Coliform	Ocean Co HD
5	Lower Delaware	19	Haynes Creek at Himmelein Rd in Medford	AN0168, WHART623	Pineland Biological Community	NJDEP AMNET, Pinelands
3	Lower Delaware	19	Haynes Creek below Breakneck Avenue	WHATAUNT	Pineland Biological Community	Pinelands
3	Lower Delaware	19	Haynes Creek below Falls Rd	WHAPINES	Pineland Biological Community	Pinelands
3	Lower Delaware	19	Haynes Creek Trib at Hopewell Rd	WHATRBLU	Pineland Biological Community	Pinelands
5	Atlantic Coast	14	Hays Mill Creek at Atco	01409401	pH	USGS/Pinelands Data
1	Atlantic Coast	14	Hays Mill Creek at Atco	01409401	Phosphorus, Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids,	USGS/Pinelands Data
5	Atlantic Coast	14	Hays Mill Creek at Tremont Ave in Waterford	AN0565, MHATREMO	Pineland Biological Community	NJDEP AMNET, Pinelands
5	Atlantic Coast	14	Hays Mill Creek near Chesilhurst	01409402	pH	USGS/Pinelands Data
1	Atlantic Coast	14	Hays Mill Creek near Chesilhurst	01409402	Phosphorus, Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids,	USGS/Pinelands Data
1	Atlantic Coast	13	Haystack Brook (Muddy Ford Bk) at Greenville Rd in Howell	AN0505	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	13	Haystack Brook at Maxim-Southard Rd (upstream) in Howell	MB-153, MB-154, AN0503	Benthic Macroinvertebrates	Monmouth Co HD, NJDEP AMNET
3	Atlantic Coast	13	Haystack Brook at Maxim-Southard Rd In Howell	18	pH, Total Suspended Solids	Monmouth Co HD
1	Atlantic Coast	13	Haystack Brook at Maxim-Southard Rd in Howell	18	Phosphorus, Nitrate	Monmouth Co HD
4	Atlantic Coast	13	Haystack Brook at Maxim-Southard Rd in Howell	18	Fecal Coliform	Monmouth Co HD
3	Atlantic Coast	13	Haystack Brook at Rt 547 in Howell	AN0504	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	02	Heaters Pond-02	Heaters Pond	Fecal Coliform	Sparta Twp HD
1	Raritan	10	Heathcote Brook at Academy St in South Brunswick	AN0396	Benthic Macroinvertebrates	NJDEP AMNET
4	Raritan	10	Heathcote Brook at Kingston	01401400, 10-MIL-2	Fecal Coliform	NJDEP/USGS Data
1	Raritan	10	Heathcote Brook at KIngston	01401400, 10-MIL-2	Phosphorus, Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia	NJDEP/USGS Data
3	Raritan	10	Heathcote Brook at Stouts Ln in South Brunswick	AN0395	Benthic Macroinvertebrates	NJDEP AMNET
1	Northeast	03	Henion Pond-03	Camp Vacamus Lily Pad, Camp Vacamus Sun Fish	Fecal Coliform	Passaic Co HD
1	Raritan	09	Hercules Pond	Hercules Pond	Fecal Coliform	Middlesex Co Public HD
1	Northwest	02	Heritage Lakes-02	Heritage Lakes: The Quarry	Fecal Coliform	Sussex Co HD
1	Atlantic Coast	16	Hidden Acres Lake-16	Hidden Acres	Fecal Coliform	Cape May Co HD
1	Northeast	02	Hidden Valley Lake-02	Hidden Valley Lake	Fecal Coliform	Sussex Co HD
1	Northeast	03	High Crest Lake-03	High Crest Lake	Fecal Coliform	Passaic Co HD
1	Northwest	02	Highland Lake 1-02	Highland Lake, Lake 4 Beach5	Fecal Coliform	Sussex Co HD

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1	Northwest	02	Highland Lake-02	Highland Lake, Lake 1 Beach1, Lake 2 Beach 4, Lake 2 Beach2, Lake 2 Beach3, Highland Lakes Raceway	Fecal Coliform	Sussex Co HD
1	Northeast	03	Highlands/Weis	Highlands/Weis	Fecal Coliform	Passaic Co HD
1	Northeast	06	Hilltop Left and Right	Hilltop Left and Right	Fecal Coliform	Twp of Pequannock
1	Atlantic Coast	14	Hobb Lake-14	Great Times Camp	Fecal Coliform	Camden Co HD
5	Atlantic Coast	12	Hockhockson Brook at Hockhockson Rd in Colts Neck	AN0475	Benthic Macroinvertebrates	NJDEP AMNET
4	Northeast	04	Hohokus Brook at Mouth at Paramus	01391100	Fecal Coliform	NJDEP/USGS Data
3	Northeast	04	Hohokus Brook at Mouth at Paramus	01391100	Phosphorus, Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia	NJDEP/USGS Data
1	Northeast	04	Hohokus Brook at Old Mill Rd in Franklin Lakes	AN0283	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	04	Hohokus Brook at Park Ave in Allendale	AN0285	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	04	Hohokus Brook at Spring St in Ridgewood Village	AN0288	Benthic Macroinvertebrates, Unknown Toxicity	NJDEP AMNET
1	Northwest	01	Holiday Lake-01	Holiday Lakes	Fecal Coliform	Sussex Co HD
5	Atlantic Coast	13	Holiday Lake-13	Ocean Acres Beach	Fecal Coliform	Ocean Co HD
1	Raritan	08	Holland Brook at Holland Brook Rd in Readlngton	AN0342	Benthic Macroinvertebrates	NJDEP AMNET
5	Raritan	08	Holland Brook at S Br Rd in Branchburg	AN0343	Benthic Macroinvertebrates	NJDEP AMNET
1	Raritan	08	Holland Brook at South Branch Rd in Branchburg	EWQ0343	Phosphorus, Temperature, Dissolved Oxygen, pH, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized	EWQ
1	Atlantic Coast	12	Hollow Brook at Route 35 in Neptune Twnshp	10	Phosphorus, Nitrate	Monmouth Co HD
3	Atlantic Coast	12	Hollow Brook at Route 35 In Neptune Twnshp	10	pH, Total Suspended Solids	Monmouth Co HD
4	Atlantic Coast	12	Hollow Brook at Route 35 in Neptune Twnshp	10	Fecal Coliform	Monmouth Co HD
5	Lower Delaware	17	Holly Green Campground Pond-17	Holly Green Campground	Fecal Coliform	Gloucester Co HD
1	Lower Delaware	19	Holly Lake-19	Holly Lake Association	Fecal Coliform	Burlington Co HD
1	Northwest	01	Honey Run at Rt 519 in Hope	AN0046	Benthic Macroinvertebrates	NJDEP AMNET
5	Northwest	01	Honey Run near Hope	01445900	Dissolved Oxygen , Fecal Coliform	NJDEP/USGS Data
1	Northwest	01	Honey Run near Hope	01445900	Phosphorus, Temperature, pH, Nitrate, Dissolved Solids, Total Suspended Solids,	NJDEP/USGS Data
5	Atlantic Coast	12	Hooks Creek Lake-12	Cheesequake SP Left and Right	Fecal Coliform	Shore Region
4	Atlantic Coast	12	Hooks Creek Lake-12	Hooks Creek Lake	Phosphorus	NJDEP Clean Lakes
5	Atlantic Coast	12	Hop Brook at Roberts Rd in Holmdel	AN0465	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	12	Hop Brook at Willow Brook Rd in Holmdel	AN0466	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	13	Horicon Lake-13	Lake Horicon Beach - North and South	Fecal Coliform	Ocean Co HD
5	Atlantic Coast	14	Horse Pond Stream below Butterworth's Bogs Rd	BHOBUTTR1	Pineland Biological Community	Pinelands
1	Raritan	08	Horseshoe Lake-08	Horseshoe Lake 1 and Lake 2	Fecal Coliform	Roxbury Twp Board of Health
3	Atlantic Coast	15	Hospitality Branch at Blue Bell Rd in Monroe	AN0627	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	15	Hospitality Branch at Blue Bell Rd near Cecil	01411035	Phosphorus, Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia	NJDEP/USGS Data
4	Atlantic Coast	15	Hospitality Branch at Blue Bell Rd near Cecil	01411035	Fecal Coliform	NJDEP/USGS Data

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5	Atlantic Coast	15	Hospitality Branch at Blue Bell Rd near Cecil	01411035	pH	NJDEP/USGS Data
3	Atlantic Coast	15	Hospitality Branch at Rt 538 in Monroe	AN0628	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	15	Hospitality Branch at Rt 54 in Folsom	AN0633	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	15	Hospitality Branch near Cecil	01411050	pH	NJDEP/USGS Data
3	Atlantic Coast	15	Hospitality Branch near Cecil	01411050	Temperature, Total Suspended Solids	NJDEP/USGS Data
1	Atlantic Coast	15	Hospitality Branch near Cecil	01411050	Phosphorus, Fecal Coliform, Dissolved Oxygen, Nitrate, Dissolved Solids,	NJDEP/USGS Data
3	Atlantic Coast	14	Hospitality Brook below Route 563	WHOSPITA	Pineland Biological Community	Pinelands
5	Lower Delaware	17	Hudson Branch at Vineland	17-HUD-1	Arsenic, Chromium	NJDEP Metal Recon
3	Lower Delaware	17	Hudson Branch at Vineland	17-HUD-1	Cadmium, Copper, Mercury, Nickel, Selenium, Silver, thallium, Zinc	NJDEP Metal Recon
1	Lower Delaware	17	Hudson Lake-17	Sportsman Club	Fecal Coliform	Salem Co HD
4	Northeast	05	Hudson River	Hudson River	Mercury	EPA, HEP (GLEC)
3	Northeast	05	Hudson River	N1, N2, N3, N3A, N3B, N4, N5, N6	Fecal Coliform	IEC
1	Northeast	05	Hudson River	N1, N2, N3, N3A, N3B, N4, N5, N6	Fecal Coliform, Dissolved Oxygen	IEC
3	Raritan	07	Hudson River	Weehawken (Location B)	Fecal Coliform	Hudson Co HD
5	Northeast	05	Hudson River - NYC & Battery	HR1, HR2	Fish-PCB, Fish-Dioxin	EPA, HEP (GLEC), NJDEP Fish Tissue Monitoring
1	Northeast	05	Hudson River - NYC & Battery	HR1, HR2	Copper, Lead, Nickel	EPA, HEP (GLEC), NJDEP Fish Tissue Monitoring
5	Northeast	05	Hudson River at G.W. Bridge	HR4	Fish-PCB, Fish-Dioxin	EPA, HEP (GLEC), NJDEP Fish Tissue Monitoring
1	Northeast	05	Hudson River at G.W. Bridge	HR4	Copper, Lead, Nickel	EPA, HEP (GLEC), NJDEP Fish Tissue Monitoring
5	Northeast	05	Hudson River near Yonkers	HR7	Fish-PCB, Fish-Dioxin	EPA, HEP (GLEC), NJDEP Fish Tissue Monitoring
1	Northeast	05	Hudson River near Yonkers	HR7	Copper, Lead, Nickel	EPA, HEP (GLEC), NJDEP Fish Tissue Monitoring
5	Northeast	05	Hudson River- NYC Area	Hudson River- NYC Area	Fish-PCB, Fish-Dioxin	EPA, HEP (GLEC), NJDEP Fish Tissue Monitoring
1	Northeast	05	Hudson River- NYC Area	Hudson River- NYC Area	Copper, Lead, Nickel	EPA, HEP (GLEC), NJDEP Fish Tissue Monitoring
1	Lower Delaware	18	Hurff Lake	Hurff Lake	Fecal Coliform	Gloucester Co HD
3	Atlantic Coast	12	Husky Brook at South St In Eatontown	33	pH, Total Suspended Solids	Monmouth Co HD
1	Atlantic Coast	12	Husky Brook at South St in Eatontown	33	Phosphorus, Nitrate	Monmouth Co HD
4	Atlantic Coast	12	Husky Brook at South St in Eatontown	33	Fecal Coliform	Monmouth Co HD
3	Atlantic Coast	12	Husky Brook at South St in Eatontown	MB-33	Benthic Macroinvertebrates	Monmouth Co HD
1	Northwest	01	Iliff Lake-01	Lake Iliff	Fecal Coliform	Sussex Co HD
4	Lower Delaware	20	Imlaystown Lake-20	Imlaystown Lake	Phosphorus	NJDEP Clean Lakes
3	Atlantic Coast	14	Impoundment on Horse Pond Stream (Lake 1616-14)	BHOBUTTR2	Pineland Biological Community	Pinelands
1	Raritan	08	India Brook at Calais Rd BR#733 in Randolph	AN0344A	Benthic Macroinvertebrates	NJDEP AMNET
1	Raritan	08	India Brook at MountaInside Rd in Mendham	AN0345	Benthic Macroinvertebrates	NJDEP AMNET
1	Raritan	08	India Brook Unknown Trib at Calais Rd in Randolph	AN0344	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	17	Indian Branch at Rt 47 in Franklin	AN0724	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	17	Indian Branch at Sta Rd in Janvier (Franklin.)	AN0724A	Benthic Macroinvertebrates	NJDEP AMNET

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1	Lower Delaware	17	Indian Branch near Malaga	01411466	Phosphorus, Fecal Coliform, Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized	NJDEP/USGS Data
5	Lower Delaware	17	Indian Branch near Malaga	01411466	pH	NJDEP/USGS Data
3	Atlantic Coast	14	Indian Cabin Creek above Landing Creek	LINCABIN	Pineland Biological Community	Pinelands
3	Atlantic Coast	14	Indian Cabin Creek at EHC Lk outlet in Egg Harbor	AN0594	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	14	Indian Cabin Creek at Fifth Ave in Mullica	AN0593	Benthic Macroinvertebrates	NJDEP AMNET
1	Northeast	06	Indian Grave Brook at Hardscrabble Rd in Bernardsville	AN0214	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	06	Indian Lake-06	Indian Clubhouse, Indian Franklin, Indian Main	Fecal Coliform	Denville HD
1	Atlantic Coast	15	Indian Lake-15	Indian Branch	Fecal Coliform	Atlantic Co HD
5	Atlantic Coast	14	Indian Mills Brook at Indian Mills	01409449	pH	NJDEP/USGS Data
1	Atlantic Coast	14	Indian Mills Brook at Indian Mills	01409449	Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids,	NJDEP/USGS Data
3	Atlantic Coast	14	Indian Mills Brook at Indian Mills	01409449	Phosphorus, Fecal Coliform	NJDEP/USGS Data
5	Atlantic Coast	14	Indian Mills Brook at Willow Grove Rd in Shamong	AN0582, BINSHADS	Pineland Biological Community	NJDEP AMNET, Pinelands
3	Atlantic Coast	14	Indian Mills Brook impoundment above Old Schoolhouse Rd (Lake 1685-14)	BINSCHOO	Pineland Biological Community	Pinelands
5	Atlantic Coast	14	Indian Mills Pond-14	Indian Mills Pond, BMULAKED	Pineland Biological Community	NJDEP Clean Lakes, Pinelands
3	Atlantic Coast	14	Indian Mills Pond-14	Indian Mills Pond, BMULAKED	Phosphorus	NJDEP Clean Lakes, Pinelands
3	Lower Delaware	19	Indian Run at Birmingham Rd in Pemberton	EWQ0151A	Phosphorus, pH, Total Suspended Solids	EWQ
1	Lower Delaware	19	Indian Run at Birmingham Rd in Pemberton	EWQ0151A	Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Unionized Ammonia	EWQ
5	Lower Delaware	19	Indian Run at Birmingham Rd in Pemberton	AN0151A	Benthic Macroinvertebrates	NJDEP AMNET
3	Lower Delaware	17	Indian Run at Cedar Ln Rd in Upper Pittsgrove	AN0746	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	17	Indian Run at Husted Sta Rd in Pittsgrove	AN0747	Benthic Macroinvertebrates	NJDEP AMNET
1	Northeast	06	Inlet Left and Right	Inlet Left and Right	Fecal Coliform	Twp of Pequannock
5	Northeast	06	Intervale Lake-06	Lake Intervale	Fecal Coliform	Parsippany Troy Hills HD
5	Lower Delaware	17	Iona Lake-17	Iona Lake	Fecal Coliform	NJDEP Clean Lakes, Gloucester Co HD
3	Lower Delaware	17	Iona Lake-17	Iona Lake	Phosphorus	NJDEP Clean Lakes, Gloucester Co HD
3	Raritan	09	Ireland Brook at Patricks Corners	01404470	Suspended Solids	NJDEP/USGS Data
5	Raritan	09	Ireland Brook at Patricks Corners	01404470	pH	NJDEP/USGS Data
1	Raritan	09	Ireland Brook at Patricks Corners	01404470	Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Unionized Ammonia	NJDEP/USGS Data
5	Raritan	09	Ireland Brook at Riva Rd in South Brunswick	AN0433	Benthic Macroinvertebrates	NJDEP AMNET
3	Raritan	09	Iresick Brook at Rt 527 in Old Bridge	AN0452	Benthic Macroinvertebrates	NJDEP AMNET
3	Lower Delaware	20	Ivanhoe Brook at Millers Mill Rd in Upper Freehold	AN0123	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	20	Ivanhoe Brook at Olde Noah Hunt Rd in Millstone	MB-FA	Benthic Macroinvertebrates	Monmouth Co HD
3	Atlantic Coast	15	Jack Pudding Branch at Cologne Ave. in Hamilton	AN0640B	Benthic Macroinvertebrates	NJDEP AMNET
3	Lower Delaware	19	Jacks Run at Range Rd in New Hanover	AN0149B, NJARANGE	Pineland Biological Community	NJDEP AMNET, Pinelands

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1	Northwest	01	Jacksonburg Creek at Rt 602 in Hardwick	AN0028	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	01	Jacksonburg Creek at Rt 94 in Blairstown	AN0029	Benthic Macroinvertebrates	NJDEP AMNET
4	Northwest	01	Jacksonburg Creek near Blairstown	01443600	Fecal Coliform	NJDEP/USGS Data
3	Northwest	01	Jacksonburg Creek near Blairstown	01443600	pH, Temperature	NJDEP/USGS Data
1	Northwest	01	Jacksonburg Creek near Blairstown	01443600	Phosphorus, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids,	NJDEP/USGS Data
3	Northwest	01	Jacksonburg Creek near Millbrook	01443550	Fecal Coliform, pH, Temperature	NJDEP/USGS Data
1	Northwest	01	Jacksonburg Creek near Millbrook	01443550	Phosphorus, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids,	NJDEP/USGS Data
5	Northwest	11	Jacobs Creek above Rt 29	DRBCNJ0003	Fecal Coliform, pH	DRBC
3	Northwest	11	Jacobs Creek above Rt 29	DRBCNJ0003	Phosphorus, Nitrate, Unionized Ammonia	DRBC
1	Northwest	11	Jacobs Creek above Rt 29	DRBCNJ0003	Temperature, Dissolved Oxygen, Dissolved Solids, Total Suspended Solids	DRBC
1	Northwest	11	Jacobs Creek at Bear Tavern	01462739	Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids,	NJDEP/USGS Data
4	Northwest	11	Jacobs Creek at Bear Tavern	01462739	Fecal Coliform	NJDEP/USGS Data
3	Northwest	11	Jacobs Creek at Bear Tavern	01462739	Phosphorus, pH	NJDEP/USGS Data
5	Northwest	01	Jacobs Creek at Bear Tavern Rd in Hopewell	AN0106A	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	11	Jacobs Creek at Rt 29 in Ewlng	AN0106	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	11	Jacobs Creek at Rt 546 in Hopewell	AN0105	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	11	Jacobs Creek at Woosamonsa Rd in Hopewell	AN0102	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	19	Jade Run at Rt 206 in Southampton	AN0157, SJART616	Pineland Biological Community	NJDEP AMNET, Pinelands
5	Lower Delaware	19	Jade Run at Rt 206 in Vincentown	01465847	Phosphorus, Dissolved Oxygen, pH,	EWQ
3	Lower Delaware	19	Jade Run at Rt 206 in Vincentown	01465847	Nitrate	EWQ
1	Lower Delaware	19	Jade Run at Rt 206 in Vincentown	01465847	Temperature, Dissolved Solids, Total Suspended Solids, Unionized Ammonia	EWQ
1	Lower Delaware	19	Jade Run at Stockton Bridge Rd in Pemberton	AN0157A, SJASTOCK	Pineland Biological Community	NJDEP AMNET, Pinelands
3	Atlantic Coast	13	Jakes Branch at Double Trouble Rd in South Toms River	AN0543	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	13	Jakes Branch at Dover Rd in Berkeley	AN0542	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	13	Trouble	01408702	Dissolved Oxygen, pH	NJDEP/USGS Data
1	Atlantic Coast	13	Jakes Branch at Dover Rd near Double Trouble	01408702	Phosphorus, Fecal Coliform, Temperature, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia,	NJDEP/USGS Data
5	Atlantic Coast	16	James Sound	James Sound-1 thru 11	Total Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
1	Atlantic Coast	16	James Sound	James Sound-1 thru 11	Dissolved Oxygen, Fecal Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
1	Lower Delaware	19	JCC Camp Lake-19	JCC Camps at Medford	Fecal Coliform	Burlington Co HD
1	Northwest	01	Jefferson Lake-01	Jefferson Lake	Fecal Coliform, Fish Community	Sussex Co HD, NJDEP Freshwater Fisheries
5	Atlantic Coast	16	Jenkins Sound	Jenkins Sound-1 thru 10	Total Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
1	Atlantic Coast	16	Jenkins Sound	Jenkins Sound-1 thru 10	Dissolved Oxygen, Fecal Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
5	Lower Delaware	19	Jennings Lake-19	WBAJENNL	Pineland Biological Community	Pinelands
5	Atlantic Coast	13	Jesse Creek/Thompson Creek Estuary	1807D	Total Coliform	NJDEP Shellfish Monitoring

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
5	Atlantic Coast	16	Jones/Stites/Carino/Taylor Creek Estuary	3603B	Total Coliform	NJDEP Shellfish Monitoring
5	Lower Delaware	20	Jumping Brook at Bunting Bridge Rd in New Hanover	AN0119	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	12	Jumping Brook at Corlies Ave in Neptune	AN0480	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	12	Jumping Brook at Essex Rd in Tinton Falls	AN0479	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	12	Jumping Brook at Green Grove	01407720	pH	NJDEP/USGS Data
3	Atlantic Coast	12	Jumping Brook at Green Grove	01407720	Dissolved Oxygen, Dissolved Solids, Total Suspended Solids	NJDEP/USGS Data
1	Atlantic Coast	12	JumpIng Brook at Green Grove	01407720	Phosphorus, Fecal Coliform, Temperature, Dissolved Oxygen, Nitrate, Unionized	NJDEP/USGS Data
1	Atlantic Coast	12	Jumping Brook near Neptune	01407760	Phosphorus, Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia	NJDEP/USGS Data
5	Atlantic Coast	12	Jumping Brook near Neptune	01407760	Fecal Coliform, pH	NJDEP/USGS Data
1	Atlantic Coast	12	Jumping Brook-Tidal	R06	Dissolved Oxygen	NJDEP Coastal Monitoring
1	Northeast	03	Kampfe Lake-03	Kampfe Lake Assoc., Kampfe Lake	Fecal Coliform	Twp of Pequannock
1	Lower Delaware	18	Kandle Lake-18	Lake Kandle	Fecal Coliform	Gloucester Co HD
1	Northeast	03	Kanouse Brook at Rt 23 in West Milford	AN0262	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	13	Kennedy Lake-13	Kennedy Lake	Fish Community	NJDEP Freshwater Fisheries
5	Atlantic Coast	13	Kettle Creek at Moore Rd in Brick	AN0516	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	13	Kettle Creek at New Hampshire Ave in Lakewood	AN0515	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	13	Kettle Creek-Tidal	R09, 1614	Dissolved Oxygen	NJDEP Coastal Monitoring, Shellfish Monitoring
5	Atlantic Coast	13	Kettle Creek-Tidal	R09, 1614	Total Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
3	Lower Delaware	19	Kettle Run at Hopewell Rd in Evesham	AN0167, WKEHOPEW	Pineland Biological Community	NJDEP AMNET, Pinelands
3	Lower Delaware	19	Kettle Run at Sawmill Rd	WKESAWMI	Pineland Biological Community	Pinelands
3	Lower Delaware	19	Kettle Run-19	Girl Scouts Kettle Run, WKEGIRLS	Pineland Biological Community	Burlington Co HD, Pinelands
1	Lower Delaware	19	Kettle Run-19	Girl Scouts Kettle Run, WKEGIRLS	Fecal Coliform	Burlington Co HD, Pinelands
3	Raritan	07	Kill Van Kull	K2, K1, UH-1, Passaic-K1	Fecal Coliform	IEC, PVSC, HEP (GLEC), NJDEP Fish Tissue Monitoring
1	Raritan	07	Kill Van Kull	K2, K1, UH-1, Passaic-K1	Temperature, pH, Dissolved Oxygen, Unionized Ammonia, Copper, Lead, Nickel	IEC, PVSC, HEP (GLEC), NJDEP Fish Tissue Monitoring
5	Raritan	07	Kill Van Kull	UH-11	Mercury, Fish-PCB, Fish-Dioxin	IEC, PVSC, HEP (GLEC), NJDEP Fish Tissue Monitoring
1	Northeast	04	Kilroy Park Lake-04	Kilroy Park (Tom's Lake)	Fecal Coliform	Passaic Co HD
5	Raritan	07	Kings Creek	Kings Creek	Toxic Discharge	HEP (GLEC)
4	Lower Delaware	18	Kirkwood Lake-18	Kirkwood Lake	Phosphorus	NJDEP Clean Lakes
5	Northeast	03	Kitchell Lake-03	Kitchell Lake Assoc.	Fecal Coliform	Passaic Co HD
1	Northwest	01	Kittatinny Lake-01	Shore	Fecal Coliform	Sussex Co HD
5	Atlantic Coast	12	L Street Beach (Belmar)	L Street Beach (Belmar)	Fecal Coliform	Cooperative Coastal Monitoring Program
5	Northwest	01	Lackawanna Lake-01	Lake Lackawanna: Speers Beach	Fecal Coliform	Sussex Co HD
3	Atlantic Coast	14	Ladys Lake-14	MMULADYL	Pineland Biological Community	Pinelands
1	Northeast	06	Lafayette Municipal Pond-01	Lafayette Municipal Beach	Fecal Coliform	Sussex Co HD
1	Atlantic Coast	12	Lafetras Brook at Hope Rd in TInton Falls	32	Nitrate	Monmouth Co HD

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
3	Atlantic Coast	12	Lafetras Brook at Hope Rd In Tinton Falls	32	pH, Total Suspended Solids	Monmouth Co HD
4	Atlantic Coast	12	Lafetras Brook at Hope Rd in Tinton Falls	32	Fecal Coliform	Monmouth Co HD
5	Atlantic Coast	12	Lafetras Brook at Hope Rd in Tinton Falls	32	Phosphorus	Monmouth Co HD
5	Lower Delaware	20	Lahaway Creek at New Egypt - Allentown Rd in Upper Freehold	AN0124	Benthic Macroinvertebrates	NJDEP AMNET
1	Lower Delaware	20	Lahaway Creek At Rt 537 At Mercerville	01464440	Fecal Coliform, Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total	NJDEP/USGS Data
3	Lower Delaware	20	Lahaway Creek At Rt 537 At Mercerville	01464440	Phosphorus, pH	NJDEP/USGS Data
5	Lower Delaware	20	Lahaway Creek at Rt 537 in Upper Freehold	AN0122, MB-117	Benthic Macroinvertebrates	NJDEP AMNET, Monmouth Co HD
1	Northwest	01	Lake Aeroflex-01	Lake Aeroflex	Fish Community	NJDEP Freshwater Fisheries
1	Northwest	01	Lake Ashroe-01	Lake Ashroe: Kittatinny Mt. BSA Res.	Fecal Coliform	Sussex Co HD
5	Atlantic Coast	13	Lake Barnegat-13	Lake Barnegat- Middle Beach	Fecal Coliform	Ocean Co HD
5	Atlantic Coast	13	Lake Carasaljo-13	Lake Carasaljo	Fish-Mercury	NJDEP Fish Tissue Monitoring
1	Northwest	02	Lake Conway-02	Lake Conway	Fecal Coliform	Sussex Co HD
5	Northeast	03	Lake Edenwold-03	Lake Edenwold	Fecal Coliform	Butler HD
5	Northwest	01	Lake Hopatcong-01	Lake Hopatcong, Byram Bay Comm Club, Davis Cove, Beck Lane Prop, Crescent Cove, Dox Incorp, E Shores POA, Elba Pt Homeowners, Homestead Beach, Hopatcong Shores Property, Hoptacong Gardens Comm. Club, Ingram Cove Comm, Jewish Center, Colony Club	Fecal Coliform, Fish Community, Fish-Mercury	Sussex Co HD, NJDEP Clean Lakes, Freshwater Fisheries, NJDEP Fish Tissue Monitoring
4	Northwest	01	Lake Hopatcong-01	Lake Hopatcong, Byram Bay Comm Club, Davis Cove, Beck Lane Prop, Crescent Cove, Dox Incorp, E Shores POA, Elba Pt Homeowners, Homestead Beach, Hopatcong Shores Property, Hoptacong Gardens Comm. Club, Ingram Cove Comm, Jewish Center, Colony Club	Phosphorus	Sussex Co HD, NJDEP Clean Lakes, Freshwater Fisheries, NJDEP Fish Tissue Monitoring
1	Lower Delaware	14	Lake Inawendiwin-14	Boy Scouts	Fecal Coliform	Burlington Co HD, Pinelands
3	Lower Delaware	19	Lake Inawendiwin-19	Camp Inawendiwin, SFRCAMPI	Pineland Biological Community	Burlington Co HD, Pinelands
1	Lower Delaware	19	Lake Inawendiwin-19	Camp Inawendiwin, SFRCAMPI	Fecal Coliform	Burlington Co HD, Pinelands
5	Northeast	03	Lake Ioscoe-03	Lake Iosco	Fecal Coliform	Passaic Co HD
5	Lower Delaware	19	Lake James-19	Kings Grant	Fecal Coliform	Burlington Co HD
1	Northwest	01	Lake Kemah-01	Kemah Lake Big Beach and Little Beach	Fecal Coliform	Sussex Co HD
5	Atlantic Coast	16	Lake Laurie-16	Lake Laurie Campground	Fecal Coliform	Cape May Co HD
1	Northwest	01	Lake Lenape-01	Lake Lenape	Fecal Coliform	Sussex Co HD
3	Northwest	02	Lake Lookout Brook (trib to Wawayanda Ck) at Wawayanda St Pk in Vernon	AN0294	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	12	Lake Matawan-12	65	Phosphorus, Fecal Coliform	Monmouth Co HD
1	Lower Delaware	19	Lake Mishe-Mokwa-19	Medford Lakes Colony Club Beach 3 and Beach 4	Fecal Coliform	Burlington Co HD
5	Northwest	02	Lake Mohawk-02	Lake Mohawk: Sleepy Lagoon, Alpine Beach, Beach 1, Beach 2, Beach 3, Beach 4, Beach 5, Beach 6, Happly Valley Beach, Manitou Beach, Tamarack Beach	Fecal Coliform	Sparta Twp HD

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
5	Atlantic Coast	14	Lake Mo-Li-Th-Ma-14	Camp Haluwasa, NPUHALUW	Pineland Biological Community	Cape May Co HD, Pinelands
1	Atlantic Coast	14	Lake Mo-Li-Th-Ma-14	Camp Haluwasa, NPUHALUW	Fecal Coliform	Cape May Co HD, Pinelands
4	Northwest	01	Lake Musconetcong -01	Lake Musconetcong	Phosphorus	NJDEP Clean Lakes
5	Atlantic Coast	16	Lake Nummy-16	Lake Nummy, Belleplain SF, Lake Nummy-Center, Left, and Right	Fish-Mercury	Southern Region, NJDEP Fish Tissue Monitoring
3	Atlantic Coast	16	Lake Nummy-16	Lake Nummy, Belleplain SF, Lake Nummy-Center, Left, and Right	Phosphorus	NJDEP Clean Lakes
1	Atlantic Coast	16	Lake Nummy-16	Lake Nummy, Belleplain SF, Lake Nummy-Center, Left, and Right	Fecal Coliform	Southern Region, NJDEP Fish Tissue Monitoring
1	Northeast	06	Lake Reality-06	Lake Reality	Fecal Coliform	Borough of Kinnelon
1	Northwest	01	Lake Robert Rooke-01	Rooke Lake (Camp Linwood MacDonald)	Fecal Coliform	Sussex Co HD
1	Northwest	01	Lake Shawanni-01	Lake Shawanni; Lindley Cook 4H	Fecal Coliform	Sussex Co HD
5	Lower Delaware	18	Lake Silvestro	Lake Silvestro	Fecal Coliform	Gloucester Co HD
1	Northeast	03	Lake Stockholm-03	Lake Stockholm North and South	Fecal Coliform	Sparta Twp HD
1	Lower Delaware	19	Lake Stockwell-19	Camp Ockanickon Boys, Family, and Pomona	Fecal Coliform	Burlington Co HD
5	Northeast	06	Lake Swannanoa-06	Lake Swannanoa Country Club	Fecal Coliform	Jefferson Twp HD
5	Atlantic Coast	12	Lake Takanassee-12	50	Phosphorus, Fecal Coliform	Monmouth Co HD
5	Northeast	05	Lake Tappan-05	Lake Tappan	Fish-Mercury	NJDEP Fish Tissue Monitoring
5	Raritan	09	Lake Topanemus at Pond Rd in Freehold	61	Phosphorus	Monmouth Co HD
4	Raritan	09	Lake Topanemus at Pond Rd in Freehold	61	Fecal Coliform	Monmouth Co HD
1	Northwest	01	Lake Tranquility-01	Lake Tranquility Beach A and Beach B	Fecal Coliform	Sussex Co HD
5	Northwest	01	Lake Winona-01	Lake Winona Civic Association	Fecal Coliform	Jefferson Twp HD
1	Atlantic Coast	15	Lakes Bay	Lakes Bay-1 thru 14	Fecal Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
1	Atlantic Coast	15	Lakes Bay	Lakes Bay-1 thru 4 and 6 thru 14	Dissolved Oxygen	NJDEP Coastal Monitoring, Shellfish Monitoring
5	Atlantic Coast	15	Lakes Bay	Lakes Bay-1 thu 10 and 12 thru 14	Total Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
1	Atlantic Coast	15	Lakes Bay	Shelter Island-11	Total Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
5	Atlantic Coast	15	Lakes Bay	Beach Thorofare-5	Dissolved Oxygen	NJDEP Coastal Monitoring, Shellfish Monitoring
1	Lower Delaware	19	Lakeside	Lakeside	Fecal Coliform	Burlington Co HD
4	Raritan	08	Lamington River at Burnt Mills	01399780	Fecal Coliform	NJDEP/USGS Data
5	Raritan	08	Lamington River at Burnt Mills	01399780	Phosphorus	NJDEP/USGS Data
1	Raritan	08	LamIngton River at Burnt Mills	01399780	Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended	NJDEP/USGS Data
5	Raritan	08	Lamington River at Ironia Rd in Chester	AN0356	Benthic Macroinvertebrates	NJDEP AMNET
1	Raritan	08	Lamington River at Rt 24 in Chester	AN0358	Benthic Macroinvertebrates	NJDEP AMNET
5	Raritan	08	Lamington River at Rt 24 in Milltown	EWQ0358	Phosphorus	EWQ
1	Raritan	08	Lamington River at Rt 24 in Milltown	EWQ0358	pH, Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended	EWQ
1	Raritan	08	LamIngton River at Rt 512 in Tewksbury	AN0360	Benthic Macroinvertebrates	NJDEP AMNET
5	Raritan	08	Lamington River at Rt 523 in Lamington	EWQ0363	Temperature	EWQ
1	Raritan	08	Lamington River at Rt 523 in Lamington	EWQ0363	Dissolved Oxygen, pH, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized	EWQ

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Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
3	Raritan	08	Lamington River at Rt 523 in Lamington	EWQ0363	Phosphorus	EWQ
1	Raritan	08	Lamington River at Rt 523 in Tewksbury	AN0363	Benthic Macroinvertebrates	NJDEP AMNET
1	Raritan	08	LamIngton River at Walsh Rd in BedmInster	AN0370	Benthic Macroinvertebrates	NJDEP AMNET
4	Raritan	08	Lamington River near Ironia	01399200	Fecal Coliform	NJDEP/USGS Data
5	Raritan	08	Lamington River near Ironia	01399200	Phosphorus, Dissolved Oxygen	NJDEP/USGS Data
4	Raritan	08	Lamington River near Pottersville	01399500	Fecal Coliform	NJDEP/USGS Data
5	Raritan	08	Lamington River near Pottersville	01399500	Phosphorus	NJDEP/USGS Data
1	Raritan	08	LamIngton River near Pottersville	01399500	Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended	NJDEP/USGS Data
1	Raritan	08	LamIngton River Unknown Trib at Black River Rd in BedmInster	AN0361	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	14	Landing Creek at Indian Cabin Rd in Egg Harbor	AN0592, LLANDIND	Pineland Biological Community	NJDEP AMNET, Pinelands
5	Atlantic Coast	14	Landing Creek at Rt 30 in Mullica	AN0590, LLANDMOS	Pineland Biological Community	NJDEP AMNET, Pinelands
3	Atlantic Coast	14	Landing Creek near Egg Harbor	01409600	Dissolved Oxygen, Total Suspended Solids	NJDEP/USGS Data
1	Atlantic Coast	14	LandIng Creek near Egg Harbor	01409600	Phosphorus, Temperature, pH, Nitrate, Unionized Ammonia	NJDEP/USGS Data
5	Atlantic Coast	12	Lanes Creek at Edwards Ave in Long Branch	46	Fecal Coliform	Monmouth Co HD
5	Atlantic Coast	12	Lapattatong Creek at 1st St - Peterson's Marina in Keyport	51	Fecal Coliform	Monmouth Co HD
1	Lower Delaware	17	Laurel Lake 2-17	Laurel Lake: Mist Road Bathing Area, Nymph Road Bathing Area, Olive Road Bathing Area, Narcissus Dock Bathing Area, Narcissus Rd Bathing Area	Fecal Coliform	Cumberland Co HD
3	Lower Delaware	17	Laurel Lake1-17	Laurel Lake	Phosphorus	NJDEP Clean Lakes
5	Raritan	09	Lawrence Brook at Davidsons Mill Rd in South Brunswick	AN0431	Benthic Macroinvertebrates	NJDEP AMNET
5	Raritan	09	Lawrence Brook at Ridge Rd in South Brunswick	AN0430	Benthic Macroinvertebrates	NJDEP AMNET
5	Raritan	09	Lawrence Brook at Riva Rd in Milltown	AN0434	Benthic Macroinvertebrates	NJDEP AMNET
1	Raritan	09	Lawrence Brook at Riva Rd in Milltown	EWQ0434	Phosphorus, Temperature, Dissolved Oxygen, pH, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized	EWQ
5	Raritan	09	Lawrence Brook on Davidson's Mill Rd, Black Horse	9-LAW-1	Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Zinc	NJDEP Metal Recon
3	Raritan	09	Lawrence Brook on Davidson's Mill Rd, Black Horse	9-LAW-1	Nickel, Selenium	NJDEP Metal Recon
1	Northwest	01	Lawrenceville School Camp Pond-01	Lawrenceville School Camp Pond	Fecal Coliform	Warren Co HD
1	Atlantic Coast	15	Lazy River Lake-15	Lazy River	Fecal Coliform	Atlantic Co HD
1	Lower Delaware	17	Lebanon Branch (Mill Creek) at Sherman Ave in Deerfield	AN0752	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	12	Lefferts Lake-12	66, Lefferts Lake	pH, Total Suspended Solids	Monmouth Co HD, NJDEP Freshwater Fisheries
1	Atlantic Coast	12	Lefferts Lake-12	66, Lefferts Lake	Nitrate, Fecal Coliform	Monmouth Co HD, NJDEP Freshwater Fisheries
5	Atlantic Coast	12	Lefferts Lake-12	66, Lefferts Lake	Phosphorus, Fish Community	Monmouth Co HD, NJDEP Freshwater Fisheries
1	Atlantic Coast	15	Lenape Lake -15	Lake Lenape "The Cove", Lenape Park, Lake Lenape	Fecal Coliform, Fish Community	Atlantic Co HD, NJDEP Freshwater Fisheries

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
5	Atlantic Coast	15	Lenape Lake -15	Lenape Lake	Fish-Mercury	Atlantic Co HD, NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring
3	Atlantic Coast	15	Lenape Lake-15	Lenape Lake	Phosphorus	Atlantic Co HD, NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring
1	Lower Delaware	20	Liberty Lake-20	Liberty Lake	Fecal Coliform	Burlington Co HD
4	Atlantic Coast	15	Lily Lake-15	Lily Lake	Phosphorus	NJDEP Clean Lakes
4	Northeast	05	Lincoln Park Lake-05	Lincoln Park Lake	Phosphorus	NJDEP Clean Lakes
5	Lower Delaware	18	Linden Lake-18	Linden Lake	Fish-Mercury	NJDEP Fish Tissue Monitoring
1	Northeast	03	Lindy Lake-03	Lindy Lake Association	Fecal Coliform	Passaic Co HD
1	Raritan	08	Lingerts Pond-08	Demott Pond	Fish Community	NJDEP Freshwater Fisheries
1	Lower Delaware	19	Lion Tamers Club	Lion Tamers Club	Fecal Coliform	Burlington Co HD
5	Northeast	03	Lionhead Lake-03	Lions Head Lake	Fecal Coliform	Passaic Co HD
1	Atlantic Coast	14	Little Bay	Little Bay-1	Total Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
1	Atlantic Coast	14	Little Bay	Little Bay-1, 2	Dissolved Oxygen, Fecal Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
5	Atlantic Coast	14	Little Bay	Little Bay-2	Total Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
3	Lower Delaware	19	Little Creek at Chairville	01465893	Dissolved Solids	NJDEP/USGS Data
1	Lower Delaware	19	Little Creek at Chairville	01465893	Phosphorus, Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia	NJDEP/USGS Data
5	Lower Delaware	19	Little Creek at Chairville	01465893	pH, Fecal Coliform	NJDEP/USGS Data
5	Lower Delaware	19	Little Creek at Eayrestown Rd in Lumberton	AN0160	Benthic Macroinvertebrates	NJDEP AMNET
3	Lower Delaware	19	Little Creek at Rt 70 in Southampton	AN0158, WLIRTE70, WLIHAWKI	Pineland Biological Community	NJDEP AMNET, Pinelands
5	Lower Delaware	17	Little Ease Run at Grant Ave in Franklin	AN0727	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	17	Franklin	AN0728	Benthic Macroinvertebrates	NJDEP AMNET
1	Lower Delaware	17	Little Ease Run at Porchtown	01411458	Phosphorus, Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia	NJDEP/USGS Data
4	Lower Delaware	17	Little Ease Run at Porchtown	01411458	Fecal Coliform	NJDEP/USGS Data
5	Lower Delaware	17	Little Ease Run at Porchtown	01411458	pH	NJDEP/USGS Data
3	Lower Delaware	17	Little Ease Run UNK Trib at Carpenter Rd in Glassboro	AN0726	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	13	Little Egg Harbor	Little Egg Harbor-1 thru 4	Dissolved Oxygen, Fecal Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
1	Atlantic Coast	13	Little Egg Harbor	Little Egg Harbor-1	Total Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
5	Atlantic Coast	13	Little Egg Harbor	Little Egg Harbor-2 thru 4	Total Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
1	Northwest	01	Little Flat Brook at Deckertown Tnpk (Rt 650) in Montague	AN0004	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	01	Little Flat Brook at Degroat Rd in Sandyston	AN0005, AN0005A	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	01	Little Flat Brook at Rt 615 in Sandyston	EWQ0005A, DRBC/NPS2251	Phosphorus, Fecal Coliform, Temperature, Dissolved Oxygen, pH, Dissolved Solids, Total Suspended Solids, Unionized	EWQ, DRBC
3	Northwest	01	Little Flat Brook at Rt 615 in Sandyston	EWQ0005A, DRBC/NPS2251	Nitrate	EWQ, DRBC

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
3	Atlantic Coast	14	Little Hauken Run at Rt 563 in Washington	AN0601, WLIHAUKN	Pineland Biological Community	NJDEP AMNET, Pinelands
1	Northwest	11	Little Nishisakawick at Rt 29 in Frenchtown	AN0083	Benthic Macroinvertebrates	NJDEP AMNET
3	Northwest	11	Little Shabakunk Creek at Princeton Pike (Rt 583) in Lawrence	AN0112	Benthic Macroinvertebrates	NJDEP AMNET
3	Northwest	11	Little Shabakunk Creek at Rt 206 in Lawrence	AN0112X	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	18	Little Timber Creek	Little Timber Creek	Fish-Mercury	NJDEP Fish Tissue Monitoring
3	Lower Delaware	18	Little Timber Creek at Devon Rd in Bellmawr	AN0666	Benthic Macroinvertebrates	NJDEP AMNET
3	Lower Delaware	18	Little Timber Creek at Paulsboro Rd in Logan	AN0678	Benthic Macroinvertebrates	NJDEP AMNET
3	Northeast	06	Loantaka Brook at Bluestone Terr in Morris	AN0220	Benthic Macroinvertebrates	NJDEP AMNET
3	Northeast	06	Loantaka Brook at Green Village Rd in Chatham	AN0221	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	11	Lockatong Creek at Oak Grove Rd in FranklIn	AN0086	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	11	Lockatong Creek at Rosemont-Raven Rock Rd Bridge	DRBCNJ0013	Fecal Coliform, Dissolved Oxygen, pH, Nitrate, Dissolved Solids, Total Suspended	DRBC
5	Northwest	11	Lockatong Creek at Rosemont-Raven Rock Rd Bridge	DRBCNJ0013	Phosphorus, Temperature	DRBC
1	Northwest	11	Lockatong Creek at Rt 12 in KIngwood	AN0087	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	11	Lockatong Creek at Rt 29 in Delaware	AN0089	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	11	Lockatong Creek at Rt 519 in KIngwood	AN0088	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	13	Long Branch at Lacey - Ocean boundary in Lacey	AN0550	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	12	Long Brook at Wyckoff Mills	01407868, 25	Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids,	NJDEP/USGS Data, Monmouth Co HD
4	Atlantic Coast	12	Long Brook at Wyckoff Mills	01407868, 25	Fecal Coliform	NJDEP/USGS Data, Monmouth Co HD
5	Atlantic Coast	12	Long Brook at Wyckoff Mills	01407868, 25	Phosphorus, pH	NJDEP/USGS Data, Monmouth Co HD
1	Northwest	01	Long Pine Pond-01	YMCA Long Pine Pond	Fecal Coliform	Sussex Co HD
1	Northwest	02	Lookover Lake-02	Lake Lookover	Fecal Coliform	Passaic Co HD
5	Northwest	01	Lopatcong Creek at Main St in Phillipsburg	DRBCNJ0028	Fecal Coliform	DRBC
3	Northwest	01	Lopatcong Creek at Main St in Phillipsburg	DRBCNJ0028	Solids	DRBC
1	Northwest	01	Lopatcong Creek at Main St in Phillipsburg	DRBCNJ0028	Dissolved Solids	DRBC
1	Northwest	01	Lopatcong Creek at Montana Mt Rd in Harmony	AN0051	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	01	Lopatcong Creek at Old Rt 22 in Phillipsburg	AN0053	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	01	Lopatcong Creek at Rt 57 in Port Warren	AN0052	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	01	Lopatcong Creek at Rt 57 in Port Warren	EWQ0052	Phosphorus, Dissolved Oxygen, pH, Nitrate, Dissolved Solids, Unionized	EWQ
3	Northwest	01	Lopatcong Creek at Rt 57 in Port Warren	EWQ0052	Temperature, Total Suspended Solids	EWQ
1	Lower Delaware	19	Lower Aetna Lake-19	Medford Lakes Colony Club Beach 1 and Beach 2	Fecal Coliform	Burlington Co HD
3	Lower Delaware	17	Lower Alloway Creek at Perry Rd in Lower Alloways Creek	AN0704	Benthic Macroinvertebrates	NJDEP AMNET
4	Lower Delaware	20	Lower Sylvan Lake-20	Lower Sylvan Lake	Phosphorus	NJDEP Clean Lakes
1	Northwest	01	Lubbers Run at Rt 206 in Byram	AN0066	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	01	Lubbers Run at Rt 206 in Lockwood	EWQ0066	Phosphorus, Dissolved Oxygen, pH, Nitrate, Dissolved Solids, Total Suspended	EWQ
3	Northwest	01	Lubbers Run at Rt 206 in Lockwood	EWQ0066	Temperature	EWQ

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1	Northwest	01	Lubbers Run at Rt 607 in Byram	AN0065	Benthic Macroinvertebrates	NJDEP AMNET
5	Northwest	01	Lubbers Run at Waterloo Rd (N of Rt 604) in Byram	AN0069A	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	14	Lucas Branch at Pleasant Mills - Weekstown Rd in Mullica	AN0589	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	16	Ludlams Pond-16	Holly Lake Campground	Fecal Coliform	Cape May Co HD
1	Northeast	03	Macopin River at Echo Lake	01382410	Phosphorus, Fecal Coliform, pH, Nitrate, Dissolved Solids, Total Suspended Solids,	NJDEP/USGS Data
5	Northeast	03	Macopin River at Echo Lake	01382410	Temperature, Dissolved Oxygen	NJDEP/USGS Data
5	Northeast	03	Macopin River at Macopin Reservoir	01382450, PQ6	Temperature	NJDEP/USGS Data, Pequannock River Coalition
4	Northeast	03	Macopin River at Macopin Reservoir	01382450, PQ6	Fecal Coliform	NJDEP/USGS Data, Pequannock River Coalition
1	Northeast	03	Macopin River at Macopin Reservoir	01382450, PQ6	Phosphorus, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended	NJDEP/USGS Data, Pequannock River Coalition
1	Northeast	03	Macopin River blw Echo Lk in West Milford	AN0263	Benthic Macroinvertebrates	NJDEP AMNET
3	Lower Delaware	17	Mac's Pond-17	Mac's Pond	Phosphorus	NJDEP Clean Lakes
3	Atlantic Coast	12	Mahoras Brook at Holland Rd in Middletown	MB-PARK3	Benthic Macroinvertebrates	Monmouth Co HD
3	Atlantic Coast	12	Mahoras Brook at Rt 35 in Holmdel	AN0460	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	12	Mahoras Brook at Rt 35 in Middletown	EWQ0460	Temperature, Dissolved Oxygen, pH, Nitrate, Phosphorus, Total Suspended	EWQ
3	Atlantic Coast	12	Mahoras Brook at Rt 35 in Middletown	EWQ0460	Dissolved Solids	EWQ
1	Atlantic Coast	12	Mahoras Brook-Tidal	R67	Dissolved Oxygen, Total Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
5	Lower Delaware	17	Major Run at Pointers - Sharptown Rd in Pilesgrove	AN0694	Benthic Macroinvertebrates	NJDEP AMNET
1	Lower Delaware	17	Major Run at Sharptown	01482530	Temperature, Dissolved Oxygen, pH, Nitrate, Dissolved Solids, Total Suspended	NJDEP/USGS Data
5	Lower Delaware	17	Major Run at Sharptown	01482530	Phosphorus , Fecal Coliform	NJDEP/USGS Data
3	Lower Delaware	17	Malaga Lake-17	Malaga	Phosphorus	Gloucester Co HD, NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring
5	Lower Delaware	17	Malaga Lake-17	Malaga Lake	Fecal Coliform, Fish-Mercury	Gloucester Co HD, NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring
1	Northeast	06	Malapardis Brook at Mt Pleasant Ave in Hanover	AN0238B	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	13	Manahawkin Bay	Manahawkin Bay-1 thru 10	Dissolved Oxygen, Fecal Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
1	Atlantic Coast	13	Manahawkin Bay	East Of Clam Island (Bb)-1	Total Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
5	Atlantic Coast	13	Manahawkin Bay	Manahawkin Bay-2 thru 10	Total Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
5	Atlantic Coast	13	Manahawkin Lake-13	A. Pauling Park Beach	Fecal Coliform	Ocean Co HD, NJDEP Clean Lakes
1	Atlantic Coast	13	Manahawkin Lake-13	ManahawkIn Lake	Oligotrophic	Ocean Co HD, NJDEP Clean Lakes
5	Raritan	09	Manalapan Brook at Federal Rd in Monearoe	AN0439	Benthic Macroinvertebrates	NJDEP AMNET
4	Raritan	09	Manalapan Brook at Federal Rd near Manalapan	01405340, 9-MAN-1	Fecal Coliform	NJDEP/USGS Data, Metal Recon

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5	Raritan	09	Manalapan Brook at Federal Rd near Manalapan	01405340, 9-MAN-1	Phosphorus, pH, Lead	NJDEP/USGS Data, Metal Recon
3	Raritan	09	Manalapan Brook at Federal Rd near Manalapan	01405340, 9-MAN-1	Arsenic, Cadmium, Mercury	NJDEP/USGS Data, Metal Recon
1	Raritan	09	Manalapan Brook at Federal Rd near Manalapan	01405340, 9-MAN-1	Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Chromium, Copper,	NJDEP/USGS Data, Metal Recon
5	Raritan	09	Monearoe	AN0440	Benthic Macroinvertebrates	NJDEP AMNET
1	Raritan	09	Manalapan Brook at Rt 33 in Manalapan	AN0438	Benthic Macroinvertebrates	NJDEP AMNET
5	Raritan	09	Manalapan Brook at Rt 524 in Ely	EWQ0437	pH	EWQ
1	Raritan	09	Manalapan Brook at Rt 524 in Ely	EWQ0437	Phosphorus, Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia	EWQ
1	Raritan	09	Manalapan Brook at Rt 524 in Millstone	AN0437	Benthic Macroinvertebrates	NJDEP AMNET
4	Raritan	09	Manalapan Brook near Spotswood	01405440, EWQ0440, 9-MAN-2	Fecal Coliform	NJDEP/USGS Data, EWQ, Metal Recon
5	Raritan	09	Manalapan Brook near Spotswood	01405440, EWQ0440, 9-MAN-2	pH, Lead, Zinc	NJDEP/USGS Data, EWQ, Metal Recon
3	Raritan	09	Manalapan Brook near Spotswood	01405440, EWQ0440, 9-MAN-2	Arsenic, Cadmium, Chromium, Copper, Mercury, Nickel, Selenium, Zinc	NJDEP/USGS Data, EWQ, Metal Recon
1	Raritan	09	Manalapan Brook near Spotswood	01405440, EWQ0440, 9-MAN-2	Phosphorus, Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia	NJDEP/USGS Data, EWQ, Metal Recon
4	Raritan	09	Manalapan Lake-09	Manalapan Lake	Phosphorus	NJDEP Clean Lakes
5	Lower Delaware	17	Manantico Creek at Hance Bridge Rd in Vineland	AN0759	Benthic Macroinvertebrates	NJDEP AMNET
1	Lower Delaware	17	Manantico Creek at Rt 49 in Millville	AN0760	Benthic Macroinvertebrates	NJDEP AMNET
1	Lower Delaware	17	Manantico Creek-Tidal	R41	Dissolved Oxygen	NJDEP Coastal Monitoring
3	Atlantic Coast	13	Manapaqua Brook at Rt 70 in Manchester	AN0532	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	12	Manasquan Reservoir-12	Manasquan Reservoir	Fish-Mercury	NJDEP Freshwater Fisheries, NJDEP Fish Tissue Monitoring
1	Atlantic Coast	12	Manasquan Reservoir-12	Manasquan Reservoir	Fish Community	NJDEP Freshwater Fisheries, NJDEP Fish Tissue Monitoring
1	Atlantic Coast	12	Manasquan River at Hospital Rd in Wall	AN0498	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	12	Manasquan River at off Turkey Swamp Rd in Freehold	AN0485	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	12	Manasquan River at Rt 547 in Howell	AN0493	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	12	Manasquan River at Rt 9 in Howell	AN0489	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	12	Manasquan River at Squankum	01408000, EWQ0489, 12-MA-1, 12-MA-2, 12-MA-3	Arsenic, Cadmium, Mercury, Silver	NJDEP/USGS Data, EWQ, Metal Recon
1	Atlantic Coast	12	Manasquan River at Squankum	01408000, EWQ0489, 12-MA-1, 12-MA-2, 12-MA-3	Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Chromium,	NJDEP/USGS Data, EWQ, Metal Recon
4	Atlantic Coast	12	Manasquan River at Squankum	01408000, EWQ0489, 12-MA-1, 12-MA-2, 12-MA-3	Fecal Coliform	NJDEP/USGS Data, EWQ, Metal Recon
5	Atlantic Coast	12	Manasquan River at Squankum	01408000, EWQ0489, 12-MA-1, 12-MA-2, 12-MA-3	Phosphorus	NJDEP/USGS Data, EWQ, Metal Recon
5	Atlantic Coast	12	Manasquan River at W Farms Rd in Howell	AN0490	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	12	Manasquan River Estuary	Manasquan River Estuary-1 thru 3	Total Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring

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1	Atlantic Coast	12	Manasquan River Estuary	Manasquan River Estuary-3	Fecal Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
5	Atlantic Coast	12	Manasquan River Estuary	Manasquan River Estuary-3	Dissolved Oxygen	NJDEP Coastal Monitoring, Shellfish Monitoring
1	Atlantic Coast	12	Manasquan River Estuary	R07; Upper Manasquan River Estuary-1; Manasquan River Estuary-2	Dissolved Oxygen, Fecal Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
3	Atlantic Coast	12	Manasquan River UNK Trib at Strickland Rd in Howell	AN0488	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	12	Mannahasset Creek at Mannahasset Ave in Long Branch	48	Fecal Coliform	Monmouth Co HD
5	Raritan	08	Manor House Outlet	Manor House Outlet	Fecal Coliform	Mount Olive HD
1	Lower Delaware	18	Mantua Creek at Greentree Rd in Glassboro	AN0668	Benthic Macroinvertebrates	NJDEP AMNET
3	Lower Delaware	18	Mantua Creek at Lambs Rd in Mantua	AN0669	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	18	Mantua Creek at Mantua Ave in Wenonah	AN0672	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	18	Mantua Creek at Rt 45 in W. Deptford	01475045	Phosphorus	EWQ
1	Lower Delaware	18	Mantua Creek at Rt 45 in W. Deptford	01475045	Temperature, Dissolved Oxygen, pH, Nitrate, Dissolved Oxygen, Total	EWQ
3	Lower Delaware	17	Manumuskin River at Fries Mill (off Cumberland - Port Eliz in Maurice River	AN0763	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	17	Manumuskin River at Main Ave in Milmay	AN0762A	Benthic Macroinvertebrates	NJDEP AMNET
3	Lower Delaware	17	Manumuskin River at Old Mays Landing Rd in Vineland	AN0762	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	15	Maple Lake-15	Maple Lake	Fish Community	NJDEP Freshwater Fisheries
3	Atlantic Coast	13	Maple Root Branch at Bowman Rd in Jackson	AN0521	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	13	Maple Root Branch at Bowman Rd near Homansville	01408285	Phosphorus, pH, Nitrate, Unionized Ammonia	NJDEP/USGS Data
3	Atlantic Coast	13	Maple Root Branch at Bowman Rd near Homansville	01408285	Fecal Coliform, Temperature, Dissolved Oxygen, Total Suspended Solids	NJDEP/USGS Data
5	Atlantic Coast	15	Maple Run (Asbury Run) at Mill Rd in Egg Harbor	AN0619	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	01	Marcia Lake-01	High Point SP, Lake Marcia	Fecal Coliform	Northern Region, NJDEP Clean Lakes
3	Northwest	01	Marcia Lake-01	Marcia Lake	Phosphorus	Northern Region, NJDEP Clean Lakes
3	Atlantic Coast	15	Mare Run at Rt 559 in Hamilton	AN0638	Benthic Macroinvertebrates	NJDEP AMNET
1	Raritan	08	Marine Lake-08	Lake Silver Springs	Fecal Coliform	Roxbury Twp Board of Health
5	Lower Delaware	18	Marlton Lake-18	Marlton Lake	Fish-Mercury	NJDEP Fish Tissue Monitoring
3	Atlantic Coast	12	Marsh Bog Brook at Cranberry Bog Rd in Howell	AN0491	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	12	Marsh Bog Brook at Squankum	01407997, 24	Phosphorus, Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia	NJDEP/USGS Data, Monmouth Co HD
4	Atlantic Coast	12	Marsh Bog Brook at Squankum	01407997, 24	Fecal Coliform	NJDEP/USGS Data, Monmouth Co HD
5	Atlantic Coast	12	Marsh Bog Brook at Squankum	01407997, 24	pH	NJDEP/USGS Data, Monmouth Co HD
3	Atlantic Coast	12	Marsh Bog Brook at Yellow Brook Rd in Howell	AN0492	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	15	Marsh Lake Branch (Collings Br) at Blue Anchor Rd in Buena Vista	AN0632	Benthic Macroinvertebrates	NJDEP AMNET

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3	Atlantic Coast	15	Marsh Lake Branch (Collings Br) at Unexpected Rd in Buena Vista	AN0631	Benthic Macroinvertebrates	NJDEP AMNET
4	Lower Delaware	17	Mary Elmer Lake-17	Mary Elmer Lake	Phosphorus	NJDEP Clean Lakes
1	Northwest	01	Mashipacong Pond-01	Lake Masipacong: Trail Blazers Boys and Trail Blazers Girls	Fecal Coliform	Sussex Co HD
5	Lower Delaware	17	Maskells Mill Pond-17	Maskells Mill Pond	Fish-Mercury	NJDEP Fish Tissue Monitoring
1	Lower Delaware	17	Maskells Millpond-17	Maskells Millpond	Fish Community	NJDEP Freshwater Fisheries, NJDEP Fish Tissue Monitoring
3	Lower Delaware	18	Mason Run at Chews Landing Rd in Lindenwold	AN0662	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	19	Masons Creek at Rt 38 in Hainesport	AN0173	Benthic Macroinvertebrates	NJDEP AMNET
3	Lower Delaware	19	Masons Creek UNK Trib at Ark Rd in Lumberton	AN0172	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	12	Matawan Creek Estuary	8, R62	Total Coliform	NJDEP Shellfish Monitoring
3	Atlantic Coast	12	Matawan Creek UNK Trib at Morganville Rd in Old Bridge	AN0456	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	12	Matawan Creek-Tidal	8, R62	Fecal Coliform, Dissolved Oxygen	Monmouth Co HD, NJDEP Coastal Monitoring
4	Raritan	09	Matchaponix Brook at Englishtown	01405195	Fecal Coliform	NJDEP/USGS Data
3	Raritan	09	Matchaponix Brook at Englishtown	01405195	Phosphorus, pH	NJDEP/USGS Data
1	Raritan	09	Matchaponix Brook at Englishtown	01405195	Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids,	NJDEP/USGS Data
5	Raritan	09	Matchaponix Brook at Rt 527 in Manalapan	AN0448	Benthic Macroinvertebrates	NJDEP AMNET
1	Raritan	09	Matchaponix Brook at Spotswood	01405302, EWQ0451	Fecal Coliform, Temperature, Dissolved Oxygen, Dissolved Solids, Total	NJDEP/USGS Data, EWQ
5	Raritan	09	Matchaponix Brook at Spotswood	01405302, EWQ0451	Phosphorus, pH, Nitrate	NJDEP/USGS Data, EWQ
5	Raritan	09	Matchaponix Brook at Texas Rd in Monearoe	AN0451	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	14	Mattix Run (Frenches Ditch) at Moss Mill Rd in Galloway	AN0615	Benthic Macroinvertebrates	NJDEP AMNET
3	Lower Delaware	17	Maurice River (Scotland Run) at Willow Grove Rd in Vineland	AN0733	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	17	Maurice River and Cove	3847,3847A,3847B,3847C,3847D,3848,3848A,3848B,3848C,3900A,3900D,3900G,3900H,3900J,3900L,3900M	Fecal Coliform	Coastal Water Quality Monitoring
1	Lower Delaware	17	Maurice River at Almond Ave in VIneland	AN0740	Benthic Macroinvertebrates	NJDEP AMNET
3	Lower Delaware	17	Maurice River at Norma	01411500	Cadmium, Lead, Mercury	NJDEP/USGS Data
1	Lower Delaware	17	Maurice River at Norma	01411500	Phosphorus, Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia,	NJDEP/USGS Data
4	Lower Delaware	17	Maurice River at Norma	01411500	Fecal Coliform	NJDEP/USGS Data
5	Lower Delaware	17	Maurice River at Norma	01411500	pH, Arsenic	NJDEP/USGS Data
5	Lower Delaware	17	Maurice River at Sherman Ave in Vineland	AN0751	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	17	Maurice River Estuary	3900J, 3900I, 3900M	Total Coliform	NJDEP Shellfish Monitoring
3	Lower Delaware	17	Maurice River near Millville	01411800, 17-MAU-1	pH, Cadmium, Lead, Mercury	NJDEP/USGS Data, Metal Recon
1	Lower Delaware	17	Maurice River near Millville	01411800, 17-MAU-1	Phosphorus, Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia,	NJDEP/USGS Data, Metal Recon
4	Lower Delaware	17	Maurice River near Millville	01411800, 17-MAU-1	Fecal Coliform	NJDEP/USGS Data, Metal Recon

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5	Lower Delaware	17	Maurice River near Millville	01411800, 17-MAU-1	Arsenic	NJDEP/USGS Data, Metal Recon
1	Lower Delaware	17	Maurice River-Tidal	R40, R43, 3900A, 3900M	Dissolved Oxygen	NJDEP Coastal Monitoring
3	Atlantic Coast	12	McClees Creek at Whipporwill Rd in Middletown	AN0462	Benthic Macroinvertebrates	NJDEP AMNET
1	Lower Delaware	19	McDonalds Branch at USGS gage in Woodland	AN0146, GMCBUTTE	Pineland Biological Community	NJDEP AMNET, Pinelands
3	Lower Delaware	19	McDonalds Branch in Lebanon State Forest	01466500	Mercury, Zinc, Silver	NJDEP/USGS Data
1	Lower Delaware	19	McDonalds Branch in Lebanon State Forest	01466500	Phosphorus, Fecal Coliform, Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized	NJDEP/USGS Data
1	Northeast	03	McDonalds Ponds-03	P.V. Park: Diving Boards, Left Beach, Left Guard Stand, North Shore, Right Beach, Right Guard Stand,South Shore	Fecal Coliform	Twp of Pequannock
5	Raritan	09	McGellairds Brook at Rt 527 in Englishtown	AN0447	Benthic Macroinvertebrates	NJDEP AMNET
3	Raritan	09	McGellairds Brook at Rt 9 in Freehold	AN0444, MB-97	Benthic Macroinvertebrates	NJDEP AMNET
4	Raritan	09	McGolliard Brook at Main St in Englishtown	22	Fecal Coliform	Monmouth Co HD
5	Raritan	09	McGolliard Brook at Main St in Englishtown	22	Phosphorus	Monmouth Co HD
1	Raritan	09	McGolliard Brook at MaIn St in Englishtown	22	Nitrate	Monmouth Co HD
3	Raritan	09	McGolliard Brook at Main St In Englishtown	22	pH, Total Suspended Solids	Monmouth Co HD
3	Atlantic Coast	15	McNeals Branch at Rt 666 in Estell Manor	AN0651	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	03	Meadow Brook at Highland Ave in Wanaque	AN0256A	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	13	Medeteconk River Estuary	R08, Upper Medeteconk River Estuary-1	Dissolved Oxygen, Fecal Coliform	NJDEP Coastal Monitoring
5	Lower Delaware	17	Memorial Lake-17	Memorial Lake	Fish-Mercury	NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring
4	Lower Delaware	17	Memorial Lake-17	Memorial Lake	Phosphorus	NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring
1	Lower Delaware	17	Menantico Lake-17	Menantico Pond	Fish Community	NJDEP Freshwater Fisheries
3	Lower Delaware	17	Menantico Pond-17	Menantico Pond	Phosphorus	NJDEP Clean Lakes
1	Northeast	06	Mendham Pond-06	Mendham Township Pond Beach, Pond Inlet, Pond Outlet	Fecal Coliform	Bernards Twp HD
3	Northwest	11	Mercer County Park Lake-11	Mercer County Park Lake	Phosphorus	NJDEP Clean Lakes
5	Northwest	01	Merrill Cr Reservoir-01	Merrill Creek Reservoir	Fish-Mercury	NJDEP Fish Tissue Monitoring
1	Northwest	01	Merrill Creek at Farm Rd in Greenwich	AN0060	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	01	Merrill Creek at Merrill Creek Rd (abv res) in Harmony	AN0059	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	01	Merrill Creek Reservoir-01	Merrill Creek Reservoir	Fish Community	NJDEP Freshwater Fisheries
5	Atlantic Coast	13	Metedeconk River Estuary	Upper Medeteconk River Estuary-1	Total Coliform	NJDEP Shellfish Monitoring
3	Atlantic Coast	13	Metedeconk River N Br at Aldrich Rd in Jackson	AN0501, MB-147	Benthic Macroinvertebrates	NJDEP AMNET, Monmouth Co HD
1	Atlantic Coast	13	Metedeconk River N Br at Jackson Mills Rd in Freehold	6	Nitrate	Monmouth Co HD
3	Atlantic Coast	13	Metedeconk River N Br at Jackson Mills Rd In Freehold	6	pH, Total Suspended Solids	Monmouth Co HD
5	Atlantic Coast	13	Metedeconk River N Br at Jackson Mills Rd in Freehold	6	Phosphorus, Fecal Coliform	Monmouth Co HD
4	Atlantic Coast	13	Metedeconk River N Br at Jackson Mills Rd in Freehold	6	Fecal Coliform	Monmouth Co HD

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
5	Atlantic Coast	13	Metedeconk River N Br at Jackson Mills Rd in Freehold	AN0500, AN0499, MB-146, MB-148	Benthic Macroinvertebrates	NJDEP AMNET, Monmouth Co HD
1	Atlantic Coast	13	Metedeconk River N Br at Lakewood	01408100	Phosphorus, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids,	NJDEP/USGS Data
4	Atlantic Coast	13	Metedeconk River N Br at Lakewood	01408100	Fecal Coliform	NJDEP/USGS Data
5	Atlantic Coast	13	Metedeconk River N Br at Lakewood	01408100	Temperature, pH	NJDEP/USGS Data
1	Atlantic Coast	13	Metedeconk River N Br at Rt 88 in Brick	AN0506	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	13	Metedeconk River N Br at Rt 9 in Howell	AN0502, MB-135	Benthic Macroinvertebrates	NJDEP AMNET, Monmouth Co HD
3	Atlantic Coast	13	Metedeconk River S Br at Bennetts Mill Rd in Jackson	AN0510	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	13	Metedeconk River S Br at Cedar Bridge Rd in Lakewood	AN0511	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	13	Metedeconk River S Br at Chambers Bridge Rd in Brick	AN0512	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	13	Metedeconk River S Br at Cooks Bridge Rd in Jackson	AN0510A	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	13	Metedeconk River S Br at Jackson Mills Rd in Jackson	AN0509	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	13	Metedeconk River S Br at Leesville-Siloam Rd in Jackson	AN0508	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	13	Metedeconk River S Br near Laurelton	01408152	pH	NJDEP/USGS Data
1	Atlantic Coast	13	Metedeconk River S Br near Laurelton	01408152	Phosphorus, Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia	NJDEP/USGS Data
4	Atlantic Coast	13	Metedeconk River S Br near Laurelton	01408152	Fecal Coliform	NJDEP/USGS Data
3	Raritan	08	Middle Brook at Burnt Mills	01399100	Suspended Solids	NJDEP/USGS Data
1	Raritan	08	Middle Brook at Burnt Mills	01399100	Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Unionized Ammonia	NJDEP/USGS Data
1	Raritan	08	Middle Brook at River Rd in BedmInster	AN0355	Benthic Macroinvertebrates	NJDEP AMNET
1	Raritan	08	Middle Brook at Spook Hollow Rd in BedmInster	AN0354	Benthic Macroinvertebrates	NJDEP AMNET
1	Raritan	09	Middle Brook at Talmage Ave in Bridgewater	AN0420	Benthic Macroinvertebrates	NJDEP AMNET
1	Raritan	09	Middle Brook E Br at Gilbride Rd in Bridgewater	AN0419	Benthic Macroinvertebrates	NJDEP AMNET
3	Raritan	09	Middle Brook E Br at Green Valley Rd in Warren	AN0418	Benthic Macroinvertebrates	NJDEP AMNET
5	Raritan	09	Middle Brook W Br at Chimney Rk Rd at Martinsville	01403171	Fecal Coliform	NJDEP/USGS Data
1	Raritan	09	Middle Brook W Br at Chimney Rk Rd at Martinsville	01403171	Phosphorus, Temperature, Dissolved Oxygen, pH, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized	NJDEP/USGS Data
3	Raritan	09	Middle Brook W Br at Chimney Rock Rd in Bridgewater	AN0417	Benthic Macroinvertebrates	NJDEP AMNET
3	Raritan	09	Middle Brook W Br at Crim Rd in Bridgewater	AN0416	Benthic Macroinvertebrates	NJDEP AMNET
1	Northeast	03	Middle Lake Village	Middle Lake Village	Fecal Coliform	Passaic Co HD
5	Lower Delaware	17	Middle Marsh Creek Estuary	4101E	Total Coliform	NJDEP Shellfish Monitoring
5	Atlantic Coast	15	Middle River Estuary	2900A, 2900B, 2900C, 2900D, 2900E	Dissolved Oxygen, Total Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
3	Atlantic Coast	14	Mile Run at Hawkins - Speedwell Rd in Washington	AN0598	Benthic Macroinvertebrates	NJDEP AMNET

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
5	Raritan	09	Mile Run at Rt 527 in Franklin	AN0429	Benthic Macroinvertebrates	NJDEP AMNET
3	Raritan	09	Milford Brook at Pease Rd in Manalapan	AN0446	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	13	Mill Branch of Tuckerton Creek at Nugentown Rd in Tuckerton	AN0559	Benthic Macroinvertebrates	NJDEP AMNET
3	Northeast	06	Mill Brook at Palmer Rd in Randolph	AN0244	Benthic Macroinvertebrates	NJDEP AMNET
3	Raritan	09	Mill Brook at Woodbridge Ave in Edison	AN0436	Benthic Macroinvertebrates	NJDEP AMNET
3	Northwest	01	Mill Brook UNK Trib at off Rt 23 in Montague	AN0001	Benthic Macroinvertebrates	NJDEP AMNET
1	Lower Delaware	19	Mill Creek at Levitt Pkwy in Willingboro	EWQ0175	Temperature, Dissolved Oxygen, pH, Nitrate, Dissolved Solids, Total Suspended	EWQ
5	Lower Delaware	19	Mill Creek at Levitt Pkwy in Willingboro	AN0175	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	19	Mill Creek at Levitt Pkwy in Willingboro	EWQ0175	Phosphorus	EWQ
3	Atlantic Coast	13	Mill Creek at of Hay Rd in Stafford	AN0555A	Benthic Macroinvertebrates	NJDEP AMNET
1	Lower Delaware	17	Mill Creek at off Spur 552 (Union Lk WMA) in Millville	AN0753	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	15	Mill Creek at Rt 557 in Upper	AN0652	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	17	Mill Creek at Rt 650 in Greenwich	AN0716B	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	13	Mill Creek at Rt 72 in Stafford	AN0555	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	16	Mill Creek Estuary	3207B	Total Coliform	NJDEP Shellfish Monitoring
5	Atlantic Coast	13	Mill Creek-Tidal	1706	Total Coliform	NJDEP Shellfish Monitoring
1	Atlantic Coast	14	Mill Pond-14	Nacote Creek Beach	Fecal Coliform	Atlantic Co HD
5	Raritan	10	Millstone River above Raritan River confl in Franklin	AN0414	Benthic Macroinvertebrates	NJDEP AMNET
5	Raritan	10	Millstone River at Applegarth Rd in Monearoe	AN0382D	Benthic Macroinvertebrates	NJDEP AMNET
3	Raritan	10	Millstone River at Backbone Hill Rd in Millstone	MB-MILL5, MB-MILL4	Benthic Macroinvertebrates	Monmouth Co HD
4	Raritan	10	Millstone River at Blackwells Mills	01402000, 10-MIL-5, 10-MIL-6	Fecal Coliform	NJDEP/USGS Data, Metal Recon
5	Raritan	10	Millstone River at Blackwells Mills	01402000, 10-MIL-5, 10-MIL-6	Phosphorus, Arsenic	NJDEP/USGS Data, Metal Recon
3	Raritan	10	Millstone River at Blackwells Mills	01402000, 10-MIL-5, 10-MIL-6	Cadmium, Mercury	NJDEP/USGS Data, Metal Recon
1	Raritan	10	Millstone River at Blackwells Mills	01402000, 10-MIL-5, 10-MIL-6	Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Chromium,	NJDEP/USGS Data, Metal Recon
5	Raritan	10	Millstone River at Blackwells Mills Rd in Hillsborough	AN0410	Benthic Macroinvertebrates	NJDEP AMNET
1	Raritan	10	Millstone River at Corner of Rt 33 & Millstone Rd in Millstone	MB-MILL1	Benthic Macroinvertebrates	Monmouth Co HD
3	Raritan	10	Millstone River at Grovers Mill	01400650	Cadmium, Lead, Mercury	NJDEP/USGS Data
5	Raritan	10	Millstone River at Grovers Mills Rd in Plainsboro	AN0382	Benthic Macroinvertebrates	NJDEP AMNET
5	Raritan	10	Millstone River at Kingston	01401440, 10-MIL-2	Phosphorus, Fecal Coliform, pH, Temperature, Arsenic, Mercury	NJDEP/USGS Data, Metal Recon
3	Raritan	10	Millstone River at Kingston	01401440, 10-MIL-2	Cadmium, Lead	NJDEP/USGS Data, Metal Recon
1	Raritan	10	Millstone River at Kingston	01401440, 10-MIL-2	Chromium, Copper, Nickel, Selenium, Zinc	NJDEP/USGS Data, Metal Recon
3	Raritan	10	Millstone River at Nolan Dr in Millstone	MB-MILL3	Benthic Macroinvertebrates	Monmouth Co HD
3	Raritan	10	Millstone River at off Rt 27 in Princeton	AN0397	Benthic Macroinvertebrates	NJDEP AMNET

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
1	Raritan	10	Millstone River at Roberts Rd in Millstone	MB-MILL6	Benthic Macroinvertebrates	Monmouth Co HD
3	Raritan	10	Millstone River at Roberts Rd in Millstone	MB-MILL6	Benthic Macroinvertebrates	Monmouth Co HD
5	Raritan	10	Millstone River at Rt 33 in Millstone	AN0379, AN0378, MB-MILL2	Benthic Macroinvertebrates	NJDEP AMNET, Monmouth Co HD
5	Raritan	10	Millstone River at Rt 535 in East Windsor	AN0382B	Benthic Macroinvertebrates	NJDEP AMNET
4	Raritan	10	Millstone River at Weston	01402540, 10-MIL-3	Fecal Coliform	NJDEP/USGS Data, Metal Recon
5	Raritan	10	Millstone River at Weston	01402540, 10-MIL-3	Phosphorus, pH, Arsenic	NJDEP/USGS Data, Metal Recon
3	Raritan	10	Millstone River at Weston	01402540, 10-MIL-3	Cadmium, Mercury	NJDEP/USGS Data, Metal Recon
1	Raritan	10	Millstone River at Weston	01402540, 10-MIL-3	Chromium, Copper, Lead, Nickel, Selenium, Zinc	NJDEP/USGS Data, Metal Recon
1	Raritan	10	Millstone River near Grovers Mill	01400640, 01400650	Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Chromiuim,	NJDEP/USGS Data, Metal Recon
4	Raritan	10	Millstone River near Grovers Mills	01400640, 01400650	Fecal Coliform	NJDEP/USGS Data, Metal Recon
5	Raritan	10	Millstone River near Grovers Mills	01400640, 01400650	Phosphorus, Arsenic	NJDEP/USGS Data, Metal Recon
3	Raritan	10	Millstone River near Grovers Mills	01400640, 01400650	Cadmium, Mercury	NJDEP/USGS Data, Metal Recon
4	Raritan	10	Millstone River near Manalapan	01400540, 01400530, 5, 10-MIL-1	Fecal Coliform	NJDEP/USGS Data, Monmouth Co HD, Metal Recon
5	Raritan	10	Millstone River near Manalapan	01400540, 01400530, 5, 10-MIL-1	Phosphorus, pH, Total Suspended Solids, Arsenic	NJDEP/USGS Data, Monmouth Co HD, Metal Recon
3	Raritan	10	Millstone River near Manalapan	01400540, 01400530, 5, 10-MIL-1	Cadmium, Mercury	NJDEP/USGS Data, Monmouth Co HD, Metal Recon
1	Raritan	10	Millstone River near Manalapan	01400540, 01400530, 5, 10-MIL-1	Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Unionized Ammonia, Chromium, Copper, Lead, Nickel,	NJDEP/USGS Data, Monmouth Co HD, Metal Recon
1	Raritan	10	Millstone River off Rt 1 in Plainsboro	10-MIL-7	Selenium, Zinc	NJDEP Metal Recon
5	Raritan	10	Millstone River off Rte 1 in Plainsboro	10-MIL-7	Arsenic	NJDEP Metal Recon
1	Lower Delaware	19	Mimosa Lakes-19	Mimosa Lake Beach	Fecal Coliform	Burlington Co HD
5	Raritan	08	Bernardsville	AN0352	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	12	Mine Brook at Creamery Rd in Colts Neck	AN0473	Benthic Macroinvertebrates	NJDEP AMNET
5	Raritan	08	Mine Brook at Far Hills Rd (Rt 512) in Far Hills	AN0353	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	12	Mine Brook at Mercer Rd In Colts Neck	58	pH, Total Suspended Solids	Monmouth Co HD
1	Atlantic Coast	12	MIne Brook at Mercer Rd in Colts Neck	58	Phosphorus, Fecal Coliform, Nitrate	Monmouth Co HD
1	Northwest	01	MIne Brook at Rt 517 in WashIngton	AN0067	Benthic Macroinvertebrates	NJDEP AMNET
1	Raritan	08	Mine Hill Lake-08	Mine Hill Beach	Fecal Coliform	Madison Boro Board of Health
3	Atlantic Coast	12	Howell	AN0494	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	12	Mingamahone Brook at Rt 524 in Howell	AN0495	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	12	MIngamahone Brook near Earle	01408009	Phosphorus, Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids,	NJDEP/USGS Data
4	Atlantic Coast	12	Mingamahone Brook near Earle	01408009	Fecal Coliform	NJDEP/USGS Data
5	Atlantic Coast	12	Mingamahone Brook near Earle	01408009	pH, Total Suspended Solids	NJDEP/USGS Data
3	Atlantic Coast	12	Mingomohone Brook at Belmar Blvd In Farmingdale	23	pH, Total Suspended Solids	Monmouth Co HD

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1	Atlantic Coast	12	MIngomohone Brook at Belmar Blvd in FarmIngdale	23	Phosphorus, Fecal Coliform, Nitrate	Monmouth Co HD
3	Lower Delaware	19	Mirror Lake-19	Mirror Lake	Phosphorus	Burlington Co HD, NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring
5	Lower Delaware	19	Mirror Lake-19	Mirror Lake	Fecal Coliform, Fish-Mercury	Burlington Co HD, NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring
3	Lower Delaware	20	Miry Run at Holmes Mill Rd in Upper Freehold	AN0125B	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	20	Miry Run at Meirs Rd in Cream Ridge	AN0125A	Benthic Macroinvertebrates	NJDEP AMNET
3	Northwest	11	Miry Run at Pond Rd in Washington	AN0115A	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	11	Miry Run at Route 533 at Mercerville	01463850	Temperature, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized	NJDEP/USGS Data
4	Northwest	11	Miry Run at Route 533 in Mercerville	01463850	Fecal Coliform	NJDEP/USGS Data
5	Northwest	11	Miry Run at Route 533 in Mercerville	01463850	Phosphorus, Dissolved Oxygen, pH	NJDEP/USGS Data
5	Northwest	11	Miry Run at Rt 533 in Hamilton	AN0115	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	15	Miry Run at Thelma Ave in Egg Harbor	AN0642	Benthic Macroinvertebrates	NJDEP AMNET
3	Lower Delaware	19	Mohegan Lake-19	Mohegan Lake YMCA Camp Moore, YMCA Camp Moore Family Lake,	Pineland Biological Community	Burlington Co HD, Pinelands
1	Lower Delaware	19	Mohegan Lake-19	Mohegan Lake YMCA Camp Moore, YMCA Camp Moore Family Lake,	Fecal Coliform	Burlington Co HD, Pinelands
5	Northeast	04	Molly Ann Brook at Totowa Ave in Paterson	AN0276	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	13	Money Island (Dover)	Money Island (Dover)	Fecal Coliform	Cooperative Coastal Monitoring Program
5	Northeast	03	Monksville Reservoir-03	Monksville Reservoir	Fish-Mercury	NJDEP Freshwater Fisheries, NJDEP Fish Tissue Monitoring
1	Northeast	03	Monksville Reservoir-03	Monksville Reservoir	Fish Community	NJDEP Freshwater Fisheries, NJDEP Fish Tissue Monitoring
1	Northeast	03	Montclair YMCA Near Beach and Far Beach	Montclair YMCA Near Beach and Far Beach	Fecal Coliform	Passaic Co HD
1	Northwest	11	Moores Creek at Barry Rd in West Amwell	AN0100	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	11	Moores Creek at Rt 29 in Hopewell	AN0101	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	20	Moorhouse Brook Trib S at Moorhouse Rd in New Egypt	AN0121A	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	06	Morris County Park Lake, Beach, Inlet, Outlet,	Morris County Park Lake, Beach, Inlet, Outlet,	Fecal Coliform	Bernards Twp HD
3	Raritan	07	Morse Creek on Edgar Rd in Linden	7-MOR-1	Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium, Silver,	NJDEP Metal Recon
1	Northeast	03	Morse Lake-03	Morse Lake POA, Morse Lake	Fecal Coliform	Twp of Pequannock
1	Atlantic Coast	14	Morses Mill Stream at Riverside Dr in Port Republic	AN0614	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	14	Morses Mill Stream below College Drive	LMORSESM	Pineland Biological Community	Pinelands
1	Atlantic Coast	14	Moss Mill Lake-14	Evergreen Woods	Fecal Coliform	Atlantic Co HD
1	Northeast	03	Mossmans Brook at CIInton Rd (abv res) in West Milford	AN0260	Benthic Macroinvertebrates	NJDEP AMNET
1	Northeast	06	Mount Hope Pond-06	Mount Hope Pond Left, Middle, and Right	Fecal Coliform	Rockaway Twp HD
1	Northwest	02	Mount Laurel Lake-02	Mt. Laurel Beach Club	Fecal Coliform	Passaic Co HD
1	Lower Delaware	19	Mount Misery Brook at Upton	01466100	Temperature, Dissolved Oxygen, pH, Nitrate, Phosphorus, Dissolved Solids, Total Suspended Solids, Unionized	NJDEP/USGS Data

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
5	Lower Delaware	19	Mount Misery Brook at Upton	01466100	Fecal Coliform	NJDEP/USGS Data
1	Lower Delaware	19	Mount Misery Brook M Br at Mount Misery-Pasadena Rd	GMIMOUNT	Pineland Biological Community	Pinelands
1	Lower Delaware	19	Mount Misery Brook N Br at unnamed sand rd	GNOSANDR	Pineland Biological Community	Pinelands
3	Northwest	01	Mountain Lake Brook at blw Mtn Lk in Liberty	AN0044	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	01	Mountain Lake-01	Mountain Lake	Fecal Coliform	Warren Co HD
5	Northeast	06	Mountain Lake-06	Mountain Lake	Fecal Coliform, Fish-Mercury	Montville Twp HD, NJDEP Fish Tissue Monitoring
1	Northeast	03	Mountain Springs Lake-03	Mountain Springs Lake	Fecal Coliform	Passaic Co HD
3	Lower Delaware	19	Mt Misery Brook at Rt 70 in Pemberton	AN0145, GMORTE70	Pineland Biological Community	NJDEP AMNET, Pinelands
1	Northeast	03	Mt. Glen Lakes-03	Mt. Glen Lakes	Fecal Coliform	Passaic Co HD
3	Northeast	06	Mt. Hope Pond-06	Mt. Hope Pond	Phosphorus	NJDEP Clean Lakes
1	Lower Delaware	19	Mt. Misery Lake-19	Methodist Camps, GMOUCAMP	Pineland Biological Community	Burlington Co HD, Pinelands
1	Lower Delaware	19	Mt. Misery Lake-19	Methodist Camps, GMOUCAMP	Fecal Coliform	Burlington Co HD, Pinelands
3	Atlantic Coast	13	Muddy Ford Brook at Lakewood-Allenwood Rd In Howell	17	pH, Total Suspended Solids	Monmouth Co HD
1	Atlantic Coast	13	Muddy Ford Brook at Lakewood-Allenwood Rd in Howell	17	Phosphorus, Nitrate	Monmouth Co HD
4	Atlantic Coast	13	Muddy Ford Brook at Lakewood-Allenwood Rd in Howell	17	Fecal Coliform	Monmouth Co HD
3	Lower Delaware	17	Muddy Run at blw Palatine Lk in Pittsgrove	AN0745	Benthic Macroinvertebrates	NJDEP AMNET
1	Lower Delaware	17	Muddy Run at Burlington Rd in Upper Pittsgrove	01382	Benthic Macroinvertebrates	NJDEP AMNET
3	Lower Delaware	17	Muddy Run at Dutch Row Rd in Elmer	AN0742	Benthic Macroinvertebrates	NJDEP AMNET
1	Lower Delaware	17	Muddy Run at Lebanon Rd in Pittsgrove	AN0749	Benthic Macroinvertebrates	NJDEP AMNET
3	Lower Delaware	17	Muddy Run at Parvins Mill Rd in Pittsgrove	AN0748	Benthic Macroinvertebrates	NJDEP AMNET
1	Lower Delaware	17	Muddy Run near Norma	01411780	Phosphorus, Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia	NJDEP/USGS Data
3	Lower Delaware	17	Muddy Run near Norma	01411780	Fecal Coliform, pH	NJDEP/USGS Data
1	Raritan	08	Mulhockaway Creek at Rt 635 in Union	AN0321	Benthic Macroinvertebrates	NJDEP AMNET
4	Raritan	08	Mulhockaway Creek at Van Syckel	01396660, 8-MU-1	Fecal Coliform	NJDEP/USGS Data, Metal Recon
3	Raritan	08	Mulhockaway Creek at Van Syckel	01396660, 8-MU-1	Arsenic, Cadmium, Mercury	NJDEP/USGS Data, Metal Recon
1	Raritan	08	Mulhockaway Creek at Van Syckel	01396660, 8-MU-1	Phosphorus, Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Chromium, Copper, Lead, Nickel,	NJDEP/USGS Data, Metal Recon
5	Atlantic Coast	14	Mullica River	Mullica River	Fish-Mercury, Fish-PCB, Fish-Dioxin	NJDEP Fish Tissue Monitoring
3	Atlantic Coast	14	Mullica River above Central New Jersey/Conrail RR Bridge	MMURRBRG	Pineland Biological Community	Pinelands
1	Atlantic Coast	14	Mullica River above dike below Old Jack	MMUDIKES	Pineland Biological Community	Pinelands
3	Atlantic Coast	14	Mullica River at Burnt House Rd in Waterford	AN0562	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	14	Mullica River at Constable Bridge in Washington	AN0564, MMUCONST	Pineland Biological Community	NJDEP AMNET, Pinelands
5	Atlantic Coast	14	Mullica River at Green Bank	Mullica River at Green Bank	Temperature	NJDEP/USGS Data
5	Atlantic Coast	14	Mullica River at Indian Mills	01409383	Dissolved Oxygen	USGS/Pinelands Data

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1	Atlantic Coast	14	Mullica River at Indian Mills	01409383	Phosphorus, Temperature, pH, Nitrate, Dissolved Solids, Unionized Ammonia	USGS/Pinelands Data
5	Atlantic Coast	14	Mullica River at Jackson - Medford Rd in Medford	AN0560, MMULADYS	Pineland Biological Community	NJDEP AMNET, Pinelands
3	Atlantic Coast	14	Mullica River at Jackson Rd in Shamong	AN0561, MMULJACK	Pineland Biological Community	NJDEP AMNET, Pinelands
5	Atlantic Coast	14	Mullica River at Outlet Of Atsion Lake at Atsion	01409387, 14-MUL-2	Copper, Lead, Zinc	NJDEP/USGS Data, Metal Recon
3	Atlantic Coast	14	Mullica River at Outlet Of Atsion Lake at Atsion	01409387, 14-MUL-2	Arsenic, Cadmium, Chromium, Mercury, Nickel, Selenium, Silver	NJDEP/USGS Data, Metal Recon
1	Atlantic Coast	14	Mullica River at Outlet Of Atsion Lake at Atsion	01409387, 14-MUL-2	Phosphorus, Fecal Coliform, Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized	NJDEP/USGS Data, Metal Recon
3	Atlantic Coast	14	Mullica River at Wilderness Area	MMUWILDR	Pineland Biological Community	Pinelands
1	Atlantic Coast	14	Mullica River Estuary	R26, R27, R28, R29, 2005, 2002A, 2009A, 2011A	Dissolved Oxygen, Fecal Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
1	Atlantic Coast	14	Mullica River Lower Estuary	2000, 2000A-C, 2001, 2001A-E, 2002, 2002A-B, 2003, 2003C, 1900, 1900A-D, 1903J	Total Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
5	Atlantic Coast	14	Mullica River Middle Estuary	2004, 2004A, 2004B, 2005, 2005A, 2005B, 2005D, 2006, 2006A, 2006B	Total Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
5	Atlantic Coast	14	Mullica River near Atco	01409375	pH	USGS/Pinelands Data
1	Atlantic Coast	14	Mullica River near Atco	01409375	Phosphorus, Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids,	USGS/Pinelands Data
5	Atlantic Coast	14	Mullica River near Batsto	0140940050	pH	USGS/Pinelands Data
1	Atlantic Coast	14	Mullica River near Batsto	0140940050	Phosphorus, Fecal Coliform, Temperature, Dissolved Oxygen, Nitrate, Dissolved	USGS/Pinelands Data
3	Atlantic Coast	14	Mullica River Tributary above Quaker Br	MMUTRQUA	Pineland Biological Community	Pinelands
5	Atlantic Coast	14	Mullica River Upper Estuary	2007, 2007A, 2007B, 2007C, 2007D, 2007E, 2008, 2008A, 2008B, 2009, 2009A, 2009B, 2010, 2010A, 2010B, 2010C, 2011, 2011A, 2012, 2012A, 2012B, 2012C, 2013, 2013A, 2013B, 2014, 2015, 2015A, 2015B, 2015C, 2017, 2017A, 2018,	Total Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
5	Northwest	01	Musconetcog River at Lockwood	01455801	Phosphorus, Fecal Coliform, Temperature	NJDEP/USGS Data
4	Northwest	01	Musconetcong River at Beattystown	01456200, 1-MUS-3	Fecal Coliform	NJDEP/USGS Data, EWQ, Metal Recon
5	Northwest	01	Musconetcong River at Beattystown	01456200, 1-MUS-3	Temperature, Arsenic	NJDEP/USGS Data, EWQ, Metal Recon
3	Northwest	01	Musconetcong River at Beattystown	01456200, 1-MUS-3	Mercury	NJDEP/USGS Data, EWQ, Metal Recon
1	Northwest	01	Musconetcong River at Beattystown	01456200, 1-MUS-3	Phosphorus, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Cadmium, Chromium, Copper, Lead, Nickel,	NJDEP/USGS Data, EWQ, Metal Recon
1	Northwest	01	Musconetcong River at Kings Hwy in Washington	AN0069	Benthic Macroinvertebrates	NJDEP AMNET
4	Northwest	01	Musconetcong River at Lake Hopatcong	01455500	Fecal Coliform	NJDEP/USGS Data
5	Northwest	01	Musconetcong River at Lake Hopatcong	01455500	pH, Temperature	NJDEP/USGS Data
5	Northwest	01	Musconetcong River at New Hampton Rd in Lebanon	AN0072	Benthic Macroinvertebrates	NJDEP AMNET

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
5	Northwest	01	Musconetcong River at Riegelsville	01457400, DBRCNJ0025, 1-MUS-5	Phosphorus, Temperature, Total Suspended Solids	NJDEP/USGS Data, DRBC, Metal Recon
4	Northwest	01	Musconetcong River at Riegelsville	01457400, DBRCNJ0025, 1-MUS-5	Fecal Coliform	NJDEP/USGS Data, DRBC, Metal Recon
3	Northwest	01	Musconetcong River at Riegelsville	01457400, DBRCNJ0025, 1-MUS-5	Arsenic, Mercury	NJDEP/USGS Data, DRBC, Metal Recon
1	Northwest	01	Musconetcong River at Riegelsville	01457400, DBRCNJ0025, 1-MUS-5	pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Unionized Ammonia, Cadmium, Chromium, Copper, Lead, Nickel,	NJDEP/USGS Data, DRBC, Metal Recon
1	Northwest	01	Musconetcong River at River Rd in Pohatcong	AN0074	Benthic Macroinvertebrates	NJDEP AMNET
5	Northwest	01	Musconetcong River at Rt 206 in Netcong	AN0063A	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	01	Musconetcong River at Rt 579 in Greenwich	AN0073	Benthic Macroinvertebrates	NJDEP AMNET
5	Northwest	01	Musconetcong River at Rt 604 (abv Saxton Lk) in Mt Olive	AN0069E	Benthic Macroinvertebrates	NJDEP AMNET
5	Northwest	01	Musconetcong River at S of Rt 604 & Rt 80 in Mt Olive	AN0069D	Benthic Macroinvertebrates	NJDEP AMNET
3	Northwest	01	Musconetcong River blw Lk Hopatcong in Roxbury	AN0062	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	01	Musconetcong River blw Lk Musconetcong in Mount Olive	AN0063	Benthic Macroinvertebrates	NJDEP AMNET
5	Northwest	01	Musconetcong River blw Waterloo Village lower dam in Mt Olive	AN0069C	Benthic Macroinvertebrates	NJDEP AMNET
4	Northwest	01	Musconetcong River near Bloomsbury	01457000, EWQ0072, 1-MUS-4	Fecal Coliform	NJDEP/USGS Data, EWQ, Metal Recon
5	Northwest	01	Musconetcong River near Bloomsbury	01457000, EWQ0072, 1-MUS-4	pH	NJDEP/USGS Data, EWQ, Metal Recon
3	Northwest	01	Musconetcong River near Bloomsbury	01457000, EWQ0072, 1-MUS-4	Arsenic, Mercury	NJDEP/USGS Data, EWQ, Metal Recon
1	Northwest	01	Musconetcong River near Bloomsbury	01457000, EWQ0072, 1-MUS-4	Phosphorus, Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Cadmium, Chromium, Copper, Lead,	NJDEP/USGS Data, EWQ, Metal Recon
1	Northwest	01	Musconetcong River off Rt 604 (abv Lubbers Run) in Byram	AN0064	Benthic Macroinvertebrates	NJDEP AMNET
5	Northwest	01	Musconetcong River off Rt 604 (blw Lubbers Run) in Lockwood	AN0069B	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	01	Musconetcong River Unknown Trib at Rt 57 in Mansfield	AN0071	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	14	Muskingum Brook above Tuckerton Rd	BMUSKTUC	Pineland Biological Community	Pinelands
3	Atlantic Coast	14	Muskingum Brook at Tabernacle Rd in Shamong	AN0583	Benthic Macroinvertebrates	NJDEP AMNET
4	Northeast	05	Musquapsink Brook at River Vale	01377499	Fecal Coliform	NJDEP/USGS Data
5	Northeast	05	Musquapsink Brook at River Vale	01377499	Phosphorus, Arsenic	NJDEP/USGS Data
1	Northeast	05	MusquapsInk Brook at River Vale	01377499	Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended	NJDEP/USGS Data
3	Northeast	05	MusquapsInk Brook at River Vale	01377499	Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium, Zinc	NJDEP/USGS Data
5	Northeast	05	Musquapsink River at Harrington Ave in Westwood	AN0206	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	12	Musquash Brook at Brighton Ave in Neptune Twnshp	11	Fecal Coliform	Monmouth Co HD
5	Atlantic Coast	13	Mystic	1925, 1926, 1926A	Total Coliform	NJDEP Shellfish Monitoring

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
5	Northeast	04	Naachtpunkt Brook at Continental Dr (abv outfall) in Wayne	AN0273A	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	04	Naachtpunkt Brook at Continental Dr (blw outfall) in Wayne	AN0273B	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	14	Nacote & Mott Rivers Estuary	2005C, 2005E	Total Coliform	NJDEP Shellfish Monitoring
1	Atlantic Coast	14	Nacote Creek-Tidal	R30, R31	Dissolved Oxygen	NJDEP Coastal Monitoring
1	Lower Delaware	17	Nanamuskin River-Tidal	R42	Dissolved Oxygen	NJDEP Coastal Monitoring
5	Lower Delaware	17	Nantuxent Creek Estuary	3804L, 3408P	Total Coliform	NJDEP Shellfish Monitoring
3	Lower Delaware	18	Narriticon Lake-18	Narriticon Lake	Phosphorus	NJDEP Clean Lakes
5	Atlantic Coast	12	Navesink River	Navesink River	Fish-PCB, Fish-Dioxin	NJDEP Fish Tissue Monitoring
5	Atlantic Coast	12	Navesink River Estuary	Shrewsbury/Navesink Estuary-4 thru 7	Total Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
1	Atlantic Coast	12	NavesInk River Estuary	Shrewsbury/Navesink Estuary-4 thru 7	Dissolved Oxygen, Fecal Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
1	Northwest	02	Neepaulin Lake-02	Lake Neepaulin	Fecal Coliform	Sussex Co HD
3	Lower Delaware	20	Negro Run at Red Valley Rd in Upper Freehold	AN0128, MB-122	Benthic Macroinvertebrates	NJDEP AMNET, Monmouth Co HD
5	Atlantic Coast	14	Nescochague Creek at Pleasant Mills	01409411	pH	USGS/Pinelands Data
1	Atlantic Coast	14	Nescochague Creek at Pleasant Mills	01409411	Phosphorus, Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids,	USGS/Pinelands Data
3	Atlantic Coast	14	Nescochague Creek at Pleasant Mills in Mullica	AN0576, NNEMILLS	Pineland Biological Community	NJDEP AMNET, Pinelands
5	Atlantic Coast	14	Nescochague Creek near West Mill Rd	NNEWESTM	Pineland Biological Community	Pinelands
4	Raritan	08	Neshanic River at Reaville	01398000, 8-NE-1	Fecal Coliform	NJDEP/USGS Data, Metal Recon
5	Raritan	08	Neshanic River at Reaville	01398000, 8-NE-1	Phosphorus, Total Suspended Solids, Copper	NJDEP/USGS Data, Metal Recon
3	Raritan	08	Neshanic River at Reaville	01398000, 8-NE-1	Arsenic, Mercury	NJDEP/USGS Data, Metal Recon
1	Raritan	08	Neshanic River at Reaville	01398000, 8-NE-1	Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Unionized Ammonia, Cadmium, Chromium, Lead,	NJDEP/USGS Data, Metal Recon
5	Raritan	08	Neshanic River at Reaville - Everitt Rd in Raritan	AN0333	Benthic Macroinvertebrates	NJDEP AMNET
3	Raritan	08	Neshanic River at Rt 514 in Clover Hill	EWQ0337	Phosphorus	EWQ
1	Raritan	08	Neshanic River at Rt 514 in Clover Hill	EWQ0337	Temperature, Dissolved Oxygen, pH, Nitrate, Dissolved Solids, Total Suspended	EWQ
5	Raritan	08	Neshanic River at Rt 514 in Hillsborough	AN0337	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	15	New Brooklyn Lake-15	New Brooklyn Lake	Fish-Mercury	NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring
4	Atlantic Coast	15	New Brooklyn Lake-15	New Brooklyn Lake	Phosphorus	NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring
5	Raritan	09	New Market Pond-09	New Market Pond	Fish Community, Fish-PCB, Fish-Dioxin	NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring, Freshwater Fisheries
3	Raritan	09	New Market Pond-09	New Market Pond	Phosphorus	NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring, Freshwater Fisheries
5	Northwest	11	New Sharon Brook at Sharon Rd in Washington	AN0109B	Benthic Macroinvertebrates	NJDEP AMNET

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Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
5	Raritan	07	Newark Bay	Newark Bay	Mercury, Fish-PCB, Fish-Dioxin	PVSC, HEP (GLEC), NJDEP Fish Tissue Monitoring
3	Raritan	07	Newark Bay	Passaic-B1, Passaic-B2	Fecal Coliform	PVSC, HEP (GLEC), NJDEP Fish Tissue Monitoring
1	Raritan	07	Newark Bay	Passaic-B1, Passaic-B2	Dissolved Oxygen, Temperature, pH, Unionized Ammonia, Copper, Lead, Nickel	PVSC, HEP (GLEC), NJDEP Fish Tissue Monitoring
5	Raritan	07	Newark Bay	Newark Bay Tribs	Fish-PCB, Fish-Dioxin	NJDEP Fish Tissue Monitoring
3	Raritan	07	Newark Bay	Hudson County Park (Location D)	Fecal Coliform	Hudson Co HD
1	Lower Delaware	17	Newport Creek-Tidal	R51	Dissolved Oxygen	NJDEP Coastal Monitoring
5	Lower Delaware	18	Newton Creek	Newton Creek	Copper, Zinc	304(l)
5	Lower Delaware	18	Newton Creek at Rt 168 in W Collingswood	EWQ0653	pH, Phosphorus	EWQ
1	Lower Delaware	18	Newton Creek at Rt 168 in W Collingswood	EWQ0653	Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids,	EWQ
5	Lower Delaware	18	Newton Creek N Br	Newton Creek N Br	Fish-Mercury	NJDEP Fish Tissue Monitoring
5	Lower Delaware	18	Newton Creek S Br	Newton Creek S Br	Fish-Mercury	NJDEP Fish Tissue Monitoring
3	Lower Delaware	18	Newton Creek S Br at Rt 168 in Mount Ephraim	AN0654	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	18	Newton Lake-18	Newton Lake	Fish-PCB, Fish-Dioxin	NJDEP Fish Tissue Monitoring
3	Lower Delaware	17	Nichomus Run at Rt 45 in Pilesgrove	AN0692	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	11	Nishisakawick Creek at Airport Rd in Alexandria	AN0080	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	11	Nishisakawick Creek at Creek Rd (Frenchtown Pk) in Frenchtown	AN0082	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	11	Nishisakawick Creek at off Creek Rd in Alexandria	AN0081	Benthic Macroinvertebrates	NJDEP AMNET
4	Northwest	11	Nishisakawick Creek near Frenchtown	01458570, DRBCNJ0020	Fecal Coliform	NJDEP/USGS Data, DRBC
1	Northwest	11	Nishisakawick Creek near Frenchtown	01458570, DRBCNJ0020	Phosphorus, Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia	NJDEP/USGS Data, DRBC
5	Lower Delaware	20	North Community Lake	North Community Lake	Fish Community	NJDEP Freshwater Fisheries
5	Northeast	05	North Hudson Park Lake-05	North Hudson Park Lake	Phosphorus	NJDEP Clean Lakes
3	Lower Delaware	20	North Run at Cookstown	01464380	Phosphorus	NJDEP/USGS Data
1	Lower Delaware	20	North Run at Cookstown	01464380	Temperature, Dissolved Oxygen, pH, Nitrate, Dissolved Solids, Total Suspended	NJDEP/USGS Data
5	Lower Delaware	20	North Run at Cookstown	01464380	Fecal Coliform	NJDEP/USGS Data
5	Lower Delaware	20	North Run at Main St in North Hanover	AN0120	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	20	North Run Trib at Highland Ave in Wrightstown	AN0120A	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	12	Northern Coastal Waters - Raritan Bay to Barnegat Inlet	Northern Coastal Waters - Raritan Bay to Barnegat Inlet	Fish-PCB	NJDEP Fish Tissue Monitoring
3	Atlantic Coast	12	Nut Swamp Brook at Normandy Rd in Middletown	AN0464	Benthic Macroinvertebrates	NJDEP AMNET
3	Raritan	07	NY-NJ Harbor	Jersey City (Location E, Location C)	Fecal Coliform	Hudson Co HD
5	Raritan	07	NY-NJ Harbor	NYC and Battery (HR1, HR2)	Mercury	HEP (GLEC)
1	Raritan	07	NY-NJ Harbor	NYC and Battery (HR1, HR2)	Copper, Lead, Nickel	HEP (GLEC)
5	Raritan	09	NY-NJ Harbor	NY-NJ Harbor wide	PCB, Dioxin, PAHs, Pesticides	HEP (GLEC)
5	Raritan	07	NY-NJ Harbor	Upper New York Harbor	Mercury, Fish-PCB, Fish-Dioxin	HEP (GLEC), NJDEP Fish Tissue Monitoring

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
1	Raritan	07	NY-NJ Harbor	Upper New York Harbor-1, Upper New York Harbor-2	Dissolved Oxygen	IEC
1	Northeast	06	NYODA Camp-06	NYODA Girls Camp Inc.	Fecal Coliform	Jefferson Twp HD
5	Northeast	03	Oak Ridge Reservoir-03	Oak Ridge Reservoir	Fish-Mercury	NJDEP Fish Tissue Monitoring
3	Raritan	09	Oakeys Brook at Davidsons Mill Rd in North Brunswick	AN0432	Benthic Macroinvertebrates	NJDEP AMNET
3	Lower Delaware	20	Oakford Lake-20	Oakford Lake	Phosphorus	NJDEP Clean Lakes
1	Lower Delaware	19	Oakwood Lake-19	Oakwood Lakes	Fecal Coliform	Burlington Co HD
5	Atlantic Coast	13	Ocean Bathing Beach-13	Ocean Twp Bathing Beach	Fecal Coliform	Ocean Co HD
5	Atlantic Coast	13	Ocean County Park Lake-13	Ocean County Park Beach	Fecal Coliform	Ocean Co HD
1	Lower Delaware	17	Old Cedar Lake-17	Old Cedar Lake	Fecal Coliform	Gloucester Co HD
3	Lower Delaware	19	Old Forge Lake-14	SFRHAMPT	Pineland Biological Community	Pinelands
3	Atlantic Coast	13	Old Hurricane Branch at Beckerville Rd in Manchester	AN0531	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	16	Old Robins Branch at Beaver Causeway in Dennis	AN0769	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	16	Old RobIns Branch near North Dennis	01411440	Nitrate, Unionized Ammonia	NJDEP/USGS Data
3	Atlantic Coast	16	Old Robins Branch near North Dennis	01411440	Phosphorus, Fecal Coliform, Dissolved Oxygen, pH, Temperature, Total	NJDEP/USGS Data
1	Northeast	04	Oldham Pond-04	North Haledon Beach (left) and (right)	Fecal Coliform	Passaic Co HD
3	Lower Delaware	18	Oldmans Creek at Jessups Mill	01477440	Solids	NJDEP/USGS Data
1	Lower Delaware	18	Oldmans Creek at Jessups Mill	01477440	Phosphorus, Temperature, Dissolved Oxygen, Nitrate, Unionized Ammonia	NJDEP/USGS Data
4	Lower Delaware	18	Oldmans Creek at Jessups Mill	01477440	Fecal Coliform	NJDEP/USGS Data
3	Lower Delaware	18	Oldmans Creek at Lk Rd in South Harrison	AN0687	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	18	Oldmans Creek at Pointers - Auburn Rd in Auburn	EWQ0689	Phosphorus, Total Suspended Solids	EWQ
3	Lower Delaware	18	Oldmans Creek at Pointers - Auburn Rd in Auburn	EWQ0689	Dissolved Oxygen	EWQ
1	Lower Delaware	18	Oldmans Creek at Pointers - Auburn Rd in Auburn	EWQ0689	Temperature, pH, Nitrate, Dissolved Solids, Unionized Ammonia	EWQ
1	Lower Delaware	18	Oldmans Creek at Porches Mill	01477510	Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended	NJDEP/USGS Data
4	Lower Delaware	18	Oldmans Creek at Porches Mill	01477510	Fecal Coliform	NJDEP/USGS Data
5	Lower Delaware	18	Oldmans Creek at Porches Mill	01477510	Phosphorus	NJDEP/USGS Data
3	Lower Delaware	18	Oldmans Creek at Swedesboro-Monroeville Rd in South Harrison	AN0686	Benthic Macroinvertebrates	NJDEP AMNET
1	Lower Delaware	18	Oldmans Creek Lake-18	Oldmans Creek Lake	Fecal Coliform	Gloucester Co HD
3	Lower Delaware	19	Ong Run at W Lake Shore Dr in Pemberton	AN0149A, NONWLAKE	Pineland Biological Community	NJDEP AMNET, Pinelands
5	Lower Delaware	19	Ong Run at West Lake Shore Dr in Pemberton	EWQ0149A	pH	EWQ
1	Lower Delaware	19	Ong Run at West Lake Shore Dr in Pemberton	EWQ0149A	Phosphorus, Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia	EWQ
5	Northeast	05	Oradell Reservoir-05	Oradell Reservoir	Fish-Mercury	NJDEP Fish Tissue Monitoring
5	Lower Delaware	17	Oranoaken Creek Estuary	3867F, 3867J	Total Coliform	NJDEP Shellfish Monitoring
3	Atlantic Coast	14	Oswego Lake-14	Oswego Lake, OOSWLAKE	Community	NJDEP Clean Lakes, Pinelands
1	Atlantic Coast	14	Oswego River above Oswego Lake	OOSLAKUP	Pineland Biological Community	Pinelands

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Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
1	Atlantic Coast	14	Oswego River at Andrews Rd in Bass River	AN0606, OOSOLMAR	Pineland Biological Community	NJDEP AMNET, Pinelands
5	Atlantic Coast	14	Oswego River at Harrisville	01410000, 14-OSW-1	Copper	NJDEP/USGS Data, Metal Recon
3	Atlantic Coast	14	Oswego River at Harrisville	01410000, 14-OSW-1	Arsenic, Cadmium, Chromium, Lead, Mercury, Nickel, Selenium, Silver, Zinc	NJDEP/USGS Data, Metal Recon
1	Atlantic Coast	14	Oswego River at Harrisville	01410000, 14-OSW-1	Phosphorus, Fecal Coliform, Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized	NJDEP/USGS Data, Metal Recon
3	Atlantic Coast	14	Oswego River at Rt 539 in Barnegat	AN0603	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	14	Oswego River at Spur 563 in Bass River	AN0607, OOSHARST	Pineland Biological Community	NJDEP AMNET, Pinelands
1	Atlantic Coast	14	Oswego River below Beaver Dam Rd	OOSBEAVR	Pineland Biological Community	Pinelands
1	Atlantic Coast	14	Oswego River impoundment above Old Cedar Bridge-Barnegat Rd (Lake 1729-14)	OOSCEDRI	Pineland Biological Community	Pinelands
1	Atlantic Coast	14	Oswego River impoundment at Howardsville (Lake 1634-14)	OOSHOWIM	Pineland Biological Community	Pinelands
1	Atlantic Coast	14	Otter Pond-14	WBUOTTER	Pineland Biological Community	Pinelands
1	Atlantic Coast	16	Outdoor World Lake-16	Outdoor World Lake and Shore	Fecal Coliform	Cape May Co HD
1	Atlantic Coast	16	Outdoor World Sea Pines Lake-16	Outdoor World Sea Pines	Fecal Coliform	Cape May Co HD
5	Northeast	03	Outlet Trib of Maple Lake	PQ14	Temperature	Pequannock River Coalition
3	Northeast	05	Overpeck Creek at Dean Dr in Englewood	AN0212	Benthic Macroinvertebrates	NJDEP AMNET
4	Northeast	05	Overpeck Lake-05	Overpeck Lake	Phosphorus	NJDEP Clean Lakes
3	Atlantic Coast	13	Oyster Creek at Rt 532 in Ocean	AN0552	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	13	Oyster Creek Estuary	1663	Total Coliform	NJDEP Shellfish Monitoring
1	Atlantic Coast	13	Oyster Creek Estuary	1663	Fecal Coliform	NJDEP Coastal Monitoring
3	Northeast	03	Packanack Brook at Osbourne Rd in Wayne	AN0270	Benthic Macroinvertebrates	NJDEP AMNET
1	Northeast	03	Packanack Lake-03	Packanack Lake East and West	Fecal Coliform	Passaic Co HD
1	Northeast	03	Pacock River	PQ02	Temperature	Pequannock River Coalition
5	Lower Delaware	17	Pages Run at Newport	01412200	pH	NJDEP/USGS Data
1	Lower Delaware	17	Pages Run at Newport	01412200	Fecal Coliform, Dissolved Oxygen, Nitrate, Dissolved Solids, Unionized Ammonia	NJDEP/USGS Data
3	Lower Delaware	17	Pages Run at Newport	01412200	Suspended Solids	NJDEP/USGS Data
3	Lower Delaware	19	Pakim Lake-19	Pakim Lake, GCOPAKIM	Phosphorus	NJDEP Clean Lakes, Pinelands
1	Lower Delaware	19	Pakim Lake-19	Pakim Lake, GCOPAKIM	Pineland Biological Community	NJDEP Clean Lakes, Pinelands
3	Lower Delaware	17	Palatine Branch at Dubois Rd in Pittsgrove	AN0744	Benthic Macroinvertebrates	NJDEP AMNET
3	Lower Delaware	17	Palatine Branch at Shirley Rd in Upper Pittsgrove	AN0743	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	02	Panorama Lake-02	Lake Panorama	Fecal Coliform	Sussex Co HD
1	Lower Delaware	17	Panther Branch (Manantico Creek) at Italia Ave in Vineland	AN0758	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	01	Panther Lake-01	Panther Lake Beach 1 and Beach 2	Fecal Coliform	Sussex Co HD
1	Northwest	02	PapakatIng Creek W Br at Rt 519 in Wantage	AN0305	Benthic Macroinvertebrates	NJDEP AMNET
4	Northwest	02	Papakating Creek at Pelletown	01367800	Fecal Coliform	NJDEP/USGS Data
1	Northwest	02	PapakatIng Creek at Pelletown	01367800	Phosphorus, Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia	NJDEP/USGS Data
5	Northwest	02	Papakating Creek at Rt 565 in Frankford	AN0304	Toxicity	NJDEP AMNET

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
5	Northwest	02	Papakating Creek at Rt 565 in Wantage	AN0307	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	02	Papakating Creek at Rt 619 & Gunn Rd in Frankford	AN0303	Benthic Macroinvertebrates	NJDEP AMNET
4	Northwest	02	Papakating Creek at Sussex	01367910, 01367909, 2-PAP-1	Fecal Coliform	NJDEP/USGS Data, Sussex MUA, Metal Recon
5	Northwest	02	Papakating Creek at Sussex	01367910, 01367909, 2-PAP-1	Phosphorus, Arsenic	NJDEP/USGS Data, Sussex MUA, Metal Recon
3	Northwest	02	Papakating Creek at Sussex	01367910, 01367909, 2-PAP-1	Cadmium, Mercury	NJDEP/USGS Data, Sussex MUA, Metal Recon
1	Northwest	02	Papakating Creek at Sussex	01367910, 01367909, 2-PAP-1	Temperature, Dissolved Oxygen, pH, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Chromium,	NJDEP/USGS Data, Sussex MUA, Metal Recon
4	Northwest	02	Papakating Creek near Sussex	01367860	Fecal Coliform	NJDEP/USGS Data
3	Northwest	02	Papakating Creek near Sussex	01367860	Phosphorus, pH	NJDEP/USGS Data
1	Northwest	02	Papakating Creek near Sussex	01367860	Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids,	NJDEP/USGS Data
4	Northwest	02	Papakating Creek near Wykertown	01367780	Fecal Coliform	NJDEP/USGS Data, EWQ
1	Northwest	02	Papakating Creek near Wykertown	01367780	Phosphorus, Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia	NJDEP/USGS Data, EWQ
4	Northwest	02	Papakating Creek W Br at McCoys Corner	01367850	Fecal Coliform	NJDEP/USGS Data
1	Northwest	02	Papakating Creek W Br at McCoys Corner	01367850	Phosphorus, Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia	NJDEP/USGS Data
5	Northwest	02	Papakating Creek W Br at Rt 565 in Wantage	AN0306	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	14	Papoose Branch at Jenkins Rd in Bass River	AN0605, OPAPOOSE	Pineland Biological Community	NJDEP AMNET, Pinelands
1	Atlantic Coast	14	Papoose Branch near Sim Place	01409960	Phosphorus, Fecal Coliform, Temperature, pH, Dissolved Oxygen, Nitrate, Total Suspended Solids, Unionized Ammonia	NJDEP/USGS Data
3	Atlantic Coast	14	Paradise Lake-14	NALPARAD	Pineland Biological Community	Atlantic Co HD, Pinelands
1	Atlantic Coast	14	Paradise Lake-14	Paradise Lake	Fecal Coliform	Atlantic Co HD, Pinelands
1	Lower Delaware	18	Pargy Creek at Swedesboro Ave in E G	EWQ0677	Phosphorus, Temperature, Dissolved Oxygen, pH, Nitrate, Dissolved Solids,	EWQ
3	Lower Delaware	18	Pargy Creek at Swedesboro Ave in E G	EWQ0677	Total Suspended Solids	EWQ
3	Lower Delaware	18	Pargy Creek at Swedesboro Ave in East Greenwich	AN0677	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	12	Parker Creek Branch-Tidal	40, R04	Dissolved Oxygen	Monmouth Co HD, NJDEP Coastal Monitoring
5	Atlantic Coast	13	Parker Run-Estuary	1801, 1801A, 1801C, 1801D, 1801F	Total Coliform	NJDEP Shellfish Monitoring
5	Atlantic Coast	13	Parker Run-Tidal	R19	Dissolved Oxygen	NJDEP Coastal Monitoring
5	Lower Delaware	19	Parkers Creek at Creek Rd in Moorestown	EWQ0174	Phosphorus	EWQ
1	Lower Delaware	19	Parkers Creek at Creek Rd in Moorestown	EWQ0174	Temperature, Dissolved Oxygen, pH, Nitrate, Dissolved Solids, Total Suspended	EWQ
5	Lower Delaware	19	Parkers Creek at Rt 603 in Mt Laurel	AN0174A	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	06	Parsippany Lake-06	Lake Parsippany: Hoffman Beach and Johnson Beach, and Drewes Beach	Fecal Coliform	Parsippany Troy Hills HD
5	Lower Delaware	17	Deerfield	AN0711	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	17	Parvin Branch at Rt 55 in Vineland	AN0750	Benthic Macroinvertebrates	NJDEP AMNET
3	Lower Delaware	17	Parvin Lake-17	Parvin Lake	Phosphorus	NJDEP Clean Lakes

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
1	Lower Delaware	17	Parvin Lake-17	Parvin Lake	Fish Community	NJDEP Freshwater Fisheries
5	Lower Delaware	17	Parvin Lake-17	Parvin SP, Parvin Lake, Center, Left, and Right	Fecal Coliform	Southern Region
5	Northeast	05	Pascack Brook at Westwood	01377500, 5-PAS-1	Phosphorus, Arsenic, Mercury	NJDEP/USGS Data, Metal Recon
3	Northeast	05	Pascack Brook at Westwood	01377500, 5-PAS-1	Dissolved Solids	NJDEP/USGS Data, Metal Recon
1	Northeast	05	Pascack Brook at Westwood	01377500, 5-PAS-1	Temperature, pH, Dissolved Oxygen, Nitrate, Total Suspended Solids, Unionized Ammonia, Cadmium, Chromium, Copper,	NJDEP/USGS Data, Metal Recon
4	Northeast	05	Pascack Brook at Westwood	01377500, 5-PAS-1	Fecal Coliform	NJDEP/USGS Data, Metal Recon
1	Northeast	05	Pascack Brook at Westwood Ave & Harrington Ave in Westwood	AN0207	Benthic Macroinvertebrates	NJDEP AMNET
1	Northeast	04	Passaic Estuary	Passaic Estuary	Copper, Lead, Nickel	HEP (GLEC)
5	Northeast	06	Passaic River	Great Piece	Fish-Mercury	NJDEP Fish Tissue Monitoring
5	Northeast	04	Passaic River - Tidal	Passaic River - Tidal	Arsenic, Mercury	HEP (GLEC), USEPA, 1999
1	Northeast	04	Passaic River - Tidal	Passaic River - Tidal	Copper, Lead, Nickel	HEP (GLEC), USEPA, 1999
1	Northeast	04	Passaic River (tidal) at Rutgers St. in Kerny	Passaic-4	Unionized Ammonia	PVSC
1	Northeast	04	Passaic River (tidal) at Union Ave in Rutherford	Passaic-6	Temperature, Dissolved Oxygen, pH	PVSC
5	Northeast	04	Passaic River (tidal) at Rutgers St. in Kernytown	Passaic-4	Phosphorus, Fecal Coliform	PVSC
5	Northeast	04	Passaic River (tidal) at Union Ave. in Rutherford	Passaic-6	Fecal Coliform	PVSC
1	Northeast	04	Passaic River (tidal) Below Second River	Passaic-1, Passaic-2, Passaic-3	Unionized Ammonia	PVSC
3	Northeast	04	Passaic River (tidal) Below Second River	Passaic-1, Passaic-2, Passaic-3	Fecal Coliform	PVSC
5	Northeast	06	Passaic River at Eagle Rock Ave in East Hanover	AN0231	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	06	Passaic River at Eagle Rock Ave in East Hanover	EWQ0231	Phosphorus, Dissolved Solids, Total Suspended Solids	EWQ
1	Northeast	06	Passaic River at Eagle Rock Ave in Hanover Neck	EWQ0231	Temperature, Dissolved Oxygen, pH, Nitrate, Unionized Ammonia	EWQ
1	Northeast	04	Passaic River at Elmwood Park	01389880, 01389870, Passaic-8 , Passaic-9, Passaic-10, 4-SITE-5	Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended	NJDEP/USGS Data, EWQ, PVSC, Metal Recon
5	Northeast	04	Passaic River at Elmwood Park	01389880, 01389870, Passaic-8 , Passaic-9, Passaic-10, 4-SITE-5	Phosphorus, Fecal Coliform, Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Silver, Thallium, Zinc, Cyanide	NJDEP/USGS Data, EWQ, PVSC, Metal Recon
5	Northeast	06	Passaic River at Fairmount Ave in Long Hill	AN0229C	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	04	Passaic River at Little Falls	01389500, Passaic-11, Passaic-12, 4-SITE-6, 4-PAS-3	Phosphorus, Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Silver,	NJDEP/USGS Data, PVSC, Metal Recon
1	Northeast	04	Passaic River at Little Falls	01389500, Passaic-11, Passaic-12, 4-SITE-6, 4-PAS-3	Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Nickel,	NJDEP/USGS Data, PVSC, Metal Recon
4	Northeast	04	Passaic River at Little Falls	01389500, Passaic-11, Passaic-12, 4-SITE-6, 4-PAS-3	Fecal Coliform	NJDEP/USGS Data, PVSC, Metal Recon
5	Northeast	06	Passaic River at Old Mt Pleasant Ave in E Hanover	AN0231B	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	06	Passaic River at Passaic Ave in Millburn	AN0231A	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	04	Passaic River at River Rd (Dundee Dam) in Garfield	AN0292O	Benthic Macroinvertebrates	NJDEP AMNET

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
1	Northeast	04	Passaic River at Riverview Rd in Totowa	AN0274	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	06	Passaic River at S Main Ave in Warren	AN0228	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	04	Passaic River at Singac	01389130, 4-PAS-4	Phosphorus, Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Silver,	NJDEP/USGS Data, Metal Recon
3	Northeast	04	Passaic River at Singac	01389130, 4-PAS-4	Selenium, Nickel	NJDEP/USGS Data, Metal Recon
4	Northeast	04	Passaic River at Singac	01389130, 4-PAS-4	Fecal Coliform	NJDEP/USGS Data, Metal Recon
5	Northeast	06	Passaic River at Snyder Ave in Berkeley	AN0229B	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	06	Passaic River at Stanley Ave in Summit	AN0229	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	06	Passaic River at Summit Ave in Summit	AN0230	Benthic Macroinvertebrates	NJDEP AMNET
1	Northeast	06	Passaic River at Tempewick Rd in Mendham	AN0213	Benthic Macroinvertebrates	NJDEP AMNET
3	Northeast	06	Passaic River at Tempewick Rd near Mendham	01378660	Dissolved Oxygen	NJDEP/USGS Data
1	Northeast	06	Passaic River at Tempewick Rd near Mendham	01378660	Phosphorus, Temperature, pH, Nitrate, Dissolved Solids, Total Suspended Solids,	NJDEP/USGS Data
5	Northeast	06	Passaic River at Tempewick Rd near Mendham	01378660	Fecal Coliform	NJDEP/USGS Data
5	Northeast	06	Passaic River at Two Bridges	01382000, 6-SITE-3	Phosphorus, Arsenic, Mercury	NJDEP/USGS Data, Metal Recon
3	Northeast	06	Passaic River at Two Bridges	01382000, 6-SITE-3	Cadmium	NJDEP/USGS Data, Metal Recon
1	Northeast	06	Passaic River at Two Bridges	01382000, 6-SITE-3	Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Chromium,	NJDEP/USGS Data, Metal Recon
4	Northeast	06	Passaic River at Two Bridges	01382000, 6-SITE-3	Fecal Coliform	NJDEP/USGS Data, Metal Recon
1	Northeast	06	Passaic River at Valley Rd in Long Hill	AN0224	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	06	Passaic River at Watchung Ave in Chatham	AN0230A	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	06	Passaic River at Willard St in Montville	AN0274A	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	04	Passaic River Below Pompton River at Two Bridges	01389005	Phosphorus	NJDEP/USGS Data
1	Northeast	04	Passaic River below Pompton River at Two Bridges	01389005	Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Unionized	NJDEP/USGS Data
5	Northeast	04	Passaic River from Route 280 to confluence of Pompton River (Two Bridges)	Passaic River from Route 280 to confluence of Pompton River (Two	Fish-Mercury	NJDEP Fish Tissue Monitoring
5	Northeast	04	Passaic River Lower, Estuary and Tribs	Passaic River Lower, Estuary and Tribs	Fish-PCB, Fish-Dioxin	NJDEP Fish Tissue Monitoring
5	Northeast	06	Passaic River near Chatham	01379500, 6-SITE-1, 6-PAS-2	Phosphorus, Total Suspended Solids, Arsenic, Cadmium, Copper, Lead,	NJDEP/USGS Data, Metal Recon
3	Northeast	06	Passaic River near Chatham	01379500, 6-SITE-1, 6-PAS-2	Chromium, Nickel, Selenium	NJDEP/USGS Data, Metal Recon
1	Northeast	06	Passaic River near Chatham	01379500, 6-SITE-1, 6-PAS-2	Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Unionized	NJDEP/USGS Data, Metal Recon
4	Northeast	06	Passaic River near Chatham	01379500, 6-SITE-1, 6-PAS-2	Fecal Coliform	NJDEP/USGS Data, Metal Recon
5	Northeast	06	Passaic River near Millington	01379000, EWQ0224, 6-SITE-2, 6-PAS-1	Phosphorus, Arsenic, Cadmium, Copper, Lead, Mercury, Silver, Zinc, Cyanide	NJDEP/USGS Data, EWQ, Metal Recon
3	Northeast	06	Passaic River near Millington	01379000, EWQ0224, 6-SITE-2, 6-PAS-1	Chromium, Nickel, Selenium	NJDEP/USGS Data, EWQ, Metal Recon
1	Northeast	06	Passaic River near MillIngton	01379000, EWQ0224, 6-SITE-2, 6-PAS-1	Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended	NJDEP/USGS Data, EWQ, Metal Recon

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
4	Northeast	06	Passaic River near Millington	01379000, EWQ0224, 6-SITE-2, 6-PAS-1	Fecal Coliform	NJDEP/USGS Data, EWQ, Metal Recon
3	Atlantic Coast	15	Patcong Creek at Spruce Ave in Egg Harbor	AN0618	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	15	Patcong Creek-Tidal	R34, R35, 2863B	Dissolved Oxygen	NJDEP Coastal Monitoring
5	Atlantic Coast	15	Patcong River Estuary	2801A, 2862, 2863A, 2863B, 2863C, 2863D, 2863E, 2863G, 2863H, 2863L, 2863M	Dissolved Oxygen, Total Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
4	Northwest	01	Paulins Kill at Balesville	01443440, 1-PAU-1	Fecal Coliform	NJDEP/USGS Data, EWQ, Metal Recon
5	Northwest	01	Paulins Kill at Balesville	01443440, 1-PAU-1	Arsenic	NJDEP/USGS Data, EWQ, Metal Recon
3	Northwest	01	Paulins Kill at Balesville	01443440, 1-PAU-1	Mercury	NJDEP/USGS Data, EWQ, Metal Recon
1	Northwest	01	PaulIns Kill at Balesville	01443440, 1-PAU-1	Phosphorus, Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Cadmium, Chromium, Copper, Lead,	NJDEP/USGS Data, EWQ, Metal Recon
4	Northwest	01	Paulins Kill at Blairstown	01443500	Fecal Coliform	NJDEP/USGS Data
5	Northwest	01	Paulins Kill at Blairstown	01443500	Temperature	NJDEP/USGS Data
1	Northwest	01	Paulins Kill at Blairstown	01443500	Phosphorus, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended	NJDEP/USGS Data
5	Northwest	01	Paulins Kill at Rt 46 Bridge near I-80	DRBCNJ0036	Temperature	DRBC
1	Northwest	01	Paulins Kill at Rt 46 Bridge near I-80	DRBCNJ0036	Phosphorus, Fecal Coliform, Dissolved Oxygen, pH, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized	DRBC
5	Northwest	01	Paulins Kill at Rt 46 in Knowlton	AN0032	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	01	PaulIns Kill at Rt 626 in Hampton	AN0021	Benthic Macroinvertebrates	NJDEP AMNET
5	Northwest	01	Paulins Kill at Rt 663 in Lafayette	AN0015	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	01	PaulIns Kill at USGS gage in Blairstown	AN0025	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	01	PaulIns Kill at Vail Rd in Blairstown	AN0032A	Benthic Macroinvertebrates	NJDEP AMNET
5	Northwest	01	Paulins Kill at Warbasse Junction Rd near Lafayette	01443250	Phosphorus, Fecal Coliform, Dissolved Oxygen	NJDEP/USGS Data
3	Northwest	01	Paulins Kill at Warbasse Junction Rd near Lafayette	01443250	Dissolved Solids	NJDEP/USGS Data
1	Northwest	01	Paulins Kill at Warbasse Junction Rd near Lafayette	01443250	Temperature, pH, Nitrate, Total Suspended Solids, Unionized Ammonia	NJDEP/USGS Data
3	Northwest	01	Paulins Kill blw Paulins Kill Lk in Stillwater	AN0022	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	01	Paulins Kill Lake-01	Paulinskill Lake North(Main), Paulinskill Lake South	Fecal Coliform	Sussex Co HD
5	Northwest	01	Paulins Kill Trib at Rt 94 & Old Beaver Run Rd in Lafayette	AN0016A	Benthic Macroinvertebrates	NJDEP AMNET
5	Northwest	01	Paulins Kill Trib at Van Sickle Rd in Lafayette	AN0021A	Benthic Macroinvertebrates	NJDEP AMNET
3	Northwest	01	Paulins Kill UNK Trib at Lafayette Meadows Rd in Lafayette	AN0016	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	01	PaulIns Kill Unknown Trib at Rt 623 in Lafayette	AN0014	Benthic Macroinvertebrates	NJDEP AMNET
5	Raritan	08	Pavillion Beach	Pavillion Beach	Fecal Coliform	Mount Olive HD
1	Raritan	08	Pax Amicus Beach	Pax Amicus Beach	Fecal Coliform	Mount Olive HD
1	Raritan	08	Peapack Brook at Fox Chase Rd in Chester	AN0349	Benthic Macroinvertebrates	NJDEP AMNET

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
1	Raritan	08	Peapack Brook at Old Dutch Rd in BedmInster	AN0350	Benthic Macroinvertebrates	NJDEP AMNET
3	Northeast	04	Grove	AN0275A	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	04	Peckman River at McBride Ave in West Paterson	AN0275	Benthic Macroinvertebrates	NJDEP AMNET
3	Northeast	04	Peckman River at West Patterson	01389600	Phosphorus, Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia	NJDEP/USGS Data
4	Northeast	04	Peckman River at West Patterson	01389600	Fecal Coliform	NJDEP/USGS Data
1	Raritan	10	Peddie Lake-10	Peddie Lake	Fish Community	NJDEP Freshwater Fisheries
1	Lower Delaware	19	Pemberton Lake-19	Pemberton Lake	Fish Community	NJDEP Freshwater Fisheries
1	Atlantic Coast	14	Penn Swamp Branch at Quaker Bridge - Batsto Rd in Washington	AN0587, BPEBRIDG	Pineland Biological Community	NJDEP AMNET, Pinelands
5	Lower Delaware	18	Pennsauken Creek	Pennsauken Creek, Mainstem	Lead, Mercury	304(l)
5	Lower Delaware	18	Pennsauken Creek at Forked Landing	Pennsauken Creek at Forked Landing	Fish-PCB, Fish-Dioxin	NJDEP Fish Tissue Monitoring
5	Lower Delaware	18	Pennsauken Creek at Rt 130 in Pennsauken	01467082	Phosphorus	EWQ
1	Lower Delaware	18	Pennsauken Creek at Rt 130 in Pennsauken	01467082	Dissolved Oxygen, pH, Nitrate, Total Suspended Solids, Unionized Ammonia	EWQ
3	Lower Delaware	18	Pennsauken Creek at Rt 130 in Pennsauken	01467082	Temperature, Dissolved Solids	EWQ
3	Lower Delaware	18	Pennsauken Creek N Br at Church Rd in Mount Laurel	AN0178	Benthic Macroinvertebrates	NJDEP AMNET
3	Lower Delaware	18	Pennsauken Creek N Br at Fellowship Rd in Cherry Hill	Pennsauken Creek N Br at Fellowship Rd in Cherry Hill	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	18	Pennsauken Creek N Br at Fellowship Rd in Mount Laurel	AN0179	Benthic Macroinvertebrates	NJDEP AMNET
3	Lower Delaware	18	Pennsauken Creek N Br near Morrestown	01467069, 18-PE-1, 18-PE-2	Cadmium, Mercury	NJDEP/USGS Data, Metal Recon
1	Lower Delaware	18	Pennsauken Creek N Br near Morrestown	01467069, 18-PE-1, 18-PE-2	Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Chromium,	NJDEP/USGS Data, Metal Recon
4	Lower Delaware	18	Pennsauken Creek N Br near Morrestown	01467069, 18-PE-1, 18-PE-2	Fecal Coliform	NJDEP/USGS Data, Metal Recon
5	Lower Delaware	18	Pennsauken Creek N Br near Morrestown	01467069, 18-PE-1, 18-PE-2	Phosphorus, Arsenic	NJDEP/USGS Data, Metal Recon
3	Lower Delaware	18	Pennsauken Creek S Br at Cherry Hill	01467081, 18-PE-3	Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium, Zinc	NJDEP/USGS Data, Metal Recon
1	Lower Delaware	18	Pennsauken Creek S Br at Cherry Hill	01467081, 18-PE-3	Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Unionized	NJDEP/USGS Data, Metal Recon
4	Lower Delaware	18	Pennsauken Creek S Br at Cherry Hill	01467081, 18-PE-3	Fecal Coliform	NJDEP/USGS Data, Metal Recon
5	Lower Delaware	18	Pennsauken Creek S Br at Cherry Hill	01467081, 18-PE-3	Phosphorus, Total Suspended Solids, Arsenic	NJDEP/USGS Data, Metal Recon
5	Lower Delaware	18	Pennsauken Creek S Br at Greentree Rd in Evesham	AN0182	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	18	Pennsauken Creek S Br at Rt 41 in Cherry Hill	AN0183	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	15	Penny Pot Stream at Eighth St in Folsom	AN0626	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	03	Pequannock River - Butler	PQ10	Temperature	Pequannock River Coalition
5	Northeast	03	Pequannock River above Clinton	PQ4	Temperature	Pequannock River Coalition
5	Northeast	03	Pequannock River above Macopin	PQ7	Temperature	Pequannock River Coalition
4	Northeast	03	Pequannock River Above Pacock	PQ01	Temperature	Pequannock River Coalition

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
5	Northeast	03	Pequannock River at Macopin Intake Dam	01382500, PQ8, 3-SITE-8, 3-PEQ-1	Temperature, Dissolved Oxygen, Lead	NJDEP/USGS Data, Pequannock River Coalition, Metal Recon
3	Northeast	03	Pequannock River at Macopin Intake Dam	01382500, PQ8, 3-SITE-8, 3-PEQ-1	Arsenic, Cadmium, Mercury	NJDEP/USGS Data, Pequannock River Coalition, Metal Recon
1	Northeast	03	Pequannock River at Macopin Intake Dam	01382500, PQ8, 3-SITE-8, 3-PEQ-1	Phosphorus, Fecal Coliform, pH, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Chromium, Copper,	NJDEP/USGS Data, Pequannock River Coalition, Metal Recon
5	Northeast	03	Pequannock River at Riverdale	01382800, PQ11	Temperature	NJDEP/USGS Data, EWQ, Pequannock River Coalition
1	Northeast	03	Pequannock River at Riverdale	01382800, PQ11	Dissolved Oxygen, Nitrate, Dissolved Solids, Unionized Ammonia	NJDEP/USGS Data, EWQ, Pequannock River Coalition
3	Northeast	03	Pequannock River at Riverdale	01382800, PQ11	Phosphorus, Fecal Coliform, Temperature, pH, Nitrate, Total Suspended Solids	NJDEP/USGS Data, EWQ, Pequannock River Coalition
5	Northeast	03	Pequannock River at Rt 23 (abv res) in West Milford	AN0259	Benthic Macroinvertebrates	NJDEP AMNET
1	Northeast	03	Pequannock River at Rt 23 (abv res) in West Milford	EWQ0259	Phosphorus, Dissolved Oxygen, pH, Nitrate, Dissolved Solids, Total Suspended	EWQ
1	Northeast	03	Pequannock River at Rt 23 (Macopin Intake) in West Milford	AN0264	Benthic Macroinvertebrates	NJDEP AMNET
1	Northeast	03	Pequannock River at Rt 511 in Butler	AN0265	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	03	Pequannock River at Rt 515 in Hardyston	AN0258	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	03	Pequannock River below Clinton	PQ5	Temperature	Pequannock River Coalition
5	Northeast	03	Pequannock River below Pacock	PQ3	Temperature	Pequannock River Coalition
1	Northwest	01	Pequest River at Cemetery Rd in Independence	AN0041	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	01	Pequest River at Huntsville	01445000	Phosphorus, Fecal Coliform, Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized	NJDEP/USGS Data, EWQ
4	Northwest	01	Pequest River at Pequest	01445500, 1-PEQ-2	Fecal Coliform	NJDEP/USGS Data, EWQ, Metal Recon
5	Northwest	01	Pequest River at Pequest	01445500, 1-PEQ-2	Phosphorus, pH, Total Suspended Solids	NJDEP/USGS Data, EWQ, Metal Recon
3	Northwest	01	Pequest River at Pequest	01445500, 1-PEQ-2	Arsenic, Mercury	NJDEP/USGS Data, EWQ, Metal Recon
1	Northwest	01	Pequest River at Pequest	01445500, 1-PEQ-2	Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Unionized Ammonia, Cadmium, Chromium, Copper, Lead,	NJDEP/USGS Data, EWQ, Metal Recon
1	Northwest	01	Pequest River at Pequest Rd in Green	AN0037	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	01	Pequest River at Pequest Rd in White	AN0043	Benthic Macroinvertebrates	NJDEP AMNET
5	Northwest	01	Pequest River at Rt 206 in Andover	AN0035	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	01	Pequest River at Rt 615 in Allamuchy	AN0039	Benthic Macroinvertebrates	NJDEP AMNET
4	Northwest	01	Pequest River at Rt206 Below Springdale	01444970	Fecal Coliform	NJDEP/USGS Data
1	Northwest	01	Pequest River at Rt206 Below SprIngdale	01444970	Phosphorus, pH, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized	NJDEP/USGS Data
3	Northwest	01	Pequest River at Rt206 Below Springdale	01444970	Temperature, Dissolved Oxygen	NJDEP/USGS Data
1	Northwest	01	Pequest River at Water St in Belvidere	AN0048	Benthic Macroinvertebrates	NJDEP AMNET
4	Northwest	01	Pequest River on Water Street at Belvidere	01446400, DRBCNJ0033, 1-PEQ-3	Fecal Coliform	NJDEP/USGS Data, DRBC, Metal Recon

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Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
5	Northwest	01	Pequest River on Water Street at Belvidere	01446400, DRBCNJ0033, 1-PEQ-3	Phosphorus, pH, Temperature, Arsenic, Cadmium, Chromium, Lead, Mercury	NJDEP/USGS Data, DRBC, Metal Recon
3	Northwest	01	Pequest River on Water Street at Belvidere	01446400, DRBCNJ0033, 1-PEQ-3	Silver	NJDEP/USGS Data, DRBC, Metal Recon
1	Northwest	01	Pequest River on Water Street at Belvidere	01446400, DRBCNJ0033, 1-PEQ-3	Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Copper, Nickel, Selenium, Zinc	NJDEP/USGS Data, DRBC, Metal Recon
5	Northwest	01	Pequest River UNK Trib at Brighton Rd in Green	AN0036	Benthic Macroinvertebrates	NJDEP AMNET
4	Raritan	09	Peters Brook at Rt 28 at Somerville	01400395	Fecal Coliform	NJDEP/USGS Data
3	Raritan	09	Peters Brook at Rt 28 at Somerville	01400395	Phosphorus, pH	NJDEP/USGS Data
1	Raritan	09	Peters Brook at Rt 28 at Somerville	01400395	Temperature, Dissolved Oxygen, Nitrate, Total Suspended Solids, Unionized	NJDEP/USGS Data
5	Raritan	09	Peters Brook at Rt 28 in Somerville	AN0376	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	12	Pews Creek-Tidal	R66	Dissolved Oxygen, Total Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
1	Lower Delaware	17	Phillips Creek-Tidal	R49	Dissolved Oxygen	NJDEP Coastal Monitoring
1	Northeast	03	Pia Costa Lake-03	Lincoln Park Community Lake Beginning, Diving Area, and Swim Lanes	Fecal Coliform	Lincoln Park HD
1	Lower Delaware	17	Pickle Factory Dock	Pickle Factory Dock	Fecal Coliform	Cumberland Co HD
3	Raritan	10	Pike Run at Rt 206 in Hillsborough	AN0402	Benthic Macroinvertebrates	NJDEP AMNET
5	Raritan	10	Pike Run at Rt 533 in Montgomery	AN0405	Benthic Macroinvertebrates	NJDEP AMNET
4	Raritan	10	Pike Run near Rocky Hill	01401700	Fecal Coliform	NJDEP/USGS Data
5	Raritan	10	Pike Run near Rocky Hill	01401700	Phosphorus	NJDEP/USGS Data
1	Raritan	10	Pike Run near Rocky Hill	01401700	Temperature, pH, Dissolved Oxygen, Nitrate, Total Suspended Solids, Unionized	NJDEP/USGS Data
3	Raritan	10	Pike Run near Rocky Hill	01401700	Dissolved Solids	NJDEP/USGS Data
1	Atlantic Coast	14	Pilgrim Lake-14	Pilgrim Lake Campground	Fecal Coliform	Burlington Co HD
3	Atlantic Coast	12	Pine Brook at Hockhockson Rd In Tinton Falls	34	pH, Total Suspended Solids	Monmouth Co HD
1	Atlantic Coast	12	PIne Brook at Hockhockson Rd in TInton Falls	34	Phosphorus, Nitrate	Monmouth Co HD
4	Atlantic Coast	12	Pine Brook at Hockhockson Rd in Tinton Falls	34	Fecal Coliform	Monmouth Co HD
3	Atlantic Coast	12	Pine Brook at Hockhockson Rd in Tinton Falls	MB-34	Benthic Macroinvertebrates	Monmouth Co HD
5	Raritan	09	Pine Brook at Pension Rd in Manalapan	AN0449	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	12	Pine Brook at Squankum Rd in Macedonia	AN0476A	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	12	Pine Brook at Tinton Ave (Rt 537) in Tinton Falls	AN0476	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	16	Pine Haven Lake-16	Pine Haven Campground	Fecal Coliform	Cape May Co HD
1	Lower Delaware	18	Pine Hill Scout Camp Lake-18	Camp Pine Hill	Fecal Coliform	Camden Co HD
5	Atlantic Coast	13	Pine Lake-13	Pine Lake Bathing Beach	Fecal Coliform	Ocean Co HD
3	Lower Delaware	19	Pine Lake-19	East Lake Pine Colony Club, South Lake Pine Colony Club, Main Lake Pine Colony Club, WHAPINEL	Pineland Biological Community	Burlington Co HD, Pinelands
1	Lower Delaware	19	Pine Lake-19	East Lake Pine Colony Club, South Lake Pine Colony Club, Main Lake Pine Colony Club, WHAPINEL	Fecal Coliform	Burlington Co HD, Pinelands
3	Lower Delaware	17	Pine Mt Creek at Rt 623 in Greenwich	AN0717	Benthic Macroinvertebrates	NJDEP AMNET
1	Northeast	03	Pinecliff Lake-03	Pinecliff Lake	Fecal Coliform	Passaic Co HD

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
1	Northeast	03	Pines Lake-03	Pines Lake South and West	Fecal Coliform	Passaic Co HD
3	Atlantic Coast	14	Plains Branch at Jenkins Rd in Bass River	AN0604	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	14	Plains Branch impoundment above Beaver Dam Rd (Lake 1770-14)	OPLTRIMP	Pineland Biological Community	Pinelands
5	Lower Delaware	18	Plank Run at Rt 322 in Harrison	AN0670A	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	20	Pleasant Run at Extonville Rd in Hamilton	AN0126B	Benthic Macroinvertebrates	NJDEP AMNET
1	Raritan	08	Pleasant Run at Pleasant Run Rd in ReadIngton	AN0339	Benthic Macroinvertebrates	NJDEP AMNET
5	Raritan	08	Pleasant Run at S Br Rd in Branchburg	AN0340	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	02	Pleasant Valley Lake-02	Pleasant Valley Lake	Fecal Coliform	Sussex Co HD
5	Atlantic Coast	13	Plohemus Creek-Tidal	1614G	Total Coliform	NJDEP Shellfish Monitoring
5	Northwest	01	Plum Brook at Pine Hill Rd in Delaware	AN0093	Benthic Macroinvertebrates	NJDEP AMNET
3	Northwest	11	Plum Brook at Rt 579 in Raritan	AN0092	Benthic Macroinvertebrates	NJDEP AMNET
5	Northwest	11	Plum Brook near Locktown	01461262	Fecal Coliform	NJDEP/USGS Data
3	Northwest	11	Plum Brook near Locktown	01461262	Phosphorus	NJDEP/USGS Data
1	Northwest	11	Plum Brook near Locktown	01461262	Temperature, pH, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized	NJDEP/USGS Data
1	Northwest	01	Plymouth Lake-01	Plymouth Lake	Fecal Coliform	Sussex Co HD
5	Northwest	01	Pohatcong Creek at Buttermilk Bridge Rd in Washington	AN0057	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	01	Pohatcong Creek at Carpentersville Rd in Pohatcong	AN0061	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	01	Pohatcong Creek at Edison Rd in FranklIn	AN0058	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	01	Pohatcong Creek at Janes Chapel Rd in Mansfield	AN0054	Benthic Macroinvertebrates	NJDEP AMNET
5	Northwest	01	Pohatcong Creek at New Village	01455200	Temperature	NJDEP/USGS Data, EWQ
1	Northwest	01	Pohatcong Creek at New Village	01455200	Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized	NJDEP/USGS Data, EWQ
5	Northwest	01	Pohatcong Creek at O'Brian Rd in Mansfield	AN0054A	Benthic Macroinvertebrates	NJDEP AMNET
5	Northwest	01	Pohatcong Creek at River Rd Bridge	DRBCNJ0027	Phosphorus, Fecal Coliform	DRBC
1	Northwest	01	Pohatcong Creek at River Rd Bridge	DRBCNJ0027	Temperature, Dissolved Oxygen, pH, Nitrate, Dissolved Solids, Total Suspended	DRBC
5	Northwest	01	Mansfield	AN0055	Benthic Macroinvertebrates	NJDEP AMNET
5	Northwest	01	Mansfield	EWQ0055	Temperature	EWQ
3	Northwest	01	Pohatcong Creek at Tunnel Hill Rd in Washington	EWQ0055	Dissolved Oxygen	EWQ
1	Northwest	01	Pohatcong Creek at Tunnel Hill Rd in Washington	EWQ0055	Phosphorus, pH, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized	EWQ
4	Atlantic Coast	13	Pohatcong Lake-13	Pohatcong/Tuckerton Lake	Phosphorus	NJDEP Clean Lakes
5	Atlantic Coast	13	Point Pleasant Canal	1308C	Total Coliform	NJDEP Shellfish Monitoring
1	Atlantic Coast	13	Point Pleasant Canal	1308C, 1601B	Dissolved Oxygen	NJDEP Coastal Monitoring
3	Lower Delaware	19	Pole Bridge Branch at blw Country Lk in Pemberton	AN0144, GPOWISSA	Pineland Biological Community	NJDEP AMNET, Pinelands
1	Lower Delaware	19	Pole Bridge Branch at Whites Bogs-Pasadena Rd	GPOWHITE	Pineland Biological Community	Pinelands
1	Lower Delaware	19	Pole Bridge Branch impoundment below Rt 70 (Lake 1417-19)	GPORT70D	Pineland Biological Community	Pinelands
3	Lower Delaware	19	Pole Bridge Branch near Browns Mills	01466200	Suspended Solids	NJDEP/USGS Data

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1	Lower Delaware	19	Pole Bridge Branch near Browns Mills	01466200	Temperature, pH, Dissolved Oxygen, Nitrate, Unionized Ammonia	NJDEP/USGS Data
5	Lower Delaware	19	Pompeston Creek at New Albany Rd in Moorestown	AN0177A	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	18	Pompeston Creek at Rt 130 in Cinnaminson	AN0177	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	03	Pompton Lake-03	Pompton Lake	Fish-Mercury	NJDEP Fish Tissue Monitoring
5	Northeast	03	Pompton River at Lincoln Park	Pompton River at Lincoln Park	Fish-Mercury	NJDEP Fish Tissue Monitoring
1	Northeast	03	Pompton River at Newark Pompton Tnpk in Pequannock	AN0268	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	03	Pompton River at Newark Pompton Tnpk in Pequannock	AN0268	Benthic Macroinvertebrates, Unknown Toxicity	NJDEP AMNET
5	Northeast	03	Pompton River at Pequannock River	Pompton River at Pequannock River	Fish-Mercury	NJDEP Fish Tissue Monitoring
5	Northeast	03	Pompton River at Pompton Plains	01388500, 3-SITE-7	Lead	NJDEP/USGS Data, Metal Recon
3	Northeast	03	Pompton River at Pompton Plalns	01388500, 3-SITE-7	Arsenic, Cadmium, Mercury	NJDEP/USGS Data, Metal Recon
1	Northeast	03	Pompton River at Pompton Plalns	01388500, 3-SITE-7	Phosphorus, Fecal Coliform, Dissolved Oxygen, Temperature, pH, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Copper, Chromium,	NJDEP/USGS Data, Metal Recon
5	Northeast	03	Pompton River at Pompton Plains Cross Rd in Pequannock	AN0268A	Benthic Macroinvertebrates, Unknown Toxicity	NJDEP AMNET
5	Northeast	03	Pompton River at Rt 202 in Wayne	01388910	Phosphorus	EWQ
1	Northeast	03	Pompton River at Rt 202 in Wayne	01388910	Temperature, Dissolved Oxygen, pH, Nitrate, Dissolved Solids, Total Suspended	EWQ
3	Northeast	03	Pompton River Trib at Ryerson Rd	01388720	Phosphorus	NJDEP/USGS Data
1	Northeast	03	Pompton River Trib at Ryerson Rd	01388720	Temperature, Dissolved Oxygen, pH, Nitrate, Dissolved Solids, Total Suspended	NJDEP/USGS Data
5	Northeast	03	Pompton River Trib at Ryerson Rd	01388720	Fecal Coliform	NJDEP/USGS Data
5	Northwest	11	Pond Run at Rt 533 in Hamilton	AN0117	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	01	PophandusIng Brook at off Rt 519 in White	AN0049	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	12	Poplar Brook at Almyr Ave in Deal	AN0478	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	12	Poplar Brook at Deal	01407630, 59	pH, Total Suspended Solids	NJDEP/USGS Data, Monmouth Co HD
1	Atlantic Coast	12	Poplar Brook at Deal	01407630, 59	Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Unionized Ammonia	NJDEP/USGS Data, Monmouth Co HD
4	Atlantic Coast	12	Poplar Brook at Deal	01407630, 59	Fecal Coliform	NJDEP/USGS Data, Monmouth Co HD
5	Atlantic Coast	12	Poplar Brook at Deal	01407630, 59	Phosphorus	NJDEP/USGS Data, Monmouth Co HD
3	Atlantic Coast	12	Poricy Brook at Navesink River Rd in Middletown	AN0463	Benthic Macroinvertebrates	NJDEP AMNET
1	Northeast	03	Post Brook Farms Lake-03	Post Brook Farms CC	Fecal Coliform	Passaic Co HD
5	Northeast	06	Powder Mill Pond-06	Tabor Lake Corporation	Fecal Coliform	Parsippany Troy Hills HD
5	Northeast	04	Preakness Brook at French Hill Rd in Wayne	AN0273	Benthic Macroinvertebrates	NJDEP AMNET
1	Northeast	04	Preakness Brook at Paterson - Hamburg Tnpk in Wayne	AN0272	Benthic Macroinvertebrates	NJDEP AMNET
3	Northeast	04	Preakness Brook near Little Falls	01389080	Phosphorus, Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia	NJDEP/USGS Data

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4	Northeast	04	Preakness Brook near Little Falls	01389080	Fecal Coliform	NJDEP/USGS Data
1	Raritan	08	Prescott Brook at Station Rd in Readlngton	AN0327	Benthic Macroinvertebrates	NJDEP AMNET
3	Lower Delaware	19	Presidential Lake-19	Presidential Lake, GBIPRESU	Phosphorus, Pineland Biological Community	NJDEP Clean Lakes, Burlington Co HD, Pinelands
1	Lower Delaware	19	Presidential Lakes-19	Presidential Lake, GBIPRESU	Fecal Coliform	NJDEP Clean Lakes, Burlington Co HD, Pinelands
3	Atlantic Coast	14	Prices Branch at Burnt Mill Rd in Waterford	AN0568, MPRBURNT	Pineland Biological Community	NJDEP AMNET, Pinelands
1	Northeast	06	Primrose Brook at Jockey Hollow Nat'l Pk in Hardlng	AN0215	Benthic Macroinvertebrates	NJDEP AMNET
1	Northeast	06	Primrose Brook at Lees Mill Rd in Hardlng	AN0216	Benthic Macroinvertebrates	NJDEP AMNET
3	Northeast	06	Primrose Brook at Morristown National Park	01378780	Arsenic, Cadmium, Mercury, Silver	NJDEP/USGS Data
1	Northeast	06	Primrose Brook at Morristown National Park	01378780	Phosphorus, Fecal Coliform, Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Chromium, Copper, Lead,	NJDEP/USGS Data
3	Lower Delaware	20	Prospertown Lake-20	Prospertown Lake	Phosphorus	NJDEP Clean Lakes
1	Lower Delaware	20	Prospertown Lake-20	Prospertown Lake	Fish Community	NJDEP Freshwater Fisheries
3	Atlantic Coast	14	Pump Branch at Old White Horse Pike in Winslow	AN0569, NPUMDIKE	Pineland Biological Community	NJDEP AMNET, Pinelands
3	Atlantic Coast	14	Pump Branch impoundment off Cedar Avenue (Lake 1930-14)	NPUIMPNT	Pineland Biological Community	Pinelands
5	Atlantic Coast	14	Pump Branch near Waterford Works	01409408	pH	NJDEP/USGS Data
1	Atlantic Coast	14	Pump Branch near Waterford Works	01409408	Phosphorus, Fecal Coliform, Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized	NJDEP/USGS Data
1	Lower Delaware	17	Rabins Beach	Rabins Beach	Fecal Coliform	Cumberland Co HD
5	Lower Delaware	18	Raccoon Creek at Ellis Mill Rd in Elk	AN0679	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	17	Raccoon Creek at Rt 130 in Bridgeport	01477160	Phosphorus, Total Suspended Solids	EWQ
3	Lower Delaware	17	Raccoon Creek at Rt 130 in Bridgeport	01477160	Dissolved Solids	EWQ
1	Lower Delaware	17	Raccoon Creek at Rt 130 in Bridgeport	01477160	Temperature, Dissolved Oxygen, pH, Nitrate, Unionized Ammonia	EWQ
5	Lower Delaware	18	Raccoon Creek at Tomlin Sta Rd in Harrison	AN0683	Benthic Macroinvertebrates	NJDEP AMNET
3	Lower Delaware	18	Raccoon Creek near Swedesboro	01477120, 18-RAC-1	Arsenic, Cadmium, Mercury	NJDEP/USGS Data, Metal Recon
1	Lower Delaware	18	Raccoon Creek near Swedesboro	01477120, 18-RAC-1	Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Chromium,	NJDEP/USGS Data, Metal Recon
4	Lower Delaware	18	Raccoon Creek near Swedesboro	01477120, 18-RAC-1	Fecal Coliform	NJDEP/USGS Data, Metal Recon
5	Lower Delaware	18	Raccoon Creek near Swedesboro	01477120, 18-RAC-1	Phosphorus, Silver	NJDEP/USGS Data, Metal Recon
5	Lower Delaware	18	Raccoon Creek S Br at High St in Harrison	AN0682	Benthic Macroinvertebrates	NJDEP AMNET
3	Lower Delaware	18	Raccoon Creek S Br at Swedesboro Rd in South Harrison	AN0681	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	17	Raccoon Ditch at Davis Mill Rd in Greenwich	AN0708	Benthic Macroinvertebrates	NJDEP AMNET
5	Raritan	07	Rahway River at Kenilworth Blvd in Cranford	AN0194	Benthic Macroinvertebrates	NJDEP AMNET
3	Raritan	07	Orange	AN0192	Benthic Macroinvertebrates	NJDEP AMNET
4	Raritan	07	Rahway River at Rahway	01395000, 7-RAH-1	Fecal Coliform	NJDEP/USGS Data, Metal Recon, Drinking Water

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5	Raritan	07	Rahway River at Rahway	01395000, 7-RAH-1	Phosphorus, Arsenic, TCE	NJDEP/USGS Data, Metal Recon, Drinking Water
3	Raritan	07	Rahway River at Rahway	01395000, 7-RAH-1	Mercury	NJDEP/USGS Data, Metal Recon
1	Raritan	07	Rahway River at Rahway	01395000, 7-RAH-1	Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Cadnium,	NJDEP/USGS Data, Metal Recon
5	Raritan	07	Rahway River at River Rd & Church St in Rahway	AN0195	Benthic Macroinvertebrates	NJDEP AMNET
5	Raritan	07	Rahway River at Washington Ave (Rt 82) in Springfield	AN0193	Benthic Macroinvertebrates	NJDEP AMNET
1	Raritan	07	Rahway River Estuary	RAH1, RAH2	Fecal Coliform	IEC
4	Raritan	07	Rahway River near Springfield	01394500	Fecal Coliform	NJDEP/USGS Data, Drinking Water
5	Raritan	07	Rahway River near Springfield	01394500	Phosphorus	NJDEP/USGS Data, Drinking Water
1	Raritan	07	Rahway River near SprIngfield	01394500	Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended	NJDEP/USGS Data
5	Raritan	07	Rahway River S Br at Colonia	01396030	Phosphorus , Fecal Coliform	NJDEP/USGS Data
3	Raritan	07	Rahway River S Br at Colonia	01396030	Dissolved Solids	NJDEP/USGS Data
1	Raritan	07	Rahway River S Br at Colonia	01396030	Temperature, pH, Dissolved Oxygen, Nitrate, Unionized Ammonia, Total	NJDEP/USGS Data
5	Raritan	07	Rahway River S Br at Merrill Park in Woodbridge	AN0201	Benthic Macroinvertebrates	NJDEP AMNET
5	Raritan	07	Rahway River S Br at Parsonnage Rd in Edison	AN0200	Benthic Macroinvertebrates	NJDEP AMNET
3	Raritan	07	Rahway River S Br near Maple Ave in Woodbridge	7-SBR-1	Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium, Silver,	NJDEP Metal Recon
4	Raritan	07	Rahway River W Br at Northfield Av at West Orange	01393960	Fecal Coliform	NJDEP/USGS Data
5	Raritan	07	Rahway River W Br at Northfield Av at West Orange	01393960	Phosphorus, Dissolved Solids, Chloride	NJDEP/USGS Data
1	Raritan	07	Rahway River W Br at Northfield Av at West Orange	01393960	Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Unionized	NJDEP/USGS Data
3	Raritan	07	Rahway River W Br at Northfield Av at West Orange	01393960	Total Suspended Solids, Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium, Silver, thallium,	NJDEP/USGS Data
3	Lower Delaware	17	Rainbow Lake-17	Rainbow Lake	Phosphorus	NJDEP Clean Lakes
5	Northeast	06	Rainbow Lakes-06	Rainbow Lakes Comm. Club	Fecal Coliform	Parsippany Troy Hills HD
1	Atlantic Coast	12	RamanessIn Brook at Willow Rd in Holmdel	53	Nitrate	Monmouth Co HD
3	Atlantic Coast	12	Ramanessin Brook at Willow Rd In Holmdel	53	pH, Total Suspended Solids	Monmouth Co HD
4	Atlantic Coast	12	Ramanessin Brook at Willow Rd in Holmdel	53	Fecal Coliform	Monmouth Co HD
5	Atlantic Coast	12	Ramanessin Brook at Willow Rd in Holmdel	53	Phosphorus	Monmouth Co HD
1	Northeast	03	Ramapo Lake-03	Ramapo Lake	Fish Community	NJDEP Freshwater Fisheries
5	Northeast	03	Ramapo River at Dawes Highway	01388100, 01388000	Phosphorus, Dissolved Oxygen, pH	NJDEP/USGS Data, EWQ
1	Northeast	03	Ramapo River at Dawes Highway	01388100, 01388000	Temperature, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized	NJDEP/USGS Data, EWQ
3	Northeast	03	Ramapo River at Dawes Highway	01388100, 01388000	Fecal Coliform	NJDEP/USGS Data, EWQ
1	Northeast	03	Ramapo River at Lenape Ln in Oakland	AN0267	Benthic Macroinvertebrates	NJDEP AMNET
1	Northeast	03	Ramapo River at W Ramapo Ave in Mahwah	AN0266	Benthic Macroinvertebrates	NJDEP AMNET

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5	Northeast	03	Ramapo River near Mahwah	01387500, 3-SITE-9, 3-RAM-1	Phosphorus	NJDEP/USGS Data, Metal Recon
3	Northeast	03	Ramapo River near Mahwah	01387500, 3-SITE-9, 3-RAM-1	Arsenic, Cadmium, Mercury	NJDEP/USGS Data, Metal Recon
1	Northeast	03	Ramapo River near Mahwah	01387500, 3-SITE-9, 3-RAM-1	Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Sodium,	NJDEP/USGS Data, Metal Recon
4	Northeast	03	Ramapo River near Mahwah	01387500, 3-SITE-9, 3-RAM-1	Fecal Coliform	NJDEP/USGS Data, Metal Recon
3	Northeast	04	Ramsey Brook at Allendale	01390900	Phosphorus, Dissolved Solids	NJDEP/USGS Data
1	Northeast	04	Ramsey Brook at Allendale	01390900	Temperature, pH, Dissolved Oxygen, Nitrate, Total Suspended Solids, Unionized	NJDEP/USGS Data
4	Northeast	04	Ramsey Brook at Allendale	01390900	Fecal Coliform	NJDEP/USGS Data
5	Northeast	04	Ramsey Brook at Grenadier Dr W of Cortland Tr in Mahwah	AN0286X	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	04	Ramsey Brook at Masonicus Rd in Mahwah	AN0286	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	04	Ramsey Brook at Park Ave in Allendale	AN0287	Toxicity	NJDEP AMNET
1	Northwest	01	Ramseysburg Creek at Rt 46 in Knowlton	AN0034	Benthic Macroinvertebrates	NJDEP AMNET
3	Lower Delaware	19	Rancocas Creek N Br above New Lisbon-Four Mile Rd	NNONEWLI	Pineland Biological Community	Pinelands
5	Lower Delaware	19	Rancocas Creek N Br at Browns Mills	01465970	Phosphorus, Fecal Coliform, pH, Mercury	NJDEP/USGS Data, 304(l)
5	Lower Delaware	19	Rancocas Creek N Br at Hanover Furnace	01465950, 19-RA-1N	Copper, Mercury, Lead	NJDEP/USGS Data, Metal Recon
1	Lower Delaware	19	Rancocas Creek N Br at Hanover Furnace	01465950, 19-RA-1N	Phosphorus, Temperature, pH, Dissolved Oxygen, Nitrate, Unionized Ammonia,	NJDEP/USGS Data, Metal Recon
3	Lower Delaware	19	Rancocas Creek N Br at Hanover Furnace	01465950, 19-RA-1N	Total Suspended Solids, Arsenic, Cadmium	NJDEP/USGS Data, Metal Recon
3	Lower Delaware	19	Rancocas Creek N Br at Iron Works Park at Mt Holly	01467005, 01467006, 01467003, 19-RA-4N	Cadmium, Mercury	NJDEP/USGS Data, EWQ, Metal Recon
1	Lower Delaware	19	Rancocas Creek N Br at Iron Works Park at Mt Holly	01467005, 01467006, 01467003, 19-RA-4N	Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Chromium, Nickel,	NJDEP/USGS Data, EWQ, Metal Recon
4	Lower Delaware	19	Rancocas Creek N Br at Iron Works Park at Mt Holly	01467005, 01467006, 01467003, 19-RA-4N	Fecal Coliform	NJDEP/USGS Data, EWQ, Metal Recon
5	Lower Delaware	19	Rancocas Creek N Br at Iron Works Park at Mt Holly	01467005, 01467006, 01467003, 19-RA-4N	Phosphorus, pH, Arsenic, Copper, Lead	NJDEP/USGS Data, EWQ, Metal Recon
3	Lower Delaware	19	Rancocas Creek N Br at Main St in Pemberton	AN0149, NNORT616	Pineland Biological Community	NJDEP AMNET, Pinelands
5	Lower Delaware	19	Rancocas Creek N Br at Pemberton	01467000, 19-RA-3N	Copper, Lead	NJDEP/USGS Data, Metal Recon
3	Lower Delaware	19	Rancocas Creek N Br at Pemberton	01467000, 19-RA-3N	Arsenic, Cadmium, Mercury	NJDEP/USGS Data, Metal Recon
1	Lower Delaware	19	Rancocas Creek N Br at Pemberton	01467000, 19-RA-3N	Phosphorus, Fecal Coliform, Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Chromium, Nickel, Selenium,	NJDEP/USGS Data, Metal Recon
5	Lower Delaware	19	Rancocas Creek N Br at Pine St Pk in Mount Holly	AN0151	Benthic Macroinvertebrates	NJDEP AMNET
3	Lower Delaware	19	Rancocas Creek N Br blw Hanover Lk in Pemberton	AN0143, NNOMILIT	Pineland Biological Community	NJDEP AMNET, Pinelands
1	Lower Delaware	19	Rancocas Creek N Br Trib above Magnolia Rd	NNOTRMGU	Pineland Biological Community	Pinelands

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3	Lower Delaware	19	Rancocas Creek S Br at Buddtown - Beaverville Rd in Southampton	AN0156, SSORIDGE	Pineland Biological Community	NJDEP AMNET, Pinelands
3	Lower Delaware	19	Rancocas Creek S Br at Burr's Mill Rd	SSOBURRS	Pineland Biological Community	Pinelands
1	Lower Delaware	19	Rancocas Creek S Br at Hainesport	Rancocas, EWQ0176S, 19-RA-1S	Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Chromium, Copper,	NJDEP/USGS Data, EWQ, Metal Recon
5	Lower Delaware	19	Rancocas Creek S Br at Hainesport	Rancocas, EWQ0176S, 19-RA-1S	Phosphorus, Fecal Coliform, Arsenic	NJDEP/USGS Data, EWQ, Metal Recon
3	Lower Delaware	19	Rancocas Creek S Br at Hainsport	Rancocas, EWQ0176S, 19-RA-1S	pH, Cadmium, Mercury	EWQ, Metal Recon
5	Lower Delaware	19	Rancocas Creek S Br at Mt Holly - Eayrestown Rd in Lumberton	AN0161	Benthic Macroinvertebrates	NJDEP AMNET
3	Lower Delaware	19	Rancocas Creek S Br at Ridge Rd in Southampton	EWQ0156	Phosphorus	EWQ
1	Lower Delaware	19	Rancocas Creek S Br at Ridge Rd in Southampton	EWQ0156	Temperature, Dissolved Oxygen, pH, Nitrate, Dissolved Solids, Total Suspended	EWQ
5	Lower Delaware	19	Rancocas Creek S Br at Vincentown	01465850, 19-RA-3S	Phosphorus, pH, Lead	NJDEP/USGS Data, Metal Recon
3	Lower Delaware	19	Rancocas Creek S Br at Vincentown	01465850, 19-RA-3S	Arsenic, Cadmium, Mercury	NJDEP/USGS Data, Metal Recon
1	Lower Delaware	19	Rancocas Creek S Br at VIncentown	01465850, 19-RA-3S	Fecal Coliform, Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Arsenic, Chromium, Copper, Nickel,	NJDEP/USGS Data, Metal Recon
5	Lower Delaware	19	Rancocas Creek S Br Trib at Burr's Mill Rd	SSOTRBUR	Pineland Biological Community	Pinelands
3	Lower Delaware	19	Rancocas Creek SW Br at Elmwood Rd in Evesham	AN0162	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	19	Rancocas Creek SW Br at Hartford Rd	WSOHARTF	Pineland Biological Community	Pinelands
5	Lower Delaware	19	Rancocas Creek SW Br at Rt 70 in Medford	AN0169, WSORT541, WSORTE70, WSOMEDPK	Pineland Biological Community	NJDEP AMNET, Pinelands
5	Lower Delaware	19	Rancocas Creek SW Br at Rt 70 in Medford	EWQ0169, 19-RA-2S	Phosphorus, pH, Arsenic	EWQ, Metal Recon
1	Lower Delaware	19	Rancocas Creek SW Br at Rt 70 in Medford	EWQ0169, 19-RA-2S	Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Chromium, Copper,	EWQ, Metal Recon
3	Lower Delaware	19	Rancocas Creek SW Br at Rt 70 In Medford	EWQ0169, 19-RA-2S	Cadmium, Mercury	NJDEP Metal Recon
5	Raritan	08	Randolph Park Lake-08	Randolph Park Lake Left Beach, Right Beach, and Swim Lanes	Fecal Coliform	Randoph Twp HD
1	Raritan	09	Raritan Bay	Raritan Bay-1 thru 7	Dissolved Oxygen, Fecal Coliform, Copper, Nickel, Lead, Mercury	NJDEP Coastal Monitoring, Shellfish Monitoring, IEC, HEP (GLEC)
5	Raritan	09	Raritan Bay	Raritan Bay-1 thru 7	Total Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring, IEC, HEP (GLEC)
1	Raritan	09	Raritan Bay - Sandy Hook Bay	Sandy Hook Bay	Arsenic, Chromium, Copper, Lead, Mercury, Nickel, Silver, Zinc	HEP (GLEC)
5	Raritan	09	Raritan Bay and Tidal Tributaries	Raritan Bay and Tidal Tributaries	Fish-PCB, Fish-Dioxin	NJDEP Fish Tissue Monitoring
5	Raritan	09	Raritan River	Raritan River	Fish-Mercury	NJDEP Fish Tissue Monitoring
5	Raritan	09	Raritan River abv Millstone River confl in Bridgewater	AN0377	Benthic Macroinvertebrates	NJDEP AMNET
1	Raritan	09	Raritan River at Fieldville Dam (I287) in Piscataway	AN0428	Benthic Macroinvertebrates	NJDEP AMNET

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
1	Raritan	09	Raritan River at Landing Lane in Johnson Pk in Piscatawa	01404170	Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Unionized Ammonia	EWQ
5	Raritan	09	Raritan River at Landing Lane in Johnson Pk in Piscataway	01404170	Phosphorus, Total Suspended Solids	EWQ
3	Raritan	09	Raritan River at Landing Lane in Johnson Pk, Piscatawa	01404170	pH	EWQ
4	Raritan	09	Raritan River at Manville	01400500	Fecal Coliform	NJDEP/USGS Data, EWQ
5	Raritan	09	Raritan River at Manville	01400500	Phosphorus	NJDEP/USGS Data, EWQ
1	Raritan	09	Raritan River at Manville	01400500	Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended	NJDEP/USGS Data, EWQ
5	Raritan	09	Raritan River at Millstone River	Raritan River at Millstone River	Fish-Mercury	NJDEP Fish Tissue Monitoring
5	Raritan	08	Raritan River at Neshanic Station	Raritan River at Neshanic Station	Fish-Mercury	NJDEP Fish Tissue Monitoring
4	Raritan	09	Raritan River at Queens Bridge	01403300	Fecal Coliform	NJDEP/USGS Data, NAWQA, HEP (GLEC)
5	Raritan	09	Raritan River at Queens Bridge	01403300	Phosphorus, Fecal Coliform, Total Suspended Solids, Arsenic, Benzene	NJDEP/USGS Data, NAWQA, HEP (GLEC)
1	Raritan	09	Raritan River at Queens Bridge	01403300	Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Unionized Ammonia, Chromium, Copper, Lead,	NJDEP/USGS Data, NAWQA, HEP (GLEC)
3	Raritan	09	Raritan River at Queens Bridge	01403300	Cadmium, Mercury	NJDEP/USGS Data, NAWQA, HEP (GLEC)
5	Raritan	09	Raritan River at Route 1	Raritan River at Route 1	Fish-Mercury	NJDEP Fish Tissue Monitoring
5	Raritan	09	Raritan River Estuary	Raritan River Estuary	Total Coliform	HEP (GLEC), IEC, NJDEP Shellfish Monitoring
1	Raritan	09	Raritan River Estuary	Raritan River Estuary	Copper, Lead, Mercury, Nickel	HEP (GLEC), IEC, NJDEP Shellfish Monitoring
5	Raritan	09	Raritan River Estuary	001	Arsenic, Cadmium, Zinc	HEP (GLEC)
5	Raritan	09	Raritan River Estuary	002	Arsenic, Cadmium, PCB	HEP (GLEC)
1	Raritan	09	Raritan River Estuary	RR1, RR2	Fecal Coliform	HEP (GLEC), IEC, NJDEP Shellfish Monitoring
1	Raritan	08	Raritan River N Br at Burnt Mills	01399120	Phosphorus, Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia	NJDEP/USGS Data
4	Raritan	08	Raritan River N Br at Burnt Mills	01399120, 8-NB-2	Fecal Coliform	NJDEP/USGS Data, Metal Recon
5	Raritan	08	Raritan River N Br at Burnt Mills	01399120, 8-NB-2	Copper	NJDEP/USGS Data, Metal Recon
3	Raritan	08	Raritan River N Br at Burnt Mills	01399120, 8-NB-2	Arsenic, Cadmium, Chromium, Lead, Mercury, Nickel, Selenium, Zinc	NJDEP/USGS Data, Metal Recon
5	Raritan	08	Raritan River N Br at Roxitucus Rd in Mendham	AN0351A	Benthic Macroinvertebrates	NJDEP AMNET
1	Raritan	08	Raritan River N Br at Rt 202 in Bedminster	AN0351	Benthic Macroinvertebrates	NJDEP AMNET
3	Raritan	08	Raritan River N Br at Rt 202 in Far Hills	EWQ0351	pH	EWQ
1	Raritan	08	Raritan River N Br at Rt 202 in Far Hills	EWQ0351	Phosphorus, Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia	EWQ
1	Raritan	08	Raritan River N Br at Rt 202 in Brburg	AN0374	Benthic Macroinvertebrates	NJDEP AMNET
1	Raritan	08	Raritan River N Br at Rt 24 in Mendham	AN0346	Benthic Macroinvertebrates	NJDEP AMNET
4	Raritan	08	Raritan River N Br near Chester	01398260	Fecal Coliform	NJDEP/USGS Data

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
1	Raritan	08	Raritan River N Br near Chester	01398260	Phosphorus, Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia	NJDEP/USGS Data
4	Raritan	08	Raritan River N Br near Raritan	01400000	Fecal Coliform	NJDEP/USGS Data
1	Raritan	08	Raritan River N Br near Raritan	01400000	Phophorus, Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia	NJDEP/USGS Data
4	Raritan	08	Raritan River S Br Arch St at High Bridge	01396535, 8-SB-2	Fecal Coliform	NJDEP/USGS Data, Metal Recon
5	Raritan	08	Raritan River S Br Arch St at High Bridge	01396535, 8-SB-2	Temperature	NJDEP/USGS Data, Metal Recon
3	Raritan	08	Raritan River S Br Arch St at High Bridge	01396535, 8-SB-2	Arsenic, Cadmium, Mercury	NJDEP/USGS Data, Metal Recon
1	Raritan	08	Raritan River S Br Arch St at High Bridge	01396535, 8-SB-2	Phosphorus, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Chromium,	NJDEP/USGS Data, Metal Recon
1	Raritan	08	Raritan River S Br at Elm St in Brburg	AN0338	Benthic Macroinvertebrates	NJDEP AMNET
4	Raritan	08	Raritan River S Br at Middle Valley	01396280, EWQ0316, 8-SB-1	Fecal Coliform	NJDEP/USGS Data, EWQ, Metal Recon
5	Raritan	08	Raritan River S Br at Middle Valley	01396280, EWQ0316, 8-SB-1	Phosphorus, Temperature	NJDEP/USGS Data, EWQ, Metal Recon
1	Raritan	08	Raritan River S Br at Middle Valley	01396280, EWQ0316, 8-SB-1	pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Chromium, Copper, Lead,	NJDEP/USGS Data, EWQ, Metal Recon
3	Raritan	08	Raritan River S Br at Middle Valley	01396280, EWQ0316, 8-SB-1	Arsenic, Cadmium, Mercury	NJDEP/USGS Data, Metal Recon
1	Raritan	08	Raritan River S Br at River Rd (dwnstr of Rt 512) in Califon	AN0316	Benthic Macroinvertebrates	NJDEP AMNET
1	Raritan	08	Raritan River S Br at River Rd (Ken Lockwood Gorge) in Lebanon	AN0317	Benthic Macroinvertebrates	NJDEP AMNET
1	Raritan	08	Raritan River S Br at Rt 173 & Rt 513 in CIInton	AN0322	Benthic Macroinvertebrates	NJDEP AMNET
1	Raritan	08	Raritan River S Br at Rt 517 in WashIngton	AN0315	Benthic Macroinvertebrates	NJDEP AMNET
1	Raritan	08	Raritan River S Br at Rt 613 in Raritan	AN0329	Benthic Macroinvertebrates	NJDEP AMNET
3	Raritan	08	Raritan River S Br at Smithtown Rd in Mount Olive	AN0310	Benthic Macroinvertebrates	NJDEP AMNET
4	Raritan	08	Raritan River S Br at South Branch	01398102, 01398070, 8-SB-6	Fecal Coliform	NJDEP/USGS Data, Metal Recon
5	Raritan	08	Raritan River S Br at South Branch	01398102, 01398070, 8-SB-6	Phosphorus, pH, Arsenic, Chromium, Copper, Lead	NJDEP/USGS Data, Metal Recon
1	Raritan	08	Raritan River S Br at South Branch	01398102, 01398070, 8-SB-6	Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Nickel, Selenium,	NJDEP/USGS Data, Metal Recon
3	Raritan	08	Raritan River S Br at South Branch	01398102, 8-SB-6	Cadmium, Mercury, Silver	NJDEP/USGS Data, Metal Recon
4	Raritan	08	Raritan River S Br at Stanton Station	01397000, 8-SB-3	Fecal Coliform	NJDEP/USGS Data, Metal Recon
5	Raritan	08	Raritan River S Br at Stanton Station	01397000, 8-SB-3	pH, Temperature, Arsenic	NJDEP/USGS Data, Metal Recon
3	Raritan	08	Raritan River S Br at Stanton Station	01397000, 8-SB-3	Cadmium, Mercury	NJDEP/USGS Data, Metal Recon

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
1	Raritan	08	Raritan River S Br at Stanton Station	01397000, 8-SB-3	Phosphorus, Dissolved Oxygen,, Nitrate, Total Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Chromium,	NJDEP/USGS Data, Metal Recon
5	Raritan	08	Raritan River S Br at Station Rd in Raritan	AN0326	Benthic Macroinvertebrates	NJDEP AMNET
1	Raritan	08	Raritan River S Br at Studdiford Dr in Brburg	AN0341	Benthic Macroinvertebrates	NJDEP AMNET
4	Raritan	08	Raritan River S Br at Three Bridges	01397400, 8-SB-4	Fecal Coliform	NJDEP/USGS Data, EWQ, Metal Recon
5	Raritan	08	Raritan River S Br at Three Bridges	01397400, 8-SB-4	Phosphorus	NJDEP/USGS Data, EWQ, Metal Recon
1	Raritan	08	Raritan River S Br at Three Bridges	01397400, 8-SB-4	Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Chromium,	NJDEP/USGS Data, EWQ, Metal Recon
3	Raritan	08	Raritan River S Br at Three Bridges	01397400, 8-SB-4	Arsenic, Cadmium, Mercury	NJDEP/USGS Data, Metal Recon
3	Raritan	09	Raritan River trib at Rt 527 in Franklin	AN0427	Benthic Macroinvertebrates	NJDEP AMNET
3	Lower Delaware	18	Rattling Run at Tomlin Rd in East Greenwich	AN0676	Benthic Macroinvertebrates	NJDEP AMNET
5	Raritan	08	Ravine Lake-08	Ravine Lake (Somerset Lake)	Fecal Coliform	Bernards Twp HD
1	Atlantic Coast	14	Red Wing Lakes-14	Red Wing	Fecal Coliform	Atlantic Co HD
3	Lower Delaware	17	Reed Branch at Royal Ave in Franklin	AN0731	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	15	Reeds Bay	Reeds Bay-1 thru 8	Dissolved Oxygen, Fecal Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
5	Atlantic Coast	15	Reeds Bay	Unnamed Creek-1; Somers Cove-2; Somers Marsh-3; Reeds Bay-5,6,8	Total Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
1	Atlantic Coast	15	Reeds Bay	Reeds Bay-4; Sand Thorofare-7	Total Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
1	Atlantic Coast	15	Resort Campground Lake-15	Resort County Club	Fecal Coliform	Cape May Co HD
1	Northeast	06	Ricabear Lake-06	Lake Rickabear Beach	Fecal Coliform	Borough of Kinnelon
1	Atlantic Coast	16	Richardson Sound	Richardson Sound-1 thru 16	Dissolved Oxygen, Fecal Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
5	Atlantic Coast	16	Richardson Sound	Old Turtle Thorofare-1; Unnamed Creek-2,7; Old Turtle Thorofare-3; Taugh Creek-4; Slaughter Gut-6; Stingeree Creek-8; Grassy Sound-12	Total Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
1	Atlantic Coast	16	Richardson Sound	10,11	Total Coliform	NJDEP Shellfish Monitoring
1	Northeast	03	Rickonda Lake-03	Lake Riconda Beach	Fecal Coliform	Passaic Co HD
3	Atlantic Coast	13	Ridgeway Branch at Rt 571 in Jackson	AN0527	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	13	Ridgeway Branch at Rt 70 in Manchester	AN0528	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	13	Ridgeway Branch of Toms River	Ridgeway Branch of Toms River	Fish-Mercury	NJDEP Fish Tissue Monitoring
3	Atlantic Coast	13	Ridgeway Branch UNK Trib at Colliers Mill WMA (outlet of Turn Mill in Jackson	AN0525A	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	03	Ringwood Creek at Manor Rd in Ringwood St. Park	01384495	Temperature	EWQ
1	Northeast	03	Ringwood Creek at Manor Rd in Ringwood St. Park	01384495	Phosphorus, Dissolved Oxygen, pH, Nitrate, Dissolved Solids, Total Suspended	EWQ
3	Northwest	11	Rising Sun Lake-11	Rising Sun Lake	Phosphorus	NJDEP Clean Lakes
1	Atlantic Coast	14	Roberts (Tom Roberts) Branch impoundment above Carranza Rd (Lake 1717-14)	BTOIMPCA	Pineland Biological Community	Pinelands
3	Atlantic Coast	14	Roberts Branch at Carranza Rd in Shamong	AN0580, BTOMCARR	Pineland Biological Community	NJDEP AMNET, Pinelands
4	Raritan	07	Robinson Branch at Scotch Plains	01395200	Fecal Coliform	NJDEP/USGS Data

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
5	Raritan	07	Robinson Branch at Scotch Plains	01395200	Phosphorus	NJDEP/USGS Data
3	Raritan	07	Robinson Branch at Scotch Plains	01395200	pH, Total Suspended Solids	NJDEP/USGS Data
1	Raritan	07	RobInson Branch at Scotch PlaIns	01395200	Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Unionized Ammonia	NJDEP/USGS Data
4	Raritan	07	Robinson Branch at St Georges Av at Rahway	01396003, 7-ROB-1	Fecal Coliform	NJDEP/USGS Data, Metal Recon
5	Raritan	07	Robinson Branch at St Georges Av at Rahway	01396003, 7-ROB-1	Phosphorus, Arsenic	NJDEP/USGS Data, Metal Recon
1	Raritan	07	RobInson Branch at St Georges Av at Rahway	01396003, 7-ROB-1	Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Unionized	NJDEP/USGS Data, Metal Recon
3	Raritan	07	Robinson Branch at St Georges Av at Rahway	01396003, 7-ROB-1	Total Suspended Solids, Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium, Silver, thallium,	NJDEP/USGS Data, Metal Recon
5	Raritan	07	Robinsons Branch at Goodmans Crossing in Scotch Plains	AN0196	Benthic Macroinvertebrates	NJDEP AMNET
5	Raritan	07	Robinsons Branch at Rt 27 in Rahway	AN0199	Benthic Macroinvertebrates	NJDEP AMNET
3	Raritan	07	Robinsons Branch trib at Lamberts Mill Rd in Westfield	AN0198	Benthic Macroinvertebrates	NJDEP AMNET
3	Raritan	07	Robinsons Branch trib at Raritan (Terrell) Rd in Scotch Plains	AN0197	Benthic Macroinvertebrates	NJDEP AMNET
5	Raritan	10	Rock Brook at Burnt Hill Rd in Montgomery	AN0400, 10-RO-1	Benthic Macroinvertebrates	NJDEP AMNET, Metal Recon
3	Raritan	10	Rock Brook at Long Hill Rd in Montgomery	AN0399	Benthic Macroinvertebrates	NJDEP AMNET
5	Raritan	10	Rock Brook at Zion	01401560	Fecal Coliform	NJDEP/USGS Data
1	Raritan	10	Rock Brook at Zion	01401560	Phosphorus, Temperature, Dissolved Oxygen, pH, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized	NJDEP/USGS Data
3	Raritan	10	Rock Brook on Burnt Hill Rd in Montgomery.	10-RO-1	Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium, Zinc	NJDEP Metal Recon
1	Northeast	03	Rock Lodge Pond-03	Rock Lodge Club (Rocky) and (Sandy)	Fecal Coliform	Sparta Twp HD
1	Northeast	06	Rock Ridge Lake-06	Rock Ridge	Fecal Coliform	Denville HD
1	Raritan	08	Rockaway Creek at Island Rd in ReadIngton	AN0369	Benthic Macroinvertebrates	NJDEP AMNET
4	Raritan	08	Rockaway Creek at Whitehouse	01399700, EWQ0369, 8-RO-1	Fecal Coliform	NJDEP/USGS Data, EWQ, Metal Recon
5	Raritan	08	Rockaway Creek at Whitehouse	01399700, EWQ0369, 8-RO-1	Phosphorus, Lead, Mercury	NJDEP/USGS Data, EWQ, Metal Recon
3	Raritan	08	Rockaway Creek at Whitehouse	01399700, EWQ0369, 8-RO-1	Arsenic, Cadmium, Chromium, Copper, Nickel, Selenium, Zinc	NJDEP/USGS Data, EWQ, Metal Recon
1	Raritan	08	Rockaway Creek at Whitehouse	01399700, EWQ0369, 8-RO-1	Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended	NJDEP/USGS Data, EWQ, Metal Recon
1	Raritan	08	Rockaway Creek N Br at Rockaway Rd in Tewksbury	AN0365	Benthic Macroinvertebrates	NJDEP AMNET
1	Raritan	08	Rockaway Creek N Br at Rockaway Rd in Tewksbury	AN0366	Benthic Macroinvertebrates	NJDEP AMNET
1	Raritan	08	Rockaway Creek N Br at Rt 512 in Tewksbury	AN0364	Benthic Macroinvertebrates	NJDEP AMNET
5	Raritan	08	Rockaway Creek S Br at Rt 22 in Readington	AN0368	Benthic Macroinvertebrates	NJDEP AMNET
1	Raritan	08	Rockaway Creek S Br at WIndy Acres Farm in CIInton	AN0367	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	06	Rockaway River	Rockaway River	Fish-Mercury	NJDEP Fish Tissue Monitoring
5	Northeast	06	Rockaway River at Berkshire Valley Rd in Jefferson	AN0241	Benthic Macroinvertebrates	NJDEP AMNET

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
3	Northeast	06	Rockaway River at Blackwell St	01379853	Phosphorus, Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia	NJDEP/USGS Data
4	Northeast	06	Rockaway River at Blackwell St	01379853	Fecal Coliform	NJDEP/USGS Data
1	Northeast	06	Rockaway River at Blackwell St (Rt 513) in Rockaway	AN0243	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	06	Rockaway River at Boonton	01380500, 01380450, 6-SITE-11	Arsenic, Cadmium, Chromium, Lead, Mercury, Selenium, Zinc,	NJDEP/USGS Data, EWQ, Metal Recon
3	Northeast	06	Rockaway River at Boonton	01380500, 01380450, 6-SITE-11	Copper, Nickel	NJDEP/USGS Data, EWQ, Metal Recon
1	Northeast	06	Rockaway River at Boonton	01380500, 01380450, 6-SITE-11	Phosphorus, Fecal Coliform, Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized	NJDEP/USGS Data, EWQ, Metal Recon
1	Northeast	06	Rockaway River at Longwood Valley	01379680, 01379700	Phosphorus, Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia	NJDEP/USGS Data, EWQ
4	Northeast	06	Rockaway River at Longwood Valley	01379680, 01379700	Fecal Coliform	NJDEP/USGS Data
5	Northeast	06	Rockaway River at Morris Ave in Boonton	AN0250	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	06	Rockaway River at Pine Brook	01381200, 6-SITE-10, 6-ROC-1	Phosphorus, Tetrachloroethylene, Tricholoroethylene	NJDEP/USGS Data, EWQ, Metal Recon
1	Northeast	06	Rockaway River at PIne Brook	01381200, 6-SITE-10, 6-ROC-1	Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Chromium,	NJDEP/USGS Data, EWQ, Metal Recon
3	Northeast	06	Rockaway River at Pine Brook	01381200, 6-SITE-10, 6-ROC-1	Arsenic, Cadmium, Mercury	NJDEP/USGS Data, Metal Recon
4	Northeast	06	Rockaway River at Pine Brook	01381200, 6-SITE-10, 6-ROC-1	Fecal Coliform	NJDEP/USGS Data, EWQ, Metal Recon
1	Northeast	06	Rockaway River at Pocono Rd in Denville	AN0248	Benthic Macroinvertebrates	NJDEP AMNET
3	Northeast	06	Rockaway River at River Rd in Parsippany-Troy Hills	AN0251	Benthic Macroinvertebrates	NJDEP AMNET
1	Northeast	06	Rockaway River below Longwood Lk in Jefferson	AN0240	Benthic Macroinvertebrates	NJDEP AMNET
1	Raritan	10	Rocky Brook at Bitner Rd in Millstone	MB-PARK5	Benthic Macroinvertebrates	Monmouth Co HD
1	Raritan	10	Rocky Brook at PerrIneville	01400585	Phosphorus, Fecal Coliform, Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized	NJDEP/USGS Data, 304(l)
5	Raritan	10	Rocky Brook at PerrIneville	01400585	Arsenic, Chromium, Lead, Zinc	NJDEP/USGS Data, 304(l)
3	Raritan	10	Rocky Brook at PerrIneville	01400585	Selenium, Silver	NJDEP/USGS Data, 304(l)
3	Raritan	10	Rocky Brook at Perrineville Rd in Millstone	AN0380, MB-70	Benthic Macroinvertebrates	NJDEP AMNET, Monmouth Co HD
5	Raritan	10	Rocky Brook at Rt 33 in Hightstown	AN0381	Benthic Macroinvertebrates	NJDEP AMNET
5	Raritan	10	Rocky Brook on Rte 130 in Hightstown	10-ROC-2	Chromium, Lead, Zinc	NJDEP Metal Recon
3	Raritan	10	Rocky Brook on Rte 130 in Hightstown	10-ROC-2	Nickel, Selenium	NJDEP Metal Recon
5	Raritan	10	Rocky Brook on Rte 33 in Hightstown	10-ROC-1	Arsenic, Chromium, Lead, Zinc	NJDEP Metal Recon
3	Raritan	10	Rocky Brook on Rte 33 in Hightstown	10-ROC-1	Selenium, Zinc	NJDEP Metal Recon
1	Raritan	08	Rocky Run above Unknown Trib	Rocky04	Benthic Macroinvertebrates	NJDEP Permits
1	Raritan	08	Rocky Run below Unknown Trib	Rocky05	Benthic Macroinvertebrates	NJDEP Permits
1	Raritan	08	Rocky Run Trib above discharge	Rocky01	Benthic Macroinvertebrates	NJDEP Permits
1	Raritan	08	Rocky Run Trib below discharge	Rocky03	Benthic Macroinvertebrates	NJDEP Permits

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
1	Raritan	08	Rogerene Lake-08	Lake Rogerene Civic Assoc.	Fecal Coliform	Madison Boro Board of Health
3	Raritan	10	Rosedale Lake-10	Rosedale Lake	Phosphorus	NJDEP Clean Lakes
1	Raritan	08	Round Valley Reservoir Recreational Area-08	Round Valley Recreational Area	Fecal Coliform	Central Region, NJDEP Clean Lakes
4	Raritan	08	Round Valley Reservoir Recreational Area-08	Round Valley Recreational Area	Phosphorus	Central Region, NJDEP Clean Lakes
5	Raritan	08	Round Valley Reservoir-08	Round Valley Reservoir	Fish-Mercury	NJDEP Freshwater Fisheries, NJDEP Fish Tissue Monitoring
1	Raritan	08	Round Valley Reservoir-08	Round Valley Reservoir	Fish Community	NJDEP Freshwater Fisheries, NJDEP Fish Tissue Monitoring
5	Atlantic Coast	14	Roundabout Creek Estuary	2001F	Total Coliform	NJDEP Shellfish Monitoring
3	Raritan	10	Royce Brook at Rt 206 in Hillsborough	AN0411	Benthic Macroinvertebrates	NJDEP AMNET
5	Raritan	10	Royce Brook at Rt 533 in Manville	AN0413	Benthic Macroinvertebrates	NJDEP AMNET
3	Raritan	10	Royce Brook Branch at Rt 206 in Hillsborough	AN0412	Benthic Macroinvertebrates	NJDEP AMNET
3	Raritan	10	Running Brook (Rocky Brook) at Baird Rd (guardrail) in Millstone	MB-RA, MB-RB	Benthic Macroinvertebrates	Monmouth Co HD
1	Northeast	06	Russia Brook at Milton - Dover Rd in Jefferson	AN0239	Benthic Macroinvertebrates	NJDEP AMNET
1	Northeast	06	Ryker Lake-06	Ryker Lake	Fish Community	NJDEP Freshwater Fisheries
5	Northeast	04	Saddle River at Dunkerhook Rd in Fair Lawn	AN0289	Toxicity	NJDEP AMNET
5	Northeast	04	River	AN0281	Toxicity	NJDEP AMNET
1	Northeast	04	Saddle River at E Ridgewood Ave in Paramus	AN0282	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	04	Saddle River at E Ridgewood Ave in Paramus	AN0282	Unknown Toxicity	NJDEP AMNET
5	Northeast	04	Saddle River at Lodi	01391500, 01391200, 01391490, 01391550, Passaic-7, 4-SITE-12, 4-SITE-	Phosphorus, Dissolved Solids, Arsenic	NJDEP/USGS Data, PVSC, Metal Recon
3	Northeast	04	Saddle River at Lodi	01391500, 01391200, 01391490, 01391550, Passaic-7, 4-SITE-12, 4-SITE-	Mercury, Silver	NJDEP/USGS Data, PVSC, Metal Recon
1	Northeast	04	Saddle River at Lodi	01391500, 01391200, 01391490, 01391550, Passaic-7, 4-SITE-12, 4-SITE-13, 4-SAD-1	Temperature, pH, Dissolved Oxygen, Nitrate, Total Suspended Solids, Unionized Ammonia, Cadmium, Chromium, Copper,	NJDEP/USGS Data, PVSC, Metal Recon
4	Northeast	04	Saddle River at Lodi	01391500, 01391200, 01391490, 01391550, Passaic-7, 4-SITE-12, 4-SITE-	Fecal Coliform	NJDEP/USGS Data, PVSC, Metal Recon
5	Northeast	04	Saddle River at Marcellus Pl in Garfield	AN0291	Toxicity	NJDEP AMNET
1	Northeast	04	Saddle River at Old Stone Church Rd in Upper Saddle River	AN0279	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	04	Saddle River at Railroad Ave in Rochelle Park	AN0290	Toxicity	NJDEP AMNET
5	Northeast	04	Saddle River at Ridgewood	01390510	pH	NJDEP/USGS Data
1	Northeast	04	Saddle River at Ridgewood	01390500, 01390470, 01390518, 01390510	Phosphorus, Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia	NJDEP/USGS Data
4	Northeast	04	Saddle River at Ridgewood	01390510	Fecal Coliform	NJDEP/USGS Data
5	Northeast	04	Saddle River W Br at Old Stone Church Rd in Upper Saddle River	AN0280	Benthic Macroinvertebrates	NJDEP AMNET
1	Northeast	04	Saddle River W Br at Upper Saddle River	01390445	Phosphorus, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended	NJDEP/USGS Data
3	Northeast	04	Saddle River W Br at Upper Saddle River	01390445	Temperature	NJDEP/USGS Data
4	Northeast	04	Saddle River W Br at Upper Saddle River	01390445	Fecal Coliform	NJDEP/USGS Data
1	Northwest	02	Saginaw Lake-02	Saginaw Lake	Fecal Coliform	Sparta Twp HD
1	Lower Delaware	19	Saipe Lake-19	Medford Pines	Fecal Coliform	Burlington Co HD

2004 Integrated List of Waterbodies

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
5	Lower Delaware	17	Salem River at Commissioners Rd (Rt 581) in Upper Pittsgrove	AN0690	Benthic Macroinvertebrates	NJDEP AMNET
4	Lower Delaware	17	Salem River at Courses Landing	Salem River at Courses Landing	Fecal Coliform	NJDEP/USGS Data
5	Lower Delaware	17	Salem River at Courses Landing	Salem River at Courses Landing	Oxygen	NJDEP/USGS Data
5	Lower Delaware	17	Salem River at Kings Hwy in Pilesgrove	AN0693	Benthic Macroinvertebrates	NJDEP AMNET
3	Lower Delaware	17	Salem River at Mill St in Woodstown	AN0691	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	17	Salem River at Newkirk Sta Rd in U Pittsgrove	AN0690A	Benthic Macroinvertebrates	NJDEP AMNET
1	Lower Delaware	17	Salem River at Woodstown	01482500	Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended	NJDEP/USGS Data
4	Lower Delaware	17	Salem River at Woodstown	01482500	Fecal Coliform	NJDEP/USGS Data
5	Lower Delaware	17	Salem River at Woodstown	01482500	Phosphorus	NJDEP/USGS Data
1	Lower Delaware	17	Salem River-Tidal	R57	Dissolved Oxygen	NJDEP Coastal Monitoring
1	Northwest	01	Sand Pond-01	Camp No-Be-Bo-Sco	Fecal Coliform	Warren Co HD
1	Atlantic Coast	13	Sapp Creek Estuary	1808D	Total Coliform	NJDEP Shellfish Monitoring
1	Lower Delaware	17	Sarah Run at Telegraph Rd in Stow Creek	AN0705	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	16	Savages Run (East Ck) at Sunset Rd in Dennis	AN0766	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	16	Savages Run Estuary	1388K	Total Coliform	NJDEP Shellfish Monitoring
3	Atlantic Coast	16	Savages Run In Belleplain State Forest	01411441	Suspended Solids	NJDEP/USGS Data
1	Atlantic Coast	16	Savages Run in BelleplaIn State Forest	01411441	Phosphorus, Temperature, Dissolved Oxygen, Unionized Ammonia	NJDEP/USGS Data
4	Atlantic Coast	16	Savages Run in Belleplain State Forest	01411441	Fecal Coliform	NJDEP/USGS Data
3	Raritan	09	Sawmill Brook at Ryders Ln in East Brunswick	AN0435	Benthic Macroinvertebrates	NJDEP AMNET
3	Northwest	01	Sawmill Lake-01	Sawmill Lake	Phosphorus	NJDEP Clean Lakes
5	Northwest	01	Sawmill Pond-01	Sawmill Pond	Fish-Mercury	NJDEP Fish Tissue Monitoring
3	Northwest	01	Saxton Lake-01	Saxton Lake	Phosphorus	NJDEP Clean Lakes
1	Northeast	03	Scarlet Oak Pond-03	Scarlet Oak Pond	Fish Community	NJDEP Freshwater Fisheries
1	Northwest	02	Scenic Lake-02	Scenic Lakes	Fecal Coliform	Sussex Co HD
3	Atlantic Coast	13	School House Branch (Cabinfield Br) at Lanes Mill Rd in Lakewood	AN0507	Benthic Macroinvertebrates	NJDEP AMNET
1	Lower Delaware	17	Scotland Run at Clayton - Williamstown Rd (Rt 610) in Clayton	AN0722	Benthic Macroinvertebrates	NJDEP AMNET
3	Lower Delaware	17	Scotland Run at Rt 322 in Monroe	AN0721	Benthic Macroinvertebrates	NJDEP AMNET
3	Lower Delaware	17	Scotland Run at Rt 40 in Franklin	AN0725	Benthic Macroinvertebrates	NJDEP AMNET
1	Lower Delaware	17	Scotland Run at Rt 538 in FranklIn	AN0723	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	16	Seashore Campsites Lake-16	Seashore Campsites	Fecal Coliform	Cape May Co HD
5	Raritan	08	Second Neshanic River at Rt 31 in Raritan	AN0331	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	04	Second River at McCarter Hwy in Belleville	AN0293	Benthic Macroinvertebrates	NJDEP AMNET
1	Northeast	04	Second River at Union Av in Newark	Passaic-5	Unionized Ammonia	PVSC
5	Northeast	04	Second River at Union Av in Newark	Passaic-5	Phosphorus, Fecal Coliform, pH	PVSC
1	Northwest	01	Seneca Lake-01	Seneca Lake	Fecal Coliform	Sparta Twp HD
3	Northwest	11	Shabakunk Creek at Bull Run Rd in Hopewell	AN0113	Benthic Macroinvertebrates	NJDEP AMNET
5	Northwest	11	Shabakunk Creek at Rt 206 in Lawrence	AN0114	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	11	Shabakunk Creek near Lawrenceville	01463810	Temperature, Dissolved Oxygen	NJDEP/USGS Data

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
3	Northwest	11	Shabakunk Creek near Lawrenceville	01463810	Phosphorus, pH, Nitrate, Dissolved Solids, Unionized Ammonia	NJDEP/USGS Data
5	Atlantic Coast	12	Shadow Lake-12	Shadow Lake	Fish-Mercury	NJDEP Freshwater Fisheries, NJDEP Fish Tissue Monitoring
1	Atlantic Coast	12	Shadow Lake-12	Shadow Lake	Fish Community	NJDEP Freshwater Fisheries, NJDEP Fish Tissue Monitoring
3	Atlantic Coast	14	Shadow Lake-14	BINSHADW	Pineland Biological Community	Pinelands
3	Raritan	10	Shallow Brook at N of Scotts Cor in Plainsboro	AN0388	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	14	Shane Branch above Carranza Rd	WSACARRA	Pineland Biological Community	Pinelands
1	Atlantic Coast	14	Shane Branch above fourth dike above Carranza Rd	WSA4DIKE	Pineland Biological Community	Pinelands
3	Atlantic Coast	13	Shannae Brook at Colliers Mills WMA in Jackson	AN0526	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	13	Shannoc Brook Trib at Colliers Mills	01408480	pH	NJDEP/USGS Data
3	Atlantic Coast	13	Shannoc Brook Trib at Colliers Mills	01408480	Dissolved Oxygen	NJDEP/USGS Data
1	Atlantic Coast	13	Shannoc Brook Trib at Colliers Mills	01408480	Phosphorus, Fecal Coliform, Temperature, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia	NJDEP/USGS Data
1	Atlantic Coast	13	Shannoc Lake-13	Shannoc Lake	Fish Community	NJDEP Freshwater Fisheries
3	Lower Delaware	20	Shappen Run at Holmes Mill Rd in Upper Freehold	MB-120	Benthic Macroinvertebrates	Monmouth Co HD
5	Atlantic Coast	12	Shark River	Shark River	Fish-PCB, Fish-Dioxin	NJDEP Fish Tissue Monitoring
5	Atlantic Coast	12	Shark River at Remsens Mills Rd in Neptune	AN0482	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	12	Shark River at Shark River Sta Rd in Wall	AN0481	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	12	Shark River Brook at Shark River Station Rd in Tinton Falls	30	Phosphorus	Monmouth Co HD
1	Atlantic Coast	12	Shark River Brook at Shark River Station Rd in TInton Falls	30	Fecal Coliform, Nitrate	Monmouth Co HD
3	Atlantic Coast	12	Shark River Brook at Shark River Station Rd in TInton Falls	30	pH, Total Suspended Solids	Monmouth Co HD
5	Atlantic Coast	12	Shark River Estuary	Shark River Estuary-1	Dissolved Oxygen, Total Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
1	Atlantic Coast	12	Shark River Estuary	Shark River Estuary-1	Fecal Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
1	Atlantic Coast	12	Shark River near Neptune	01407750, EWQ0482	pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Unnionized Ammonia	NJDEP/USGS Data, EWQ
3	Atlantic Coast	12	Shark River near Neptune	01407750, EWQ0482	Temperature, Total Suspended Solids	NJDEP/USGS Data, EWQ
5	Atlantic Coast	12	Shark River near Neptune	01407750, EWQ0482	Phosphorus, Fecal Coliform	NJDEP/USGS Data, EWQ
1	Atlantic Coast	12	Shark River-Tidal	R06	Dissolved Oxygen	NJDEP Coastal Monitoring
1	Lower Delaware	19	Sharps Run at Rt 541 at Medford	01465884	Temperature, pH, Nitrate, Total Suspended Solids, Unionized Ammonia	NJDEP/USGS Data
4	Lower Delaware	19	Sharps Run at Rt 541 at Medford	01465884	Fecal Coliform	NJDEP/USGS Data
5	Lower Delaware	19	Sharps Run at Rt 541 at Medford	01465884	Phosphorus	NJDEP/USGS Data
3	Lower Delaware	19	Sharps Run at Rt 541 in Medford	AN0170	Benthic Macroinvertebrates	NJDEP AMNET
1	Lower Delaware	19	Shawnee Country Lake-19	Shawnee Country OSA	Fecal Coliform	Burlington Co HD
1	Northwest	01	Shawnee Lake-01	3	Fecal Coliform	Jefferson Twp HD
3	Lower Delaware	17	Shaws Mill Pond-17	Shaws Mill Pond	Phosphorus	NJDEP Clean Lakes, NJDEP Freshwater Fisheries

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
1	Lower Delaware	17	Shaws Mill Pond-17	Shaws Mill Pond	Fish Community	NJDEP Clean Lakes, NJDEP Freshwater Fisheries
3	Atlantic Coast	13	Shenandoah Lake-13	Shenandoah Lake	Phosphorus	NJDEP Clean Lakes
1	Northeast	03	Sheppard Pond-03	Ringwood SP, Shepherd Lake	Phosphorus, Fecal Coliform, Fish Community	NJDEP Clean Lakes, NJDEP Freshwater Fisheries, Northern Region
1	Lower Delaware	17	Sheppards Mill Pond-17	Sheppards Mill Pond	Fecal Coliform	Cumberland Co HD
1	Lower Delaware	19	Sherwood Forest Pond-19	Sherwood Forest	Fecal Coliform	Burlington Co HD
5	Atlantic Coast	12	Shewsbury River	Shewsbury River	Fish-PCB, Fish-Dioxin	NJDEP Fish Tissue Monitoring
1	Northwest	01	Shimers Brook	DRBC/NPS47	Fecal Coliform, Dissolved Oxygen, pH	DRBC
3	Northwest	01	Shimers Brook	DRBC/NPS47	Temperature	DRBC
1	Northwest	01	Shimers Brook at Rt 521 in Montague	AN0003	Benthic Macroinvertebrates	NJDEP AMNET
5	Northwest	01	Shipetaukin Creek at Rt 583 in Lawrence	AN0111	Benthic Macroinvertebrates	NJDEP AMNET
3	Northwest	11	Shipetaukin Creek UNK Trib at Van Kirk Rd in Lawrence	AN0110	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	14	Shoal Branch at Jones Mill Rd in Woodland	AN0597	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	14	Shoal Branch at off Rt. 532 in Woodland	AN0597A	Benthic Macroinvertebrates	NJDEP AMNET
1	Raritan	08	Shongum Lake-08	Shongum Lake	Fecal Coliform	Roxbury Twp Board of Health
5	Atlantic Coast	12	Shrewsbury River Estuary	R59, Shrewsbury/Navesink Estuary-1 thru 3, 8	Total Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
1	Atlantic Coast	12	Shrewsbury River Estuary	Shrewsbury/Navesink Estuary-1 thru 3	Dissolved Oxygen, Fecal Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
5	Atlantic Coast	12	Shrewsbury River Estuary	Shrewsbury/Navesink Estuary-8	Dissolved Oxygen	NJDEP Coastal Monitoring, Shellfish Monitoring
1	Atlantic Coast	12	Shrewsbury River Estuary	Shrewsbury/Navesink Estuary-8	Fecal Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
1	Northwest	01	Silver Lake-01	Silver Lake	Fecal Coliform	Warren Co HD
1	Northwest	02	Silver Lake-02	Silver Lake	Fish Community	NJDEP Freshwater Fisheries
3	Atlantic Coast	12	Silver Lake-12	Silver Lake	Phosphorus	NJDEP Clean Lakes
3	Raritan	10	Simonson Brook at Canal Rd in Franklin	AN0406	Benthic Macroinvertebrates	NJDEP AMNET
5	Raritan	10	Six Mile Run at Canal Rd in Blackwells Mill	EWQ0409	Phosphorus	EWQ
1	Raritan	10	Six Mile Run at Canal Rd in Blackwells Mill	EWQ0409	Temperature, Dissolved Oxygen, pH, Nitrate, Dissolved Solids, Total Suspended	EWQ
5	Raritan	10	Six Mile Run at Canal Rd in Franklin	AN0409	Benthic Macroinvertebrates	NJDEP AMNET
3	Raritan	10	Six Mile Run at Rt 27 in Franklin	AN0408	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	14	Skit Branch above Hampton Rd	BSKITHAM	Pineland Biological Community	Pinelands
1	Atlantic Coast	14	Skit Branch at Carranza Rd in Shamong	AN0581, BSKITCAR	Pineland Biological Community	NJDEP AMNET, Pinelands
1	Atlantic Coast	14	Skit Branch at Hampton Furnace	01409439	Phosphorus, Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids,	USGS/Pinelands Data
1	Atlantic Coast	14	Skit Branch near Hampton Gate	01409435	Phosphorus, Fecal Coliform, Temperature, Dissolved Oxygen, pH, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized	NJDEP/USGS Data
1	Atlantic Coast	14	Skit Branch widening	BSKWIDEN	Pineland Biological Community	Pinelands
1	Atlantic Coast	15	Skulls Bay	Skulls Bay-1 thru 5	Dissolved Oxygen, Fecal Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
1	Atlantic Coast	15	Skulls Bay	Mulberry Thorofare-1; Ship Channel-4; Longport 2-5	Total Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
5	Atlantic Coast	15	Skulls Bay	Skulls Bay-2,3	Total Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
5	Northeast	03	Skyline Lakes-03	Skyline Lake Main/Lower Beach and Upper Beach	Fecal Coliform	Passaic Co HD
1	Atlantic Coast	14	Sleeper Branch above Mullica River	MSLPLEAS	Pineland Biological Community	Pinelands
3	Atlantic Coast	14	Sleeper Branch at Parkdale in Waterford	AN0566, MSLMAPLE, MSLEPARK	Pineland Biological Community	NJDEP AMNET, Pinelands
3	Atlantic Coast	14	Sleeper Branch bogs	MSL206BG	Pineland Biological Community	Pinelands
3	Atlantic Coast	14	Sleeper Branch diversion (Saltars Ditch)	MSLSALTD	Pineland Biological Community	Pinelands
5	Atlantic Coast	14	Sleeper Branch near Atsion	0140940370	pH	USGS/Pinelands Data
1	Atlantic Coast	14	Sleeper Branch near Atsion	0140940370	Phosphorus, Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids,	USGS/Pinelands Data
1	Atlantic Coast	15	Sleepy Hollow CG Lake-15	Sleepy Hollow	Fecal Coliform	Atlantic Co HD
5	Northeast	06	Slough Brook at Parsonage Hill Rd in Millburn	AN0231C	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	16	Sluice Creek Estuary	Sluice Creek Estuary	Total Coliform	NJDEP Shellfish Monitoring
3	Lower Delaware	19	Smithville Lake-19	Smithville Lake	Phosphorus	NJDEP Clean Lakes
1	Northeast	03	Smoke Rise Unknown Trib	PQ9	Temperature	Pequannock River Coalition
5	Raritan	09	South River	South River	Lead, Mercury	304(l)
3	Atlantic Coast	15	South River at Estelle Ave in Hamilton	AN0643	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	15	South River at Forty Wire Rd in Hamilton	AN0644	Benthic Macroinvertebrates	NJDEP AMNET
3	Raritan	09	South River at Rt 535 in South River	01406580	pH	EWQ
1	Raritan	09	South River at Rt 535 in South River	01406580	Temperature, Dissolved Oxygen, Total Suspended Solids, Unionized Ammonia	EWQ
5	Atlantic Coast	15	South River near Belcoville	01411220	pH	NJDEP/USGS Data
1	Atlantic Coast	15	South River near Belcoville	01411220	Phosphorus, Fecal Coliform, Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized	NJDEP/USGS Data
3	Lower Delaware	20	South Run at Cookstown Rd in New Hanover	AN0119A	Benthic Macroinvertebrates	NJDEP AMNET
1	Lower Delaware	17	Southern NJ Council	Southern NJ Council	Fecal Coliform	Salem Co HD
1	Northeast	06	Sparta Lake-06	Sparta Lake	Fecal Coliform	Sparta Twp HD
5	Northeast	06	Speedwell Lake-06	Speedwell Lake	Fish-Mercury	NJDEP Fish Tissue Monitoring
5	Atlantic Coast	12	Spring Lake-12	Spring Lake	Phosphorus, Fish-Mercury	NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring
4	Lower Delaware	20	Spring Lake-20	Spring Lake	Phosphorus	NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring
5	Atlantic Coast	14	Springers Brook at Hampton Rd in Shamong	AN0585, BSPRIHAM	Pineland Biological Community	NJDEP AMNET, Pinelands
3	Atlantic Coast	14	Springers Brook at Rt 206 in Shamong	AN0584	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	14	Springers Brook below Deep Run	BSPRDIKE	Pineland Biological Community	Pinelands
5	Atlantic Coast	14	Springers Brook impoundment on northern side of Indian Ann Trail (Lake 1757-14)	BSPTRAIL	Pineland Biological Community	Pinelands
5	Atlantic Coast	14	Springers Brook near Hampton Furnace	01409455	pH	USGS/Pinelands Data
1	Atlantic Coast	14	SprIngers Brook near Hampton Furnace	01409455	Phosphorus, Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids,	USGS/Pinelands Data
5	Raritan	08	Spruce Run at Clinton	01396800, 8-SP-1	Phosphorus, Temperature, pH, Cadmium	NJDEP/USGS Data, Metal Recon
3	Raritan	08	Spruce Run at Clinton	01396800, 8-SP-1	Arsenic, Chromium, Copper, Lead, Mercury, Nickel, Selenium, Zinc	NJDEP/USGS Data, Metal Recon
5	Raritan	08	Spruce Run at Newport	01396550	Temperature	NJDEP/USGS Data

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
1	Raritan	08	Spruce Run at Newport	01396550	Phosphorus, Fecal Coliform, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Chromium, Copper, Lead, Nickel,	NJDEP/USGS Data
3	Raritan	08	Spruce Run at Newport	01396550	Arsenic, Cadmium, Mercury	NJDEP/USGS Data
1	Raritan	08	Spruce Run at Newport Rd in Lebanon	AN0318	Benthic Macroinvertebrates	NJDEP AMNET
1	Raritan	08	Spruce Run at Rt 31 in Glen Gardner	AN0319	Benthic Macroinvertebrates	NJDEP AMNET
4	Raritan	08	Spruce Run near Glen Gardner	01396588, 8-SP-2	Fecal Coliform	NJDEP/USGS Data, Metal Recon
5	Raritan	08	Spruce Run near Glen Gardner	01396588, 8-SP-2	Temperature	NJDEP/USGS Data, Metal Recon
3	Raritan	08	Spruce Run near Glen Gardner	01396588, 8-SP-2	Arsenic, Cadmium, Mercury	NJDEP/USGS Data, Metal Recon
1	Raritan	08	Spruce Run near Glen Gardner	01396588, 8-SP-2	Phosphorus, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Chromium,	NJDEP/USGS Data, Metal Recon
5	Raritan	08	Spruce Run Reservoir-08	Spruce Run Reservoir	Fish Community, Fish-Mercury	NJDEP Freshwater Fisheries, Fish Tissue Monitoring
1	Raritan	08	Spruce Run Reservoir-08	Spruce Run SP (East Beach) and (West Beach)	Fecal Coliform	Central Region
3	Atlantic Coast	15	Squankum Branch at Malaga Rd in Monroe	AN0624	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	12	Squankum Brook at Easy St In Howell	16	pH, Total Suspended Solids	Monmouth Co HD
1	Atlantic Coast	12	Squankum Brook at Easy St in Howell	16	Phosphorus, Nitrate	Monmouth Co HD
4	Atlantic Coast	12	Squankum Brook at Easy St in Howell	16	Fecal Coliform	Monmouth Co HD
3	Atlantic Coast	12	Squankum Brook at Easy St in Howell	MB-16	Benthic Macroinvertebrates	Monmouth Co HD
1	Atlantic Coast	12	Squankum Brook at Spur 549 in Howell	AN0497	Benthic Macroinvertebrates	NJDEP AMNET
1	Lower Delaware	19	Squaw Lake-19	Camp Ockanickon Girls, WHATRSQU	Fecal Coliform	Burlington Co HD, Pinelands
5	Lower Delaware	19	Squaw Lake-19	Camp Ockanickon Girls, WHATRSQU	Community	Burlington Co HD, Pinelands
5	Atlantic Coast	13	Stafford Forge Lake-13	Stafford Forge Lake	Fish-Mercury	NJDEP Fish Tissue Monitoring
1	Atlantic Coast	12	Stan Brook at Easy St in Howell	AN0496	Benthic Macroinvertebrates	NJDEP AMNET
1	Northeast	03	Star Lake-03	Star Lake Belmont and Hilltop	Fecal Coliform	Passaic Co HD
5	Northwest	01	Steenykill Lake-01	Steenykill Lake	Fish-Mercury	NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring
3	Northwest	01	Steenykill Lake-01	Steenykill Lake	Phosphorus	NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring
3	Atlantic Coast	15	Stephens Creek at Eleventh Ave in Estell Manor	AN0645	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	15	Stephens Creek at Rt 50 in Estell Manor	AN0646	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	18	Stewart Lake-18	Stewart Lake	Fish-PCB, Fish-Dioxin	NJDEP Fish Tissue Monitoring
1	Northeast	06	Stickle Pond-03	Smoke Rise Beach	Fecal Coliform	Borough of Kinnelon
1	Atlantic Coast	16	Stiles Sound	Stiles Sound-1	Total Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring Program
1	Atlantic Coast	16	Stiles Sound	Stiles Sound-1; Ingram Thorofare-2	Dissolved Oxygen, Fecal Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring Program
5	Atlantic Coast	16	Stiles Sound	Ingram Thorofare-2	Total Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring Program
1	Lower Delaware	17	Still Run at Aura Rd in Elk	AN0729	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	17	Still Run at Little Mill Rd in Franklin	AN0730	Benthic Macroinvertebrates	NJDEP AMNET

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
1	Lower Delaware	17	Still Run at Little Mill Rd near Clayton	01411452	Phosphorus, Fecal Coliform, Temperature, Dissolved Oxygen, pH, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized	NJDEP/USGS Data
3	Lower Delaware	18	Still Run at Quaker Rd in East Greenwich	AN0675	Benthic Macroinvertebrates	NJDEP AMNET
1	Lower Delaware	17	Still Run at Rt 40 in FranklIn	AN0732	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	18	Still Run at Union Rd in E Greenwich	AN0675A	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	17	Still Run near Malaga	01411453	pH	NJDEP/USGS Data
3	Lower Delaware	17	Still Run near Malaga	01411453	Dissolved Oxygen	NJDEP/USGS Data
1	Lower Delaware	17	Still Run near Malaga	01411453	Phosphorus, Fecal Coliform, Temperature, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia	NJDEP/USGS Data
3	Lower Delaware	18	Still Run near Mickelton	01476600	Phosphorus, pH	NJDEP/USGS Data
1	Lower Delaware	18	Still Run near Mickelton	01476600	Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids,	NJDEP/USGS Data
4	Lower Delaware	18	Still Run near Mickelton	01476600	Fecal Coliform	NJDEP/USGS Data
3	Atlantic Coast	14	Stockton State(Fred) Lake-14	Stockton State(Fred) Lake, LMOSTOCK	Community	NJDEP Clean Lakes, Pinelands
5	Lower Delaware	18	Stone Bridge Branch above Waddell's Bridge in Gloucester	AN0655A	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	18	Stone Bridge Branch below Waddell's Bridge in Gloucester	AN0655B	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	18	Stone Bridge Branch trib at Waddell Farm in Gloucester	AN0655	Benthic Macroinvertebrates	NJDEP AMNET
3	Northwest	11	Stone Tavern Lake-11	Stone Tavern Lake	Phosphorus	NJDEP Clean Lakes
1	Northeast	03	Stonehouse Brook	PQ12	Temperature	Pequannock River Coalition
1	Northeast	03	Stoneybrook Swim Club Lake-03	Stoneybrook Swim Club	Fecal Coliform	Butler HD
3	Northeast	06	Stony Brook at Boonton	01380320	Dissolved Solids, Total Suspended Solids	NJDEP/USGS Data
1	Northeast	06	Stony Brook at Boonton	01380320	Phosphorus, Temperature, pH, Dissolved Oxygen, Nitrate, Unionized Ammonia	NJDEP/USGS Data
4	Northeast	06	Stony Brook at Boonton	01380320	Fecal Coliform	NJDEP/USGS Data
5	Raritan	10	Stony Brook at Carter Rd in Lawrence.	AN0393B	Benthic Macroinvertebrates	NJDEP AMNET
1	Raritan	08	Stony Brook at Fairview Ave in WashIngton	AN0313	Benthic Macroinvertebrates	NJDEP AMNET
4	Raritan	08	Stony Brook at Fairview Avenue at Naughright	01396219	Fecal Coliform	NJDEP/USGS Data
3	Raritan	08	Stony Brook at Fairview Avenue at Naughright	01396219	Phosphorus	NJDEP/USGS Data
1	Raritan	08	Stony Brook at Fairview Avenue at Naughright	01396219	Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended	NJDEP/USGS Data
5	Raritan	10	Stony Brook at Linvale Rd in Amwell	AN0391A	Benthic Macroinvertebrates	NJDEP AMNET
5	Raritan	10	Stony Brook at Mine Rd in Hopewell	AN0391	Benthic Macroinvertebrates	NJDEP AMNET
5	Raritan	10	Stony Brook at Old Mill Rd in Hopewell	AN0392	Benthic Macroinvertebrates	NJDEP AMNET
5	Raritan	10	Stony Brook at Pennington-Rocky Hill Rd in Hopewell	AN0392A	Benthic Macroinvertebrates	NJDEP AMNET
4	Raritan	10	Stony Brook at Princeton	01401000, 10-STO-1, 10-STO-4	Fecal Coliform	NJDEP/USGS Data, EWQ, Metal Recon
5	Raritan	10	Stony Brook at Princeton	01401000, 10-STO-1, 10-STO-4	Phosphorus, pH, Total Suspended Solids, Arsenic	NJDEP/USGS Data, EWQ, Metal Recon
3	Raritan	10	Stony Brook at Princeton	01401000, 10-STO-1, 10-STO-4	Cadmium, Mercury	NJDEP/USGS Data, EWQ, Metal Recon

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
1	Raritan	10	Stony Brook at PrInceton	01401000, 10-STO-1, 10-STO-4	Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Unionized Ammonia, Chromium, Copper, Lead, Nickel,	NJDEP/USGS Data, EWQ, Metal Recon
5	Raritan	10	Stony Brook at Province Line Rd in Princeton.	AN0393A	Benthic Macroinvertebrates	NJDEP AMNET
5	Raritan	10	Stony Brook at Rt 206 in Princeton	AN0393	Benthic Macroinvertebrates	NJDEP AMNET
5	Raritan	09	Stony Brook at Sunlit Dr. in Watchung	AN0422A	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	06	Stony Brook at Valley Rd in Boonton	AN0249	Benthic Macroinvertebrates	NJDEP AMNET
5	Raritan	09	Stony Brook at Westend Ave in North Plainfield	AN0422	Benthic Macroinvertebrates	NJDEP AMNET
1	Raritan	10	Stony Brook on Mine Rd in Hopewell	10-STO-3	Selenium, Zinc	NJDEP Metal Recon
5	Raritan	10	Stony Brook on Mine Rd in Hopewell	10-STO-3	Mercury	NJDEP Metal Recon
3	Raritan	10	Stony Brook on Mine Rd in Hopewell	10-STO-3	Arsenic, Cadmium	NJDEP Metal Recon
1	Northwest	01	Stony Lake-01	Stokes SF, Stoney Lake	Fecal Coliform	Northern Region
3	Northwest	01	Stony Lake-01	Stony Lake	Phosphorus	NJDEP Clean Lakes
1	Lower Delaware	17	Stow Creek-Tidal	R50, R53, R54	Dissolved Oxygen	NJDEP Coastal Monitoring
5	Lower Delaware	17	Straight Creek Estuary	3869A	Total Coliform	NJDEP Shellfish Monitoring
5	Lower Delaware	18	Strawbridge Lake-18	Strawbridge Lake	Fish-PCB, Fish-Dioxin	NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring
4	Lower Delaware	18	Strawbridge Lake-18	Strawbridge Lake	Phosphorus	NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring
5	Lower Delaware	19	Sturbridge Lake-19	Chatham Lake, Foxview Beach	Fecal Coliform	Camden Co HD
5	Atlantic Coast	13	Success Lake-13	Success Lake	Fish-Mercury	NJDEP Freshwater Fisheries, NJDEP Fish Tissue Monitoring
3	Atlantic Coast	13	Success Lake-13	Success Lake	Phosphorus	NJDEP Clean Lakes
1	Atlantic Coast	13	Success Lake-13	Success Lake	Fish Community	NJDEP Freshwater Fisheries, NJDEP Fish Tissue Monitoring
1	Northwest	02	Summit Lake-02	Summit Lake	Fecal Coliform	Sparta Twp HD
1	Northeast	06	Sun Air Campground-06	Sun Air Campground	Fecal Coliform	Jefferson Twp HD
1	Atlantic Coast	13	Sunken Branch at Mule Rd in Berkeley	AN0538	Benthic Macroinvertebrates	NJDEP AMNET
3	Northeast	06	Sunrise Lake-06	Sunrise Lake	Phosphorus	NJDEP Clean Lakes
5	Northeast	06	Sunrise Lake-06	Sunrise Lake	Fecal Coliform	Bernards Twp HD
5	Raritan	08	Sunset Lake-08	Sunset Lake	Fecal Coliform	Bridgewater Twp
1	Lower Delaware	17	Sunset Lake-17	Sunset Lake	Fish Community	NJDEP Freshwater Fisheries, NJDEP Clean Lakes, Cumberland Co HD, NJDEP Fish Tissue Monitoring
4	Lower Delaware	17	Sunset Lake-17	Sunset Lake, Sunset Lake Bathing Beach	Phosphorus	NJDEP Freshwater Fisheries, NJDEP Clean Lakes, Cumberland Co HD, NJDEP Fish Tissue Monitoring
5	Lower Delaware	17	Sunset Lake-17	Sunset Lake, Sunset Lake Bathing Beach	Fecal Coliform, Fish-Mercury	NJDEP Freshwater Fisheries, NJDEP Clean Lakes, Cumberland Co HD, NJDEP Fish Tissue Monitoring
3	Northeast	06	Surprise Lake-06	Surprise Lake	Phosphorus	NJDEP Clean Lakes
3	Northwest	11	Swan Creek at Swan St in Lambertville	AN0099	Benthic Macroinvertebrates	NJDEP AMNET
3	Lower Delaware	19	Swan Lake-14	WKEMARLT	Pineland Biological Community	Pinelands

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
5	Northwest	01	Swartswood Lake-01	Swartswood Lake	Phosphorus, Fish Community, Fish-Mercury	NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring, NJDEP Freshwater Fisheries, Northern Region
1	Northwest	01	Swartswood Lake-01	Swartswood SP Beach	Fecal Coliform	NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring, NJDEP Freshwater Fisheries, Northern Region
5	Lower Delaware	19	Swedes Run at Garwood Rd in Moorestown	AN0176A	Benthic Macroinvertebrates	NJDEP AMNET
3	Lower Delaware	18	Swedes Run at Rt 130 in Delran	EWQ0176	Dissolved Oxygen	EWQ
1	Lower Delaware	18	Swedes Run at Rt 130 in Delran	EWQ0176	Phosphorus, Temperature, pH, Nitrate, Dissolved Solids, Total Suspended Solids,	EWQ
5	Lower Delaware	18	Swedes Run at Rt 130 in Delran	AN0176	Benthic Macroinvertebrates	NJDEP AMNET
3	Lower Delaware	17	Swedes Run at Swedes Bridge Rd in Mannington	AN0698	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	12	Swimming River-Tidal	R01	Dissolved Oxygen	NJDEP Coastal Monitoring
5	Northwest	02	Tall Timbers POA	Tall Timbers POA	Fecal Coliform	Sussex Co HD
5	Lower Delaware	19	Tamarack Lake-19	Tamarkack Lake, WHATROAK	Pineland Biological Community	Burlington Co HD, Pinelands
1	Lower Delaware	19	Tamarack Lake-19	Tamarkack Lake, WHATROAK	Fecal Coliform	Burlington Co HD, Pinelands
1	Northwest	02	Tamaracks Lake-02	Tamarack Lake North, Remote, South, and Stockholm	Fecal Coliform	Sparta Twp HD
1	Raritan	08	Chester	AN0357	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	19	Taunton Lake-19	Taunton Lake, WHATAUNL	Pineland Biological Community	Burlington Co HD, Pinelands
1	Lower Delaware	19	Taunton Lake-19	Taunton Lake, WHATAUNL	Fecal Coliform	Burlington Co HD, Pinelands
5	Northeast	06	Telemark Lake-06	Lake Telemark	Fecal Coliform	Rockaway Twp HD
3	Raritan	10	Ten Mile Run at Canal Rd in Franklin	AN0407	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	05	Tenakill Brook at Cedar Lane at Closter	01378387, 5-TEN-2	Arsenic	NJDEP/USGS Data, Metal Recon
3	Northeast	05	Tenakill Brook at Cedar Lane at Closter	01378387, 5-TEN-2	Mercury, Silver	NJDEP/USGS Data, Metal Recon
1	Northeast	05	Tenakill Brook at Cedar Lane at Closter	01378387, 5-TEN-2	Phosphorus, Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Cadmium, Chromium, Copper, Nickel,	NJDEP/USGS Data, Metal Recon
4	Northeast	05	Tenakill Brook at Cedar Lane at Closter	01378387, 5-TEN-2	Fecal Coliform	NJDEP/USGS Data, Metal Recon
5	Northeast	05	Tenakill Brook at Cedar Ln in Closter	AN0209	Benthic Macroinvertebrates	NJDEP AMNET
3	Northeast	05	Tenakill Brook on Grant Ave, Creskill	5-TEN-1	Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium, Zinc	NJDEP Metal Recon
5	Raritan	09	Tennent Brook at Old Bridge-South Amboy Rd in Old Bridge	AN0455	Benthic Macroinvertebrates	NJDEP AMNET
3	Raritan	09	Manalapan	AN0445	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	17	The Glades	3840K	Total Coliform	NJDEP Shellfish Monitoring
3	Raritan	08	Third Neshanic River at Copper Hill	01397950	Dissolved Oxygen	NJDEP/USGS Data
1	Raritan	08	Third Neshanic River at Copper Hill	01397950	Phosphorus, Temperature, pH, Nitrate, Dissolved Solids, Total Suspended Solids,	NJDEP/USGS Data
5	Raritan	08	Third Neshanic River at Rt 31 in Raritan	AN0332	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	04	Third River at Kingland Ave in Clifton	AN0292	Benthic Macroinvertebrates	NJDEP AMNET
3	Northeast	04	Third River at W Passaic Ave in Bloomfield	AN0292A	Benthic Macroinvertebrates	NJDEP AMNET

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
3	Atlantic Coast	15	Three Pond Brook at Rt 54 in Buena Vista	AN0634	Benthic Macroinvertebrates	NJDEP AMNET
3	Lower Delaware	17	Thundergust Lake-17	Thundergust Lake	Phosphorus	NJDEP Clean Lakes
5	Lower Delaware	19	Timber Lake-19	Timber Lake	Fecal Coliform	Gloucester Co HD
1	Atlantic Coast	14	Timberline Lakes-14	Timberline Lake Campground	Fecal Coliform	Burlington Co HD
3	Atlantic Coast	13	Titmouse Creek at Friendship Rd In Howell	19	pH, Total Suspended Solids	Monmouth Co HD
1	Atlantic Coast	13	Titmouse Creek at Friendship Rd in Howell	19	Phosphorus, Nitrate	Monmouth Co HD
4	Atlantic Coast	13	Titmouse Creek at Friendship Rd in Howell	19	Fecal Coliform	Monmouth Co HD
1	Northwest	01	Tomahawk Lake-01	Tomahawk Lake (Kiddie Lake Area) and (Large Lake Area)	Fecal Coliform	Sussex Co HD
5	Lower Delaware	18	Toms Dam Branch at Peter Cheeseman Rd in Gloucester	AN0658A	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	04	Toms Lake-04	North Cove Beach and Swim Lanes	Fecal Coliform	Passaic Co HD
5	Atlantic Coast	13	Toms River	Toms River	Fish-PCB, Fish-Dioxin	NJDEP Fish Tissue Monitoring
5	Atlantic Coast	13	Toms River - Tidal	Toms River - Tidal	Arsenic, Copper, Lead, Nickel, Zinc	304(l)
5	Atlantic Coast	13	Toms River at Anderson Rd in Jackson	AN0519A	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	13	Toms River at Oakridge Pkwy in Dover	AN0535	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	13	Toms River at Paint Island Rd in Millstone	AN0517	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	13	Toms River at Route 537 in Millstone	7	Nitrate	Monmouth Co HD
3	Atlantic Coast	13	Toms River at Route 537 In Millstone	7	pH, Total Suspended Solids	Monmouth Co HD
4	Atlantic Coast	13	Toms River at Route 537 in Millstone	7	Fecal Coliform	Monmouth Co HD
5	Atlantic Coast	13	Toms River at Route 537 in Millstone	7	Phosphorus	Monmouth Co HD
3	Atlantic Coast	13	Toms River at Rt 528 in Jackson	AN0519	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	13	Toms River at Rt 571 in Dover	AN0524	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	13	Toms River at Rt 571 in Millstone	AN0518	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	13	Toms River at S Hope Chapel Rd (Rt 547) in Jackson	AN0523	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	13	Toms River Estuary	R11; Toms River Estuary-1; Toms River/Barnegat Bay-2	Dissolved Oxygen, Fecal Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring, 304(l)
5	Atlantic Coast	13	Toms River Estuary	Toms River Estuary-1; Toms River/Barnegat Bay-2	Total Coliform, Arsenic, Copper, Lead, Nickel, Zinc	NJDEP Coastal Monitoring, Shellfish Monitoring, 304(l)
3	Atlantic Coast	13	Toms River near Toms River	01408500, 01408300, 13-TOM-1	Arsenic, Cadmium, Mercury	NJDEP/USGS Data, Metal Recon
1	Atlantic Coast	13	Toms River near Toms River	01408500, 01408300, 13-TOM-1	Phosphorus, Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia,	NJDEP/USGS Data, Metal Recon
4	Atlantic Coast	13	Toms River near Toms River	01408500, 01408300, 13-TOM-1	Fecal Coliform	NJDEP/USGS Data, Metal Recon
5	Atlantic Coast	13	Toms River near Toms River	01408500, 01408300, 13-TOM-1	pH, Lead	NJDEP/USGS Data, Metal Recon
5	Atlantic Coast	13	Toms River Trib at Rt 37 in Dover	AN0544	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	13	Toms RiverTtrib at Rt 528 in Jackson	AN0520	Benthic Macroinvertebrates	NJDEP AMNET
1	Raritan	09	Topanemus Lake at Pond Rd in Freehold	61	Nitrate	Monmouth Co HD
3	Raritan	09	Topanemus Lake at Pond Rd in Freehold	61	pH, Total Suspended Solids	Monmouth Co HD
4	Raritan	09	Topanemus Lake-09	Topanemus Lake	Phosphorus	NJDEP Clean Lakes, Monmouth Co HD
3	Atlantic Coast	12	Town Brook at Middletown	01407090	Phosphorus, pH	NJDEP/USGS Data

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
1	Atlantic Coast	12	Town Brook at Middletown	01407090	Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids,	NJDEP/USGS Data
4	Atlantic Coast	12	Town Brook at Middletown	01407090	Fecal Coliform	NJDEP/USGS Data
3	Atlantic Coast	12	Town Brook at Spruce Rd in Middletown	AN0461	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	17	Town Swamp Brook at Buckshutem Rd in Fairfield	AN0716A	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	16	Townsend Sound	Townsend Sound-1 thru 5	Dissolved Oxygen, Fecal Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
5	Atlantic Coast	16	Townsend Sound	Clam Thorofare-1; Lower Ludlam Thorofare-2; Townsend Channel-4,5	Total Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
1	Atlantic Coast	16	Townsend Sound	Stow Creek-3	Total Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
1	Northwest	02	Toyes Recreation	Toyes Recreation	Fecal Coliform	Sussex Co HD
1	Raritan	08	WashIngton	AN0359	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	01	Trout Brook at Pond Brook Rd (Rt 612) in Stillwater	AN0024	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	12	Trout Brook at Richdale Rd in Colts Neck	55	Phosphorus, Nitrate	Monmouth Co HD
5	Atlantic Coast	12	Trout Brook at Richdale Rd in Colts Neck	55	Fecal Coliform	Monmouth Co HD
3	Atlantic Coast	12	Trout Brook at Richdale Rd in Colts Neck	55	pH, Total Suspended Solids	Monmouth Co HD
3	Atlantic Coast	12	Trout Brook at Richdale Rd in Colts Neck	MB-55	Benthic Macroinvertebrates	Monmouth Co HD
5	Northwest	01	Trout Brook at Rt 57 in Hackettstown	AN0068	Benthic Macroinvertebrates	NJDEP AMNET
5	Northwest	01	Trout Brook at Rt 612 in Allamuchy	AN0038	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	12	Troutmans Creek at Atlantic Ave in Long Branch	47	Fecal Coliform	Monmouth Co HD
5	Atlantic Coast	12	Troutmans Creek at Joline Ave in Long Branch	62	Fecal Coliform	Monmouth Co HD
1	Northeast	06	Troy Brook at Beaverwyck Rd in Parsippany-Troy Hills	AN0237	Benthic Macroinvertebrates	NJDEP AMNET
3	Northwest	01	Troy Brook at blw Swartswood Lk in Stillwater	AN0023	Benthic Macroinvertebrates	NJDEP AMNET
3	Northeast	06	Troy Brook at Lake Rd in Mountain Lakes	AN0236	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	01	Troy Brook at Swartswood Rd in Stillwater	AN0023A	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	14	Tub Mill Branch at Spur 563 in Bass River	AN0609	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	15	Tuckahoe Lake-15	Tuckahoe Lake	Phosphorus	NJDEP Clean Lakes
3	Atlantic Coast	15	Tuckahoe River at Cumberland Ave in Estell Manor	AN0648	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	15	Tuckahoe River at head of river	01411300	Phosphorus, Fecal Coliform, Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized	NJDEP/USGS Data
5	Atlantic Coast	15	Tuckahoe River at head of river	01411300	pH	NJDEP/USGS Data
3	Atlantic Coast	15	Tuckahoe River at Rt 49 in Estell Manor	AN0650	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	15	Tuckahoe River at Rt 49 in Maurice River	AN0649	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	15	Tuckahoe River Estuary	2903	Total Coliform	NJDEP Shellfish Monitoring
5	Atlantic Coast	15	Tuckahoe River Estuary	2901A, 2901B, 2902, 2902A	Total Coliform	NJDEP Shellfish Monitoring
1	Atlantic Coast	15	Tuckahoe River near Estelle Manor	01411290	Temperature, Nitrate, Phosphorus, Dissolved Solids, Total Suspended Solids,	NJDEP/USGS Data
5	Atlantic Coast	15	Tuckahoe River near Estelle Manor	01411290	pH	NJDEP/USGS Data
3	Atlantic Coast	15	Tuckahoe River near Estelle Manor	01411290	Dissolved Oxygen	NJDEP/USGS Data
1	Atlantic Coast	15	Tuckahoe River-Tidal	R37, 2901A, 2902A	Dissolved Oxygen	NJDEP Coastal Monitoring

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
3	Atlantic Coast	13	Tuckerton Creek at Poor Mans Pkwy in Little Egg Harbor	AN0559A	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	13	Tuckerton Creek Estuary	1928A, 1836A-H	Total Coliform	NJDEP Shellfish Monitoring
1	Atlantic Coast	13	Tuckerton Creek-Tidal	R20	Dissolved Oxygen	NJDEP Coastal Monitoring
3	Atlantic Coast	14	Tulpehocken Creek at Carranza Rd in Tabernacle	AN0599	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	14	Tulpehocken Creek at Maxwell - Friendship Rd in Washington	AN0600, WTUHAWKN	Pineland Biological Community	NJDEP AMNET, Pinelands
1	Atlantic Coast	14	Tulpehocken Creek near JenkIns	01409780	Phosphorus, Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids,	USGS/Pinelands Data
5	Atlantic Coast	12	Turkey Swamp Brook below Turkey Swamp Lk in Freehold	AN0489A	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	12	Turkey Swamp-12	Turkey Swamp	Phosphorus	NJDEP Clean Lakes
3	Lower Delaware	18	Turners Run at Last Bridge Crossing in Washington	AN0657	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	13	Turnmill Lake-13	Turnmill Lake	Phosphorus, Fish Community	NJDEP Clean Lakes, NJDEP Freshwater Fisheries
5	Atlantic Coast	12	Turtle Mill Brook-Tidal	R05	Fecal Coliform	Monmouth Co HD
3	Lower Delaware	17	Two Penny Run at E Quillytown Rd in Carneys Point	AN0695	Benthic Macroinvertebrates	NJDEP AMNET
1	Lower Delaware	17	Two Penny Run near Danceys Corner	01482560	Dissolved Solids, Unionized Ammonia	NJDEP/USGS Data
3	Lower Delaware	17	Two Penny Run near Danceys Corner	01482560	Dissolved Oxygen, pH, Temperature, Nitrate, Total Suspended Solids	NJDEP/USGS Data
4	Lower Delaware	17	Two Penny Run near Danceys Corner	01482560	Fecal Coliform	NJDEP/USGS Data
5	Lower Delaware	17	Two Penny Run near Danceys Corner	01482560	Phosphorus	NJDEP/USGS Data
1	Atlantic Coast	13	Union Branch at Beacon Ave in Manchester	AN0534	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	13	Union Branch at Colonial Dr in Manchester	AN0533	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	14	Union Creek above Alternate Route 561	LUNIOMOS	Pineland Biological Community	Pinelands
5	Lower Delaware	17	Union Lake-17	Union Lake	Fish-Mercury	NJDEP Freshwater Fisheries, Cumberland Co HD,NJDEP Fish Tissue Monitoring
1	Lower Delaware	17	Union Lake-17	Union Lake, Union Lake Bathing Area	Fecal Coliform, Fish Community	NJDEP Freshwater Fisheries, Cumberland Co HD,NJDEP Fish Tissue Monitoring
1	Lower Delaware	19	Union Mill Lake-19	Union Mill Lake Colony Club	Fecal Coliform	Burlington Co HD
1	Lower Delaware	19	Upper Aetna Lake-19	Medford Lakes Colony Club Beach 5	Fecal Coliform	Burlington Co HD
1	Northwest	02	Upper East Highland Lake-02	Highland Lake, Lake 5 Beach7	Fecal Coliform	Sussex Co HD
1	Northwest	02	Upper Greenwood Lake-02	Upper Greenwood Lake POA	Fecal Coliform	Passaic Co HD
1	Northwest	01	Upper Mohawk Lake-01	Upper Mohawk Lake	Fecal Coliform	Sparta Twp HD
5	Lower Delaware	20	Upper Sylvan Lake-20	Sylvan Lake	Phosphorus, Fecal Coliform	NJDEP Clean Lakes, Burlington Co HD
3	Northeast	04	Valentine Brook at Forest Ave in Allendale	AN0284	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	04	Valentine Brook at Forest Ave in Allendale	AN0284	Unknown Toxicity	NJDEP AMNET
1	Northeast	06	Valhalla Lake-06	Lake Valhalla Beach and Dock	Fecal Coliform	Montville Twp HD
1	Northwest	01	Van Campens Brook at Flatbrookville - Middleville Rd in Walpack	AN0009	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	01	Van Campens Brook at Mill Rd in Hardwick	AN0010	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	01	Van Campens Brook at Old Mine Rd Bridge	DRBC/NPS31	Oxygen, pH	DRBC

2004 Integrated List of Waterbodies

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
1	Northwest	01	Van Campens Brook at Old MIne Rd in Hardwick	AN0011	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	05	Van Saun Brook at Main St & Rt 4 in Hackensack	AN0211	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	02	Vernon Valley Lake-02	Vernon Valley Lake	Fecal Coliform	Sussex Co HD
4	Northeast	04	Verona Park Lake-04	Verona Park Lake	Phosphorus	NJDEP Clean Lakes
1	Atlantic Coast	16	View Lake-16	Oceanview Campground	Fecal Coliform	Cape May Co HD
1	Northeast	06	Village Left and Right	Village Left and Right	Fecal Coliform	Twp of Pequannock
1	Lower Delaware	17	Vineland YMCA	Vineland YMCA	Fecal Coliform	Salem Co HD
1	Atlantic Coast	12	Waackaack Creek-Tidal	35, R65, SRB4	Dissolved Oxygen	Monmouth Co HD, NJDEP Coastal Monitoring, NJDEP Shellfish Monitoring
5	Atlantic Coast	12	Waackaack Creek-Tidal	35, R65, SRB4	Fecal Coliform, Total Coliform	Monmouth Co HD, NJDEP Coastal Monitoring, NJDEP Shellfish Monitoring
5	Atlantic Coast	14	Wading River	Wading River	Fish-Mercury	NJDEP Fish Tissue Monitoring
3	Atlantic Coast	14	Wading River above Tulpehocken Creek	WWETULPC	Pineland Biological Community	Pinelands
3	Atlantic Coast	14	Wading River below Ford Rd	WWEFORDR	Pineland Biological Community	Pinelands
3	Atlantic Coast	14	Wading River below Mile Run	WWEMILER	Pineland Biological Community	Pinelands
5	Atlantic Coast	14	Wading River Estuary	2011B, 2011C	Total Coliform	NJDEP Shellfish Monitoring
3	Atlantic Coast	14	Wading River W Br at Chatsworth	01409690	Solids	NJDEP/USGS Data
1	Atlantic Coast	14	WadIng River W Br at Chatsworth	01409690	Phosphorus, Temperature, Dissolved Oxygen, Nitrate, Unionized Ammonia	NJDEP/USGS Data
1	Atlantic Coast	14	WadIng River W Br at Maxwell	01409815	Phosphorus, Fecal Coliform, Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized	NJDEP/USGS Data
3	Atlantic Coast	14	Wading River W Br at Rt 532 in Woodland	AN0595	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	14	Wading River W Br at Rt 563 in Washington	AN0602, WWEEVANB	Pineland Biological Community	NJDEP AMNET, Pinelands
3	Atlantic Coast	14	Wading River W Br at Rt 563 in Woodland	AN0596	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	14	WadIng River W Br near JenkIns	01409750	Phosphorus, Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids,	USGS/Pinelands Data
1	Atlantic Coast	14	Wading River-Tidal	R22, R23	Dissolved Oxygen	NJDEP Coastal Monitoring
1	Northwest	02	Wallkill Lake-02	Lake Wallkill	Fecal Coliform	Sussex Co HD
5	Northwest	02	Wallkill River at Kennedy Ave in Ogdensburg	AN0298	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	02	Wallkill River at Kennedy Ave in Ogdensburg	Wallkill B	Phosphorus, Temperature, Dissolved Oxygen, pH, Nitrate, Dissolved Solids,	Sussex MUA
5	Northwest	02	Wallkill River at Rt 15 (near municipal bldg) in Sparta	AN0297	Benthic Macroinvertebrates	NJDEP AMNET
3	Northwest	02	Wallkill River at Rt 23 in Hamburg	01367735	Dissolved Solids	EWQ
1	Northwest	02	Wallkill River at Rt 23 in Hamburg	01367735	Phosphorus, Temperature, Dissolved Oxygen, pH, Nitrate, Total Suspended	EWQ
5	Northwest	02	Wallkill River at Rt 565 in Wantage	AN0302	Benthic Macroinvertebrates	NJDEP AMNET
5	Northwest	02	Wallkill River at Rt 94 in Hamburg	2-WAL-3	Arsenic	NJDEP Metal Recon
3	Northwest	02	Wallkill River at Rt 94 in Hamburg	2-WAL-3	Cadmium, Mercury	NJDEP Metal Recon
1	Northwest	02	Wallkill River at Rt 94 in Hamburg	2-WAL-3	Selenium, Zinc	NJDEP Metal Recon
5	Northwest	02	Wallkill River at Rt 94 in Hamburg	AN0300	Benthic Macroinvertebrates	NJDEP AMNET

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
1	Northwest	02	Wallkill River at Scott Rd at FranklIn	01367715, Wallkill D, 2-WAL-2	Phosphorus, Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Chromium, Copper, Lead, Nickel,	NJDEP/USGS Data, EWQ, Sussex MUA, Metal Recon
3	Northwest	02	Wallkill River at Scott Rd in Franklin	01367715, Wallkill D, 2-WAL-2	Cadmium, Mercury	NJDEP/USGS Data, EWQ, Sussex MUA, Metal Recon
4	Northwest	02	Wallkill River at Scott Rd in Franklin	01367715, Wallkill D, 2-WAL-2	Fecal Coliform	NJDEP/USGS Data, EWQ, Sussex MUA, Metal Recon
5	Northwest	02	Wallkill River at Scott Rd in Franklin	01367715, Wallkill D, 2-WAL-2	Arsenic	NJDEP/USGS Data, EWQ, Sussex MUA, Metal Recon
5	Northwest	02	Wallkill River at Scott Rd in Franklin	AN0299	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	02	Wallkill River at Sparta	01367625, Wallkill A	Phosphorus, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended	NJDEP/USGS Data, Sussex MUA
4	Northwest	02	Wallkill River at Sparta	01367625, Wallkill A	Fecal Coliform	NJDEP/USGS Data, Sussex MUA
5	Northwest	02	Wallkill River at Sparta	01367625, Wallkill A	Temperature	NJDEP/USGS Data, Sussex MUA
3	Northwest	02	Wallkill River near Franklin	01367700, Wallkill C, 2-WAL-1	Cadmium, Mercury	NJDEP/USGS Data, Sussex MUA, Metal Recon
1	Northwest	02	Wallkill River near Franklin	01367700, Wallkill C, 2-WAL-1	Phosphorus, Temperature, pH, Nitrate, Dissolved Solids, Unionized Ammonia, Chromium, Copper, Lead, Nickel,	NJDEP/USGS Data, Sussex MUA, Metal Recon
4	Northwest	02	Wallkill River near Franklin	01367700, Wallkill C, 2-WAL-1	Fecal Coliform	NJDEP/USGS Data, Sussex MUA, Metal Recon
5	Northwest	02	Wallkill River near Franklin	01367700, Wallkill C, 2-WAL-1	Arsenic	NJDEP/USGS Data, Sussex MUA, Metal Recon
3	Northwest	02	Wallkill River near Sussex	01367770, 2-WAL-4	Cadmium, Mercury	NJDEP/USGS Data, Metal Recon
1	Northwest	02	Wallkill River near Sussex	01367770, 2-WAL-4	Phosphorus, Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Chromium, Copper, Lead, Nickel,	NJDEP/USGS Data, Metal Recon
5	Northwest	02	Wallkill River near Sussex	01367770, 2-WAL-4	Arsenic	NJDEP/USGS Data, Metal Recon
4	Northwest	02	Wallkill River near Sussex	01367770, 2-WAL-4	Fecal Coliform	NJDEP/USGS Data, Metal Recon
3	Northwest	02	Wallkill River near Unionville	01368000, Wallkill E, 2-WAL-5	Cadmium, Mercury	NJDEP/USGS Data, Metal Recon
1	Northwest	02	Wallkill River near Unionville	01368000, Wallkill E, 2-WAL-5	Phosphorus, Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Chromium, Copper, Lead, Nickel,	NJDEP/USGS Data, Sussex MUA, Metal Recon
4	Northwest	02	Wallkill River near Unionville	01368000, Wallkill E, 2-WAL-5	Fecal Coliform	NJDEP/USGS Data, Sussex MUA, Metal Recon
5	Northwest	02	Wallkill River near Unionville	01368000, Wallkill E, 2-WAL-5	Arsenic	NJDEP/USGS Data, Sussex MUA, Metal Recon
5	Northeast	03	Wanaque Reservoir-03	Wanaque Reservoir	Fish-Mercury	NJDEP Fish Tissue Monitoring
1	Northeast	03	Wanaque River at E Shore Dr in West Milford	AN0255	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	03	Wanaque River at E Shore Dr in West Milford	AN0255	Unknown Toxicity	NJDEP AMNET
5	Northeast	03	Wanaque River at Highland Ave (blw STP) in Wanaque	AN0256	Benthic Macroinvertebrates, Unknown Toxicity	NJDEP AMNET

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Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
1	Northeast	03	Wanaque River at Highland Avenue at Wanaque	01387010	Phosphorus, Fecal Coliform, Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized	NJDEP/USGS Data, EWQ
5	Northeast	03	Wanaque River at Pompton Lakes	01387014, 01387041	Phosphorus	NJDEP/USGS Data
1	Northeast	03	Wanaque River at Pompton Lakes	01387014, 01387041	Temperature, Dissolved Oxygen, pH, Nitrate, Dissolved Solids, Total Suspended	NJDEP/USGS Data
4	Northeast	03	Wanaque River at Pompton Lakes	01387014, 01387041	Fecal Coliform	NJDEP/USGS Data
5	Northeast	03	Wanaque River at Wanaque	01387000	Oxygen	NJDEP/USGS Data
1	Northeast	03	Wanaque River at Wanaque Ave in Pompton Lakes	AN0257	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	03	Wanaque River at Wanaque Ave in Pompton Lakes	AN0257	Unknown Toxicity	NJDEP AMNET
3	Northeast	03	Wanaque River near Awosting	01383505	pH, Temperature, Dissolved Oxygen	NJDEP/USGS Data
1	Northeast	03	Wanaque River near AwostIng	01383505	Phosphorus, Fecal Coliform, Nitrate, Dissolved Solids, Total Suspended Solids,	NJDEP/USGS Data
1	Northwest	01	Wapalanne Lake-01	Lake Wapalanne: NJ School of Cons.	Fecal Coliform	Sussex Co HD
5	Atlantic Coast	12	Ware Creek-Estuary	Ware Creek-Estuary	Total Coliform	NJDEP Shellfish Monitoring
3	Atlantic Coast	13	Waretown Creek-Tidal	R16	Dissolved Oxygen, Total Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
3	Northwest	11	Warford Creek at Rt 29 in Kingwood	AN0085	Benthic Macroinvertebrates	NJDEP AMNET
1	Lower Delaware	18	Washington Lake-18	Washington Township Lake	Fecal Coliform	Gloucester Co HD
1	Raritan	09	Washington Valley Reservoir-09	Washington Valley Reservoir	Fish Community	NJDEP Freshwater Fisheries
3	Raritan	09	Watchung Lake-09	Watchung Lake	Phosphorus	NJDEP Clean Lakes
3	Atlantic Coast	15	Watering Race at Rt 50 in Hamilton	AN0639	Benthic Macroinvertebrates	NJDEP AMNET
1	Northeast	06	Watnong Brook at Lake Rd in Morris	AN0234A	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	06	Watnong Brook at W Hanover Rd in Morris	AN0234B	Benthic Macroinvertebrates	NJDEP AMNET
3	Northwest	02	Wawayanda Brook at Canal Rd in Vernon	AN0295	Benthic Macroinvertebrates	NJDEP AMNET
5	Northwest	02	Wawayanda Lake-02	Wawayanda Lake	Fish-Mercury	Northern Region, NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring
3	Northwest	02	Wawayanda Lake-02	Wawayanda Lake	Phosphorus	Northern Region, NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring
1	Northwest	02	Wawayanda Lake-02	Wawayanda SP East Beach and West Beach	Fecal Coliform	Northern Region, NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring
5	Northwest	02	Wawayanda/Pochuck River at Alt Rt 515 in Maple Grange	01368900	Phosphorus, Temperature	EWQ
1	Northwest	02	Wawayanda/Pochuck River at Alt Rt 515 in Maple Grange	01368900	Dissolved Oxygen, pH, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized	EWQ
5	Raritan	09	Weamaconk Creek at Rt 522 in Englishtown	AN0443, MB-81	Benthic Macroinvertebrates	NJDEP AMNET, Monmouth Co HD
3	Raritan	09	Weamaconk Creek at Rt 9 in Freehold	AN0441, MB-82	Benthic Macroinvertebrates	NJDEP AMNET,Monmouth Co HD
5	Raritan	09	Weamaconk Lake-09	Weamaconk Lake	Phosphorus	NJDEP Clean Lakes
3	Atlantic Coast	13	Webbs Mill Branch at Rt 539 in Lacey	AN0545	Benthic Macroinvertebrates	NJDEP AMNET
4	Raritan	09	Weemaconk Creek at Main St in Manalapan	9	Fecal Coliform	Monmouth Co HD
5	Raritan	09	Weemaconk Creek at Main St in Manalapan	9	Phosphorus	Monmouth Co HD

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Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
1	Raritan	09	Weemaconk Creek at MaIn St in Manalapan	9	Nitrate	Monmouth Co HD
3	Raritan	09	Weemaconk Creek at Main St In Manalapan	9	pH, Total Suspended Solids	Monmouth Co HD
5	Raritan	07	Weequahic Lake-07	Weequahic Lake	Phosphorus	NJDEP Clean Lakes
3	Atlantic Coast	13	Wells Mill Pond-13	Wells Mill Pond	Phosphorus	NJDEP Clean Lakes
4	Raritan	09	Wemrock Brook at Rt #9 (After 1St Pipe) in Freehold	69	Fecal Coliform	Monmouth Co HD
5	Raritan	09	Wemrock Brook at Rt #9 (After 1St Pipe) in Freehold	69	Phosphorus	Monmouth Co HD
3	Raritan	09	Wemrock Brook at Rt #9 (After 1St Pipe) In Freehold	69	pH, Total Suspended Solids	Monmouth Co HD
4	Raritan	09	Wemrock Brook at Rt #9 (Before Pipes) in Freehold	68	Fecal Coliform	Monmouth Co HD
5	Raritan	09	Wemrock Brook at Rt #9 (Before Pipes) in Freehold	68	Phosphorus	Monmouth Co HD
3	Raritan	09	Wemrock Brook at Rt #9 (Before Pipes) In Freehold	68	pH, Total Suspended Solids	Monmouth Co HD
1	Raritan	09	Wemrock Brook at Rt 9 (after 1st Pipe) in Freehold	69	Nitrate	Monmouth Co HD
1	Raritan	09	Wemrock Brook at Rt 9 (before Pipes) in Freehold	68	Nitrate	Monmouth Co HD
3	Raritan	09	Wemrock Brook at Wemrock Rd in Freehold	AN0442	Benthic Macroinvertebrates	NJDEP AMNET
1	Lower Delaware	18	Wenonah Lake-18	Wenonah Lake Playground	Fecal Coliform	Gloucester Co HD
5	Atlantic Coast	14	Wesickaman Creek at Atsion-Quakerbridge Rd in Shamong	AN0563, MWETHREE	Pineland Biological Community	NJDEP AMNET, Pinelands
3	Atlantic Coast	14	Wesickaman Creek impoundment at Atsion Road	MWEATSIO	Pineland Biological Community	Pinelands
5	Atlantic Coast	13	West Beach (Pine Beach)	West Beach (Pine Beach)	Fecal Coliform	Cooperative Coastal Monitoring Program
5	Northeast	03	West Brook	WB1, WB2, WB3, WB4, WB5, WB6	Temperature	Pequannock River Coalition
1	Atlantic Coast	16	West Creek at Leesburg	01411444	Phosphorus, Fecal Coliform, Temperature, Dissolved Oxygen, pH, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized	NJDEP/USGS Data
3	Atlantic Coast	16	West Creek at Rt 550 in Maurice River	AN0765	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	16	West Creek Estuary	1887C, 1887D	Total Coliform	NJDEP Shellfish Monitoring
5	Northeast	06	West Lake-06	Sabeys Beach, West Payson Lake Main Beach	Fecal Coliform	Borough of Kinnelon
3	Atlantic Coast	13	Westecunk Creek at Forge Rd in Eagleswood	AN0557	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	13	Westecunk Creek at Pollypod Rd in Little Egg Harbor	AN0557A	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	13	Westecunk Creek at RR Ave in Eagleswood	AN0558	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	13	Westecunk Creek Estuary	1712, 1713C, 1714, 1714A	Total Coliform	NJDEP Shellfish Monitoring
1	Atlantic Coast	13	Westecunk Creek-Tidal	R18, 1712	Dissolved Oxygen	
5	Atlantic Coast	12	Whale Creek-Tidal	R61	Dissolved Oxygen	NJDEP Coastal Monitoring
5	Atlantic Coast	12	Ocean	AN0477	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	12	Whale Pond Brook at Route 35 in Eatontown	01407617, 31	Phosphorus, Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia	NJDEP/USGS Data, Monmouth Co HD
4	Atlantic Coast	12	Whale Pond Brook at Route 35 in Eatontown	01407617, 31	Fecal Coliform	NJDEP/USGS Data, Monmouth Co HD

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
5	Atlantic Coast	12	Whale Pond Brook at Route 35 in Eatontown	01407617, 31	pH	NJDEP/USGS Data, Monmouth Co HD
5	Northeast	06	Whippany River at Edwards Rd in Parsippany-Troy Hills	AN0238	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	06	Whippany River at Jefferson Rd in Hanover	AN0235	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	06	Whippany River at Morristown	01381500, 6-WHI-1	Phosphorus	NJDEP/USGS Data, Metal Recon
3	Northeast	06	Whippany River at Morristown	01381500, 6-WHI-1	Arsenic, Cadmium, Mercury	NJDEP/USGS Data, Metal Recon
1	Northeast	06	Whippany River at Morristown	01381500, 6-WHI-1	Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Chromium,	NJDEP/USGS Data, Metal Recon
4	Northeast	06	Whippany River at Morristown	01381500, 6-WHI-1	Fecal Coliform	NJDEP/USGS Data, Metal Recon
1	Northeast	06	Whippany River at Mt Pleasant Rd in Mendham	AN0232	Benthic Macroinvertebrates	NJDEP AMNET
1	Northeast	06	Morristown	AN0234	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	06	Whippany River at Whitehead Rd in Morris	AN0233	Benthic Macroinvertebrates	NJDEP AMNET
1	Northeast	06	Whippany River at Whitehead Rd in Morris	EWQ0233	Phosphorus, Temperature, Dissolved Oxygen, pH, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized	EWQ
5	Northeast	06	Whippany River near Pine Brook	01381800, 6-WHI-2	Phosphorus, Lead	NJDEP/USGS Data, Metal Recon
3	Northeast	06	Whippany River near Pine Brook	01381800, 6-WHI-2	Arsenic, Cadmium, Mercury	NJDEP/USGS Data, Metal Recon
1	Northeast	06	Whippany River near PIne Brook	01381800, 6-WHI-2	Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Chromium,	NJDEP/USGS Data, Metal Recon
4	Northeast	06	Whippany River near Pine Brook	01381800, 6-WHI-2	Fecal Coliform	NJDEP/USGS Data, Metal Recon
1	Northwest	01	White Lake-01	White Lake	Fish Community	NJDEP Freshwater Fisheries
1	Northwest	02	White Lake-02	White Lake Camp Sacajawea, Swim Club Bathing Area 1, and Swim Club Bathing Area 2	Fecal Coliform	Sparta Twp HD
3	Lower Delaware	17	White Marsh Run at Hogbin Rd in Millville	AN0754	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	17	White Marsh Run at Rt 555 in Millville	AN0755	Benthic Macroinvertebrates	NJDEP AMNET
5	Northeast	06	White Meadow Lake-06	White Meadow Lake 1, 2, and 3	Fecal Coliform	Rockaway Twp HD
3	Atlantic Coast	15	White Oak Branch at Jackson Rd in Monroe	AN0630	Benthic Macroinvertebrates	NJDEP AMNET
1	Northeast	06	White Rock Lake-06	White Rock Lake Assoc.	Fecal Coliform	Jefferson Twp HD
5	Lower Delaware	19	Whitesbog Pond-19	Whitesbog Pond	Fish-Mercury	NJDEP Fish Tissue Monitoring
3	Northwest	11	Wickecheoke Creek at Croton	01461220	Phosphorus, Dissolved Oxygen	NJDEP/USGS Data
1	Northwest	11	Wickecheoke Creek at Croton	01461220	Temperature, pH, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized	NJDEP/USGS Data
5	Northwest	11	Wickecheoke Creek at Croton	01461220	Fecal Coliform	NJDEP/USGS Data
5	Northwest	11	Wickecheoke Creek at Locktown - Sergeantsville Rd in Delaware	AN0091	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	11	Wickecheoke Creek at Rt 29 in Stockton	AN0095	Benthic Macroinvertebrates	NJDEP AMNET
3	Northwest	11	Wickecheoke Creek at Rt 579 in Raritan	AN0090	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	11	Wickecheoke Creek at Sergeantsville Rd in Delaware	AN0094	Benthic Macroinvertebrates	NJDEP AMNET

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Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
1	Northwest	11	Wickecheoke Creek at Stockton	01461300, DRBCNJ0012	pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized	NJDEP/USGS Data, DRBC
5	Northwest	11	Wickecheoke Creek at Stockton	01461300, DRBCNJ0012	Phosphorus, Fecal Coliform, Temperature	NJDEP/USGS Data, DRBC
3	Northwest	11	Wickecheoke Creek near Sergenstville	01461282	Phosphorus	NJDEP/USGS Data
1	Northwest	11	Wickecheoke Creek near Sergenstville	01461282	Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended	NJDEP/USGS Data
5	Northwest	11	Wickecheoke Creek near Sergenstville	01461282	Fecal Coliform	NJDEP/USGS Data
5	Atlantic Coast	14	Wildcat Branch below Burnt Mill Rd	MWIBURNT	Pineland Biological Community	Pinelands
3	Atlantic Coast	12	Wilkson Creek at Church St in Aberdeen	AN0458	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	13	Willis Creek Estuary	1928, 1928B	Total Coliform	NJDEP Shellfish Monitoring
1	Raritan	08	Willoughby Brook at Rt 31 in Lebanon	AN0320	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	12	Willow Brook at Schank Rd in Holmdel	AN0467	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	12	Willow Brook at Willow Brook Rd in Colts Neck	AN0468	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	12	Willow Brook at Willow Brook Rd in Holmdel	52	Nitrate	Monmouth Co HD
3	Atlantic Coast	12	Willow Brook at Willow Brook Rd In Holmdel	52	pH, Total Suspended Solids	Monmouth Co HD
4	Atlantic Coast	12	Willow Brook at Willow Brook Rd in Holmdel	52	Fecal Coliform	Monmouth Co HD
5	Atlantic Coast	12	Willow Brook at Willow Brook Rd in Holmdel	52	Phosphorus	Monmouth Co HD
5	Atlantic Coast	12	Willow Brook Trib at Igoe Rd in Marlboro	AN0468A	Benthic Macroinvertebrates	NJDEP AMNET
5	Lower Delaware	17	Willow Grove Lake-17	Willow Grove Lake	Fish-Mercury	NJDEP Fish Tissue Monitoring
5	Northwest	01	Wills Brook at Acorn St in Mt Olive	AN0064C	Benthic Macroinvertebrates	NJDEP AMNET
5	Northwest	01	Wills Brook at Erie Lackawanna RR Bridge in Mt Olive	AN0064B	Benthic Macroinvertebrates	NJDEP AMNET
1	Lower Delaware	17	Wilson Lake-17	Wilson Lake	Fish Community	Gloucester Co HD, NJDEP Fish Tissue Monitoring, NJDEP Freshwater Fisheries
5	Lower Delaware	17	Wilson Lake-17	Wilson Lake	Fecal Coliform, Fish-Mercury	Gloucester Co HD, NJDEP Fish Tissue Monitoring,NJDEP Freshwater Fisheries
3	Lower Delaware	17	Wilson Lake-17	Wilson Lake	Phosphorus	NJDEP Clean Lakes
1			Wilson Park Lake	Wilson Park Lake	Fish Community	NJDEP Freshwater Fisheries
5	Atlantic Coast	14	Winter Creek Estuary	2003I	Total Coliform	NJDEP Shellfish Monitoring
5	Atlantic Coast	13	Winward Beach (Brick)	Winward Beach (Brick)	Fecal Coliform	Cooperative Coastal Monitoring Program
3	Lower Delaware	19	Wood Lake-19	Woodlake	Fecal Coliform	Burlington County HD
5	Lower Delaware	18	Woodbury Creek at Rt 45, Woodbury Ck Park in Woodbury	01474730	pH	EWQ
3	Lower Delaware	18	Woodbury Creek at Rt 45, Woodbury Creek Park in Woodbury	01474730	Phosphorus	EWQ
1	Lower Delaware	18	Woodbury Creek at Rt 45, Woodbury Creek Park, in Woodbury	01474730	Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids,	EWQ
4	Lower Delaware	18	Woodbury Lake-18	Woodbury Lake	Phosphorus	NJDEP Clean Lakes
3	Northwest	11	Woolseys Brook at Rt 546 in Hopewell	AN0104	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	13	Wrangel Brook at Congasia Rd in Manchester	AN0536	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	13	Wrangel Brook at Mule Rd in Berkeley	AN0537	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	13	Wrangel Brook at S Hampton Rd in Berkeley	AN0539	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	13	Wrangel Brook-Tidal	R11	Dissolved Oxygen	NJDEP Coastal Monitoring

Sublist	Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
3	Atlantic Coast	12	Wreck Pond Brook at Allenwood Rd In Wall	14	pH, Total Suspended Solids	Monmouth Co HD
1	Atlantic Coast	12	Wreck Pond Brook at Allenwood Rd in Wall	14	Phosphorus, Nitrate	Monmouth Co HD
4	Atlantic Coast	12	Wreck Pond Brook at Allenwood Rd in Wall	14	Fecal Coliform	Monmouth Co HD
3	Atlantic Coast	12	Wreck Pond Brook at Allenwood Rd in Wall	MB-14	Benthic Macroinvertebrates	Monmouth Co HD
5	Atlantic Coast	12	Wreck Pond Brook at Old Mill Rd in Wall	AN0483	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	12	Wreck Pond-12	Wreck Pond	Phosphorus	NJDEP Clean Lakes
3	Northwest	01	Yards Creek at Mt Vernon Rd in Blairstown	AN0030	Benthic Macroinvertebrates	NJDEP AMNET
1	Northwest	01	Yards Creek at Rt 94 in Knowlton	AN0031	Benthic Macroinvertebrates	NJDEP AMNET
5	Atlantic Coast	12	Yellow Brook at Creamery Rd in Colts Neck	AN0472	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	12	Yellow Brook at Elton-Adelphia Rd In Howell	15	pH, Total Suspended Solids	Monmouth Co HD
1	Atlantic Coast	12	Yellow Brook at Elton-Adelphia Rd in Howell	15	Phosphorus, Fecal Coliform, Nitrate	Monmouth Co HD
1	Atlantic Coast	12	Yellow Brook at Muhlebrink Rd in Colts Neck	01467460	Phosphorus, Temperature, Dissolved Oxygen, pH, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized	EWQ
3	Atlantic Coast	12	Yellow Brook at Rt 537 in Colts Neck	AN0471	Benthic Macroinvertebrates	NJDEP AMNET
3	Atlantic Coast	12	Yellow Brook near Malboro	01407360, 12-YEL-1	pH, Arsenic, Cadmium, Copper, Lead, Mercury, Silver	NJDEP/USGS Data, Metal Recon
1	Atlantic Coast	12	Yellow Brook near Malboro	01407360, 12-YEL-1	Phosphorus, Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia,	NJDEP/USGS Data, Metal Recon
4	Atlantic Coast	12	Yellow Brook near Malboro	01407360, 12-YEL-1	Fecal Coliform	NJDEP/USGS Data, Metal Recon
5	Atlantic Coast	12	York Avenue Beach (Spring Lake)	York Avenue Beach (Spring Lake)	Fecal Coliform	Cooperative Coastal Monitoring Program

Appendix 1B

Sublist 5 with Priority Ranking

Appendix I B Sublist 5 of the 2004 Integrated List (By Waterbody/Parameter) With Priority Ranking

Region	WMA	Station Name/Waterbody	Site ID #	Impairment	Priority	Data Source
Lower Delaware	17	4 Seasons Campground Pond-17	Four Seasons	Fecal Coliform	High	Salem Co HD
Atlantic Coast	15	Absecon Bay	Absecon Bay-1 thru 15	Total Coliform	High	NJDEP Coastal Monitoring, NJDEP Shellfish Monitoring
Atlantic Coast	15	Absecon Creek Estuary	2401	Total Coliform	High	NJDEP Shellfish Monitoring
Atlantic Coast	15	Absecon Creek-Tidal	R33	Dissolved Oxygen	Medium	NJDEP Coastal Monitoring
Northeast	05	Ackermans Creek	Adjacent to Berry's Creek Reach 02030103-034-0.11	Chlorinated Benzenes	High	Remanded 303d List, (F.R. V.66, #195, 10/9/01)
Northeast	05	Ackermans Creek	Adjacent to Berry's Creek Reach 02030103-034-0.11	Chromium	High	Remanded 303d List, (F.R. V.66, #195, 10/9/01)
Northeast	05	Ackermans Creek	Adjacent to Berry's Creek Reach 02030103-034-0.11	Mercury	High	Remanded 303d List, (F.R. V.66, #195, 10/9/01)
Northeast	05	Ackermans Creek	Adjacent to Berry's Creek Reach 02030103-034-0.11	PCB	High	Remanded 303d List, (F.R. V.66, #195, 10/9/01)
Atlantic Coast	14	Albertson Branch near Elm	0140940970	pH	Medium	USGS/Pinelands Data
Atlantic Coast	14	Albertson Brook at Old Bridge Crossing in Hammonton	AN0572, NALDEREL	Pineland Biological Community	Low	NJDEP AMNET, Pinelands
Atlantic Coast	14	Albertson Brook at Wharton Ave in Waterford	AN0571, NALBFLEM	Pineland Biological Community	Low	NJDEP AMNET, Pinelands
Lower Delaware	18	Alcyon Lake-18	Alcyon Lake	Mercury	High	NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring
Lower Delaware	18	Alcyon Lake-18	Alcyon Lake	Phosphorus	Medium	NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring
Lower Delaware	20	Allentown Lake-20	Allentown Lake	Phosphorus	Medium	NJDEP Clean Lakes
Lower Delaware	17	Alloway Creek at Yorktown - Friesburg Rd in Alloway	AN0699	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	17	Alloway Creek Estuary	Alloway Creek Estuary	Total Coliform	High	NJDEP Shellfish Monitoring
Raritan	09	Ambrose Brook at Raritan Ave in Middlesex	AN0425	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	09	Ambrose Brook at School St. in No. Stelton	AN0425B	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	14	Anchor Lake One-14	NBLABBOG	Pineland Biological Community	Low	Pinelands
Lower Delaware	20	Annaricken Brook near Jobstown	01464578	Phosphorus	Medium	NJDEP/USGS Data
Northeast	03	Apshawa Brook	PQ15	Temperature	High	Pequannock River Coalition
Raritan	07	Arthur Kill	Arthur Kill-4	Total Coliform	High	NJDEP Shellfish Monitoring
Raritan	07	Arthur Kill and Tidal Tributaries	Arthur Kill and Tidal Tributaries	Dioxin	High	NJDEP Fish Tissue Monitoring
Raritan	07	Arthur Kill and Tidal Tributaries	Arthur Kill and Tidal Tributaries	PCB	High	NJDEP Fish Tissue Monitoring
Lower Delaware	20	Assiscunk Creek at Cedar Lane at Springfield	20-AS-1	Arsenic	High	NJDEP Metal Recon
Lower Delaware	20	Assiscunk Creek at Cedar Lane at Springfield	20-AS-1	Cadmium	High	NJDEP Metal Recon
Lower Delaware	20	Assiscunk Creek at Cedar Lane at Springfield	20-AS-1	Chromium	High	NJDEP Metal Recon
Lower Delaware	20	Assiscunk Creek at Cedar Lane at Springfield	20-AS-1	Lead	High	NJDEP Metal Recon
Lower Delaware	20	Assiscunk Creek at Cedar Lane at Springfield	20-AS-1	Mercury	High	NJDEP Metal Recon
Lower Delaware	20	Assiscunk Creek at Hedding Rd (near Jacksonville) in Mansfield	AN0141	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northwest	11	Assunpink Creek	Assunpink Creek	Mercury	High	NJDEP Fish Tissue Monitoring
Northwest	11	Assunpink Creek at Mulberry St in Trenton	AN0116	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northwest	11	Assunpink Creek at Peace Street at Trenton	01464020, 01464000, DRBCNJ1338, 11-AS-3	Arsenic	High	NJDEP/USGS Data, DRBC, Metal Recon

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Region	WMA	Station Name/Waterbody	Site ID #	Impairment	Priority	Data Source
Northwest	11	Assunpink Creek at Peace Street at Trenton	01464020, 01464000, DRBCNJ1338, 11-AS-3	Fecal Coliform	High	NJDEP/USGS Data, DRBC, Metal Recon
Northwest	11	Assunpink Creek at Peace Street at Trenton	01464020, 01464000, DRBCNJ1338, 11-AS-3	Lead	High	NJDEP/USGS Data, DRBC, Metal Recon
Northwest	11	Assunpink Creek at Peace Street at Trenton	01464020, 01464000, DRBCNJ1338, 11-AS-3	Phosphorus	Medium	NJDEP/USGS Data, DRBC, Metal Recon
Northwest	11	Assunpink Creek at Route 539 in Upper Freehold	4	Phosphorus	Medium	Monmouth Co HD
Northwest	11	Assunpink Creek at Rt 535 in West Windsor	AN0109	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northwest	11	Assunpink Creek at Willow St in Trenton	AN0118	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northwest	11	Assunpink Creek at Windsor Rd in Washington	AN0109A	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northwest	11	Assunpink Creek near Clarksville	01463620, 11-AS-2	Arsenic	High	NJDEP/USGS, Metal Recon
Northwest	11	Assunpink Creek near Clarksville	01463620, 11-AS-2	Cadmium	High	NJDEP/USGS, Metal Recon
Northwest	11	Assunpink Creek near Clarksville	01463620, 11-AS-2	Copper	High	NJDEP/USGS, Metal Recon
Northwest	11	Assunpink Creek near Clarksville	01463620, 11-AS-2	Lead	High	NJDEP/USGS, Metal Recon
Northwest	11	Assunpink Creek near Clarksville	01463620, 11-AS-2	Mercury	High	NJDEP/USGS, Metal Recon
Northwest	11	Assunpink Creek near Edinburg	11-AS-4	Arsenic	High	NJDEP Metal Recon
Northwest	11	Assunpink Creek near Edinburg	11-AS-4	Cadmium	High	NJDEP Metal Recon
Northwest	11	Assunpink Creek near Edinburg	11-AS-4	Copper	High	NJDEP Metal Recon
Northwest	11	Assunpink Creek near Edinburg	11-AS-4	Lead	High	NJDEP Metal Recon
Northwest	11	Assunpink Creek near Edinburg	11-AS-4	Mercury	High	NJDEP Metal Recon
Northwest	11	Assunpink Creek Trib near Assunpink WMA office in Millstone	AN0109T	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northwest	11	Assunpink Lake-11	Assunpink Lake	Mercury	High	NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring
Atlantic Coast	14	Atco Lake-14	MHAATCOL	Pineland Biological Community	Low	Pinelands
Atlantic Coast	15	Atlantic City Reservoir-15	Atlantic City Reservoir	Mercury	High	NJDEP Fish Tissue Monitoring
Atlantic Ocean	Atlantic Ocean	Atlantic Ocean	All (Long Branch to Cape May)	Dissolved Oxygen	Medium	NJDEP Shellfish Monitoring, Bureau of Marine Water Monitoring, USEPA-Region II
Atlantic Ocean	Atlantic Ocean	Atlantic Ocean	Asbury Park Offshore-93,95,97,98,100,102,104; Atlantic Ocean-6,12; Atlantic Ocean Sea Isle-16; NJ Atlantic Ocean-53, 59; Cape May Channel-7	Total Coliform	High	NJDEP Shellfish Monitoring, Bureau of Marine Water Monitoring, USEPA-Region II
Atlantic Coast	14	Atsion Lake-14	Atsion Lake	Mercury	High	NJDEP Clean Lakes, Southern Region,NJDEP Fish Tissue Monitoring, Pinelands
Atlantic Coast	15	Babcock Creek near Mays Landing	01411196	pH	Medium	NJDEP/USGS Data
Raritan	08	Back Brook at Rt 609 in East Amwell	AN0335	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	20	Back Creek at Yardville-Hamilton Sq Rd in Hamilton	AN0131A	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	20	Bacon Run at Georgetown - Bordentown Rd in Georgetown	AN0133A	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	20	Bacons Creek near Mansfield Square	01464529	pH	Medium	NJDEP/USGS Data
Atlantic Coast	14	Ballanger Creek Estuary	2003D, 2003H	Total Coliform	High	NJDEP Shellfish Monitoring

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Region	WMA	Station Name/Waterbody	Site ID #	Impairment	Priority	Data Source
Atlantic Coast	13	Bamber Lake-13	Bamber Lake - East Lake and West Lake	Fecal Coliform	High	Ocean Co HD
Raritan	09	Barclay Brook near Englishtown	01405285	pH	Medium	NJDEP/USGS Data
Lower Delaware	20	Barkers Brook at Jacksonville-Smithville Rd in Springfield	AN0141O	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	20	Barkers Brook N Br near Jobstown	01464583	pH	Medium	NJDEP/USGS Data
Lower Delaware	20	Barkers Brook N Br near Jobstown	01464583	Phosphorus	Medium	NJDEP/USGS Data
Atlantic Coast	13	Barnegat Bay	Barnegat Bay-1 thru 5, 7 thru 31, 33 thru 41	Total Coliform	High	NJDEP Coastal Monitoring, Shellfish Monitoring
Atlantic Coast	12	Barren Neck Brook at Long Bridge Rd in Colts Neck	56	Phosphorus	Medium	Monmouth Co HD
Lower Delaware	17	Barrett Run at Bridgeton	01413013	Phosphorus	Medium	NJDEP/USGS Data
Lower Delaware	17	Barrett Run at W Ave in Bridgeton	AN0714	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	19	Barton Run at Tuckerton Rd in Medford	AN0166, WBATUCKE	Pineland Biological Community	Low	NJDEP AMNET, Pinelands
Lower Delaware	19	Barton Run at Tuckerton Rd on Hoot Owl Estate	EWQ0166	pH	Medium	EWQ
Lower Delaware	19	Barton Run below Jennings Lake	WBAJENNS	Pineland Biological Community	Low	Pinelands
Lower Delaware	19	Barton Run impoundment above Tuckerton Rd (Lake 1523-19)	WBACONDO	Pineland Biological Community	Low	Pinelands
Atlantic Coast	14	Bass River E Br near New Gretna	01410150, 14-EBR-1	Copper	High	NJDEP/USGS Data, Metal Recon
Atlantic Coast	14	Bass River E Br near New Gretna	01410150, 14-EBR-1	Lead	High	NJDEP/USGS Data, Metal Recon
Atlantic Coast	14	Bass River E Br near New Gretna	01410150, 14-EBR-1	Zinc	High	NJDEP/USGS Data, Metal Recon
Atlantic Coast	14	Bass River Estuary	2007B, 2007C, 2007D, 2007E	Total Coliform	High	NJDEP Shellfish Monitoring
Atlantic Coast	14	Batsto Lake-14	Batsto Lake	Mercury	High	NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring, Pinelands
Atlantic Coast	14	Batsto River at Batsto	01409500, 14-BAT-1	Copper	High	NJDEP/USGS Data, Metal Recon
Atlantic Coast	14	Batsto River at Batsto	01409500, 14-BAT-1	pH	Medium	NJDEP/USGS Data, Metal Recon
Atlantic Coast	14	Batsto River at Hampton Furnace	01409432	pH	Medium	USGS/Pinelands Data
Atlantic Coast	14	Batsto River at Quaker Bridge	01409470	pH	Medium	USGS/Pinelands Data
Raritan	10	Bear Brook at Stobbe Ln in West WIndsor	AN0384	Unknown Toxicity	Low	NJDEP AMNET
Northwest	01	Bear Creek at Dark Moon Rd in Frelinghuysen	AN0040A	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northwest	01	Bear Creek near Alphano in Allamuchy	AN0040	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	08	Beaver Brook at Lehigh St in Clinton	AN0324	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	06	Beaver Brook at Morris Ave in Denville	AN0246	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northwest	02	Beaver Run at Cemetery Rd in Wantage	AN0301	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	13	Beaverdam Creek Estuary	1401C, 1401D, 1600, 1600A, 1600B	Total Coliform	High	NJDEP Shellfish Monitoring
Atlantic Coast	14	Beaverdam Lake-14	MWIBEAVR	Pineland Biological Community	Low	Pinelands
Lower Delaware	17	Beck Creek Estuary	3801D-I	Total Coliform	High	NJDEP Shellfish Monitoring
Raritan	10	Beden Brook at Great Rd in Blawenburg	AN0401B	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	10	Bedens Brook at Aunt Molly Rd (abv STP) in Hopewell	AN0398	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	10	Bedens Brook at Rt 206 in Montgomery	AN0401	Benthic Macroinvertebrates	Low	NJDEP AMNET

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Region	WMA	Station Name/Waterbody	Site ID #	Impairment	Priority	Data Source
Raritan	10	Bedens Brook near Rocky Hill	01401600, 10-BED-2, 10-BED-3	Arsenic	High	NJDEP/USGS Data, EWQ, Metal Recon
Raritan	10	Bedens Brook near Rocky Hill	01401600, 10-BED-2, 10-BED-3	Lead	High	NJDEP/USGS Data, EWQ, Metal Recon
Raritan	10	Bedens Brook near Rocky Hill	01401600, 10-BED-2, 10-BED-3	Phosphorus	High	NJDEP/USGS Data, EWQ, Metal Recon
Northeast	03	Belchers Brook at Union Valley Rd in West Milford	AN0255C	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	05	Berry's Creek	Berry's Creek Reach 02030103-034	Arsenic	High	Remanded 303d List, (F.R. V.66, #195, 10/9/01)
Northeast	05	Berry's Creek	Berry's Creek Reach 02030103-034	Copper	High	Remanded 303d List, (F.R. V.66, #195, 10/9/01)
Northeast	05	Berry's Creek	Berry's Creek Reach 02030103-034	Lead	High	Remanded 303d List, (F.R. V.66, #195, 10/9/01)
Northeast	05	Berry's Creek	Berry's Creek Reach 02030103-034	Mercury	High	Remanded 303d List, (F.R. V.66, #195, 10/9/01)
Northeast	05	Berry's Creek	Berry's Creek Reach 02030103-034	PCB	High	Remanded 303d List, (F.R. V.66, #195, 10/9/01)
Atlantic Coast	16	Bidwell Ditch-Tidal	R39	Dissolved Oxygen	Medium	NJDEP Coastal Monitoring, Shellfish Monitoring
Raritan	10	Big Bear Brook at Old Trenton Rd (Rt 535) in West Windsor	AN0383	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	10	Big Bear Brook at Old Trenton Rd (Rt 535) in West Windsor	AN0383	Unknown Toxicity	Low	
Atlantic Coast	12	Big Brook at Colts Neck	EWQ0470, 21, 57	Phosphorus	Medium	EWQ, Monmouth Co HD
Atlantic Coast	12	Big Brook at Cross Rd in Colts Neck	AN0470	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	14	Big Creek Estuary	1924A, 1924B	Total Coliform	High	NJDEP Shellfish Monitoring
Atlantic Coast	16	Big Elder Creek Estuary	3136	Total Coliform	High	NJDEP Shellfish Monitoring
Lower Delaware	18	Big Timber Creek	Big Timber Creek	Mercury	High	NJDEP Fish Tissue Monitoring
Lower Delaware	18	Big Timber Creek N Br at Glendora	01467359	Phosphorus	Medium	NJDEP/USGS Data
Lower Delaware	18	Big Timber Creek N Br at Park Ave in Lindenwold	AN0661	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	18	Big Timber Creek N Br at Rt 168 In Gloucester	AN0663	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	18	Big Timber Creek S Br at Almonesson Rd in Blenheim	EWQ0659	Phosphorus	Medium	EWQ
Lower Delaware	18	Big Timber Creek S Br at Blackwood Terrace	01467329, 18-BIG-1	Phosphorus	Medium	NJDEP/USGS Data, Metal Recon
Lower Delaware	18	Big Timber Creek S Br at Turnersville - Sicklerville Rd in Washington	AN0658	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	12	Birch Swamp Brook	Adjacent to Matawan Creek Reach 02030104-328-0.42	Arsenic	High	Remanded 303d List, (F.R. V.66, #195, 10/9/01)
Atlantic Coast	12	Birch Swamp Brook	Adjacent to Matawan Creek Reach 02030104-328-0.42	Copper	High	Remanded 303d List, (F.R. V.66, #195, 10/9/01)
Atlantic Coast	12	Birch Swamp Brook	Adjacent to Matawan Creek Reach 02030104-328-0.42	Lead	High	Remanded 303d List, (F.R. V.66, #195, 10/9/01)
Atlantic Coast	12	Birch Swamp Brook	Adjacent to Matawan Creek Reach 02030104-328-0.42	PCB	High	Remanded 303d List, (F.R. V.66, #195, 10/9/01)
Northeast	06	Black Brook at Madison	01378855	Arsenic	High	NJDEP/USGS Data
Northeast	06	Black Brook at Madison	01378855	Phosphorus	High	NJDEP/USGS Data
Northeast	06	Black Brook at New Vernon Rd in Long Hill	AN0223	Benthic Macroinvertebrates	Low	NJDEP AMNET

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Region	WMA	Station Name/Waterbody	Site ID #	Impairment	Priority	Data Source
Northeast	06	Black Brook at Southern Blvd in Chatham	AN0222	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northwest	02	Black Creek at Marker Rd in Vernon	AN0296	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northwest	02	Black Creek at Rt 94/517 in Vernon	Wallkill F	Phosphorus	Medium	Sussex MUA
Northwest	02	Black Creek at Rt 94/517 in Vernon	Wallkill F	Temperature	Medium	Sussex MUA
Northwest	02	Black Creek at Sandhill Rd in Vernon	Wallkill G	Dissolved Oxygen	Medium	Sussex MUA
Northwest	02	Black Creek near Vernon	01368950, Wallkill H	Phosphorus	Medium	NJDEP/USGS Data, EWQ, Sussex MUA
Lower Delaware	20	Blacks Creek at Chesterfield - Georgetown Rd	01464527	Phosphorus	Medium	NJDEP/USGS Data
Lower Delaware	20	Blacks Creek at Chesterfield - Georgetown Rd in Chesterfield	AN0132	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	17	Blackwater Branch at Main Rd in Franklin	AN0738	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	17	Blackwater Branch at Maurice River Pkwy in Vineland	AN0739	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	14	Blue Anchor Brook above Pump Branch	NBLCONFL	Pineland Biological Community	Low	Pinelands
Atlantic Coast	14	Blue Anchor Brook at Elm	0140940950	pH	Medium	NJDEP/USGS Data
Atlantic Coast	14	Blue Anchor Brook impoundment above Rt 30 (Lake 1950-14)	NBLSPRNG	Pineland Biological Community	Low	Pinelands
Northeast	06	Boonton Reservoir-06	Boonton Reservoir	Mercury	High	NJDEP Fish Tissue Monitoring
Atlantic Coast	12	Bordons Brook at Rt 520 in Holmdel	54	Phosphorus	Medium	Monmouth Co HD
Raritan	09	Bound Brook	Bound Brook	Dioxin	High	NJDEP Fish Tissue Monitoring
Raritan	09	Bound Brook	Bound Brook	PCB	High	NJDEP Fish Tissue Monitoring
Raritan	09	Bound Brook at Bound Brook Rd in Middlesex	AN0424	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	09	Bound Brook at Middlesex	01403900	Phosphorus	High	NJDEP/USGS Data
Raritan	09	Bound Brook at Middlesex	01403900	Total Suspended Solids	Medium	NJDEP/USGS Data
Raritan	09	Bound Brook at Route 28 at Middlesex	01403385	Phosphorus	High	NJDEP/USGS Data
Raritan	09	Bound Brook at Woodbrook Rd in South Plainfield	AN0424B	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	15	Braddock Lake-15	Collings Lakes #1 (Braddock)	Fecal Coliform	High	Atlantic Co HD
Atlantic Coast	12	Branchport Creek-Tidal	45, R05	Fecal Coliform	High	Monmouth Co HD, NJDEP Coastal Monitoring
Atlantic Coast	12	Brown Avenue Beach (Spring Lake)	Brown Avenue Beach (Spring Lake)	Fecal Coliform	High	Cooperative Coastal Monitoring Program
Northeast	03	Bubbling Springs-03	Bubbling Springs	Fecal Coliform	High	Passaic Co HD
Lower Delaware	17	Buckshutem Creek near Laurel Lake	01411950	Fecal Coliform	High	NJDEP/USGS Data
Raritan	08	Budd Lake-08	Mt. Olive Municipal Beach, Budd Lake	Fecal Coliform	High	Mount Olive HD, NJDEP Fish Tissue Monitoring
Raritan	08	Budd Lake-08	Mt. Olive Municipal Beach, Budd Lake	Mercury	High	Mount Olive HD, NJDEP Fish Tissue Monitoring
Lower Delaware	19	Budds Run at Main St in Pemberton	AN0150, NBURT616	Pineland Biological Community	Low	NJDEP AMNET, Pinelands
Atlantic Coast	15	Buena Vista CG-15	Buena Vista CG	Fecal Coliform	High	Atlantic Co HD
Lower Delaware	17	Burnt Mill Branch at Forest Grove Rd in Newfield	AN0734A	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	13	Butterfly Pond-13	Butterfly Bogs Pond	Mercury	High	NJDEP Fish Tissue Monitoring
Raritan	08	Cakepoulin Creek	Cakepoulin Creek Reach 02030105-043-0.00	DDT	High	Remanded 303d List, (F.R. V.66, #195, 10/9/01)

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Region	WMA	Station Name/Waterbody	Site ID #	Impairment	Priority	Data Source
Raritan	08	Cakepoulin Creek at Lansdown Rd near Lansdown	01396900	Phosphorus	Medium	NJDEP/USGS Data
Lower Delaware	19	Camp Darkwaters	Camp Darkwaters	Fecal Coliform	High	
Northeast	06	Camp Lewis-06	Camp Lewis	Fecal Coliform	High	Rockaway Twp HD
Northeast	03	Cannistear Reservoir-03	Cannistear Reservoir	Mercury	High	NJDEP Fish Tissue Monitoring
Northeast	06	Canoe Brook at Parsonage Hill Rd in Millburn	AN0231D	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	17	Canton Drain at Maskell Mill	01413065	pH	Medium	NJDEP/USGS Data
Lower Delaware	17	Canton Drain Estuary	Canton Drain Estuary	Total Coliform	High	NJDEP Shellfish Monitoring
Atlantic Coast	16	Cape May Canal	1319B-D	Total Coliform	High	NJDEP Shellfish Monitoring
Atlantic Coast	13	Carasaljo Lake-13	Lake Carasalijo North Beach and South Beach	Fecal Coliform	High	Ocean Co HD, NJDEP Clean Lakes
Raritan	10	Carnegie Lake-10	Carnegie Lake	Mercury	High	NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring
Lower Delaware	17	Cedar Branch at Italia Ave in Vineland	AN0757	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	13	Cedar Bridge Branch at Moore Rd in Brick	AN0514	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	09	Cedar Brook at Cedarbook Ave in So. Plainfield	AN0424A	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	14	Cedar Brook at Myrtle Ave in Hammonton	ANO575, NCEAIRPO	Pineland Biological Community	Low	NJDEP AMNET, Pinelands
Atlantic Coast	13	Cedar Creek Estuary	R12, Cedar Creek-1	Total Coliform	High	NJDEP Coastal Monitoring, Shellfish Monitoring
Lower Delaware	17	Cedar Creek Estuary	3805C, 3805J, 3805L, 3805M	Total Coliform	High	NJDEP Shellfish Monitoring
Atlantic Coast	15	Cedar Lake-15	Cedar Lake	Mercury	High	NJDEP Fish Tissue Monitoring
Lower Delaware	17	Cedar Lake-17	Cedar Lake	Fecal Coliform	High	Cumberland Co HD
Atlantic Coast	13	Cedar Run at Rt 9 in Stafford	AN0556	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	13	Cedar Run-Tidal	R17	Total Coliform	High	NJDEP Coastal Monitoring, Shellfish Monitoring
Atlantic Coast	13	Ceder Creek Estuary	1702	Total Coliform	High	NJDEP Shellfish Monitoring
Atlantic Coast	12	Chingarora Creek-Tidal	36, R64	Dissolved Oxygen	Medium	Monmouth Co HD, NJDEP Coastal Monitoring
Atlantic Coast	12	Chingarora Creek-Tidal	36, R64	Fecal Coliform	High	Monmouth Co HD, NJDEP Coastal Monitoring
Lower Delaware	18	Clementon Lake-18	Clementon Lake	Mercury	High	NJDEP Fish Tissue Monitoring
Northeast	03	Clinton Brook below Clinton Reservoir	PQ16	Temperature	High	Pequannock River Coalition
Northeast	03	Clinton Reservoir-03	Clinton Reservoir	Mercury	High	NJDEP Freshwater Fisheries, NJDEP Fish Tissue Monitoring
Northwest	02	Clove Brook at Loomis Ave in Sussex	AN0309	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northwest	01	Clove Brook at Rt 23 in Montague	AN0002	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northwest	02	Clove Brook UNK Trib at Rose Marrow Ave in Wantage	AN0308	Unknown Toxicity	Low	NJDEP AMNET
Northwest	02	Clove Lake-02	Clove Lake	Phosphorus	High	NJDEP Clean Lakes
Atlantic Coast	13	Coastal Tributaries-Tidal	1667, 1670, 1672, 1711E, 1918, 1377, 1378	Total Coliform	High	NJDEP Shellfish Monitoring
Lower Delaware	17	Cohansey River at Rt 540 in Upper Deerfield	AN0710	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	17	Cohansey River at Seeley	01412800, 17-COH-1	Lead	High	NJDEP/USGS Data, Metal Recon
Lower Delaware	17	Cohansey River at Seeley	01412800, 17-COH-1	pH	Medium	NJDEP/USGS Data, Metal Recon

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Region	WMA	Station Name/Waterbody	Site ID #	Impairment	Priority	Data Source
Lower Delaware	17	Cohansey River at Seeley	01412800, 17-COH-1	Phosphorus	Medium	NJDEP/USGS Data, Metal Recon
Lower Delaware	17	Cohansey River at Silver Lk Rd in Upper Deerfield	AN0712	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	17	Cohansey River Estuary	Cohansey River Estuary	Total Coliform	High	NJDEP Shellfish Monitoring
Northeast	05	Coles Brook at Hackensack	01378560	Phosphorus	Medium	NJDEP/USGS Data
Northeast	06	Community Assoc. of Prospect Point	Community Assoc. of Prospect Point	Fecal Coliform	High	
Atlantic Coast	12	Como Lake-12	Como Lake	Phosphorus	Medium	NJDEP Clean Lakes
Northeast	06	Conference Center Left and Right	Conference Center Left and Right	Fecal Coliform	High	
Lower Delaware	18	Cooper River at Haddonfield	01467150, 01467140, 18-CO-4	Arsenic	High	NJDEP/USGS Data, Metal Recon
Lower Delaware	18	Cooper River at Haddonfield	01467150, 01467140, 18-CO-4	Lead	High	NJDEP/USGS Data, Metal Recon
Lower Delaware	18	Cooper River at Haddonfield	01467150, 01467140, 18-CO-4	Phosphorus	High	NJDEP/USGS Data, Metal Recon
Lower Delaware	18	Cooper River at Haddonfield	01467150, 01467140, 18-CO-4	Tetrachloroethylene	High	NJDEP/USGS Data, Metal Recon
Lower Delaware	18	Cooper River at Hopkins Pond	Cooper River	Dioxin	High	NJDEP Fish Tissue Monitoring
Lower Delaware	18	Cooper River at Hopkins Pond	Cooper River	PCB	High	NJDEP Fish Tissue Monitoring
Lower Delaware	18	Cooper River at Kaighn Ave in Camden	01467191	pH	Medium	EWQ
Lower Delaware	18	Cooper River at Kaighn Ave in Camden	01467191	Phosphorus	High	EWQ
Lower Delaware	18	Cooper River at Lindenwold	01467120	Phosphorus	High	NJDEP/USGS Data
Lower Delaware	18	Cooper River at Rt 130 at Camden	18-CO-1	Arsenic	High	NJDEP Metal Recon
Lower Delaware	18	Cooper River at Rt 130 at Camden	18-CO-1	Lead	High	NJDEP Metal Recon
Lower Delaware	18	Cooper River at Rt 130 at Camden	18-CO-1	Mercury	High	NJDEP Metal Recon
Lower Delaware	18	Cooper River at Rt 130 at Camden	18-CO-1	Tetrachloroethylene	High	NJDEP Metal Recon
Lower Delaware	18	Cooper River Lake-18	Cooper River Lake	Dioxin	High	NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring
Lower Delaware	18	Cooper River Lake-18	Cooper River Lake	PCB	High	NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring
Lower Delaware	18	Cooper River N Br at Kresson	01467155, 18-CO-2	Arsenic	High	NJDEP/USGS Data, Metal Recon
Lower Delaware	18	Cooper River N Br at Kresson	01467155, 18-CO-2	Dissolved Oxygen	Medium	NJDEP/USGS Data, Metal Recon
Lower Delaware	18	Cooper River N Br at Kresson	01467155, 18-CO-2	pH	Medium	NJDEP/USGS Data, Metal Recon
Lower Delaware	18	Cooper River N Br at Kresson	01467155, 18-CO-2	Phosphorus	High	NJDEP/USGS Data, Metal Recon
Lower Delaware	18	Cooper River N Br at River Dr in Cherry Hill	AN0188	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	18	Cooper River N Br at Springdale Rd in Cherry Hill	AN0187	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	18	Cooper River S Br at Evesham Rd in Cherry Hill	AN0190	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	18	Cooper River S Br at Gibbsboro Rd in Gibbsboro	AN0189	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	18	Cooper River, spillway below Evans Pond	Cooper River	Dioxin	High	NJDEP Fish Tissue Monitoring
Lower Delaware	18	Cooper River, spillway below Evans Pond	Cooper River	PCB	High	NJDEP Fish Tissue Monitoring
Atlantic Coast	16	Cordery Creek Estuary	2308	Total Coliform	High	NJDEP Shellfish Monitoring
Atlantic Coast	16	Corson Sound	Crook Horn Creek-1,2; Corson Sound-6,9; Whale Creek-10,11; Ludlam Bay-7; Unnamed Creek-13	Total Coliform	High	NJDEP Shellfish Monitoring
Northeast	06	Cozy Lake-06	Cozy Lakers	Fecal Coliform	High	Jefferson Twp HD
Lower Delaware	20	Crafts Creek at Island Rd in Mansfield	AN0136	Benthic Macroinvertebrates	Low	NJDEP AMNET

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Region	WMA	Station Name/Waterbody	Site ID #	Impairment	Priority	Data Source
Northwest	01	Cranberry Lake-01	Cranberry Lake	Mercury	High	Sussex Co HD, NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring
Raritan	10	Cranbury Book near Prospect Plains	01400690	pH	Medium	NJDEP/USGS Data, EWQ
Raritan	10	Monearoe	AN0385	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	10	Cranbury Brook at Edgemere Ave in Plainsboro	AN0386	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	15	Cranes Lake-15	Hospitality Creek Campground	Fecal Coliform	High	Gloucester Co HD
Northwest	01	Crater Lake-01	Crater Lake	Mercury	High	NJDEP Fish Tissue Monitoring
Atlantic Coast	16	Creesse Creek Estuary	3413A, 3500B, 3500C	Total Coliform	High	NJDEP Shellfish Monitoring
Raritan	08	Cross Roads Outdoor Ministries (Camp Beisler)	Cross Roads Outdoor Ministries (Camp Beisler)	Fecal Coliform	High	
Lower Delaware	20	Crosswicks Creek	Crosswicks Creek	Mercury	High	NJDEP Fish Tissue Monitoring
Lower Delaware	20	Crosswicks Creek at Extonville	01464500, 20-CRO-1	Fecal Coliform	High	NJDEP/USGS Data, Metal Recon
Lower Delaware	20	Crosswicks Creek at Extonville	01464500, 20-CRO-1	Phosphorus	Medium	NJDEP/USGS Data, Metal Recon
Lower Delaware	20	Crosswicks Creek at Groveville Rd at Groveville	01464504, 20-CRO-2	Phosphorus	Medium	NJDEP/USGS Data, Metal Recon
Lower Delaware	20	Crosswicks Creek at Main St in Hamilton	AN0126	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	20	Crosswicks Creek at Rt 528 (blw Oakford Lk) in New Egypt	AN0121D	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	20	Crosswicks Creek at Rt 537 in Plumsted	AN0121	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	20	Crosswicks Creek at Walnford Rd in Upper Freehold	2	Phosphorus	Medium	Monmouth Co HD
Lower Delaware	20	Crosswicks Creek near New Egypt	01464420	Phosphorus	Medium	NJDEP/USGS Data
Lower Delaware	20	Crosswicks Creek Trib S at Cookstown - New Egypt Rd in Cookstown	AN0121B	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	20	Crosswicks Creek UNK Trib at Iron Bridge Rd in Chesterfield	AN0126A	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	03	Crystal Lake-03	Crystal Lake (Ramapo Mountain Lakes, Inc.)	Fecal Coliform	High	Bergen Co HD
Lower Delaware	20	Crystal Lake-20	Crystal Lake	Mercury	High	NJDEP Fish Tissue Monitoring
Northwest	02	Crystal Springs-02	Crystal Springs: The Quarry	Fecal Coliform	High	Sussex Co HD
Atlantic Coast	15	Cushman Lake-15	Collings Lakes #2 (Jays Lake North), Collings Lakes #3 (Jays Lake South)	Fecal Coliform	High	Atlantic Co HD
Northeast	03	Dam Brook Trib to Pompton River at Ryerson Rd in Lincoln Park	AN0269	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	09	Davidsons Mill Pond-09	Davidsons Mill Pond	Fish Community	Low	NJDEP Clean Lakes, Freshwater Fisheries
Northeast	06	Dead River at King George Rd in Bernards	AN0227	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	06	Dead River near Millington	01379200	Nitrate	High	NJDEP/USGS Data
Northeast	06	Dead River near Millington	01379200	Phosphorus	High	NJDEP/USGS Data
Northeast	06	Dead River near Millington	01379200	Total Suspended Solids	Medium	NJDEP/USGS Data
Atlantic Coast	12	Deal Lake-12	1, Deal Lake	Fecal Coliform	High	NJDEP Clean Lakes, Monmouth Co HD
Atlantic Coast	12	Debois Creek at Strickland Rd in Freehold	AN0487	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	09	Deep Run at Rt 516 in Old Bridge	AN0454	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	09	Deep Run at Rt 516 in Old Bridge	EWQ0454	pH	Medium	EWQ

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Raritan	09	Deep Run at Rt 9 in Old Bridge	AN0453	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	04	Deepavaal Brook at Ltl Falls Ave in Fairfield	AN0271	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	13	Deer Head Lake-13	Deer Head - Upper Beach	Fecal Coliform	High	Sussex Co HD
Northwest	02	Deer Trail Lake-02	Deer Trail Lake	Fecal Coliform	High	Sparta Twp HD
Delaware	17	Delaware Bay	Delaware Bay East-5,16,17; Dennis Ck 12; Delaware Bay Offshore-13; Cherry Tree Ck to Artificial Island-18; Delaware Bay Channel-22	Dissolved Oxygen	Medium	NJDEP Coastal Monitoring, Shellfish Monitoring, Fish Tissue Monitoring, DRBC
Delaware	17	Delaware Bay	Lower Maurice R-11	Fecal Coliform	High	NJDEP Coastal Monitoring, Shellfish Monitoring, Fish Tissue Monitoring, DRBC
Delaware	17	Delaware Bay	Delaware Bay-all	PCB	High	NJDEP Coastal Monitoring, Shellfish Monitoring, Fish Tissue Monitoring, DRBC
Delaware	17	Delaware Bay	Delaware Bay East-5,16,17; Delaware Bay Offshore-13; Delaware Bay Channel-21	Temperature	Medium	NJDEP Coastal Monitoring, Shellfish Monitoring, Fish Tissue Monitoring, DRBC
Delaware	17	Delaware Bay	Cherry Tree Ck to Artificial Island-2,4; Cohansey Cove-6; Back Ck-7; Dyer Cove-8; Delaware Bay Inshore-10; Lower Maurice R-11; Dennis Ck-12; Delaware Bay East-14,15	Total Coliform	High	NJDEP Coastal Monitoring, Shellfish Monitoring, Fish Tissue Monitoring, DRBC
Lower Delaware	17	Delaware Bay Tribs	Delaware River Tribs- All Tidal	Dioxin	High	NJDEP Fish Tissue Monitoring
Lower Delaware	17	Delaware Bay Tribs	Delaware River Tribs- All Tidal	PCB	High	NJDEP Fish Tissue Monitoring
Lower Delaware	17	Delaware Bay Tribs-Tidal	3841I-M, 3860B/C. 3862C/D,3884C/D	Total Coliform	High	NJDEP Coastal Monitoring, Shellfish Monitoring
Delaware	01	Delaware River Zone 1	Delaware River at Easton PA	Arsenic	High	304(l)
Delaware	01	Delaware River Zone 1	Delaware River at Easton PA	Cadmium	High	304(l)
Delaware	01	Delaware River Zone 1	Delaware River at Easton PA	Chromium	High	304(l)
Delaware	01	Delaware River Zone 1	Delaware River at Easton PA	Copper	High	304(l)
Delaware	01	Delaware River Zone 1	1D2, 1D3, 1D4, 1D5, 1D6	Dissolved Solids	Medium	DRBC
Delaware	01	Delaware River Zone 1	1D6, 1E2, 1E5	Fecal Coliform	High	DRBC
Delaware	01	Delaware River Zone 1	Delaware River at Easton PA	Lead	High	304(l)
Delaware	01	Delaware River Zone 1	Delaware River at Easton PA	Mercury	High	304(l)
Delaware	01	Delaware River Zone 1	Delaware River Zone 1	Mercury	High	NJDEP Fish Tissue Monitoring
Delaware	01	Delaware River Zone 1	1E4	pH	Medium	DRBC
Delaware	20	Delaware River Zone 2	Delaware River Zone 2, Reach 02040201-004	Cadmium	High	304(l)
Delaware	20	Delaware River Zone 2	Delaware River Zone 2, Reach 02040201-004	Mercury	High	304(l)
Delaware	20	Delaware River Zone 3	Delaware River Zone 3, Reach 02040202-035	Arsenic	High	304(l)
Delaware	20	Delaware River Zone 3	Delaware River Zone 3, Reach 02040202-030	Cadmium	High	304(l)
Delaware	20	Delaware River Zone 3	Delaware River Zone 3, Reach 02040202-035	Cadmium	High	304(l)
Delaware	20	Delaware River Zone 3	Delaware River Zone 3	Dissolved Oxygen	Medium	DRBC

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Delaware	20	Delaware River Zone 3	Delaware River Zone 3, Reach 02040202-035	Mercury	High	304(l)
Delaware	20	Delaware River Zone 3	Delaware River Zone 3	Temperature	Medium	DRBC
Delaware	18	Delaware River Zone 4	Delaware River Zone 4	Copper	High	DRBC
Delaware	18	Delaware River Zone 4	Delaware River Zone 4	Temperature	Medium	DRBC
Delaware	18	Delaware River, Lower	Delaware River (Camden to Delaware State Line)	Mercury	High	NJDEP Fish Tissue Monitoring
Delaware	20	Delaware River/Estuary	Delaware River/Estuary (Trenton to Delaware Bay)	DDT, DDE, DDD	High	DRBC, NJDEP Fish Tissue Monitoring
Delaware	20	Delaware River/Estuary	Delaware River/Estuary (Easton, PA to Delaware Bay and Tidal Tribs)	Dioxin	High	NJDEP Fish Tissue Monitoring
Delaware	20	Delaware River/Estuary	Delaware River/Estuary (Trenton to Delaware Bay)	Mercury	High	DRBC, NJDEP Fish Tissue Monitoring
Delaware	20	Delaware River/Estuary	Delaware River/Estuary (Easton, PA to Delaware Bay and Tidal Tribs)	PCB	High	NJDEP Fish Tissue Monitoring
Delaware	20	Delaware River/Estuary	Delaware River/Estuary (Trenton to Delaware Bay)	Zinc	High	DRBC, NJDEP Fish Tissue Monitoring
Atlantic Coast	16	Dennis Creek Estuary	1888M-V	Total Coliform	High	NJDEP Shellfish Monitoring
Atlantic Coast	16	Dennis Creek Trib 2 at Dennisville	01411428	pH	Medium	NJDEP/USGS Data
Atlantic Coast	16	Dennis Creek-Tidal	R38	Dissolved Oxygen	Medium	NJDEP Coastal Monitoring
Raritan	10	Devils Brook at New Rd in South Brunswick	AN0387	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	10	Devils Brook at Schalk's Rd in Plainsboro	AN0389	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	09	Devoe Lake-09	Devoe Lake	Mercury	High	NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring
Atlantic Coast	13	Dinner Point Creek Estuary	1713, 1713A, 1713B	Total Coliform	High	NJDEP Shellfish Monitoring
Lower Delaware	17	Dividing Creek Estuary	3840B, 3840C, 3840D, 3840E, 3840F, R44	Dissolved Oxygen	Medium	NJDEP Coastal Monitoring, Shellfish Monitoring
Lower Delaware	17	Dividing Creek Estuary	3840B, 3840C, 3840D, 3840E, 3840F, R44	Total Coliform	High	NJDEP Coastal Monitoring, Shellfish Monitoring
Lower Delaware	20	Doctors Creek at Allentown	01464515	Phosphorus	Medium	NJDEP/USGS Data
Lower Delaware	20	Doctors Creek at Breza Rd in Upper Freehold	AN0129, MB-123	Benthic Macroinvertebrates	Low	NJDEP AMNET, Monmouth Co HD
Lower Delaware	20	Doctors Creek at Route 539 in Upper Freehold	3	Phosphorus	Medium	Monmouth Co HD
Lower Delaware	20	Doctors Creek at Rt 130 in Hamilton	AN0130	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	20	Doctors Creek at Sharon Station Rd in Upper Freehold	MB-PARK1	Benthic Macroinvertebrates	Low	Monmouth Co HD
Lower Delaware	20	Doctors Creek at Spring Rd in Millstone	AN0127A	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	05	Dorotockys Run on Old Tappan Rd, Old Tappan	5-DOR-1	Arsenic	High	NJDEP Metal Recon
Northeast	05	Dorotockys Run on Old Tappan Rd, Old Tappan	5-DOR-1	Mercury	High	NJDEP Metal Recon
Atlantic Coast	13	Double Creek Estuary	1672, 1672A, 1673, 1673A	Total Coliform	High	NJDEP Shellfish Monitoring
Atlantic Coast	13	Double Trouble Lake-13	Double Trouble Lake	Mercury	High	NJDEP Fish Tissue Monitoring
Raritan	08	Drakes Brook at Emans Rd in Roxbury	AN0311	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	04	Dundee Lake-04	Dundee Lake	Mercury	High	NJDEP Fish Tissue Monitoring
Northwest	01	Dunnfield Creek at Dunnfield	01442760	pH	Medium	NJDEP/USGS Data
Northeast	05	Dwars Kill on Blanch Ave., Norwood	5-DWA-1	Mercury	High	NJDEP Metal Recon

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Atlantic Coast	16	East Creek Lake-16	East Creek Lake	Mercury	High	NJDEP Fish Tissue Monitoring
Lower Delaware	17	Eastern Gate Lake-17	Eastern Gate Lake	Fecal Coliform	High	Gloucester Co HD
Northeast	03	Echo Lake-03	Echo Lake Reservoir	Mercury	High	NJDEP Freshwater Fisheries, Atlantic Co HD, NJDEP Fish Tissue Monitoring
Raritan	09	Edmunds Creek	Adjacent to Mill Brook at 02030105-059-0.00; Trib to Lower Raritan River	PCB	High	Remanded 303d List, (F.R. V.66, #195, 10/9/01)
Lower Delaware	18	Edwards Run at Jefferson	01475090	Fecal Coliform	High	NJDEP/USGS Data
Lower Delaware	18	Edwards Run at Jefferson	01475090	Phosphorus	Medium	NJDEP/USGS Data
Lower Delaware	18	Edwards Run at Jessups Mill Rd in Mantua	AN0674	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	07	Elizabeth River at Lakeview Rd & Maple Terr in Union	AN0202X	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	07	Elizabeth River at Summer St in Hillside	AN0204X	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	07	Elizabeth River at Ursino Lk at Elizabeth	01393450, 7-ELI-2	Dissolved Solids	Medium	NJDEP/USGS Data, Metal Recon
Raritan	07	Elizabeth River at Ursino Lk at Elizabeth	01393450, 7-ELI-2	Phosphorus	Medium	NJDEP/USGS Data, Metal Recon
Raritan	07	Elizabeth River W Br near Union	01393350, 7-WBE-1	Phosphorus	Medium	NJDEP/USGS Data, Metal Recon
Atlantic Coast	14	Elm(James) Lake-14	NGREAR30	Pineland Biological Community	Low	Pinelands
Northeast	03	Erskine Lake-03	Erskine Little Beach, Main Beach, and Upper Beach	Fecal Coliform	High	Passaic Co HD
Raritan	10	Etra Lake-10	Etra Lake	Phosphorus	Medium	NJDEP Clean Lakes
Lower Delaware	18	Evans Pond-18	Evans Pond	Dioxin	High	NJDEP Fish Tissue Monitoring
Lower Delaware	18	Evans Pond-18	Evans Pond	PCB	High	NJDEP Fish Tissue Monitoring
Atlantic Coast	16	FishIng Creek at Rio Grande	01411400	pH	Medium	NJDEP/USGS Data
Atlantic Coast	16	Fishing Creek at Rt 47 in Middle	AN0771	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	16	Fishing Creek Estuary	Fishing Creek Estuary	Total Coliform	High	NJDEP Shellfish Monitoring
Atlantic Coast	12	Flat Creek at Middle Rd in Hazlet	AN0459	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	03	Forest Hill Lake-03	Forest Hill Park Beach, Forest Hill Park Inlet	Fecal Coliform	High	Passaic Co HD
Northwest	01	Forest Lake-01	Forest Lake: Boardwalk Beach, Cove Beach, Harbor View Beach, Main Beach	Fecal Coliform	High	Sussex Co HD
Atlantic Coast	13	Forked River Estuary	1661	Total Coliform	High	NJDEP Shellfish Monitoring
Lower Delaware	17	Fortescue Creek Estuary	3840L, 3862E, 3862G, 3862H, 3841K, 3841L, 3841M	Total Coliform	High	NJDEP Shellfish Monitoring
Northwest	01	Fox Hollow Lake-01	Fox Hollow Lake	Fecal Coliform	High	Sparta Twp HD
Northeast	06	Foxs Pond-06	Park Lake Beach, Inlet, and Swim Lanes	Fecal Coliform	High	Randoph Twp HD
Lower Delaware	17	Franklinville Lake-17	Franklinville Lake	Fecal Coliform	High	Gloucester Co HD
Northwest	01	Furnace Brook at Pequest Rd in White	AN0042	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northwest	01	Furnace Lake-01	Furnace Lake Beach	Fecal Coliform	High	Warren Co HD
Lower Delaware	17	Gandy's Beach	Gandy's Beach	Fecal Coliform	High	
Northeast	04	Goffle Brook at Wagaraw Rd in Hawthorne	AN0277	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	12	Gravelly Brook at Church St in Aberdeen	AN0457	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	12	Gravelly Brook at Lloyd Rd in Marlboro	20	Phosphorus	Medium	Monmouth Co HD

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Atlantic Coast	14	Great Bay	Great Bay-1,2,3: Great Bay	Total Coliform	High	NJDEP Coastal Monitoring, Shellfish Monitoring
Northeast	06	Great Brook at Woodland Rd (Gr Swamp WMA) in Harding	AN0219	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	15	Great Egg Harbor	Great Egg Harbor-1, 4 thru 11, and 13 thru 14	Total Coliform	High	NJDEP Coastal Monitoring, Shellfish Monitoring
Atlantic Coast	15	Great Egg Harbor	Ship Channel-12; Ocean City Bay-14	Dissolved Oxygen	Medium	NJDEP Coastal Monitoring, Shellfish Monitoring
Atlantic Coast	15	Great Egg Harbor River at Camden Co. Park in Berlin	AN0620A	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	15	Great Egg Harbor River at Folsom	01411000, 15-GEH-2	Copper	High	NJDEP/USGS Data, Metal Recon
Atlantic Coast	15	Great Egg Harbor River at Folsom	01411000, 15-GEH-2	Lead	High	NJDEP/USGS Data, Metal Recon
Atlantic Coast	15	Great Egg Harbor River at Folsom	01411000, 15-GEH-2	pH	Medium	NJDEP/USGS Data, Metal Recon
Atlantic Coast	15	Great Egg Harbor River at Weymouth	01411110, 15-GEH-3	Copper	High	NJDEP/USGS Data, Metal Recon
Atlantic Coast	15	Great Egg Harbor River at Weymouth	01411110, 15-GEH-3	pH	Medium	NJDEP/USGS Data, Metal Recon
Atlantic Coast	15	Great Egg Harbor River Estuary	Great Egg Harbor River Estuary	Arsenic	High	304(l)
Atlantic Coast	15	Great Egg Harbor River Estuary	Great Egg Harbor River Estuary	Cadmium	High	304(l)
Atlantic Coast	15	Great Egg Harbor River Estuary	Great Egg Harbor River Estuary	Chromium	High	304(l)
Atlantic Coast	15	Great Egg Harbor River Estuary	Great Egg Harbor River Estuary	Lead	High	304(l)
Atlantic Coast	15	Great Egg Harbor River Estuary	Great Egg Harbor River Estuary	Mercury	High	304(l)
Atlantic Coast	15	Great Egg Harbor River Estuary	Great Egg Harbor River Estuary	Zinc	High	304(l)
Atlantic Coast	15	Great Egg Harbor River Middle Estuary	2807A, 2807B, 2810, 2810A, 2812, 2805, 2806, 2808, 2808A	Total Coliform	High	NJDEP Shellfish Monitoring
Atlantic Coast	15	Great Egg Harbor River near Sicklerville	01410784, 15-GEH-1	Mercury	High	NJDEP/USGS Data, Metal Recon
Atlantic Coast	15	Great Egg Harbor River near Sicklerville	01410784, 15-GEH-1	pH	Medium	NJDEP/USGS Data, Metal Recon
Atlantic Coast	15	Great Egg Harbor River Trib at 2nd Ave in Hammonton	AN0635H	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	15	Great Egg Harbor River Upper Estuary	2812B, 2814,2814A, 2816,2816A, 2816B, 2818, 2818A, 2819, 2821,2821A, 2821B, 2821C, 2821D, 2822A, 2823A,2824A, 2824B, 2825, 2826,2826A, 2827,2827A	Total Coliform	High	NJDEP Shellfish Monitoring
Atlantic Coast	16	Great Sound	Gravens Thorofare-1; Long Reach-5; Holmes Cove-6	Total Coliform	High	NJDEP Coastal Monitoring, Shellfish Monitoring
Atlantic Coast	14	Great Swamp Branch at Rt 206 in Hammonton	AN0574, NGRMIDDL	Pineland Biological Community	Low	NJDEP AMNET, Pinelands
Atlantic Coast	14	Great Swamp Branch Below Rt 206 near Hammonton	0140941070	Nitrate	High	NJDEP/USGS Data
Atlantic Coast	14	Great Swamp Branch Below Rt 206 near Hammonton	0140941070	pH	Medium	NJDEP/USGS Data
Atlantic Coast	14	Great Swamp Branch Impoundment above Myrtle Street	NGRMYRTL	Pineland Biological Community	Low	Pinelands
Raritan	09	Green Brook at Apple Tree Rd in Watchung.	AN0421B	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	09	Green Brook at Clinton Ave in North Plainfield	AN0423	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	09	Green Brook at Main St in Bound Brook	AN0426	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	09	Green Brook at New Providence Rd in Seeleys Mill	AN0421A	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	09	Green Brook at off Mill Rd in Sebrings Mill	AN0426A	Benthic Macroinvertebrates	Low	NJDEP AMNET

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Raritan	09	Green Brook at Raymond Ave in Plainfield	AN0421	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	16	Green Creek at Rt 47 in Middle	AN0770	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	06	Green Pond Brook at Mt Pleasant Tnpk in Wharton	AN0242	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	03	Green Turtle Lake-03	Green Turtle Lake	Mercury	High	NJDEP Fish Tissue Monitoring
Northwest	01	Green Valley Beach Campground	Green Valley Beach Campground	Fecal Coliform	High	
Northeast	03	Greenwood Lake-03	Greenwood Lake	Dissolved Oxygen	High	Passaic Co HD, NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring
Northeast	03	Greenwood Lake-03	Greenwood Lake	Phosphorus	High	Passaic Co HD, NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring
Northeast	03	Greenwood Lake-03	Greenwood Lake	Sedimentation	Medium	Passaic Co HD, NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring
Lower Delaware	18	Grenloch Lake-18	Grenloch Lake	Phosphorus	Medium	NJDEP Clean Lakes
Atlantic Coast	13	Ground Hog Brook at Locust Ave in Howell	MB-139	Benthic Macroinvertebrates	Low	Monmouth Co HD
Raritan	10	Grove Mill Pond-10	Grovers Mill Pond	Mercury	High	NJDEP Fish Tissue Monitoring
Northeast	05	Hackensack River - Tidal	Hackensack River - Tidal	Dioxin	High	HEP (GLEC), EPA, 1999; NJDEP Fish Tissue Monitoring
Northeast	05	Hackensack River - Tidal	Hackensack River - Tidal	Mercury	High	HEP (GLEC), EPA, 1999; NJDEP Fish Tissue Monitoring
Northeast	05	Hackensack River - Tidal	Hackensack River - Tidal	PCB	High	HEP (GLEC), EPA, 1999; NJDEP Fish Tissue Monitoring
Northeast	05	Hackensack River at New Milford	01378500	Fecal Coliform	High	NJDEP/USGS Data
Northeast	05	Hackensack River at New Milford	01378500	Phosphorus	Medium	NJDEP/USGS Data
Northeast	05	Hackensack River at Old Tappan	01376970, 5-HAC-2	Arsenic	High	NJDEP/USGS Data, Metal Recon
Northeast	05	Hackensack River at Old Tappan Rd in Old Tappan	AN0205	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	05	Hackensack River at Rivervale	01377000, 5-HAC-3	Arsenic	High	NJDEP/USGS Data, Metal Recon
Northeast	05	Hackensack River at Rivervale	01377000, 5-HAC-3	Chromium	High	NJDEP/USGS Data, Metal Recon
Northeast	05	Hackensack River at Rivervale	01377000, 5-HAC-3	Copper	High	NJDEP/USGS Data, Metal Recon
Northeast	05	Hackensack River at Rivervale	01377000, 5-HAC-3	Lead	High	NJDEP/USGS Data, Metal Recon
Northeast	05	Hackensack River at Rivervale	01377000, 5-HAC-3	Mercury	High	NJDEP/USGS Data, Metal Recon
Northwest	01	Hainesville Pond-01	Hainesville Pond	Mercury	High	NJDEP Fish Tissue Monitoring
Northwest	11	Hakihokake Creek at Bridge St Bridge in Milford	DRBCNJ0023	Fecal Coliform	High	DRBC
Northwest	11	Hakihokake Creek at Bridge St Bridge in Milford	DRBCNJ0023	pH	Medium	DRBC
Northwest	11	Hakihokake Creek at Bridge St Bridge in Milford	DRBCNJ0023	Temperature	Medium	DRBC
Atlantic Coast	16	Hall Creek Estuary	Hall Creek Estuary	Total Coliform	High	NJDEP Shellfish Monitoring
Atlantic Coast	14	Hammonton Creek above Chestnut Avenue	LHACHEST	Pineland Biological Community	Low	Pinelands
Atlantic Coast	14	Hammonton Creek at Rt. 542 in Hammonton	AN0577A	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	14	Hammonton Creek at Westcoatville	01409416, 14-HAM-2, 14-HAM-1	Arsenic	High	NJDEP/USGS Data, Metal Recon
Atlantic Coast	14	Hammonton Creek at Westcoatville	01409416, 14-HAM-2, 14-HAM-1	Mercury	High	NJDEP/USGS Data, Metal Recon

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Atlantic Coast	14	Hammonton Creek at Westcoatville	01409416, 14-HAM-2, 14-HAM-1	Nitrate	High	NJDEP/USGS Data, Metal Recon
Atlantic Coast	14	Hammonton Creek at Westcoatville	01409416, 14-HAM-2, 14-HAM-1	pH	Medium	NJDEP/USGS Data, Metal Recon
Atlantic Coast	14	Hammonton Creek at Westcoatville	01409416, 14-HAM-2, 14-HAM-1	Phosphorus	Medium	NJDEP/USGS Data, Metal Recon
Atlantic Coast	14	Hammonton Lake-14	Hammonton Lake, Hammonton Bathing Beach (Center), (Left), and (Right), LHAMLAKE	Fecal Coliform	High	NJDEP Clean Lakes, Atlantic Co HD, Pinelands
Atlantic Coast	14	Hammonton Lake-14	Hammonton Lake, Hammonton Bathing Beach (Center), (Left), and (Right), LHAMLAKE	Pineland Biological Community	Low	NJDEP Clean Lakes, Atlantic Co HD, Pinelands
Atlantic Coast	12	Hannabrand Brook at Old Mill Rd near Sprink l	01407806, EWQ0484	Fecal Coliform	High	NJDEP/USGS Data, EWQ
Atlantic Coast	12	Hannabrand Brook at Old Mill Rd near Sprink l	01407806, EWQ0484	pH	Medium	NJDEP/USGS Data, EWQ
Atlantic Coast	14	Harrisville Lake-14	Harrisville Lake	Mercury	High	NJDEP Fish Tissue Monitoring
Lower Delaware	19	Haynes Creek at Himmelein Rd in Medford	AN0168, WHART623	Pineland Biological Community	Low	NJDEP AMNET, Pinelands
Atlantic Coast	14	Hays Mill Creek at Atco	01409401	pH	Medium	USGS/Pinelands Data
Atlantic Coast	14	Hays Mill Creek at Tremont Ave in Waterford	AN0565, MHATREMO	Pineland Biological Community	Low	NJDEP AMNET, Pinelands
Atlantic Coast	14	Hays Mill Creek near Chesilhurst	01409402	pH	Medium	USGS/Pinelands Data
Atlantic Coast	13	Haystack Brook at Maxim-Southard Rd (upstream) in Howell	MB-153, MB-154, AN0503	Benthic Macroinvertebrates	Low	Monmouth Co HD, NJDEP AMNET
Atlantic Coast	12	Hockhockson Brook at Hockhockson Rd in Colts Neck	AN0475	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	04	Hohokus Brook at Park Ave in Allendale	AN0285	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	04	Hohokus Brook at Spring St in Ridgewood Village	AN0288	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	04	Hohokus Brook at Spring St in Ridgewood Village	AN0288	Unknown Toxicity	Low	
Atlantic Coast	13	Holiday Lake-13	Ocean Acres Beach	Fecal Coliform	High	Ocean Co HD
Raritan	08	Holland Brook at S Br Rd in Branchburg	AN0343	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	17	Holly Green Campground Pond-17	Holly Green Campground	Fecal Coliform	High	Gloucester Co HD
Northwest	01	Honey Run near Hope	01445900	Dissolved Oxygen	Medium	NJDEP/USGS Data
Northwest	01	Honey Run near Hope	01445900	Fecal Coliform	High	NJDEP/USGS Data
Atlantic Coast	12	Hooks Creek Lake-12	Cheesequake SP Left and Right	Fecal Coliform	High	Shore Region
Atlantic Coast	12	Hop Brook at Roberts Rd in Holmdel	AN0465	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	12	Hop Brook at Willow Brook Rd in Holmdel	AN0466	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	14	Horse Pond Stream below Butterworth's Bogs Rd	BHOBUTTR	Pineland Biological Community	Low	Pinelands
Atlantic Coast	15	Hospitality Branch at Blue Bell Rd near Cecil	01411035	pH	Medium	NJDEP/USGS Data
Atlantic Coast	15	Hospitality Branch near Cecil	01411050	pH	Medium	NJDEP/USGS Data
Lower Delaware	17	Hudson Branch at Vineland	17-HUD-1	Arsenic	High	NJDEP Metal Recon
Lower Delaware	17	Hudson Branch at Vineland	17-HUD-1	Chromium	High	NJDEP Metal Recon
Northeast	05	Hudson River - NYC & Battery	HR1, HR2	Dioxin	High	EPA, HEP (GLEC), NJDEP Fish Tissue Monitoring
Northeast	05	Hudson River - NYC & Battery	HR1, HR2	PCB	High	EPA, HEP (GLEC), NJDEP Fish Tissue Monitoring
Northeast	05	Hudson River at G.W. Bridge	HR4	Dioxin	High	EPA, HEP (GLEC), NJDEP Fish Tissue Monitoring

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Northeast	05	Hudson River at G.W. Bridge	HR4	PCB	High	EPA, HEP (GLEC), NJDEP Fish Tissue Monitoring
Northeast	05	Hudson River near Yonkers	HR7	Dioxin	High	EPA, HEP (GLEC), NJDEP Fish Tissue Monitoring
Northeast	05	Hudson River near Yonkers	HR7	PCB	High	EPA, HEP (GLEC), NJDEP Fish Tissue Monitoring
Northeast	05	Hudson River- NYC Area	Hudson River- NYC Area	Dioxin	High	EPA, HEP (GLEC), NJDEP Fish Tissue Monitoring
Northeast	05	Hudson River- NYC Area	Hudson River- NYC Area	PCB	High	EPA, HEP (GLEC), NJDEP Fish Tissue Monitoring
Lower Delaware	17	Indian Branch at Rt 47 in Franklin	AN0724	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	17	Indian Branch at Sta Rd in Janvier (Franklin.)	AN0724A	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	17	Indian Branch near Malaga	01411466	pH	Medium	NJDEP/USGS Data
Northeast	06	Indian Lake-06	Indian Clubhouse, Indian Franklin, Indian Main	Fecal Coliform	High	Denville HD
Atlantic Coast	14	Indian Mills Brook at Indian Mills	01409449	pH	Medium	NJDEP/USGS Data
Atlantic Coast	14	Indian Mills Brook at Willow Grove Rd in Shamong	AN0582, BINSHADS	Pineland Biological Community	Low	NJDEP AMNET, Pinelands
Atlantic Coast	14	Indian Mills Pond-14	BMULAKED	Pineland Biological Community	Low	NJDEP Clean Lakes, Pinelands
Lower Delaware	19	Indian Run at Birmingham Rd in Pemberton	AN0151A	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	17	Indian Run at Husted Sta Rd in Pittsgrove	AN0747	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	06	Intervale Lake-06	Lake Intervale	Fecal Coliform	High	Parsippany Troy Hills HD
Lower Delaware	17	Iona Lake-17	Iona Lake	Fecal Coliform	High	NJDEP Clean Lakes, Gloucester Co HD
Raritan	09	Ireland Brook at Patricks Corners	01404470	pH	Medium	NJDEP/USGS Data
Raritan	09	Ireland Brook at Riva Rd in South Brunswick	AN0433	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	20	Ivanhoe Brook at Olde Noah Hunt Rd in Millstone	MB-FA	Benthic Macroinvertebrates	Low	Monmouth Co HD
Northwest	11	Jacobs Creek above Rt 29	DRBCNJ0003	Fecal Coliform	High	DRBC
Northwest	11	Jacobs Creek above Rt 29	DRBCNJ0003	pH	Medium	DRBC
Northwest	01	Jacobs Creek at Bear Tavern Rd in Hopewell	AN0106A	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	19	Jade Run at Rt 206 in Southampton	AN0157, SJART616	Pineland Biological Community	Low	NJDEP AMNET, Pinelands
Lower Delaware	19	Jade Run at Rt 206 in Vincentown	01465847	Dissolved Oxygen	Medium	EWQ
Lower Delaware	19	Jade Run at Rt 206 in Vincentown	01465847	pH	Medium	EWQ
Lower Delaware	19	Jade Run at Rt 206 in Vincentown	01465847	Phosphorus	High	EWQ
Atlantic Coast	16	James Sound	James Sound-1 thru 11	Total Coliform	High	NJDEP Coastal Monitoring, Shellfish Monitoring
Atlantic Coast	16	Jenkins Sound	Jenkins Sound-1 thru 10	Total Coliform	High	NJDEP Coastal Monitoring, Shellfish Monitoring
Lower Delaware	19	Jennings Lake-19	WBAJENNL	Pineland Biological Community	Low	Pinelands
Atlantic Coast	13	Jesse Creek/Thompson Creek Estuary	1807D	Total Coliform	High	NJDEP Shellfish Monitoring
Atlantic Coast	16	Jones/Stites/Carino/Taylor Creek Estuary	3603B	Total Coliform	High	NJDEP Shellfish Monitoring
Lower Delaware	20	Jumping Brook at Bunting Bridge Rd in New Hanover	AN0119	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	12	Jumping Brook at Corlies Ave in Neptune	AN0480	Benthic Macroinvertebrates	Low	NJDEP AMNET

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Region	WMA	Station Name/Waterbody	Site ID #	Impairment	Priority	Data Source
Atlantic Coast	12	Jumping Brook at Green Grove	01407720	pH	Medium	NJDEP/USGS Data
Atlantic Coast	12	Jumping Brook near Neptune	01407760	Fecal Coliform	High	NJDEP/USGS Data
Atlantic Coast	12	Jumping Brook near Neptune	01407760	pH	Medium	NJDEP/USGS Data
Atlantic Coast	13	Kettle Creek at Moore Rd in Brick	AN0516	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	13	Kettle Creek-Tidal	R09, 1614H	Total Coliform	High	NJDEP Coastal Monitoring, Shellfish Monitoring
Raritan	07	Kill Van Kull	UH-11	Dioxin	High	HEP (GLEC), NJDEP Fish Tissue Monitoring
Raritan	07	Kill Van Kull	UH-11	Mercury	High	HEP (GLEC), NJDEP Fish Tissue Monitoring
Raritan	07	Kill Van Kull	UH-11	PCB	High	HEP (GLEC), NJDEP Fish Tissue Monitoring
Raritan	07	Kings Creek	Kings Creek	Toxic Discharge	High	HEP (GLEC)
Northeast	03	Kitchell Lake-03	Kitchell Lake Assoc.	Fecal Coliform	High	Passaic Co HD
Atlantic Coast	12	L Street Beach (Belmar)	L Street Beach (Belmar)	Fecal Coliform	High	Cooperative Coastal Monitoring Program
Northwest	01	Lackawanna Lake-01	Lake Lackawanna: Speers Beach	Fecal Coliform	High	Sussex Co HD
Atlantic Coast	12	Lafetras Brook at Hope Rd in Tinton Falls	32	Phosphorus	Medium	Monmouth Co HD
Lower Delaware	20	Lahaway Creek at New Egypt - Allentown Rd in Upper Freehold	AN0124, MB-117	Benthic Macroinvertebrates	Low	NJDEP AMNET, Monmouth Co HD
Lower Delaware	20	Lahaway Creek at Rt 537 in Upper Freehold	AN0122	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	13	Lake Barnegat-13	Lake Barnegat- Middle Beach	Fecal Coliform	High	Ocean Co HD
Atlantic Coast	13	Lake Carasaljo-13	Lake Carasaljo	Mercury	High	NJDEP Fish Tissue Monitoring
Northeast	03	Lake Edenwold-03	Lake Edenwold	Fecal Coliform	High	Butler HD
Northwest	01	Lake Hopatcong-01	Lake Hopatcong, Byram Bay Comm Club, Davis Cove, Beck Lane Prop, Crescent Cove, Dox Incorp, E Shores POA, Elba Pt Homeowners, Homestead Beach, Hopatcong Shores Property, Hoptacong Gardens Comm. Club, Ingram Cove Comm, Jewish Center, Colony Club	Fecal Coliform	High	Sussex Co HD, NJDEP Clean Lakes, Freshwater Fisheries, NJDEP Fish Tissue Monitoring
Northwest	01	Lake Hopatcong-01	Lake Hopatcong, Byram Bay Comm Club, Davis Cove, Beck Lane Prop, Crescent Cove, Dox Incorp, E Shores POA, Elba Pt Homeowners, Homestead Beach, Hopatcong Shores Property, Hoptacong Gardens Comm. Club, Ingram Cove Comm, Jewish Center, Colony Club	Fish Community	Low	Sussex Co HD, NJDEP Clean Lakes, Freshwater Fisheries, NJDEP Fish Tissue Monitoring
Northwest	01	Lake Hopatcong-01	Lake Hopatcong, Byram Bay Comm Club, Davis Cove, Beck Lane Prop, Crescent Cove, Dox Incorp, E Shores POA, Elba Pt Homeowners, Homestead Beach, Hopatcong Shores Property, Hoptacong Gardens Comm. Club, Ingram Cove Comm, Jewish Center, Colony Club	Mercury	High	Sussex Co HD, NJDEP Clean Lakes, Freshwater Fisheries, NJDEP Fish Tissue Monitoring
Northeast	03	Lake Ioscoe-03	Lake Iosco	Fecal Coliform	High	Passaic Co HD

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Lower Delaware	19	Lake James-19	Kings Grant	Fecal Coliform	High	Burlington Co HD
Atlantic Coast	16	Lake Laurie-16	Lake Laurie Campground	Fecal Coliform	High	Cape May Co HD
Northwest	02	Lake Mohawk-02	Lake Mohawk: Sleepy Lagoon, Alpine Beach, Beach 1, Beach 2, Beach 3, Beach 4, Beach 5, Beach 6, Happly Valley Beach, Manitou Beach, Tamarack Beach	Fecal Coliform	High	Sparta Twp HD
Atlantic Coast	14	Lake Mo-Li-Th-Ma-14	Camp Haluwasa, NPUHALUW	Pineland Biological Community	Low	Cape May Co HD, Pinelands
Atlantic Coast	16	Lake Nummy-16	Lake Nummy, Belleplain SF, Lake Nummy-Center, Left, and Right	Mercury	High	Southern Region, NJDEP Fish Tissue Monitoring
Lower Delaware	18	Lake Silvestro	Lake Silvestro	Fecal Coliform	High	
Northeast	06	Lake Swannanoa-06	Lake Swannanoa Country Club	Fecal Coliform	High	Jefferson Twp HD
Atlantic Coast	12	Lake Takanassee-12	50	Fecal Coliform	High	Monmouth Co HD
Atlantic Coast	12	Lake Takanassee-12	50	Phosphorus	Medium	Monmouth Co HD
Northeast	05	Lake Tappan-05	Lake Tappan	Mercury	High	NJDEP Fish Tissue Monitoring
Raritan	09	Lake Topanemus Lake at Pond Rd in Freehold	61	Phosphorus	Medium	Monmouth Co HD
Northwest	01	Lake Winona-01	Lake Winona Civic Association	Fecal Coliform	High	Jefferson Twp HD
Atlantic Coast	15	Lakes Bay	Beach Thorofare-5	Dissolved Oxygen	Medium	NJDEP Coastal Monitoring, Shellfish Monitoring
Atlantic Coast	15	Lakes Bay	Lakes Bay-1 thu 10 and 12 thru 14	Total Coliform	High	NJDEP Coastal Monitoring, Shellfish Monitoring
Raritan	08	Lamington River at Burnt Mills	01399780	Phosphorus	High	NJDEP/USGS Data
Raritan	08	Lamington River at Ironia Rd in Chester	AN0356	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	08	Lamington River at Rt 24 in Milltown	EWQ0358	Phosphorus	High	EWQ
Raritan	08	Lamington River at Rt 523 in Lamington	EWQ0363	Temperature	Medium	EWQ
Raritan	08	Lamington River near Ironia	01399200	Dissolved Oxygen	Medium	NJDEP/USGS Data
Raritan	08	Lamington River near Ironia	01399200	Phosphorus	High	NJDEP/USGS Data
Raritan	08	Lamington River near Pottersville	01399500	Phosphorus	High	NJDEP/USGS Data
Atlantic Coast	14	Landing Creek at Rt 30 in Mullica	AN0590, LLANDMOS	Pineland Biological Community	Low	NJDEP AMNET, Pinelands
Atlantic Coast	12	Lanes Creek at Edwards Ave in Long Branch	46	Fecal Coliform	High	Monmouth Co HD
Atlantic Coast	12	Lapattatong Creek at 1st St - Peterson's Marina in Keyport	51	Fecal Coliform	High	Monmouth Co HD
Raritan	09	Lawrence Brook at Davidsons Mill Rd in South Brunswick	AN0431	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	09	Lawrence Brook at Ridge Rd in South Brunswick	AN0430	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	09	Lawrence Brook at Riva Rd in Milltown	AN0434	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	09	Lawrence Brook on Davidson's Mill Rd, Black Horse	9-LAW-1	Arsenic	High	NJDEP Metal Recon
Raritan	09	Lawrence Brook on Davidson's Mill Rd, Black Horse	9-LAW-1	Cadmium	High	NJDEP Metal Recon
Raritan	09	Lawrence Brook on Davidson's Mill Rd, Black Horse	9-LAW-1	Chromium	High	NJDEP Metal Recon
Raritan	09	Lawrence Brook on Davidson's Mill Rd, Black Horse	9-LAW-1	Copper	High	NJDEP Metal Recon

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Raritan	09	Lawrence Brook on Davidson's Mill Rd, Black Horse	9-LAW-1	Lead	High	NJDEP Metal Recon
Raritan	09	Lawrence Brook on Davidson's Mill Rd, Black Horse	9-LAW-1	Mercury	High	NJDEP Metal Recon
Raritan	09	Lawrence Brook on Davidson's Mill Rd, Black Horse	9-LAW-1	Zinc	High	NJDEP Metal Recon
Atlantic Coast	12	Lefferts Lake-12	66, Lefferts Lake	Fish Community	Low	Monmouth Co HD, NJDEP Freshwater Fisheries
Atlantic Coast	12	Lefferts Lake-12	66, Lefferts Lake	Phosphorus	Medium	Monmouth Co HD, NJDEP Freshwater Fisheries
Atlantic Coast	15	Lenape Lake -15	Lenape Lake	Mercury	High	Atlantic Co HD, NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring
Lower Delaware	18	Linden Lake-18	Linden Lake	Mercury	High	NJDEP Fish Tissue Monitoring
Northeast	03	Lionhead Lake-03	Lions Head Lake	Fecal Coliform	High	Passaic Co HD
Atlantic Coast	14	Little Bay	Little Bay-2	Total Coliform	High	NJDEP Coastal Monitoring, Shellfish Monitoring
Lower Delaware	19	Little Creek at Chairville	01465893	Fecal Coliform	High	NJDEP/USGS Data
Lower Delaware	19	Little Creek at Chairville	01465893	pH	Medium	NJDEP/USGS Data
Lower Delaware	19	Little Creek at Eayrestown Rd in Lumberton	AN0160	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	17	Little Ease Run at Grant Ave in Franklin	AN0727	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	17	Little Ease Run at Leonard Cake Rd in Franklin	AN0728	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	17	Little Ease Run at Porchtown	01411458	pH	Medium	NJDEP/USGS Data
Atlantic Coast	13	Little Egg Harbor	Little Egg Harbor-2 thru 4	Total Coliform	High	NJDEP Coastal Monitoring, Shellfish Monitoring
Lower Delaware	18	Little Timber Creek	Little Timber Creek	Mercury	High	NJDEP Fish Tissue Monitoring
Northwest	11	Lockatong Creek at Rosemont-Raven Rock Rd Bridge	DRBCNJ0013	Phosphorus	Medium	DRBC
Northwest	11	Lockatong Creek at Rosemont-Raven Rock Rd Bridge	DRBCNJ0013	Temperature	Medium	DRBC
Atlantic Coast	12	Long Brook at Wyckoff Mills	01407868, 25	pH	Medium	NJDEP/USGS Data, Monmouth Co HD
Atlantic Coast	12	Long Brook at Wyckoff Mills	01407868, 25	Phosphorus	Medium	NJDEP/USGS Data, Monmouth Co HD
Northwest	01	Lopatcong Creek at Main St in Phillipsburg	DRBCNJ0028	Fecal Coliform	High	DRBC
Northwest	01	Lubbers Run at Waterloo Rd (N of Rt 604) in Byram	AN0069A	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	16	Ludlams Pond-16	Holly Lake Campground	Fecal Coliform	High	Cape May Co HD
Northeast	03	MacopIn River at Echo Lake	01382410	Dissolved Oxygen	Medium	NJDEP/USGS Data
Northeast	03	MacopIn River at Echo Lake	01382410	Temperature	High	NJDEP/USGS Data
Northeast	03	Macopin River at Macopin Reservoir	01382450, PQ6	Temperature	High	NJDEP/USGS Data, Pequannock River Coalition
Lower Delaware	17	Major Run at Pointers - Sharptown Rd in Pilesgrove	AN0694	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	17	Major Run at Sharptown	01482530	Fecal Coliform	High	NJDEP/USGS Data
Lower Delaware	17	Major Run at Sharptown	01482530	Phosphorus	Medium	NJDEP/USGS Data

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Region	WMA	Station Name/Waterbody	Site ID #	Impairment	Priority	Data Source
Lower Delaware	17	Malaga Lake-17	Malaga Lake	Fecal Coliform	High	Gloucester Co HD, NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring
Lower Delaware	17	Malaga Lake-17	Malaga Lake	Mercury	High	Gloucester Co HD, NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring
Atlantic Coast	13	Manahawkin Bay	Manahawkin Bay-2 thru 10	Total Coliform	High	NJDEP Coastal Monitoring, Shellfish Monitoring
Atlantic Coast	13	Manahawkin Lake-13	A. Pauling Park Beach	Fecal Coliform	High	Ocean Co HD, NJDEP Clean Lakes
Raritan	09	Manalapan Brook at Federal Rd in Monearoe	AN0439	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	09	Manalapan Brook at Federal Rd near Manalapan	01405340, 9-MAN-1	Lead	High	NJDEP/USGS Data, Metal Recon
Raritan	09	Manalapan Brook at Federal Rd near Manalapan	01405340, 9-MAN-1	pH	Medium	NJDEP/USGS Data, Metal Recon
Raritan	09	Manalapan Brook at Federal Rd near Manalapan	01405340, 9-MAN-1	Phosphorus	Medium	NJDEP/USGS Data, Metal Recon
Raritan	09	Manalapan Brook at Old Forge Rd in Monearoe	AN0440	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	09	Manalapan Brook at Rt 524 in Ely	EWQ0437	pH	Medium	EWQ
Raritan	09	Manalapan Brook near Spotswood	01405440, EWQ0440, 9-MAN-2	Lead	High	NJDEP/USGS Data, EWQ, Metal Recon
Raritan	09	Manalapan Brook near Spotswood	01405440, EWQ0440, 9-MAN-2	pH	Medium	NJDEP/USGS Data, EWQ, Metal Recon
Raritan	09	Manalapan Brook near Spotswood	01405440, EWQ0440, 9-MAN-2	Zinc	High	NJDEP/USGS Data, EWQ, Metal Recon
Lower Delaware	17	Manantico Creek at Hance Bridge Rd in Vineland	AN0759	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	12	Manasquan Reservoir-12	Manasquan Reservoir	Mercury	High	NJDEP Fish Tissue Monitoring
Atlantic Coast	12	Manasquan River at Rt 547 in Howell	AN0493	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	12	Manasquan River at Rt 9 in Howell	AN0489	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	12	Manasquan River at Squankum	01408000, EWQ0489, 12-MA-1, 12-MA-2, 12-MA-3	Phosphorus	Medium	NJDEP/USGS Data, EWQ, Metal Recon
Atlantic Coast	12	Manasquan River at W Farms Rd in Howell	AN0490	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	12	Manasquan River Estuary	Manasquan River Estuary-3	Dissolved Oxygen	Medium	NJDEP Coastal Monitoring, Shellfish Monitoring
Atlantic Coast	12	Manasquan River Estuary	Manasquan River Estuary-1 thru 3	Total Coliform	High	NJDEP Coastal Monitoring, Shellfish Monitoring
Atlantic Coast	12	Mannahasset Creek at Mannahasset Ave in Long Branch	48	Fecal Coliform	High	Monmouth Co HD
Raritan	08	Manor House Outlet	Manor House Outlet	Fecal Coliform	High	
Lower Delaware	18	Mantua Creek at Mantua Ave in Wenonah	AN0672	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	18	Mantua Creek at Rt 45 in W. Deptford	01475045	Phosphorus	Medium	EWQ
Lower Delaware	17	Manumuskin River at Main Ave in Milmay	AN0762A	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	15	Maple Run (Asbury Run) at Mill Rd in Egg Harbor	AN0619	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	18	Marlton Lake-18	Marlton Lake	Mercury	High	NJDEP Fish Tissue Monitoring
Atlantic Coast	12	Marsh Bog Brook at Squankum	01407997, 24	pH	Medium	NJDEP/USGS Data, Monmouth Co HD
Lower Delaware	17	Maskells Mill Pond-17	Maskells Mill Pond	Mercury	High	NJDEP Fish Tissue Monitoring

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Region	WMA	Station Name/Waterbody	Site ID #	Impairment	Priority	Data Source
Lower Delaware	19	Masons Creek at Rt 38 in Hainesport	AN0173	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	12	Matawan Creek Estuary	8, R62	Total Coliform	High	NJDEP Shellfish Monitoring
Atlantic Coast	12	Matawan Creek-Tidal	8, R62	Dissolved Oxygen	Medium	Monmouth Co HD, NJDEP Coastal Monitoring
Atlantic Coast	12	Matawan Creek-Tidal	8, R62	Fecal Coliform	High	Monmouth Co HD, NJDEP Coastal Monitoring
Raritan	09	Matchaponix Brook at Rt 527 in Manalapan	AN0448	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	09	Matchaponix Brook at Spotswood	01405302, EWQ0451	Nitrate	High	NJDEP/USGS Data, EWQ
Raritan	09	Matchaponix Brook at Spotswood	01405302, EWQ0451	pH	Medium	NJDEP/USGS Data, EWQ
Raritan	09	Matchaponix Brook at Spotswood	01405302, EWQ0451	Phosphorus	High	NJDEP/USGS Data, EWQ
Raritan	09	Matchaponix Brook at Texas Rd in Monearoe	AN0451	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	17	Maurice River and Cove	3847,3847A,3847B,3847C,3847D,3848,3848A,3848B,3848C,3900A,3900D,3900G,3900H,3900J,3900L,3900M	Fecal Coliform	High	Coastal Water Quality Monitoring
Lower Delaware	17	Maurice River at Norma	01411500	Arsenic	High	NJDEP/USGS Data
Lower Delaware	17	Maurice River at Norma	01411500	pH	Medium	NJDEP/USGS Data
Lower Delaware	17	Maurice River at Sherman Ave in Vineland	AN0751	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	17	Maurice River Estuary	3900J, 3900l, 3900M	Total Coliform	High	NJDEP Shellfish Monitoring
Lower Delaware	17	Maurice River near Millville	01411800, 17-MAU-1	Arsenic	High	NJDEP/USGS Data, Metal Recon
Raritan	09	McGellairds Brook at Rt 527 in Englishtown	AN0447	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	09	McGolliard Brook at Main St in Englishtown	22	Phosphorus	Medium	Monmouth Co HD
Northeast	03	Meadow Brook at Highland Ave in Wanaque	AN0256A	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	17	Memorial Lake-17	Memorial Lake	Mercury	High	NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring
Northwest	01	Merrill Cr Reservoir-01	Merrill Creek Reservoir	Mercury	High	NJDEP Fish Tissue Monitoring
Atlantic Coast	13	Metedeconk River Estuary	Upper Medeteconk River Estuary-1	Total Coliform	High	NJDEP Shellfish Monitoring
Atlantic Coast	13	Metedeconk River N Br at Jackson Mills Rd in Freehold	AN0500, AN0499, MB-146, MB-148	Benthic Macroinvertebrates	Low	NJDEP AMNET, Monmouth Co HD
Atlantic Coast	13	Metedeconk River N Br at Jackson Mills Rd in Freehold	6	Phosphorus	Medium	Monmouth Co HD
Atlantic Coast	13	Metedeconk River N Br at Lakewood	01408100	pH	Medium	NJDEP/USGS Data
Atlantic Coast	13	Metedeconk River N Br at Lakewood	01408100	Temperature	Medium	NJDEP/USGS Data
Atlantic Coast	13	Metedeconk River S Br at Chambers Bridge Rd in Brick	AN0512	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	09	Middle Brook W Br at Chimney Rk Rd at Martinsville	01403171	Fecal Coliform	High	NJDEP/USGS Data
Lower Delaware	17	Middle Marsh Creek Estuary	4101E	Total Coliform	High	NJDEP Shellfish Monitoring
Atlantic Coast	15	Middle River Estuary	2900A, 2900B, 2900C, 2900D, 2900E	Dissolved Oxygen	Medium	NJDEP Coastal Monitoring, Shellfish Monitoring
Atlantic Coast	15	Middle River Estuary	2900A, 2900B, 2900C, 2900D, 2900E	Total Coliform	High	NJDEP Coastal Monitoring, Shellfish Monitoring
Raritan	09	Mile Run at Rt 527 in Franklin	AN0429	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	19	Mill Creek at Levitt Pkwy in Willingboro	AN0175	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	19	Mill Creek at Levitt Pkwy in Willingboro	EWQ0175	Phosphorus	High	EWQ
Lower Delaware	17	Mill Creek at Rt 650 in Greenwich	AN0716B	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	13	Mill Creek at Rt 72 in Stafford	AN0555	Benthic Macroinvertebrates	Low	NJDEP AMNET

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Region	WMA	Station Name/Waterbody	Site ID #	Impairment	Priority	Data Source
Atlantic Coast	13	Mill Creek-Tidal	1706	Total Coliform	High	NJDEP Shellfish Monitoring
Raritan	10	Millstone River above Raritan River confl in Franklin	AN0414	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	10	Millstone River at Applegarth Rd in Monearoe	AN0382D	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	10	Millstone River at Blackwells Mills	01402000, 10-MIL-5, 10-MIL-6	Arsenic	High	NJDEP/USGS Data, Metal Recon
Raritan	10	Millstone River at Blackwells Mills	01402000, 10-MIL-5, 10-MIL-6	Phosphorus	High	NJDEP/USGS Data, Metal Recon
Raritan	10	Millstone River at Blackwells Mills Rd in Hillsborough	AN0410	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	10	Millstone River at Grovers Mills Rd in Plainsboro	AN0382	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	10	Millstone River at Kingston	01401440, 10-MIL-2	Arsenic	High	NJDEP/USGS Data, Metal Recon
Raritan	10	Millstone River at Kingston	01401440, 10-MIL-2	Fecal Coliform	High	NJDEP/USGS Data, Metal Recon
Raritan	10	Millstone River at Kingston	01401440, 10-MIL-2	Mercury	High	NJDEP/USGS Data, Metal Recon
Raritan	10	Millstone River at Kingston	01401440, 10-MIL-2	pH	Medium	NJDEP/USGS Data, Metal Recon
Raritan	10	Millstone River at Kingston	01401440, 10-MIL-2	Phosphorus	High	NJDEP/USGS Data, Metal Recon
Raritan	10	Millstone River at Kingston	01401440, 10-MIL-2	Temperature	Medium	NJDEP/USGS Data, Metal Recon
Raritan	10	Millstone River at Rt 33 in Millstone	AN0379, AN0378, MB-MILL2	Benthic Macroinvertebrates	Low	NJDEP AMNET, Monmouth Co HD
Raritan	10	Millstone River at Rt 535 in East Windsor	AN0382B	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	10	Millstone River at Weston	01402540, 10-MIL-3	Arsenic	High	NJDEP/USGS Data
Raritan	10	Millstone River at Weston	01402540, 10-MIL-3	pH	Medium	NJDEP/USGS Data
Raritan	10	Millstone River at Weston	01402540, 10-MIL-3	Phosphorus	High	NJDEP/USGS Data
Raritan	10	Millstone River near Grovers Mills	01400640, 01400650	Arsenic	High	NJDEP/USGS Data, Metal Recon
Raritan	10	Millstone River near Grovers Mills	01400640, 01400650	Phosphorus	Medium	NJDEP/USGS Data, Metal Recon
Raritan	10	Millstone River near Manalapan	01400540, 01400530, 5, 10-MIL-1	Arsenic	High	NJDEP/USGS Data, Monmouth Co HD, Metal Recon
Raritan	10	Millstone River near Manalapan	01400540, 01400530, 5, 10-MIL-1	pH	Medium	NJDEP/USGS Data, Monmouth Co HD, Metal Recon
Raritan	10	Millstone River near Manalapan	01400540, 01400530, 5, 10-MIL-1	Phosphorus	High	NJDEP/USGS Data, Monmouth Co HD, Metal Recon
Raritan	10	Millstone River near Manalapan	01400540, 01400530, 5, 10-MIL-1	Total Suspended Solids	Medium	NJDEP/USGS Data, Monmouth Co HD, Metal Recon
Raritan	10	Millstone River off Rte 1 in Plainsboro	10-MIL-7	Arsenic	High	NJDEP Metal Recon
Raritan	08	Mine Brook at Bernardsville Rd in Bernardsville	AN0352	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	12	Mine Brook at Creamery Rd in Colts Neck	AN0473	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	08	Mine Brook at Far Hills Rd (Rt 512) in Far Hills	AN0353	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	12	Mingamahone Brook at Rt 524 in Howell	AN0495	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	12	Mingamahone Brook near Earle	01408009	pH	Medium	NJDEP/USGS Data
Atlantic Coast	12	Mingamahone Brook near Earle	01408009	Total Suspended Solids	Medium	NJDEP/USGS Data
Lower Delaware	19	Mirror Lake-19	Mirror Lake	Fecal Coliform	High	Burlington Co HD, NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring
Lower Delaware	19	Mirror Lake-19	Mirror Lake	Mercury	High	Burlington Co HD, NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring

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Region	WMA	Station Name/Waterbody	Site ID #	Impairment	Priority	Data Source
Lower Delaware	20	Miry Run at Meirs Rd in Cream Ridge	AN0125A	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northwest	11	Miry Run at Route 533 in Mercerville	01463850	Dissolved Oxygen	Medium	NJDEP/USGS Data
Northwest	11	Miry Run at Route 533 in Mercerville	01463850	pH	Medium	NJDEP/USGS Data
Northwest	11	Miry Run at Route 533 in Mercerville	01463850	Phosphorus	Medium	NJDEP/USGS Data
Northwest	11	Miry Run at Rt 533 in Hamilton	AN0115	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	04	Molly Ann Brook at Totowa Ave in Paterson	AN0276	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	13	Money Island (Dover)	Money Island (Dover)	Fecal Coliform	High	Cooperative Coastal Monitoring Program
Northeast	03	Monksville Reservoir-03	Monksville Reservoir	Mercury	High	NJDEP Freshwater Fisheries, NJDEP Fish Tissue Monitoring
Lower Delaware	20	Moorhouse Brook Trib S at Moorhouse Rd in New Egypt	AN0121A	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	06	Morris County Park Lake, Beach, Inlet, Outlet,	Morris County Park Lake, Beach, Inlet, Outlet,	Fecal Coliform	High	
Atlantic Coast	14	Morses Mill Stream below College Drive	LMORSESM	Pineland Biological Community	Low	Pinelands
Lower Delaware	19	Mount Misery Brook at Upton	01466100	Fecal Coliform	High	NJDEP/USGS Data
Northeast	06	Mountain Lake-06	Mountain Lake	Fecal Coliform	High	Montville Twp HD, NJDEP Fish Tissue Monitoring
Northeast	06	Mountain Lake-06	Mountain Lake	Mercury	High	Montville Twp HD, NJDEP Fish Tissue Monitoring
Atlantic Coast	14	Mullica River	Mullica River	Dioxin	High	NJDEP Fish Tissue Monitoring
Atlantic Coast	14	Mullica River	Mullica River	Mercury	High	NJDEP Fish Tissue Monitoring
Atlantic Coast	14	Mullica River	Mullica River	PCB	High	NJDEP Fish Tissue Monitoring
Atlantic Coast	14	Mullica River at Green Bank	Mullica River at Green Bank	Fecal Coliform	High	NJDEP/USGS Data
Atlantic Coast	14	Mullica River at Green Bank	Mullica River at Green Bank	pH	Medium	NJDEP/USGS Data
Atlantic Coast	14	Mullica River at Green Bank	Mullica River at Green Bank	Phosphorus	Medium	NJDEP/USGS Data
Atlantic Coast	14	Mullica River at Green Bank	Mullica River at Green Bank	Temperature	Medium	NJDEP/USGS Data
Atlantic Coast	14	Mullica River at Indian Mills	01409383	Dissolved Oxygen	Medium	USGS/Pinelands Data
Atlantic Coast	14	Mullica River at Jackson - Medford Rd in Medford	AN0560, MMULADYS	Pineland Biological Community	Low	NJDEP AMNET, Pinelands
Atlantic Coast	14	Mullica River at Outlet of Atsion Lake	01409387, 14-MUL-2	Copper	High	NJDEP/USGS Data, Metal Recon
Atlantic Coast	14	Mullica River at Outlet of Atsion Lake	01409387, 14-MUL-2	Lead	High	NJDEP/USGS Data, Metal Recon
Atlantic Coast	14	Mullica River at Outlet of Atsion Lake	01409387, 14-MUL-2	Zinc	High	NJDEP/USGS Data, Metal Recon
Atlantic Coast	14	Mullica River Middle Estuary	2004, 2004A, 2004B, 2005, 2005A, 2005B, 2005D, 2006, 2006A, 2006B	Total Coliform	High	NJDEP Coastal Monitoring, Shellfish Monitoring
Atlantic Coast	14	Mullica River near Atco	01409375	pH	Medium	USGS/Pinelands Data
Atlantic Coast	14	Mullica River near Batsto	0140940050	pH	Medium	USGS/Pinelands Data
Atlantic Coast	14	Mullica River Upper Estuary	2007D, 2007E, 2008, 2008A, 2008B, 2009, 2009A, 2009B, 2010, 2010A, 2010B, 2010C, 2011, 2011A, 2012, 2012A, 2012B, 2012C, 2013, 2013A, 2013B, 2014, 2015, 2015A, 2015B, 2015C, 2017, 2017A, 2018,	Total Coliform	High	NJDEP Coastal Monitoring, Shellfish Monitoring
Northwest	01	Musconetcog River at Lockwood	01455801	Fecal Coliform	High	NJDEP/USGS Data

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Northwest	01	Musconetcog River at Lockwood	01455801	Phosphorus	Medium	NJDEP/USGS Data
Northwest	01	Musconetcog River at Lockwood	01455801	Temperature	Medium	NJDEP/USGS Data
Northwest	01	Musconetcong River at Beattystown	01456200, 1-MUS-3	Arsenic	High	NJDEP/USGS Data, Metal Recon
Northwest	01	Musconetcong River at Beattystown	01456200, 1-MUS-3	Temperature	Medium	NJDEP/USGS Data, Metal Recon
Northwest	01	Musconetcong River at Lake Hopatcong	01455500	pH	Medium	NJDEP/USGS Data
Northwest	01	Musconetcong River at Lake Hopatcong	01455500	Temperature	Medium	NJDEP/USGS Data
Northwest	01	Musconetcong River at New Hampton Rd in Lebanon	AN0072	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northwest	01	Musconetcong River at Riegelsville	01457400, DBRCNJ0025, 1-MUS-5	Phosphorus	Medium	NJDEP/USGS Data, DRBC, Metal Recon
Northwest	01	Musconetcong River at Riegelsville	01457400, DBRCNJ0025, 1-MUS-5	Temperature	Medium	NJDEP/USGS Data, DRBC, Metal Recon
Northwest	01	Musconetcong River at Riegelsville	01457400, DBRCNJ0025, 1-MUS-5	Total Suspended Solids	Medium	NJDEP/USGS Data, DRBC, Metal Recon
Northwest	01	Musconetcong River at Rt 206 in Netcong	AN0063A	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northwest	01	Musconetcong River at Rt 604 (abv Saxton Lk) in Mt Olive	AN0069E	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northwest	01	Musconetcong River at S of Rt 604 & Rt 80 in Mt Olive	AN0069D	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northwest	01	Musconetcong River blw Waterloo Village lower dam in Mt Olive	AN0069C	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northwest	01	Musconetcong River near Bloomsbury	01457000, EWQ0072, 1-MUS-4	pH	Medium	NJDEP/USGS Data, EWQ, Metal Recon
Northwest	01	Musconetcong River off Rt 604 (blw Lubbers Run) in Lockwood	AN0069B	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	14	Muskingum Brook above Tuckerton Rd	BMUSKTUC	Pineland Biological Community	Low	Pinelands
Northeast	05	Musquapsink Brook at River Vale	01377499	Arsenic	High	NJDEP/USGS Data
Northeast	05	Musquapsink Brook at River Vale	01377499	Phosphorus	Medium	NJDEP/USGS Data
Northeast	05	Musquapsink River at Harrington Ave in Westwood	AN0206	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	12	Musquash Brook at Brighton Ave in Neptune Twnshp	11	Fecal Coliform	High	Monmouth Co HD
Atlantic Coast	13	Mystic	1925, 1926, 1926A	Total Coliform	High	NJDEP Shellfish Monitoring
Northeast	04	Naachtpunkt Brook at Continental Dr (abv outfall) in Wayne	AN0273A	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	04	Naachtpunkt Brook at Continental Dr (blw outfall) in Wayne	AN0273B	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	14	Nacote & Mott Rivers Estuary	2005C, 2005E	Total Coliform	High	NJDEP Shellfish Monitoring
Lower Delaware	17	Nantuxent Creek Estuary	3804L, 3408P	Total Coliform	High	NJDEP Shellfish Monitoring
Atlantic Coast	12	Navesink River	Navesink River	Dioxin	High	NJDEP Fish Tissue Monitoring
Atlantic Coast	12	Navesink River	Navesink River	PCB	High	NJDEP Fish Tissue Monitoring
Atlantic Coast	12	Navesink River Estuary	Shrewsbury/Navesink Estuary-4 thru 7	Total Coliform	High	NJDEP Coastal Monitoring, Shellfish Monitoring
Atlantic Coast	14	Nescochague Creek at Pleasant Mills	01409411	pH	Medium	USGS/Pinelands Data
Atlantic Coast	14	Nescochague Creek near West Mill Rd	NNEWESTM	Pineland Biological Community	Low	Pinelands
Raritan	08	Neshanic River at Reaville	01398000, 8-NE-1	Copper	High	NJDEP/USGS Data, Metal Recon

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Region	WMA	Station Name/Waterbody	Site ID #	Impairment	Priority	Data Source
Raritan	08	Neshanic River at Reaville	01398000, 8-NE-1	Phosphorus	High	NJDEP/USGS Data, Metal Recon
Raritan	08	Neshanic River at Reaville	01398000, 8-NE-1	Total Suspended Solids		NJDEP/USGS Data, Metal Recon
Raritan	08	Neshanic River at Reaville - Everitt Rd in Raritan	AN0333	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	08	Neshanic River at Rt 514 in Hillsborough	AN0337	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	15	New Brooklyn Lake-15	New Brooklyn Lake	Mercury	High	NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring
Raritan	09	New Market Pond-09	New Market Pond	Dioxin	High	NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring, Freshwater Fisheries
Raritan	09	New Market Pond-09	New Market Pond	Fish Community	Low	NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring, Freshwater Fisheries
Raritan	09	New Market Pond-09	New Market Pond	PCB	High	NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring, Freshwater Fisheries
Northwest	11	New Sharon Brook at Sharon Rd in Washington	AN0109B	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	07	Newark Bay	Newark Bay	Dioxin	High	HEP (GLEC), NJDEP Fish Tissue Monitoring
Raritan	07	Newark Bay	Newark Bay	Mercury	High	HEP (GLEC), NJDEP Fish Tissue Monitoring
Raritan	07	Newark Bay	Newark Bay	PCB	High	HEP (GLEC), NJDEP Fish Tissue Monitoring
Raritan	07	Newark Bay	Newark Bay Tribs	Dioxin	High	NJDEP Fish Tissue Monitoring
Raritan	07	Newark Bay	Newark Bay Tribs	PCB	High	NJDEP Fish Tissue Monitoring
Lower Delaware	18	Newton Creek	Newton Creek	Copper	High	304(l)
Lower Delaware	18	Newton Creek	Newton Creek	Zinc	High	304(l)
Lower Delaware	18	Newton Creek at Rt 168 in W Collingswood	EWQ0653	pH	Medium	EWQ
Lower Delaware	18	Newton Creek at Rt 168 in W Collingswood	EWQ0653	Phosphorus	Medium	EWQ
Lower Delaware	18	Newton Creek N Br	Newton Creek N Br	Mercury	High	NJDEP Fish Tissue Monitoring
Lower Delaware	18	Newton Creek S Br	Newton Creek S Br	Mercury	High	NJDEP Fish Tissue Monitoring
Lower Delaware	18	Newton Lake-18	Newton Lake	Dioxin	High	NJDEP Fish Tissue Monitoring
Lower Delaware	18	Newton Lake-18	Newton Lake	PCB	High	NJDEP Fish Tissue Monitoring
Lower Delaware	20	North Community Lake	North Community Lake	Fish Community	Low	NJDEP Freshwater Fisheries
Northeast	05	North Hudson Park Lake-05	North Hudson Park Lake	Phosphorus	Medium	NJDEP Clean Lakes
Lower Delaware	20	North Run at Cookstown	01464380	Fecal Coliform	High	NJDEP/USGS Data
Lower Delaware	20	North Run at Main St in North Hanover	AN0120	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	20	North Run Trib at Highland Ave in Wrightstown	AN0120A	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	12	Northern Coastal Waters - Raritan Bay to Barnegat Inlet	Northern Coastal Waters - Raritan Bay to Barnegat Inlet	PCB	High	NJDEP Fish Tissue Monitoring
Raritan	09	NY-NJ Harbor	NY-NJ Harbor wide	Dioxin	High	HEP (GLEC)
Raritan	07	NY-NJ Harbor	Upper New York Harbor	Dioxin	High	HEP (GLEC), NJDEP Fish Tissue Monitoring
Raritan	07	NY-NJ Harbor	NYC and Battery (HR1, HR2)	Mercury	High	HEP (GLEC)

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Region	WMA	Station Name/Waterbody	Site ID #	Impairment	Priority	Data Source
Raritan	07	NY-NJ Harbor	Upper New York Harbor	Mercury	High	HEP (GLEC), NJDEP Fish Tissue Monitoring
Raritan	09	NY-NJ Harbor	NY-NJ Harbor wide	PAHs	High	HEP (GLEC)
Raritan	09	NY-NJ Harbor	NY-NJ Harbor wide	PCB	High	HEP (GLEC)
Raritan	07	NY-NJ Harbor	Upper New York Harbor	PCB	High	HEP (GLEC), NJDEP Fish Tissue Monitoring
Raritan	09	NY-NJ Harbor	NY-NJ Harbor wide	Pesticides	High	HEP (GLEC)
Northeast	03	Oak Ridge Reservoir-03	Oak Ridge Reservoir	Mercury	High	NJDEP Fish Tissue Monitoring
Atlantic Coast	13	Ocean Bathing Beach-13	Ocean Twp Bathing Beach	Fecal Coliform	High	Ocean Co HD
Atlantic Coast	13	Ocean County Park Lake-13	Ocean County Park Beach	Fecal Coliform	High	Ocean Co HD
Atlantic Coast	16	Old Robins Branch at Beaver Causeway in Dennis	AN0769	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	18	Oldmans Creek at Kings Hwy in Woolwich	AN0688	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	18	Oldmans Creek at Pointers - Auburn Rd in Auburn	EWQ0689	Phosphorus	Medium	EWQ
Lower Delaware	18	Oldmans Creek at Pointers - Auburn Rd in Auburn	EWQ0689	Total Suspended Solids		EWQ
Lower Delaware	18	Oldmans Creek at Porches Mill	01477510	Phosphorus	Medium	NJDEP/USGS Data
Lower Delaware	19	Ong Run at West Lake Shore Dr in Pemberton	EWQ0149A	pH	Medium	EWQ
Northeast	05	Oradell Reservoir-05	Oradell Reservoir	Mercury	High	NJDEP Fish Tissue Monitoring
Lower Delaware	17	Oranoaken Creek Estuary	3867F, 3867J	Total Coliform	High	NJDEP Shellfish Monitoring
Atlantic Coast	14	Oswego River at Harrisville	01410000, 14-OSW-1	Copper	High	NJDEP/USGS, Metal Recon
Northeast	03	Outlet Trib of Maple Lake	PQ14	Temperature	Medium	Pequannock River Coalition
Atlantic Coast	13	Oyster Creek Estuary	1663	Total Coliform	High	NJDEP Shellfish Monitoring
Lower Delaware	17	Pages Run at Newport	01412200	pH	Medium	NJDEP/USGS Data
Northwest	02	Papakating Creek at Rt 565 in Frankford	AN0304	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northwest	02	Papakating Creek at Rt 565 in Frankford	AN0304	Unknown Toxicity	Low	
Northwest	02	Papakating Creek at Rt 565 in Wantage	AN0307	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northwest	02	Papakating Creek at Sussex	01367910, 01367909, 2-PAP-1	Arsenic	High	NJDEP/USGS Data, Sussex MUA, Metal Recon
Northwest	02	Papakating Creek at Sussex	01367910, 01367909, 2-PAP-1	Phosphorus	High	NJDEP/USGS Data, Sussex MUA, Metal Recon
Northwest	02	Papakating Creek W Br at Rt 565 in Wantage	AN0306	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	12	Parker Creek Branch-Tidal	40, R04	Dissolved Oxygen	Medium	Monmouth Co HD, NJDEP Coastal Monitoring
Atlantic Coast	13	Parker Run-Estuary	1801, 1801A, 1801C, 1801D, 1801F	Total Coliform	High	NJDEP Shellfish Monitoring
Atlantic Coast	13	Parker Run-Tidal	R19	Dissolved Oxygen	Medium	NJDEP Coastal Monitoring
Lower Delaware	19	Parkers Creek at Creek Rd in Moorestown	EWQ0174	Phosphorus	High	EWQ
Lower Delaware	19	Parkers Creek at Rt 603 in Mt Laurel	AN0174A	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	06	Parsippany Lake-06	Lake Parsippany: Hoffman Beach and Johnson Beach, and Drewes Beach	Fecal Coliform	High	Parsippany Troy Hills HD
Lower Delaware	17	Parsonage Run at Finley Rd in Upper Deerfield	AN0711	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	17	Parvin Branch at Rt 55 in Vineland	AN0750	Benthic Macroinvertebrates	Low	NJDEP AMNET

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Lower Delaware	17	Parvin Lake-17	Parvin SP, Parvin Lake, Center, Left, and Right	Fecal Coliform	High	Southern Region
Northeast	05	Pascack Brook at Westwood	01377500, 5-PAS-1	Arsenic	High	NJDEP/USGS Data, Metal Recon
Northeast	05	Pascack Brook at Westwood	01377500, 5-PAS-1	Mercury	High	NJDEP/USGS Data, Metal Recon
Northeast	05	Pascack Brook at Westwood	01377500, 5-PAS-1	Phosphorus	Medium	NJDEP/USGS Data, Metal Recon
Northeast	06	Passaic River	Great Piece	Mercury	High	NJDEP Fish Tissue Monitoring
Northeast	04	Passaic River - Tidal	Passaic River - Tidal	Arsenic	High	HEP (GLEC), USEPA, 1999
Northeast	04	Passaic River - Tidal	Passaic River - Tidal	Mercury	High	HEP (GLEC), USEPA, 1999
Northeast	04	Passaic River (Tidal) at Rutgers St. in Kernytown	Passaic-4	Fecal Coliform	High	PVSC
Northeast	04	Passaic River (Tidal) at Rutgers St. in Kernytown	Passaic-4	Phosphorus	Medium	PVSC
Northeast	04	Passaic River (Tidal) at Union Ave. in Rutherford	Passaic-6	Fecal Coliform	High	PVSC
Northeast	06	Passaic River at Eagle Rock Ave in East Hanover	AN0231	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	06	Passaic River at Eagle Rock Ave in East Hanover	EWQ0231	Dissolved Solids	Medium	EWQ
Northeast	06	Passaic River at Eagle Rock Ave in East Hanover	EWQ0231	Phosphorus	High	EWQ
Northeast	06	Passaic River at Eagle Rock Ave in East Hanover	EWQ0231	Total Suspended Solids	Medium	EWQ
Northeast	04	Passaic River at Elmwood Park	01389880, 01389870, Passaic-8 , Passaic-9, Passaic-10, 4-SITE-5	Arsenic	High	NJDEP/USGS Data, EWQ, PVSC, Metal Recon
Northeast	04	Passaic River at Elmwood Park	01389880, 01389870, Passaic-8 , Passaic-9, Passaic-10, 4-SITE-5	Cadmium	High	NJDEP/USGS Data, EWQ, PVSC, Metal Recon
Northeast	04	Passaic River at Elmwood Park	01389880, 01389870, Passaic-8 , Passaic-9, Passaic-10, 4-SITE-5	Chromium	High	NJDEP/USGS Data, EWQ, PVSC, Metal Recon
Northeast	04	Passaic River at Elmwood Park	01389880, 01389870, Passaic-8 , Passaic-9, Passaic-10, 4-SITE-5	Copper	High	NJDEP/USGS Data, EWQ, PVSC, Metal Recon
Northeast	04	Passaic River at Elmwood Park	01389880, 01389870, Passaic-8 , Passaic-9, Passaic-10, 4-SITE-5	Cyanide	High	NJDEP/USGS Data, EWQ, PVSC, Metal Recon
Northeast	04	Passaic River at Elmwood Park	01389880, 01389870, Passaic-8 , Passaic-9, Passaic-10, 4-SITE-5	Fecal Coliform	High	NJDEP/USGS Data, EWQ, PVSC, Metal Recon
Northeast	04	Passaic River at Elmwood Park	01389880, 01389870, Passaic-8 , Passaic-9, Passaic-10, 4-SITE-5	Lead	High	NJDEP/USGS Data, EWQ, PVSC, Metal Recon
Northeast	04	Passaic River at Elmwood Park	01389880, 01389870, Passaic-8 , Passaic-9, Passaic-10, 4-SITE-5	Mercury	High	NJDEP/USGS Data, EWQ, PVSC, Metal Recon
Northeast	04	Passaic River at Elmwood Park	01389880, 01389870, Passaic-8 , Passaic-9, Passaic-10, 4-SITE-5	Phosphorus	High	NJDEP/USGS Data, EWQ, PVSC, Metal Recon
Northeast	04	Passaic River at Elmwood Park	01389880, 01389870, Passaic-8 , Passaic-9, Passaic-10, 4-SITE-5	Silver	High	NJDEP/USGS Data, EWQ, PVSC, Metal Recon
Northeast	04	Passaic River at Elmwood Park	01389880, 01389870, Passaic-8 , Passaic-9, Passaic-10, 4-SITE-5	Thallium	High	NJDEP/USGS Data, EWQ, PVSC, Metal Recon
Northeast	04	Passaic River at Elmwood Park	01389880, 01389870, Passaic-8 , Passaic-9, Passaic-10, 4-SITE-5	Zinc	High	NJDEP/USGS Data, EWQ, PVSC, Metal Recon
Northeast	06	Passaic River at Fairmount Ave in Long Hill	AN0229C	Benthic Macroinvertebrates	Low	NJDEP AMNET
01409416	04	Passaic River at Little Falls	01389500, Passaic-11, Passaic-12, 4-SITE-6, 4-PAS-3	Arsenic	High	NJDEP/USGS Data, PVSC, Metal Recon
01409416	04	Passaic River at Little Falls	01389500, Passaic-11, Passaic-12, 4-SITE-6, 4-PAS-3	Cadmium	High	NJDEP/USGS Data, PVSC, Metal Recon

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01409416	04	Passaic River at Little Falls	01389500, Passaic-11, Passaic-12, 4-SITE-6, 4-PAS-3	Chromium	High	NJDEP/USGS Data, PVSC, Metal Recon
01409416	04	Passaic River at Little Falls	01389500, Passaic-11, Passaic-12, 4-SITE-6, 4-PAS-3	Copper	High	NJDEP/USGS Data, PVSC, Metal Recon
01409416	04	Passaic River at Little Falls	01389500, Passaic-11, Passaic-12, 4-SITE-6, 4-PAS-3	Cyanide	High	NJDEP/USGS Data, PVSC, Metal Recon
01409416	04	Passaic River at Little Falls	01389500, Passaic-11, Passaic-12, 4-SITE-6, 4-PAS-3	Lead	High	NJDEP/USGS Data, PVSC, Metal Recon
01409416	04	Passaic River at Little Falls	01389500, Passaic-11, Passaic-12, 4-SITE-6, 4-PAS-3	Mercury	High	NJDEP/USGS Data, PVSC, Metal Recon
01409416	04	Passaic River at Little Falls	01389500, Passaic-11, Passaic-12, 4-SITE-6, 4-PAS-3	Phosphorus	High	NJDEP/USGS Data, PVSC, Metal Recon
01409416	04	Passaic River at Little Falls	01389500, Passaic-11, Passaic-12, 4-SITE-6, 4-PAS-3	Silver	High	NJDEP/USGS Data, PVSC, Metal Recon
01409416	04	Passaic River at Little Falls	01389500, Passaic-11, Passaic-12, 4-SITE-6, 4-PAS-3	Thallium	High	NJDEP/USGS Data, PVSC, Metal Recon
01409416	04	Passaic River at Little Falls	01389500, Passaic-11, Passaic-12, 4-SITE-6, 4-PAS-3	Zinc	High	NJDEP/USGS Data, PVSC, Metal Recon
Northeast	06	Passaic River at Old Mt Pleasant Ave in E Hanover	AN0231B	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	06	Passaic River at Passaic Ave in Millburn	AN0231A	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	04	Passaic River at River Rd (Dundee Dam) in Garfield	AN0292O	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	06	Passaic River at S Main Ave in Warren	AN0228	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	04	Passaic River at Singac	01389130, 4-PAS-4	Arsenic	High	NJDEP/USGS Data, Metal Recon
Northeast	04	Passaic River at Singac	01389130, 4-PAS-4	Cadmium	High	NJDEP/USGS Data, Metal Recon
Northeast	04	Passaic River at Singac	01389130, 4-PAS-4	Chromium	High	NJDEP/USGS Data, Metal Recon
Northeast	04	Passaic River at Singac	01389130, 4-PAS-4	Copper	High	NJDEP/USGS Data, Metal Recon
Northeast	04	Passaic River at Singac	01389130, 4-PAS-4	Cyanide	High	NJDEP/USGS Data, Metal Recon
Northeast	04	Passaic River at Singac	01389130, 4-PAS-4	Lead	High	NJDEP/USGS Data, Metal Recon
Northeast	04	Passaic River at Singac	01389130, 4-PAS-4	Mercury	High	NJDEP/USGS Data, Metal Recon
Northeast	04	Passaic River at Singac	01389130, 4-PAS-4	Phosphorus	High	NJDEP/USGS Data, Metal Recon
Northeast	04	Passaic River at Singac	01389130, 4-PAS-4	Silver	High	NJDEP/USGS Data, Metal Recon
Northeast	04	Passaic River at Singac	01389130, 4-PAS-4	Thallium	High	NJDEP/USGS Data, Metal Recon
Northeast	04	Passaic River at Singac	01389130, 4-PAS-4	Zinc	High	NJDEP/USGS Data, Metal Recon
Northeast	06	Passaic River at Snyder Ave in Berkeley	AN0229B	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	06	Passaic River at Stanley Ave in Summit	AN0229	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	06	Passaic River at Summit Ave in Summit	AN0230	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	06	Passaic River at Tempewick Rd near Mendham	01378660	Fecal Coliform	High	NJDEP/USGS Data
Northeast	06	Passaic River at Two Bridges	01382000, 6-SITE-3	Arsenic	High	NJDEP/USGS Data, Metal Recon
Northeast	06	Passaic River at Two Bridges	01382000, 6-SITE-3	Mercury	High	NJDEP/USGS Data, Metal Recon
Northeast	06	Passaic River at Two Bridges	01382000, 6-SITE-3	Phosphorus	High	NJDEP/USGS Data, Metal Recon
Northeast	06	Passaic River at Watchung Ave in Chatham	AN0230A	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	06	Passaic River at Willard St in Montville	AN0274A	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	04	Passaic River Below Pompton River at Two Bridges	01389005	Phosphorus	High	NJDEP/USGS Data

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Northeast	04	Passaic River from Route 280 to confluence of Pompton River (Two Bridges)	Passaic River from Route 280 to confluence of Pompton River (Two Bridges)	Mercury	High	NJDEP Fish Tissue Monitoring
Northeast	04	Passaic River Lower, Estuary and Tribs	Passaic River Lower, Estuary and Tribs	Dioxin	High	NJDEP Fish Tissue Monitoring
Northeast	04	Passaic River Lower, Estuary and Tribs	Passaic River Lower, Estuary and Tribs	PCB	High	NJDEP Fish Tissue Monitoring
Northeast	06	Passaic River near Chatham	01379500, 6-SITE-1, 6-PAS-2	Arsenic	High	NJDEP/USGS Data, Metal Recon
Northeast	06	Passaic River near Chatham	01379500, 6-SITE-1, 6-PAS-2	Cadmium	High	NJDEP/USGS Data, Metal Recon
Northeast	06	Passaic River near Chatham	01379500, 6-SITE-1, 6-PAS-2	Copper	High	NJDEP/USGS Data, Metal Recon
Northeast	06	Passaic River near Chatham	01379500, 6-SITE-1, 6-PAS-2	Cyanide	High	NJDEP/USGS Data, Metal Recon
Northeast	06	Passaic River near Chatham	01379500, 6-SITE-1, 6-PAS-2	Lead	High	NJDEP/USGS Data, Metal Recon
Northeast	06	Passaic River near Chatham	01379500, 6-SITE-1, 6-PAS-2	Mercury	High	NJDEP/USGS Data, Metal Recon
Northeast	06	Passaic River near Chatham	01379500, 6-SITE-1, 6-PAS-2	Phosphorus	High	NJDEP/USGS Data, Metal Recon
Northeast	06	Passaic River near Chatham	01379500, 6-SITE-1, 6-PAS-2	Silver	High	NJDEP/USGS Data, Metal Recon
Northeast	06	Passaic River near Chatham	01379500, 6-SITE-1, 6-PAS-2	Total Suspended Solids	Medium	NJDEP/USGS Data, Metal Recon
Northeast	06	Passaic River near Chatham	01379500, 6-SITE-1, 6-PAS-2	Zinc	High	NJDEP/USGS Data, Metal Recon
Northeast	06	Passaic River near Millington	01379000, EWQ0224, 6-SITE-2, 6-PAS-1	Arsenic	High	NJDEP/USGS Data, EWQ, Metal Recon
Northeast	06	Passaic River near Millington	01379000, EWQ0224, 6-SITE-2, 6-PAS-1	Cadmium	High	NJDEP/USGS Data, EWQ, Metal Recon
Northeast	06	Passaic River near Millington	01379000, EWQ0224, 6-SITE-2, 6-PAS-1	Copper	High	NJDEP/USGS Data, EWQ, Metal Recon
Northeast	06	Passaic River near Millington	01379000, EWQ0224, 6-SITE-2, 6-PAS-1	Cyanide	High	NJDEP/USGS Data, EWQ, Metal Recon
Northeast	06	Passaic River near Millington	01379000, EWQ0224, 6-SITE-2, 6-PAS-1	Lead	High	NJDEP/USGS Data, EWQ, Metal Recon
Northeast	06	Passaic River near Millington	01379000, EWQ0224, 6-SITE-2, 6-PAS-1	Mercury	High	NJDEP/USGS Data, EWQ, Metal Recon
Northeast	06	Passaic River near Millington	01379000, EWQ0224, 6-SITE-2, 6-PAS-1	Phosphorus	High	NJDEP/USGS Data, EWQ, Metal Recon
Northeast	06	Passaic River near Millington	01379000, EWQ0224, 6-SITE-2, 6-PAS-1	Silver	High	NJDEP/USGS Data, EWQ, Metal Recon
Northeast	06	Passaic River near Millington	01379000, EWQ0224, 6-SITE-2, 6-PAS-1	Zinc	High	NJDEP/USGS Data, EWQ, Metal Recon
Atlantic Coast	15	Patcong River Estuary	2801A, 2862, 2863A, 2863B, 2863C, 2863D, 2863E, 2863G, 2863H, 2863L, 2863M	Dissolved Oxygen	Medium	NJDEP Coastal Monitoring, Shellfish Monitoring
Atlantic Coast	15	Patcong River Estuary	2801A, 2862, 2863A, 2863B, 2863C, 2863D, 2863E, 2863G, 2863H, 2863L, 2863M	Total Coliform	High	NJDEP Coastal Monitoring, Shellfish Monitoring
Northwest	01	Paulins Kill at Balesville	01443440, 1-PAU-1	Arsenic	High	NJDEP/USGS Data, EWQ, Metal Recon
Northwest	01	Paulins Kill at Blairstown	01443500	Temperature	Medium	NJDEP/USGS Data
Northwest	01	Paulins Kill at Rt 46 Bridge near I-80	DRBCNJ0036	Temperature	Medium	DRBC
Northwest	01	Paulins Kill at Rt 46 in Knowlton	AN0032	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northwest	01	Paulins Kill at Rt 663 in Lafayette	AN0015	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northwest	01	Paulins Kill at Warbasse Junction Rd near Lafayette	01443250	Dissolved Oxygen	Medium	NJDEP/USGS Data

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Northwest	01	Paulins Kill at Warbasse Junction Rd near Lafayette	01443250	Fecal Coliform	High	NJDEP/USGS Data
Northwest	01	Paulins Kill at Warbasse Junction Rd near Lafayette	01443250	Phosphorus	Medium	NJDEP/USGS Data
Northwest	01	Paulins Kill Trib at Rt 94 & Old Beaver Run Rd in Lafayette	AN0016A	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northwest	01	Paulins Kill Trib at Van Sickle Rd in Lafayette	AN0021A	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	08	Pavillion Beach	Pavillion Beach	Fecal Coliform	High	
Northeast	04	Peckman River at McBride Ave in West Paterson	AN0275	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	18	Pennsauken Creek	Pennsauken Creek, Mainstem	Arsenic	High	304(l)
Lower Delaware	18	Pennsauken Creek	Pennsauken Creek, Mainstem	Cadmium	High	304(l)
Lower Delaware	18	Pennsauken Creek	Pennsauken Creek, Mainstem	Chromium	High	304(l)
Lower Delaware	18	Pennsauken Creek	Pennsauken Creek, Mainstem	Copper	High	304(l)
Lower Delaware	18	Pennsauken Creek	Pennsauken Creek, Mainstem	Lead	High	304(l)
Lower Delaware	18	Pennsauken Creek	Pennsauken Creek, Mainstem	Mercury	High	304(l)
Lower Delaware	18	Pennsauken Creek at Forked Landing	Pennsauken Creek at Forked Landing	Dioxin	High	NJDEP Fish Tissue Monitoring
Lower Delaware	18	Pennsauken Creek at Forked Landing	Pennsauken Creek at Forked Landing	PCB	High	NJDEP Fish Tissue Monitoring
Lower Delaware	18	Pennsauken Creek at Rt 130 in Pennsauken	01467082	Phosphorus	Medium	EWQ
Lower Delaware	18	Pennsauken Creek N Br at Fellowship Rd in Mount Laurel	AN0179	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	18	Pennsauken Creek N Br near Morrestown	01467069, 18-PE-1, 18-PE-2	Arsenic	High	NJDEP/USGS Data, Metal Recon
Lower Delaware	18	Pennsauken Creek N Br near Morrestown	01467069, 18-PE-1, 18-PE-2	Phosphorus	Medium	NJDEP/USGS Data, Metal Recon
Lower Delaware	18	Pennsauken Creek S Br at Cherry Hill	01467081, 18-PE-3	Arsenic	High	NJDEP/USGS, Metal Recon
Lower Delaware	18	Pennsauken Creek S Br at Cherry Hill	01467081, 18-PE-3	Phosphorus	Medium	NJDEP/USGS, Metal Recon
Lower Delaware	18	Pennsauken Creek S Br at Cherry Hill	01467081, 18-PE-3	Total Suspended Solids	Medium	NJDEP/USGS, Metal Recon
Lower Delaware	18	Pennsauken Creek S Br at Greentree Rd in Evesham	AN0182	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	18	Pennsauken Creek S Br at Rt 41 in Cherry Hill	AN0183	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	03	Pequannock River - Butler	PQ10	Temperature	High	Pequannock River Coalition
Northeast	03	Pequannock River above Clinton	PQ4	Temperature	High	Pequannock River Coalition
Northeast	03	Pequannock River above Macopin	PQ7	Temperature	High	Pequannock River Coalition
Northeast	03	Pequannock River at Macopin Intake Dam	01382500, PQ8, 3-SITE-8, 3-PEQ-1	Dissolved Oxygen	Medium	NJDEP/USGS Data, Pequannock River Coalition, Metal Recon
Northeast	03	Pequannock River at Macopin Intake Dam	01382500, PQ8, 3-SITE-8, 3-PEQ-1	Lead	High	NJDEP/USGS Data, Pequannock River Coalition, Metal Recon
Northeast	03	Pequannock River at Macopin Intake Dam	01382500, PQ8, 3-SITE-8, 3-PEQ-1	Temperature	High	NJDEP/USGS Data, Pequannock River Coalition, Metal Recon
Northeast	03	Pequannock River at Riverdale	01382800, PQ11	Temperature	High	EWQ, Pequannock River Coalition
Northeast	03	Pequannock River at Rt 23 (abv res) in West Milford	AN0259	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	03	Pequannock River at Rt 515 in Hardyston	AN0258	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	03	Pequannock River below Clinton	PQ5	Temperature	High	Pequannock River Coalition
Northeast	03	Pequannock River below Pacock	PQ3	Temperature	High	Pequannock River Coalition

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Northwest	01	Pequest River at Pequest	01445500, 1-PEQ-2	pH	Medium	NJDEP/USGS Data, EWQ, Metal Recon
Northwest	01	Pequest River at Pequest	01445500, 1-PEQ-2	Phosphorus	Medium	NJDEP/USGS Data, EWQ, Metal Recon
Northwest	01	Pequest River at Pequest	01445500, 1-PEQ-2	Total Suspended Solids	Medium	NJDEP/USGS Data, EWQ, Metal Recon
Northwest	01	Pequest River at Rt 206 in Andover	AN0035	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northwest	01	Pequest River on Water Street at Belvidere	01446400, DRBCNJ0033, 1-PEQ-3	Arsenic	High	NJDEP/USGS Data, DRBC, Metal Recon
Northwest	01	Pequest River on Water Street at Belvidere	01446400, DRBCNJ0033, 1-PEQ-3	Cadmium	High	NJDEP/USGS Data, DRBC, Metal Recon
Northwest	01	Pequest River on Water Street at Belvidere	01446400, DRBCNJ0033, 1-PEQ-3	Chromium	High	NJDEP/USGS Data, DRBC, Metal Recon
Northwest	01	Pequest River on Water Street at Belvidere	01446400, DRBCNJ0033, 1-PEQ-3	Lead	High	NJDEP/USGS Data, DRBC, Metal Recon
Northwest	01	Pequest River on Water Street at Belvidere	01446400, DRBCNJ0033, 1-PEQ-3	Mercury	High	NJDEP/USGS Data, DRBC, Metal Recon
Northwest	01	Pequest River on Water Street at Belvidere	01446400, DRBCNJ0033, 1-PEQ-3	pH	Medium	NJDEP/USGS Data, DRBC, Metal Recon
Northwest	01	Pequest River on Water Street at Belvidere	01446400, DRBCNJ0033, 1-PEQ-3	Phosphorus	Medium	NJDEP/USGS Data, DRBC, Metal Recon
Northwest	01	Pequest River on Water Street at Belvidere	01446400, DRBCNJ0033, 1-PEQ-3	Temperature	Medium	NJDEP/USGS Data, DRBC, Metal Recon
Northwest	01	Pequest River UNK Trib at Brighton Rd in Green	AN0036	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	09	Peters Brook at Rt 28 in Somerville	AN0376	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	10	Pike Run at Rt 533 in Montgomery	AN0405	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	10	Pike Run near Rocky Hill	01401700	Phosphorus	Medium	NJDEP/USGS Data
Raritan	09	Pine Brook at Pension Rd in Manalapan	AN0449	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	12	Pine Brook at Squankum Rd in Macedonia	AN0476A	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	12	Pine Brook at Tinton Ave (Rt 537) in Tinton Falls	AN0476	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	13	Pine Lake-13	Pine Lake Bathing Beach	Fecal Coliform	High	Ocean Co HD
Lower Delaware	18	Plank Run at Rt 322 in Harrison	AN0670A	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	20	Pleasant Run at Extonville Rd in Hamilton	AN0126B	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	08	Pleasant Run at S Br Rd in Branchburg	AN0340	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	13	Plohemus Creek-Tidal	1614G	Total Coliform	High	NJDEP Shellfish Monitoring
Northwest	01	Plum Brook at Pine Hill Rd in Delaware	AN0093	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northwest	11	Plum Brook near Locktown	01461262	Fecal Coliform	High	NJDEP/USGS Data
Northwest	01	Pohatcong Creek at Buttermilk Bridge Rd in Washington	AN0057	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northwest	01	Pohatcong Creek at New Village	01455200	Fecal Coliform	High	NJDEP/USGS Data, EWQ
Northwest	01	Pohatcong Creek at New Village	01455200	pH	Medium	NJDEP/USGS Data, EWQ
Northwest	01	Pohatcong Creek at New Village	01455200	Phosphorus	Medium	NJDEP/USGS Data, EWQ
Northwest	01	Pohatcong Creek at New Village	01455200	Temperature	Medium	NJDEP/USGS Data, EWQ
Northwest	01	Pohatcong Creek at O'Brian Rd in Mansfield	AN0054A	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northwest	01	Pohatcong Creek at River Rd Bridge	DRBCNJ0027	Fecal Coliform	High	DRBC

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Northwest	01	Pohatcong Creek at River Rd Bridge	DRBCNJ0027	Phosphorus	Medium	DRBC
Northwest	01	Pohatcong Creek at Tunnel Hill Rd in Mansfield	AN0055	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northwest	01	Pohatcong Creek at Tunnel Hill Rd in Mansfield	EWQ0055	Temperature	Medium	EWQ
Atlantic Coast	13	Point Pleasant Canal	1308C	Total Coliform	High	NJDEP Shellfish Monitoring
Lower Delaware	19	Pompeston Creek at New Albany Rd in Moorestown	AN0177A	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	18	Pompeston Creek at Rt 130 in Cinnaminson	AN0177	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	03	Pompton Lake-03	Pompton Lake	Mercury	High	NJDEP Fish Tissue Monitoring
Northeast	03	Pompton River at Lincoln Park	Pompton River at Lincoln Park	Mercury	High	NJDEP Fish Tissue Monitoring
Northeast	03	Pompton River at Newark Pompton Tnpk in Pequannock	AN0268	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	03	Pompton River at Newark Pompton Tnpk in Pequannock	AN0268	Unknown Toxicity	Low	
Northeast	03	Pompton River at Pequannock River	Pompton River at Pequannock River	Mercury	High	NJDEP Fish Tissue Monitoring
Northeast	03	Pompton River at Pompton Plains	01388500, 3-SITE-7	Lead	High	NJDEP/USGS Data, Metal Recon
Northeast	03	Pompton River at Pompton Plains Cross Rd in Pequannock	AN0268A	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	03	Pompton River at Pompton Plains Cross Rd in Pequannock	AN0268A	Unknown Toxicity	Low	
Northeast	03	Pompton River at Rt 202 in Wayne	01388910	Phosphorus	Medium	EWQ
Northeast	03	Pompton River Trib at Ryerson Rd	01388720	Fecal Coliform	High	NJDEP/USGS Data
Northwest	11	Pond Run at Rt 533 in Hamilton	AN0117	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	12	Poplar Brook at Deal	01407630, 59	Phosphorus	Medium	NJDEP/USGS Data, Monmouth Co HD
Northeast	06	Powder Mill Pond-06	Tabor Lake Corporation	Fecal Coliform	High	Parsippany Troy Hills HD
Northeast	04	Preakness Brook at French Hill Rd in Wayne	AN0273	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	14	Pump Branch near Waterford Works	01409408	pH	Medium	NJDEP/USGS Data
Lower Delaware	18	Raccoon Creek at Ellis Mill Rd in Elk	AN0679	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	18	Raccoon Creek at N Main St in Harrison	AN0680	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	17	Raccoon Creek at Rt 130 in Bridgeport	01477160	Phosphorus	Medium	EWQ
Lower Delaware	17	Raccoon Creek at Rt 130 in Bridgeport	01477160	Total Suspended Solids	Medium	EWQ
Lower Delaware	18	Raccoon Creek at Tomlin Sta Rd in Harrison	AN0683	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	18	Raccoon Creek near Swedesboro	01477120, 18-RAC-1	Phosphorus	Medium	NJDEP/USGS Data, Metal Recon
Lower Delaware	18	Raccoon Creek near Swedesboro	01477120, 18-RAC-1	Silver	High	NJDEP/USGS Data, Metal Recon
Lower Delaware	18	Raccoon Creek S Br at High St in Harrison	AN0682	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	17	Raccoon Ditch at Davis Mill Rd in Greenwich	AN0708	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	07	Rahway River at Kenilworth Blvd in Cranford	AN0194	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	07	Rahway River at Rahway	01395000, 7-RAH-1	Arsenic	High	NJDEP/USGS Data, Metal Recon, Drinking Water
Raritan	07	Rahway River at Rahway	01395000, 7-RAH-1	Phosphorus	Medium	NJDEP/USGS Data, Metal Recon, Drinking Water
Raritan	07	Rahway River at Rahway	01395000, 7-RAH-1	Trichloroethylene	High	NJDEP/USGS Data, Metal Recon, Drinking Water

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Raritan	07	Rahway River at River Rd & Church St in Rahway	AN0195	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	07	Rahway River at Washington Ave (Rt 82) in Springfield	AN0193	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	07	Rahway River near Springfield	01394500	Phosphorus	Medium	NJDEP/USGS Data, Drinking Water
Raritan	07	Rahway River S Br at Colonia	01396030	Fecal Coliform	High	NJDEP/USGS Data
Raritan	07	Rahway River S Br at Colonia	01396030	Phosphorus	Medium	NJDEP/USGS Data
Raritan	07	Rahway River S Br at Merrill Park in Woodbridge	AN0201	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	07	Rahway River S Br at Parsonnage Rd in Edison	AN0200	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	07	Rahway River W Br at Northfield Av at West Orange	01393960	Chloride	Medium	NJDEP/USGS Data
Raritan	07	Rahway River W Br at Northfield Av at West Orange	01393960	Dissolved Solids	Medium	NJDEP/USGS Data
Raritan	07	Rahway River W Br at Northfield Av at West Orange	01393960	Phosphorus	Medium	NJDEP/USGS Data
Northeast	06	Rainbow Lakes-06	Rainbow Lakes Comm. Club	Fecal Coliform	High	Parsippany Troy Hills HD
Atlantic Coast	12	Ramanessin Brook at Willow Rd in Holmdel	53	Phosphorus	Medium	Monmouth Co HD
Northeast	03	Ramapo River at Dawes Highway	01388100, 01388000	Dissolved Oxygen	Medium	NJDEP/USGS Data, EWQ
Northeast	03	Ramapo River at Dawes Highway	01388100, 01388000	pH	Medium	NJDEP/USGS Data, EWQ
Northeast	03	Ramapo River at Dawes Highway	01388100, 01388000	Phosphorus	Medium	NJDEP/USGS Data, EWQ
Northeast	03	Ramapo River near Mahwah	01387500, 3-SITE-9, 3-RAM-1	Phosphorus	Medium	NJDEP/USGS Data, Metal Recon
Northeast	04	Ramsey Brook at Grenadier Dr W of Cortland Tr in Mahwah	AN0286X	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	04	Ramsey Brook at Masonicus Rd in Mahwah	AN0286	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	04	Ramsey Brook at Park Ave in Allendale	AN0287	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	04	Ramsey Brook at Park Ave in Allendale	AN0287	Unknown Toxicity	Low	
Lower Delaware	19	Rancocas Creek N Br at Browns Mills	01465970	Fecal Coliform	High	NJDEP/USGS Data, 304(l)
Lower Delaware	19	Rancocas Creek N Br at Browns Mills	01465970	Mercury	High	NJDEP/USGS Data, 304(l)
Lower Delaware	19	Rancocas Creek N Br at Browns Mills	01465970	pH	Medium	NJDEP/USGS Data, 304(l)
Lower Delaware	19	Rancocas Creek N Br at Browns Mills	01465970	Phosphorus	High	NJDEP/USGS Data, 304(l)
Lower Delaware	19	Rancocas Creek N Br at Hanover Furnace	01465950, 19-RA-1N	Copper	High	NJDEP Metal Recon
Lower Delaware	19	Rancocas Creek N Br at Hanover Furnace	01465950, 19-RA-1N	Lead	High	NJDEP Metal Recon
Lower Delaware	19	Rancocas Creek N Br at Hanover Furnace	01465950, 19-RA-1N	Mercury	High	NJDEP Metal Recon
Lower Delaware	19	Rancocas Creek N Br at Iron Works Park at Mt Holly	01467005, 01467006, 01467003, 19-RA-4N	Arsenic	High	NJDEP/USGS Data, EWQ, Metal Recon
Lower Delaware	19	Rancocas Creek N Br at Iron Works Park at Mt Holly	01467005, 01467006, 01467003, 19-RA-4N	Copper	High	NJDEP/USGS Data, EWQ, Metal Recon
Lower Delaware	19	Rancocas Creek N Br at Iron Works Park at Mt Holly	01467005, 01467006, 01467003, 19-RA-4N	Lead	High	NJDEP/USGS Data, EWQ, Metal Recon
Lower Delaware	19	Rancocas Creek N Br at Iron Works Park at Mt Holly	01467005, 01467006, 01467003, 19-RA-4N	pH	Medium	NJDEP/USGS Data, EWQ, Metal Recon
Lower Delaware	19	Rancocas Creek N Br at Iron Works Park at Mt Holly	01467005, 01467006, 01467003, 19-RA-4N	Phosphorus	Medium	NJDEP/USGS Data, EWQ, Metal Recon
Lower Delaware	19	Rancocas Creek N Br at Pemberton	01467000, 19-RA-3N	Copper	High	NJDEP/USGS Data, Metal Recon
Lower Delaware	19	Rancocas Creek N Br at Pemberton	01467000, 19-RA-3N	Lead	High	NJDEP/USGS Data, Metal Recon

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Lower Delaware	19	Rancocas Creek N Br at Pine St Pk in Mount Holly	AN0151	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	19	Rancocas Creek S Br at Hainesport	Rancocas, EWQ0176S, 19-RA-1S	Arsenic	High	NJDEP/USGS Data, EWQ, Metal Recon
Lower Delaware	19	Rancocas Creek S Br at Hainesport	Rancocas, EWQ0176S, 19-RA-1S	Fecal Coliform	High	NJDEP/USGS Data, EWQ, Metal Recon
Lower Delaware	19	Rancocas Creek S Br at Hainesport	Rancocas, EWQ0176S, 19-RA-1S	Phosphorus	Medium	NJDEP/USGS Data, EWQ, Metal Recon
Lower Delaware	19	Rancocas Creek S Br at Mt Holly - Eayrestown Rd in Lumberton	AN0161	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	19	Rancocas Creek S Br at Vincentown	01465850, 19-RA-3S	Lead	High	NJDEP/USGS Data, Metal Recon
Lower Delaware	19	Rancocas Creek S Br at Vincentown	01465850, 19-RA-3S	pH	Medium	NJDEP/USGS Data, Metal Recon
Lower Delaware	19	Rancocas Creek S Br at Vincentown	01465850, 19-RA-3S	Phosphorus	Medium	NJDEP/USGS Data, Metal Recon
Lower Delaware	19	Rancocas Creek S Br Trib at Burr's Mill Rd	SSOTRBUR	Pineland Biological Community	Low	Pinelands
Lower Delaware	19	Rancocas Creek SW Br at Hartford Rd	WSOHARTF	Pineland Biological Community	Low	Pinelands
Lower Delaware	19	Rancocas Creek SW Br at Rt 70 in Medford	EWQ0169, 19-RA-2S	Arsenic	High	EWQ, Metal Recon
Lower Delaware	19	Rancocas Creek SW Br at Rt 70 in Medford	EWQ0169, 19-RA-2S	pH	Medium	EWQ, Metal Recon
Lower Delaware	19	Rancocas Creek SW Br at Rt 70 in Medford	EWQ0169, 19-RA-2S	Phosphorus	High	EWQ, Metal Recon
Lower Delaware	19	Rancocas Creek SW Br at Rt 70 in Medford	AN0169, WSORT541, WSORTE70, WSOMEDPK	Pineland Biological Community	Low	NJDEP AMNET, Pinelands
Raritan	08	Randolph Park Lake-08	Randolph Park Lake Left Beach, Right Beach, and Swim Lanes	Fecal Coliform	High	Randoph Twp HD
Raritan	09	Raritan Bay	Raritan Bay-1 thru 7	Total Coliform	High	NJDEP Coastal Monitoring, Shellfish Monitoring, IEC, HEP (GLEC)
Raritan	09	Raritan Bay and Tidal Tributaries	Raritan Bay and Tidal Tributaries	Dioxin	High	NJDEP Fish Tissue Monitoring
Raritan	09	Raritan Bay and Tidal Tributaries	Raritan Bay and Tidal Tributaries	PCB	High	NJDEP Fish Tissue Monitoring
Raritan	09	Raritan River	Raritan River	Mercury	High	NJDEP Fish Tissue Monitoring
Raritan	09	Raritan River abv Millstone River conf in Bridgewater	AN0377	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	09	Raritan River at Landing Lane in Johnson Pk in Piscataway	01404170	Phosphorus	High	EWQ
Raritan	09	Raritan River at Landing Lane in Johnson Pk in Piscataway	01404170	Total Suspended Solids	Medium	EWQ
Raritan	09	Raritan River at Manville	01400500	Phosphorus	Medium	NJDEP/USGS Data, EWQ
Raritan	09	Raritan River at Millstone River	Raritan River at Millstone River	Mercury	High	NJDEP Fish Tissue Monitoring
Raritan	08	Raritan River at Neshanic Station	Raritan River at Neshanic Station	Mercury	High	NJDEP Fish Tissue Monitoring
Raritan	09	Raritan River at Queens Bridge	01403300	Arsenic	High	NJDEP/USGS Data, NAWQA, HEP (GLEC)
Raritan	09	Raritan River at Queens Bridge	01403300	Phosphorus	High	NJDEP/USGS Data, NAWQA, HEP (GLEC)
Raritan	09	Raritan River at Queens Bridge	01403300	Total Suspended Solids		NJDEP/USGS Data, NAWQA, HEP (GLEC)
Raritan	09	Raritan River at Route 1	Raritan River at Route 1	Mercury	High	NJDEP Fish Tissue Monitoring
Raritan	09	Raritan River Estuary	Raritan River Estuary, Reach 02030105-001	Arsenic	High	HEP (GLEC)
Raritan	09	Raritan River Estuary	Raritan River Estuary, Reach 02030105-002	Arsenic	High	HEP (GLEC)

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Raritan	09	Raritan River Estuary	Raritan River Estuary, Reach 02030105-001	Cadmium	High	HEP (GLEC)
Raritan	09	Raritan River Estuary	Raritan River Estuary, Reach 02030105-002	Cadmium	High	HEP (GLEC)
Raritan	09	Raritan River Estuary	Raritan River Estuary, Reach 02030105-002	PCB	High	HEP (GLEC)
Raritan	09	Raritan River Estuary	Raritan River Estuary	Total Coliform	High	HEP (GLEC), IEC, NJDEP Shellfish Monitoring
Raritan	09	Raritan River Estuary	Raritan River Estuary, Reach 02030105-001	Zinc	High	HEP (GLEC)
Raritan	08	Raritan River N Br at Burnt Mills	01399120, 8-NB-2	Copper	High	NJDEP/USGS Data, Metal Recon
Raritan	08	Raritan River N Br at Roxitucus Rd in Mendham	AN0351A	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	08	Raritan River S Br Arch St at High Bridge	01396535, 8-SB-2	Temperature	Medium	NJDEP/USGS Data, Metal Recon
Raritan	08	Raritan River S Br at Middle Valley	01396280, EWQ0316, 8-SB-1	Phosphorus	Medium	NJDEP/USGS Data, EWQ, Metal Recon
Raritan	08	Raritan River S Br at Middle Valley	01396280, EWQ0316, 8-SB-1	Temperature	Medium	NJDEP/USGS Data, EWQ, Metal Recon
Raritan	08	Raritan River S Br at South Branch	01398102, 01398070, 8-SB-6	Arsenic	High	NJDEP/USGS Data, Metal Recon
Raritan	08	Raritan River S Br at South Branch	01398102, 01398070, 8-SB-6	Chromium	High	NJDEP/USGS Data, Metal Recon
Raritan	08	Raritan River S Br at South Branch	01398102, 01398070, 8-SB-6	Copper	High	NJDEP/USGS Data, Metal Recon
Raritan	08	Raritan River S Br at South Branch	01398102, 01398070, 8-SB-6	Lead	High	NJDEP/USGS Data, Metal Recon
Raritan	08	Raritan River S Br at South Branch	01398102, 01398070, 8-SB-6	pH	Medium	NJDEP/USGS Data, Metal Recon
Raritan	08	Raritan River S Br at South Branch	01398102, 01398070, 8-SB-6	Phosphorus	High	NJDEP/USGS Data, Metal Recon
Raritan	08	Raritan River S Br at Stanton Station	01397000, 8-SB-3	Arsenic	High	NJDEP/USGS Data, Metal Recon
Raritan	08	Raritan River S Br at Stanton Station	01397000, 8-SB-3	pH	Medium	NJDEP/USGS Data, Metal Recon
Raritan	08	Raritan River S Br at Stanton Station	01397000, 8-SB-3	Temperature	Medium	NJDEP/USGS Data, Metal Recon
Raritan	08	Raritan River S Br at Station Rd in Raritan	AN0326	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	08	Raritan River S Br at Three Bridges	01397400, 8-SB-4	Phosphorus	High	NJDEP/USGS Data, EWQ, Metal Recon
Raritan	08	Ravine Lake-08	Ravine Lake (Somerset Lake)	Fecal Coliform	High	Bernards Twp HD
Atlantic Coast	15	Reeds Bay	Unnamed Creek-1; Somers Cove-2; Somers Marsh-3; Reeds Bay-5,6,8	Total Coliform	High	NJDEP Coastal Monitoring, Shellfish Monitoring
Atlantic Coast	16	Richardson Sound	Old Turtle Thorofare-1; Unnamed Creek-2,7; Old Turtle Thorofare-3; Taugh Creek-4; Slaughter Gut-6; Stingeree Creek-8; Grassy Sound-12	Total Coliform	High	NJDEP Coastal Monitoring, Shellfish Monitoring
Atlantic Coast	13	Ridgeway Branch at Rt 70 in Manchester	AN0528	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	13	Ridgeway Branch of Toms River	Ridgeway Branch of Toms River	Mercury	High	NJDEP Fish Tissue Monitoring
Northeast	03	Ringwood Creek at Manor Rd in Ringwood St. Park	01384495	Temperature	Medium	EWQ
Raritan	07	Robinson Branch at Scotch Plains	01395200	Phosphorus	Medium	NJDEP/USGS Data
Raritan	07	Robinson Branch at St Georges Av at Rahway	01396003, 7-ROB-1	Arsenic	High	NJDEP/USGS Data, Metal Recon
Raritan	07	Robinson Branch at St Georges Av at Rahway	01396003, 7-ROB-1	Phosphorus	Medium	NJDEP/USGS Data, Metal Recon
Raritan	07	Robinsons Branch at Goodmans Crossing in Scotch Plains	AN0196	Benthic Macroinvertebrates	Low	NJDEP AMNET

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Raritan	07	Robinsons Branch at Rt 27 in Rahway	AN0199	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	10	Rock Brook at Burnt Hill Rd in Montgomery	AN0400	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	10	Rock Brook at Zion	01401560	Fecal Coliform	High	NJDEP/USGS Data
Raritan	08	Rockaway Creek at Whitehouse	01399700, EWQ0369, 8-RO-1	Lead	High	NJDEP/USGS Data, EWQ, Metal Recon
Raritan	08	Rockaway Creek at Whitehouse	01399700, EWQ0369, 8-RO-1	Mercury	High	NJDEP/USGS Data, EWQ, Metal Recon
Raritan	08	Rockaway Creek at Whitehouse	01399700, EWQ0369, 8-RO-1	Phosphorus	High	NJDEP/USGS Data, EWQ, Metal Recon
Raritan	08	Rockaway Creek S Br at Rt 22 in Readington	AN0368	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	06	Rockaway River	Rockaway River	Mercury	High	NJDEP Fish Tissue Monitoring
Northeast	06	Rockaway River at Berkshire Valley Rd in Jefferson	AN0241	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	06	Rockaway River at Boonton	01380500, 01380450, 6-SITE-11	Arsenic	High	NJDEP/USGS Data, EWQ, Metal Recon
Northeast	06	Rockaway River at Boonton	01380500, 01380450, 6-SITE-11	Cadmium	High	NJDEP/USGS Data, EWQ, Metal Recon
Northeast	06	Rockaway River at Boonton	01380500, 01380450, 6-SITE-11	Chromium	High	NJDEP/USGS Data, EWQ, Metal Recon
Northeast	06	Rockaway River at Boonton	01380500, 01380450, 6-SITE-11	Lead	High	NJDEP/USGS Data, EWQ, Metal Recon
Northeast	06	Rockaway River at Boonton	01380500, 01380450, 6-SITE-11	Mercury	High	NJDEP/USGS Data, EWQ, Metal Recon
Northeast	06	Rockaway River at Boonton	01380500, 01380450, 6-SITE-11	Selenium	High	NJDEP/USGS Data, EWQ, Metal Recon
Northeast	06	Rockaway River at Boonton	01380500, 01380450, 6-SITE-11	Tetrachloroethylene	High	NJDEP/USGS Data, EWQ, Metal Recon
Northeast	06	Rockaway River at Boonton	01380500, 01380450, 6-SITE-11	Trichloroethylene	High	NJDEP/USGS Data, EWQ, Metal Recon
Northeast	06	Rockaway River at Boonton	01380500, 01380450, 6-SITE-11	Zinc	High	NJDEP/USGS Data, EWQ, Metal Recon
Northeast	06	Rockaway River at Morris Ave in Boonton	AN0250	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	06	Rockaway River at Pine Brook	01381200, 6-SITE-10, 6-ROC-1	Phosphorus	High	NJDEP/USGS Data, EWQ, Metal Recon
Northeast	06	Rockaway River at Pine Brook	01381200, 6-SITE-10, 6-ROC-1	Tetrachloroethylene	High	NJDEP/USGS Data, EWQ, Metal Recon
Raritan	10	Rocky Brook at PerrIneville	01400585	Arsenic	High	NJDEP/USGS Data
Raritan	10	Rocky Brook at PerrIneville	01400585	Chromium	High	NJDEP/USGS Data
Raritan	10	Rocky Brook at PerrIneville	01400585	Lead	High	NJDEP/USGS Data
Raritan	10	Rocky Brook at PerrIneville	01400585	Zinc	High	NJDEP/USGS Data
Raritan	10	Rocky Brook at Rt 33 in Hightstown	AN0381	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	10	Rocky Brook on Rte 130 in Hightstown	10-ROC-2	Chromium	High	NJDEP Metal Recon
Raritan	10	Rocky Brook on Rte 130 in Hightstown	10-ROC-2	Lead	High	NJDEP Metal Recon
Raritan	10	Rocky Brook on Rte 130 in Hightstown	10-ROC-2	Zinc	High	NJDEP Metal Recon
Raritan	10	Rocky Brook on Rte 33 in Hightstown	10-ROC-1	Arsenic	High	NJDEP Metal Recon
Raritan	10	Rocky Brook on Rte 33 in Hightstown	10-ROC-1	Chromium	High	NJDEP Metal Recon
Raritan	10	Rocky Brook on Rte 33 in Hightstown	10-ROC-1	Lead	High	NJDEP Metal Recon
Raritan	10	Rocky Brook on Rte 33 in Hightstown	10-ROC-1	Zinc	High	NJDEP Metal Recon

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Region	WMA	Station Name/Waterbody	Site ID #	Impairment	Priority	Data Source
Raritan	08	Round Valley Reservoir-08	Round Valley Reservoir	Mercury	High	NJDEP Freshwater Fisheries, NJDEP Fish Tissue Monitoring
Atlantic Coast	14	Roundabout Creek Estuary	2001F	Total Coliform	High	NJDEP Shellfish Monitoring
Raritan	10	Royce Brook at Rt 533 in Manville	AN0413	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	04	Saddle River at Dunkerhook Rd in Fair Lawn	AN0289	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	04	Saddle River at Dunkerhook Rd in Fair Lawn	AN0289	Unknown Toxicity	Low	
Northeast	04	Saddle River at E Allendale Ave in Saddle River	AN0281	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	04	Saddle River at E Allendale Ave in Saddle River	AN0281	Unknown Toxicity	Low	
Northeast	04	Saddle River at E Ridgewood Ave in Paramus	AN0282	Unknown Toxicity	Low	NJDEP AMNET
Northeast	04	Saddle River at Lodi	01391500, 01391200, 01391490, 01391550, Passaic-7, 4-SITE-12, 4-SITE-13, 4-SAD-1	Arsenic	High	NJDEP/USGS Data, PVSC, Metal Recon
Northeast	04	Saddle River at Lodi	01391500, 01391200, 01391490, 01391550, Passaic-7, 4-SITE-12, 4-SITE-13, 4-SAD-1	Dissolved Solids	Medium	NJDEP/USGS Data, PVSC, Metal Recon
Northeast	04	Saddle River at Lodi	01391500, 01391200, 01391490, 01391550, Passaic-7, 4-SITE-12, 4-SITE-13, 4-SAD-1	Phosphorus	Medium	NJDEP/USGS Data, PVSC, Metal Recon
Northeast	04	Saddle River at Marcellus Pl in Garfield	AN0291	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	04	Saddle River at Marcellus Pl in Garfield	AN0291	Unknown Toxicity	Low	
Northeast	04	Saddle River at Railroad Ave in Rochelle Park	AN0290	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	04	Saddle River at Railroad Ave in Rochelle Park	AN0290	Unknown Toxicity	Low	
Northeast	04	Saddle River at Ridgewood	01390500, 01390518, 01390510	pH	Medium	NJDEP/USGS Data
Northeast	04	Saddle River W Br at Old Stone Church Rd in Upper Saddle River	AN0280	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	17	Salem River at Commissioners Rd (Rt 581) in Upper Pittsgrove	AN0690	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	17	Salem River at Courses Landing	Salem River at Courses Landing	Dissolved Oxygen	Medium	NJDEP/USGS Data
Lower Delaware	17	Salem River at Courses Landing	Salem River at Courses Landing	Phosphorus	Medium	NJDEP/USGS Data
Lower Delaware	17	Salem River at Courses Landing	Salem River at Courses Landing	Temperature	Medium	NJDEP/USGS Data
Lower Delaware	17	Salem River at Kings Hwy in Pilesgrove	AN0693	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	17	Pittsgrove	AN0690A	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	17	Salem River at Woodstown	01482500	Phosphorus	Medium	NJDEP/USGS Data
Atlantic Coast	16	Savages Run Estuary	1388K	Total Coliform	High	NJDEP Shellfish Monitoring
Northwest	01	Sawmill Pond-01	Sawmill Pond	Mercury	High	NJDEP Fish Tissue Monitoring
Raritan	08	Second Neshanic River at Rt 31 in Raritan	AN0331	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	04	Second River at McCarter Hwy in Belleville	AN0293	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	04	Second River at Union Av in Newark	Passaic-5	Fecal Coliform	High	PVSC
Northeast	04	Second River at Union Av in Newark	Passaic-5	pH	Medium	PVSC
Northeast	04	Second River at Union Av in Newark	Passaic-5	Phosphorus	Medium	PVSC
Northwest	11	Shabakunk Creek at Rt 206 in Lawrence	AN0114	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	12	Shadow Lake-12	Shadow Lake	Mercury	High	NJDEP Freshwater Fisheries, NJDEP Fish Tissue Monitoring
Atlantic Coast	13	Shannoc Brook Trib at Colliers Mills	01408480	pH	Medium	NJDEP/USGS Data

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Region	WMA	Station Name/Waterbody	Site ID #	Impairment	Priority	Data Source
Atlantic Coast	12	Shark River	Shark River	Dioxin	High	NJDEP Fish Tissue Monitoring
Atlantic Coast	12	Shark River	Shark River	PCB	High	NJDEP Fish Tissue Monitoring
Atlantic Coast	12	Shark River at Remsens Mills Rd in Neptune	AN0482	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	12	Shark River at Shark River Sta Rd in Wall	AN0481	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	12	Shark River Brook at Shark River Station Rd in Tinton Falls	30	Phosphorus	Medium	Monmouth Co HD
Atlantic Coast	12	Shark River Estuary	Shark River Estuary-1	Dissolved Oxygen	Medium	NJDEP Coastal Monitoring, Shellfish Monitoring
Atlantic Coast	12	Shark River Estuary	Shark River Estuary-1	Total Coliform	High	NJDEP Coastal Monitoring, Shellfish Monitoring
Atlantic Coast	12	Shark River near Neptune	01407750, EWQ0482	Fecal Coliform	High	NJDEP/USGS Data, EWQ
Atlantic Coast	12	Shark River near Neptune	01407750, EWQ0482	Phosphorus	Medium	NJDEP/USGS Data, EWQ
Lower Delaware	19	Sharps Run at Rt 541 at Medford	01465884	Phosphorus	High	NJDEP/USGS Data
Atlantic Coast	12	Shewsbury River	Shewsbury River	Dioxin	High	NJDEP Fish Tissue Monitoring
Atlantic Coast	12	Shewsbury River	Shewsbury River	PCB	High	NJDEP Fish Tissue Monitoring
Northwest	01	Shipetaukin Creek at Rt 583 in Lawrence	AN0111	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	12	Shrewsbury River Estuary	Shrewsbury/Navesink Estuary-8	Dissolved Oxygen	Medium	NJDEP Coastal Monitoring, Shellfish Monitoring
Atlantic Coast	12	Shrewsbury River Estuary	Shrewsbury/Navesink Estuary-4 thru 8	Total Coliform	High	NJDEP Coastal Monitoring, Shellfish Monitoring
Raritan	10	Six Mile Run at Canal Rd in Blackwells Mill	EWQ0409	Phosphorus	Medium	EWQ
Raritan	10	Six Mile Run at Canal Rd in Franklin	AN0409	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	15	Skulls Bay	Skulls Bay-2,3	Total Coliform	High	NJDEP Coastal Monitoring, Shellfish Monitoring
Northeast	03	Skyline Lakes-03	Skyline Lake Main/Lower Beach and Upper Beach	Fecal Coliform	High	Passaic Co HD
Atlantic Coast	14	Sleeper Branch near Atsion	0140940370	pH	Medium	USGS/Pinelands Data
Northeast	06	Slough Brook at Parsonage Hill Rd in Millburn	AN0231C	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	16	Sluice Creek Estuary	Sluice Creek Estuary	Total Coliform	High	NJDEP Shellfish Monitoring
Raritan	09	South River	South River	Arsenic	High	304(l)
Raritan	09	South River	South River	Cadmium	High	304(l)
Raritan	09	South River	South River	Chromium	High	304(l)
Raritan	09	South River	South River	Copper	High	304(l)
Raritan	09	South River	South River	Lead	High	304(l)
Raritan	09	South River	South River	Mercury	High	304(l)
Atlantic Coast	15	South River near Belcoville	01411220	pH	Medium	NJDEP/USGS Data
Northeast	06	Speedwell Lake-06	Speedwell Lake	Mercury	High	NJDEP Fish Tissue Monitoring
Atlantic Coast	12	Spring Lake-12	Spring Lake	Mercury	High	NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring
Atlantic Coast	12	Spring Lake-12	Spring Lake	Phosphorus	Medium	NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring
Atlantic Coast	14	Springers Brook at Hampton Rd in Shamong	AN0585, BSPRIHAM	Pineland Biological Community	Low	NJDEP AMNET, Pinelands
Atlantic Coast	14	Springers Brook impoundment on northern side of Indian Ann Trail (Lake 1757-14)	BSPTRAIL	Pineland Biological Community	Low	Pinelands
Atlantic Coast	14	Springers Brook near Hampton Furnace	01409455	pH	Medium	USGS/Pinelands Data

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Region	WMA	Station Name/Waterbody	Site ID #	Impairment	Priority	Data Source
Raritan	08	Spruce Run at Clinton	01396800, 8-SP-1	Cadmium	High	NJDEP/USGS Data, Metal Recon
Raritan	08	Spruce Run at Clinton	01396800, 8-SP-1	pH	Medium	NJDEP/USGS Data, Metal Recon
Raritan	08	Spruce Run at Clinton	01396800, 8-SP-1	Phosphorus	High	NJDEP/USGS Data, Metal Recon
Raritan	08	Spruce Run at Clinton	01396800, 8-SP-1	Temperature	Medium	NJDEP/USGS Data, Metal Recon
Raritan	08	Spruce Run at Newport	01396550	Temperature	Medium	NJDEP/USGS Data, Metal Recon
Raritan	08	Spruce Run near Glen Gardner	01396588, 8-SP-2	Temperature	Medium	NJDEP/USGS Data, Metal Recon
Raritan	08	Spruce Run Reservoir-08	Spruce Run Reservoir	Fish Community	Low	NJDEP Freshwater Fisheries, Fish Tissue Monitoring
Raritan	08	Spruce Run Reservoir-08	Spruce Run Reservoir	Mercury	High	NJDEP Freshwater Fisheries, Fish Tissue Monitoring
Lower Delaware	19	Squaw Lake-19	Camp Ockanickon Girls, WHATRSQU	Pineland Biological Community	Low	Burlington Co HD, Pinelands
Atlantic Coast	13	Stafford Forge Lake-13	Stafford Forge Lake	Mercury	High	NJDEP Fish Tissue Monitoring
Northwest	01	Steenykill Lake-01	Steenykill Lake	Mercury	High	NJDEP Freshwater Fisheries, NJDEP Fish Tissue Monitoring
Lower Delaware	18	Stewart Lake-18	Stewart Lake	Dioxin	High	NJDEP Fish Tissue Monitoring
Lower Delaware	18	Stewart Lake-18	Stewart Lake	PCB	High	NJDEP Fish Tissue Monitoring
Atlantic Coast	16	Stiles Sound	Ingram Thorofare-2	Total Coliform	High	NJDEP Coastal Monitoring, Shellfish Monitoring
Lower Delaware	17	Still Run at Ltl Mill Rd in Franklin	AN0730	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	18	Still Run at Union Rd in E Greenwich	AN0675A	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	17	Still Run near Malaga	01411453	pH	Medium	NJDEP/USGS Data
Lower Delaware	18	Stone Bridge Branch above Waddell's Bridge in Gloucester	AN0655A	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	18	Stone Bridge Branch below Waddell's Bridge in Gloucester	AN0655B	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	18	Stone Bridge Branch trib at Waddell Farm in Gloucester	AN0655	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	10	Stony Brook at Carter Rd in Lawrence.	AN0393B	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	10	Stony Brook at Linvale Rd in Amwell	AN0391A	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	10	Stony Brook at Mine Rd in Hopewell	AN0391	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	10	Stony Brook at Old Mill Rd in Hopewell	AN0392	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	10	Stony Brook at Pennington-Rocky Hill Rd in Hopewell	AN0392A	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	10	Stony Brook at Princeton	01401000, 10-STO-1, 10-STO-4	Arsenic	High	NJDEP/USGS Data, EWQ, Metal Recon
Raritan	10	Stony Brook at Princeton	01401000, 10-STO-1, 10-STO-4	pH	Medium	NJDEP/USGS Data, EWQ, Metal Recon
Raritan	10	Stony Brook at Princeton	01401000, 10-STO-1, 10-STO-4	Phosphorus	High	NJDEP/USGS Data, EWQ, Metal Recon
Raritan	10	Stony Brook at Princeton	01401000, 10-STO-1, 10-STO-4	Total Suspended Solids		NJDEP/USGS Data, EWQ, Metal Recon
Raritan	10	Stony Brook at Province Line Rd in Princeton.	AN0393A	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	10	Stony Brook at Rt 206 in Princeton	AN0393	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	09	Stony Brook at Sunlit Dr. in Watchung	AN0422A	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	06	Stony Brook at Valley Rd in Boonton	AN0249	Benthic Macroinvertebrates	Low	NJDEP AMNET

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Region	WMA	Station Name/Waterbody	Site ID #	Impairment	Priority	Data Source
Raritan	09	Stony Brook at Westend Ave in North Plainfield	AN0422	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	10	Stony Brook on Mine Rd in Hopewell	10-STO-3	Mercury	High	NJDEP Metal Recon
Lower Delaware	17	Straight Creek Estuary	3869A	Total Coliform	High	NJDEP Shellfish Monitoring
Lower Delaware	18	Strawbridge Lake-18	Strawbridge Lake	Dioxin	High	NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring
Lower Delaware	18	Strawbridge Lake-18	Strawbridge Lake	PCB	High	NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring
Lower Delaware	19	Sturbridge Lake-19	Chatham Lake, Foxview Beach	Fecal Coliform	High	Camden Co HD
Atlantic Coast	13	Success Lake-13	Success Lake	Mercury	High	NJDEP Freshwater Fisheries, NJDEP Fish Tissue Monitoring
Northeast	06	Sunrise Lake-06	Sunrise Lake	Fecal Coliform	High	Bernards Twp HD
Raritan	08	Sunset Lake-08	Sunset Lake	Fecal Coliform	High	Bridgewater Twp
Lower Delaware	17	Sunset Lake-17	Sunset Lake, Sunset Lake Bathing Beach	Fecal Coliform	High	NJDEP Freshwater Fisheries, NJDEP Clean Lakes, Cumberland Co HD, NJDEP Fish Tissue Monitoring
Lower Delaware	17	Sunset Lake-17	Sunset Lake, Sunset Lake Bathing Beach	Mercury	High	NJDEP Freshwater Fisheries, NJDEP Clean Lakes, Cumberland Co HD, NJDEP Fish Tissue Monitoring
Northwest	01	Swartswood Lake-01	Swartswood Lake	Fish Community	Low	NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring, NJDEP Freshwater Fisheries, Northern Region
Northwest	01	Swartswood Lake-01	Swartswood Lake	Mercury	High	NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring, NJDEP Freshwater Fisheries, Northern Region
Northwest	01	Swartswood Lake-01	Swartswood Lake	Phosphorus	Medium	NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring, NJDEP Freshwater Fisheries, Northern Region
Lower Delaware	19	Swedes Run at Garwood Rd in Moorestown	AN0176A	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	18	Swedes Run at Rt 130 in Delran	AN0176	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northwest	02	Tall Timbers POA	Tall Timbers POA	Fecal Coliform	High	
Lower Delaware	19	Tamarack Lake-19	Tamarkack Lake, WHATROAK	Pineland Biological Community	Low	Burlington Co HD, Pinelands
Lower Delaware	19	Taunton Lake-19	Taunton Lake, WHATAUNL	Pineland Biological Community	Low	Burlington Co HD, Pinelands
Northeast	06	Telemark Lake-06	Lake Telemark	Fecal Coliform	High	Rockaway Twp HD
Northeast	05	Tenakill Brook at Cedar Lane at Closter	01378387, 5-TEN-2	Arsenic	High	NJDEP/USGS Data, Metal Recon
Northeast	05	Tenakill Brook at Cedar Ln in Closter	AN0209	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	09	Tennent Brook at Old Bridge-South Amboy Rd in Old Bridge	AN0455	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	17	The Glades	3840K	Total Coliform	High	NJDEP Shellfish Monitoring
Raritan	08	Third Neshanic River at Rt 31 in Raritan	AN0332	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	04	Third River at Kingland Ave in Clifton	AN0292	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	19	Timber Lake-19	Timber Lake	Fecal Coliform	High	Gloucester Co HD
Lower Delaware	18	Toms Dam Branch at Peter Cheeseman Rd in Gloucester	AN0658A	Benthic Macroinvertebrates	Low	NJDEP AMNET

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Region	WMA	Station Name/Waterbody	Site ID #	Impairment	Priority	Data Source
Northeast	04	Toms Lake-04	North Cove Beach and Swim Lanes	Fecal Coliform	High	Passaic Co HD
Atlantic Coast	13	Toms River	Toms River	Dioxin	High	NJDEP Fish Tissue Monitoring
Atlantic Coast	13	Toms River	Toms River	PCB	High	NJDEP Fish Tissue Monitoring
Atlantic Coast	13	Toms River - Tidal	Toms River - Tidal	Arsenic	High	304(l)
Atlantic Coast	13	Toms River - Tidal	Toms River - Tidal	Copper	High	304(l)
Atlantic Coast	13	Toms River - Tidal	Toms River - Tidal	Lead	High	304(l)
Atlantic Coast	13	Toms River - Tidal	Toms River - Tidal	Zinc	High	304(l)
Atlantic Coast	13	Toms River at Anderson Rd in Jackson	AN0519A	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	13	Toms River at Route 537 in Millstone	7	Phosphorus	Medium	Monmouth Co HD
Atlantic Coast	13	Toms River Estuary	Toms River Estuary-1; Toms River/Barnegat Bay-2	Arsenic	High	NJDEP Coastal Monitoring, Shellfish Monitoring, 304(l)
Atlantic Coast	13	Toms River Estuary	Toms River Estuary-1; Toms River/Barnegat Bay-2	Copper	High	NJDEP Coastal Monitoring, Shellfish Monitoring, 304(l)
Atlantic Coast	13	Toms River Estuary	Toms River Estuary-1; Toms River/Barnegat Bay-2	Lead	High	NJDEP Coastal Monitoring, Shellfish Monitoring, 304(l)
Atlantic Coast	13	Toms River Estuary	Toms River Estuary-1; Toms River/Barnegat Bay-2	Total Coliform	High	NJDEP Coastal Monitoring, Shellfish Monitoring, 304(l)
Atlantic Coast	13	Toms River Estuary	Toms River Estuary-1; Toms River/Barnegat Bay-2	Zinc	High	NJDEP Coastal Monitoring, Shellfish Monitoring, 304(l)
Atlantic Coast	13	Toms River near Toms River	01408500, 01408300, 13-TOM-1	Lead	High	NJDEP/USGS Data, Metal Recon
Atlantic Coast	13	Toms River near Toms River	01408500, 01408300, 13-TOM-1	pH	Medium	NJDEP/USGS Data, Metal Recon
Atlantic Coast	13	Toms River Trib at Rt 37 in Dover	AN0544	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	17	Town Swamp Brook at Buckshutem Rd in Fairfield	AN0716A	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	16	Townsend Sound	Clam Thorofare-1; Lower Ludlam Thorofare-2; Townsend Channel-4,5	Total Coliform	High	NJDEP Coastal Monitoring, Shellfish Monitoring
Atlantic Coast	12	Trout Brook at Richdale Rd in Colts Neck	55	Fecal Coliform	High	Monmouth Co HD
Northwest	01	Trout Brook at Rt 57 in Hackettstown	AN0068	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northwest	01	Trout Brook at Rt 612 in Allamuchy	AN0038	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	12	Troutmans Creek at Atlantic Ave in Long Branch	47	Fecal Coliform	High	Monmouth Co HD
Atlantic Coast	12	Troutmans Creek at Joline Ave in Long Branch	62	Fecal Coliform	High	Monmouth Co HD
Atlantic Coast	15	Tuckahoe River at head of river	01411300	pH	Medium	NJDEP/USGS Data
Atlantic Coast	15	Tuckahoe River Estuary	2901A, 2901B, 2902, 2902A	Total Coliform	High	NJDEP Shellfish Monitoring
Atlantic Coast	15	Tuckahoe River near Estelle Manor	01411290	pH	Medium	NJDEP/USGS Data
Atlantic Coast	13	Tuckerton Creek Estuary	1928A, 1836A-H	Total Coliform	High	NJDEP Shellfish Monitoring
Atlantic Coast	12	Turkey Swamp Brook below Turkey Swamp Lk in Freehold	AN0489A	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	12	Turtle Mill Brook-Tidal	R05	Fecal Coliform	High	Monmouth Co HD
Lower Delaware	17	Two Penny Run near Danceys Corner	01482560	Phosphorus	Medium	NJDEP/USGS Data
Atlantic Coast	13	Union Branch at Colonial Dr in Manchester	AN0533	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	17	Union Lake-17	Union Lake	Mercury	High	NJDEP Freshwater Fisheries, Cumberland Co HD,NJDEP Fish Tissue Monitoring
Lower Delaware	20	Upper Sylvan Lake-20	Sylvan Lake	Fecal Coliform	High	NJDEP Clean Lakes, Burlington Co HD

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Region	WMA	Station Name/Waterbody	Site ID #	Impairment	Priority	Data Source
Lower Delaware	20	Upper Sylvan Lake-20	Sylvan Lake	Phosphorus	Medium	NJDEP Clean Lakes, Burlington Co HD
Northeast	04	Valentine Brook at Forest Ave in Allendale	AN0284	Unknown Toxicity	Low	NJDEP AMNET
Northeast	05	Van Saun Brook at Main St & Rt 4 in Hackensack	AN0211	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	12	Waackaack Creek-Tidal	35, R65	Fecal Coliform	High	Monmouth Co HD, NJDEP Coastal Monitoring, NJDEP Shellfish Monitoring
Atlantic Coast	12	Waackaack Creek-Tidal	35, R65	Total Coliform	High	Monmouth Co HD, NJDEP Coastal Monitoring, NJDEP Shellfish Monitoring
Atlantic Coast	14	Wading River	Wading River	Mercury	High	NJDEP Fish Tissue Monitoring
Atlantic Coast	14	Wading River Estuary	2011B, 2011C	Total Coliform	High	NJDEP Shellfish Monitoring
Northwest	02	Wallkill River at Kennedy Ave in Ogdensburg	AN0298	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northwest	02	Wallkill River at Rt 15 (near municipal bldg) in Sparta	AN0297	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northwest	02	Wallkill River at Rt 565 in Wantage	AN0302	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northwest	02	Wallkill River at Rt 94 in Hamburg	2-WAL-3	Arsenic	High	NJDEP Metal Recon
Northwest	02	Wallkill River at Rt 94 in Hamburg	AN0300	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northwest	02	Wallkill River at Scott Rd in Franklin	01367715, Wallkill D, 2-WAL-2	Arsenic	High	NJDEP/USGS Data, EWQ, Sussex MUA, Metal Recon
Northwest	02	Wallkill River at Scott Rd in Franklin	AN0299	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northwest	02	Wallkill River at Sparta	01367625, Wallkill A	Temperature	Medium	NJDEP/USGS Data, Sussex MUA
Northwest	02	Wallkill River near Franklin	01367700, Wallkill C, 2-WAL-1	Arsenic	High	NJDEP/USGS Data, Sussex MUA, Metal Recon
Northwest	02	Wallkill River near Sussex	01367770, 2-WAL-4	Arsenic	High	NJDEP/USGS Data, Metal Recon
Northwest	02	Wallkill River near Unionville	01368000, Wallkill E, 2-WAL-5	Arsenic	High	NJDEP/USGS Data, Sussex MUA, Metal Recon
Northeast	03	Wanaque Reservoir-03	Wanaque Reservoir	Mercury	High	NJDEP Fish Tissue Monitoring
Northeast	03	Wanaque River at E Shore Dr in West Milford	AN0255	Unknown Toxicity	Low	NJDEP AMNET
Northeast	03	Wanaque River at Highland Ave (blw STP) in Wanaque	AN0256	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	03	Wanaque River at Highland Ave (blw STP) in Wanaque	AN0256	Unknown Toxicity	Low	
Northeast	03	Wanaque River at Pompton Lakes	01387014, 01387041	Phosphorus	Medium	NJDEP/USGS Data
Northeast	03	Wanaque River at Wanaque	01387000	Dissolved Oxygen	Medium	NJDEP/USGS Data
Northeast	03	Wanaque River at Wanaque	01387000	Fecal Coliform	High	NJDEP/USGS Data
Northeast	03	Wanaque River at Wanaque	01387000	Phosphorus	Medium	NJDEP/USGS Data
Northeast	03	Wanaque River at Wanaque Ave in Pompton Lakes	AN0257	Unknown Toxicity	Low	NJDEP AMNET
Atlantic Coast	12	Ware Creek-Estuary	Ware Creek-Estuary	Total Coliform	High	NJDEP Shellfish Monitoring
Northeast	06	Watnong Brook at W Hanover Rd in Morris	AN0234B	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northwest	02	Wawayanda Lake-02	Wawayanda Lake	Mercury	High	Northern Region, NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring
Northwest	02	Wawayanda/Pochuck River at Alt Rt 515 in Maple Grange	01368900	Phosphorus	Medium	EWQ

Appendix I B Sublist 5 of the 2004 Integrated List (By Waterbody/Parameter) With Priority Ranking

Region	WMA	Station Name/Waterbody	Site ID #	Impairment	Priority	Data Source
Northwest	02	Wawayanda/Pochuck River at Alt Rt 515 in Maple Grange	01368900	Temperature	Medium	EWQ
Raritan	09	Weamaconk Creek at Rt 522 in Englishtown	AN0443, MB-81	Benthic Macroinvertebrates	Low	NJDEP AMNET, Monmouth Co HD
Raritan	09	Weamaconk Lake-09	Weamaconk Lake	Phosphorus	Medium	NJDEP Clean Lakes
Raritan	09	Weemaconk Creek at Main St in Manalapan	9	Phosphorus	Medium	Monmouth Co HD
Raritan	07	Weequahic Lake-07	Weequahic Lake	Phosphorus	Medium	NJDEP Clean Lakes
Raritan	09	Wemrock Brook at Rt #9 (After 1St Pipe) in Freehold	69	Phosphorus	Medium	Monmouth Co HD
Raritan	09	Wemrock Brook at Rt #9 (Before Pipes) in Freehold	68	Phosphorus	Medium	Monmouth Co HD
Atlantic Coast	14	Wesickaman Creek at Atsion-Quakerbridge Rd in Shamong	AN0563, MWETHREE, MWEATSIO	Pineland Biological Community	Low	NJDEP AMNET, Pinelands
Atlantic Coast	13	West Beach (Pine Beach)	West Beach (Pine Beach)	Fecal Coliform	High	Cooperative Coastal Monitoring Program
Northeast	03	West Brook	WB1, WB2, WB3, WB4, WB5, WB6	Temperature	Medium	Pequannock River Coalition
Atlantic Coast	16	West Creek Estuary	1887C, 1887D	Total Coliform	High	NJDEP Shellfish Monitoring
Northeast	06	West Lake-06	Sabeys Beach, West Fayson Lake Main Beach	Fecal Coliform	High	Borough of Kinnelon
Atlantic Coast	13	Westecunk Creek Estuary	1712, 1713C, 1714, 1714A	Total Coliform	High	NJDEP Shellfish Monitoring
Atlantic Coast	12	Whale Creek-Tidal	R61	Dissolved Oxygen	Medium	NJDEP Coastal Monitoring
Atlantic Coast	12	Whale Pond Brook at Larchwood Ave in Ocean	AN0477	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	12	Whale Pond Brook at Route 35 in Eatontown	01407617, 31	pH	Medium	NJDEP/USGS Data, Monmouth Co HD
Northeast	06	Whippany River at Edwards Rd in Parsippany-Troy Hills	AN0238	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	06	Whippany River at Jefferson Rd in Hanover	AN0235	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	06	Whippany River at Morristown	01381500, 6-WHI-1	Phosphorus	High	NJDEP/USGS Data, Metal Recon
Northeast	06	Whippany River at Whitehead Rd in Morris	AN0233	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	06	Whippany River near Pine Brook	01381800, 6-WHI-2	Lead	High	NJDEP/USGS Data, Metal Recon
Northeast	06	Whippany River near Pine Brook	01381800, 6-WHI-2	Phosphorus	Medium	NJDEP/USGS Data, Metal Recon
Lower Delaware	17	White Marsh Run at Rt 555 in Millville	AN0755	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	06	White Meadow Lake-06	White Meadow Lake 1, 2, and 3	Fecal Coliform	High	Rockaway Twp HD
Lower Delaware	19	Whitesbog Pond-19	Whitesbog Pond	Mercury	High	NJDEP Fish Tissue Monitoring
Northwest	11	Wickecheoke Creek at Croton	01461220	Fecal Coliform	High	NJDEP/USGS Data
Northwest	11	Wickecheoke Creek at Locktown - Sergeantsville Rd in Delaware	AN0091	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northwest	11	Wickecheoke Creek at Stockton	01461300, DRBCNJ0012	Fecal Coliform	High	NJDEP/USGS Data, DRBC
Northwest	11	Wickecheoke Creek at Stockton	01461300, DRBCNJ0012	Phosphorus	Medium	NJDEP/USGS Data, DRBC
Northwest	11	Wickecheoke Creek at Stockton	01461300, DRBCNJ0012	Temperature	Medium	NJDEP/USGS Data, DRBC
Northwest	11	Wickecheoke Creek near Sergenstville	01461282	Fecal Coliform	High	NJDEP/USGS Data
Atlantic Coast	14	Wildcat Branch below Burnt Mill Rd	MWIBURNT	Pineland Biological Community	Low	Pinelands
Atlantic Coast	13	Willis Creek Estuary	1928, 1928B	Total Coliform	High	NJDEP Shellfish Monitoring
Atlantic Coast	12	Willow Brook at Schank Rd in Holmdel	AN0467	Benthic Macroinvertebrates	Low	NJDEP AMNET

Appendix I B Sublist 5 of the 2004 Integrated List (By Waterbody/Parameter) With Priority Ranking

Region	WMA	Station Name/Waterbody	Site ID #	Impairment	Priority	Data Source
Atlantic Coast	12	Willow Brook at Willow Brook Rd in Colts Neck	AN0468	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	12	Willow Brook at Willow Brook Rd in Holmdel	52	Phosphorus	Medium	Monmouth Co HD
Atlantic Coast	12	Willow Brook Trib at Igoe Rd in Marlboro	AN0468A	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	17	Willow Grove Lake-17	Willow Grove Lake	Mercury	High	NJDEP Fish Tissue Monitoring
Northwest	01	Wills Brook at Acorn St in Mt Olive	AN0064C	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northwest	01	Wills Brook at Erie Lackawanna RR Bridge in Mt Olive	AN0064B	Benthic Macroinvertebrates	Low	NJDEP AMNET
Lower Delaware	17	Wilson Lake-17	Wilson Lake	Fecal Coliform	High	Gloucester Co HD, NJDEP Fish Tissue Monitoring
Lower Delaware	17	Wilson Lake-17	Wilson Lake	Mercury	High	Gloucester Co HD, NJDEP Fish Tissue Monitoring
Atlantic Coast	14	Winter Creek Estuary	2003I	Total Coliform	High	NJDEP Shellfish Monitoring
Atlantic Coast	13	Winward Beach (Brick)	Winward Beach (Brick)	Fecal Coliform	High	Cooperative Coastal Monitoring Program
Lower Delaware	18	Woodbury Creek at Rt 45, Woodbury Ck Park in Woodbury	01474730	pH	Medium	EWQ
Atlantic Coast	13	Wrangel Brook at Mule Rd in Berkeley	AN0537	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	12	Wreck Pond Brook at Old Mill Rd in Wall	AN0483	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	12	Wreck Pond-12	Wreck Pond	Phosphorus	Medium	NJDEP Clean Lakes
Atlantic Coast	12	Yellow Brook at Creamery Rd in Colts Neck	AN0472	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	12	York Avenue Beach (Spring Lake)	York Avenue Beach (Spring Lake)	Fecal Coliform	High	Cooperative Coastal Monitoring Program

Appendix 1 C

TMDL or Other Responses to be Completed by 2006

TMDLs or other responses to be completed by 2006

CONVENTIONAL POLLUTANTS:

Northeast Region:

WMA 4

Site ID	Station Name	Non-Attainment Parameter(s)	Response(s) by 2006:
01391500, 01391200, 01391490, 01391550, 4-SITE-12, Passaic-7, 4-site-13, 4-sad-1	Saddle River at Lodi	Phosphorus	TP TMDL

WMA 5

Site ID	Station Name	Non-Attainment Parameter(s)	Response(s) by 2006:
1378560	Coles Brook at Hackensack	Phosphorus	TP TMDL
1378500	Hackensack River at New Milford	Phosphorus	TP TMDL
1377499	Musquapsink Brook at River Vale	Phosphorus	TP TMDL
1377500, 5-PAS-1	Pascack Brook at Westwood	Phosphorus	TP TMDL

Lower Delaware Region:

Delaware River/Estuary (Trenton to Delaware Bay)	PCBs	Phase II TMDL

WMA 18

Site ID	Station Name	Non-Attainment Parameter(s)	Response(s) by 2006:
1467082	Pennsauken Creek Rt 130 in Pennsauken	Phosphorus	TP TMDL
01467069, 18-PE-1, 18-PE-2	Pennsauken Creek N Br near Moorestown	Phosphorus	TP TMDL
01467081, 18-PE-3	Pennsauken Creek S Br at Cherry Hill	Phosphorus	TP TMDL

WMA 19

Site ID	Station Name	Non-Attainment Parameter(s)	Response(s) by 2006:
1465970	Rancocas Creek N Br at Browns Mills	Phosphorus	TP TMDL
01467005, 01467006, 01467003	Rancocas Creek N Br at Iron Works Mt Holly	Phosphorus	TP TMDL
01465850, 19-RA-3S	Rancocas Cr S Br at Vincentown	Phosphorus	TP TMDL
EWQ0169, 19-RA-2S	Rancocas Creek S Br at Rt 70 in Medford	Phosphorus	TP TMDL

WMA 20

Site ID	Station Name	Non-Attainment Parameter(s)	Response(s) by 2006:

Northwest Region:

WMA 1

Site ID	Station Name	Non-Attainment Parameter(s)	Response(s) by 2006:
01457400, 1-MUS-5	Musconetcong River at Riegelsville	Phosphorus	TPTMDL
01455801	Musconetcog River at Lockwood	Phosphorus	TPTMDL
01445500, 1-PEQ-2	Pequest River at Pequest	Phosphorus	TPTMDL
Swartswood Lake	Swartswood Lake-01	Phosphorus	TPTMDL
01455200	Pohatcong Creek at New Village	Phosphorus	TPTMDL

TMDLs or other responses to be completed by 2006:

WMA 2

Site ID	Station Name	Non-Attainment Parameter(s)	Response(s) by 2006:
01368950, Wallkill H	Black Creek near Vernon	Phosphorus	TPTMDL

WMA 11

Site ID	Station Name	Non-Attainment Parameter(s)	Response(s) by 2006:
01464020, 01464000, DRBCNJ1338, 11-AS-3	Assunpink Creek at Peace Street at Trenton	Phosphorus	TPTMDL
4	Assunpink Creek at Route 539 in Upper Freehold	Phosphorus	TPTMDL
01464000	Assunpink Creek at Trenton	Phosphorus	TPTMDL
01461300	Wickecheoke Creek at Stockton	Phosphorus	TPTMDL

Raritan Region:

WMA 7:

Site ID	Station Name	Non-Attainment Parameter(s)	Response(s) by 2006:
01381200, 6-SITE-10, 6-ROC-1	Rockaway River at Pine Brook	Phosphorus	TPTMDL
01393450, 7-ELI-2	Elizabeth River at Ursino Lk at Elizabeth	Phosphorus	TPTMDL
01395000, 7-RAH-1	Rahway River at Rahway	Phosphorus	TPTMDL
01393960	Rahway River W Br at Northfield Ave at West Orange	Phosphorus	TPTMDL

WMA 8:

Site ID	Station Name	Non-Attainment Parameter(s)	Response(s) by 2006:
01396900	Cakepoulin Creek at Lansdown Rd near Lansdown	Phosphorus	TPTMDL
01399780	Lamington River at Burnt Mills	Phosphorus	TPTMDL
01399200	Lamington River near Ironia	Phosphorus	TPTMDL
01399500	Lamington River near Pottersville	Phosphorus	TPTMDL
01398000, 8-NE-1	Neshanic River at Reaville	Phosphorus	TPTMDL
01396280, AN0316, 8-SB-1	Raritan River S Br at Middle Valley	Phosphorus	TPTMDL
01398102, 8-SB-6	Raritan River S Br at South Branch	Phosphorus	TPTMDL
01397400, 8-SB-4	Raritan River S Br at Three Bridges	Phosphorus	TPTMDL
01396800, 8-SP-1	Spruce Run at Clinton	Phosphorus	TPTMDL

WMA 9:

Site ID	Station Name	Non-Attainment Parameter(s)	Response(s) by 2006:
01400500	Raritan River at Manville	Phosphorus	TPTMDL
9	Weemaconk Creek at Main St in Manalapan	Phosphorus	TPTMDL
69	Wemrock Brook at Rt #9 (After 1St Pipe) in Freehold	Phosphorus	TPTMDL
01403900	Bound Brook at Middlesex	Phosphorus	TPTMDL
01403385	Bound Brook at Route 28 at Middlesex	Phosphorus	TPTMDL
61	Lake Topanemus at Pond Rd in Freehold	Phosphorus	TPTMDL
01405340, 9-MAN-1	Manalapan Brook at Federal Rd near Manalapan	Phosphorus	TPTMDL
01405302, AN0451	Matchaponix Brook at Spotswood	Phosphorus	TPTMDL
22	McGolliard Brook at Main St in Englishtown	Phosphorus	TPTMDL
01404170	Raritan River at Landing Lane in Johnson Pk in Piscataway	Phosphorus	TPTMDL
01403300	Raritan River at Queens Bridge	Phosphorus	TPTMDL
68	Wemrock Brook at Rt #9 (Before Pipes) in Freehold	Phosphorus	TPTMDL

TMDLs or other responses to be completed by 2006:

WMA 10:

Site ID	Station Name	Non-Attainment Parameter(s)	Response(s) by 2006:
01401600, 10-BED-2, 10-BED-3	Bedens Brook near Rocky Hill	Phosphorus	TPTMDL
01402000, 10-MIL-5, 10-MIL-6	Millstone River at Blackwells Mills	Phosphorus	TPTMDL
01400650	Millstone River at Grovers Mill	Phosphorus	TPTMDL
01401440, 10-MIL-2	Millstone River at Kingston	Phosphorus	TPTMDL
01402540, 10-MIL-3	Millstone River at Weston	Phosphorus	TPTMDL
01400540, 01400530, 5, 10-MIL-1	Millstone River near Manalapan	Phosphorus	TPTMDL
01401700	Pike Run near Rocky Hill	Phosphorus	TPTMDL
AN0409	Six Mile Run at Canal Rd in Franklin	Phosphorus	TPTMDL
01401000, 10-STO-1, 10-STO-4	Stony Brook at Princeton	Phosphorus	TPTMDL

Raritan Region:Harbor Impairments

Site ID	Station Name	Non-Attainment Parameter(s)			Response(s) by 2006:		
	Passaic River Lower, Estuary and Tribs	Fish-Dioxin	Fish-PCB		Fish-Dioxin TMDL	Fish-PCB TMDL	
	Passaic River Estuary	Arsenic		Mercury	Mercury TMDL		
HR1, HR2	Hackensack River - Tidal	Fish-Dioxin	Fish-PCB	Mercury	Fish-Dioxin TMDL	Fish-PCB TMDL	Mercury-TMDL
HR1, HR2	Hudson River - NYC & Battery	Fish-Dioxin	Fish-PCB	Mercury	Fish-Dioxin TMDL	Fish-PCB TMDL	Mercury-TMDL
HR 4	Hudson River at G.W. Bridge	Fish-Dioxin	Fish-PCB	Mercury	Fish-Dioxin TMDL	Fish-PCB TMDL	Mercury-TMDL
	Hudson River- NYC Area	Fish-Dioxin	Fish-PCB	Mercury	Fish-Dioxin TMDL	Fish-PCB TMDL	Mercury-TMDL
	(c0nt.)	Fish-Dioxin	Fish-PCB	Mercury	Fish-Dioxin TMDL	Fish-PCB TMDL	Mercury-TMDL
UH-11	Kill Van Kull	Fish-Dioxin	Fish-PCB	Mercury	Fish-Dioxin TMDL	Fish-PCB TMDL	Mercury-TMDL
	New York Harbor, Upper	Fish-Dioxin	Fish-PCB	Mercury	Fish-Dioxin TMDL	Fish-PCB TMDL	Mercury-TMDL
	Newark Bay	Fish-Dioxin	Fish-PCB	Mercury	Fish-Dioxin TMDL	Fish-PCB TMDL	Mercury-TMDL
	Newark Bay Tribs	Fish-Dioxin	Fish-PCB	Mercury	Fish-Dioxin TMDL	Fish-PCB TMDL	Mercury-TMDL
	Raritan Bay and Tidal Tributaries	Fish-Dioxin	Fish-PCB	Mercury	Fish-Dioxin TMDL	Fish-PCB TMDL	Mercury-TMDL
HR7	Hudson River near Yonkers	Fish-Dioxin	Fish-PCB	Mercury	Fish-Dioxin TMDL	Fish-PCB TMDL	Mercury-TMDL
	Passaic River from Route 280 to confluence of Pompton Ri	Fish-Mercury					
	NY-NJ Harbor Wid	PCB, PAHs	Pesticides	Dioxin	PCB TMDL		
	Sandy Hook Bay	Pathogens			Total Coliform TMDL		
Arthur Kill-4: Raritan Bay	Arthur Kill	Pathogens			Total Coliform TMDL		
02030105-002 & 02030105-001	Raritan River Estuary	Pathogens	PCB	Arsenic, Cadmium, Zinc	Total Coliform TMDL	PCB TMDL	Arsenic, Cadmium, Zinc, TMDL
Raritan Bay-1 thru 7	Raritan Bay	Pathogens			Total Coliform TMDL		

Atlantic Coastal Region:

WMA 12

Site ID	Station Name	Non-Attainment Parameter(s)	Response(s) by 2006:
01407750	Shark River near Neptune	Phosphorus	TP TMDL
Wreck Pond	Wreck Pond-12	Fecal coliform	Fecal TMDL

WMA 14

Site ID	Station Name	Non-Attainment Parameter(s)	Response(s) by 2006:
01409416, 14-HAM-2	Hammonton Creek at Westcoatville	Phosphorus	TP TMDL
	Mullica River at Green Bank	Phosphorus	TP TMDL

WMA 15

Site ID	Station Name	Non-Attainment Parameter(s)	Response(s) by 2006:
01410820	Great Egg Harbor River at Blue Anchor	Phosphorus	TP TMDL

Appendix 1 D

Waterbodies Delisted from Sublist 5

Delisting Reference Codes

For waters listed on previous 303(d) Lists, there are several possible scenarios that may result in a waterbody being removed from a 303(d) list (Sublist 5). Some scenarios that could result in the removal of a waterbody from sublist 5 follow:

1. A determination is made that the waterbody is meeting water quality standards (i.e., no TMDL is required). For example:
   - **A.** An error was made in the initial listing causing an erroneous listing;
   - **B.** New Information: More recent and/or more accurate data which meets the QA/QC requirements identified in Section 3.2 of this Methods Document demonstrates that a designated use or SWQ criterion is being met for the waterbody (with or without a TMDL). See additional information regarding metals data in Section 8.3 below;
   - **C.** Revisions to the SWQS may cause a waterbody to come into compliance with standards or no water quality standard exists.

2. Reassessment of available information or data: Waterbody listed on previous 303d list is based on data, which is insufficient to meet current data quality requirements. Some examples:
   - **A.** New Macro-Invertebrate Protocol: Macroinvertebrate data had been collected under conditions not calibrated to reference conditions specified in the sampling protocol. See Section 6.1 and Table 6.5 for detailed information
   - **B.** Criterion not measurable.
   - **C.** Sufficient data not available (i.e. frequency, number of samples or QA/QC requirements not met.

3. TMDL has been completed. A waterbody will be removed from Sublist 5 and placed in Sublist 4a once a TMDL, which is expected to result in full attainment of the SWQS, has been developed and approved by the USEPA.

4. Other pollution control requirements are reasonably expected to result in the attainment of the water quality standard in the near future. These requirements must be specifically applicable to the particular water quality problem. This includes the installation of new control equipment or elimination of discharges.

5. Impairment is not caused by a pollutant.

6. New spatial extent – When sufficient data warrants, waterbodies previously listed on a large scale may be broken down into smaller assessment units and placed in other sublists, if appropriate. Waterbodies listed based on CWA Section 304(l) and previously identified by RF1 segments will be identified by the station causing the original listing when station information is available.

7. Natural causes - Waters that exceed standards but drain wilderness or similar areas and it can be documented that there are no human contributions to the standard exceedance.

Appendix I D Waterbody/Parameter Combinations Delisted in 2004

(Delisting Rational Codes located at bottom of table)

Region	WMA	Station Name/Waterbody	Site ID #	Impairment	Data Source	Parameters Delisted	Delisting Rational
Atlantic Coast	15	Absecon Bay	Absecon Bay-1 thru 15	Total Coliform	NJDEP Coastal Monitoring, NJDEP Shellfish Monitoring	Dissolved Oxygen	1B
Atlantic Coast	14	Absegami Lake-14	Absegami Lake		NJDEP Clean Lakes	Phosphorus	1A
Lower Delaware	20	Annaricken Brook near Jobstown	01464578	Phosphorus	NJDEP/USGS Data	Fecal Coliform	3
Raritan	07	Arthur Kill	Arthur Kill		HEP (GLEC)	Mercury	3
Northwest	11	Assunpink Creek at Peace Street at Trenton	01464020, 01464000, DRBCNJ1338, 11-AS-	Phosphorus, Fecal Coliform,	NJDEP/USGS Data, DRBC, Metal Recon	Copper	1B
Northwest	12	Assunpink Creek at Peace Street at Trenton	01464020, 01464000, DRBCNJ1338, 11-AS-		NJDEP/USGS Data, DRBC, Metal Recon	Zinc	1B
Atlantic Ocean	Atlantic Ocean	Atlantic Ocean	Asbury Park Offshore-(8,4,15,29,37,63,75,83	Total Coliform	NJDEP Shellfish Monitoring, Bureau of Marine Water Monitoring, USEPA-Region	Total Coliform	1B
Lower Delaware	20	Bacons Creek near Mansfield Square	01464529	pH	NJDEP/USGS Data	Fecal Coliform	3
Lower Delaware	20	Barkers Brook N Br near Jobstown	01464583	Phosphorus, pH	NJDEP/USGS Data	Fecal Coliform	3
Atlantic Coast	12	Barren Neck Brook at Long Bridge Rd in Colts Neck	56	Phosphorus	Monmouth Co HD	Fecal Coliform	3
Atlantic Coast	14	Bass River E Br near New Gretna	01410150, 14-EBR-1	Copper, Lead, Zinc	NJDEP/USGS Data, Metal Recon	Dissolved Solids	1B
Northeast	06	Beaver Brook at Rockaway	01380100, 01380098		NJDEP/USGS Data	Fecal Coliform	3
Raritan	10	Bedens Brook near Rocky Hill	01401600, 10-BED-2, 10-BED-3	Phosphorus, Arsenic, Lead	NJDEP/USGS Data, EWQ, Metal Recon	Fecal Coliform	3
Lower Delaware	18	Bell Lake-18	Bell Lake		NJDEP Clean Lakes	Phosphorus	3
Lower Delaware	18	Bells Lake-18	Greenwood Park Bells Lake			Fecal Coliform	1B
Lower Delaware	18	Bethel Lake-18	Bethel Lake		NJDEP Clean Lakes	Phosphorus	3
Atlantic Coast	12	Big Brook at Colts Neck	EWQ0470, 21, 57	Phosphorus	EWQ, Monmouth Co HD	Fecal Coliform	3
Lower Delaware	18	Big Timber Creek N Br at Glendora	01467359	Phosphorus	NJDEP/USGS Data	Fecal Coliform	3
Lower Delaware	18	Big Timber Creek S Br at Blackwood Terrace	01467329, 18-BIG-1	Phosphorus	NJDEP/USGS Data, Metal Recon	Arsenic	1B
Lower Delaware	18	Big Timber Creek S Br at Glenloch	01467327		NJDEP/USGS Data	Fecal Coliform	3
Atlantic Coast	16	Big Timber Lake-16	Big Timber Lake			Fecal Coliform	1B
Northeast	06	Black Brook at Madison	01378855	Phosphorus, Arsenic	NJDEP/USGS Data	Fecal Coliform	3
Northwest	02	Black Creek near Vernon	01368950, Wallkill H	Phosphorus	NJDEP/USGS Data, EWQ, Sussex MUA	Fecal Coliform	3
Lower Delaware	18	Blackwood Lake-18	Blackwood Lake		NJDEP Clean Lakes	Phosphorus	3

Region	WMA	Station Name/Waterbody	Site ID #	Impairment	Data Source	Parameters Delisted	Delisting Rational
Atlantic Coast	12	Bordons Brook at Rt 520 in Holmdel	54	Phosphorus	Monmouth Co HD	Fecal Coliform	3
Raritan	09	Bound Brook at Middlesex	01403900	Phosphorus, Total	NJDEP/USGS Data	Fecal Coliform	3
Raritan	09	Bound Brook at Route 28 at Middlesex	01403385	Phosphorus	NJDEP/USGS Data	Fecal Coliform	3
Lower Delaware	17	Burnt Mill Lake-17	Burnt Mill Lake		NJDEP Clean Lakes	Phosphorus	3
Raritan	08	Camp Bernie	Camp Bernie			Fecal Coliform	1B
Northeast	06	Canoe Brook near Summit	01379530		NJDEP/USGS Data	Fecal Coliform	3
Raritan	09	Carroll's Garden Lake	Carroll's Garden Lake			Fecal Coliform	1B
Raritan	08	Chambers Brook at North Branch Depot	01399900		NJDEP/USGS Data	Fecal Coliform	3
Atlantic Coas	14	Clarks Mill Stream at Rt 575 in Port Republic	AN0613			Benthic Macroinvertebrates	1A
Northeast	05	Coles Brook at Hackensack	01378560	Phosphorus	NJDEP/USGS Data	Fecal Coliform	1B
Lower Delaware	18	Cooper River				Fish-Dioxin	1B
Lower Delaware	18	Cooper River				Fish-PCB	1B
Lower Delaware	18	Cooper River at Haddonfield	01467150, 01467140, 18-CO-4	Phosphorus, Arsenic, Lead,	NJDEP/USGS Data, Metal Recon	Fecal Coliform	3
Lower Delaware	19	Cooper River at Haddonfield	01467140		NJDEP/USGS Data, Metal Recon	Dissolved Oxygen	1B
Lower Delaware	18	Cooper River at Lindenwold	01467120	Phosphorus	NJDEP/USGS Data	Fecal Coliform	3
Lower Delaware	18	Cooper River Lake-18	Cooper River Lake	Fish-PCB, Fish-Dioxin	NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring	Fish-Chlordane	1B
Lower Delaware	18	Cooper River N Br at Kresson	01467155, 18-CO-2	Phosphorus, Dissolved	NJDEP/USGS Data, Metal Recon	Fecal Coliform	3
Lower Delaware	18	Cooper River Park-18	Cooper River Park			Fish - Mercury	1B
Northwest	11	Copper Creek near Frenchtown	01458710		NJDEP/USGS Data	Fecal Coliform	3
Atlantic Coast	16	Corson Sound	Corson Sound-5: Corsons Sound	Total Coliform	NJDEP Shellfish Monitoring	Total Coliform	1B
Northwest	01	Cranberry Lake-01	Cranberry Lake	Fish-Mercury	Sussex Co HD, NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring	Phosphorus	3
Raritan	10	Cranbury Book near Prospect Plains	01400690	pH	NJDEP/USGS Data, EWQ	Fecal Coliform	3
Lower Delaware	20	Crosswicks Creek at Groveville Rd at Groveville	01464504, 20-CRO-2	Phosphorus	NJDEP/USGS Data, Metal Recon	Fecal Coliform	3
Lower Delaware	20	Crosswicks Creek at Walnford Rd in Upper Freehold	2	Phosphorus	Monmouth Co HD	Fecal Coliform	3
Raritan	09	Davidsons Mill Pond-09	Davidsons Mill Pond	Fish Community	NJDEP Clean Lakes, Freshwater Fisheries	Phosphorus	3
Northeast	06	Dead River near Millington	01379200	Phosphorus, Nitrate, Total	NJDEP/USGS Data	Fecal Coliform	3

Region	WMA	Station Name/Waterbody	Site ID #	Impairment	Data Source	Parameters Delisted	Delisting Rational
Atlantic Coast	12	Deal Lake-12	1, Deal Lake	Fecal Coliform	NJDEP Clean Lakes, Monmouth Co HD	Phosphorus	3
Northeast	04	Deepavaal Brook at Fairfield	01389138		NJDEP/USGS Data	Fecal Coliform	3
Delaware	20	Delaware River Zone 1-5 (Yardley, PA -Delaware Bay)				Fish-PCB	1B
Delaware	20	Delaware River Zone 1-5 (Yardley, PA -Delaware Bay)				Fish-Chlordane	1B
Delaware	20	Delaware River Zone 3	Delaware River Zone 3		NJDEP Fish Tissue Monitoring	Fish-Chlordane	1B
Delaware	20	Delaware River Zone 3	Delaware River Zone 3		NJDEP Fish Tissue Monitoring	Fish-PCB	1B
Delaware	20	Delaware River/Estuary	Delaware River/Estuary (Trenton	DDT, DDE, DDD, Dieldrin;	DRBC, NJDEP Fish Tissue Monitoring	PCB	3
Atlantic Coast	16	Dennisville Lake-16	Dennisville Lake			Phosphorus	1A
Raritan	09	Devoe Lake-09	Devoe Lake	Fish-Mercury	NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring	Phosphorus	3
Northeast	04	Diamond Brook at Fair Lawn	01389860		NJDEP/USGS Data	Fecal Coliform	3
Lower Delaware	20	Doctors Creek at Allentown	01464515	Phosphorus	NJDEP/USGS Data	Fecal Coliform	3
Northwest	02	Double Kill at Waywayanda	01368820		NJDEP/USGS Data	Fecal Coliform	3
Northwest	01	Dry Brook at Rt 519 near Branchville	01443370, EWQ0020		NJDEP/USGS Data, EWQ	Fecal Coliform	3
Raritan	10	Duck Pond Run at Clarksville	01401200		NJDEP/USGS Data	Copper	1A
Atlantic Coast	16	East Creek Pond-16	East Creek Pond			Fish-Mercury	1B
Raritan	07	Echo Lake-07	Echo Lake		NJDEP Clean Lakes	Phosphorus	3
Raritan	07	Elizabeth River at Ursino Lk at Elizabeth	01393450, 7-ELI-2	Phosphorus, Dissolved Solids	NJDEP/USGS Data, Metal Recon	Fecal Coliform	3
Raritan	07	Elizabeth River W Br near Union	01393350, 7-WBE-1	Phosphorus	NJDEP/USGS Data, Metal Recon	Fecal Coliform	3
Northwest	01	Flat Brook near Flatbrookville	01440000, DRBC/NPS32		NJDEP/USGS Data, DRBC	Temperature	1B
Atlantic Coast	12	Franklin Lake-12	Franklin Lake		NJDEP Clean Lakes	Phosphorus	3
Lower Delaware	17	Garrison Lake-17	Lake Garrison North and South			Fecal Coliform	1B
Northwest	01	Ghost Lake-01	Ghost Lake		NJDEP Clean Lakes	Phosphorus	3
Lower Delaware	17	Giampietro Lake-17	Giampietro Lake		NJDEP Clean Lakes	Phosphorus	3
Northwest	02	Glen Lake	Glen Lake			Fecal Coliform	1B
Northeast	04	Goffle Brook at Hawthorne	01389850		NJDEP/USGS Data	Fecal Coliform	3
Atlantic Coast	14	Great Bay	Great Bay-1 thru 6: Great Bay		NJDEP Coastal Monitoring, Shellfish Monitoring	Dissolved Oxygen	1B

Region	WMA	Station Name/Waterbody	Site ID #	Impairment	Data Source	Parameters Delisted	Delisting Rational
Atlantic Coast	15	Great Egg Harbor River at Folsom	01411000, 15-GEH-2	pH, Copper, Lead	NJDEP/USGS Data, Metal Recon	Arsenic	1B
Atlantic Coast	15	Great Egg Harbor River at Weymouth	01411110, 15-GEH-3	pH, Copper	NJDEP/USGS Data, Metal Recon	Lead	1B
Atlantic Coast	15	Great Egg Harbor River at Weymouth	01411110, 15-GEH-3	pH, Copper	NJDEP/USGS Data, Metal Recon	Fecal Coliform	3
Atlantic Coast	15	Great Egg Harbor River near Sicklerville	01410784, 15-GEH-1	pH, Mercury	NJDEP/USGS Data, Metal Recon	Lead	1B
Raritan	09	Green Brook at North Plainfield	01403470		NJDEP/USGS Data	Fecal Coliform	3
Northeast	03	Greenwood Lake-03	Greenwood Lake	Phosphorus, Sedimentation,	Passaic Co HD, NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring	Fish-Mercury	1B
Atlantic Coast	14	Gun Branch at Rt 206 in Hammonton	AN0568G		NJDEP AMNET	Benthic Macroinvertebrates	1A
Northeast	05	Hackensack River - Tidal	Hackensack River - Tidal	Mercury, Fish-PCB, Fish-	HEP (GLEC), EPA, 1999; NJDEP Fish Tissue Monitoring	Fish-Chlordane	1B
Northeast	05	Hackensack River at Rivervale	01377000, 5-HAC-3	Arsenic, Chromium,	NJDEP/USGS Data, Metal Recon	Fecal Coliform	3
Atlantic Coast	14	Hammonton Creek at Westcoatville	01409416, 14-HAM-2, 14-HAM-1	Phosphorus, pH, Nitrate, Arsenic,	NJDEP/USGS Data, Metal Recon	Lead	1B
Atlantic Coast	14	Hammonton Creek at Westcoatville	01409416, 14-HAM-2, 14-HAM-1	Phosphorus, pH, Nitrate, Arsenic,	NJDEP/USGS Data, Metal Recon	Fecal Coliform	3
Atlantic Coast	14	Hammonton Lake-14	Hammonton Lake, Hammonton Bathing	Fecal Coliform, Pineland	NJDEP Clean Lakes, Atlantic Co HD, Pinelands	Phosphorus	3
Lower Delaware	18	Harrisonville Lake-18	Harrisonville Lake		NJDEP Clean Lakes	Phosphorus	3
Atlantic Coast	12	Haystack Brook at Maxim-Southard Rd in Howell	18		Monmouth Co HD	Fecal Coliform	3
Northwest	02	Heaters Pond-02	Heaters Pond			Fecal Coliform	1B
Raritan	10	Heathcote Brook at Kingston	01401400, 10-MIL-2		NJDEP/USGS Data, Metal Recon	Fecal Coliform	3
Northeast	04	Hohokus Brook at Mouth at Paramus	01391100		NJDEP/USGS Data	Fecal Coliform	3
Atlantic Coast	12	Hollow Brook at Route 35 in Neptune Twnshp	10		Monmouth Co HD	Fecal Coliform	3
Atlantic Coast	12	Hooks Creek	Hooks Creek		NJDEP Clean Lakes	Phosphorus	3
Atlantic Coast	15	Hospitality Branch at Blue Bell Rd near Cecil	01411035	pH	NJDEP/USGS Data	Fecal Coliform	3
Northeast	05	Hudson River - NYC & Battery	HR1, HR2	Fish-PCB, Fish-Dioxin	EPA, HEP (GLEC), NJDEP Fish Tissue Monitoring	Mercury	3
Northeast	05	Hudson River at G.W. Bridge	HR4	Fish-PCB, Fish-Dioxin	EPA, HEP (GLEC), NJDEP Fish Tissue Monitoring	Mercury	3
Northeast	05	Hudson River near Yonkers	HR7	Fish-PCB, Fish-Dioxin	EPA, HEP (GLEC), NJDEP Fish Tissue Monitoring	Mercury	3
Northeast	05	Hudson River- NYC Area	Hudson River- NYC Area	Fish-PCB, Fish-Dioxin	EPA, HEP (GLEC), NJDEP Fish Tissue Monitoring	Mercury	3
Atlantic Coast	12	Husky Brook at South St in Eatontown	33		Monmouth Co HD	Fecal Coliform	3
Lower Delaware	20	Imlaystown Lake-20	Imlaystown Lake		NJDEP Clean Lakes	Phosphorus	3

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Lower Delaware	17	Indian Branch near Malaga	01411466	pH	NJDEP/USGS Data	Fecal Coliform	3
Northwest	01	Jacksonburg Creek near Blairstown	01443600		NJDEP/USGS Data	Fecal Coliform	3
Northwest	11	Jacobs Crek at Bear Tavern	01462739		NJDEP/USGS Data	Fecal Coliform	3
Lower Delaware	18	Kirkwood Lake-18	Kirkwood Lake		NJDEP Clean Lakes	Phosphorus	3
Atlantic Coast	12	Lafetras Brook at Hope Rd in Tinton Falls	32	Phosphorus	Monmouth Co HD	Fecal Coliform	3
Northwest	01	Lake Hopatcong-01	Lake Hopatcong, Byram Bay Comm	Fecal Coliform, Fish	Sussex Co HD, NJDEP Clean Lakes, Freshwater Fisheries, NJDEP Fish Tissue	Phosphorus	3
Atlantic Coast	14	Lake Mo-Li-Th-Ma-14	Camp Haluwasa, NPUHALUW	Pineland Biological	Cape May Co HD, Pinelands	Fecal Coliform	1B
Northwest	01	Lake Musconetcong -01	Lake Musconetcong		NJDEP Clean Lakes	Phosphorus	3
Atlantic Coast	16	Lake Nummy-16	Lake Nummy, Belleplain SF, Lake	Fish-Mercury	Southern Region, NJDEP Fish Tissue Monitoring	Fecal Coliform	1B
Lower Delaware	19	Lakeside	Lakeside			Fecal Coliform	1B
Raritan	08	Lamington River at Burnt Mills	01399780	Phosphorus	NJDEP/USGS Data	Fecal Coliform	3
Raritan	08	Lamington River near Ironia	01399200	Phosphorus, Dissolved	NJDEP/USGS Data	Fecal Coliform	3
Raritan	08	Lamington River near Pottersville	01399500	Phosphorus	NJDEP/USGS Data	Fecal Coliform	3
Atlantic Coast	15	Lenape Lake -15	Lenape Lake	Fish-Mercury	Atlantic Co HD, NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring	Fecal Coliform	1B
Atlantic Coast	15	Lily Lake-15	Lily Lake		NJDEP Clean Lakes	Phosphorus	3
Northeast	05	Lincoln Park Lake-05	Lincoln Park Lake		NJDEP Clean Lakes	Phosphorus	3
Northeast	03	Lindy Lake-03	Lindy Lake Association			Fecal Coliform	1B
Atlantic Coast	14	Little Bay	Little Bay-1, Little Bay-2		NJDEP Coastal Monitoring	Dissolved Oxygen	1B
Lower Delaware	17	Little Ease Run at Porchtown	01411458	pH	NJDEP/USGS Data	Fecal Coliform	3
Atlantic Coast	13	Little Egg Harbor	Little Egg Harbor-1 thru 4		NJDEP Coastal Monitoring, Shellfish Monitoring	Dissolved Oxygen	1B
Atlantic Coast	12	Long Brook at Wyckoff Mills	01407868, 25	Phosphorus, pH	NJDEP/USGS Data, Monmouth Co HD	Fecal Coliform	3
Northeast	03	Macopin River at Macopin Reservoir	01382450, PQ6	Temperature	NJDEP/USGS Data, Pequannock River Coalition	Fecal Coliform	3
Atlantic Coast	13	Manahawkin Bay	Manahawkin Bay-1 thru 10		NJDEP Coastal Monitoring, Shellfish Monitoring	Dissolved Oxygen	1B
Raritan	09	Manalapan Brook at Federal Rd near Manalapan	01405340, 9-MAN-1	Phosphorus, pH, Lead	NJDEP/USGS Data, Metal Recon	Fecal Coliform	3
Raritan	09	Manalapan Brook near Spotswood	01405440, EWQ0440, 9-MAN-2	pH, Lead, Zinc	NJDEP/USGS Data, EWQ, Metal Recon	Phosphorus	1B
Raritan	09	Manalapan Brook near Spotswood	01405440, EWQ0440, 9-MAN-2	pH, Lead, Zinc	NJDEP/USGS Data, EWQ, Metal Recon	Arsenic	1A

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Raritan	09	Manalapan Brook near Spotswood	01405440, EWQ0440, 9-MAN-2	pH, Lead, Zinc	NJDEP/USGS Data, EWQ, Metal Recon	Fecal Coliform	3
Raritan	09	Manalapan Lake-09	Manalapan Lake		NJDEP Clean Lakes	Phosphorus	3
Atlantic Coast	12	Manasquan River at Squankum	01408000, EWQ0489, 12-MA-1, 12-MA-2, 12-	Phosphorus	NJDEP/USGS Data, EWQ, Metal Recon	Fecal Coliform	3
Atlantic Coast	12	Marsh Bog Brook at Squankum	01407997, 24	pH	NJDEP/USGS Data, Monmouth Co HD	Fecal Coliform	3
Lower Delaware	17	Mary Elmer Lake-17	Mary Elmer Lake		NJDEP Clean Lakes	Phosphorus	3
Raritan	09	Matchaponix Brook at Englishtown	01405195		NJDEP/USGS Data	Fecal Coliform	3
Lower Delaware	17	Maurice River (Scotland Run) at Willow Grove Rd in Vineland	AN0733			Aquatic Life	2A
Lower Delaware	17	Maurice River at Norma	01411500	pH, Arsenic	NJDEP/USGS Data	Fecal Coliform	3
Lower Delaware	17	Maurice River near Millville	01411800, 17-MAU-1	Arsenic	NJDEP/USGS Data, Metal Recon	Lead	1B
Raritan	09	McGolliard Brook at Main St in Englishtown	22	Phosphorus	Monmouth Co HD	Fecal Coliform	3
Lower Delaware	17	Memorial Lake-17	Memorial Lake	Fish-Mercury	NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring	Phosphorus	3
Atlantic Coast	13	Metedeconk River N Br at Aldrich Rd in Jackson	AN0501, MB-147		NJDEP AMNET	Benthic Macroinvertebrates	1A
Atlantic Coast	13	Metedeconk River N Br at Jackson Mills Rd in Freehold	6	Phosphorus	Monmouth Co HD	Fecal Coliform	3
Atlantic Coast	13	Metedeconk River N Br at Lakewood	01408100	Temperature, pH	NJDEP/USGS Data	Fecal Coliform	3
Atlantic Coast	13	Metedeconk River N Br at Rt 9 in Howell	AN0502, MB-135		NJDEP AMNET	Aquatic Life	2A
Atlantic Coast	13	Metedeconk River S Br near Laurelton	01408152		NJDEP/USGS Data	Fecal Coliform	3
Raritan	10	Millstone River at Blackwells Mills	01402000, 10-MIL-5, 10-MIL-6	Phosphorus, Arsenic	NJDEP/USGS Data, Metal Recon	Fecal Coliform	3
Raritan	10	Millstone River at Kingston	01401440, 10-MIL-2	Phosphorus, Fecal Coliform,	NJDEP/USGS Data, Metal Recon	Cadmium	1B
Raritan	10	Millstone River at Weston	01402540, 10-MIL-3	Phosphorus, pH, Arsenic	NJDEP/USGS Data	Fecal Coliform	3
Raritan	10	Millstone River near Grovers Mills	01400640, 01400650	Phosphorus, Arsenic	NJDEP/USGS Data, Metal Recon	Fecal Coliform	3
Raritan	10	Millstone River near Manalapan	01400540, 01400530, 5, 10-MIL-1	Phosphorus, pH, Total	NJDEP/USGS Data, Monmouth Co HD, Metal Recon	Fecal Coliform	3
Raritan	10	Millstone River near Manalapan	01400540, 01400530, 5, 10-MIL-1	Phosphorus, pH, Total	NJDEP/USGS Data, Monmouth Co HD, Metal Recon	Lead	1B
Atlantic Coast	12	Mingamahone Brook near Earle	01408009	pH, Total Suspended	NJDEP/USGS Data	Fecal Coliform	3
Northwest	11	Miry Run at Route 533 in Mercerville	01463850	Phosphorus, Dissolved	NJDEP/USGS Data	Fecal Coliform	3
Northeast	03	Montclair YMCA Near Beach and Far Beach	Montclair YMCA Near Beach and Far Beach			Fecal Coliform	1B
Northeast	03	Morse Lake-03	Morse Lake POA, Morse Lake			Fecal Coliform	1B

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Atlantic Coast	13	Muddy Ford Brook at Lakewood-Allenwood Rd in Howell	17		Monmouth Co HD	Fecal Coliform	3
Raritan	08	Mulhockaway Creek at Van Syckel	01396660, 8-MU-1		NJDEP/USGS Data, Metal Recon	Fecal Coliform	3
Atlantic Coast	14	Mullica River Estuary	2005, 2002A		NJDEP Coastal Monitoring, Shellfish Monitoring	Dissolved Oxygen	1B
Northwest	01	Musconetcong River at Beattystown	01456200, 1-MUS-3	Temperature, Arsenic	NJDEP/USGS Data, Metal Recon	Fecal Coliform	3
Northwest	01	Musconetcong River at Lake Hopatcong	01455500	pH, Temperature	NJDEP/USGS Data	Fecal Coliform	3
Northwest	01	Musconetcong River at Riegelsville	01457400, DBRCNJ0025, 1-MUS-	Phosphorus, Temperature,	NJDEP/USGS Data, DRBC, Metal Recon	Fecal Coliform	3
Northwest	01	Musconetcong River near Bloomsbury	01457000, EWQ0072, 1-MUS-4	pH	NJDEP/USGS Data, EWQ, Metal Recon	Fecal Coliform	3
Northeast	05	Musquapsink Brook at River Vale	01377499	Phosphorus, Arsenic	NJDEP/USGS Data	Fecal Coliform	3
Raritan	08	Neshanic River at Reaville	01398000, 8-NE-1	Phosphorus, Total	NJDEP/USGS Data, Metal Recon	pH	1B
Raritan	08	Neshanic River at Reaville	01398000, 8-NE-1	Phosphorus, Total	NJDEP/USGS Data, Metal Recon	Lead	1A
Raritan	08	Neshanic River at Reaville	01398000, 8-NE-1	Phosphorus, Total	NJDEP/USGS Data, Metal Recon	Fecal Coliform	3
Atlantic Coast	15	New Brooklyn Lake-15	New Brooklyn Lake	Fish-Mercury	NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring	Phosphorus	3
Lower Delaware	18	Newton Lake-18	Newton Lake	Fish-PCB, Fish-Dioxin	NJDEP Fish Tissue Monitoring	Fish -Chlordane	1B
Northwest	11	Nishisakawick Creek near Frenchtown	01458570, DRBCNJ0020		NJDEP/USGS Data, DRBC	Fecal Coliform	3
Lower Delaware	17	Old Cedar Lake-17	Old Cedar Lake			Fecal Coliform	1B
Lower Delaware	18	Oldmans Creek at Jessups Mill	01477440		NJDEP/USGS Data	Fecal Coliform	3
Lower Delaware	18	Oldmans Creek at Porches Mill	01477510	Phosphorus	NJDEP/USGS Data	Fecal Coliform	3
Atlantic Coast	14	Oswego River at Harrisville	01410000, 14-OSW-1	Copper	NJDEP/USGS, Metal Recon	Zinc	1A
Northeast	05	Overpeck Lake-05	Overpeck Lake		NJDEP Clean Lakes	Phosphorus	3
Northeast	03	Packanack Lake-03	Packanack Lake East and West			Fecal Coliform	1B
Northwest	02	Papakating Creek at Pelletown	01367800		NJDEP/USGS Data	Fecal Coliform	3
Northwest	02	Papakating Creek at Sussex	01367910, 01367909, 2-PAP-1	Phosphorus, Arsenic	NJDEP/USGS Data, Sussex MUA, Metal Recon	Fecal Coliform	3
Northwest	02	Papakating Creek near Sussex	01367860		NJDEP/USGS Data	Fecal Coliform	3
Northwest	02	Papakating Creek near Wykertown	01367780		NJDEP/USGS Data	Fecal Coliform	3
Northwest	02	Papakating Creek W Br at McCoys Corner	01367850		NJDEP/USGS Data	Fecal Coliform	3
Northeast	05	Pascack Brook at Westwood	01377500, 5-PAS-1	Phosphorus, Arsenic,	NJDEP/USGS Data, Metal Recon	Fecal Coliform	3

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01409416	04	Passaic River at Little Falls	01389500, Passaic-11, Passaic-12, 4-SITE-6,	Phosphorus, Arsenic,	NJDEP/USGS Data, PVSC, Metal Recon	Fecal Coliform	3
Northeast	04	Passaic River at Singac	01389130, 4-PAS-4	Phosphorus, Arsenic,	NJDEP/USGS Data, Metal Recon	Fecal Coliform	1B
Northeast	06	Passaic River at Two Bridges	01382000, 6-SITE-3	Phosphorus, Arsenic,	NJDEP/USGS Data, Metal Recon	Fecal Coliform	3
Northeast	06	Passaic River at Two Bridges	01382000, 6-SITE-3	Phosphorus, Arsenic,	NJDEP/USGS Data, Metal Recon	Chromium	1B
Northeast	06	Passaic River at Two Bridges	01382000, 6-SITE-3	Phosphorus, Arsenic,	NJDEP/USGS Data, Metal Recon	Copper	1B
Northeast	06	Passaic River at Two Bridges	01382000, 6-SITE-3	Phosphorus, Arsenic,	NJDEP/USGS Data, Metal Recon	Lead	1B
Northeast	04	Passaic River Lower, Estuary and Tribs	Passaic River Lower, Estuary and Tribs	Fish-PCB, Fish-Dioxin	NJDEP Fish Tissue Monitoring	Fish-Chlordane	1B
Northeast	06	Passaic River near Chatham	01379500, 6-SITE-1, 6-PAS-2	Phosphorus, Total	NJDEP/USGS Data, Metal Recon	Fecal Coliform	3
Northeast	06	Passaic River near Millington	01379000, EWQ0224, 6-SITE-2, 6-PAS-1	Phosphorus, Arsenic,	NJDEP/USGS Data, EWQ, Metal Recon	Fecal Coliform	3
Northeast	06	Passaic River near Millington	01379000, EWQ0224, 6-SITE-2, 6-PAS-1	Phosphorus, Arsenic,	NJDEP/USGS Data, EWQ, Metal Recon	Dissolved Oxygen	1B
Northwest	01	Paulins Kill at Balesville	01443440, 1-PAU-1	Arsenic	NJDEP/USGS Data, EWQ, Metal Recon	Fecal Coliform	3
Northwest	01	Paulins Kill at Blairstown	01443500	Temperature	NJDEP/USGS Data	Fecal Coliform	3
Northwest	01	Paulins Kill Lake-01	Paulinskill Lake North(Main), Paulinskill			Fecal Coliform	3
Northeast	04	Peckman River at West Paterson	01389600		NJDEP/USGS Data	Fecal Coliform	3
Lower Delaware	18	Pennsauken Creek at Forked Landing	Pennsauken Creek at Forked Landing	Fish-PCB, Fish-Dioxin	NJDEP Fish Tissue Monitoring	Fish-Chlordane	1B
Lower Delaware	18	Pennsauken Creek N Br				Fish-PCB	1B
Lower Delaware	18	Pennsauken Creek N Br				Fish-Chlordane	1B
Lower Delaware	18	Pennsauken Creek N Br near Morrestown	01467069, 18-PE-1, 18-PE-2	Phosphorus, Arsenic	NJDEP/USGS Data, Metal Recon	Lead	1B
Lower Delaware	18	Pennsauken Creek N Br near Morrestown	01467069, 18-PE-1, 18-PE-2	Phosphorus, Arsenic	NJDEP/USGS Data, Metal Recon	Fecal Coliform	3
Lower Delaware	18	Pennsauken Creek S Br				Fish-PCB	1B
Lower Delaware	18	Pennsauken Creek S Br				Fish-Chlordane	1B
Lower Delaware	18	Pennsauken Creek S Br at Cherry Hill	01467081, 18-PE-3	Phosphorus, Total	NJDEP/USGS, Metal Recon	Fecal Coliform	3
Northeast	03	Pequannock River Upper				Fish-Mercury	1B
Northwest	01	Pequest River at Pequest	01445500, 1-PEQ-2	Phosphorus, pH, Total	NJDEP/USGS Data, EWQ, Metal Recon	Fecal Coliform	3
Northwest	01	Pequest River at Rt206 Below Springdale	01444970		NJDEP/USGS Data	Fecal Coliform	3
Northwest	01	Pequest River on Water Street at Belvidere	01446400, DRBCNJ0033, 1-PEQ-	Phosphorus, pH, Temperature,	NJDEP/USGS Data, DRBC, Metal Recon	Fecal Coliform	3

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Raritan	09	Peters Brook at Rt 28 at Somerville	01400395		NJDEP/USGS Data	Fecal Coliform	3
Raritan	10	Pike Run near Rocky Hill	01401700	Phosphorus	NJDEP/USGS Data	Fecal Coliform	3
Lower Delaware	19	Pine Lake-19	Main Lake Pine Colony Club			Fecal Coliform	1B
Atlantic Coast	12	Pine Brook at Hockhockson Rd in Tinton Falls	34		Monmouth Co HD	Fecal Coliform	3
Northeast	03	Pines Lake-03	Pines Lake South and West			Fecal Coliform	1B
Atlantic Coast	13	Pohatcong/Tuckerton Lake-13	Pohatcong Lake		NJDEP Clean Lakes	Phosphorus	3
Atlantic Coast	12	Poplar Brook at Deal	01407630, 59	Phosphorus	NJDEP/USGS Data, Monmouth Co HD	Fecal Coliform	3
Northeast	04	Preakness Brook near Little Falls	01389080		NJDEP/USGS Data	Fecal Coliform	3
Lower Delaware	19	Presidential Lakes-19	Presidential Lakes			Fecal Coliform	1B
Lower Delaware	18	Raccoon Creek near Swedesboro	01477120, 18-RAC-1	Phosphorus, Silver	NJDEP/USGS Data, Metal Recon	Fecal Coliform	3
Raritan	07	Rahway River at Rahway	01395000, 7-RAH-1	Phosphorus, Arsenic, TCE	NJDEP/USGS Data, Metal Recon, Drinking Water	Fecal Coliform	3
Raritan	07	Rahway River near Springfield	01394500	Phosphorus	NJDEP/USGS Data, Drinking Water	Fecal Coliform	3
Raritan	10	Duck Pond Run at Clarksville	01401200		NJDEP/USGS Data	Lead	1A
Raritan	10	Duck Pond Run at Clarksville	01401200		NJDEP/USGS Data	Zinc	1A
Raritan	10	Duck Pond Run at Clarksville	01401200		NJDEP/USGS Data	Fecal Coliform	3
Raritan	07	Rahway River W Br at Northfield Av at West Orange	01393960	Phosphorus, Dissolved	NJDEP/USGS Data	Copper	1A
Atlantic Coast	12	Ramanessin Brook at Willow Rd in Holmdel	53	Phosphorus	Monmouth Co HD	Fecal Coliform	3
Northeast	03	Ramapo River near Mahwah	01387500, 3-SITE-9, 3-RAM-1	Phosphorus	NJDEP/USGS Data, Metal Recon	Fecal Coliform	3
Northeast	04	Ramsey Brook at Allendale	01390900		NJDEP/USGS Data	Fecal Coliform	3
Lower Delaware	19	Rancocas Creek N Br at Iron Works Park at Mt Holly	01467005, 01467006, 01467003, 19-RA-4N	Phosphorus, pH, Arsenic, Copper,	NJDEP/USGS Data, EWQ, Metal Recon	Fecal Coliform	3
Lower Delaware	19	Rancocas Creek S Br at Hainesport	Rancocas, EWQ0176S, 19-RA-1S	Phosphorus, Fecal Coliform,	NJDEP/USGS Data, EWQ, Metal Recon	Lead	1B
Raritan	09	Raritan River (non-tidal)				Mercury	6
Raritan	09	Raritan River at Manville	01400500	Phosphorus	NJDEP/USGS Data, EWQ	pH	1B
Raritan	09	Raritan River at Manville	01400500	Phosphorus	NJDEP/USGS Data, EWQ	Fecal Coliform	3
Raritan	09	Raritan River at Queens Bridge	01403300	Phosphorus, Total	NJDEP/USGS Data, NAWQA, HEP (GLEC)	Fecal Coliform	3
Raritan	09	Raritan River at Queens Bridge	01403300 (non tidal)	Phosphorus, Total	NJDEP/USGS Data, NAWQA, HEP (GLEC)	Mercury	1B

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Raritan	08	Raritan River N Br at Burnt Mills	01399120, 8-NB-2	Copper	NJDEP/USGS Data, Metal Recon	Fecal Coliform	3
Raritan	08	Raritan River N Br near Chester	01398260		NJDEP/USGS Data	Fecal Coliform	3
Raritan	08	Raritan River N Br near Raritan	01400000		NJDEP/USGS Data	Phosphorus	1B
Raritan	08	Raritan River N Br near Raritan	01400000		NJDEP/USGS Data	Fecal Coliform	3
Raritan	08	Raritan River S Br Arch St at High Bridge	01396535, 8-SB-2	Temperature	NJDEP/USGS Data, Metal Recon	Fecal Coliform	3
Raritan	08	Raritan River S Br at Middle Valley	01396280, EWQ0316, 8-SB-1	Phosphorus, Temperature	NJDEP/USGS Data, EWQ, Metal Recon	Fecal Coliform	3
Raritan	08	Raritan River S Br at South Branch	01398102, 01398070, 8-SB-6	Phosphorus, pH, Arsenic,	NJDEP/USGS Data, Metal Recon	Fecal Coliform	3
Raritan	08	Raritan River S Br at Stanton Station	01397000, 8-SB-3	pH, Temperature,	NJDEP/USGS Data, Metal Recon	Fecal Coliform	3
Raritan	08	Raritan River S Br at Three Bridges	01397400, 8-SB-4	Phosphorus	NJDEP/USGS Data, EWQ, Metal Recon	Fecal Coliform	3
Atlantic Coast	15	Reeds Bay	Reeds Bay-1 thru 8		NJDEP Coastal Monitoring, Shellfish Monitoring	Dissolved Oxygen	1B
Northeast	06	Ricabear Lake-06	Lake Rickabear Beach			Fecal Coliform	1B
Raritan	07	Robinson Branch at Scotch Plains	01395200	Phosphorus	NJDEP/USGS Data	Fecal Coliform	3
Raritan	07	Robinson Branch at St Georges Av at Rahway	01396003, 7-ROB-1	Phosphorus, Arsenic	NJDEP/USGS Data, Metal Recon	Fecal Coliform	3
Raritan	08	Rockaway Creek at Whitehouse	01399700, EWQ0369, 8-RO-1	Phosphorus, Lead, Mercury	NJDEP/USGS Data, EWQ, Metal Recon	pH	1B
Northeast	06	Rockaway River at Blackwell St	01379853		NJDEP/USGS Data	Fecal Coliform	3
Northeast	06	Rockaway River at Longwood Valley	01379680, 01379700			Fecal Coliform	3
Northeast	06	Rockaway River at Longwood Valley	01381200, 6-SITE-10, 6-ROC-1	Phosphorus, Tetrachloroethyl	NJDEP/USGS Data, EWQ, Metal Recon	Lead	1B
Atlantic Coast	12	Marsh Bog Brook at Squankum	01407997, 24		NJDEP/USGS Data, Monmouth Co HD	Phosphorus	1B
Raritan	08	Round Valley Reservoir Recreational Area-08			Central Region, NJDEP Clean Lakes	Phosphorus	1B
Northeast	04	Saddle River at E Ridgewood Ave in Paramus	AN0282	Unknown Toxicity	NJDEP AMNET	Aquatic Life	1A
Northeast	04	Saddle River at Lodi	01391500, 01391200, 01391490, 01391550,	Phosphorus, Dissolved	NJDEP/USGS Data, PVSC, Metal Recon	Fecal Coliform	3
Northeast	04	Saddle River at Ridgewood	01390500, 01390518, 01390510	pH	NJDEP/USGS Data	Fecal Coliform	3
Northeast	04	Saddle River at Saddle River	01390470		NJDEP/USGS Data	Fecal Coliform	1B
Northeast	04	Saddle River W Br at Upper Saddle River	01390445		NJDEP/USGS Data	Fecal Coliform	3
Lower Delaware	17	Salem River at Courses Landing	Salem River at Courses Landing	Phosphorus, Temperature,	NJDEP/USGS Data	Fecal Coliform	3
Lower Delaware	17	Salem River at Woodstown	01482500	Phosphorus	NJDEP/USGS Data	Fecal Coliform	3

Region	WMA	Station Name/Waterbody	Site ID #	Impairment	Data Source	Parameters Delisted	Delisting Rational
Atlantic Coast	16	Savages Run in Belleplain State Forest	01411441		NJDEP/USGS Data	Fecal Coliform	3
Northwest	01	Seneca Lake-01	Seneca Lake			Fecal Coliform	1B
Lower Delaware	19	Sharps Run at Rt 541 at Medford	01465884	Phosphorus	NJDEP/USGS Data	Fecal Coliform	3
Atlantic Coast	15	Skulls Bay	Skulls Bay-1 thru 5		NJDEP Coastal Monitoring, Shellfish Monitoring	Dissolved Oxygen	1B
Lower Delaware	20	Spring Lake-20	Spring Lake		NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring	Phosphorus	3
Raritan	08	Spruce Run at Newport	01396550	Temperature	NJDEP/USGS Data, Metal Recon	Fecal Coliform	1B
Raritan	08	Spruce Run near Glen Gardner	01396588, 8-SP-2	Temperature	NJDEP/USGS Data, Metal Recon	Fecal Coliform	3
Atlantic Coast	12	Squankum Brook at Easy St & Rt 547 in Howell	MB-16			Benthic Macroinvertebrates	1A
Atlantic Coast	12	Squankum Brook at Easy St in Howell	16		Monmouth Co HD	Fecal Coliform	3
Lower Delaware	18	Stewart Lake-18	Stewart Lake	Fish-PCB, Fish-Dioxin	NJDEP Fish Tissue Monitoring	Fish-Chlordane	1B
Lower Delaware	18	Still Run near Mickelton	01476600		NJDEP/USGS Data	Fecal Coliform	3
Northeast	06	Stony Brook at Boonton	01380320		NJDEP/USGS Data	Fecal Coliform	3
Raritan	08	Stony Brook at Fairview Avenue at Naughright	01396219		NJDEP/USGS Data	Fecal Coliform	3
Raritan	10	Stony Brook at Princeton	01401000, 10-STO-1, 10-STO-4	Phosphorus, pH, Total	NJDEP/USGS Data, EWQ, Metal Recon	Copper	1B
Raritan	10	Stony Brook on Mine Rd in Hopewell	10-STO-3	Mercury	NJDEP Metal Recon	Arsenic	1B
Lower Delaware	18	Strawbridge Lake-18	Strawbridge Lake	Fish-PCB, Fish-Dioxin	NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring	Fish-Chlordane	1B
Northwest	02	Summit Lake-02	Summit Lake			Fecal Coliform	1B
Lower Delaware	17	Sunset Lake-17	Sunset Lake, Sunset Lake Bathing Beach	Fecal Coliform, Fish-Mercury	NJDEP Freshwater Fisheries, NJDEP Clean Lakes, Cumberland Co HD, NJDEP	Phosphorus	3
Northeast	05	Tenakill Brook at Cedar Lane at Closter	01378387, 5-TEN-2	Arsenic	NJDEP/USGS Data, Metal Recon	Fecal Coliform	3
Northeast	05	Tenakill Brook on Grant Ave, Creskill	5-TEN-1			Lead	1A
Northeast	04	Third River at W Passaic Ave in Bloomfield	AN0292A		NJDEP AMNET	Benthic Macroinvertebrates	1A
Atlantic Coast	13	Titmouse Creek at Friendship Rd in Howell	19		Monmouth Co HD	Fecal Coliform	3
Northwest	01	Tomahawk Lake-01	Tomahawk Lake (Kiddie Lake Area) and			Fecal Coliform	1B
Atlantic Coast	13	Toms River at Route 537 in Millstone	7	Phosphorus	Monmouth Co HD	Fecal Coliform	3
Atlantic Coast	13	Toms River near Toms River	01408500, 01408300, 13-TOM-1	pH, Lead	NJDEP/USGS Data, Metal Recon	Fecal Coliform	3
Raritan	09	Lake Topanemus Lake at Pond Rd in Freehold	61	Phosphorus	Monmouth Co HD	Fecal Coliform	3

Region	WMA	Station Name/Waterbody	Site ID #	Impairment	Data Source	Parameters Delisted	Delisting Rational
Raritan	09	Topanemus Lake-09	Topanemus Lake		NJDEP Clean Lakes	Phosphorus	3
Atlantic Coast	12	Town Brook at Middletown	01407090		NJDEP/USGS Data	Fecal Coliform	3
Lower Delaware	17	Two Penny Run near Danceys Corner	01482560	Phosphorus	NJDEP/USGS Data	Fecal Coliform	3
Northwest	01	Upper Mohawk Lake-01	Upper Mohawk Lake			Fecal Coliform	1B
Northeast	04	Verona Park Lake-04	Verona Park Lake		NJDEP Clean Lakes	Phosphorus	3
Northwest	02	Wallkill River at Scott Rd in Franklin	01367715, Wallkill D, 2-WAL-2	Arsenic	NJDEP/USGS Data, EWQ, Sussex MUA, Metal Recon	Fecal Coliform	3
Raritan	08	Round Valley Reservoir Recreational Area-08			Central Region, NJDEP Clean Lakes	Fecal Coliform	3
Northwest	02	Wallkill River at Sparta	01367625, Wallkill A	Temperature	NJDEP/USGS Data, Sussex MUA	Fecal Coliform	3
Northwest	02	Wallkill River at Sparta	01367625, Wallkill A		NJDEP/USGS Data, Sussex MUA	Phosphorus	1B
Northwest	02	Wallkill River near Franklin	01367700, Wallkill C, 2-WAL-1	Arsenic	NJDEP/USGS Data, Sussex MUA, Metal Recon	Phosphorus	1B
Northwest	02	Wallkill River near Sussex	01367770, 2-WAL-4	Arsenic	NJDEP/USGS Data, Metal Recon	Fecal Coliform	3
Northwest	02	Wallkill River near Unionville	01368000, Wallkill E, 2-WAL-5	Arsenic	NJDEP/USGS Data, Sussex MUA, Metal Recon	Fecal Coliform	3
Northeast	03	Wanaque River at Pompton Lakes	01387014, 01387041	Phosphorus	NJDEP/USGS Data	Fecal Coliform	1B
Raritan	09	Weemaconk Creek at Main St in Manalapan	9	Phosphorus	Monmouth Co HD	Fecal Coliform	3
Raritan	09	Wemrock Brook at Rt #9 (After 1St Pipe) in Freehold	69	Phosphorus	Monmouth Co HD	Fecal Coliform	3
Raritan	09	Wemrock Brook at Rt #9 (Before Pipes) in Freehold	68	Phosphorus	Monmouth Co HD	Fecal Coliform	3
Northwest	02	Wallkill River near Franklin	01367700, Wallkill C, 2-WAL-1		NJDEP/USGS Data, Sussex MUA, Metal Recon	Fecal Coliform	3
Atlantic Coast	12	Whale Pond Brook at Route 35 in Eatontown	01407617, 31	pH	NJDEP/USGS Data, Monmouth Co HD	Phosphorus	1B
Northeast	06	Whippany River near Pine Brook	01381800, 6-WHI-2	Phosphorus, Lead	NJDEP/USGS Data, Metal Recon	Dissolved Oxygen	1B
Northwest	11	Wickecheoke Creek at Stockton	01461300, DRBCNJ0012	Phosphorus, Fecal Coliform,	NJDEP/USGS Data, DRBC	pH	1B
Atlantic Coast	12	Willow Brook at Willow Brook Rd in Holmdel	52	Phosphorus	Monmouth Co HD	Fecal Coliform	3
Lower Delaware	18	Woodbury Lake-18	Woodbury Lake		NJDEP Clean Lakes	Phosphorus	3
Atlantic Coast	12	Wreck Pond Brook at Allenwood Rd in Wall	14		Monmouth Co HD	Fecal Coliform	3
Atlantic Coast	12	Yellow Brook near Malboro	01407360, 12-YEL-1		NJDEP/USGS Data, Metal Recon	Fecal Coliform	3
Raritan	10	Stony Brook on Mine Rd in Hopewell	10-STO-3		NJDEP Metal Recon	Cadmium	1B
Raritan	10	Stony Brook on Mine Rd in Hopewell	10-STO-3		NJDEP Metal Recon	Chromium	1B

Region	WMA	Station Name/Waterbody	Site ID #	Impairment	Data Source	Parameters Delisted	Delisting Rational
Raritan	10	Stony Brook on Mine Rd in Hopewell	10-STO-3		NJDEP Metal Recon	Lead	1B
Raritan	10	Stony Brook on Mine Rd in Hopewell	10-STO-3		NJDEP Metal Recon	Zinc	1B
Lower Delaware	18	Big Timber Creek S Br at Blackwood Terrace	01467329, 18-BIG-1		NJDEP/USGS Data, Metal Recon	Lead	1B
Lower Delaware	18	Big Timber Creek S Br at Blackwood Terrace	01467329, 18-BIG-1		NJDEP/USGS Data, Metal Recon	Fecal Coliform	3
Raritan	10	Millstone River at Kingston	01401440, 10-MIL-2		NJDEP/USGS Data, Metal Recon	Chromium	1B
Raritan	10	Millstone River at Kingston	01401440, 10-MIL-2		NJDEP/USGS Data, Metal Recon	Lead	1B
Raritan	10	Millstone River at Kingston	01401440, 10-MIL-2		NJDEP/USGS Data, Metal Recon	Zinc	1B
Atlantic Coast	15	Great Egg Harbor River at Folsom	01411000, 15-GEH-2		NJDEP/USGS Data, Metal Recon	Cadmium	1B
Atlantic Coast	15	Great Egg Harbor River at Folsom	01411000, 15-GEH-2		NJDEP/USGS Data, Metal Recon	Chromium	1B
Atlantic Coast	15	Great Egg Harbor River at Folsom	01411000, 15-GEH-2		NJDEP/USGS Data, Metal Recon	Mercury	1B
Atlantic Coast	15	Great Egg Harbor River at Folsom	01411000, 15-GEH-2		NJDEP/USGS Data, Metal Recon	Zinc	1B
Raritan	10	Stony Brook at Princeton	01401000, 10-STO-1, 10-STO-4		NJDEP/USGS Data, EWQ, Metal Recon	Lead	1B
Raritan	10	Stony Brook at Princeton	01401000, 10-STO-1, 10-STO-4		NJDEP/USGS Data, EWQ, Metal Recon	Fecal Coliform	3
Raritan	07	Rahway River W Br at Northfield Av at West Orange	01393960		NJDEP/USGS Data	Lead	1A
Raritan	07	Rahway River W Br at Northfield Av at West Orange	01393960		NJDEP/USGS Data	Zinc	1A
Raritan	07	Rahway River W Br at Northfield Av at West Orange	01393960		NJDEP/USGS Data	Fecal Coliform	3
Northeast	06	Whippany River near Pine Brook	01381800, 6-WHI-2		NJDEP/USGS Data, Metal Recon	Total Suspended Solids	1B
Northeast	06	Rockaway River at Longwood Valley	01381200, 6-SITE-10, 6-ROC-1		NJDEP/USGS Data, EWQ, Metal Recon	Fecal Coliform	3
Northeast	04	Saddle River at Lodi	01391200		NJDEP/USGS Data, PVSC, Metal Recon	Unionized Ammonia	1B
Lower Delaware	17	Maurice River near Millville	01411800, 17-MAU-1		NJDEP/USGS Data, Metal Recon	Mercury	1B
Lower Delaware	17	Maurice River near Millville	01411800, 17-MAU-1		NJDEP/USGS Data, Metal Recon	Fecal Coliform	3
Raritan	08	Rockaway Creek at Whitehouse	01399700, EWQ0369, 8-RO-1		NJDEP/USGS Data, EWQ, Metal Recon	Fecal Coliform	3
Northwest	11	Wickecheoke Creek at Stockton	01461300, DRBCNJ0012		NJDEP/USGS Data, DRBC	Unionized Ammonia	1B
Atlantic Coast	12	Whale Pond Brook at Route 35 in Eatontown	01407617, 31		NJDEP/USGS Data, Monmouth Co HD	Fecal Coliform	3

Region	WMA	Station Name/Waterbody	Site ID #	Impairment	Data Source	Parameters Delisted	Delisting Rational

Delisting Reference Codes

For waters listed on previous 303(d) Lists, there are several possible scenarios that may result in a waterbody being removed from a 303(d) list (Sublist 5). Some scenarios that could result in the removal of a waterbody from sublist 5 follow:

1. A determination is made that the waterbody is meeting water quality standards (i.e., no TMDL is required). For example:

- **A.** An error was made in the initial listing causing an erroneous listing;
- **B.** New Information: More recent and/or more accurate data which meets the QA/QC requirements identified in Section 3.2 of this Methods Document demonstrates that a designated use or SWQ criterion is being met for the waterbody (with or without a TMDL). See additional information regarding metals data in Section 8.3 below;
- **C.** Revisions to the SWQS may cause a waterbody to come into compliance with standards or no water quality standard exists.

2. Reassessment of available information or data: Waterbody listed on previous 303d list is based on data, which is insufficient to meet current data quality requirements. Some examples:

- **A.** New Macro-Invertebrate Protocol: Macroinvertebrate data had been collected under conditions not calibrated to reference conditions specified in the sampling protocol. See Section 6.1 and Table 6.5 for detailed information
- **B.** Criterion not measurable.
- **C.** Sufficient data not available (i.e. frequency, number of samples or QA/QC requirements not met.

3. TMDL has been completed. A waterbody will be removed from Sublist 5 and placed in Sublist 4a once a TMDL, which is expected to result in full attainment of the SWQS, has been developed and approved by the USEPA.

4. Other pollution control requirements are reasonably expected to result in the attainment of the water quality standard in the near future. These requirements must be specifically applicable to the particular water quality problem. This includes the installation of new control equipment or elimination of discharges.

5. Impairment is not caused by a pollutant.

6. New spatial extent – When sufficient data warrants, waterbodies previously listed on a large scale may be broken down into smaller assessment units and placed in other sublists, if appropriate. Waterbodies listed based on CWA Section 304(l) and previously identified by RF1 segments will be identified by the station causing the original listing when station information is available.

7. Natural causes - Waters that exceed standards but drain wilderness or similar areas and it can be documented that there are no human contributions to the standard exceedance.

Appendix IE

2002-2004 Comparison Document

Region	WMA	2002 Station Name/Waterbody	2002 Site ID #	Previously Listed on 2002 Sublist 5	2004 Station Name/Waterbody	2004 Site ID #	Listed on 2004 Sublist 5	Delisted/Rational	Parameters Added
Lower Delaware	17	4 Seasons Campground Pond-17	Four Seasons	Fecal Coliform	4 Seasons Campground Pond-17	Four Seasons	Fecal Coliform		
Atlantic Coast	15	Absecon Bay	Absecon Bay-1 thru 15	Dissolved Oxygen, Pathogens	Absecon Bay	Absecon Bay-1 thru 15	Total Coliform	Dissolved Oxygen, 1B	
Atlantic Coast	15	Absecon Creek Estuary	2401	Pathogens	Absecon Creek Estuary	2401	Total Coliform		
Atlantic Coast	14	Absegami Lake-14	Absegami Lake	Nutrients/Sedimentation (Eutrophic)	Absegami Lake-14	Absegami Lake		Phosphorus 1A	
Northeast	05	Ackermans Creek Adjacent to Berry's Creek Reach 02030103-034-0.11		Chromium, Mercury, PCB, Chlorinated Benzenes	Ackermans Creek	Adjacent to Berry's Creek Reach 02030103-034-0.11	Chromium, Mercury, PCB, Chlorinated Benzenes		
Atlantic Coast	14	Albertson Branch near Elm	0140940970	pH	Albertson Branch near Elm	0140940970	pH		
Lower Delaware	18	Alcyon Lake-18	Alcyon Lake	Nutrients/Sedimentation (Eutrophic), Fish-Mercury	Alcyon Lake-18	Alcyon Lake	Phosphorus, Fish-Mercury		
Lower Delaware	20	Allentown Lake-20	Allentown Lake	Nutrients/Sedimentation (Eutrophic)	Allentown Lake-20	Allentown Lake	Phosphorus		
Lower Delaware	17	Alloway Creek at Yorktown - Friesburg Rd in Alloway Twp	AN0699	Aquatic Life	Alloway Creek at Yorktown - Friesburg Rd in Alloway	AN0699	Benthic Macroinvertebrates		
Lower Delaware	17	Alloway Creek Estuary		Pathogens	Alloway Creek Estuary	Alloway Creek Estuary	Total Coliform		
Raritan	09	Ambrose Brook at Raritan Ave in Middlesex	AN0425	Aquatic Life	Ambrose Brook at Raritan Ave in Middlesex	AN0425	Benthic Macroinvertebrates		
Raritan	09	Ambrose Brook at School St. in No. Stelton	AN0425B	Aquatic Life	Ambrose Brook at School St. in No. Stelton	AN0425B	Benthic Macroinvertebrates		
Lower Delaware	20	Annaricken Brook near Jobstown	01464578	Phosphorus, Fecal Coliform	Annaricken Brook near Jobstown	01464578	Phosphorus	Fecal Coliform 3	
Raritan	07	Arthur Kill		Mercury	Arthur Kill	Arthur Kill		Mercury 3	
Raritan	07	Arthur Kill	Arthur Kill-4: Raritan Bay	Pathogens	Arthur Kill	Arthur Kill-4	Total Coliform		
Raritan	07	Arthur Kill and Tidal Tributaries		Fish-PCB, Fish-Dioxin	Arthur Kill and Tidal Tributaries	Arthur Kill and Tidal Tributaries	Fish-PCB, Fish-Dioxin		
Lower Delaware	20	Assiscunk Creek at Cedar Lane at Springfield	20-AS-1	Arsenic, Cadmium, Chromium, Lead, Mercury	Assiscunk Creek at Cedar Lane at Springfield	20-AS-1	Arsenic, Cadmium, Chromium, Lead, Mercury		
Lower Delaware	20	Assiscunk Creek at Hedding Rd (near Jacksonville) in Mansfield Twp	AN0141	Aquatic Life	Assiscunk Creek at Hedding Rd (near Jacksonville) in Mansfield	AN0141	Benthic Macroinvertebrates		
Northwest	11	Assunpink Creek at Mulberry St in Trenton	AN0116	Aquatic Life	Assunpink Creek at Mulberry St in Trenton	AN0116	Benthic Macroinvertebrates		
Northwest	11	Assunpink Creek at Peace Street at Trenton	01464020, 11-AS-3	Phosphorus, Fecal Coliform, Arsenic, Copper, Lead, Zinc	Assunpink Creek at Peace Street at Trenton	01464020, 01464000, DRBCNJ1338, 11-AS-3	Phosphorus, Fecal Coliform, Arsenic, Lead	Copper, Zinc 1B	
Northwest	11	Assunpink Creek at Trenton	01464000	Phosphorus, Fecal Coliform	Assunpink Creek at Peace Street at Trenton	01464020, 01464000, DRBCNJ1338, 11-AS-3	Phosphorus, Fecal Coliform, Arsenic, Lead	Copper, Zinc 1B	
Northwest	11	Assunpink Creek at Route 539 in Upper Freehold	4	Phosphorus	Assunpink Creek at Route 539 in Upper Freehold	4	Phosphorus		
Northwest	11	Assunpink Creek at Rt 535 in West Windsor Twp	AN0109	Aquatic Life	Assunpink Creek at Rt 535 in West Windsor	AN0109	Benthic Macroinvertebrates		
Northwest	11	Assunpink Creek at Willow St in Trenton	AN0118	Aquatic Life	Assunpink Creek at Willow St in Trenton	AN0118	Benthic Macroinvertebrates		
Northwest	11	Assunpink Creek at Windsor Rd in Washington Twp	AN0109A	Aquatic Life	Assunpink Creek at Windsor Rd in Washington	AN0109A	Benthic Macroinvertebrates		
Northwest	11	Assunpink Creek near Clarksville	01463620, 11-AS-2	Arsenic, Cadmium, Copper, Lead, Mercury	Assunpink Creek near Clarksville	01463620, 11-AS-2	Arsenic, Cadmium, Copper, Lead, Mercury		
Northwest	11	Assunpink Creek near Edinburg	11-AS-4	Arsenic, Cadmium, Copper, Lead, Mercury	Assunpink Creek near Edinburg	11-AS-4	Arsenic, Cadmium, Copper, Lead, Mercury		
Northwest	11	Assunpink Creek Trib near Assunpink WMA office in Millstone Twp	AN0109T	Aquatic Life	Assunpink Creek Trib near Assunpink WMA office in Millstone	AN0109T	Benthic Macroinvertebrates		
Northwest	11	Assunpink Lake-11	Assunpink Lake	Fish-Mercury	Assunpink Lake-11	Assunpink Lake	Fish-Mercury		
Atlantic Coast	15	Atlantic City Reservoir-15	Atlantic City Reservoir	Fish-Mercury	Atlantic City Reservoir-15	Atlantic City Reservoir	Fish-Mercury		

Region	WMA	2002 Station Name/Waterbody	2002 Site ID #	Previously Listed on 2002 Sublist 5	2004 Station Name/Waterbody	2004 Site ID #	Listed on 2004 Sublist 5	Delisted/Rational	Parameters Added
Atlantic Ocean	Atlantic Ocean	Atlantic Ocean	Atlantic Ocean-1,5,12,13,17,21,22,23,26,38,39,40,42,43,44,45,47,48,51,67,69,70,71,74,78,79,80,81,82,86,87,88,89,90,91,92,94,103,105,106,107,108,112,114,115,118: Atlantic Ocean, Atlantic Ocean-4: Cape May Beach, Atlantic Ocean-7: Cape May Channel, Atlantic Ocean-8: Wildwood Offshore, Atlantic Ocean-16: Atlantic Ocean Sea Isle, Atlantic Ocean-25,35,52,56,61,65: Atlantic City Offshore, Atlantic Ocean-75,93,96,99,101,109,110,111,113,116,: Asbury Park Offshore, Atlantic Ocean-83: Mantoloking Offshore	Dissolved Oxygen	Atlantic Ocean	All (Long Branch to Cape May)	Dissolved Oxygen		
Atlantic Ocean	Atlantic Ocean	Atlantic Ocean	Atlantic Ocean-75,93,95,96,97,98,102,104,109,100,116: Asbury Park Offshore, Atlantic Ocean-12: Atlantic Ocean, Atlantic Ocean-16: Atlantic Ocean Sea Isle, Atlantic Ocean-4: Cape May Beach, Atlantic Ocean-6, 53, 59: New Jersey Atlantic Ocean, Atlantic Ocean-7: Cape May Channel, Atlantic Ocean-8: Wildwood Offshore, Atlantic Ocean-83: Mantoloking Offshore,	Pathogens	Atlantic Ocean	Asbury Park Offshore-93,95,97,98,100,102,104; Atlantic Ocean-6,12; Atlantic Ocean Sea Isle-16; NJ Atlantic Ocean-53, 59; Cape May Channel-7	Total Coliform	Total Coliform (8,4,75,83,96, 109.110.116), 1B	
Atlantic Coast	15	Babcock Creek near Mays Landing	01411196	pH	Babcock Creek near Mays Landing	01411196	pH		
Raritan	08	Back Brook at Rt 609 in East Amwell Twp	AN0335	Aquatic Life	Back Brook at Rt 609 in East Amwell	AN0335	Benthic Macroinvertebrates		
Lower Delaware	20	Back Creek at Yardville-Hamilton Sq Rd in Hamilton Twp	AN0131A	Aquatic Life	Back Creek at Yardville-Hamilton Sq Rd in Hamilton	AN0131A	Benthic Macroinvertebrates		
Lower Delaware	20	Bacon Run at Georgetown - Bordentown Rd in Georgetown	AN0133A	Aquatic Life	Bacon Run at Georgetown - Bordentown Rd in Georgetown	AN0133A	Benthic Macroinvertebrates		
Lower Delaware	20	Bacons Creek near Mansfield Square	01464529	Fecal Coliform, pH	Bacons Creek near Mansfield Square	01464529	pH	Fecal Coliform 3	
Atlantic Coast	14	Ballanger Creek Estuary	2003D, 2003H	Pathogens	Ballanger Creek Estuary	2003D, 2003H	Total Coliform		
Atlantic Coast	13	Bamber Lake-13	Bamber Lake - East Lake and West Lake	Fecal Coliform	Bamber Lake-13	Bamber Lake - East Lake and West Lake	Fecal Coliform		
Raritan	09	Barclay Brook near Englishtown	01405285	pH	Barclay Brook near Englishtown	01405285	pH		
Lower Delaware	20	Barkers Brook at Jacksonville-Smithville Rd in Springfield Twp	AN0141O	Aquatic Life	Barkers Brook at Jacksonville-Smithville Rd in Springfield	AN0141O	Benthic Macroinvertebrates		
Lower Delaware	20	Barkers Brook N Br near Jobstown	01464583	Phosphorus, Fecal Coliform, pH	Barkers Brook N Br near Jobstown	01464583	Phosphorus, pH	Fecal Coliform 3	

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Atlantic Coast	13	Barnegat Bay	Barnegat Bay-1,5: Lower Metedeconk R, Barnegat Bay-2: Central Long Beach Island, Barnegat Bay-3,4,11,12,13,16,21: North Long Beach Island, Barnegat Bay-7: Kettle Creek, Barnegat Bay-8: North Barnegat Bay, Barnegat Bay-9: Lavalette, Barnegat Bay-10: Kettle Creek, Barnegat Bay-14,15: Silver Bay, Barnegat Bay 17: Applegate Cove, Barnegat Bay-18: Seaside Heights, Barnegat Bay-19: Shelter Cove,Barnegat Bay-20: Barnegat Bay - Toms River, Barnegat Bay-22: Double Creek, Barnegat Bay-23: North Barnegat Bay, Barnegat Bay-24,41: Barnegat Light, Barnegat Bay-25: East Of Clam Island, Barnegat Bay-26: Oyster Creek, Barnegat Bay-27: Oyster Creek Canal South, Barnegat Bay-28: Oyster Creek Canal North, Barnegat Bay-29: Barnegat Bay Toms River, Barnegat Bay-30: Barnegat Bay - Seaside, Barnegat Bay-31: Forked River South Branch, Barnegat Bay-33: Sloop Creek, Barnegat Bay-34: West Barnegat Bay, Barnegat Bay-35: Barnegat Bay - Boat Ramp, Barnegat Bay-36: Clamming And Maple Creeks, Barnegat Bay-37: Sunrise	Pathogens	Barnegat Bay	Barnegat Bay-1 thru 5, 7 thru 31, 33 thru 41	Total Coliform		
Atlantic Coast	12	Barren Neck Brook at Long Bridge Rd in Colts Neck	56	Phosphorus, Fecal Coliform	Barren Neck Brook at Long Bridge Rd in Colts Neck	56	Phosphorus	Fecal Coliform 3	
Lower Delaware	17	Barrett Run at W Ave in Bridgeton	AN0714	Aquatic Life	Barrett Run at W Ave in Bridgeton	AN0714	Benthic Macroinvertebrates		
Atlantic Coast	14	Bass River E Br near New Gretna	01410150, 14-EBR-1	Dissolved Solids, Copper, Lead, Zinc	Bass River E Br near New Gretna	01410150, 14-EBR-1	Copper, Lead, Zinc	Dissolved Solids 1B	
Atlantic Coast	14	Bass River Estuary	2007B, 2007C, 2007D, 2007E	Pathogens	Bass River Estuary	2007B, 2007C, 2007D, 2007E	Total Coliform		
Atlantic Coast	14	Batsto Lake-14	Batsto Lake	Fish-Mercury	Batsto Lake-14	Batsto Lake	Fish-Mercury		
Atlantic Coast	14	Batsto River at Batsto	01409500, 14-BAT-1	pH, Copper	Batsto River at Batsto	01409500, 14-BAT-1	pH, Copper		
Atlantic Coast	14	Batsto River at Hampton Furnace	01409432	pH	Batsto River at Hampton Furnace	01409432	pH		
Atlantic Coast	14	Batsto River at Quaker Bridge	01409470	pH	Batsto River at Quaker Bridge	01409470	pH		
Raritan	10	Bear Brook at Stobbe Ln in West WIndsor Twp	AN0384	Unknown Toxicity	Bear Brook at Stobbe Ln in West WIndsor	AN0384	Unknown Toxicity		
Northwest	01	Bear Creek at Dark Moon Rd in Frelinghuysen Twp	AN0040A	Aquatic Life	Bear Creek at Dark Moon Rd in Frelinghuysen	AN0040A	Benthic Macroinvertebrates		
Northwest	01	Bear Creek near Alphano in Allamuchy Twp	AN0040	Aquatic Life	Bear Creek near Alphano in Allamuchy	AN0040	Benthic Macroinvertebrates		
Raritan	08	Beaver Brook at Lehigh St in Clinton	AN0324	Aquatic Life	Beaver Brook at Lehigh St in Clinton	AN0324	Benthic Macroinvertebrates		

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Northeast	06	Beaver Brook at Morris Ave in Denville Twp	AN0246	Aquatic Life	Beaver Brook at Morris Ave in Denville	AN0246	Benthic Macroinvertebrates		
Northeast	06	Beaver Brook at Rockaway	01380100	Fecal Coliform	Beaver Brook at Rockaway	01380100, 01380098		Fecal Coliform 3	
Northwest	02	Beaver Run at Cemetery Rd in Wantage Twp	AN0301	Aquatic Life	Beaver Run at Cemetery Rd in Wantage	AN0301	Benthic Macroinvertebrates		
Atlantic Coast	13	Beaverdam Creek Estuary	1401C, 1401D, 1600, 1600A, 1600B	Pathogens	Beaverdam Creek Estuary	1401C, 1401D, 1600, 1600A, 1600B	Total Coliform		
Raritan	10	Beden Brook at Great Rd in Blawenburg	AN0401B	Aquatic Life	Beden Brook at Great Rd in Blawenburg	AN0401B	Benthic Macroinvertebrates		
Raritan	10	Bedens Brook at Aunt Molly Rd (abv STP) in Hopewell Twp	AN0398, 10-BED-1	Aquatic Life	Bedens Brook at Aunt Molly Rd (abv STP) in Hopewell	AN0398, 10-BED-1	Benthic Macroinvertebrates		
Raritan	10	Bedens Brook at Rt 206 in Montgomery Twp	AN0401	Aquatic Life	Bedens Brook at Rt 206 in Montgomery	AN0401	Benthic Macroinvertebrates		
Raritan	10	Bedens Brook near Rocky Hill	01401600, 10-BED-2, 10-BED-3	Phosphorus, Fecal Coliform, Arsenic, Lead	Bedens Brook near Rocky Hill	01401600, 10-BED-2, 10-BED-3	Phosphorus, Arsenic, Lead	Fecal Coliform 3	
Northeast	03	Belchers Brook at Union Valley Rd in West Milford Twp	AN0255C	Aquatic Life	Belchers Brook at Union Valley Rd in West Milford	AN0255C	Benthic Macroinvertebrates		
Lower Delaware	18	Bell Lake-18	Bell Lake	Nutrients/Sedimentation (Eutrophic)	Bell Lake-18	Bell Lake		Phosphorus 3	
Lower Delaware	18	Bells Lake-18	Greenwood Park Bells Lake	Fecal Coliform	Bells Lake-18	Greenwood Park Bells Lake		Fecal Coliform 1B	
Northeast	05	Berry's Creek Reach 02030103-034		Mercury, Arsenic, Lead, Copper, PCB	Berry's Creek	Berry's Creek Reach 02030103-034	Mercury, Arsenic, Lead, Copper, PCB		
Lower Delaware	18	Bethel Lake-18	Bethel Lake	Nutrients/Sedimentation (Eutrophic)	Bethel Lake-18	Bethel Lake		Phosphorus 3	
Raritan	10	Big Bear Brook at Old Trenton Rd (Rt 535) in West Windsor Twp	AN0383	Aquatic Life, Unknown Toxicity	Big Bear Brook at Old Trenton Rd (Rt 535) in West Windsor	AN0383	Benthic Macroinvertebrates, Unknown Toxicity		
Atlantic Coast	12	Big Brook at Cross Rd in Colts Neck Twp	AN0470	Aquatic Life	Big Brook at Cross Rd in Colts Neck	AN0470	Benthic Macroinvertebrates		
Atlantic Coast	12	Big Brook at Laurelwood Dr in Colts Neck	57	Phosphorus, Fecal Coliform	Big Brook at Colts Neck	EWQ0470, 21, 57	Phosphorus	Fecal Coliform 3	
Atlantic Coast	12	Big Brook at Maywood Drive in Marlboro	21	Phosphorus, Fecal Coliform	Big Brook at Colts Neck	EWQ0470, 21, 57	Phosphorus	Fecal Coliform 3	
Atlantic Coast	13	Big Creek Estuary	1924A, 1924B	Pathogens	Big Creek Estuary	1924A, 1924B	Total Coliform		
Lower Delaware	18	Big Timber Ck N Br at Rt 168 In Gloucester Twp	AN0663	Aquatic Life	Big Timber Creek	Big Timber Creek	Fish-Mercury		
Lower Delaware	18	Big Timber Creek		Fish-Mercury	Big Timber Creek N Br at Glendora	01467359	Phosphorus	Fecal Coliform 3	
Lower Delaware	18	Big Timber Creek N Br at Glendora	01467359	Phosphorus, Fecal Coliform	Big Timber Creek N Br at Park Ave in Lindenwold	AN0661	Benthic Macroinvertebrates		
Lower Delaware	18	Big Timber Creek N Br at Park Ave in Lindenwold	AN0661	Aquatic Life	Big Timber Creek N Br at Rt 168 In Gloucester	AN0663	Benthic Macroinvertebrates		
Lower Delaware	18	Big Timber Creek S Br at Blackwood Terrace	01467329, 18-BIG-1	Phosphorus, Fecal Coliform, Arsenic, Lead	Big Timber Creek S Br at Blackwood Terrace	01467329, 18-BIG-1	Phosphorus	Arsenic, Lead 1B, Fecal Coliform 3	
Lower Delaware	18	Big Timber Creek S Br at Glenloch	01467327	Fecal Coliform	Big Timber Creek S Br at Glenloch	01467327		Fecal Coliform 3	
Lower Delaware	18	Big Timber Creek S Br at Turnersville - Sicklerville Rd in Washington Twp	AN0658	Aquatic Life	Big Timber Creek S Br at Turnersville - Sicklerville Rd in Washington	AN0658	Benthic Macroinvertebrates		
Atlantic Coast	16	Big Timber Lake-16	Big Timber Lake	Fecal Coliform	Big Timber Lake-16	Big Timber Lake		Fecal Coliform 1B	
Atlantic Coast	12	Birch Swamp Brook Adjacent to Matawan Creek Reach 02030104-328-0.42		Arsenic, Lead, Copper, PCB	Birch Swamp Brook	Adjacent to Matawan Creek Reach 02030104-328-0.42	Arsenic, Lead, Copper, PCB		
Northeast	06	Black Brook at Madison	01378855	Phosphorus, Fecal Coliform	Black Brook at Madison	01378855	Phosphorus, Arsenic	Fecal Coliform 3	Arsenic
Northeast	06	Black Brook at New Vernon Rd in Long Hill Twp	AN0223	Aquatic Life	Black Brook at New Vernon Rd in Long Hill	AN0223	Benthic Macroinvertebrates		
Northeast	06	Black Brook at Southern Blvd in Chatham Twp	AN0222	Aquatic Life	Black Brook at Southern Blvd in Chatham	AN0222	Benthic Macroinvertebrates		

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Northwest	02	Black Creek at Marker Rd in Vernon Twp	AN0296	Aquatic Life	Black Creek at Marker Rd in Vernon	AN0296	Benthic Macroinvertebrates		
Northwest	02	Black Creek near Vernon	01368950	Fecal Coliform	Black Creek near Vernon	01368950, Wallkill H	Phosphorus	Fecal Coliform 3	Phosphorus
Lower Delaware	20	Blacks Creek at Chesterfield - Georgetown Rd in Chesterfield Twp	AN0132	Aquatic Life	Blacks Creek at Chesterfield - Georgetown Rd in Chesterfield	AN0132	Benthic Macroinvertebrates		
Lower Delaware	17	Blackwater Br at Main Rd in Franklin Twp	AN0738	Aquatic Life	Blackwater Branch at Main Rd in Franklin	AN0738	Benthic Macroinvertebrates		
Lower Delaware	17	Blackwater Br at Maurice River Pkwy in Vineland	AN0739	Aquatic Life	Blackwater Branch at Maurice River Pkwy in Vineland	AN0739	Benthic Macroinvertebrates		
Lower Delaware	18	Blackwood Lake-18	Blackwood Lake	Nutrients/Sedimentation (Eutrophic)	Blackwood Lake-18	Blackwood Lake		Phosphorus 3	
Atlantic Coast	14	Blue Anchor Brook at Elm	0140940950	pH	Blue Anchor Brook at Elm	0140940950	pH		
Atlantic Coast	12	Bordons Brook at Route 520 in Holmdel	54	Phosphorus, Fecal Coliform	Bordons Brook at Rt 520 in Holmdel	54	Phosphorus	Fecal Coliform 3	
Raritan	09	Bound Brook at Bound Brook Rd in Middlesex	AN0424	Aquatic Life	Bound Brook at Bound Brook Rd in Middlesex	AN0424	Benthic Macroinvertebrates		
Raritan	09	Bound Brook at Middlesex	01403900	Phosphorus, Fecal Coliform, Total Suspended Solids	Bound Brook at Middlesex	01403900	Phosphorus, Total Suspended Solids	Fecal Coliform 3	
Raritan	09	Bound Brook at Route 28 at Middlesex	01403385	Phosphorus, Fecal Coliform	Bound Brook at Route 28 at Middlesex	01403385	Phosphorus	Fecal Coliform 3	
Raritan	09	Bound Brook at Woodbrook Rd in South Plainfield	AN0424B	Aquatic Life	Bound Brook at Woodbrook Rd in South Plainfield	AN0424B	Benthic Macroinvertebrates		
Atlantic Coast	15	Braddock Lake-15	Collings Lakes #1 (Braddock)	Fecal Coliform	Braddock Lake-15	Collings Lakes #1 (Braddock)	Fecal Coliform		
Atlantic Coast	12	Branchport Creek at Berdan Pl in Long Branch	45	Fecal Coliform	Branchport Creek-Tidal	45, R05	Fecal Coliform		
Northeast	03	Bubbling Springs-03	Bubbling Springs	Fecal Coliform	Bubbling Springs-03	Bubbling Springs	Fecal Coliform		
Lower Delaware	17	Buckshutem Creek near Laurel Lake	01411950	Fecal Coliform	Buckshutem Creek near Laurel Lake	01411950	Fecal Coliform		
Raritan	08	Budd Lake-08	Mt. Olive Municipal Beach, Budd Lake	Fecal Coliform	Budd Lake-08	Mt. Olive Municipal Beach, Budd Lake	Fecal Coliform, Fish-Mercury		Fish-Mercury
Lower Delaware	17	Burnt Mill Br at Forest Grove Rd in Newfield	AN0734A	Aquatic Life	Burnt Mill Branch at Forest Grove Rd in Newfield	AN0734A	Benthic Macroinvertebrates		
Lower Delaware	17	Burnt Mill Lake-17	Burnt Mill Lake	Nutrients/Sedimentation (Eutrophic)	Burnt Mill Lake-17	Burnt Mill Lake		Phosphorus 3	
Raritan	08	Cakepoulin (Capoloony) Creek Reach 02030105-043-0.00		DDT	Cakepoulin Creek	Cakepoulin Creek Reach 02030105-043-0.00	DDT		
Raritan	08	Camp Bernie	Camp Bernie	Fecal Coliform	Camp Bernie	Camp Bernie		Fecal Coliform 1B	
Lower Delaware	19	Camp Darkwaters	Camp Darkwaters	Fecal Coliform	Camp Darkwaters	Camp Darkwaters	Fecal Coliform		
Northeast	06	Camp Lewis-06	Camp Lewis	Fecal Coliform	Camp Lewis-06	Camp Lewis	Fecal Coliform		
Northeast	03	Cannistear Reservoir-03	Cannistear Reservoir	Fish-Mercury	Cannistear Reservoir-03	Cannistear Reservoir	Fish-Mercury		
Northeast	06	Canoe Brook at Parsonage Hill Rd in Millburn Twp	AN0231D	Aquatic Life	Canoe Brook at Parsonage Hill Rd in Millburn	AN0231D	Benthic Macroinvertebrates		
Northeast	06	Canoe Brook near Summit	01379530	Fecal Coliform	Canoe Brook near Summit	01379530		Fecal Coliform 3	
Lower Delaware	17	Canton Drain at Maskell Mill	01413065	pH	Canton Drain at Maskell Mill	01413065	pH		
Atlantic Coast	13	Carasaljo Lake-13	Lake Carasalijo North Beach and South Beach	Fecal Coliform	Carasaljo Lake-13	Lake Carasalijo North Beach and South Beach	Fecal Coliform		
Raritan	10	Carnegie Lake-10	Carnegie Lake	Fish-Mercury	Carnegie Lake-10	Carnegie Lake	Fish-Mercury		
Raritan	09	Carroll's Garden Lake	Carroll's Garden Lake	Fecal Coliform	Carroll's Garden Lake	Carroll's Garden Lake		Fecal Coliform 1B	
Lower Delaware	17	Cedar Br at Italia Ave in Vineland	AN0757	Aquatic Life	Cedar Branch at Italia Ave in Vineland	AN0757	Benthic Macroinvertebrates		
Atlantic Coast	13	Cedar Bridge Br at Moore Rd in Brick Twp	AN0514	Aquatic Life	Cedar Bridge Branch at Moore Rd in Brick	AN0514	Benthic Macroinvertebrates		
Raritan	09	Cedar Brook at Cedarbook Ave. in So. Plainfield	AN0424A	Aquatic Life	Cedar Brook at Cedarbook Ave in So. Plainfield	AN0424A	Benthic Macroinvertebrates		
Lower Delaware	17	Cedar Creek Estuary	3805C, 3805J, 3805L, 3805M	Pathogens	Cedar Creek Estuary	3805C, 3805J, 3805L, 3805M	Total Coliform		

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Lower Delaware	17	Cedar Lake-17	Cedar Lake	Fecal Coliform	Cedar Lake-17	Cedar Lake	Fecal Coliform		
Atlantic Coast	13	Cedar Run at Rt 9 in Stafford Twp	AN0556	Aquatic Life	Cedar Run at Rt 9 in Stafford	AN0556	Benthic Macroinvertebrates		
Raritan	08	Chambers Brook at North Branch Depot	01399900	Fecal Coliform	Chambers Brook at North Branch Depot	01399900		Fecal Coliform 3	
Lower Delaware	18	Chestnut Br at Mantua Blvd in Mantua Twp	AN0671	Aquatic Life	Chestnut Branch at Mantua Blvd in Mantua	AN0671	Benthic Macroinvertebrates		
Atlantic Coast	12	Chingorora Creek at Broadway in Union Beach	36	Fecal Coliform	Chingarora Creek-Tidal	36, R64	Fecal Coliform, Dissolved Oxygen		Dissolved Oxygen
Atlantic Coast	14	Clarks Mill Stream at Rt 575 in Port Republic	AN0613	Aquatic Life	Clarks Mill Stream at Rt 575 in Port Republic	AN0613		Benthic Macroinvertebrates 1A	
Northwest	02	Clove Brook at Loomis Ave in Sussex	AN0309	Aquatic Life	Clove Brook at Loomis Ave in Sussex	AN0309	Benthic Macroinvertebrates		
Northwest	01	Clove Brook at Rt 23 in Montague Twp	AN0002	Aquatic Life	Clove Brook at Rt 23 in Montague	AN0002	Benthic Macroinvertebrates		
Northwest	02	Clove Brook UNK Trib at Rose Marrow Ave in Wantage Twp	AN0308	Unknown Toxicity	Clove Brook UNK Trib at Rose Marrow Ave in Wantage	AN0308	Unknown Toxicity		
Northwest	02	Clove Lake-02	Clove Lake	Nutrients/Sedimentation (Eutrophic)	Clove Lake-02	Clove Lake	Phosphorus		
Lower Delaware	17	Cohansey River at Rt 540 in Upper Deerfield Twp	AN0710	Aquatic Life	Cohansey River at Rt 540 in Upper Deerfield	AN0710	Benthic Macroinvertebrates		
Lower Delaware	17	Cohansey River at Seeley	01412800, 17-COH-1	Fecal Coliform, Lead	Cohansey River at Seeley	01412800, 17-COH-1	Phosphorus, pH, Lead		pH
Lower Delaware	17	Cohansey River at Silver Lk Rd in Upper Deerfield Twp	AN0712	Aquatic Life	Cohansey River at Silver Lk Rd in Upper Deerfield	AN0712	Benthic Macroinvertebrates		
Lower Delaware	17	Cohansey River Estuary		Pathogens	Cohansey River Estuary	Cohansey River Estuary	Total Coliform		
Northeast	05	Coles Brook at Hackensack	01378560	Phosphorus, Fecal Coliform	Coles Brook at Hackensack	01378560	Phosphorus	Fecal Coliform 1B	
Northeast	06	Community Assoc. of Prospect Point	Community Assoc. of Prospect Point	Fecal Coliform	Community Assoc. of Prospect Point	Community Assoc. of Prospect Point	Fecal Coliform		
Atlantic Coast	12	Como Lake-12	Como Lake	Nutrients/Sedimentation (Eutrophic)	Como Lake-12	Como Lake	Phosphorus		
Northeast	06	Conference Center Left and Right	Conference Center Left and Right	Fecal Coliform	Conference Center Left and Right	Conference Center Left and Right	Fecal Coliform		
Lower Delaware	18	Cooper River		Fish-PCB, Fish-Chlordane	Cooper River			Fish-PCB, Fish-Dioxin 1B	
Lower Delaware	18	Cooper River at Haddonfield	01467150, 18-CO-4	Phosphorus, Fecal Coliform, Arsenic, Lead, Tetrachloroethylene	Cooper River at Haddonfield	01467150, 01467140, 18-CO-4	Phosphorus, Arsenic, Lead, Tetrachloroethylene	Dissolved Oxygen (01467140) 1B, Fecal Coliform 3	
Lower Delaware	18	Cooper River at Lawnside	01467140	Phosphorus, Fecal Coliform, Dissolved Oxygen	Cooper River at Haddonfield	01467150, 01467140, 18-CO-4	Phosphorus, Arsenic, Lead, Tetrachloroethylene	Dissolved Oxygen (01467140) 1B, Fecal Coliform 3	
Lower Delaware	18	Cooper River at Lindenwold	01467120	Phosphorus, Fecal Coliform	Cooper River at Lindenwold	01467120	Phosphorus	Fecal Coliform 3	
Lower Delaware	18	Cooper River at Rt 130 at Camden	18-CO-1	Arsenic, Lead, Tetrachloroethylene	Cooper River at Rt 130 at Camden	18-CO-1	Arsenic, Lead, Mercury, Tetrachloroethylene		Mercury(mistake in '02)
Lower Delaware	18	Cooper River Lake-18	Cooper River Lake	Fish-Chlordane	Cooper River Lake-18	Cooper River Lake	Fish-PCB, Fish-Dioxin	Fish-Chlordane 1B	Fish-PCB, Fish-Dioxin
Lower Delaware	18	Cooper River N Br at Kresson	01467155, 18-CO-2	Fecal Coliform	Cooper River N Br at Kresson	01467155, 18-CO-2	Phosphorus, Dissolved Oxygen, pH, Arsenic	Fecal Coliform 3	Phosphorus, Dissolved Oxygen, pH, Arsenic
Lower Delaware	18	Cooper River N Br at River Dr in Cherry Hill Twp	AN0188	Aquatic Life	Cooper River N Br at River Dr in Cherry Hill	AN0188	Benthic Macroinvertebrates		
Lower Delaware	18	Cooper River N Br at Springdale Rd in Cherry Hill Twp	AN0187	Aquatic Life	Cooper River N Br at Springdale Rd in Cherry Hill	AN0187	Benthic Macroinvertebrates		
Lower Delaware	18	Cooper River Park-18	Cooper River Park	Fish-Mercury	Cooper River Park-18	Cooper River Park		Fish - Mercury 1B	

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Lower Delaware	18	Cooper River S Br at Evesham Rd in Cherry Hill Twp	AN0190	Aquatic Life	Cooper River S Br at Evesham Rd in Cherry Hill	AN0190	Benthic Macroinvertebrates		
Lower Delaware	18	Cooper River S Br at Gibbsboro Rd in Gibbsboro	AN0189	Aquatic Life	Cooper River S Br at Gibbsboro Rd in Gibbsboro	AN0189	Benthic Macroinvertebrates		
Northwest	11	Copper Creek near Frenchtown	01458710	Fecal Coliform	Copper Creek near Frenchtown	01458710		Fecal Coliform 3	
Atlantic Coast	16	Corson Sound	Corson Sound-1,2: Crook Horn Creek, Corson Sound-5,6,9: Corsons Sound, Corson Sound-10,11: Whale Creek, Corson Sound-7: Ludlam Bay, Corson Sound-13: Unnamed Creek	Pathogens	Corson Sound	Crook Horn Creek-1,2; Corson Sound-6,9; Whale Creek-10,11; Ludlam Bay-7; Unnamed Creek-13	Total Coliform	Total Coliform (Corson Sound-5: Corsons Sound) 1B	
Northeast	06	Cozy Lake-06	Cozy Lakers	Fecal Coliform	Cozy Lake-06	Cozy Lakers	Fecal Coliform		
Lower Delaware	20	Crafts Creek at Island Rd in Mansfield Twp	AN0136	Aquatic Life	Crafts Creek at Island Rd in Mansfield	AN0136	Benthic Macroinvertebrates		
Northwest	01	Cranberry Lake-01	Cranberry Lake	Nutrients/Sedimentation (Eutrophic), Fish-Mercury	Cranberry Lake-01	Cranberry Lake	Fish-Mercury	Phosphorus 3	
Raritan	10	Cranbury Book near Prospect Plains	01400690	Fecal Coliform, pH	Cranbury Book near Prospect Plains	01400690	pH	Fecal Coliform 3	
Raritan	10	Cranbury Brook at Applegarth Rd in Monearoe Twp	AN0385	Aquatic Life	Cranbury Brook at Applegarth Rd in Monearoe	AN0385	Benthic Macroinvertebrates		
Raritan	10	Cranbury Brook at Edgemere Ave in Plainsboro Twp	AN0386	Aquatic Life	Cranbury Brook at Edgemere Ave in Plainsboro	AN0386	Benthic Macroinvertebrates		
Atlantic Coast	15	Cranes Lake-15	Hospitality Creek Campground	Fecal Coliform	Cranes Lake-15	Hospitality Creek Campground	Fecal Coliform		
Atlantic Coast	16	Creesse Creek Estuary	3413A, 3500B, 3500C	Pathogens	Creesse Creek Estuary	3413A, 3500B, 3500C	Total Coliform		
Lower Delaware	20	Crosswicks Creek		Fish-Mercury	Crosswicks Creek	Crosswicks Creek	Fish-Mercury		
Lower Delaware	20	Crosswicks Creek at Extonville	01464500, 20-CRO-1	Phosphorus, Fecal Coliform	Crosswicks Creek at Extonville	01464500, 20-CRO-1	Phosphorus, Fecal Coliform		
Lower Delaware	20	Crosswicks Creek at Groveville Rd. at Groveville	01464504, 20-CRO-2	Phosphorus, Fecal Coliform	Crosswicks Creek at Groveville Rd at Groveville	01464504, 20-CRO-2	Phosphorus	Fecal Coliform 3	
Lower Delaware	20	Crosswicks Creek at Main St in Hamilton Twp	AN0126	Aquatic Life	Crosswicks Creek at Main St in Hamilton	AN0126	Benthic Macroinvertebrates		
Lower Delaware	20	Crosswicks Creek at Rt 528 (blw Oakford Lk) in New Egypt	AN0121D	Aquatic Life	Crosswicks Creek at Rt 528 (blw Oakford Lk) in New Egypt	AN0121D	Benthic Macroinvertebrates		
Lower Delaware	20	Crosswicks Creek at Rt 537 in Plumsted Twp	AN0121	Aquatic Life	Crosswicks Creek at Rt 537 in Plumsted	AN0121	Benthic Macroinvertebrates		
Lower Delaware	20	Crosswicks Creek at Walnford Rd in Upper Freehold	2	Phosphorus, Fecal Coliform	Crosswicks Creek at Walnford Rd in Upper Freehold	2	Phosphorus	Fecal Coliform 3	
Lower Delaware	20	Crosswicks Creek near New Egypt	01464420	Phosphorus	Crosswicks Creek near New Egypt	01464420	Phosphorus		
Lower Delaware	20	Crosswicks Creek Trib S at Cookstown - New Egypt Rd in Cookstown	AN0121B	Aquatic Life	Crosswicks Creek Trib S at Cookstown - New Egypt Rd in Cookstown	AN0121B	Benthic Macroinvertebrates		
Lower Delaware	20	Crosswicks Creek UNK Trib at Iron Bridge Rd in Chesterfield Twp	AN0126A	Aquatic Life	Crosswicks Creek UNK Trib at Iron Bridge Rd in Chesterfield	AN0126A	Benthic Macroinvertebrates		
Lower Delaware	20	Crystal Lake-20	Crystal Lake	Fish-Mercury	Crystal Lake-20	Crystal Lake	Fish-Mercury		
Atlantic Coast	15	Cushman Lake-15	Collings Lakes #2 (Jays Lake North), Collings Lakes #3 (Jays Lake South)	Fecal Coliform	Cushman Lake-15	Collings Lakes #2 (Jays Lake North), Collings Lakes #3 (Jays Lake South)	Fecal Coliform		
Northeast	03	Dam Brook Trib to Pompton River at Ryerson Rd in Lincoln Park	AN0269	Aquatic Life	Dam Brook Trib to Pompton River at Ryerson Rd in Lincoln Park	AN0269	Benthic Macroinvertebrates		
Raritan	09	Davidsons Mill Pond-09	Davidsons Mill Pond	Nutrients/Sedimentation (Eutrophic), Aquatic Life	Davidsons Mill Pond-09	Davidsons Mill Pond	Fish Community	Phosphorus 3	
Northeast	06	Dead River at King George Rd in Bernards Twp	AN0227	Aquatic Life	Dead River at King George Rd in Bernards	AN0227	Benthic Macroinvertebrates		
Northeast	06	Dead River near Millington	01379200	Phosphorus, Fecal Coliform, Nitrate, Total Suspended Solids	Dead River near Millington	01379200	Phosphorus, Nitrate, Total Suspended Solids	Fecal Coliform 3	

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Atlantic Coast	12	Deal Lake at Ocean Ave in Asbury	1	Fecal Coliform	Deal Lake-12	1, Deal Lake	Fecal Coliform	Phosphorus 3	Fecal Coliform
Atlantic Coast	12	Deal Lake-12	Deal Lake	Nutrients/Sedimentation (Eutrophic)	Deal Lake-12	1, Deal Lake	Fecal Coliform	Phosphorus 3	Fecal Coliform
Atlantic Coast	12	Debois Creek at Strickland Rd in Freehold Twp	AN0487	Aquatic Life	Debois Creek at Strickland Rd in Freehold	AN0487	Benthic Macroinvertebrates		
Raritan	09	Deep Run at Rt 516 in Old Bridge Twp	AN0454	Aquatic Life	Deep Run at Rt 516 in Old Bridge	AN0454	Benthic Macroinvertebrates		
Raritan	09	Deep Run at Rt 9 in Old Bridge Twp	AN0453	Aquatic Life	Deep Run at Rt 9 in Old Bridge	AN0453	Benthic Macroinvertebrates		
Northeast	04	Deepavaal Brook at Fairfield	01389138	Fecal Coliform	Deepavaal Brook at Fairfield	01389138		Fecal Coliform 3	
Northeast	04	Deepavaal Brook at Ltl Falls Ave in Fairfield	AN0271	Aquatic Life	Deepavaal Brook at Ltl Falls Ave in Fairfield	AN0271	Benthic Macroinvertebrates		
Northwest	02	Deer Trail Lake-02	Deer Trail Lake	Fecal Coliform	Deer Trail Lake-02	Deer Trail Lake	Fecal Coliform		
Lower Delaware	17	Delaware Bay	Tree Creek To Artificial Island, Delaware Bay-6: Cohansey Cove, Delaware Bay-7: Back Creek, Delaware Bay-8: Dyer Cove, Delaware Bay-10: Delaware Bay Inshore, Delaware Bay-11: Lower Maurice River, Delaware Bay-12: Dennis Creek, Delaware Bay 14,15: Delaware Bay East	Pathogens	Delaware Bay	Cherry Tree Ck to Artificial Island-2,4; Cohansey Cove 6; Back Ck-7; Dyer Cove-8; Delaware Bay Inshore-10; Lower Maurice R-11; Dennis Ck-12; Delaware Bay East-14,15	Total Coliform		
Lower Delaware	17	Delaware Bay	Delaware Bay-1 thru 16	Fish-PCB	Delaware Bay	Delaware Bay-all	Fish-PCB		
Northwest	01	Delaware River at Easton PA	01447000	Arsenic, Cadmium, Chromium. Copper, Lead, Mercury	Delaware River Zone 1	Delaware River at Easton PA	Arsenic, Cadmium, Chromium. Copper, Lead, Mercury		
Northwest	01	Delaware River Zone 1		Fish-Mercury	Delaware River Zone 1	Delaware River Zone 1	Fish-Mercury		
Lower Delaware	20	Delaware River Zone 1-5 (Yardley, PA - Delaware Bay)		Fish-PCB, Fish-Chlordane	Delaware River Zone 1-5 (Yardley, PA -Delaware Bay)			Fish-PCB, Fish-Chlordane 1B	
Lower Delaware	20	Delaware River Zone 2, 02040201-004		Cadmium, Mercury	Delaware River Zone 2	Delaware River Zone 2, Reach 02040201-004	Cadmium, Mercury		
Lower Delaware	18	Delaware River Zone 3 Reach 02040202-030		Cadmium	Delaware River Zone 3	Delaware River Zone 3, Reach 02040202-030	Cadmium		
Lower Delaware	20	Delaware River Zone 3, 02040202-035		Arsenic, Cadmium, Mercury	Delaware River Zone 3	Delaware River Zone 3, Reach 02040202-035	Arsenic, Cadmium, Mercury		
Lower Delaware	20	Delaware River/Estuary (Trenton to head of Delaware Bay)		PCB, DDT, DDE, DDD, Dieldrin; Fish-Mercury, Fish-DDT, Fish-DDE, Fish-DDD, Shellfish-Zinc	Delaware River/Estuary	Delaware River/Estuary (Trenton to Delaware Bay)	DDT, DDE, DDD, Dieldrin; Fish-Mercury, Fish-DDT, Fish-DDE, Fish DDD, Shellfish-Zinc	PCB 3	
Atlantic Coast	16	Dennis Creek Trib 2 at Dennisville	01411428	pH	Dennis Creek Trib 2 at Dennisville	01411428	pH		
Atlantic Coast	16	Dennisville Lake-16	Dennisville Lake	Nutrients/Sedimentation (Eutrophic)	Dennisville Lake-16	Dennisville Lake		Phosphorus 1A	
Raritan	10	Devils Brook at New Rd in South Brunswick Twp	AN0387	Aquatic Life	Devils Brook at New Rd in South Brunswick	AN0387	Benthic Macroinvertebrates		
Raritan	10	Devils Brook at Schalk's Rd in Plainsboro Twp	AN0389	Aquatic Life	Devils Brook at Schalk's Rd in Plainsboro	AN0389	Benthic Macroinvertebrates		
Raritan	09	Devoe Lake-09	Devoe Lake	Nutrients/Sedimentation (Eutrophic)	Devoe Lake-09	Devoe Lake	Fish-Mercury	Phosphorus 3	Fish-Mercury

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Northeast	04	Diamond Brook at Fair Lawn	01389860	Fecal Coliform	Diamond Brook at Fair Lawn	01389860		Fecal Coliform 3	
Atlantic Coast	13	Dinner Point Creek Estuary	1713, 1713A, 1713B	Pathogens	Dinner Point Creek Estuary	1713, 1713A, 1713B	Total Coliform		
Lower Delaware	17	Dividing Creek Estuary	3840B, 3840C, 3840D, 3840E, 3840F	Pathogens	Dividing Creek Estuary	3840B, 3840C, 3840D, 3840E, 3840F, R44	Dissolved Oxygen, Total Coliform		Dissolved Oxygen
Lower Delaware	20	Doctors Creek at Allentown	01464515	Phosphorus, Fecal Coliform	Doctors Creek at Allentown	01464515	Phosphorus	Fecal Coliform 3	
Lower Delaware	20	Doctors Creek at Breza Rd in Upper Freehold Twp	AN0129, MB-123	Aquatic Life	Doctors Creek at Breza Rd in Upper Freehold	AN0129, MB-123	Benthic Macroinvertebrates		
Lower Delaware	20	Doctors Creek at Route 539 in Upper Freehold	3	Phosphorus	Doctors Creek at Route 539 in Upper Freehold	3	Phosphorus		
Lower Delaware	20	Doctors Creek at Rt 130 in Hamilton Twp	AN0130	Aquatic Life	Doctors Creek at Rt 130 in Hamilton	AN0130	Benthic Macroinvertebrates		
Lower Delaware	20	Doctors Creek at Sharon Station Rd in Upper Freehold	MB-PARK1	Aquatic Life	Doctors Creek at Sharon Station Rd in Upper Freehold	MB-PARK1	Benthic Macroinvertebrates		
Lower Delaware	20	Doctors Creek at Spring Rd in Millstone Twp	AN0127A	Aquatic Life	Doctors Creek at Spring Rd in Millstone	AN0127A	Benthic Macroinvertebrates		
Northeast	05	Dorotockys Run on Old Tappan Rd, Old Tappan	5-DOR-1	Arsenic, Mercury	Dorotockys Run on Old Tappan Rd, Old Tappan	5-DOR-1	Arsenic, Mercury		
Atlantic Coast	13	Double Creek Estuary	1672, 1672A, 1673, 1673A	Pathogens	Double Creek Estuary	1672, 1672A, 1673, 1673A	Total Coliform		
Northwest	02	Double Kill at Waywayanda	01368820	Fecal Coliform	Double Kill at Waywayanda	01368820		Fecal Coliform 3	
Raritan	08	Drakes Brook at Emans Rd in Roxbury Twp	AN0311	Aquatic Life	Drakes Brook at Emans Rd in Roxbury	AN0311	Benthic Macroinvertebrates		
Northwest	01	Dry Brook at Rt 519 near Branchville	01443370	Fecal Coliform	Dry Brook at Rt 519 near Branchville	01443370, EWQ0020		Fecal Coliform 3	
Raritan	10	Duck Pond Run at Clarksville	01401200	Fecal Coliform, Copper, Lead, Zinc	Duck Pond Run at Clarksville	01401200		Copper, Lead, Zinc 1A, Fecal Coliform 3	
Northeast	04	Dundee Lake-04	Dundee Lake	Fish-Mercury	Dundee Lake-04	Dundee Lake	Fish-Mercury		
Northwest	01	Dunnfield Creek at Dunnfield	01442760	pH	Dunnfield Creek at Dunnfield	01442760	pH		
Northeast	05	Dwars Kill on Blanch Ave., Norwood	5-DWA-1	Mercury	Dwars Kill on Blanch Ave., Norwood	5-DWA-1	Mercury		
Atlantic Coast	16	East Creek Lake-16	East Creek Lake	Fish-Mercury	East Creek Lake-16	East Creek Lake	Fish-Mercury		
Atlantic Coast	16	East Creek Pond-16	East Creek Pond	Fish-Mercury	East Creek Pond-16	East Creek Pond		Fish-Mercury 1B	
Lower Delaware	17	Eastern Gate Lake-17	Eastern Gate Lake	Fecal Coliform	Eastern Gate Lake-17	Eastern Gate Lake	Fecal Coliform		
Raritan	07	Echo Lake-07	Echo Lake	Nutrients/Sedimentation (Eutrophic)	Echo Lake-07	Echo Lake		Phosphorus 3	
Raritan	09	Edmunds Creek Adjacent to Mill Brook at 02030105-059-0.00; Trib to Lower Raritan River		PCB	Edmunds Creek	Adjacent to Mill Brook at 02030105-059-0.00; Trib to Lower Raritan River	PCB		
Lower Delaware	18	Edwards Run at Jessups Mill Rd in Mantua Twp	AN0674	Aquatic Life	Edwards Run at Jessups Mill Rd in Mantua	AN0674	Benthic Macroinvertebrates		
Raritan	07	Elizabeth River at Lakeview Rd & Maple Terr in Union Twp	AN0202X	Aquatic Life	Elizabeth River at Lakeview Rd & Maple Terr in Union	AN0202X	Benthic Macroinvertebrates		
Raritan	07	Elizabeth River at Summer St in Hillside Twp	AN0204X	Aquatic Life	Elizabeth River at Summer St in Hillside	AN0204X	Benthic Macroinvertebrates		
Raritan	07	Elizabeth River at Ursino Lk at Elizabeth	01393450, 7-ELI-2	Phosphorus, Fecal Coliform, Dissolved Solids	Elizabeth River at Ursino Lk at Elizabeth	01393450, 7-ELI-2	Phosphorus, Dissolved Solids	Fecal Coliform 3	
Raritan	07	Elizabeth River W Br near Union	01393350, 7-WBE-1	Phosphorus, Fecal Coliform	Elizabeth River W Br near Union	01393350, 7-WBE-1	Phosphorus	Fecal Coliform 3	
Northeast	03	Erskine Lake-03	Erskine Little Beach, Main Beach, and Upper Beach	Fecal Coliform	Erskine Lake-03	Erskine Little Beach, Main Beach, and Upper Beach	Fecal Coliform		
Raritan	10	Etra Lake-10	Etra Lake	Nutrients/Sedimentation (Eutrophic)	Etra Lake-10	Etra Lake	Phosphorus		
Atlantic Coast	16	Fishing Creek at Rt 47 in Middle Twp	AN0771	Aquatic Life	Fishing Creek at Rt 47 in Middle	AN0771	Benthic Macroinvertebrates		
Northwest	01	Flat Brook near Flatbrookville	01440000	Temperature	Flat Brook near Flatbrookville	01440000, DRBC/NPS32		Temperature 1B	

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Atlantic Coast	12	Flat Creek at Middle Rd in Hazlet Twp	AN0459	Aquatic Life	Flat Creek at Middle Rd in Hazlet	AN0459	Benthic Macroinvertebrates		
Northeast	03	Forest Hill Lake-03	Forest Hill Park Beach, Forest Hill Park Inlet	Fecal Coliform	Forest Hill Lake-03	Forest Hill Park Beach, Forest Hill Park Inlet	Fecal Coliform		
Lower Delaware	17	Fortescue Creek Estuary	3840L, 3862E, 3862G, 3862H, 3841K, 3841L, 3841M	Pathogens	Fortescue Creek Estuary	3840L, 3862E, 3862G, 3862H, 3841K, 3841L, 3841M	Total Coliform		
Northwest	01	Fox Hollow Lake-01	Fox Hollow Lake	Fecal Coliform	Fox Hollow Lake-01	Fox Hollow Lake	Fecal Coliform		
Northeast	06	Foxs Pond-06	Park Lake Beach, Inlet, and Swim Lanes	Fecal Coliform	Foxs Pond-06	Park Lake Beach, Inlet, and Swim Lanes	Fecal Coliform		
Atlantic Coast	12	Franklin Lake-12	Franklin Lake	Nutrients/Sedimentation (Eutrophic)	Franklin Lake-12	Franklin Lake		Phosphorus 3	
Lower Delaware	17	Franklinville Lake-17	Franklinville Lake	Fecal Coliform	Franklinville Lake-17	Franklinville Lake	Fecal Coliform		
Northwest	01	Furnace Brook at Pequest Rd in White Twp	AN0042	Aquatic Life	Furnace Brook at Pequest Rd in White	AN0042	Benthic Macroinvertebrates		
Northwest	01	Furnace Lake-01	Furnace Lake Beach	Fecal Coliform	Furnace Lake-01	Furnace Lake Beach	Fecal Coliform		
Lower Delaware	17	Gandy's Beach	Gandy's Beach	Fecal Coliform	Gandy's Beach	Gandy's Beach	Fecal Coliform		
Lower Delaware	17	Garrison Lake-17	Lake Garrison North and South	Fecal Coliform	Garrison Lake-17	Lake Garrison North and South		Fecal Coliform 1B	
Northwest	01	Ghost Lake-01	Ghost Lake	Nutrients/Sedimentation (Eutrophic)	Ghost Lake-01	Ghost Lake		Phosphorus 3	
Lower Delaware	17	Giampietro Lake-17	Giampietro Lake	Nutrients/Sedimentation (Eutrophic)	Giampietro Lake-17	Giampietro Lake		Phosphorus 3	
Northwest	02	Glen Lake	Glen Lake	Fecal Coliform	Glen Lake	Glen Lake		Fecal Coliform 1B	
Northeast	04	Goffle Brook at Hawthorne	01389850	Fecal Coliform	Goffle Brook at Hawthorne	01389850		Fecal Coliform 3	
Northeast	04	Goffle Brook at Wagaraw Rd in Hawthorne	AN0277	Aquatic Life	Goffle Brook at Wagaraw Rd in Hawthorne	AN0277	Benthic Macroinvertebrates		
Atlantic Coast	12	Gravelly Brook at Church St in Aberdeen Twp	AN0457	Aquatic Life	Gravelly Brook at Church St in Aberdeen	AN0457	Benthic Macroinvertebrates		
Atlantic Coast	12	Gravelly Brook at Lloyd Rd in Marlboro	20	Phosphorus	Gravelly Brook at Lloyd Rd in Marlboro	20	Phosphorus		
Atlantic Coast	14	Great Bay	Great Bay-1,2,3: Great Bay	Pathogens	Great Bay	Great Bay-1,2,3: Great Bay	Total Coliform		
Atlantic Coast	14	Great Bay	Great Bay-1 thru 6	Dissolved Oxygen	Great Bay	Great Bay-1 thru 6		Dissolved Oxygen 1B	
Northeast	06	Great Brook at Woodland Rd (Gr Swamp WMA) in Harding Twp	AN0219	Aquatic Life	Great Brook at Woodland Rd (Gr Swamp WMA) in Harding	AN0219	Benthic Macroinvertebrates		
Atlantic Coast	15	Great Egg Harbor	Channel, Great Egg Harbor-4: Peck Bay, Great Egg Harbor-5: Bass Harbor, Great Egg Harbor-6: Unnamed Trib, Great Egg Harbor-7: Beach Thorofare, Great Egg Harbor-8: Ship Channel South, Great Egg Harbor-9: Ship Channel, Great Egg Harbor-10: Ocean City Bay, Great Egg Harbor-11: Lower Great Egg Harbor, Great Egg Harbor-13: Patcong Creek	Pathogens	Great Egg Harbor	Great Egg Harbor-1, 4 thru 11, and 13 thru 14	Total Coliform		
Atlantic Coast	15	Great Egg Harbor River at Camden Co. Park in Berlin	AN0620A	Aquatic Life	Great Egg Harbor River at Camden Co. Park in Berlin	AN0620A	Benthic Macroinvertebrates		
Atlantic Coast	15	Great Egg Harbor River at Folsom	01411000, 15-GEH-2	pH, Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Zinc	Great Egg Harbor River at Folsom	01411000, 15-GEH-2	pH, Copper, Lead	Arsenic, Cadmium, Chromium, Mercury, Zinc 1B	
Atlantic Coast	15	Great Egg Harbor River at Weymouth	01411110, 15-GEH-3	Fecal Coliform, pH, Copper, Lead	Great Egg Harbor River at Weymouth	01411110, 15-GEH-3	pH, Copper	Lead 1B, Fecal Coliform 3	

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Atlantic Coast	15	Great Egg Harbor River Estuary		Arsenic, Cadmium, Chromium, Lead, Mercury, Nickel, Zinc	Great Egg Harbor River Estuary	Great Egg Harbor River Estuary	Arsenic, Cadmium, Chromium, Lead, Mercury, Nickel, Zinc		
Atlantic Coast	15	Great Egg Harbor River Middle Estuary	2807A, 2807B, 2810, 2810A, 2812, 2805, 2806, 2808, 2808A	Pathogens	Great Egg Harbor River Middle Estuary	2807A, 2807B, 2810, 2810A, 2812, 2805, 2806, 2808, 2808A	Total Coliform		
Atlantic Coast	15	Great Egg Harbor River near Sicklerville	01410784, 15-GEH-1	pH, Lead, Mercury	Great Egg Harbor River near Sicklerville	01410784, 15-GEH-1	pH, Mercury	Lead, 1B	
Atlantic Coast	15	Great Egg Harbor River Trib at 2nd Ave in Hammonton	AN0635H	Aquatic Life	Great Egg Harbor River Trib at 2nd Ave in Hammonton	AN0635H	Benthic Macroinvertebrates		
Atlantic Coast	15	Great Egg Harbor River Upper Estuary	2812B, 2814,2814A, 2816,2816A, 2816B, 2818, 2818A, 2819, 2821,2821A, 2821B, 2821C, 2821D, 2822A, 2823A,2824A, 2824B, 2825, 2826,2826A, 2827,2827A	Pathogens	Great Egg Harbor River Upper Estuary	2812B, 2814,2814A, 2816,2816A, 2816B, 2818, 2818A, 2819, 2821,2821A, 2821B, 2821C, 2821D, 2822A, 2823A,2824A, 2824B, 2825, 2826,2826A, 2827,2827A	Total Coliform		
Atlantic Coast	16	Great Sound	Great Sound-1: Gravens Thorofare, Great Sound-5: Long Reach, Great Sound-6: Holmes Cove	Pathogens	Great Sound	Gravens Thorofare-1; Long Reach-5; Holmes Cove-6	Total Coliform		
Atlantic Coast	14	Great Swamp Br Below Rt 206 near Hammonton	0140941070	pH, Nitrate	Great Swamp Branch Below Rt 206 near Hammonton	0140941070	pH, Nitrate		
Raritan	09	Green Brook at Apple Tree Rd. in Watchung Twp.	AN0421B	Aquatic Life	Green Brook at Apple Tree Rd in Watchung.	AN0421B	Benthic Macroinvertebrates		
Raritan	09	Green Brook at Clinton Ave in North Plainfield	AN0423	Aquatic Life	Green Brook at Clinton Ave in North Plainfield	AN0423	Benthic Macroinvertebrates		
Raritan	09	Green Brook at Main St in Bound Brook	AN0426	Aquatic Life	Green Brook at Main St in Bound Brook	AN0426	Benthic Macroinvertebrates		
Raritan	09	Green Brook at New Providence Rd. in Seeleys Mill	AN0421A	Aquatic Life	Green Brook at New Providence Rd in Seeleys Mill	AN0421A	Benthic Macroinvertebrates		
Raritan	09	Green Brook at North Plainfield	01403470	Fecal Coliform	Green Brook at North Plainfield	01403470		Fecal Coliform 3	
Raritan	09	Green Brook at off Mill Rd. in Sebrings Mill	AN0426A	Aquatic Life	Green Brook at off Mill Rd in Sebrings Mill	AN0426A	Benthic Macroinvertebrates		
Raritan	09	Green Brook at Raymond Ave in Plainfield	AN0421	Aquatic Life	Green Brook at Raymond Ave in Plainfield	AN0421	Benthic Macroinvertebrates		
Atlantic Coast	16	Green Creek at Rt 47 in Middle Twp	AN0770	Aquatic Life	Green Creek at Rt 47 in Middle	AN0770	Benthic Macroinvertebrates		
Northeast	06	Green Pd Brook at Mt Pleasant Tnpk in Wharton	AN0242	Aquatic Life	Green Pond Brook at Mt Pleasant Tnpk in Wharton	AN0242	Benthic Macroinvertebrates		
Northwest	01	Green Valley Beach Campground	Green Valley Beach Campground	Fecal Coliform	Green Valley Beach Campground	Green Valley Beach Campground	Fecal Coliform		
Northeast	03	Greenwood Lake-03	Greenwood Lake	Nutrients/Sedimentation (Eutrophic), Dissolved Oxygen, Phosphorus	Greenwood Lake-03	Greenwood Lake	Phosphorus, Sedimentation, Dissolved Oxygen	Fish-Mercury 1B	
Lower Delaware	18	Grenloch Lake-18	Grenloch Lake	Nutrients/Sedimentation (Eutrophic)	Grenloch Lake-18	Grenloch Lake	Phosphorus		
Atlantic Coast	13	Ground Hog Brook at Locust Ave in Howell	MB-139	Aquatic Life	Ground Hog Brook at Locust Ave in Howell	MB-139	Benthic Macroinvertebrates		
Atlantic Coast	14	Gun Br at Rt 206 in Hammonton	AN0568G	Aquatic Life	Gun Branch at Rt 206 in Hammonton	AN0568G		Benthic Macroinvertebrates 1A	
Northeast	05	Hackensack River - Tidal		Mercury, Fish-PCB, Fish-Dioxin, Fish-Chlordane	Hackensack River - Tidal	Hackensack River - Tidal	Mercury, Fish-PCB, Fish-Dioxin	Fish-Chlordane 1B	
Northeast	05	Hackensack River at New Milford	01378500	Phosphorus, Fecal Coliform	Hackensack River at New Milford	01378500	Phosphorus, Fecal Coliform		
Northeast	05	Hackensack River at Old Tappan	01376970, 5-HAC-2	Arsenic	Hackensack River at Old Tappan	01376970, 5-HAC-2	Arsenic		
Northeast	05	Hackensack River at Old Tappan Rd in Old Tappan	AN0205	Aquatic Life	Hackensack River at Old Tappan Rd in Old Tappan	AN0205	Benthic Macroinvertebrates		
Northeast	05	Hackensack River at Rivervale	01377000, 5-HAC-3	Fecal Coliform, Arsenic, Chromium, Copper, Lead, Mercury	Hackensack River at Rivervale	01377000, 5-HAC-3	Arsenic, Chromium, Copper, Lead, Mercury	Fecal Coliform 3	

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Atlantic Coast	14	Hammonton Creek at Rt. 542 in Hammonton	AN0577A	Aquatic Life	Hammonton Creek at Rt. 542 in Hammonton	AN0577A	Benthic Macroinvertebrates		
Atlantic Coast	14	Hammonton Creek at Westcoatville	01409416, 14-HAM-2	Phosphorus, Fecal Coliform, pH, Lead, Mercury	Hammonton Creek at Westcoatville	01409416, 14-HAM-2, 14-HAM-1	Phosphorus, pH, Nitrate, Arsenic, Mercury	Lead 1B, Fecal Coliform 3	Nitrate, Arsenic(mistake from'02)
Atlantic Coast	14	Hammonton Lake-14	Hammonton Lake, Hammonton Bathing Beach (Center), (Left), and (Right)	Nutrients/Sedimentation (Eutrophic), Fecal Coliform	Hammonton Lake-14	Hammonton Lake, Hammonton Bathing Beach (Center), (Left), and (Right), LHAMLAKE	Fecal Coliform, Pineland Biological Community	Phosphorus 3	Pineland Biological Community
Lower Delaware	18	Harrisonville Lake-18	Harrisonville Lake	Nutrients/Sedimentation (Eutrophic)	Harrisonville Lake-18	Harrisonville Lake		Phosphorus 3	
Atlantic Coast	14	Harrisville Lake-14	Harrisville Lake	Fish-Mercury	Harrisville Lake-14	Harrisville Lake	Fish-Mercury		
Atlantic Coast	14	Hays Mill Creek at Atco	01409401	pH	Hays Mill Creek at Atco	01409401	pH		
Atlantic Coast	14	Hays Mill Creek near Chesilhurst	01409402	pH	Hays Mill Creek near Chesilhurst	01409402	pH		
Atlantic Coast	13	Haystack Brook at Maxim-Southard Rd (upstream) in Howell	MB-153	Aquatic Life	Haystack Brook at Maxim-Southard Rd (upstream) in Howell	MB-153, MB-154, AN0503	Benthic Macroinvertebrates		
Atlantic Coast	12	Haystack Brook at Maxim-Southard Rd in Howell	18	Fecal Coliform	Haystack Brook at Maxim-Southard Rd in Howell	18		Fecal Coliform 3	
Northwest	02	Heaters Pond-02	Heaters Pond	Fecal Coliform	Heaters Pond-02	Heaters Pond		Fecal Coliform 1B	
Raritan	10	Heathcote Brook at Kingston	01401400	Fecal Coliform	Heathcote Brook at Kingston	01401400, 10-MIL-2		Fecal Coliform 3	
Atlantic Coast	12	Hockhockson Brook at Hockhockson Rd in Colts Neck Twp	AN0475	Aquatic Life	Hockhockson Brook at Hockhockson Rd in Colts Neck	AN0475	Benthic Macroinvertebrates		
Northeast	04	Hohokus Brook at Mouth at Paramus	01391100	Fecal Coliform	Hohokus Brook at Mouth at Paramus	01391100		Fecal Coliform 3	
Northeast	04	Hohokus Brook at Park Ave in Allendale	AN0285	Aquatic Life	Hohokus Brook at Park Ave in Allendale	AN0285	Benthic Macroinvertebrates		
Northeast	04	Hohokus Brook at Spring St in Ridgewood Village	AN0288	Aquatic Life, Unknown Toxicity	Hohokus Brook at Spring St in Ridgewood Village	AN0288	Benthic Macroinvertebrates, Unknown Toxicity		
Atlantic Coast	13	Holiday Lake-13	Ocean Acres Beach	Fecal Coliform	Holiday Lake-13	Ocean Acres Beach	Fecal Coliform		
Raritan	08	Holland Brook at S Br Rd in Branchburg Twp	AN0343	Aquatic Life	Holland Brook at S Br Rd in Branchburg	AN0343	Benthic Macroinvertebrates		
Atlantic Coast	12	Hollow Brook at Route 35 in Neptune Twnshp	10	Fecal Coliform	Hollow Brook at Route 35 in Neptune Twnshp	10		Fecal Coliform 3	
Lower Delaware	17	Holly Green Campground Pond-17	Holly Green Campground	Fecal Coliform	Holly Green Campground Pond-17	Holly Green Campground	Fecal Coliform		
Atlantic Coast	12	Hooks Creek	Hooks Creek	Nutrients/Sedimentation (Eutrophic)	Hooks Creek	Hooks Creek		Phosphorus 3	
Atlantic Coast	12	Hooks Creek Lake-12	Cheesequake SP Left and Right	Fecal Coliform	Hooks Creek Lake-12	Cheesequake SP Left and Right	Fecal Coliform		
Atlantic Coast	12	Hop Brook at Roberts Rd in Holmdel Twp	AN0465	Aquatic Life	Hop Brook at Roberts Rd in Holmdel	AN0465	Benthic Macroinvertebrates		
Atlantic Coast	12	Hop Brook at Willow Brook Rd in Holmdel Twp	AN0466	Aquatic Life	Hop Brook at Willow Brook Rd in Holmdel	AN0466	Benthic Macroinvertebrates		
Atlantic Coast	15	Hospitality Branch at Blue Bell Road near Cecil	01411035	Fecal Coliform, pH	Hospitality Branch at Blue Bell Rd near Cecil	01411035	pH	Fecal Coliform 3	
Atlantic Coast	15	Hospitality Branch near Cecil	01411050	pH	Hospitality Branch near Cecil	01411050	pH		
Lower Delaware	17	Hudson Branch at Vineland	17-HUD-1	Arsenic, Chromium	Hudson Branch at Vineland	17-HUD-1	Arsenic, Chromium		
Northeast	05	Hudson River - NYC & Battery	HR1, HR2	Mercury, Fish-PCB, Fish-Dioxin	Hudson River - NYC & Battery	HR1, HR2	Fish-PCB, Fish-Dioxin	Mercury 3	
Northeast	05	Hudson River at G.W. Bridge	HR4	Mercury, Fish-PCB, Fish-Dioxin	Hudson River at G.W. Bridge	HR4	Fish-PCB, Fish-Dioxin	Mercury 3	
Northeast	05	Hudson River near Yonkers	HR7	Mercury, Fish-PCB, Fish-Dioxin	Hudson River near Yonkers	HR7	Fish-PCB, Fish-Dioxin	Mercury 3	
Northeast	05	Hudson River- NYC Area		Mercury, Fish-PCB, Fish-Dioxin	Hudson River- NYC Area	Hudson River- NYC Area	Fish-PCB, Fish-Dioxin	Mercury 3	
Atlantic Coast	12	Husky Brook at South St in Eatontown	33	Fecal Coliform	Husky Brook at South St in Eatontown	33		Fecal Coliform 3	

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Lower Delaware	20	Imlaystown Lake-20	Imlaystown Lake	Nutrients/Sedimentation (Eutrophic)	Imlaystown Lake-20	Imlaystown Lake		Phosphorus 3	
Lower Delaware	17	Indian Br at Rt 47 in Franklin Twp	AN0724	Aquatic Life	Indian Branch at Rt 47 in Franklin	AN0724	Benthic Macroinvertebrates		
Lower Delaware	17	Indian Br at Sta Rd. in Janvier (Franklin Twp.)	AN0724A	Aquatic Life	Indian Branch at Sta Rd in Janvier (Franklin.)	AN0724A	Benthic Macroinvertebrates		
Lower Delaware	17	Indian Branch near Malaga	01411466	Fecal Coliform	Indian Branch near Malaga	01411466	pH	Fecal Coliform 3	pH
Northeast	06	Indian Lake-06	Indian Clubhouse, Indian Franklin, Indian Main	Fecal Coliform	Indian Lake-06	Indian Clubhouse, Indian Franklin, Indian Main	Fecal Coliform		
Atlantic Coast	14	Indian Mills Brook at Indian Mills	01409449	pH	Indian Mills Brook at Indian Mills	01409449	pH		
Lower Delaware	19	Indian Run at Birmingham Rd in Pemberton Twp	AN0151A	Aquatic Life	Indian Run at Birmingham Rd in Pemberton	AN0151A	Benthic Macroinvertebrates		
Lower Delaware	17	Indian Run at Husted Sta Rd in Pittsgrove Twp	AN0747	Aquatic Life	Indian Run at Husted Sta Rd in Pittsgrove	AN0747	Benthic Macroinvertebrates		
Northeast	06	Intervale Lake-06	Lake Intervale	Fecal Coliform	Intervale Lake-06	Lake Intervale	Fecal Coliform		
Lower Delaware	17	Iona Lake-17	Iona Lake	Fecal Coliform	Iona Lake-17	Iona Lake	Fecal Coliform		
Raritan	09	Ireland Brook at Patricks Corners	01404470	pH	Ireland Brook at Patricks Corners	01404470	pH		
Raritan	09	Ireland Brook at Riva Rd in South Brunswick Twp	AN0433	Aquatic Life	Ireland Brook at Riva Rd in South Brunswick	AN0433	Benthic Macroinvertebrates		
Northwest	01	Jacksonburg Creek near Blairstown	01443600	Fecal Coliform	Jacksonburg Creek near Blairstown	01443600		Fecal Coliform 3	
Northwest	01	Jacobs Creek at Bear Tavern Rd in Hopewell Twp	AN0106A	Aquatic Life	Jacobs Creek at Bear Tavern Rd in Hopewell	AN0106A	Benthic Macroinvertebrates		
Northwest	11	Jacobs Crek at Bear Tavern	01462739	Fecal Coliform	Jacobs Crek at Bear Tavern	01462739		Fecal Coliform 3	
Atlantic Coast	16	James Sound	James Sound-1 thru 11	Pathogens	James Sound	James Sound-1 thru 11	Total Coliform		
Atlantic Coast	16	Jenkins Sound	Jenkins Sound-1 thru 10	Pathogens	Jenkins Sound	Jenkins Sound-1 thru 10	Total Coliform		
Atlantic Coast	13	Jesse Creek/Thompson Creek Estuary	1807D	Pathogens	Jesse Creek/Thompson Creek Estuary	1807D	Total Coliform		
Atlantic Coast	16	Jones/Stites/Carino/Taylor Creek Estuary	3603B	Pathogens	Jones/Stites/Carino/Taylor Creek Estuary	3603B	Total Coliform		
Lower Delaware	20	Jumping Brook at Bunting Bridge Rd in New Hanover Twp	AN0119	Aquatic Life	Jumping Brook at Bunting Bridge Rd in New Hanover	AN0119	Benthic Macroinvertebrates		
Atlantic Coast	12	Jumping Brook at Corlies Ave in Neptune Twp	AN0480	Aquatic Life	Jumping Brook at Corlies Ave in Neptune	AN0480	Benthic Macroinvertebrates		
Atlantic Coast	12	Jumping Brook at Green Grove	01407720	pH	Jumping Brook at Green Grove	01407720	pH		
Atlantic Coast	12	Jumping Brook near Neptune	01407760	Fecal Coliform, pH	Jumping Brook near Neptune	01407760	Fecal Coliform, pH		
Atlantic Coast	13	Kettle Creek at Moore Rd in Brick Twp	AN0516	Aquatic Life	Kettle Creek at Moore Rd in Brick	AN0516	Benthic Macroinvertebrates		
Raritan	07	Kill Van Kull	UH-11	Mercury, Fish-PCB, Fish-Dioxin	Kill Van Kull	UH-11	Mercury, Fish-PCB, Fish-Dioxin		
Raritan	07	Kings Creek		Toxic Discharge	Kings Creek	Kings Creek	Toxic Discharge		
Lower Delaware	18	Kirkwood Lake-18	Kirkwood Lake	Nutrients/Sedimentation (Eutrophic)	Kirkwood Lake-18	Kirkwood Lake		Phosphorus 3	
Northeast	03	Kitchell Lake-03	Kitchell Lake Assoc.	Fecal Coliform	Kitchell Lake-03	Kitchell Lake Assoc.	Fecal Coliform		
Northwest	01	Lackawanna Lake-01	Lake Lackawanna: Speers Beach	Fecal Coliform	Lackawanna Lake-01	Lake Lackawanna: Speers Beach	Fecal Coliform		
Atlantic Coast	12	Lafetras Brook at Hope Rd in Tinton Falls	32	Phosphorus, Fecal Coliform	Lafetras Brook at Hope Rd in Tinton Falls	32	Phosphorus	Fecal Coliform 3	
Lower Delaware	20	Lahaway Creek at Holmes Mill Rd in Upper Freehold	MB-117	Aquatic Life	Lahaway Creek at New Egypt - Allentown Rd in Upper Freehold	AN0124, MB-117	Benthic Macroinvertebrates		
Lower Delaware	20	Lahaway Creek at New Egypt - Allentown Rd in Upper Freehold Twp	AN0124	Aquatic Life	Lahaway Creek at New Egypt - Allentown Rd in Upper Freehold	AN0124, MB-117	Benthic Macroinvertebrates		

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Lower Delaware	20	Lahaway Creek at Rt 537 in Upper Freehold Twp	AN0122	Aquatic Life	Lahaway Creek at Rt 537 in Upper Freehold	AN0122	Benthic Macroinvertebrates		
Atlantic Coast	13	Lake Barnegat-13	Lake Barnegat- Middle Beach	Fecal Coliform	Lake Barnegat-13	Lake Barnegat- Middle Beach	Fecal Coliform		
Atlantic Coast	13	Lake Carasaljo-13	Lake Carasaljo	Fish-Mercury	Lake Carasaljo-13	Lake Carasaljo	Fish-Mercury		
Northwest	01	Lake Hopatcong-01	Lake Hopatcong, Byram Bay Community Club, Davis Cove, Beck Lane Properties, Crescent Cove, Dox Incorporated, East Shores POA, Elba Point Homeowners, Homestead Beach, Hopatcong Shores Property, Hoptacong Gardens Comm. Club, Ingram Cove Community, Jewish Center, Lake Forest Yacht Club Beach, Lake Forest Yacht Club Dock, Logan Hills Beach Club, Randal Beach Club, Shady Lawn Beach Club, Sperry Springs, Wildwood Shores POA (Bass Rock Road), Wildwood Shores POA (Lines Ave), Wildwood Shores POA (Pebble Beach), Colony Club, Shawnee Dock Association, Shore Hills, Mt Arlington Beach, Hoptacong SP	Fecal Coliform	Lake Hopatcong-01	Lake Hopatcong, Byram Bay Comm Club, Davis Cove, Beck Lane Prop, Crescent Cove, Dox Incorp, E Shores POA, Elba Pt Homeowners, Homestead Beach, Hopatcong Shores Property, Hoptacong Gardens Comm. Club, Ingram Cove Comm, Jewish Center, Colony Club	Fecal Coliform, Fish Community, Fish-Mercury	Phosphorus 3	
Northwest	01	Lake Hopatcong-01	Lake Hopatcong	Nutrients/Sedimentation (Eutrophic), Aquatic Life, Fish-Mercury	Lake Hopatcong-01	Lake Hopatcong, Byram Bay Comm Club, Davis Cove, Beck Lane Prop, Crescent Cove, Dox Incorp, E Shores POA, Elba Pt Homeowners, Homestead Beach, Hopatcong Shores Property, Hoptacong Gardens Comm. Club, Ingram Cove Comm, Jewish Center, Colony Club	Fecal Coliform, Fish Community, Fish-Mercury	Phosphorus 3	
Northeast	03	Lake Ioscoe-03	Lake Iosco	Fecal Coliform	Lake Ioscoe-03	Lake Iosco	Fecal Coliform		
Lower Delaware	19	Lake James-19	Kings Grant	Fecal Coliform	Lake James-19	Kings Grant	Fecal Coliform		
Atlantic Coast	16	Lake Laurie-16	Lake Laurie Campground	Fecal Coliform	Lake Laurie-16	Lake Laurie Campground	Fecal Coliform		
Atlantic Coast	15	Lake Lenape-15	Lake Lenape "The Cove", Lenape Park, Lake Lenape	Fecal Coliform, Fish-Mercury	Lenape Lake -15	Lenape Lake	Fish-Mercury	Fecal Coliform 1B	

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Northwest	02	Lake Mohawk-02	Lake Mohawk: Sleepy Lagoon, Alpine Beach, Beach 1, Beach 2, Beach 3, Beach 4, Beach 5, Beach 6, Happly Valley Beach, Manitou Beach, Tamarack Beach	Fecal Coliform	Lake Mohawk-02	Lake Mohawk: Sleepy Lagoon, Alpine Beach, Beach 1, Beach 2, Beach 3, Beach 4, Beach 5, Beach 6, Happly Valley Beach, Manitou Beach, Tamarack Beach	Fecal Coliform		
Atlantic Coast	14	Lake Mo-Li-Th-Ma-14	Camp Haluwasa	Fecal Coliform	Lake Mo-Li-Th-Ma-14	Camp Haluwasa, NPUHALUW	Pineland Biological Community	Fecal Coliform 1B	Pineland Biological Community
Northwest	01	Lake Musconetcong -01	Lake Musconetcong	Nutrients/Sedimentation (Eutrophic)	Lake Musconetcong -01	Lake Musconetcong		Phosphorus 3	
Atlantic Coast	16	Lake Nummy-16	Belleplain SF, Lake Nummy, Center, Left, and Right	Fecal Coliform, Fish-Mercury	Lake Nummy-16	Lake Nummy, Belleplain SF, Lake Nummy-Center, Left, and Right	Fish-Mercury	Fecal Coliform 1B	Fish-Mercury
Lower Delaware	18	Lake Silvestro	Lake Silvestro	Fecal Coliform	Lake Silvestro	Lake Silvestro	Fecal Coliform		
Northeast	06	Lake Swannanoa-06	Lake Swannanoa Country Club	Fecal Coliform	Lake Swannanoa-06	Lake Swannanoa Country Club	Fecal Coliform		
Atlantic Coast	12	Lake Takanassee at Ocean Ave in Elberon	50	Fecal Coliform	Lake Takanassee-12	50	Phosphorus, Fecal Coliform		Phosphorus
Raritan	09	Lake Topanemus at Pond Rd in Freehold	61	Phosphorus, Fecal Coliform	Lake Topanemus Lake at Pond Rd in Freehold	61	Phosphorus	Fecal Coliform 3	
Atlantic Coast	15	Lakes Bay	Lakes Bay-1 thru 12	Dissolved Oxygen	Lakes Bay	Beach Thorofare-5	Dissolved Oxygen		
Atlantic Coast	15	Lakes Bay	Lakes Bay-1,9: Beach Thorofare, Lakes Bay-2,3,7: Risley Channel, Lakes Bay-4: Jonathan Thorofare, Lakes Bay-6, 10: Lakes Bay, Lakes Bay-8: Inside Thorofare, Lakes Bay-9: Hospitality Creek, Lakes Bay-12: Bayshore Lagoon	Pathogens	Lakes Bay	Lakes Bay-1 thu 10 and 12 thru 14	Total Coliform		
Lower Delaware	19	Lakeside	Lakeside	Fecal Coliform	Lakeside	Lakeside		Fecal Coliform 1B	
Raritan	08	Lamington River at Burnt Mills	01399780	Phosphorus, Fecal Coliform	Lamington River at Burnt Mills	01399780	Phosphorus	Fecal Coliform 3	
Raritan	08	Lamington River at Ironia Rd in Chester Twp	AN0356	Aquatic Life	Lamington River at Ironia Rd in Chester	AN0356	Benthic Macroinvertebrates		
Raritan	08	Lamington River near Ironia	01399200	Phosphorus, Fecal Coliform, Dissolved Oxygen	Lamington River near Ironia	01399200	Phosphorus, Dissolved Oxygen	Fecal Coliform 3	
Raritan	08	Lamington River near Pottersville	01399500	Phosphorus, Fecal Coliform	Lamington River near Pottersville	01399500	Phosphorus	Fecal Coliform 3	
Atlantic Coast	12	Lanes Creek at Edwards Ave in Long Branch	46	Fecal Coliform	Lanes Creek at Edwards Ave in Long Branch	46	Fecal Coliform		
Raritan	09	Lawrence Brook at Davidsons Mill Rd in South Brunswick Twp	AN0431	Aquatic Life	Lawrence Brook at Davidsons Mill Rd in South Brunswick	AN0431	Benthic Macroinvertebrates		
Raritan	09	Lawrence Brook at Ridge Rd in South Brunswick Twp	AN0430	Aquatic Life	Lawrence Brook at Ridge Rd in South Brunswick	AN0430	Benthic Macroinvertebrates		
Raritan	09	Lawrence Brook at Riva Rd in Milltown	AN0434	Aquatic Life	Lawrence Brook at Riva Rd in Milltown	AN0434	Benthic Macroinvertebrates		
Raritan	09	Lawrence Brook on Davidson's Mill Rd, Black Horse	9-LAW-1	Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Zinc	Lawrence Brook on Davidson's Mill Rd, Black Horse	9-LAW-1	Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Zinc		
Atlantic Coast	12	Lefferts Lake-12	Lefferts Lake	Aquatic Life	Lefferts Lake-12	66, Lefferts Lake	Phosphorus, Fish Community		Phosphorus
Atlantic Coast	15	Lily Lake-15	Lily Lake	Nutrients/Sedimentation (Eutrophic)	Lily Lake-15	Lily Lake		Phosphorus 3	
Northeast	05	Lincoln Park Lake-05	Lincoln Park Lake	Nutrients/Sedimentation (Eutrophic)	Lincoln Park Lake-05	Lincoln Park Lake		Phosphorus 3	
Northeast	03	Lindy Lake-03	Lindy Lake Association	Fecal Coliform	Lindy Lake-03	Lindy Lake Association		Fecal Coliform 1B	
Northeast	03	Lionhead Lake-03	Lions Head Lake	Fecal Coliform	Lionhead Lake-03	Lions Head Lake	Fecal Coliform		

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Atlantic Coast	14	Little Bay	Little Bay-1: Reeds Bay/Little Bay, Little Bay-2: Reeds Bay/Little Bay	Dissolved Oxygen	Little Bay	Little Bay-1, Little Bay-2		Dissolved Oxygen 1B	
Atlantic Coast	14	Little Bay	Little Bay-2: Reeds Bay/Little Bay	Pathogens	Little Bay	Little Bay-2	Total Coliform		
Lower Delaware	19	Little Creek at Chairville	01465893	pH	Little Creek at Chairville	01465893	pH, Fecal Coliform		Fecal Coliform
Lower Delaware	19	Little Creek at Eayrestown Rd in Lumberton Twp	AN0160	Aquatic Life	Little Creek at Eayrestown Rd in Lumberton	AN0160	Benthic Macroinvertebrates		
Lower Delaware	17	Little Ease Run at Grant Ave in Franklin Twp	AN0727	Aquatic Life	Little Ease Run at Grant Ave in Franklin	AN0727	Benthic Macroinvertebrates		
Lower Delaware	17	Little Ease Run at Leonard Cake Rd in Franklin Twp	AN0728	Aquatic Life	Little Ease Run at Leonard Cake Rd in Franklin	AN0728	Benthic Macroinvertebrates		
Lower Delaware	17	Little Ease Run at Porchtown	01411458	Fecal Coliform, pH	Little Ease Run at Porchtown	01411458	pH	Fecal Coliform 3	
Atlantic Coast	13	Little Egg Harbor	Little Egg Harbor-1 thru 4	Dissolved Oxygen	Little Egg Harbor	Little Egg Harbor-1 thru 4		Dissolved Oxygen 1B	
Atlantic Coast	13	Little Egg Harbor	Little Egg Harbor-2: Tuckerton Creek, Little Egg Harbor-3: Tuckerton Cove, Little Egg Harbor-4: Central Long Beach Island	Pathogens	Little Egg Harbor	Little Egg Harbor-2 thru 4	Total Coliform		
Atlantic Coast	12	Long Brook at Howell Rd in Howell	25	Phosphorus, Fecal Coliform	Long Brook at Wyckoff Mills	01407868, 25	Phosphorus, pH	Fecal Coliform 3	pH
Atlantic Coast	12	Long Brook at Wyckoff Mills	01407868	Fecal Coliform, pH	Long Brook at Wyckoff Mills	01407868, 25	Phosphorus, pH	Fecal Coliform 3	pH
Northwest	01	Lubbers Run at Waterloo Rd (N of Rt 604) in Byram Twp	AN0069A	Aquatic Life	Lubbers Run at Waterloo Rd (N of Rt 604) in Byram	AN0069A	Benthic Macroinvertebrates		
Atlantic Coast	16	Ludlams Pond-16	Holly Lake Campground	Fecal Coliform	Ludlams Pond-16	Holly Lake Campground	Fecal Coliform		
Atlantic Coast	12	Lupattatong Creek at 1St St - Peterson's Marina in Keyport	51	Fecal Coliform	Lapattatong Creek at 1st St - Peterson's Marina in Keyport	51	Fecal Coliform		
Northeast	03	Macopin River	PQ6	Temperature	Macopin River at Macopin Reservoir	01382450, PQ6	Temperature	Fecal Coliform 3	
Northeast	03	Macopin River at Macopin Reservoir	01382450	Fecal Coliform	Macopin River at Macopin Reservoir	01382450, PQ6	Temperature	Fecal Coliform 3	
Lower Delaware	17	Major Run at Pointers - Sharptown Rd in Pilesgrove Twp	AN0694	Aquatic Life	Major Run at Pointers - Sharptown Rd in Pilesgrove	AN0694	Benthic Macroinvertebrates		
Lower Delaware	17	Malaga Lake-17	Malaga Lake	Fecal Coliform	Malaga Lake-17	Malaga Lake	Fecal Coliform, Fish-Mercury		Fish-Mercury
Atlantic Coast	13	Manahawkin Bay	Manahawkin Bay-1 thru 10	Dissolved Oxygen	Manahawkin Bay	Manahawkin Bay-1 thru 10		Dissolved Oxygen 1B	
Atlantic Coast	13	Manahawkin Bay	Long Beach Island, Manahawkin Bay-3: Off Beach Haven West, Manahawkin Bay-4: North Thorofare Island, Manahawkin Bay-5: Millcreek Thorofare, Manahawkin Bay-6: South Thorofare Island, Manahawkin Bay-7: Popular Point,Manahawkin Bay-8: Channel Cove, Manahawkin Bay-9: Mud Cove, Manahawkin Bay-10: Westecunk Creek	Pathogens	Manahawkin Bay	Manahawkin Bay-2 thru 10	Total Coliform		
Atlantic Coast	13	Manahawkin Lake-13	A. Pauling Park Beach	Fecal Coliform	Manahawkin Lake-13	A. Pauling Park Beach	Fecal Coliform		
Raritan	09	Manalapan Brook at Federal Rd in Monearoe Twp	AN0439	Aquatic Life	Manalapan Brook at Federal Rd in Monearoe	AN0439	Benthic Macroinvertebrates		
Raritan	09	Manalapan Brook at Federal Rd near Manalapan	01405340, 9-MAN-1	Phosphorus, Fecal Coliform, pH, Lead	Manalapan Brook at Federal Rd near Manalapan	01405340, 9-MAN-1	Phosphorus, pH, Lead	Fecal Coliform 3	
Raritan	09	Manalapan Brook at Old Forge Rd in Monearoe Twp	AN0440	Aquatic Life	Manalapan Brook at Old Forge Rd in Monearoe	AN0440	Benthic Macroinvertebrates		

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Raritan	09	Manalapan Brook near Spotswood	01405440, 9-MAN-2	Phosphorus, Fecal Coliform, pH, Arsenic, Lead, Zinc	Manalapan Brook near Spotswood	01405440, EWQ0440, 9-MAN-2	pH, Lead, Zinc	Phosphorus 1B, Arsenic 1A, Fecal Coliform 3	
Raritan	09	Manalapan Lake-09	Manalapan Lake	Nutrients/Sedimentation (Eutrophic)	Manalapan Lake-09	Manalapan Lake		Phosphorus 3	
Lower Delaware	17	Manantico Creek at Hance Bridge Rd in Vineland	AN0759	Aquatic Life	Manantico Creek at Hance Bridge Rd in Vineland	AN0759	Benthic Macroinvertebrates		
Atlantic Coast	12	Manasquan Reservoir-17	Manasquan Reservoir	Fish-Mercury	Manasquan Reservoir-12	Manasquan Reservoir	Fish-Mercury		
Atlantic Coast	12	Manasquan River at Rt 547 in Howell Twp	AN0493	Aquatic Life	Manasquan River at Rt 547 in Howell	AN0493	Benthic Macroinvertebrates		
Atlantic Coast	12	Manasquan River at Rt 9 in Howell Twp	AN0489	Aquatic Life	Manasquan River at Rt 9 in Howell	AN0489	Benthic Macroinvertebrates		
Atlantic Coast	12	Manasquan River at Squankum	014080000, 12-MA-1, 12-MA-2, 12-MA-3	Phosphorus, Fecal Coliform	Manasquan River at Squankum	01408000, EWQ0489, 12-MA-1, 12-MA-2, 12-MA-3	Phosphorus	Fecal Coliform 3	
Atlantic Coast	12	Manasquan River at W Farms Rd in Howell Twp	AN0490	Aquatic Life	Manasquan River at W Farms Rd in Howell	AN0490	Benthic Macroinvertebrates		
Atlantic Coast	12	Manasquan River Estuary	Manasquan River Estuary-3: Manasquan River	Dissolved Oxygen	Manasquan River Estuary	Manasquan River Estuary-3	Dissolved Oxygen		
Atlantic Coast	12	Manasquan River Estuary	Manasquan River Estuary-1 thru 3	Pathogens	Manasquan River Estuary	Manasquan River Estuary-1 thru 3	Total Coliform		
Atlantic Coast	12	Mannahasset Creek at Mannahasset Ave in Long Branch	48	Fecal Coliform	Mannahasset Creek at Mannahasset Ave in Long Branch	48	Fecal Coliform		
Lower Delaware	18	Mantua Creek at Mantua Ave in Wenonah	AN0672	Aquatic Life	Mantua Creek at Mantua Ave in Wenonah	AN0672	Benthic Macroinvertebrates		
Lower Delaware	17	Manumuskin River at Main Ave in Milmay	AN0762A	Aquatic Life	Manumuskin River at Main Ave in Milmay	AN0762A	Benthic Macroinvertebrates		
Atlantic Coast	15	Maple Run (Asbury Run) at Mill Rd in Egg Harbor Twp	AN0619	Aquatic Life	Maple Run (Asbury Run) at Mill Rd in Egg Harbor	AN0619	Benthic Macroinvertebrates		
Atlantic Coast	12	Marsh Bog Brook at Preventorium Rd in Howell	24	Fecal Coliform	Marsh Bog Brook at Squankum	01407997, 24	pH	Phosphorus 1B, Fecal Coliform 3	
Atlantic Coast	12	Marsh Bog Brook at Squankum	01407997	Phosphorus, Fecal Coliform, pH	Marsh Bog Brook at Squankum	01407997, 24	pH	Phosphorus 1B, Fecal Coliform 3	
Lower Delaware	17	Mary Elmer Lake-17	Mary Elmer Lake	Nutrients/Sedimentation (Eutrophic)	Mary Elmer Lake-17	Mary Elmer Lake		Phosphorus 3	
Lower Delaware	17	Maskells Mill Pond-17	Maskells Mill Pond	Fish-Mercury	Maskells Mill Pond-17	Maskells Mill Pond	Fish-Mercury		
Lower Delaware	19	Masons Creek at Rt 38 in Hainesport Twp	AN0173	Aquatic Life	Masons Creek at Rt 38 in Hainesport	AN0173	Benthic Macroinvertebrates		
Atlantic Coast	12	Matawan Creek at Amboy Ave in Aberdeen	8	Fecal Coliform	Matawan Creek-Tidal	8, R62	Fecal Coliform, Dissolved Oxygen		Dissolved Oxygen
Raritan	09	Matchaponix Brook at Englishtown	01405195	Fecal Coliform	Matchaponix Brook at Englishtown	01405195		Fecal Coliform 3	
Raritan	09	Matchaponix Brook at Rt 527 in Manalapan Twp	AN0448	Aquatic Life	Matchaponix Brook at Rt 527 in Manalapan	AN0448	Benthic Macroinvertebrates		
Raritan	09	Matchaponix Brook at Spotswood	01405302	pH	Matchaponix Brook at Spotswood	01405302, EWQ0451	Phosphorus, pH, Nitrate		Phosphorus,Nitrate
Raritan	09	Matchaponix Brook at Texas Rd in Monearoe Twp	AN0451	Aquatic Life	Matchaponix Brook at Texas Rd in Monearoe	AN0451	Benthic Macroinvertebrates		
Lower Delaware	17	Maurice River (Scotland Run) at Willow Grove Rd in Vineland	AN0733	Aquatic Life	Maurice River (Scotland Run) at Willow Grove Rd in Vineland	AN0733		Directly Below Lake	
Lower Delaware	17	Maurice River and Cove	3847,3847A,3847B,3847C,3847D,3848,3848A,3848B,3848C,3900A,3900D,3900G,3900H,3900J,3900L,3900M	Fecal Coliform	Maurice River and Cove	3847,3847A,3847B,3847C,3847D,3848,3848A,3848B,3848C,3900A,3900D,3900G,3900H,3900J,3900L,3900M	Fecal Coliform		
Lower Delaware	17	Maurice River at Norma	01411500	Fecal Coliform, pH	Maurice River at Norma	01411500	pH, Arsenic	Fecal Coliform 3	Arsenic
Lower Delaware	17	Maurice River at Sherman Ave in Vineland	AN0751	Aquatic Life	Maurice River at Sherman Ave in Vineland	AN0751	Benthic Macroinvertebrates		
Lower Delaware	17	Maurice River near Millville	01411800, 17-MAU-1	Fecal Coliform, Arsenic, Lead, Mercury	Maurice River near Millville	01411800, 17-MAU-1	Arsenic	Lead, Mercury 1B, Fecal Coliform 3	

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Raritan	09	McGellairds Brook at Rt 527 in Englishtown	AN0447	Aquatic Life	McGellairds Brook at Rt 527 in Englishtown	AN0447	Benthic Macroinvertebrates		
Raritan	09	McGolliard Brook at Main St in Englishtown	22	Phosphorus, Fecal Coliform	McGolliard Brook at Main St in Englishtown	22	Phosphorus	Fecal Coliform 3	
Northeast	03	Meadow Brook at Highland Ave in Wanaque	AN0256A	Aquatic Life	Meadow Brook at Highland Ave in Wanaque	AN0256A	Benthic Macroinvertebrates		
Lower Delaware	17	Memorial Lake-17	Memorial Lake	Nutrients/Sedimentation (Eutrophic)	Memorial Lake-17	Memorial Lake	Fish-Mercury	Phosphorus 3	
Lower Delaware	17	Woodstown Mem Lake-18	Woodstown Mem Lake	Fish-Mercury	Memorial Lake-17	Memorial Lake	Fish-Mercury	Phosphorus 3	
Northwest	01	Merrill Cr Reservoir-01	Merrill Creek Reservoir	Fish-Mercury	Merrill Cr Reservoir-01	Merrill Creek Reservoir	Fish-Mercury		
Atlantic Coast	13	Metedeconk River Estuary	Medeteconk River Estuary-1: Upper Meteteconk R	Pathogens	Metedeconk River Estuary	Upper Medeteconk River Estuary-1	Total Coliform		
Atlantic Coast	13	Metedeconk River N Br at Aldrich Rd in Jackson Twp	AN0501	Aquatic Life	Metedeconk River N Br at Aldrich Rd in Jackson	AN0501, MB-147		Conflicting results of sites	
Atlantic Coast	13	Metedeconk River N Br at Jackson Mills Rd in Freehold	6	Phosphorus, Fecal Coliform	Metedeconk River N Br at Jackson Mills Rd in Freehold	6	Phosphorus	Fecal Coliform 3	
Atlantic Coast	13	Metedeconk River N Br at Jackson Mills Rd in Freehold Twp	AN0500	Aquatic Life	Metedeconk River N Br at Jackson Mills Rd in Freehold	AN0500, AN0499, MB-146, MB-148	Benthic Macroinvertebrates		
Atlantic Coast	13	Metedeconk River N Br at Nomoco Rd in Freehold	MB-148	Aquatic Life	Metedeconk River N Br at Jackson Mills Rd in Freehold	AN0500, AN0499, MB-146, MB-148	Benthic Macroinvertebrates		
Atlantic Coast	13	Metedeconk River N Br at Lakewood	01408100	Fecal Coliform, pH, Temperature	Metedeconk River N Br at Lakewood	01408100	Temperature, pH	Fecal Coliform 3	
Atlantic Coast	13	Metedeconk River N Br at Rt 9 in Howell Twp	AN0502	Aquatic Life	Metedeconk River N Br at Rt 9 in Howell	AN0502, MB-135		Conflicting results of sites	
Atlantic Coast	13	Metedeconk River S Br at Chambers Bridge Rd in Brick Twp	AN0512	Aquatic Life	Metedeconk River S Br at Chambers Bridge Rd in Brick	AN0512	Benthic Macroinvertebrates		
Atlantic Coast	13	Metedeconk River S Br near Laurelton	01408152	Fecal Coliform	Metedeconk River S Br near Laurelton	01408152		Fecal Coliform 3	
Atlantic Coast	15	Middle River Estuary	2900E, 2900	Dissolved Oxygen	Middle River Estuary	2900A, 2900B, 2900C, 2900D, 2900E	Dissolved Oxygen, Total Coliform		
Atlantic Coast	15	Middle River Estuary	2900A, 2900B, 2900C, 2900D, 2900E	Pathogens	Middle River Estuary	2900A, 2900B, 2900C, 2900D, 2900E	Dissolved Oxygen, Total Coliform		
Raritan	09	Mile Run at Rt 527 in Franklin Twp	AN0429	Aquatic Life	Mile Run at Rt 527 in Franklin	AN0429	Benthic Macroinvertebrates		
Lower Delaware	19	Mill Creek at Levitt Pkwy in Willingboro Twp	AN0175	Aquatic Life	Mill Creek at Levitt Pkwy in Willingboro	AN0175	Benthic Macroinvertebrates		
Lower Delaware	17	Mill Creek at Rt 650 in Greenwich Twp	AN0716B	Aquatic Life	Mill Creek at Rt 650 in Greenwich	AN0716B	Benthic Macroinvertebrates		
Atlantic Coast	13	Mill Creek at Rt 72 in Stafford Twp	AN0555	Aquatic Life	Mill Creek at Rt 72 in Stafford	AN0555	Benthic Macroinvertebrates		
Raritan	10	Millstone River abv Raritan River conf in Franklin Twp	AN0414	Aquatic Life	Millstone River above Raritan River conf in Franklin	AN0414	Benthic Macroinvertebrates		
Raritan	10	Millstone River at Applegarth Rd in Monearoe Twp	AN0382D	Aquatic Life	Millstone River at Applegarth Rd in Monearoe	AN0382D	Benthic Macroinvertebrates		
Raritan	10	Millstone River at Blackwells Mills	01402000, 10-MIL-5, 10-MIL-6	Phosphorus, Fecal Coliform, Arsenic	Millstone River at Blackwells Mills	01402000, 10-MIL-5, 10-MIL-6	Phosphorus, Arsenic	Fecal Coliform 3	
Raritan	10	Millstone River at Blackwells Mills Rd in Hillsborough Twp	AN0410	Aquatic Life	Millstone River at Blackwells Mills Rd in Hillsborough	AN0410	Benthic Macroinvertebrates		
Raritan	10	Millstone River at Grovers Mills Rd in Plainsboro Twp	AN0382	Aquatic Life	Millstone River at Grovers Mills Rd in Plainsboro	AN0382	Benthic Macroinvertebrates		
Raritan	10	Millstone River at Kingston	01401440, 10-MIL-2	Phosphorus, Fecal Coliform, pH, Temperature, Arsenic, Cadmium, Chromium, Lead, Mercury, Zinc	Millstone River at Kingston	01401440, 10-MIL-2	Phosphorus, Fecal Coliform, pH, Temperature, Arsenic, Mercury	Cadmium, Chromium, Lead, Zinc 1B	
Raritan	10	Millstone River at Rt 33 in Millstone Twp	AN0379	Aquatic Life	Millstone River at Rt 33 in Millstone	AN0379, AN0378, MB-MILL2	Benthic Macroinvertebrates		
Raritan	10	Millstone River at Rt 535 in East Windsor Twp	AN0382B	Aquatic Life	Millstone River at Rt 535 in East Windsor	AN0382B	Benthic Macroinvertebrates		
Raritan	10	Millstone River at Weston	01402540, 10-MIL-3	Phosphorus, Fecal Coliform, pH, Arsenic	Millstone River at Weston	01402540, 10-MIL-3	Phosphorus, pH, Arsenic	Fecal Coliform 3	
Raritan	10	Millstone River near Grovers Mills	01400640	Phosphorus	Millstone River near Grovers Mills	01400640, 01400650	Phosphorus, Arsenic	Fecal Coliform 3	Arsenic

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Raritan	10	Millstone River at Grovers Mill	01400650	Phosphorus, Fecal Coliform	Millstone River near Grovers Mills	01400640, 01400650	Phosphorus, Arsenic	Fecal Coliform 3	Arsenic
Raritan	10	Millstone River near Manalapan	01400540, 10-MIL-1	Phosphorus, Fecal Coliform, pH, Total Suspended Solids, Arsenic, Lead	Millstone River near Manalapan	01400540, 01400530, 5, 10 MIL-1	Phosphorus, pH, Total Suspended Solids, Arsenic	Lead 1B, Fecal Coliform 3	
Raritan	10	Millstone River at Route 33 in Millstone	5	Phosphorus, Fecal Coliform	Millstone River near Manalapan	01400540, 01400530, 5, 10 MIL-1	Phosphorus, pH, Total Suspended Solids, Arsenic	Lead 1B, Fecal Coliform 3	
Raritan	10	Millstone River off Rte 1 in Plainsboro	10-MIL-7	Arsenic	Millstone River off Rte 1 in Plainsboro	10-MIL-7	Arsenic		
Raritan	08	Mine Brook at Bernardsville Rd in Bernardsville	AN0352	Aquatic Life	Mine Brook at Bernardsville Rd in Bernardsville	AN0352	Benthic Macroinvertebrates		
Atlantic Coast	12	Mine Brook at Creamery Rd in Colts Neck Twp	AN0473	Aquatic Life	Mine Brook at Creamery Rd in Colts Neck	AN0473	Benthic Macroinvertebrates		
Raritan	08	Mine Brook at Far Hills Rd (Rt 512) in Far Hills	AN0353	Aquatic Life	Mine Brook at Far Hills Rd (Rt 512) in Far Hills	AN0353	Benthic Macroinvertebrates		
Atlantic Coast	12	Mingamahone Brook at Rt 524 in Howell Twp	AN0495	Aquatic Life	Mingamahone Brook at Rt 524 in Howell	AN0495	Benthic Macroinvertebrates		
Atlantic Coast	12	Mingamahone Brook near Earle	01408009	Fecal Coliform, pH	Mingamahone Brook near Earle	01408009	pH, Total Suspended Solids	Fecal Coliform 3	Total Suspended Solids
Lower Delaware	19	Mirror Lake-19	Mirror Lake	Fecal Coliform, Fish-Mercury	Mirror Lake-19	Mirror Lake	Fecal Coliform, Fish-Mercury		
Lower Delaware	20	Miry Run at Meirs Rd in Cream Ridge	AN0125A	Aquatic Life	Miry Run at Meirs Rd in Cream Ridge	AN0125A	Benthic Macroinvertebrates		
Northwest	11	Miry Run at Route 533 at Mercerville	01463850	Fecal Coliform, pH	Miry Run at Route 533 in Mercerville	01463850	Phosphorus, Dissolved Oxygen, pH	Fecal Coliform 3	Phosphorus, Dissolved Oxygen
Northwest	11	Miry Run at Rt 533 in Hamilton Twp	AN0115	Aquatic Life	Miry Run at Rt 533 in Hamilton	AN0115	Benthic Macroinvertebrates		
Northeast	04	Molly Ann Brook at Totowa Ave in Paterson	AN0276	Aquatic Life	Molly Ann Brook at Totowa Ave in Paterson	AN0276	Benthic Macroinvertebrates		
Northeast	03	Monksville Reservoir-03	Monksville Reservoir	Fish-Mercury	Monksville Reservoir-03	Monksville Reservoir	Fish-Mercury		
Northeast	03	Montclair YMCA Near Beach and Far Beach	Montclair YMCA Near Beach and Far Beach	Fecal Coliform	Montclair YMCA Near Beach and Far Beach	Montclair YMCA Near Beach and Far Beach		Fecal Coliform 1B	
Lower Delaware	20	Moorhouse Brook Trib S at Moorhouse Rd in New Egypt	AN0121A	Aquatic Life	Moorhouse Brook Trib S at Moorhouse Rd in New Egypt	AN0121A	Benthic Macroinvertebrates		
Northeast	06	Morris County Park Lake, Beach, Inlet, Outlet,	Morris County Park Lake, Beach, Inlet, Outlet,	Fecal Coliform	Morris County Park Lake, Beach, Inlet, Outlet,	Morris County Park Lake, Beach, Inlet, Outlet,	Fecal Coliform		
Northeast	03	Morse Lake-03	Morse Lake POA, Morse Lake	Fecal Coliform	Morse Lake-03	Morse Lake POA, Morse Lake		Fecal Coliform 1B	
Northeast	06	Mountain Lake-06	Mountain Lake	Fecal Coliform, Fish-Mercury	Mountain Lake-06	Mountain Lake	Fecal Coliform, Fish-Mercury		
Atlantic Coast	13	Muddy Ford Brook at Lakewood-Allenwood Rd in Howell	17	Fecal Coliform	Muddy Ford Brook at Lakewood-Allenwood Rd in Howell	17		Fecal Coliform 3	
Raritan	08	Mulhockaway Creek at Van Syckel	01396660, 8-MU-1	Fecal Coliform	Mulhockaway Creek at Van Syckel	01396660, 8-MU-1		Fecal Coliform 3	
Atlantic Coast	14	Mullica River		Fish-Mercury	Mullica River	Mullica River	Fish-Mercury, Fish-PCB, Fish-Dioxin		Fish-PCB, Fish-Dioxin
Atlantic Coast	14	Mullica River at Green Bank		Phosphorus, Fecal Coliform, pH, Temperature	Mullica River at Green Bank	Mullica River at Green Bank	Phosphorus, Fecal Coliform, pH, Temperature		
Atlantic Coast	14	Mullica River at Indian Mills	01409383	Dissolved Oxygen	Mullica River at Indian Mills	01409383	Dissolved Oxygen		
Atlantic Coast	14	Mullica River at Outlet of Atsion Lake	01409387, 14-MUL-2	Copper, Lead, Zinc	Mullica River at Outlet of Atsion Lake	01409387, 14-MUL-2	Copper, Lead, Zinc		
Atlantic Coast	14	Mullica River Estuary	2005, 2002A	Dissolved Oxygen	Mullica River Estuary	2005, 2002A		Dissolved Oxygen 1B	
Atlantic Coast	14	Mullica River Middle Estuary	2004, 2004A, 2004B, 2005, 2005A, 2005B, 2005D, 2006, 2006A, 2006B	Pathogens	Mullica River Middle Estuary	2004, 2004A, 2004B, 2005, 2005A, 2005B, 2005D, 2006, 2006A, 2006B	Total Coliform		

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Atlantic Coast	14	Mullica River near Atco	01409375	pH	Mullica River near Atco	01409375	pH		
Atlantic Coast	14	Mullica River near Batsto	0140940050	pH	Mullica River near Batsto	0140940050	pH		
Atlantic Coast	14	Mullica River Upper Estuary	2007, 2007A, 2007B, 2007C, 2007D, 2007E, 2008, 2008A, 2008B, 2009, 2009A, 2009B, 2010, 2010A, 2010B, 2010C, 2011, 2011A, 2012, 2012A, 2012B, 2012C, 2013, 2013A, 2013B, 2014, 2015, 2015A, 2015B, 2015C, 2017, 2017A, 2018, 2018A, 2018B, 2018C, 2020, 2020A, 2020B, 2021A, 2021B, 2023A, 2025A, 2027A, 2029, 2029A, 2030, 2030A	Pathogens	Mullica River Upper Estuary	2007, 2007A, 2007B, 2007C, 2007D, 2007E, 2008, 2008A, 2008B, 2009, 2009A, 2009B, 2010, 2010A, 2010B, 2010C, 2011, 2011A, 2012, 2012A, 2012B, 2012C, 2013, 2013A, 2013B, 2014, 2015, 2015A, 2015B, 2015C, 2017, 2017A, 2018,	Total Coliform		
Northwest	01	Musconetcog River at Lockwood	01455801	Phosphorus, Fecal Coliform, Temperature	Musconetcog River at Lockwood	01455801	Phosphorus, Fecal Coliform, Temperature		
Northwest	01	Musconetcong River at Beattystown	01456200, 1-MUS-3	Fecal Coliform, Temperature, Arsenic	Musconetcong River at Beattystown	01456200, 1-MUS-3	Temperature, Arsenic	Fecal Coliform 3	
Northwest	01	Musconetcong River at Lake Hopatcong	01455500	Fecal Coliform, pH, Temperature	Musconetcong River at Lake Hopatcong	01455500	pH, Temperature	Fecal Coliform 3	
Northwest	01	Musconetcong River at New Hampton Rd in Lebanon Twp	AN0072	Aquatic Life	Musconetcong River at New Hampton Rd in Lebanon	AN0072	Benthic Macroinvertebrates		
Northwest	01	Musconetcong River at Riegelsville	01457400, 1-MUS-5	Phosphorus, Fecal Coliform, Temperature	Musconetcong River at Riegelsville	01457400, DBRCNJ0025, 1-MUS-5	Phosphorus, Temperature, Total Suspended Solids	Fecal Coliform 3	Total Suspended Solids
Northwest	01	Musconetcong River at Rt 206 in Netcong	AN0063A	Aquatic Life	Musconetcong River at Rt 206 in Netcong	AN0063A	Benthic Macroinvertebrates		
Northwest	01	Musconetcong River at Rt 604 (abv Saxton Lk) in Mt Olive Twp	AN0069E	Aquatic Life	Musconetcong River at Rt 604 (abv Saxton Lk) in Mt Olive	AN0069E	Benthic Macroinvertebrates		
Northwest	01	Musconetcong River at S of Rt 604 & Rt 80 in Mt Olive Twp	AN0069D	Aquatic Life	Musconetcong River at S of Rt 604 & Rt 80 in Mt Olive	AN0069D	Benthic Macroinvertebrates		
Northwest	01	Musconetcong River blw Waterloo Village lower dam in Mt Olive Twp	AN0069C	Aquatic Life	Musconetcong River blw Waterloo Village lower dam in Mt Olive	AN0069C	Benthic Macroinvertebrates		
Northwest	01	Musconetcong River near Bloomsbury	01457000, 1-MUS-4	Fecal Coliform, pH	Musconetcong River near Bloomsbury	01457000, EWQ0072, 1-MUS-4	pH	Fecal Coliform 3	
Northwest	01	Musconetcong River off Rt 604 (blw Lubbers Run) in Lockwood	AN0069B	Aquatic Life	Musconetcong River off Rt 604 (blw Lubbers Run) in Lockwood	AN0069B	Benthic Macroinvertebrates		
Northeast	05	Musquapsink Brook at River Vale	01377499	Phosphorus, Fecal Coliform	Musquapsink Brook at River Vale	01377499	Phosphorus, Arsenic	Fecal Coliform 3	Arsenic
Northeast	05	Musquapsink River at Harrington Ave in Westwood	AN0206	Aquatic Life	Musquapsink River at Harrington Ave in Westwood	AN0206	Benthic Macroinvertebrates		
Atlantic Coast	12	Musquash Brook at Brighton Ave in Neptune Twnshp	11	Fecal Coliform	Musquash Brook at Brighton Ave in Neptune Twnshp	11	Fecal Coliform		
Atlantic Coast	13	Mystic	1925, 1926, 1926A	Pathogens	Mystic	1925, 1926, 1926A	Total Coliform		
Northeast	04	Naachtpunkt Brook at Continental Dr (abv outfall) in Wayne Twp	AN0273A	Aquatic Life	Naachtpunkt Brook at Continental Dr (abv outfall) in Wayne	AN0273A	Benthic Macroinvertebrates		
Northeast	04	Naachtpunkt Brook at Continental Dr (blw outfall) in Wayne Twp	AN0273B	Aquatic Life	Naachtpunkt Brook at Continental Dr (blw outfall) in Wayne	AN0273B	Benthic Macroinvertebrates		
Atlantic Coast	14	Nacote & Mott Rivers Estuary	2005C, 2005E	Pathogens	Nacote & Mott Rivers Estuary	2005C, 2005E	Total Coliform		
Lower Delaware	17	Nantuxent Creek Estuary	3804L, 3408P	Pathogens	Nantuxent Creek Estuary	3804L, 3408P	Total Coliform		
Atlantic Coast	12	Navesink River Estuary	Shrewsbury/Navesink Estuary-1 thru 3	Pathogens	Navesink River Estuary	Shrewsbury/Navesink Estuary-4 thru 7	Total Coliform		
Atlantic Coast	14	Nescochague Creek at Pleasant Mills	01409411	pH	Nescochague Creek at Pleasant Mills	01409411	pH		
Raritan	08	Neshanic River at Reaville	01398000, 8-NE-1	Phosphorus, Fecal Coliform, pH, Total Suspended Solids, Copper, Lead	Neshanic River at Reaville	01398000, 8-NE-1	Phosphorus, Total Suspended Solids, Copper	pH 1B, Lead 1A, Fecal Coliform 3	

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Raritan	08	Neshanic River at Reaville - Everitt Rd in Raritan Twp	AN0333	Aquatic Life	Neshanic River at Reaville - Everitt Rd in Raritan	AN0333	Benthic Macroinvertebrates		
Raritan	08	Neshanic River at Rt 514 in Hillsborough Twp	AN0337	Aquatic Life	Neshanic River at Rt 514 in Hillsborough	AN0337	Benthic Macroinvertebrates		
Atlantic Coast	15	New Brooklyn Lake-15	New Brooklyn Lake	Nutrients/Sedimentation (Eutrophic), Fish-Mercury	New Brooklyn Lake-15	New Brooklyn Lake	Fish-Mercury	Phosphorus 3	
Raritan	09	New Market Pond-09	New Market Pond	Aquatic Life, Fish-PCB	New Market Pond-09	New Market Pond	Fish Community, Fish-PCB, Fish-Dioxin		Fish-Dioxin
Northwest	11	New Sharon Brook at Sharon Rd in Washington Twp	AN0109B	Aquatic Life	New Sharon Brook at Sharon Rd in Washington	AN0109B	Benthic Macroinvertebrates		
Raritan	07	New York Harbor, Upper		Mercury, Fish-PCB, Fish-Dioxin	NY-NJ Harbor	Upper New York Harbor	Mercury, Fish-PCB, Fish-Dioxin		
Raritan	07	Newark Bay		Mercury, Fish-PCB, Fish-Dioxin	Newark Bay	Newark Bay	Mercury, Fish-PCB, Fish-Dioxin		
Lower Delaware	18	Newton Creek		Copper, Zinc	Newton Creek	Newton Creek	Copper, Zinc		
Lower Delaware	18	Newton Lake-18	Newton Lake	Fish-Clordane	Newton Lake-18	Newton Lake	Fish-PCB, Fish-Dioxin	Fish -Chlordane 1B	Fish-PCB, Fish-Dioxin
Northwest	11	Nishisakawick Creek near Frenchtown	01458570	Fecal Coliform	Nishisakawick Creek near Frenchtown	01458570, DRBCNJ0020		Fecal Coliform 3	
Lower Delaware	20	North Community Lake	North Community Lake	Aquatic Life	North Community Lake	North Community Lake	Fish Community		
Northeast	05	North Hudson Park Lake-05	North Hudson Park Lake	Nutrients/Sedimentation (Eutrophic)	North Hudson Park Lake-05	North Hudson Park Lake	Phosphorus		
Lower Delaware	20	North Run at Main St in North Hanover Twp	AN0120	Aquatic Life	North Run at Main St in North Hanover	AN0120	Benthic Macroinvertebrates		
Lower Delaware	20	North Run Trib at Highland Ave in Wrightstown	AN0120A	Aquatic Life	North Run Trib at Highland Ave in Wrightstown	AN0120A	Benthic Macroinvertebrates		
Atlantic Coast	12	Northern Coastal Waters - Raritan Bay to Barnegat Inlet		Fish-PCB	Northern Coastal Waters - Raritan Bay to Barnegat Inlet	Northern Coastal Waters - Raritan Bay to Barnegat Inlet	Fish-PCB		
Raritan	07	NYC and Battery	HR1, HR2	Mercury	NY-NJ Harbor	NYC and Battery (HR1, HR2)	Mercury		
Raritan	09	NY-NJ Harbor wide		PCBs, Dioxin, PAHs, Pesticides	NY-NJ Harbor	NY-NJ Harbor wide	PCB, Dioxin, PAHs, Pesticides		
Atlantic Coast	13	Ocean County Park Lake-13	Ocean County Park Beach	Fecal Coliform	Ocean County Park Lake-13	Ocean County Park Beach	Fecal Coliform		
Atlantic Coast	13	Ocean Twp Bathing Beach-13	Ocean Twp Bathing Beach	Fecal Coliform	Ocean Bathing Beach-13	Ocean Twp Bathing Beach	Fecal Coliform		
Lower Delaware	17	Old Cedar Lake-17	Old Cedar Lake	Fecal Coliform	Old Cedar Lake-17	Old Cedar Lake		Fecal Coliform 1B	
Atlantic Coast	16	Old Robins Br at Beaver Causeway in Dennis Twp	AN0769	Aquatic Life	Old Robins Branch at Beaver Causeway in Dennis	AN0769	Benthic Macroinvertebrates		
Lower Delaware	18	Oldmans Creek at Jessups Mill	01477440	Fecal Coliform	Oldmans Creek at Jessups Mill	01477440		Fecal Coliform 3	
Lower Delaware	18	Oldmans Creek at Porches Mill	01477510	Phosphorus, Fecal Coliform	Oldmans Creek at Porches Mill	01477510	Phosphorus	Fecal Coliform 3	
Lower Delaware	17	Oranoaken Creek Estuary	3867F, 3867J	Pathogens	Oranoaken Creek Estuary	3867F, 3867J	Total Coliform		
Atlantic Coast	14	Oswego River at Harrisville	01410000, 14-OSW-1	Copper, Zinc	Oswego River at Harrisville	01410000, 14-OSW-1	Copper	Zinc 1A	
Northeast	05	Overpeck Lake-05	Overpeck Lake	Nutrients/Sedimentation (Eutrophic)	Overpeck Lake-05	Overpeck Lake		Phosphorus 3	
Northeast	03	Packanack Lake-03	Packanack Lake East and West	Fecal Coliform	Packanack Lake-03	Packanack Lake East and West		Fecal Coliform 1B	
Lower Delaware	17	Pages Run at Newport	01412200	pH	Pages Run at Newport	01412200	pH		
Northwest	02	Papakating Creek at Pelletown	01367800	Fecal Coliform	Papakating Creek at Pelletown	01367800		Fecal Coliform 3	
Northwest	02	Papakating Creek at Rt 565 in Frankford Twp	AN0304	Aquatic Life, Unknown Toxicity	Papakating Creek at Rt 565 in Frankford	AN0304	Benthic Macroinvertebrates, Unknown Toxicity		

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Northwest	02	Papakating Creek at Rt 565 in Wantage Twp	AN0307	Aquatic Life	Papakating Creek at Rt 565 in Wantage	AN0307	Benthic Macroinvertebrates		
Northwest	02	Papakating Creek at Sussex	01367910, 2-PAP-1	Phosphorus, Fecal Coliform, Arsenic	Papakating Creek at Sussex	01367910, 01367909, 2-PAP-1	Phosphorus, Arsenic	Fecal Coliform 3	
Northwest	02	Papakating Creek near Sussex	01367860	Fecal Coliform	Papakating Creek near Sussex	01367860		Fecal Coliform 3	
Northwest	02	Papakating Creek near Wykertown	01367780	Fecal Coliform	Papakating Creek near Wykertown	01367780		Fecal Coliform 3	
Northwest	02	Papakating Creek W Br at McCoys Corner	01367850	Fecal Coliform	Papakating Creek W Br at McCoys Corner	01367850		Fecal Coliform 3	
Northwest	02	Papakating Creek W Br at Rt 565 in Wantage Twp	AN0306	Aquatic Life	Papakating Creek W Br at Rt 565 in Wantage	AN0306	Benthic Macroinvertebrates		
Atlantic Coast	13	Parker Run-Estuary	1801, 1801A, 1801C, 1801D, 1801F	Pathogens	Parker Run-Estuary	1801, 1801A, 1801C, 1801D, 1801F	Total Coliform		
Lower Delaware	19	Parkers Creek at Rt 603 in Mt Laurel	AN0174A	Aquatic Life	Parkers Creek at Rt 603 in Mt Laurel	AN0174A	Benthic Macroinvertebrates		
Northeast	06	Parsippany Lake-06	Lake Parsippany: Hoffman Beach and Johnson Beach, and Drewes Beach	Fecal Coliform	Parsippany Lake-06	Lake Parsippany: Hoffman Beach and Johnson Beach, and Drewes Beach	Fecal Coliform		
Lower Delaware	17	Parsonage Run at Finley Rd in Upper Deerfield Twp	AN0711	Aquatic Life	Parsonage Run at Finley Rd in Upper Deerfield	AN0711	Benthic Macroinvertebrates		
Lower Delaware	17	Parvin Br at Rt 55 in Vineland	AN0750	Aquatic Life	Parvin Branch at Rt 55 in Vineland	AN0750	Benthic Macroinvertebrates		
Lower Delaware	17	Parvin Lake-17	Parvin SP, Parvin Lake, Center, Left, and Right	Fecal Coliform	Parvin Lake-17	Parvin SP, Parvin Lake, Center, Left, and Right	Fecal Coliform		
Northeast	05	Pascack Brook at Westwood	01377500, 5-PAS-1	Phosphorus, Fecal Coliform, Arsenic, Mercury	Pascack Brook at Westwood	01377500, 5-PAS-1	Phosphorus, Arsenic, Mercury	Fecal Coliform 3	
Northeast	04	Passaic Estuary		Arsenic, Mercury	Passaic River - Tidal	Passaic River - Tidal	Arsenic, Mercury		
Northeast	06	Passaic River	Great Piece	Fish-Mercury	Passaic River	Great Piece	Fish-Mercury		
Northeast	06	Passaic River at Eagle Rock Ave in East Hanover Twp	AN0231	Aquatic Life	Passaic River at Eagle Rock Ave in East Hanover	AN0231	Benthic Macroinvertebrates		
Northeast	04	Passaic River at Elmwood Pk	01389880, 4-SITE-5	Phosphorus, Fecal Coliform, Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Silver, Thallium, Zinc, Cyanide	Passaic River at Elmwood Park	01389880, 01389870, Passaic-8 , Passaic-9, Passaic-10, 4-SITE-5	Phosphorus, Fecal Coliform, Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Silver, Thallium, Zinc, Cyanide		
Northeast	06	Passaic River at Fairmount Ave in Long Hill	AN0229C	Aquatic Life	Passaic River at Fairmount Ave in Long Hill	AN0229C	Benthic Macroinvertebrates		
Northeast	04	Passaic River at Little Falls	01389500, 4-SITE-6, 4-PAS-3	Phosphorus, Fecal Coliform, Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Silver, Thallium, Zinc, Cyanide	Passaic River at Little Falls	01389500, Passaic-11, Passaic-12, 4-SITE-6, 4-PAS-3	Phosphorus, Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Silver, Thallium, Zinc, Cyanide	Fecal Coliform, 3	
Northeast	06	Passaic River at Old Mt Pleasant Ave in E Hanover Twp	AN0231B	Aquatic Life	Passaic River at Old Mt Pleasant Ave in E Hanover	AN0231B	Benthic Macroinvertebrates		
Northeast	06	Passaic River at Passaic Ave in Millburn Twp	AN0231A	Aquatic Life	Passaic River at Passaic Ave in Millburn	AN0231A	Benthic Macroinvertebrates		
Northeast	04	Passaic River at River Rd (Dundee Dam) in Garfield	AN0292O	Aquatic Life	Passaic River at River Rd (Dundee Dam) in Garfield	AN0292O	Benthic Macroinvertebrates		
Northeast	06	Passaic River at S Main Ave in Warren Twp	AN0228	Aquatic Life	Passaic River at S Main Ave in Warren	AN0228	Benthic Macroinvertebrates		
Northeast	04	Passaic River at Singac	01389130, 4-PAS-4	Phosphorus, Fecal Coliform, Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Silver, Thallium, Zinc, Cyanide	Passaic River at Singac	01389130, 4-PAS-4	Phosphorus, Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Silver, Thallium, Zinc, Cyanide	Fecal Coliform 1B	
Northeast	06	Passaic River at Snyder Ave in Berkeley Twp	AN0229B	Aquatic Life	Passaic River at Snyder Ave in Berkeley	AN0229B	Benthic Macroinvertebrates		
Northeast	06	Passaic River at Stanley Ave in Summit	AN0229	Aquatic Life	Passaic River at Stanley Ave in Summit	AN0229	Benthic Macroinvertebrates		
Northeast	06	Passaic River at Summit Ave in Summit	AN0230	Aquatic Life	Passaic River at Summit Ave in Summit	AN0230	Benthic Macroinvertebrates		

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Northeast	06	Passaic River at Two Bridges	01382000, 6-SITE-3	Phosphorus, Fecal Coliform, Arsenic, Chromium, Copper, Lead, Mercury	Passaic River at Two Bridges	01382000, 6-SITE-3	Phosphorus, Arsenic, Mercury	Fecal Coliform 3; Chromium, Copper, Lead 1B	
Northeast	06	Passaic River at Watchung Ave in Chatham	AN0230A	Aquatic Life	Passaic River at Watchung Ave in Chatham	AN0230A	Benthic Macroinvertebrates		
Northeast	06	Passaic River at Willard St in Montville Twp	AN0274A	Aquatic Life	Passaic River at Willard St in Montville	AN0274A	Benthic Macroinvertebrates		
Northeast	04	Passaic River Below Pompton River at Two Bridges	01389005	Phosphorus	Passaic River Below Pompton River at Two Bridges	01389005	Phosphorus		
Northeast	04	Passaic River Lower and Estuary		Fish-PCB, Fish-Chlordane, Fish-Dioxin	Passaic River Lower, Estuary and Tribs	Passaic River Lower, Estuary and Tribs	Fish-PCB, Fish-Dioxin	Fish-Chlordane 1B	
Northeast	06	Passaic River near Chatham	01379500, 6-SITE-1, 6-PAS-2	Phosphorus, Fecal Coliform, Total Suspended Solids, Arsenic, Cadmium, Copper, Lead, Mercury, Silver, Zinc, Cyanide	Passaic River near Chatham	01379500, 6-SITE-1, 6-PAS-2	Phosphorus, Total Suspended Solids, Arsenic, Cadmium, Copper, Lead, Mercury, Silver, Zinc, Cyanide	Fecal Coliform 3	
Northeast	06	Passaic River near Millington	01379000, 6-SITE-2, 6-PAS-1	Phosphorus, Fecal Coliform, Dissolved Oxygen, Arsenic, Cadmium, Copper, Lead, Mercury, Silver, Zinc, Cyanide	Passaic River near Millington	01379000, EWQ0224, 6-SITE-2, 6-PAS-1	Phosphorus, Arsenic, Cadmium, Copper, Lead, Mercury, Silver, Zinc, Cyanide	Fecal Coliform 3, Dissolved Oxygen 1B	
Atlantic Coast	15	Patcong River Estuary	2801A, 2862, 2863A, 2863B, 2863C, 2863D, 2863E, 2863G, 2863H, 2863L, 2863M	Dissolved Oxygen, Pathogens	Patcong River Estuary	2801A, 2862, 2863A, 2863B, 2863C, 2863D, 2863E, 2863G, 2863H, 2863L, 2863M	Dissolved Oxygen, Total Coliform		
Northwest	01	Paulins Kill at Balesville	01443440, 1-PAU-1	Fecal Coliform, Arsenic	Paulins Kill at Balesville	01443440, 1-PAU-1	Arsenic	Fecal Coliform 3	
Northwest	01	Paulins Kill at Blairstown	01443500	Fecal Coliform, Temperature	Paulins Kill at Blairstown	01443500	Temperature	Fecal Coliform 3	
Northwest	01	Paulins Kill at Rt 46 in Knowlton Twp	AN0032	Aquatic Life	Paulins Kill at Rt 46 in Knowlton	AN0032	Benthic Macroinvertebrates		
Northwest	01	Paulins Kill at Rt 663 in Lafayette Twp	AN0015	Aquatic Life	Paulins Kill at Rt 663 in Lafayette	AN0015	Benthic Macroinvertebrates		
Northwest	01	Paulins Kill Lake-01	Paulinskill Lake North(Main), Paulinskill Lake South	Fecal Coliform	Paulins Kill Lake-01	Paulinskill Lake North(Main), Paulinskill Lake South		Fecal Coliform 3	
Northwest	01	Paulins Kill Trib at Rt 94 & Old Beaver Run Rd in Lafayette Twp	AN0016A	Aquatic Life	Paulins Kill Trib at Rt 94 & Old Beaver Run Rd in Lafayette	AN0016A	Benthic Macroinvertebrates		
Northwest	01	Paulins Kill Trib at Van Sickle Rd in Lafayette Twp	AN0021A	Aquatic Life	Paulins Kill Trib at Van Sickle Rd in Lafayette	AN0021A	Benthic Macroinvertebrates		
Northeast	04	Peckman River at McBride Ave in West Paterson	AN0275	Aquatic Life	Peckman River at McBride Ave in West Paterson	AN0275	Benthic Macroinvertebrates		
Northeast	04	Peckman River at West Patterson	01389600	Fecal Coliform	Peckman River at West Paterson	01389600		Fecal Coliform 3	
Lower Delaware	18	Pennsauken Creek		Fish-PCB, Fish-Chlordane	Pennsauken Creek at Forked Landing	Pennsauken Creek at Forked Landing	Fish-PCB, Fish-Dioxin	Fish-Chlordane 1B	Fish-Dioxin
Lower Delaware	18	Pennsauken Creek N Br		Fish-PCB, Fish-Chlordane	Pennsauken Creek N Br			Fish-PCB, Fish-Chlordane 1B	
Lower Delaware	18	Pennsauken Creek N Br at Fellowship Rd in Mount Laurel Twp	AN0179	Aquatic Life	Pennsauken Creek N Br at Fellowship Rd in Mount Laurel	AN0179	Benthic Macroinvertebrates		
Lower Delaware	18	Pennsauken Creek N Br near Morrestown	01467069, 18-PE-1, 18-PE-2	Phosphorus, Fecal Coliform, Arsenic, Lead	Pennsauken Creek N Br near Morrestown	01467069, 18-PE-1, 18-PE-2	Phosphorus, Arsenic	Lead 1B, Fecal Coliform 3	
Lower Delaware	18	Pennsauken Creek S Br		Fish-PCB, Fish-Chlordane	Pennsauken Creek S Br			Fish-PCB, Fish-Chlordane 1B	
Lower Delaware	18	Pennsauken Creek S Br at Cherry Hill	01467081, 18-PE-3	Phosphorus, Fecal Coliform, Total Suspended Solids, Arsenic	Pennsauken Creek S Br at Cherry Hill	01467081, 18-PE-3	Phosphorus, Total Suspended Solids, Arsenic	Fecal Coliform 3	
Lower Delaware	18	Pennsauken Creek S Br at Greentree Rd in Evesham Twp	AN0182	Aquatic Life	Pennsauken Creek S Br at Greentree Rd in Evesham	AN0182	Benthic Macroinvertebrates		
Lower Delaware	18	Pennsauken Creek S Br at Rt 41 in Cherry Hill Twp	AN0183	Aquatic Life	Pennsauken Creek S Br at Rt 41 in Cherry Hill	AN0183	Benthic Macroinvertebrates		
Lower Delaware	18	Pennsauken Creek, Mainstem		Arsenic, Cadmium, Chromium, Copper, Lead, Mercury	Pennsauken Creek	Pennsauken Creek, Mainstem	Arsenic, Cadmium, Chromium, Copper, Lead, Mercury		
Northeast	03	Pequannock River - Butler	PQ10	Temperature	Pequannock River - Butler	PQ10	Temperature		

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Northeast	03	Pequannock River above Clinton	PQ4	Temperature	Pequannock River above Clinton	PQ4	Temperature		
Northeast	03	Pequannock River above Macopin	PQ7	Temperature	Pequannock River above Macopin	PQ7	Temperature		
Northeast	03	Pequannock River at Macopin Intake Dam	01382500, 3-SITE-8, 3-PEQ-1, PQ8	Temperature, Lead	Pequannock River at Macopin Intake Dam	01382500, PQ8, 3-SITE-8, 3-PEQ-1	Temperature, Dissolved Oxygen, Lead		Dissolved Oxygen
Northeast	03	Pequannock River at Rt 23 (abv res) in West Milford Twp	AN0259	Aquatic Life	Pequannock River at Rt 23 (abv res) in West Milford	AN0259	Benthic Macroinvertebrates		
Northeast	03	Pequannock River at Rt 515 in Hardyston Twp	AN0258	Aquatic Life	Pequannock River at Rt 515 in Hardyston	AN0258	Benthic Macroinvertebrates		
Northeast	03	Pequannock River below Clinton	PQ5	Temperature	Pequannock River below Clinton	PQ5	Temperature		
Northeast	03	Pequannock River below Pacock	PQ3	Temperature	Pequannock River below Pacock	PQ3	Temperature		
Northeast	03	Pequannock River Upper		Fish-Mercury	Pequannock River Upper			Fish-Mercury 1B	
Northwest	01	Pequest River at Pequest	01445500, 1-PEQ-2	Phosphorus, Fecal Coliform, Total Suspended Solids	Pequest River at Pequest	01445500, 1-PEQ-2	Phosphorus, pH, Total Suspended Solids	Fecal Coliform 3	pH
Northwest	01	Pequest River at Rt 206 in Andover Twp	AN0035	Aquatic Life	Pequest River at Rt 206 in Andover	AN0035	Benthic Macroinvertebrates		
Northwest	01	Pequest River at Rt206 Below Springdale	01444970	Fecal Coliform	Pequest River at Rt206 Below Springdale	01444970		Fecal Coliform 3	
Northwest	01	Pequest River on Water Street at Belvidere	01446400, 1-PEQ-3	Phosphorus, Fecal Coliform, pH, Temperature, Arsenic, Cadmium, Chromium, Lead, Mercury	Pequest River on Water Street at Belvidere	01446400, DRBCNJ0033, 1-PEQ-3	Phosphorus, pH, Temperature, Arsenic, Cadmium, Chromium, Lead, Mercury	Fecal Coliform 3	
Northwest	01	Pequest River UNK Trib at Brighton Rd in Green Twp	AN0036	Aquatic Life	Pequest River UNK Trib at Brighton Rd in Green	AN0036	Benthic Macroinvertebrates		
Raritan	09	Peters Brook at Rt 28 at Somerville	01400395	Fecal Coliform	Peters Brook at Rt 28 at Somerville	01400395		Fecal Coliform 3	
Raritan	09	Peters Brook at Rt 28 in Somerville	AN0376	Aquatic Life	Peters Brook at Rt 28 in Somerville	AN0376	Benthic Macroinvertebrates		
Raritan	10	Pike Run at Rt 533 in Montgomery Twp	AN0405	Aquatic Life	Pike Run at Rt 533 in Montgomery	AN0405	Benthic Macroinvertebrates		
Raritan	10	Pike Run near Rocky Hill	01401700	Phosphorus, Fecal Coliform	Pike Run near Rocky Hill	01401700	Phosphorus	Fecal Coliform 3	
Lower Delaware	19	Pine Lake-19	Main Lake Pine Colony Club	Fecal Coliform	Pine Lake-19	Main Lake Pine Colony Club		Fecal Coliform 1B	
Atlantic Coast	12	Pine Brook at Hockhockson Rd in Tinton Falls	34	Fecal Coliform	Pine Brook at Hockhockson Rd in Tinton Falls	34		Fecal Coliform 3	
Raritan	09	Pine Brook at Pension Rd in Manalapan Twp	AN0449	Aquatic Life	Pine Brook at Pension Rd in Manalapan	AN0449	Benthic Macroinvertebrates		
Atlantic Coast	12	Pine Brook at Squankum Rd in Macedonia	AN0476A	Aquatic Life	Pine Brook at Squankum Rd in Macedonia	AN0476A	Benthic Macroinvertebrates		
Atlantic Coast	12	Pine Brook at Tinton Ave (Rt 537) in Tinton Falls	AN0476	Aquatic Life	Pine Brook at Tinton Ave (Rt 537) in Tinton Falls	AN0476	Benthic Macroinvertebrates		
Atlantic Coast	13	Pine Lake-13	Pine Lake Bathing Beach	Fecal Coliform	Pine Lake-13	Pine Lake Bathing Beach	Fecal Coliform		
Northeast	03	Pines Lake-03	Pines Lake South and West	Fecal Coliform	Pines Lake-03	Pines Lake South and West		Fecal Coliform 1B	
Lower Delaware	18	Plank Run at Rt 322 in Harrison Twp	AN0670A	Aquatic Life	Plank Run at Rt 322 in Harrison	AN0670A	Benthic Macroinvertebrates		
Lower Delaware	20	Pleasant Run at Extonville Rd in Hamilton Twp	AN0126B	Aquatic Life	Pleasant Run at Extonville Rd in Hamilton	AN0126B	Benthic Macroinvertebrates		
Raritan	08	Pleasant Run at S Br Rd in Branchburg Twp	AN0340	Aquatic Life	Pleasant Run at S Br Rd in Branchburg	AN0340	Benthic Macroinvertebrates		
Northwest	01	Plum Brook at Pine Hill Rd in Delaware Twp	AN0093	Aquatic Life	Plum Brook at Pine Hill Rd in Delaware	AN0093	Benthic Macroinvertebrates		
Northwest	11	Plum Brook near Locktown	01461262	Fecal Coliform	Plum Brook near Locktown	01461262	Fecal Coliform		
Northwest	01	Pohatcong Creek at Buttermilk Bridge Rd in Washington Twp	AN0057	Aquatic Life	Pohatcong Creek at Buttermilk Bridge Rd in Washington	AN0057	Benthic Macroinvertebrates		
Northwest	01	Pohatcong Creek at New Village	01455200	Phosphorus, Fecal Coliform, pH, Temperature	Pohatcong Creek at New Village	01455200	Phosphorus, Fecal Coliform, pH, Temperature		
Northwest	01	Pohatcong Creek at O'Brian Rd in Mansfield Twp	AN0054A	Aquatic Life	Pohatcong Creek at O'Brian Rd in Mansfield	AN0054A	Benthic Macroinvertebrates		

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Northwest	01	Pohatcong Creek at Tunnel Hill Rd in Mansfield Twp	AN0055	Aquatic Life	Pohatcong Creek at Tunnel Hill Rd in Mansfield	AN0055	Benthic Macroinvertebrates		
Atlantic Coast	13	Pohatcong/Tuckerton Lake	Pohatcong Lake-13	Nutrients/Sedimentation (Eutrophic)	Pohatcong/Tuckerton Lake-13	Pohatcong Lake		Phosphorus 3	
Atlantic Coast	13	Point Pleasant Canal	1308C	Pathogens	Point Pleasant Canal	1308C	Total Coliform		
Lower Delaware	19	Pompeston Creek at New Albany Rd in Moorestown	AN0177A	Aquatic Life	Pompeston Creek at New Albany Rd in Moorestown	AN0177A	Benthic Macroinvertebrates		
Lower Delaware	18	Pompeston Creek at Rt 130 in Cinnaminson Twp	AN0177	Aquatic Life	Pompeston Creek at Rt 130 in Cinnaminson	AN0177	Benthic Macroinvertebrates		
Northeast	03	Pompton Lake-03	Pompton Lake	Fish-Mercury	Pompton Lake-03	Pompton Lake	Fish-Mercury		
Northeast	03	Pompton R at Newark Pompton Tnpk in Pequannock Twp	AN0268	Aquatic Life, Unknown Toxicity	Pompton River at Newark Pompton Tnpk in Pequannock	AN0268	Benthic Macroinvertebrates, Unknown Toxicity		
Northeast	03	Pompton River at Pompton Plains	01388500, 3-SITE-7	Lead	Pompton River at Pompton Plains	01388500, 3-SITE-7	Lead		
Northeast	03	Pompton River at Pompton Plains Cross Rd in Pequannock Twp	AN0268A	Aquatic Life, Unknown Toxicity	Pompton River at Pompton Plains Cross Rd in Pequannock	AN0268A	Benthic Macroinvertebrates, Unknown Toxicity		
Northwest	11	Pond Run at Rt 533 in Hamilton Twp	AN0117	Aquatic Life	Pond Run at Rt 533 in Hamilton	AN0117	Benthic Macroinvertebrates		
Atlantic Coast	12	Poplar Brook at Deal	01407630, 59	Phosphorus, Fecal Coliform	Poplar Brook at Deal	01407630, 59	Phosphorus	Fecal Coliform 3	
Northeast	06	Powder Mill Pond-06	Tabor Lake Corporation	Fecal Coliform	Powder Mill Pond-06	Tabor Lake Corporation	Fecal Coliform		
Northeast	04	Preakness Brook at French Hill Rd in Wayne Twp	AN0273	Aquatic Life	Preakness Brook at French Hill Rd in Wayne	AN0273	Benthic Macroinvertebrates		
Northeast	04	Preakness Brook near Little Falls	01389080	Fecal Coliform	Preakness Brook near Little Falls	01389080		Fecal Coliform 3	
Lower Delaware	19	Presidential Lakes-19	Presidential Lakes	Fecal Coliform	Presidential Lakes-19	Presidential Lakes		Fecal Coliform 1B	
Atlantic Coast	14	Pump Branch near Waterford Works	01409408	pH	Pump Branch near Waterford Works	01409408	pH		
Lower Delaware	18	Raccoon Creek at Ellis Mill Rd in Elk Twp	AN0679	Aquatic Life	Raccoon Creek at Ellis Mill Rd in Elk	AN0679	Benthic Macroinvertebrates		
Lower Delaware	18	Raccoon Creek at Tomlin Sta Rd in Harrison Twp	AN0683	Aquatic Life	Raccoon Creek at Tomlin Sta Rd in Harrison	AN0683	Benthic Macroinvertebrates		
Lower Delaware	18	Raccoon Creek near Swedesboro	01477120, 18-RAC-1	Phosphorus, Fecal Coliform, Silver	Raccoon Creek near Swedesboro	01477120, 18-RAC-1	Phosphorus, Silver	Fecal Coliform 3	
Lower Delaware	18	Raccoon Creek S Br at High St in Harrison Twp	AN0682	Aquatic Life	Raccoon Creek S Br at High St in Harrison	AN0682	Benthic Macroinvertebrates		
Lower Delaware	17	Raccoon Ditch at Davis Mill Rd in Greenwich Twp	AN0708	Aquatic Life	Raccoon Ditch at Davis Mill Rd in Greenwich	AN0708	Benthic Macroinvertebrates		
Raritan	07	Rahway River at Kenilworth Blvd in Cranford Twp	AN0194	Aquatic Life	Rahway River at Kenilworth Blvd in Cranford	AN0194	Benthic Macroinvertebrates		
Raritan	07	Rahway River at Rahway	01395000, 7-RAH-1	Phosphorus, Fecal Coliform, Arsenic	Rahway River at Rahway	01395000, 7-RAH-1	Phosphorus, Arsenic, TCE	Fecal Coliform 3	TCE
Raritan	07	Rahway River at River Rd & Church St in Rahway	AN0195	Aquatic Life	Rahway River at River Rd & Church St in Rahway	AN0195	Benthic Macroinvertebrates		
Raritan	07	Rahway River at Washington Ave (Rt 82) in Springfield Twp	AN0193	Aquatic Life	Rahway River at Washington Ave (Rt 82) in Springfield	AN0193	Benthic Macroinvertebrates		
Raritan	07	Rahway River near Springfield	01394500	Fecal Coliform	Rahway River near Springfield	01394500	Phosphorus	Fecal Coliform 3	Phosphorus
Raritan	07	Rahway River S Br at Merrill Park in Woodbridge Twp	AN0201	Aquatic Life	Rahway River S Br at Merrill Park in Woodbridge	AN0201	Benthic Macroinvertebrates		
Raritan	07	Rahway River S Br at Parsonnage Rd in Edison Twp	AN0200	Aquatic Life	Rahway River S Br at Parsonnage Rd in Edison	AN0200	Benthic Macroinvertebrates		
Raritan	07	Rahway River W Br at Northfield Ave at West Orange	01393960	Phosphorus, Fecal Coliform, Dissolved Solids, Copper, Lead, Zinc	Rahway River W Br at Northfield Av at West Orange	01393960	Phosphorus, Dissolved Solids, Chloride	Copper, Lead, Zinc 1A, Fecal Coliform 3	Chloride
Northeast	06	Rainbow Lakes-06	Rainbow Lakes Comm. Club	Fecal Coliform	Rainbow Lakes-06	Rainbow Lakes Comm. Club	Fecal Coliform		
Atlantic Coast	12	Ramanessin Brook at Willow Rd in Holmdel	53	Phosphorus, Fecal Coliform	Ramanessin Brook at Willow Rd in Holmdel	53	Phosphorus	Fecal Coliform 3	

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Northeast	03	Ramapo River near Mahwah	01387500, 3-SITE-9, 3-RAM-1	Phosphorus, Fecal Coliform	Ramapo River near Mahwah	01387500, 3-SITE-9, 3-RAM-1	Phosphorus	Fecal Coliform 3	
Northeast	04	Ramsey Brook at Allendale	01390900	Fecal Coliform	Ramsey Brook at Allendale	01390900		Fecal Coliform 3	
Northeast	04	Ramsey Brook at Grenadier Dr W of Cortland Tr in Mahwah Twp	AN0286X	Aquatic Life	Ramsey Brook at Grenadier Dr W of Cortland Tr in Mahwah	AN0286X	Benthic Macroinvertebrates		
Northeast	04	Ramsey Brook at Masonicus Rd in Mahwah Twp	AN0286	Aquatic Life	Ramsey Brook at Masonicus Rd in Mahwah	AN0286	Benthic Macroinvertebrates		
Northeast	04	Ramsey Brook at Park Ave in Allendale	AN0287	Unknown Toxicity	Ramsey Brook at Park Ave in Allendale	AN0287	Benthic Macroinvertebrates, Unknown Toxicity		Benthic Macroinvertebrates (mistake from '02)
Lower Delaware	19	Rancocas Creek N Br at Browns Mills	01465970	Phosphorus, Fecal Coliform, pH, Mercury	Rancocas Creek N Br at Browns Mills	01465970	Phosphorus, Fecal Coliform, pH, Mercury		
Lower Delaware	19	Rancocas Creek N Br at Hanover Furnace	01465950, 19-RA-1N	Copper, Mercury, Lead	Rancocas Creek N Br at Hanover Furnace	01465950, 19-RA-1N	Copper, Mercury, Lead		
Lower Delaware	19	Rancocas Creek N Br at Iron Works Park at Mt Holly	01467005	Phosphorus, pH	Rancocas Creek N Br at Iron Works Park at Mt Holly	01467005, 01467006, 01467003, 19-RA-4N	Phosphorus, pH, Arsenic, Copper, Lead	Fecal Coliform 3	Arsenic(mistake from '02)
Lower Delaware	19	Rancocas Creek N Br at Pine St at Mt Holly	01467006, 19-RA-4N	Phosphorus, Fecal Coliform, pH, Copper, Lead	Rancocas Creek N Br at Iron Works Park at Mt Holly	01467005, 01467006, 01467003, 19-RA-4N	Phosphorus, pH, Arsenic, Copper, Lead	Fecal Coliform 3	Arsenic(mistake from '02)
Lower Delaware	19	Rancocas Creek N Br at Pemberton	01467000, 19-RA-3N	Copper, Lead	Rancocas Creek N Br at Pemberton	01467000, 19-RA-3N	Copper, Lead		
Lower Delaware	19	Rancocas Creek N Br at Pine St Pk in Mount Holly Twp	AN0151	Aquatic Life	Rancocas Creek N Br at Pine St Pk in Mount Holly	AN0151	Benthic Macroinvertebrates		
Lower Delaware	19	Rancocas Creek S Br at Hainesport	19-RA-1S	Phosphorus, Fecal Coliform, Lead	Rancocas Creek S Br at Hainesport	Rancocas, EWQ0176S, 19-RA-1S	Phosphorus, Fecal Coliform, Arsenic	Lead 1B	Arsenic(mistake from '02)
Lower Delaware	19	Rancocas Creek S Br at Mt Holly - Eayrestown Rd in Lumberton Twp	AN0161	Aquatic Life	Rancocas Creek S Br at Mt Holly - Eayrestown Rd in Lumberton	AN0161	Benthic Macroinvertebrates		
Lower Delaware	19	Rancocas Creek S Br at Vincentown	01465850, 19-RA-3S	Phosphorus, pH, Lead	Rancocas Creek S Br at Vincentown	01465850, 19-RA-3S	Phosphorus, pH, Lead		
Raritan	08	Randolph Park Lake-08	Randolph Park Lake Left Beach, Right Beach, and Swim Lanes	Fecal Coliform	Randolph Park Lake-08	Randolph Park Lake Left Beach, Right Beach, and Swim Lanes	Fecal Coliform		
Raritan	09	Raritan Bay	Raritan Bay-1 thru 7	Pathogens	Raritan Bay	Raritan Bay-1 thru 7	Total Coliform		
Raritan	09	Raritan Bay and Tidal Tributaries		Fish-PCB, Fish-Dioxin	Raritan Bay and Tidal Tributaries	Raritan Bay and Tidal Tributaries	Fish-PCB, Fish-Dioxin		
Raritan	09	Raritan Bay/River		Fish-Mercury	Raritan River	Raritan River	Fish-Mercury		
Raritan	09	Raritan River (non-tidal)		Mercury	Raritan River (non-tidal)			Merged w/ 01403300 and delisted	
Raritan	09	Raritan River abv Millstone River conf in Bridgewater Twp	AN0377	Aquatic Life	Raritan River abv Millstone River conf in Bridgewater	AN0377	Benthic Macroinvertebrates		
Raritan	09	Raritan River at Manville	01400500	Phosphorus, Fecal Coliform, pH	Raritan River at Manville	01400500	Phosphorus	pH 1B, Fecal Coliform 3	
Raritan	09	Raritan River at Queens Bridge	01403300	Phosphorus, Fecal Coliform, Total Suspended Solids	Raritan River at Queens Bridge	01403300	Phosphorus, Total Suspended Solids, Arsenic, Benzene	Mercury (Raritan River (non-tidal)) 1B, Fecal Coliform 3	Arsenic, Benzene
Raritan	09	Raritan River Estuary		Pathogens	Raritan River Estuary	Raritan River Estuary	Total Coliform		
Raritan	09	Raritan River Estuary, 02030105-001		Arsenic, Cadmium, Zinc	Raritan River Estuary	Raritan River Estuary, Reach 02030105-001	Arsenic, Cadmium, Zinc		
Raritan	09	Raritan River Estuary, 02030105-002		Arsenic, Cadmium, PCB	Raritan River Estuary	Raritan River Estuary, Reach 02030105-002	Arsenic, Cadmium, PCB		
Raritan	08	Raritan River N Br at Burnt Mills	01399120, 8-NB-2	Fecal Coliform, Copper	Raritan River N Br at Burnt Mills	01399120, 8-NB-2	Copper	Fecal Coliform 3	
Raritan	08	Raritan River N Br at Roxitucus Rd in Mendham Twp	AN0351A	Aquatic Life	Raritan River N Br at Roxitucus Rd in Mendham	AN0351A	Benthic Macroinvertebrates		
Raritan	08	Raritan River N Br near Chester	01398260	Fecal Coliform	Raritan River N Br near Chester	01398260		Fecal Coliform 3	
Raritan	08	Raritan River N Br near Raritan	01400000	Phosphorus, Fecal Coliform	Raritan River N Br near Raritan	01400000		Phosphorus 1B, Fecal Coliform 3	
Raritan	08	Raritan River S Br Arch St at High Bridge	01396535, 8-SB-2	Fecal Coliform, Temperature	Raritan River S Br Arch St at High Bridge	01396535, 8-SB-2	Temperature	Fecal Coliform 3	
Raritan	08	Raritan River S Br at Middle Valley	01396280, 8-SB-1	Phosphorus, Fecal Coliform, Temperature	Raritan River S Br at Middle Valley	01396280, EWQ0316, 8-SB-1	Phosphorus, Temperature	Fecal Coliform 3	

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Raritan	08	Raritan River S Br at South Branch	01398102, 8-SB-6	Phosphorus, Fecal Coliform, pH, Arsenic, Chromium, Copper, Lead	Raritan River S Br at South Branch	01398102, 01398070, 8-SB 6	Phosphorus, pH, Arsenic, Chromium, Copper, Lead	Fecal Coliform 3	
Raritan	08	Raritan River S Br at Stanton Station	01397000, 8-SB-3	Fecal Coliform, pH, Temperature, Arsenic	Raritan River S Br at Stanton Station	01397000, 8-SB-3	pH, Temperature, Arsenic	Fecal Coliform 3	
Raritan	08	Raritan River S Br at Station Rd in Raritan Twp	AN0326	Aquatic Life	Raritan River S Br at Station Rd in Raritan	AN0326	Benthic Macroinvertebrates		
Raritan	08	Raritan River S Br at Three Bridges	01397400, 8-SB-4	Phosphorus, Fecal Coliform	Raritan River S Br at Three Bridges	01397400, 8-SB-4	Phosphorus	Fecal Coliform 3	
Raritan	08	Ravine Lake-08	Ravine Lake (Somerset Lake)	Fecal Coliform	Ravine Lake-08	Ravine Lake (Somerset Lake)	Fecal Coliform		
Atlantic Coast	15	Reeds Bay	Reeds Bay-1 thru 8	Dissolved Oxygen	Reeds Bay	Reeds Bay-1 thru 8		Dissolved Oxygen 1B	
Atlantic Coast	15	Reeds Bay	Reeds Bay1: Unnamed Creek, Reeds Bay-2: Somers Cove, Reeds Bay-3: Somers Marsh, Reeds Bay-5: Reeds Bay, Reeds Bay-6,8: Reeds Bay/Little Bay	Pathogens	Reeds Bay	Unnamed Creek-1; Somers Cove-2; Somers Marsh-3; Reeds Bay-5,6,8	Total Coliform		
Northeast	06	Ricabear Lake-06	Lake Rickabear Beach	Fecal Coliform	Ricabear Lake-06	Lake Rickabear Beach		Fecal Coliform 1B	
Atlantic Coast	16	Richardson Sound	Thorofare, Richardson Sound-2,7: Unnamed Creek, Richardson Sound-3: Old Turtle Thorofare, Richardson Sound-4: Taugh Creek, Richardson Sound-6: Slaughter Gut, Richardson Sound-8: Stingeree Creek, Richardson Sound-12: Grassy Sound, Richardson Sound-13: Grassy Sound Channel, Richardson Sound-14: Hoffman Canal, Richardson Sound-15: Wildwood Canal, Richardson Sound-16: Mud Creek	Pathogens	Richardson Sound	Old Turtle Thorofare-1; Unnamed Creek-2,7; Old Turtle Thorofare-3; Taugh Creek-4; Slaughter Gut-6; Stingeree Creek-8; Grassy Sound-12	Total Coliform		
Atlantic Coast	13	Ridgeway Br at Rt 70 in Manchester Twp	AN0528	Aquatic Life	Ridgeway Branch at Rt 70 in Manchester	AN0528	Benthic Macroinvertebrates		
Raritan	07	Robinson Br at Scotch Plains	01395200	Phosphorus, Fecal Coliform	Robinson Branch at Scotch Plains	01395200	Phosphorus	Fecal Coliform 3	
Raritan	07	Robinson Br at St Georges Av at Rahway	01396003, 7-ROB-1	Phosphorus, Fecal Coliform, Arsenic	Robinson Branch at St Georges Av at Rahway	01396003, 7-ROB-1	Phosphorus, Arsenic	Fecal Coliform 3	
Raritan	07	Robinsons Br at Goodmans Crossing in Scotch Plains Twp	AN0196	Aquatic Life	Robinsons Branch at Goodmans Crossing in Scotch Plains	AN0196	Benthic Macroinvertebrates		
Raritan	07	Robinsons Br at Rt 27 in Rahway	AN0199	Aquatic Life	Robinsons Branch at Rt 27 in Rahway	AN0199	Benthic Macroinvertebrates		
Raritan	10	Rock Brook at Burnt Hill Rd in Montgomery Twp	AN0400, 10-RO-1	Aquatic Life	Rock Brook at Burnt Hill Rd in Montgomery	AN0400, 10-RO-1	Benthic Macroinvertebrates		
Raritan	08	Rockaway Creek at Whitehouse	01399700, 8-RO-1	Phosphorus, Fecal Coliform, pH, Lead, Mercury	Rockaway Creek at Whitehouse	01399700, EWQ0369, 8-RO-1	Phosphorus, Lead, Mercury	pH 1B, Fecal Coliform 3	
Raritan	08	Rockaway Creek S Br at Rt 22 in Readington Twp	AN0368	Aquatic Life	Rockaway Creek S Br at Rt 22 in Readington	AN0368	Benthic Macroinvertebrates		
Northeast	06	Rockaway River		Fish-Mercury	Rockaway River	Rockaway River	Fish-Mercury		
Northeast	06	Rockaway River at Berkshire Valley	01379700	Fecal Coliform	Rockaway River at Longwood Valley	01379680, 01379700		Fecal Coliform 3	
Northeast	06	Rockaway River at Berkshire Valley Rd in Jefferson Twp	AN0241	Aquatic Life	Rockaway River at Berkshire Valley Rd in Jefferson	AN0241	Benthic Macroinvertebrates		
Northeast	06	Rockaway River at Blackwell St	01379853	Fecal Coliform	Rockaway River at Blackwell St	01379853		Fecal Coliform 3	
Northeast	06	Rockaway River at Boonton	01380500, 6-SITE-11	Arsenic, Cadmium, Chromium, Lead, Mercury, Selenium, Zinc, Tetrachloroethylene, Tricholorethylene	Rockaway River at Boonton	01380500, 01380450, 6-SITE-11	Arsenic, Cadmium, Chromium, Lead, Mercury, Selenium, Zinc, Tetrachloroethylene, Tricholorethylene		

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Northeast	06	Rockaway River at Morris Ave in Boonton	AN0250	Aquatic Life	Rockaway River at Morris Ave in Boonton	AN0250	Benthic Macroinvertebrates		
Northeast	06	Rockaway River at Pine Brook	01381200, 6-SITE-10, 6-ROC-1	Phosphorus, Fecal Coliform, Lead, Tetrachloroethylene, Tricholoroethylene	Rockaway River at Pine Brook	01381200, 6-SITE-10, 6-ROC-1	Phosphorus, Tetrachloroethylene, Tricholoroethylene	Fecal Coliform 3, Lead 1B	
Raritan	10	Rocky Brook at PerrIneville	01400585	Chromium, Lead, Zinc	Rocky Brook at PerrIneville	01400585	Arsenic, Chromium, Lead, Zinc		Arsenic
Raritan	10	Rocky Brook at Rt 33 in Hightstown	AN0381	Aquatic Life	Rocky Brook at Rt 33 in Hightstown	AN0381	Benthic Macroinvertebrates		
Raritan	10	Rocky Brook on Rte 130 in Hightstown	10-ROC-2	Chromium, Lead, Zinc	Rocky Brook on Rte 130 in Hightstown	10-ROC-2	Chromium, Lead, Zinc		
Raritan	10	Rocky Brook on Rte 33 in Hightstown	10-ROC-1	Arsenic, Chromium, Lead, Zinc	Rocky Brook on Rte 33 in Hightstown	10-ROC-1	Arsenic, Chromium, Lead, Zinc		
Raritan	08	Round Valley Reservoir Recreational Area-08	Round Valley Recreational Area	Nutrients/Sedimentation (Eutrophic), Fecal Coliform	Round Valley Reservoir Recreational Area-08			Phosphorus 3, Fecal Coliform 1B	
Raritan	08	Round Valley Reservoir-08	Round Valley Reservoir	Fish-Mercury	Round Valley Reservoir-08	Round Valley Reservoir	Fish-Mercury		
Atlantic Coast	14	Roundabout Creek Estuary	2001F	Pathogens	Roundabout Creek Estuary	2001F	Total Coliform		
Raritan	10	Royce Brook at Rt 533 in Manville	AN0413	Aquatic Life	Royce Brook at Rt 533 in Manville	AN0413	Benthic Macroinvertebrates		
Northeast	04	Saddle River at Dunkerhook Rd in Fair Lawn	AN0289	Aquatic Life, Unknown Toxicity	Saddle River at Dunkerhook Rd in Fair Lawn	AN0289	Benthic Macroinvertebrates, Unknown Toxicity		
Northeast	04	Saddle River at E Allendale Ave in Saddle River	AN0281	Aquatic Life, Unknown Toxicity	Saddle River at E Allendale Ave in Saddle River	AN0281	Benthic Macroinvertebrates, Unknown Toxicity		
Northeast	04	Saddle River at E Ridgewood Ave in Paramus	AN0282	Aquatic Life, Unknown Toxicity	Saddle River at E Ridgewood Ave in Paramus	AN0282	Unknown Toxicity	Aquatic life -1A	
Northeast	04	Saddle River at Fairlawn	01391200, 4-SITE-13, 4-SAD-1	Phosphorus, Fecal Coliform, Unionized Ammonia	Saddle River at Lodi	01391500, 01391200, 01391490, 01391550, Passaic-7, 4-SITE-12, 4-SITE-13, 4-SAD-1	Phosphorus, Dissolved Solids, Arsenic	Fecal Coliform 3, Unionized Ammonia 1B	Total Dissolved Solids, Arsenic
Northeast	04	Saddle River at Lodi	01391500, 4-SITE-12	Phosphorus, Fecal Coliform	Saddle River at Lodi	01391500, 01391200, 01391490, 01391550, Passaic-7, 4-SITE-12, 4-SITE-13, 4-SAD-1	Phosphorus, Dissolved Solids, Arsenic	Fecal Coliform 3, Unionized Ammonia 1B	Total Dissolved Solids, Arsenic
Northeast	04	Saddle River at Rochelle Park	01391490	Phosphorus, Fecal Coliform	Saddle River at Lodi	01391500, 01391200, 01391490, 01391550, Passaic-7, 4-SITE-12, 4-SITE-13, 4-SAD-1	Phosphorus, Dissolved Solids, Arsenic	Fecal Coliform 3, Unionized Ammonia 1B	Total Dissolved Solids, Arsenic
Northeast	04	Saddle River at Marcellus Pl in Garfield	AN0291	Aquatic Life, Unknown Toxicity	Saddle River at Marcellus Pl in Garfield	AN0291	Benthic Macroinvertebrates, Unknown Toxicity		
Northeast	04	Saddle River at Railroad Ave in Rochelle Park Twp	AN0290	Aquatic Life, Unknown Toxicity	Saddle River at Railroad Ave in Rochelle Park	AN0290	Benthic Macroinvertebrates, Unknown Toxicity		
Northeast	04	Saddle River at Ridgewood	01390500	pH	Saddle River at Ridgewood	01390500, 01390518, 01390510	pH	Fecal Coliform 3	
Northeast	04	Saddle River at Ridgewood Avenue at Ridgewood	01390510	Fecal Coliform	Saddle River at Ridgewood	01390500, 01390518, 01390510	pH	Fecal Coliform 3	
Northeast	04	Saddle River at Grove Street A	01390518	Fecal Coliform	Saddle River at Ridgewood	01390500, 01390518, 01390510	pH	Fecal Coliform 3	
Northeast	04	Saddle River at Saddle River	01390470	Fecal Coliform	Saddle River at Saddle River	01390470		Fecal Coliform 1B	
Northeast	04	Saddle River W Br at Old Stone Church Rd in Upper Saddle River	AN0280	Aquatic Life	Saddle River W Br at Old Stone Church Rd in Upper Saddle River	AN0280	Benthic Macroinvertebrates		
Northeast	04	Saddle River W Br at Upper Saddle River	01390445	Fecal Coliform	Saddle River W Br at Upper Saddle River	01390445		Fecal Coliform 3	
Lower Delaware	17	Salem River at Commissioners Rd (Rt 581) in Upper Pittsgrove Twp	AN0690	Aquatic Life	Salem River at Commissioners Rd (Rt 581) in Upper Pittsgrove	AN0690	Benthic Macroinvertebrates		
Lower Delaware	17	Salem River at Courses Landing		Phosphorus, Fecal Coliform, Temperature, Dissolved Oxygen	Salem River at Courses Landing	Salem River at Courses Landing	Phosphorus, Temperature, Dissolved Oxygen	Fecal Coliform 3	

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Lower Delaware	17	Salem River at Kings Hwy in Pilesgrove Twp	AN0693	Aquatic Life	Salem River at Kings Hwy in Pilesgrove	AN0693	Benthic Macroinvertebrates		
Lower Delaware	17	Salem River at Newkirk Sta Rd in U Pittsgrove Twp	AN0690A	Aquatic Life	Salem River at Newkirk Sta Rd in U Pittsgrove	AN0690A	Benthic Macroinvertebrates		
Lower Delaware	17	Salem River at Woodstown	01482500	Phosphorus, Fecal Coliform	Salem River at Woodstown	01482500	Phosphorus	Fecal Coliform 3	
Atlantic Coast	16	Savages Run in Belleplain State Forest	01411441	Fecal Coliform	Savages Run in Belleplain State Forest	01411441		Fecal Coliform 3	
Raritan	08	Second Neshanic River at Rt 31 in Raritan Twp	AN0331	Aquatic Life	Second Neshanic River at Rt 31 in Raritan	AN0331	Benthic Macroinvertebrates		
Northeast	04	Second River at McCarter Hwy in Belleville	AN0293	Aquatic Life	Second River at McCarter Hwy in Belleville	AN0293	Benthic Macroinvertebrates		
Northwest	01	Seneca Lake-01	Seneca Lake	Fecal Coliform	Seneca Lake-01	Seneca Lake		Fecal Coliform 1B	
Northwest	11	Shabakunk Creek at Rt 206 in Lawrence Twp	AN0114	Aquatic Life	Shabakunk Creek at Rt 206 in Lawrence	AN0114	Benthic Macroinvertebrates		
Atlantic Coast	12	Shadow Lake-12	Shadow Lake	Fish-Mercury	Shadow Lake-12	Shadow Lake	Fish-Mercury		
Atlantic Coast	13	Shannoc Brook Trib at Colliers Mills	01408480	pH	Shannoc Brook Trib at Colliers Mills	01408480	pH		
Atlantic Coast	12	Shark River at Remsens Mills Rd in Neptune Twp	AN0482	Aquatic Life	Shark River at Remsens Mills Rd in Neptune	AN0482	Benthic Macroinvertebrates		
Atlantic Coast	12	Shark River at Shark River Sta Rd in Wall Twp	AN0481	Aquatic Life	Shark River at Shark River Sta Rd in Wall	AN0481	Benthic Macroinvertebrates		
Atlantic Coast	12	Shark River Brook at Shark River Station Rd in Tinton Falls	30	Phosphorus	Shark River Brook at Shark River Station Rd in Tinton Falls	30	Phosphorus		
Atlantic Coast	12	Shark River Estuary	Shark River Estuary-1: Shark River	Dissolved Oxygen, Pathogens	Shark River Estuary	Shark River Estuary-1	Dissolved Oxygen, Total Coliform		
Atlantic Coast	12	Shark River near Neptune	01407705	Phosphorus, Fecal Coliform	Shark River near Neptune	01407750, EWQ0482	Phosphorus, Fecal Coliform		
Lower Delaware	19	Sharps Run at Rt 541 at Medford	01465884	Phosphorus, Fecal Coliform	Sharps Run at Rt 541 at Medford	01465884	Phosphorus	Fecal Coliform 3	
Northwest	01	Shipetaukin Creek at Rt 583 in Lawrence Twp	AN0111	Aquatic Life	Shipetaukin Creek at Rt 583 in Lawrence	AN0111	Benthic Macroinvertebrates		
Atlantic Coast	12	Shrewsbury River Estuary	Shrewsbury/Navesink Estuary-4 thru 7	Pathogens	Shrewsbury River Estuary	Shrewsbury/Navesink Estuary-4 thru 8	Total Coliform		
Raritan	10	Six Mile Run at Canal Rd in Franklin Twp	AN0409	Aquatic Life	Six Mile Run at Canal Rd in Franklin	AN0409	Benthic Macroinvertebrates		
Atlantic Coast	15	Skulls Bay	Skulls Bay-1 thru 5	Dissolved Oxygen	Skulls Bay	Skulls Bay-1 thru 5		Dissolved Oxygen 1B	
Atlantic Coast	15	Skulls Bay	Skulls Bay-2,3: Skulls Bay	Pathogens	Skulls Bay	Skulls Bay-2,3	Total Coliform		
Northeast	03	Skyline Lakes-03	Skyline Lake Main/Lower Beach and Upper Beach	Fecal Coliform	Skyline Lakes-03	Skyline Lake Main/Lower Beach and Upper Beach	Fecal Coliform		
Atlantic Coast	14	Sleeper Branch near Atsion	0140940370	pH	Sleeper Branch near Atsion	0140940370	pH		
Northeast	06	Slough Brook at Parsonage Hill Rd in Millburn Twp	AN0231C	Aquatic Life	Slough Brook at Parsonage Hill Rd in Millburn	AN0231C	Benthic Macroinvertebrates		
Raritan	09	South River		Arsenic, Cadmium, Chromium. Copper, Lead, Mercury	South River	South River	Arsenic, Cadmium, Chromium. Copper, Lead, Mercury		
Atlantic Coast	15	South River near Belcoville	01411220	pH	South River near Belcoville	01411220	pH		
Atlantic Coast	12	Spring Lake-12	Spring Lake	Nutrients/Sedimentation (Eutrophic), Fish-Mercury	Spring Lake-12	Spring Lake	Phosphorus, Fish-Mercury		
Lower Delaware	20	Spring Lake-20	Spring Lake	Nutrients/Sedimentation (Eutrophic)	Spring Lake-20	Spring Lake		Phosphorus 3	
Atlantic Coast	14	Springers Brook near Hampton Furnace	01409455	pH	Springers Brook near Hampton Furnace	01409455	pH		
Raritan	08	Spruce Run at Clinton	01396800, 8-SP-1	Phosphorus, pH, Temperature, Cadmium	Spruce Run at Clinton	01396800, 8-SP-1	Phosphorus, Temperature, pH, Cadmium		
Raritan	08	Spruce Run at Newport	01396550	Fecal Coliform, Temperature	Spruce Run at Newport	01396550	Temperature	Fecal Coliform 1B	

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Raritan	08	Spruce Run near Glen Gardner	01396588, 8-SP-2	Fecal Coliform, Temperature	Spruce Run near Glen Gardner	01396588, 8-SP-2	Temperature	Fecal Coliform 3	
Raritan	08	Spruce Run Reservoir-08	Spruce Run Reservoir	Aquatic Life, Fish-Mercury	Spruce Run Reservoir-08	Spruce Run Reservoir	Fish Community, Fish-Mercury		
Atlantic Coast	12	Squankum Brook at Easy St & Rt 547 in Howell	MB-16	Aquatic Life	Squankum Brook at Easy St & Rt 547 in Howell	MB-16		Benthic Macroinvertebrates 1A	
Atlantic Coast	12	Squankum Brook at Easy St in Howell	16	Fecal Coliform	Squankum Brook at Easy St in Howell	16		Fecal Coliform 3	
Atlantic Coast	14	Stafford Forge Lake-14	Stafford Forge Lake	Fish-Mercury	Stafford Forge Lake-13	Stafford Forge Lake	Fish-Mercury		
Lower Delaware	18	Stewart Lake-18	Stewart Lake	Fish-Clordane	Stewart Lake-18	Stewart Lake	Fish-PCB, Fish-Dioxin	Fish-Chlordane 1B	
Lower Delaware	17	Still Run at Ltl Mill Rd in Franklin Twp	AN0730	Aquatic Life	Still Run at Ltl Mill Rd in Franklin	AN0730	Benthic Macroinvertebrates		
Lower Delaware	18	Still Run at Union Rd in E Greenwich Twp	AN0675A	Aquatic Life	Still Run at Union Rd in E Greenwich	AN0675A	Benthic Macroinvertebrates		
Lower Delaware	17	Still Run near Malaga	01411453	pH	Still Run near Malaga	01411453	pH		
Lower Delaware	18	Still Run near Mickelton	01476600	Fecal Coliform	Still Run near Mickelton	01476600		Fecal Coliform 3	
Lower Delaware	18	Stone Bridge Br above Waddell's Bridge in Gloucester Twp	AN0655A	Aquatic Life	Stone Bridge Branch above Waddell's Bridge in Gloucester	AN0655A	Benthic Macroinvertebrates		
Lower Delaware	18	Stone Bridge Br below Waddell's Bridge in Gloucester Twp	AN0655B	Aquatic Life	Stone Bridge Branch below Waddell's Bridge in Gloucester	AN0655B	Benthic Macroinvertebrates		
Lower Delaware	18	Stone Bridge Br trib at Waddell Farm in Gloucester Twp	AN0655	Aquatic Life	Stone Bridge Branch trib at Waddell Farm in Gloucester	AN0655	Benthic Macroinvertebrates		
Northeast	06	Stony Brook at Boonton	01380320	Fecal Coliform	Stony Brook at Boonton	01380320		Fecal Coliform 3	
Raritan	10	Stony Brook at Carter Rd. in Lawrence Twp.	AN0393B	Aquatic Life	Stony Brook at Carter Rd in Lawrence.	AN0393B	Benthic Macroinvertebrates		
Raritan	08	Stony Brook at Fairview Avenue at Naughright	01396219	Fecal Coliform	Stony Brook at Fairview Avenue at Naughright	01396219		Fecal Coliform 3	
Raritan	10	Stony Brook at Linvale Rd in Amwell Twp	AN0391A	Aquatic Life	Stony Brook at Linvale Rd in Amwell	AN0391A	Benthic Macroinvertebrates		
Raritan	10	Stony Brook at Mine Rd in Hopewell Twp	AN0391	Aquatic Life	Stony Brook at Mine Rd in Hopewell	AN0391	Benthic Macroinvertebrates		
Raritan	10	Stony Brook at Old Mill Rd in Hopewell Twp	AN0392	Aquatic Life	Stony Brook at Old Mill Rd in Hopewell	AN0392	Benthic Macroinvertebrates		
Raritan	10	Stony Brook at Pennington-Rocky Hill Rd in Hopewell Twp	AN0392A	Aquatic Life	Stony Brook at Pennington-Rocky Hill Rd in Hopewell	AN0392A	Benthic Macroinvertebrates		
Raritan	10	Stony Brook at Princeton	01401000, 10-STO-1, 10-STO-4	Phosphorus, Fecal Coliform, pH, Total Suspended Solids, Arsenic, Copper, Lead	Stony Brook at Princeton	01401000, 10-STO-1, 10-STO-4	Phosphorus, pH, Total Suspended Solids, Arsenic	Copper, Lead 1B, Fecal Coliform 3	
Raritan	10	Stony Brook at Province Line Rd. in Princeton Twp.	AN0393A	Aquatic Life	Stony Brook at Province Line Rd in Princeton.	AN0393A	Benthic Macroinvertebrates		
Raritan	10	Stony Brook at Rt 206 in Princeton Twp	AN0393	Aquatic Life	Stony Brook at Rt 206 in Princeton	AN0393	Benthic Macroinvertebrates		
Raritan	09	Stony Brook at Sunlit Dr. in Watchung Boro.	AN0422A	Aquatic Life	Stony Brook at Sunlit Dr. in Watchung	AN0422A	Benthic Macroinvertebrates		
Northeast	06	Stony Brook at Valley Rd in Boonton Twp	AN0249	Aquatic Life	Stony Brook at Valley Rd in Boonton	AN0249	Benthic Macroinvertebrates		
Raritan	09	Stony Brook at Westend Ave in North Plainfield	AN0422	Aquatic Life	Stony Brook at Westend Ave in North Plainfield	AN0422	Benthic Macroinvertebrates		
Raritan	10	Stony Brook on Mine Rd in Hopewell Twp. (RF3 02030105-029)	10-STO-3	Arsenic, Cadmium, Chromium, Lead, Mercury, Zinc	Stony Brook on Mine Rd in Hopewell	10-STO-3	Mercury	Arsenic, Cadmium, Chromium, Lead, Zinc 1B	
Lower Delaware	17	Straight Creek Estuary	3869A	Pathogens	Straight Creek Estuary	3869A	Total Coliform		
Lower Delaware	18	Strawbridge Lake-18	Strawbridge Lake	Fish-Chlordane	Strawbridge Lake-18	Strawbridge Lake	Fish-PCB, Fish-Dioxin	Fish-Chlordane 1B	Fish-PCB, Fish-Dioxin
Lower Delaware	19	Sturbridge Lake-19	Chatham Lake	Fecal Coliform	Sturbridge Lake-19	Chatham Lake, Foxview Beach	Fecal Coliform		
Northwest	02	Summit Lake-02	Summit Lake	Fecal Coliform	Summit Lake-02	Summit Lake		Fecal Coliform 1B	

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Northeast	06	Sunrise Lake-06	Sunrise Lake	Fecal Coliform	Sunrise Lake-06	Sunrise Lake	Fecal Coliform		
Raritan	08	Sunset Lake-08	Sunset Lake	Fecal Coliform	Sunset Lake-08	Sunset Lake	Fecal Coliform		
Lower Delaware	17	Sunset Lake-17	Sunset Lake	Nutrients/Sedimentation (Eutrophic)	Sunset Lake-17	Sunset Lake, Sunset Lake Bathing Beach	Fecal Coliform, Fish-Mercury	Phosphorus 3	Fecal Coliform, Fish-Mercury
Northwest	01	Swartswood Lake-01	Swartswood Lake	Nutrients/Sedimentation (Eutrophic), Fish-Mercury	Swartswood Lake-01	Swartswood Lake	Phosphorus, Fish Community, Fish-Mercury		Fish Community
Lower Delaware	19	Swedes Run at Garwood Rd in Moorestown	AN0176A	Aquatic Life	Swedes Run at Garwood Rd in Moorestown	AN0176A	Benthic Macroinvertebrates		
Lower Delaware	18	Swedes Run at Rt 130 in Delran Twp	AN0176	Aquatic Life	Swedes Run at Rt 130 in Delran	AN0176	Benthic Macroinvertebrates		
Northwest	02	Tall Timbers POA	Tall Timbers POA	Fecal Coliform	Tall Timbers POA	Tall Timbers POA	Fecal Coliform		
Northeast	06	Telemark Lake-06	Lake Telemark	Fecal Coliform	Telemark Lake-06	Lake Telemark	Fecal Coliform		
Northeast	05	Tenakill Brook at Cedar Lane at Closter	01378387, 5-TEN-2	Fecal Coliform, Arsenic	Tenakill Brook at Cedar Lane at Closter	01378387, 5-TEN-2	Arsenic	Fecal Coliform 3	
Northeast	05	Tenakill Brook at Cedar Ln in Closter	AN0209	Aquatic Life	Tenakill Brook at Cedar Ln in Closter	AN0209	Benthic Macroinvertebrates		
Northeast	05	Tenakill Brook on Grant Ave, Creskill	5-TEN-1	Lead	Tenakill Brook on Grant Ave, Creskill	5-TEN-1		Lead 1A	
Raritan	09	Tennent Brook at Old Bridge-South Amboy Rd in Old Bridge Twp	AN0455	Aquatic Life	Tennent Brook at Old Bridge-South Amboy Rd in Old Bridge	AN0455	Benthic Macroinvertebrates		
Lower Delaware	17	The Glades	3840K	Pathogens	The Glades	3840K	Total Coliform		
Raritan	08	Third Neshanic River at Rt 31 in Raritan Twp	AN0332	Aquatic Life	Third Neshanic River at Rt 31 in Raritan	AN0332	Benthic Macroinvertebrates		
Northeast	04	Third River at Kingland Ave in Clifton	AN0292	Aquatic Life	Third River at Kingland Ave in Clifton	AN0292	Benthic Macroinvertebrates		
Northeast	04	Third River at W Passaic Ave in Bloomfield	AN0292A	Aquatic Life	Third River at W Passaic Ave in Bloomfield	AN0292A		Benthic Macroinvertebrates 1A	
Lower Delaware	19	Timber Lake-19	Timber Lake	Fecal Coliform	Timber Lake-19	Timber Lake	Fecal Coliform		
Atlantic Coast	13	Titmouse Creek at Friendship Rd in Howell	19	Fecal Coliform	Titmouse Creek at Friendship Rd in Howell	19		Fecal Coliform 3	
Northwest	01	Tomahawk Lake-01	Tomahawk Lake (Kiddie Lake Area) and (Large Lake Area)	Fecal Coliform	Tomahawk Lake-01	Tomahawk Lake (Kiddie Lake Area) and (Large Lake Area)		Fecal Coliform 1B	
Lower Delaware	18	Toms Dam Br at Peter Cheeseman Rd in Gloucester Twp	AN0658A	Aquatic Life	Toms Dam Branch at Peter Cheeseman Rd in Gloucester	AN0658A	Benthic Macroinvertebrates		
Atlantic Coast	13	Toms River - Tidal		Arsenic, Copper, Lead, Nickel, Zinc	Toms River - Tidal	Toms River - Tidal	Arsenic, Copper, Lead, Nickel, Zinc		
Atlantic Coast	13	Toms River at Anderson Rd in Jackson Twp	AN0519A	Aquatic Life	Toms River at Anderson Rd in Jackson	AN0519A	Benthic Macroinvertebrates		
Atlantic Coast	13	Toms River at Route 537 in Millstone	7	Phosphorus, Fecal Coliform	Toms River at Route 537 in Millstone	7	Phosphorus	Fecal Coliform 3	
Atlantic Coast	13	Toms River Estuary	Toms River Estuary-1: Toms River, Toms River Estuary-2: Toms River/Barnegat Bay	Pathogens, Arsenic, Copper, Lead, Nickel, Zinc	Toms River Estuary	Toms River Estuary-1; Toms River/Barnegat Bay-2	Total Coliform, Arsenic, Copper, Lead, Nickel, Zinc		
Atlantic Coast	13	Toms River near Toms River	01408500, 13-TOM-1	Fecal Coliform, pH, Lead	Toms River near Toms River	01408500, 01408300, 13-TOM-1	pH, Lead	Fecal Coliform 3	
Atlantic Coast	13	Toms River Trib at Rt 37 in Dover Twp	AN0544	Aquatic Life	Toms River Trib at Rt 37 in Dover	AN0544	Benthic Macroinvertebrates		
Raritan	09	Topanemus Lake-09	Topanemus Lake	Nutrients/Sedimentation (Eutrophic)	Topanemus Lake-09	Topanemus Lake		Phosphorus 3	
Atlantic Coast	12	Town Brook at Middletown	01407090	Fecal Coliform	Town Brook at Middletown	01407090		Fecal Coliform 3	
Lower Delaware	17	Town Swamp Brook at Buckshutem Rd in Fairfield Twp	AN0716A	Aquatic Life	Town Swamp Brook at Buckshutem Rd in Fairfield	AN0716A	Benthic Macroinvertebrates		
Atlantic Coast	16	Townsend Sound	Townsend Sound-1: Clam Thorofare, Townsend Sound-2: Lower Ludlam Thorofare, Townsend Sound-4,5: Townsend Channel	Pathogens	Townsend Sound	Clam Thorofare-1; Lower Ludlam Thorofare-2; Townsend Channel-4,5	Total Coliform		

Region	WMA	2002 Station Name/Waterbody	2002 Site ID #	Previously Listed on 2002 Sublist 5	2004 Station Name/Waterbody	2004 Site ID #	Listed on 2004 Sublist 5	Delisted/Rational	Parameters Added
Atlantic Coast	12	Trout Brook at Richdale Rd in Colts Neck	55	Fecal Coliform	Trout Brook at Richdale Rd in Colts Neck	55	Fecal Coliform		
Northwest	01	Trout Brook at Rt 57 in Hackettstown	AN0068	Aquatic Life	Trout Brook at Rt 57 in Hackettstown	AN0068	Benthic Macroinvertebrates		
Northwest	01	Trout Brook at Rt 612 in Allamuchy Twp	AN0038	Aquatic Life	Trout Brook at Rt 612 in Allamuchy	AN0038	Benthic Macroinvertebrates		
Atlantic Coast	12	Troutmans Creek at Atlantic Ave in Long Branch	47	Fecal Coliform	Troutmans Creek at Atlantic Ave in Long Branch	47	Fecal Coliform		
Atlantic Coast	12	Troutmans Creek at Joline Ave in Long Branch	62	Fecal Coliform	Troutmans Creek at Joline Ave in Long Branch	62	Fecal Coliform		
Atlantic Coast	15	Tuckahoe River Estuary	2901A, 2901B, 2902, 2902A	Pathogens	Tuckahoe River Estuary	2901A, 2901B, 2902, 2902A	Total Coliform		
Atlantic Coast	12	Turkey Swamp Brook below Turkey Swamp Lk in Freehold Twp	AN0489A	Aquatic Life	Turkey Swamp Brook below Turkey Swamp Lk in Freehold	AN0489A	Benthic Macroinvertebrates		
Lower Delaware	17	Two Penny Run near Danceys Corner	01482560	Phosphorus, Fecal Coliform	Two Penny Run near Danceys Corner	01482560	Phosphorus	Fecal Coliform 3	
Atlantic Coast	13	Union Br at Colonial Dr in Manchester Twp	AN0533	Aquatic Life	Union Branch at Colonial Dr in Manchester	AN0533	Benthic Macroinvertebrates		
Lower Delaware	17	Union Lake-17	Union Lake	Fish-Mercury	Union Lake-17	Union Lake	Fish-Mercury		
Lower Delaware	17	Upper Maurice River Estuary	3900J, 3900I, 3900M	Pathogens	Maurice River Estuary	3900J, 3900I, 3900M	Total Coliform		
Northwest	01	Upper Mohawk Lake-01	Upper Mohawk Lake	Fecal Coliform	Upper Mohawk Lake-01	Upper Mohawk Lake		Fecal Coliform 1B	
Lower Delaware	20	Upper Sylvan Lake-20	Sylvan Lake	Fecal Coliform	Upper Sylvan Lake-20	Sylvan Lake	Phosphorus, Fecal Coliform		
Northeast	04	Valentine Brook at Forest Ave in Allendale	AN0284	Unknown Toxicity	Valentine Brook at Forest Ave in Allendale	AN0284	Unknown Toxicity		
Northeast	05	Van Saun Brook at Main St & Rt 4 in Hackensack	AN0211	Aquatic Life	Van Saun Brook at Main St & Rt 4 in Hackensack	AN0211	Benthic Macroinvertebrates		
Northeast	04	Verona Park Lake-04	Verona Park Lake	Nutrients/Sedimentation (Eutrophic)	Verona Park Lake-04	Verona Park Lake		Phosphorus 3	
Atlantic Coast	12	Waackcaack Creek at Highland Ave in Keansburg	35	Fecal Coliform	Waackaack Creek-Tidal	35, R65	Fecal Coliform, Total Coliform		Total Coliform
Atlantic Coast	14	Wading River		Fish-Mercury	Wading River	Wading River	Fish-Mercury		
Atlantic Coast	14	Wading River Estuary	2011B, 2011C	Pathogens	Wading River Estuary	2011B, 2011C	Total Coliform		
Northwest	02	Wallkill River at Kennedy Ave in Ogdensburg	AN0298	Aquatic Life	Wallkill River at Kennedy Ave in Ogdensburg	AN0298	Benthic Macroinvertebrates		
Northwest	02	Wallkill River at Rt 15 (near municipal bldg) in Sparta Twp	AN0297	Aquatic Life	Wallkill River at Rt 15 (near municipal bldg) in Sparta	AN0297	Benthic Macroinvertebrates		
Northwest	02	Wallkill River at Rt 565 in Wantage Twp	AN0302	Aquatic Life	Wallkill River at Rt 565 in Wantage	AN0302	Benthic Macroinvertebrates		
Northwest	02	Wallkill River at Rt 94 in Hamburg	AN0300, 2-WAL-3	Aquatic Life, Arsenic	Wallkill River at Rt 94 in Hamburg	2-WAL-3	Arsenic		
Northwest	02	Wallkill River at Rt 94 in Hamburg	AN0300, 2-WAL-3	Aquatic Life, Arsenic	Wallkill River at Rt 94 in Hamburg	AN0300	Benthic Macroinvertebrates		
Northwest	02	Wallkill River at Scott Rd in Franklin	01367715, 2-WAL-2, AN0299	Fecal Coliform, Arsenic, Aquatic Life	Wallkill River at Scott Rd in Franklin	01367715, Wallkill D, 2-WAL-2	Arsenic	Fecal Coliform 3	
Northwest	02	Wallkill River at Scott Rd in Franklin	01367715, 2-WAL-2, AN0299	Fecal Coliform, Arsenic, Aquatic Life	Wallkill River at Scott Rd in Franklin	AN0299	Benthic Macroinvertebrates		
Northwest	02	Wallkill River at Sparta	01367625	Phosphorus, Fecal Coliform, Temperature	Wallkill River at Sparta	01367625, Wallkill A	Temperature	Phosphorus 1B, Fecal Coliform 3	
Northwest	02	Wallkill River near Franklin	01367700, 2-WAL-1	Phosphorus, Fecal Coliform, Arsenic	Wallkill River near Franklin	01367700, Wallkill C, 2-WAL-1	Arsenic	Phosphorus 1B, Fecal Coliform 3	
Northwest	02	Wallkill River near Sussex	01367770, 2-WAL-4	Fecal Coliform, Arsenic	Wallkill River near Sussex	01367770, 2-WAL-4	Arsenic	Fecal Coliform 3	
Northwest	02	Wallkill River near Unionville	01368000, 2-WAL-5	Fecal Coliform, Arsenic	Wallkill River near Unionville	01368000, Wallkill E, 2-WAL-5	Arsenic	Fecal Coliform 3	
Northeast	03	Wanaque Reservoir-03	Wanaque Reservoir	Fish-Mercury	Wanaque Reservoir-03	Wanaque Reservoir	Fish-Mercury		
Northeast	03	Wanaque River at E Shore Dr in West Milford Twp	AN0255	Unknown Toxicity	Wanaque River at E Shore Dr in West Milford	AN0255	Unknown Toxicity		

Region	WMA	2002 Station Name/Waterbody	2002 Site ID #	Previously Listed on 2002 Sublist 5	2004 Station Name/Waterbody	2004 Site ID #	Listed on 2004 Sublist 5	Delisted/Rational	Parameters Added
Northeast	03	Wanaque River at Highland Ave (blw STP) in Wanaque	AN0256	Aquatic Life, Unknown Toxicity	Wanaque River at Highland Ave (blw STP) in Wanaque	AN0256	Benthic Macroinvertebrates, Unknown Toxicity		
Northeast	03	Wanaque River at Pompton Lakes	01387041	Fecal Coliform	Wanaque River at Pompton Lakes	01387014, 01387041	Phosphorus	Fecal Coliform 1B	Phosphorus
Northeast	03	Wanaque River at Wanaque	01387000	Phosphorus, Fecal Coliform, Dissolved Oxygen	Wanaque River at Wanaque	01387000	Phosphorus, Fecal Coliform, Dissolved Oxygen		
Northeast	03	Wanaque River at Wanaque Ave in Pompton Lakes	AN0257	Unknown Toxicity	Wanaque River at Wanaque Ave in Pompton Lakes	AN0257	Unknown Toxicity		
Northeast	06	Watnong Brook at W Hanover Rd in Morris Twp	AN0234B	Aquatic Life	Watnong Brook at W Hanover Rd in Morris	AN0234B	Benthic Macroinvertebrates		
Raritan	09	Weamaconk Creek at Main St (Tennent Rd) in Manalapan	MB-81	Aquatic Life	Weamaconk Creek at Rt 522 in Englishtown	AN0443, MB-81	Benthic Macroinvertebrates		
Raritan	09	Weamaconk Creek at Rt 522 in Englishtown	AN0443	Aquatic Life	Weamaconk Creek at Rt 522 in Englishtown	AN0443, MB-81	Benthic Macroinvertebrates		
Raritan	09	Weamaconk Lake-09	Weamaconk Lake	Nutrients/Sedimentation (Eutrophic)	Weamaconk Lake-09	Weamaconk Lake	Phosphorus		
Raritan	09	Weemaconk Creek at Main St in Manalapan	9	Phosphorus, Fecal Coliform	Weemaconk Creek at Main St in Manalapan	9	Phosphorus	Fecal Coliform 3	
Raritan	07	Weequahic Lake-07	Weequahic Lake	Nutrients/Sedimentation (Eutrophic)	Weequahic Lake-07	Weequahic Lake	Phosphorus		
Raritan	09	Wemrock Brook at Rt #9 (After 1St Pipe) in Freehold	69	Phosphorus, Fecal Coliform	Wemrock Brook at Rt #9 (After 1St Pipe) in Freehold	69	Phosphorus	Fecal Coliform 3	
Raritan	09	Wemrock Brook at Rt #9 (Before Pipes) in Freehold	68	Phosphorus, Fecal Coliform	Wemrock Brook at Rt #9 (Before Pipes) in Freehold	68	Phosphorus	Fecal Coliform 3	
Northeast	06	West Lake-06	Sabeys Beach, West Fayson Lake Main Beach	Fecal Coliform	West Lake-06	Sabeys Beach, West Fayson Lake Main Beach	Fecal Coliform		
Atlantic Coast	13	Westecunk Creek Estuary	1712, 1713C, 1714, 1714A	Pathogens	Westecunk Creek Estuary	1712, 1713C, 1714, 1714A	Total Coliform		
Atlantic Coast	12	Whale Pond Brook at Larchwood Ave in Ocean Twp	AN0477	Aquatic Life	Whale Pond Brook at Larchwood Ave in Ocean	AN0477	Benthic Macroinvertebrates		
Atlantic Coast	12	Whale Pond Brook at Route 35 in Eatontown	31	Phosphorus, Fecal Coliform	Whale Pond Brook at Route 35 in Eatontown	01407617, 31	pH	Phosphorus 1B, Fecal Coliform 3	pH
Northeast	06	Whippany River at Edwards Rd in Parsippany-Troy Hills Twp	AN0238	Aquatic Life	Whippany River at Edwards Rd in Parsippany-Troy Hills	AN0238	Benthic Macroinvertebrates		
Northeast	06	Whippany River at Jefferson Rd in Hanover Twp	AN0235	Aquatic Life	Whippany River at Jefferson Rd in Hanover	AN0235	Benthic Macroinvertebrates		
Northeast	06	Whippany River at Whitehead Rd in Morris Twp	AN0233	Aquatic Life	Whippany River at Whitehead Rd in Morris	AN0233	Benthic Macroinvertebrates		
Northeast	06	Whippany River near Pine Brook	01381800, 6-WHI-2	Dissolved Oxygen, Total Suspended Solids, Lead	Whippany River near Pine Brook	01381800, 6-WHI-2	Phosphorus, Lead	Dissolved Oxygen, Total Suspended Solids 1B	Phosphorus (mistake from '02)
Lower Delaware	17	White Marsh Run at Rt 555 in Millville	AN0755	Aquatic Life	White Marsh Run at Rt 555 in Millville	AN0755	Benthic Macroinvertebrates		
Northeast	06	White Meadow Lake-06	White Meadow Lake 1, 2, and 3	Fecal Coliform	White Meadow Lake-06	White Meadow Lake 1, 2, and 3	Fecal Coliform		
Northwest	11	Wickecheoke Creek at Croton	01461220	Fecal Coliform	Wickecheoke Creek at Croton	01461220	Fecal Coliform		
Northwest	11	Wickecheoke Creek at Locktown - Sergeantsville Rd in Delaware Twp	AN0091	Aquatic Life	Wickecheoke Creek at Locktown - Sergeantsville Rd in Delaware	AN0091	Benthic Macroinvertebrates		
Northwest	11	Wickecheoke Creek at Stockton	01461300	Phosphorus, Fecal Coliform, pH, Temperature, Unionized Ammonia	Wickecheoke Creek at Stockton	01461300, DRBCNJ0012	Phosphorus, Fecal Coliform, Temperature	pH, Unionized Ammonia 1B	
Atlantic Coast	13	Willis Creek Estuary	1928, 1928B	Pathogens	Willis Creek Estuary	1928, 1928B	Total Coliform		
Atlantic Coast	12	Willow Brook at Schank Rd in Holmdel Twp	AN0467	Aquatic Life	Willow Brook at Schank Rd in Holmdel	AN0467	Benthic Macroinvertebrates		
Atlantic Coast	12	Willow Brook at Willow Brook Rd in Colts Neck Twp	AN0468	Aquatic Life	Willow Brook at Willow Brook Rd in Colts Neck	AN0468	Benthic Macroinvertebrates		
Atlantic Coast	12	Willow Brook at Willow Brook Rd in Holmdel	52	Phosphorus, Fecal Coliform	Willow Brook at Willow Brook Rd in Holmdel	52	Phosphorus	Fecal Coliform 3	
Atlantic Coast	12	Willow Brook Trib at Igoe Rd in Marlboro	AN0468A	Aquatic Life	Willow Brook Trib at Igoe Rd in Marlboro	AN0468A	Benthic Macroinvertebrates		

Region	WMA	2002 Station Name/Waterbody	2002 Site ID #	Previously Listed on 2002 Sublist 5	2004 Station Name/Waterbody	2004 Site ID #	Listed on 2004 Sublist 5	Delisted/Rational	Parameters Added
Northwest	01	Wills Brook at Acorn St in Mt Olive Twp	AN0064C	Aquatic Life	Wills Brook at Acorn St in Mt Olive	AN0064C	Benthic Macroinvertebrates		
Northwest	01	Wills Brook at Erie Lackawanna RR Bridge in Mt Olive Twp	AN0064B	Aquatic Life	Wills Brook at Erie Lackawanna RR Bridge in Mt Olive	AN0064B	Benthic Macroinvertebrates		
Lower Delaware	17	Wilson Lake-17	Wilson Lake	Fecal Coliform, Fish-Mercury	Wilson Lake-17	Wilson Lake	Fecal Coliform, Fish-Mercury		
Atlantic Coast	14	Winter Creek Estuary	2003I	Pathogens	Winter Creek Estuary	2003I	Total Coliform		
Lower Delaware	18	Woodbury Lake-18	Woodbury Lake	Nutrients/Sedimentation (Eutrophic)	Woodbury Lake-18	Woodbury Lake		Phosphorus 3	
Atlantic Coast	13	Wrangel Brook at Mule Rd in Berkeley Twp	AN0537	Aquatic Life	Wrangel Brook at Mule Rd in Berkeley	AN0537	Benthic Macroinvertebrates		
Atlantic Coast	12	Wreck Pond Brook at Allenwood Rd in Wall	14	Fecal Coliform	Wreck Pond Brook at Allenwood Rd in Wall	14		Fecal Coliform 3	
Atlantic Coast	12	Wreck Pond Brook at Old Mill Rd in Wall Twp	AN0483	Aquatic Life	Wreck Pond Brook at Old Mill Rd in Wall	AN0483	Benthic Macroinvertebrates		
Atlantic Coast	12	Wreck Pond-12	Wreck Pond	Nutrients/Sedimentation (Eutrophic)	Wreck Pond-12	Wreck Pond	Phosphorus		
Atlantic Coast	12	Yellow Brook at Creamery Rd in Colts Neck Twp	AN0472	Aquatic Life	Yellow Brook at Creamery Rd in Colts Neck	AN0472	Benthic Macroinvertebrates		
Atlantic Coast	12	Yellow Brook near Malboro	01407360, 12-YEL-1	Fecal Coliform	Yellow Brook near Malboro	01407360, 12-YEL-1		Fecal Coliform 3	

Principal Water Monitoring Programs Overseen By NJDEP And Other Organizations That Provided Data And Assessments For The 2004 Integrated Report

NJDEP-USGS Cooperative Ambient Stream Monitoring Network (ASMN): The New Jersey Department of Environmental Protection (NJDEP) and the United States Geological Survey (USGS) have cooperatively operated the Ambient Stream Monitoring Network since the 1970's. The data from this network have been used to identify status and trends for conventional water quality parameters, metals and recreational designated uses (fecal coliform) in freshwater, nontidal streams as well as sediment quality. A Quality Assurance Project Plan was developed and approved each year for the NJDEP-USGS Cooperative Ambient Stream Monitoring Network (ASMN). In 1996 and 1997, the ASMN included 81 stations located outside of regulatory mixing zone in well mixed, non-tidal areas. Sites were located using GPS. Conventional water quality samples were collected 5 times per year; metals were collected 2 times per year at about 2/3 of the stations on a rotating basis. Samples were collected using cross-sectional, depth-integrated sample collection techniques. Beginning in 1995, modified Clean Methods sampling techniques were implemented to improve metals data quality. Concurrent measurement of stream discharge was also collected. USGS report on water quality trends was used to assess threats to water quality (USGS, 1999a).

Redesigned Ambient Stream Monitoring Network: Although the previous network was sufficient to assess general status and trends, changes were needed to provide data for water quality indicators and watershed management. The new network, which was designed by a NJDEP and USGS interagency committee, has been operating since October 1997. By using several different types of monitoring stations, the Redesigned Ambient Stream Monitoring Network is designed to answer several important questions about surface water quality.

Reference Stations: To characterize water quality in undeveloped areas, 6 reference stations have been established in the 4 physiographic regions of the state. Data from these stations will be used to evaluate degradation in developed areas and to provide additional data to support surface water quality standards.

Land Use Indicator Stations: To characterize the effects of the 2 dominant land uses in each of 20 watershed management areas (WMA), 40 land use indicator stations were selected. Drainage area, and percent of urban, agricultural, and forest from the most recent Land Use/ Land Cover data were used to select these stations. Many Land Use Indicator stations are also monitored in the Benthic Macroinvertebrate (AMNET) Monitoring Network. These data will provide insight into the biological effects of chemical pollutants, and the effects of nonpoint sources from dominant land uses on chemical and biological water quality.

Statewide Status Stations: To provide a strong statistical basis for estimating statewide water quality indicators, 40 status stations are selected. Two statewide status stations per WMA were randomly selected from the set of ~800 Benthic Macroinvertebrate Network stations to provide a probabilistic monitoring component. From 1998 to 2000 these status stations were monitored for 1 year after which 40 new stations are randomly selected to increase spatial coverage. Beginning in 2001, the status stations are monitored for 2 years

before 40 new stations are randomly selected. These stations provide site-specific data at an increasing number of locations and can identify emerging issues.
Watershed Integrator Stations: Watershed integrator stations were located at the outlet of each WMA and at the outlets of larger watersheds within WMAs. The 23 watershed integrator stations will be used to characterize downstream water quality and will be assessed together with data from Coastal and Estuarine Water Quality Monitoring Network to evaluate pollutant transport to back bays.
Watershed Reconnaissance: Resources to conduct watershed reconnaissance sampling are available each year to address data needs. Watershed reconnaissance sampling has recently been used to monitor diurnal DO at a subset of ASMN stations. Parameters: Bacteria were monitored 5 times within 30-days as recommended in the NJSWQS. Conventional water quality parameters (i.e., dissolved oxygen, nutrients, solids, and pH) were monitored at all stations seasonally, 4 times per year. Diurnal DO data were collected at a subset of ASMN stations. Flow is continuously monitored or instantaneous discharge measurements were collected during seasonal monitoring at all stations except Statewide Status stations. Monitoring at the 6 reference stations and 40 statewide status stations included one sample event per year for total recoverable metals, pesticides and volatile organic chemicals. For both the ASMN and Redesigned ASMN, conventional water quality samples were sent to the New Jersey Department of Health and Senior Services (NJDHSS) NJ state certified laboratory; metals samples were analyzed for total recoverable (TR) metals at the USGS National Laboratory in Denver. Samples were analyzed using USEPA approved methods or equivalent USGS methods. Data were managed in USGS's National Water Information System (NWIS) and USEPA's Storage and Retrieval (STORET) database. Raw data collected between 1/96 and 12/2000 were reported by USGS in Water Year Reports. (USGS, 1997, 1998, 1999, 2000, 2001). Electronic data are available to be downloaded from NWIS at www.usgs.gov\nwis or USEPA's STORET database at www.epa.gov/owow/STORET.

303d Evaluation Monitoring: The 303d Evaluation Monitoring, also called 303d Reconnaissance Monitoring was initiated in 1998 to provide high quality, current data regarding concentrations of total recoverable and dissolved metals in waterbodies included on the 1998 303d List for metals. 67 A Quality Assurance Project Plan was developed and approved. Locational data were obtained using Global Positioning System (GPS). Sites were sampled three times during stable baseflow, often for 3 consecutive days; all sites in a WMA were sampled on the same day. Total recoverable (TR) and dissolved fraction (DF) metals samples were collected using modified Clean Methods techniques. Bottom sediment samples were also collected. USGS determined when stable baseflow conditions existed and collected flow measurements on day 2 of sampling. Samples were analyzed at the New Jersey Department of Health and Senior Services (NJDHSS) NJ State certified laboratory using EPA approved methods. Data were reviewed by NJDEP and are being entered into USEPA's Storage and Retrieval System (STORET) available at www.epa.gov/owow/STORET and are published in Preliminary Data Reports on 303d Reconnaissance Monitoring for each Watershed Management Area.

USGS National Ambient Water Quality Assessment (NAWQA): NAWQA is a water quality monitoring and assessment program carried out by the USGS designed to support national and regional needs and decisions related to water quality management and policy. The final report from the Long Island New Jersey National Ambient Water Quality Assessment (NAWQA) program was used to evaluate conventionals in freshwater non-tidal streams (USGS, 2000).

Marine and Estuarine Monitoring Program: NJDEP's Marine and Estuarine Monitoring Program was used to assess SWQS attainment, aquatic life and recreational designated uses. This monitoring network included 200 stations in tidal rivers, back bays, estuaries and inlets that were monitored quarterly for dissolved oxygen, ammonia-nitrogen, nitrate-nitrite, organic nitrogen, ortho-phosphate, chlorophyll a, Secchi depth, salinity, temperature, pH, suspended solids, fecal and enterococcus bacteria. The stations were a subset of the National Shellfish Sanitation Program stations. Data is available from the Marine Monitoring Program. Their website is http://www.state.nj.us/dep/watershedmgt/bmw/reports.htm

Ambient Biological Monitoring Network (AMNET): Aquatic life designated uses in rivers were assessed using NJDEP's Ambient Biological Monitoring Network (AMNET). This network monitored benthic macroinvertebrate organisms, including crustacean, larval insects, snails and worms, which are ubiquitous throughout the state's streams and an important component of the aquatic food web. Over 800 AMNET stations located in freshwater, non-tidal streams were sampled on a 5-year rotating schedule. Round 1 sampling was completed in the mid-1990s. Round 2 sampling conducted between 1997 and 2001 was used for this 2002 New Jersey Integrated Report. Round 3 is currently underway. Benthic macroinvertebrate communities were examined using USEPA's Rapid Bioassessment Protocols - Level II (see EPA, 1989; NJDEP, 1992). Communities were examined for pollution tolerant and intolerant forms and the results were used to compute the New Jersey Impairment Score (NJIS). NJIS scores were used to assess aquatic life designated uses as follows: **full attainment** (non-impaired; NJIS: 24-30), **non-attainment** (moderately impaired; NJIS: 9-21 and severely impaired; NJIS: 0-6). Round 2 and 3 sampling included a qualitative assessment of stream habitat quality, which was used to compute a Habitat Assessment Score. The habitat condition provide insight into factors that contribute to biological impairment. 68 AMNET monitoring results are being entered into

Warmwater Fisheries Populations: Aquatic life designated use assessment in lakes was based on assessments of lake fisheries performed by the Division of Fish and Wildlife. Lakes were selected for assessment based on the Warmwater Fisheries Management Plan, which provides primary guidance for Warmwater fisheries management in New Jersey (NJDEP, 1998c). Fish populations were sampled using electrofishing (spring or fall), shoreline seining (summer to assess fish reproduction), and/or gillnetting (fall). Conventional water quality parameters such as dissolved oxygen; pH and nutrients are recorded during the summer months when the water columns are most stratified. Fish population data were assessed by experienced fishery biologists to determine the actual or potential recreational value as a fishery and used to recommend strategies to maintain or

enhance the resource. Although the Bureau of Freshwater Fisheries is principally concerned with the recreational value of the fisheries, the assessments were based on the diversity of fish species, not only species of recreational value. Many sport fish are carnivores that depend upon an abundant and diverse forage base to support their populations. Hence, although many of these lakes are stocked, assessment results are not affected by the stocking. Individual lake assessment reports are available from the Bureau of Freshwater Fisheries by calling (908) 236-2118.

New Jersey Pinelands Commission: The Commission provided biological and chemical/physical data for streams, rivers and impoundments within the Mullica River (Zampella, R.A., et al. 2001) and Rancocas Creek (Zampella, R.A., et al. 2003) watersheds. These data are the result of the Commission's long-term environmental monitoring program designed to evaluate the consequences of the Comprehensive Management Plan for the Pinelands National Reserve. The Commission may be reached at http://www.state.nj.us/pinelands/.

Clean Lakes Program: The Clean Lakes Program was used to assess aesthetic quality of public lakes. This program was designed by USEPA to facilitate identification and remediation of eutrophic public lakes. Between 1977 and 1992, public lakes with recreational use impairments were identified by lake associations, municipalities or other entities; studies were conducted to characterize water quality and as funding was available, remediation projects were conducted. Also during the 1980's and early 1990's, NJDEP collected water quality data on a number of public lakes. The trophic status of lakes was assessed using USEPA Clean Lakes Program Guidance Manual based on total phosphorus, Secchi disk transparency and chlorophyll *a* levels (USEPA 1980). Individual Clean Lake Reports are available by calling (609) 292-0427.

USEPA Helicopter Monitoring Program: The USEPA Helicopter Monitoring Program was used to assess aquatic life and recreational designated use attainment in ocean waters. USEPARegion 2 monitors water quality in the ocean at a series of 10 transects that extend eastward from Sandy Hook to Cape May with samples taken at 1, 3, 5, 7, and 9 mile points along each transect. This assessment was based on data collected at the 1 and 3 mile stations, which were located within New Jersey's 3-mile jurisdiction. Samples collected eight to ten times during the summer 69 between 1996 and 2001 were used for this Integrated Report. Parameters included dissolved oxygen and fecal coliform. The aquatic life assessment for ocean waters was based on dissolved oxygen (DO) data collected in the USEPA Helicopter Monitoring Program. USEPA-Region 2 has found over many years of monitoring that surface DO levels are consistently acceptable (DO is at or above 5mg/l). Therefore, DO monitoring at the surface was discontinued and NJDEP assumed that surface DO is at or above 5mg/l. Current DO assessments are based on DO recorded one meter above the ocean bottom.

Fish Consumption Advisories: The presence of fish consumption advisories and bans was used to evaluate fish consumption designated use. In 1976, monitoring of fish and shellfish tissue for contaminants of concern to human health was initiated. Sampling locations were chosen to include areas where known or suspected sources of persistent

bioaccumulative toxics (PBTs) might be found (e.g., PCBs, dioxin, pesticides, and mercury). These included freshwater, estuarine and marine areas important to both recreational and commercial fisheries. Data were collected primarily through research projects targeted at species and drainages where contamination was found. The Interagency Toxics in Biota Committee, with representatives from NJDEP and NJDHSS, oversees the issuance of fish consumption advisories and bans as needed to protect human health. Sampling locations and advisories are routinely listed at the NJDEP Website (i.e., www.state.nj.us/dep/fgw) and in the New Jersey Fish and Wildlife Digests.

National Shellfish Sanitation Program: National Shellfish Sanitation Program was used to assess shellfish consumption designated use. Shellfish harvesting areas are classified in accordance with the National Shellfish Sanitation Program (NSSP) through monitoring total and fecal coliform bacteria in water and shellfish at over 2,500 sites between 5 and 12 times per year and conducting sanitary surveys to identify potential pollution sources. www.state.nj.us/dep/watershedmgt/bmw/reports.htm

Cooperative Coastal Monitoring Program: The Cooperative Coastal Monitoring Program (CCMP) was used to assess recreational designated use attainment at ocean and bay bathing beaches. A Quality Assurance Project Plan is developed and approved each year prior to the start of sampling. This monitoring program is cooperatively operated by NJDEP, the New Jersey Department of Health and Senior Services (NJDHSS) and local health agencies. Ocean and bay bathing beaches are monitored weekly, with over 6000 samples collected each summer between Memorial Day and Labor Day at 179 ocean beaches and 139 bay beaches. Results are used to open and close bathing beaches to protect public health.

Lake Bathing Beach Data: The Lake Bathing Beach monitoring program was used to assess recreational designated use attainment at lake bathing beaches. The NJDHSS oversees monitoring by local health agencies at about 360 lake beaches in New Jersey. Fecal coliform data (not closure records) were provided to NJDEP for use in Lake Beach assessments. Approximately 180 of 360 beaches have been located on GIS. Lack of GIS locations precluded assessments of the remaining lakes; efforts are underway to locate these lake beaches. 70

2002 Integrated List Sublist 5 (303d): Waterbodies on Sublist 5 of the Integrated List of Waterbodies t were placed on one of 5 sublists based on new data and assessments; or were retained on Sublist 5 in the 2004 Integrated Report if no new data were available to update the previous assessments.

Nonpoint Source Assessment (319): The most recent Nonpoint Source Assessment was incorporated into the 2000 New Jersey Water Quality Inventory Report.

Local water quality data and information: NJDEP solicited local water quality data and information through a notice published in the New Jersey Register on February 3, 2003, and NJDEP Website. Data were accepted by NJDEP for a period of 6 months and were required to be accompanied by an approved Quality Assurance Project Plan,

accurate monitoring sites locations, electronic data format, citeable report and contact information. Data that met these conditions were received from the following entities:

Monmouth County Health Department Benthic Macroinvertebrate data and ambient chemical data was collected to: support watershed initiatives; track water quality trends; obtain water quality and habitat data which could be correlated with erodible soils and land uses; and, coordinate the collection of biological data with ambient stream chemical and bacteriological monitoring. Macroinvertebrate samples were collected from Fall of 1999 through Fall of 2000. Ambient water chemistry was collected four times a year, during the months of March, June, October, and December from 1996 through 2000. Parameters included: pH, fecal coliform, TSS, phosphorus, and ammonia. Macroinvertebrate and water chemistry data are available from the Monmouth County Health Department's website at http://www.visitmonmouth.com/health/environmental/water/water.htm.

Pequannock River Coalition Diurnal temperature data were collected at 12 stations in the Pequannock River watershed during the summers of 2000 and 2001. Data is available from the Coalition at P.O. Box 392, Newfoundland, New Jersey 07435. (973-492-3212)

Hudson Regional Health Commission: The purpose of this data collection was to obtain baseline data for fecal coliform and to identify conditions which might influence concentrations such as tides, rainfall or temperature. The sampling sites were selected to represent sites publicly accessible with some recreational usage (kayaking, jet skis) Water samples were collected weekly from June 20, 2001 till October 30th for a total of 18 samples per site. One of the four sites had to be relocated after the 9/11 incident. Data are available from the Commission at 595 County Avenue, Secaucus, NJ 07094

Interstate Environmental Commission – The Commission provided fecal coliform and dissolved oxygen data for the shared waters of the NY-NJ Harbor complex. Fecal Coliform data were collected twice a week for 5 weeks (1997-2001). Information on these data can be obtained from the Commission at 311 West 43rd Street, Suite 201, New York, NY 1036. http://www.iecnynjct. org/reports.htm

Delaware River Basin Commission has the 305(b) Report responsibility for the Delaware River mainstem and estuary. The Department incorporated the Commission's Assessments into the Integrated Report. DRBC's 305 (b) Report can be found on their web page at http://www.state.nj.us/drbc

Water quality management plans Water *Quality Management Plans* were used to identify waters where TMDLs have been completed.

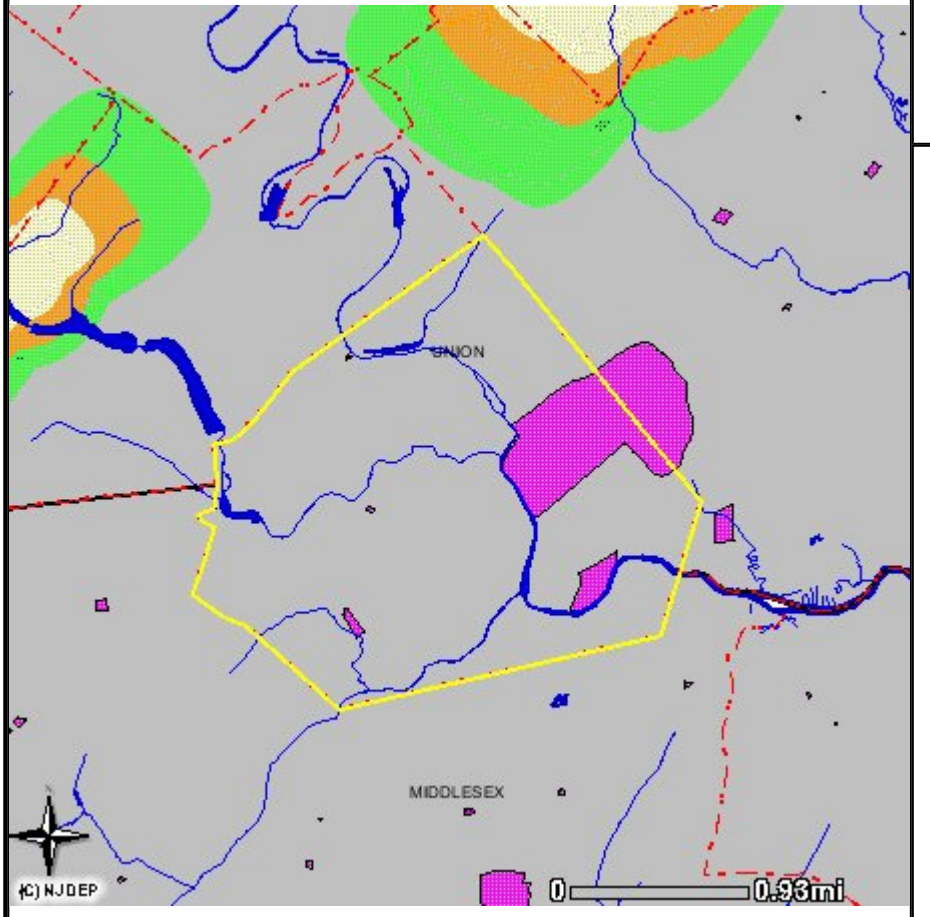
Superfund and RCRA – The Department considered data from contaminated sites in several specific instances. Five (5) waterbodies were added to the 1998 Impaired Waterbodies List as remanded by USEPA due to pollutants from contaminated sites (Federal Register Vol. 66, Number 195, Tuesday October 9, 2001). The 303d Evaluation Monitoring identified lead contamination in the Rancocas River due to activities at Fort

Dix; remediation is underway. Superfund and RCRA data are not computerized and thus are generally not readily available. However, the Department is developing EQUIS database for chemical contaminants at over 8000 contaminated sites in New Jersey. Contaminated sites will be considered in more detail as the EQUIS database is populated.

FIGURE C-6A:
CITY OF RAHWAY
GROUNDWATER RECHARGE AREAS

DATA SOURCE: NJGS RECHARGE FOR NEW JERSEY PROJECT

Groundwater Contaminated



Selected Features
Municipalities
Counties
Streams
Water Bodies
Well Head Protection Areas

Tier 1: 2-Year
Tier 2: 5-Year
Tier 3: 12-Year
Groundwater Contamination Areas (CEA)

Groundwater Contamination Areas (CKE)

New Jersey

FIGURE C-6B
CITY OF RAHWAY
GROUNDWATER RECHARGE AREAS AND SOILS MAP

Soil Map Symbol	Name	Permeability >0.2 in./hr?
Bog B	Boonton	Y
Bou D	Boonton/Urban Land	Y
Bov B	Boonton/Urban Land/Haledon	Y
FmhAt or Fmt	Fluvaquents	Y
Hak A	Haledon	Y
Hat B	Haledon/Urban Land/Hasbrouck	Y
PbpuAt or Pbs	Parsippany/Urban Land	Y
RarAr	Raritan	Y
TrkAv or SUCT	Sulfihemists and Sulfaquents	N
Udktt B or Udh	Udorthents, loamy	N
Udo B or Udy	Udorthents, organic substratum	N
UR	Urban Land	N

Note: The attached map is based on the Union County Soil Survey Map, issued 2002.

As stated in the New Jersey Stormwater Best Management Practice Manual, dated February 2004, Table 9.5-1: Minimum Design Permeability Rates for Infiltration Basins, for groundwater recharge, a minimum design permeability rate of 0.2 in/hr is required for subsurface basins and 0.5 in./hr for surface basins.

The above listed map and table shall only be used as a guide for groundwater recharge areas. Recharge requirements for all sites shall be subject to in-situ soil testing.

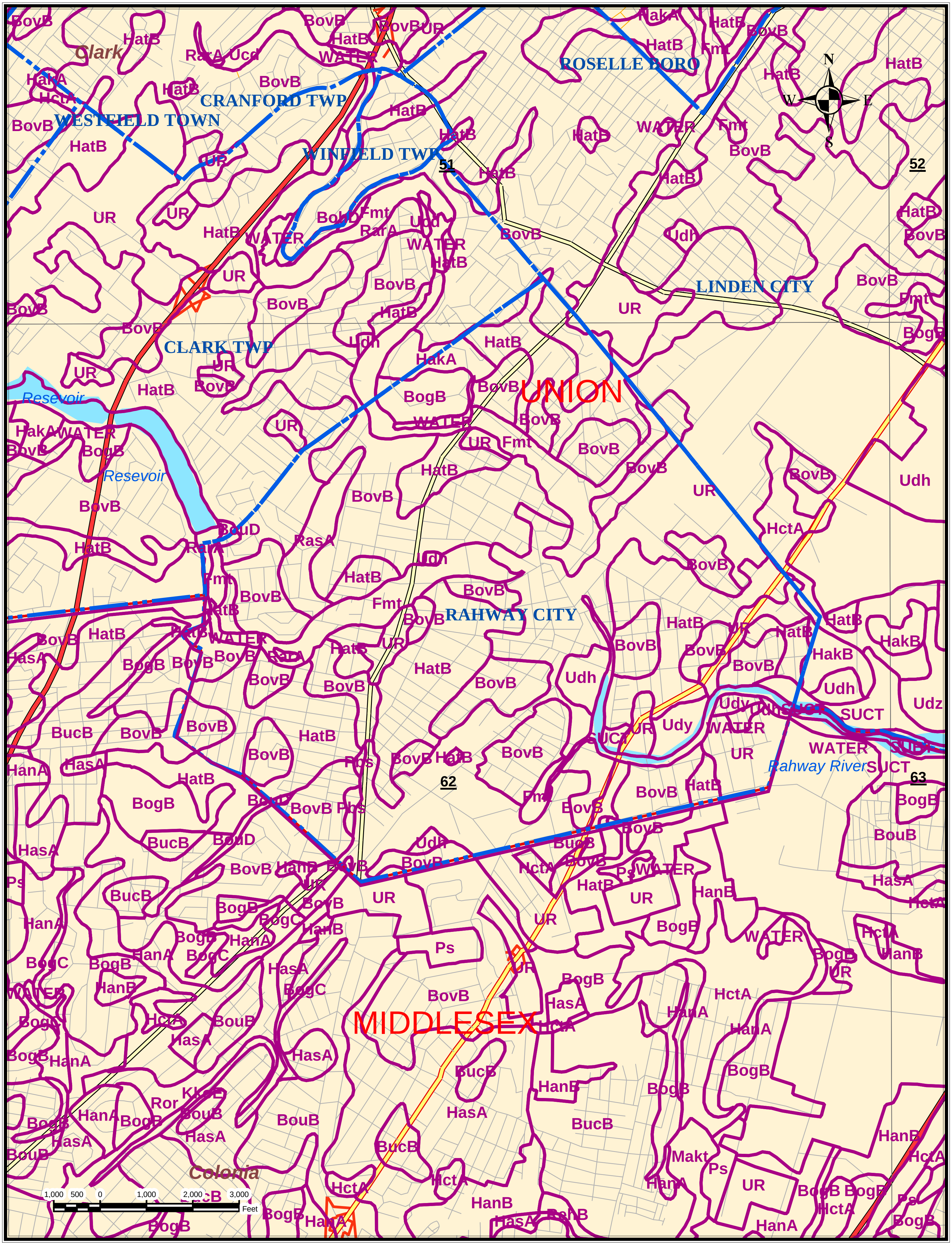
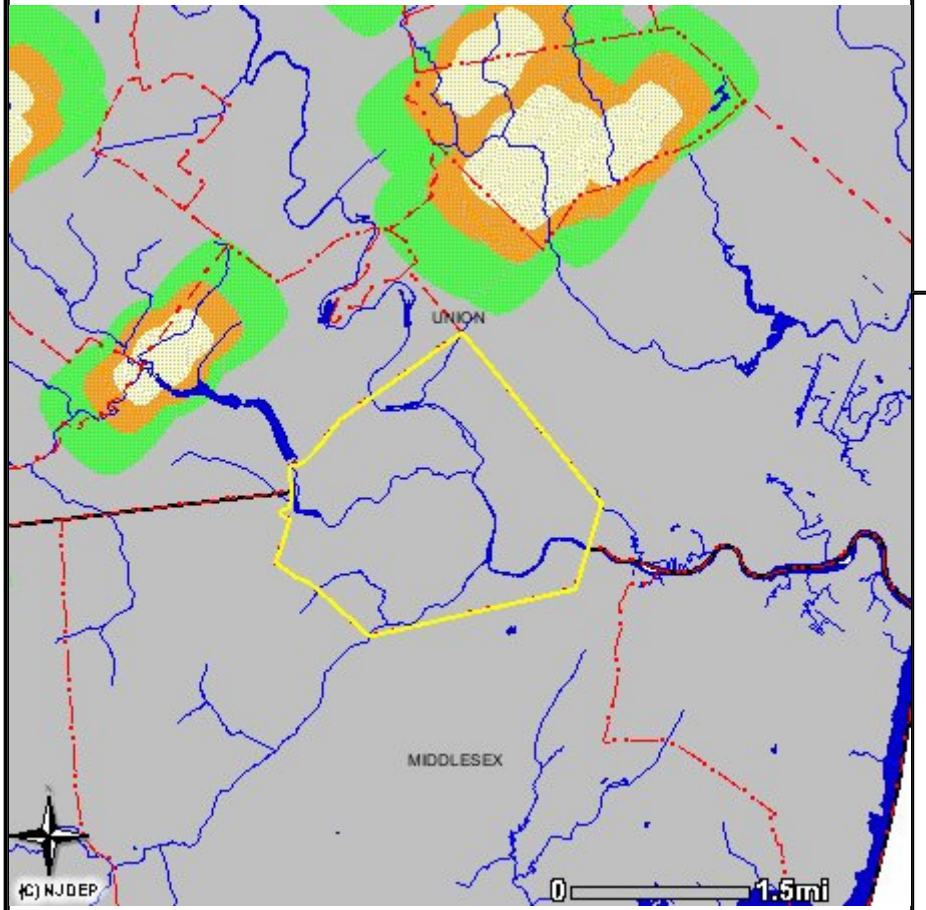

Clark
CRANFORD TWP
WESTFIELD TOWN
WINFIELD TWP
ROSELLE BORO
LINDEN CITY
CLARK TWP
UNION
RAHWAY CITY
MIDDLESEX
Colonia
Resevoir
Resevoir
Rahway River
51
52
62
63
N
E
S
W
1,000 500 0 1,000 2,000 3,000
Feet

FIGURE C-7
WELL HEAD PROTECTION AREAS

Well Head (Rahway)



Selected Features
Municipalities
Counties
Streams
Water Bodies
Well Head Protection Areas

Tier 1: 2-Year
Tier 2: 5-Year
Tier 3: 12-Year
New Jersey

A-2
DECEMBER 2012 RARITAN WATER REGION AMBIENT BIOMONITORING NETWORK STUDY

NJ Department of Environmental Protection
Water Monitoring and Standards

AMBIENT BIOMONITORING NETWORK

Raritan Water Region

Watershed Management Areas 7, 8, 9, and 10
Round 4 Benthic Macroinvertebrate Data

Volume 1 of 2

December, 2012

State of New Jersey
Chris Christie, Governor
Kim Guadagno, Lt. Governor

NJ Department of Environmental Protection
Bob Martin, Commissioner

NJ Department of Environmental Protection

Water Monitoring and Standards
Jill Lipoti, Director

Bureau of Freshwater & Biological Monitoring
Leslie McGeorge, Administrator

December 2012

AMBIENT BIOMONITORING NETWORK

Raritan Water Region
Watershed Management Areas 7, 8, 9, and 10

Round 4 Benthic Macroinvertebrate Data

Volume 1 of 2

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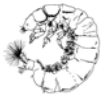
[cover photo: Site AN0361, Lamington River tributary at Black River Rd, Somerset County, NJ.]



ACKNOWLEDGEMENTS

This report would not have been possible without the significant contributions from environmental scientists at the New Jersey Department of Environmental Protection and the United States Environmental Protection Agency. Leslie McGeorge, Alena Baldwin-Brown, Alfred Korndoerfer, Victor Poretti, and Dean Bryson of NJDEP Water Monitoring and Standards provided useful editorial comments and interpretation of results. Jim Kurtenbach at U.S. EPA Region 2 provided guidance on the Network's design and implementation.

AMBIENT BIOMONITORING NETWORK

Watershed Management Areas 7, 8, 9, and 10

Raritan Water Region

Round 4 Benthic Macroinvertebrate Data

Volume 1 of 2

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Table 1

Ambient Biomonitoring Network
Watershed Management Areas 7, 8, 9, and 10

Raritan Water Region

Round 4 Benthic Macroinvertebrate Data

Volume 1 of 2

EXECUTIVE SUMMARY

Biological monitoring of freshwater systems in New Jersey provides an effective means of gauging long-term trends in surface water quality throughout the State. The Ambient Biomonitoring Network (AMNET) is one of the major ongoing monitoring programs. This statewide network of over 760 non-tidal AMNET stations employs sampling and taxonomic analysis of in-stream macroinvertebrate communities to assess the ecological condition at each station. An integrated index of "biometrics", based on community composition and pollution tolerance levels of individual taxa, is used to assign assessment ratings.

Between the start of the program (1992) up until 2004, a single statewide index, the New Jersey Impairment Score (NJIS), was used in assigning one of three assessment ratings, non-impaired, moderately impaired, and severely impaired. The NJIS was limited in that it used family level taxonomic identification for calculating scores and did not account for geographical differences in macroinvertebrate community structures. To resolve these limitations, starting with the mid 2004 data (Atlantic Region report), three indices are used for assessments; High Gradient Macroinvertebrate Index (HGMI), Coastal Plain Macroinvertebrate Index (CPMI), and Pinelands Macroinvertebrate Index (PMI). These indices account for the State's geophysically different ecoregions and use genus level taxonomic identification for calculating scores. The higher level of identification allows for more resolute and accurate results at four assessment rating levels (rather than the three previously used); "excellent", "good", "fair", and "poor". The results are considered reflective of the water and/or habitat quality at each site. This information is used by the Department, primarily in assessing progress toward the goals of the Clean Water Act via the Integrated Water Quality Monitoring and Assessment Report. AMNET data are also integral for designation of Category 1 waters, based on exceptional ecological significance.

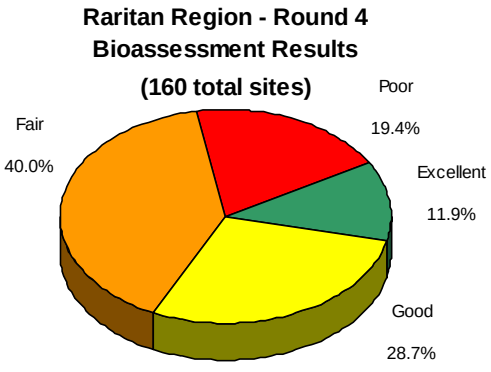


Figure 1

Results are reported separately for each of New Jersey's five major drainage basins or "Water Regions" (Lower Delaware, Upper Delaware/Northwest, Northeast, Raritan, and Atlantic), each encompassing several sub-basins ("Watershed Management Areas"). The Water Regions, with an average of 153 non-tidal AMNET sites each, are sampled in consecutive years on a five-year rotational basis. The most recent results (posted by the end of the calendar year sampling is completed for a region), and Round by Round comparisons along with raw data, can be found at:
http://www.state.nj.us/dep/wms/bfbm/amnetRnd4.html

The present study area comprises the Raritan Water Region and includes WMA #'s 7 (Elizabeth, Rahway, Woodbridge), 8 (North and South Branch Raritan), 9 (Lower Raritan, South River, Lawrence Brook), and 10 (Millstone River). This report presents the results for the biological monitoring conducted from April 2009 – November 2009 (see Map 1, page 4). The sampling of the Raritan Water Region marks the fourth round of data collection for this basin. The results obtained in the fourth round are similar to those of the previous (third round) of sampling. Currently, of the 160 AMNET sites sampled in the Raritan Water Region, 19 (11.9%) were found to exhibit "excellent" benthic macroinvertebrate communities, with 46 (28.7%) exhibiting "good", 64 (40.0%) "fair", and 31 (19.4%) exhibiting "poor" benthic communities (See Figure 1).

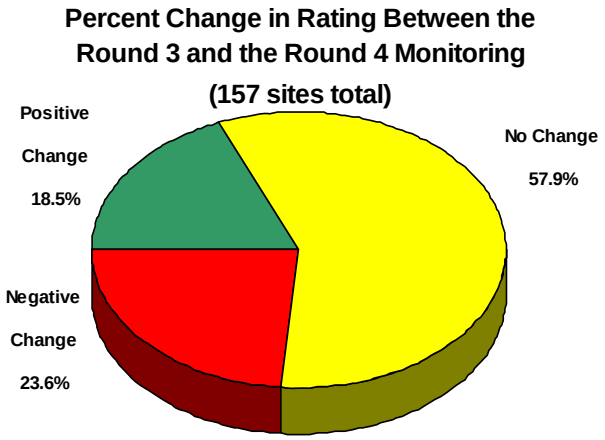


Figure 2

In order to generate trend information, results from the current (Round 4) sampling were compared to those from the same sites sampled in the earlier round (Round 3). For the purposes of comparing the two rounds, Round 3 results were re-assessed using the new indices. Of the 160 AMNET sites sampled in the Raritan Water Region, the Round 4 samplings yielded sites with more "good" (28.6%) and "fair" (40.4%) ratings than did the third round sampling (23.8%, 40.0% respectively). Conversely, the number of "excellent" (11.8%) rated sites observed in the Round 4 sampling has declined since the Round 3 sampling (16.9%) with the number of "poor" sites remaining the same (31 sites or 19.3%). Figure 2 displays the percentage of change in rating among the same 157 AMNET sites in the Raritan Water Region that were sampled during the third round study period, and again during the current (Round 4) study period. The green indicates sites that have undergone a positive change, yellow indicates no change, and red indicates a negative change. Positive change is defined as an improved rating from the previous Round's rating, while a negative change is defined as a downgraded rating from the previous Round. Individual results and changes in each site can be found in Table 4, Volume 2.

Figure 3 compares the results of each round of sampling in the Raritan Region. The percentage of excellent and severe results decreased from round 1 to round 4, while the percentage of fair results increased and good results remained stable. Earlier rounds of data were recalculated using the new indices. Some sites sampled in Round 1 were collected outside of the April – November sampling period criteria specified for the newly implemented indices. Results from these samples may not have the same degree of accuracy as those collected within the sample period criteria. More robust statistical analysis will be used in the future, if necessary, to compare significant differences between Rounds.

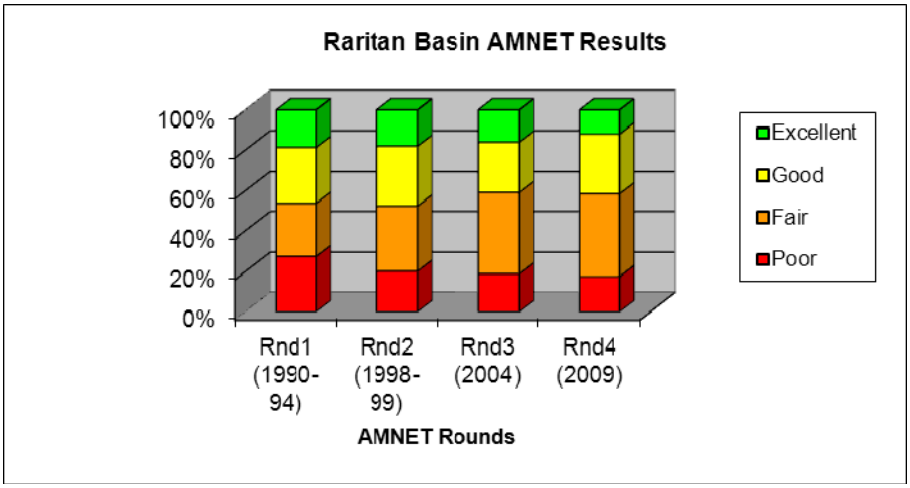


Figure 3

Assessment Rating	Round 1	Round 2	Round 3	Round 4
Excellent	19.4%	18.6%	16.9%	11.9%
Good	28.5%	27.3%	23.8%	28.8%
Fair	28.5%	32.3%	40.0%	40.0%
Poor	23.6%	21.7%	19.4%	19.4%

As reflected in the present study results, human land uses and practices, superimposed on the undisturbed physical terrain, play a major role in controlling the degree of pollution or degradation in a stream system. The relationship between benthic macroinvertebrate community impairment has been statistically related to different physiographic land types, land uses and other anthropogenic factors, on a statewide basis*. These findings concludes the following:

1) Invertebrate communities are commonly impaired in urban streams;
2) Invertebrate community impairment was related to total urban land and total wastewater flow upstream of a site;
3) Changes in aquatic community structure were statistically related to environmental variables along the urban gradient – that is to say that such things as impervious surfaces were related to a negative response in the aquatic invertebrate community.

To determine what factors are contributing to impairments, or changes in impairment ratings, the Department has established a Stressor Identification (SI) process. The purpose of the Stressor Identification (SI) process, as developed by USEPA, is to identify the principle stressor(s), including but not limited to specific pollutants, responsible for the degraded biological condition. Determining the probable cause or causes of this biological impairment, whether it be a chemical pollutant or a non-chemical stressor such as flow alteration or siltation, is the first step towards deciding whether a TMDL or other appropriate management measures will be taken to remediate the impairment. Five sites have been selected in this Water Region for initial Stressor Identification work. These sites are: AN0311 (Drakes Brook), AN0324 (Beaver Brook), AN0343 (Holland Brook) and AN0333 & AN0337 (Neshanic River).

Additional Information

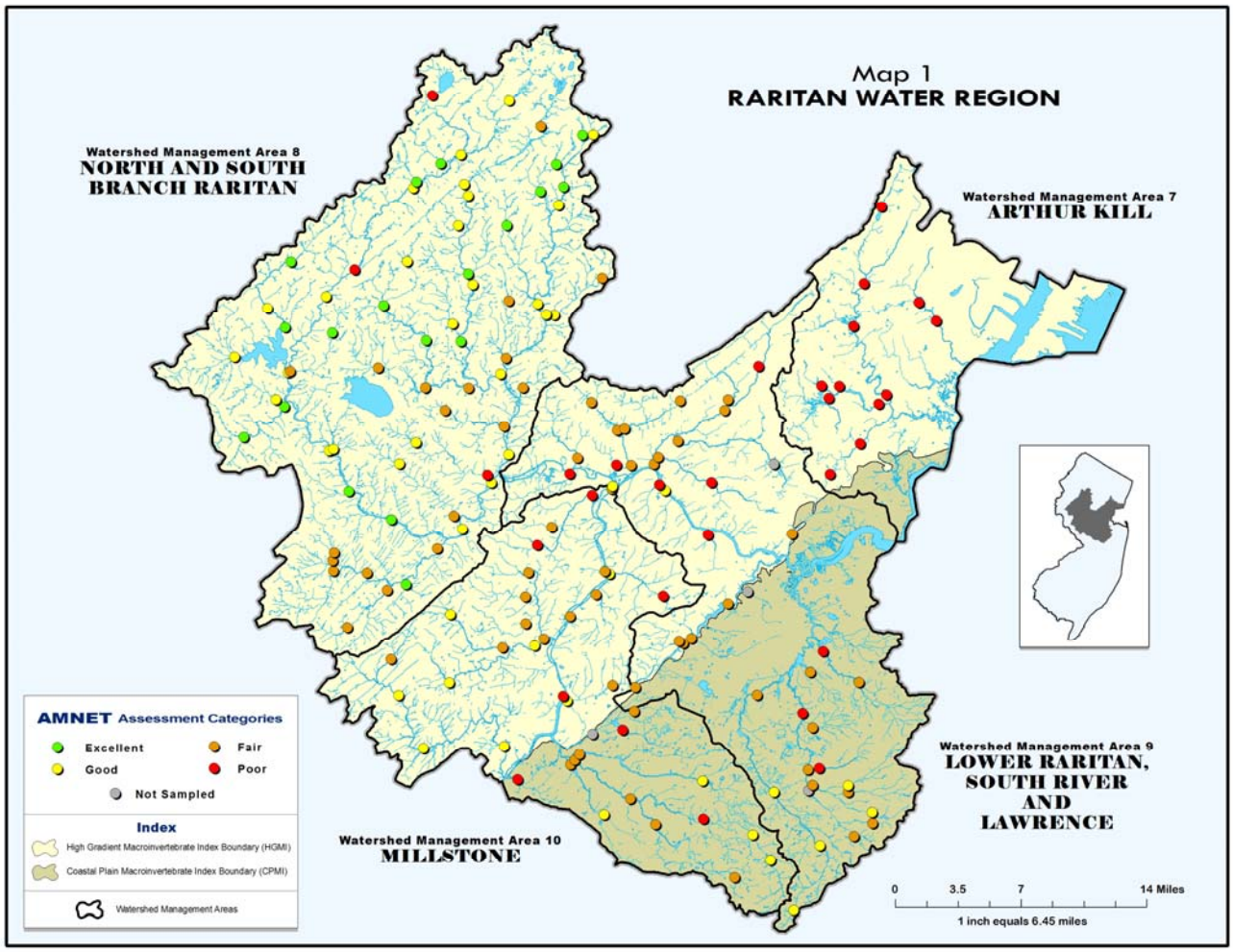
Additional Information on the AMNET program can be obtained from the WM&S' Bureau of Freshwater & Biological Monitoring by calling 609-292-0427 or visiting its website at: http://www.state.nj.us/dep/wms/bfbm

Raw data is posted on this website by the end of the calendar year that the data is received and validated. GIS shapefiles will also be available on the NJDEP web site once all data is reviewed and finalized.

Additionally, raw data is submitted to WQX as soon as the data is received and validated. WQX is USEPA's repository and framework for water quality, biological, and physical data. It is used by state environmental agencies, EPA and other federal agencies, universities, private citizens, and many others to store data. The retrieval of the data is handled through the STORET interface and can be accessed at: http://www.epa.gov/storet

Comments are welcome and may be emailed to: bfbm@dep.state.nj.us.

* Kennen, J.G. 1998. Relation of benthic macroinvertebrate community impairment to basin characteristics in New Jersey streams. Fact Sheet FS-057-98. U.S. Geological Survey. West Trenton, NJ


Map 1
RARITAN WATER REGION
Watershed Management Area 8
NORTH AND SOUTH BRANCH RARITAN
Watershed Management Area 7
ARTHUR KILL
Watershed Management Area 9
LOWER RARITAN, SOUTH RIVER AND LAWRENCE
Watershed Management Area 10
MILLSTONE
AMNET Assessment Categories
Excellent
Good
Fair
Poor
Not Sampled
Index
High Gradient Macroinvertebrate Index Boundary (HGMI)
Coastal Plain Macroinvertebrate Index Boundary (CPMI)
Watershed Management Areas
0
3.5
7
14 Miles
1 inch equals 6.45 miles

INTRODUCTION

Rationale for Biological Monitoring

Biological monitoring of freshwater systems in New Jersey provides an effective means of gauging long-term trends in surface water quality throughout the State. The Ambient Biomonitoring Network (AMNET) is one of the major ongoing monitoring programs. This statewide network of over 760 AMNET stations employs sampling and taxonomic analysis of in-stream macroinvertebrate communities to assess the ecological condition at each station. An integrated index of "biometrics", based on community composition and pollution tolerance levels of individual taxa, is used to assign assessment ratings; specifically the High Gradient Macroinvertebrate Index (HGMI). Biological monitoring, as referenced in this report, pertains to the collection and analysis of stream macroinvertebrate communities as indicators of water or habitat quality. Macroinvertebrates are larger-than-microscopic, primarily benthic (bottom-dwelling) fauna, which are generally ubiquitous in freshwater and estuarine environments, and play an integral role in the aquatic food web. Insects (largely immature forms) are especially characteristic of freshwaters; other major groups include worms, mollusks (snails, clams) and crustaceans (scuds, shrimp, crayfish, etc.). They are more readily collected and quantified than either fish or periphyton communities. Species comprising the in-stream community occupy various niches, based on functional adaptation or feeding mode (e.g. predators, filter or detritus feeders, scavengers); their presence and relative abundance is governed by environmental conditions (which may determine available food supply), and by pollution tolerance levels of the respective taxa. The overall community thus is holistically reflective of conditions in its environment. Assessments of ambient water / habitat quality can then be made based upon standardized procedures, which can show perturbations measured as changes or differences in community structure [1]. While development of a "multitrophic" approach, to include finfish and periphyton communities with invertebrates is being investigated, the primary means of assessment to date has been through macroinvertebrate community analysis.

Advantages of Using Benthic Macroinvertebrates:

1. They are good indicators of localized conditions of water quality due to their limited mobility. As such, they are well suited for the assessment of site-specific pollution impacts.
2. They are sensitive to environmental impacts from both point and non-point sources of pollution.
3. They integrate the effects of short-term environmental variations, such as oil spills and intermittent discharges.
4. Sampling is relatively easy and inexpensive.
5. They are holistic indicators of overall water quality, even for substances that may be present but at lower than detectable levels.
6. They are normally abundant in New Jersey waters as well as aquatic environments in general.
7. They serve as the primary food source for many species of commercially and recreationally important fishes.
8. Unlike chemical monitoring, where impacts to the environment tend to be by inference, not direct determination, they provide a direct measure of water quality in a manner consistent with the goals of the Clean Water Act.
9. They can be used to assess nonchemical impacts to the aquatic habitat, such as by thermal pollution, excessive sediment loading (siltation), or eutrophication.
10. To the general public, impacts to resident benthic macroinvertebrate communities are more tangible measurements of water quality than more esoteric listings of chemical test results.
11. When monitored together with relevant chemical/physical parameters, benthic macroinvertebrate communities can be used to identify sources of impairment.

Limitations of Biological Monitoring:

Biological monitoring cannot replace chemical monitoring, toxicity testing, and other standard environmental measurements. Each of these tools provides the analyst with specific information available only through its respective methodology.

The following illustrations provide an overview of the major macroinvertebrate indicator groups employed in making biological water quality assessments.

Benthic Macroinvertebrates Usually Indicative of Good Water Quality

Mayfly nymphs are often abundant wherever the water is clean. They are sensitive to various types of water pollution, including low dissolved oxygen, ammonia, biocides, and metals.

Stonefly nymphs are usually found only in cool, well-oxygenated waters free of pollution. Though not usually found in the numbers characteristic of mayflies, the presence of even a few stoneflies is indicative of good water quality.

Most caddisfly larvae, many of which build portable cases of stones, sticks, sand, and other detritus, are intolerant of water pollution.

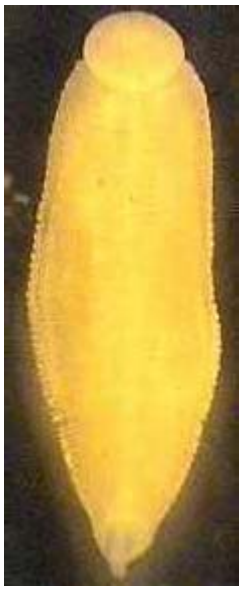
Aquatic beetles are common in well-oxygenated, swiftly running waters; many species are referred to as "riffle beetles." They are usually indicative of clean water since they are sensitive to wetting agents (soaps and detergents) and other pollutants.

All photographs taken by D.Bryson, NJDEP

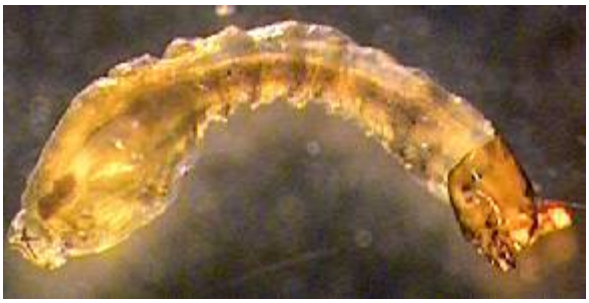
Benthic Macroinvertebrates Usually Indicative of Poor Water Quality

Midges (chironomids) are among the most common of aquatic invertebrates. They occupy a variety of aquatic habitats, including lakes, ponds, bogs, rivers, creeks, and marshes. They even exploit manmade habitats such as sewage treatment plants, water treatment plants, fish pools, irrigation ditches, and birdbaths. Many species are very tolerant of pollution.

Aquatic sowbugs, or freshwater isopods, are abundant in waters enriched with organic nutrients and low in dissolved oxygen. They are commonly observed in the recovery areas below sewage treatment plants.



Leeches and other segmented worms are very common in our lakes and streams, though not often noticed. They are tolerant of poor water quality and severe pollution.



Black fly larvae are filter feeders, capturing and ingesting plankton and bacteria from the surrounding water with specialized antennae. Some species are very tolerant of poor water quality and thus can be used as indicators of pollution.

All photographs taken by D.Bryson, NJDEP

STUDY DESIGN

Data Quality Objectives

The major goal of AMNET is to provide a long-term, cost-efficient means of gauging the quality of surface waters and watershed areas throughout the State. This is accomplished through biological sampling and analysis from a network of stream sites that adequately represents New Jersey's five major drainage basins and NJDEP's Watershed Management Areas (WMA). Administratively, a total of 21 WMA's have been delineated within New Jersey's five basins. Each major basin constitutes a "Water Region"; a major sub-basin forms each WMA. Within each WMA are several smaller sub-basins, delineated by the United States Geological Survey (USGS) as "hydrologic units," scale 11 (HUC11). The present study area comprises the Raritan Water Region, and includes WMA #'s 7 (Elizabeth, Rahway, Woodbridge), 8 (North and South Branch Raritan), 9 (Lower Raritan, South River, Lawrence Brook), and 10 (Millstone River) (see Maps 1 – 7, Volume 2). The standard sampling interval of five years, reflects a realistic temporal lag between cessation of an environmental perturbation and recovery of the impacted biological community. The Integrated Water Quality Monitoring and Assessment Report [2], which re-examines changes in New Jersey's stream systems on a two-year cycle, has indicated that five years is an optimum period for long-term biomonitoring. An ample network of stations is required for the creation of a long-term database, which in turn, is necessary for trend analysis and operation of water quality predictive models.

The AMNET program is designed to monitor a Water Region's complement of stations within a 12 to 15 month time period (depending on the size of the Water Region) giving DEP's modelers and planners a snapshot of ambient biological impacts during that continuous time interval. Administratively this sampling time interval starts at the beginning of the State's Fiscal Year in July. Sampling continues from that point, but only during the sampling index months of April - November, until all of the sites of the respective Water Region are visited. Sampling is curtailed through the coldest months (December to March), because of difficulties encountered in obtaining representative samples during this period.

SITE SELECTION

Sites were selected essentially to provide representative coverage of each Water Region, as well as the entire State. To ensure enough flow for sampling, sites on "first-order" streams are situated at least three miles downstream of headwaters (first order streams are those with no tributaries). Since most streams at this level have very little (or only intermittent) flow, most of the AMNET sites are situated on second-order streams (with only first-order streams as tributaries) and higher (with a greater hierarchy of tributaries). All sites are located in reasonably accessible and primarily wadeable segments, proceeding downstream to the head-of-tide. Sites are numbered in approximate upstream to downstream order, from the mainstem of each major sub-basin to each adjacent tributary, and then to the next adjacent sub-basin.

To maximize data correlation, AMNET, wherever possible, incorporates existing stations of the Ambient Surface Water Chemical Monitoring Network, which is administered jointly by NJDEP and the USGS [3]. Furthermore, so as to gauge the effects of major tributaries and larger lakes, many AMNET sites are located near their confluence or outlet. An attempt is made when selecting sites to obtain a sample representative of the stream's total water quality. Sites are located in areas that best represent the stream, Watershed Mangaement Area (WMA) or Hydrologic Unit.

Exact AMNET site locations were determined via the Global Positioning System (GPS) using Trimble Pathfinder units and the appropriate correction sources utilized by NJDEP. All positions were logged into the NJDEP's Geographical Information System (GIS) (see Maps 1 – 7, Appendix A, Volume 2).

A total of 164 stations had been established in the Raritan Region in the previous round (Round 3) [4].

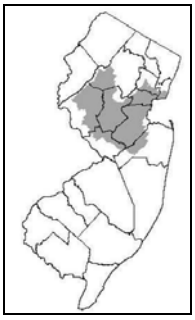


Figure 4

Map of Round 4 study area

This area sub-basins that drain to Raritan Bay via the Arthur Kill, i.e., the Elizabeth, Rahway, and Woodbridge rivers (now WMA 7), which were formerly part of the greater Passaic (Northeast) Region [4], have been included in the present study. This area (shown in Figure 4) primarily includes WMA #'s 7 (Elizabeth, Rahway, Woodbridge), 8 (North and South Branch Raritan), 9 (Lower Raritan, South River, Lawrence Brook), and 10 (Millstone River). The present Raritan study area (Figure 4) includes a total of 164 sampling sites, AN0192 – 204 and AN0310 - 454 (see Table 2, Volume 2). Four sites were not sampled this round due to mitigating factors such as bridge construction (AN0435, AN0443) or road closure permitting no access to sites (AN0424B, AN0389). This resulted in 160 sites sampled and assessed for Round 4.

FIELD & LABORATORY METHODS

Benthic macroinvertebrate sampling and analysis is performed in accordance with the NJDEP Field Procedures Manual [5], Rapid Bioassessment Protocol (RBP) guidelines of the USEPA [6] and Standard Operating Procedures (SOP) (see http://www.state.nj.us/dep/wms/bfbm/download/AMNET_SOP.pdf) of the NJDEP Aquatic Biomonitoring Laboratory [7]. As detailed in the SOP and in the quality assurance work plan [8], a thorough quality control program, with emphasis on macroinvertebrate taxonomy, is practiced.

Sample Collection

In general, a "multi-habitat" approach is used, focusing on the more productive habitat types [6]. The usual sampling device is a D-frame kick net of 800 x 900 um mesh size and one foot width (a Ponar dredge may be employed when conditions require). In high-gradient streams, where the predominant substrate is cobble, the riffle/run area is the preferred sampling habitat; other likely habitat types are sampled when present. The kick net is held firmly against the hard bottom, and an area approximately one foot upstream of the net is disturbed using feet and/or hands. This procedure is repeated, sampling all velocity/depth regimes at the site, including at least one riffle-run-riffle sequence (if present). In the low-gradient Coastal Plain streams, bottoms generally consist of sand or mud without dominant cobble/riffle areas; therefore, a variety of stable substrates including woody debris, submerged macrophytes and portions of banks, are sampled. The "jab and sweep" method [9] is employed; a minimum of 20 jabs/sweeps are taken, proportioned approximately to the numbers of each habitat type present. In all cases, stream distance sampled approaches, but does not exceed, 100 meters. Level of effort is consistent for all sites. Where possible, sampling is done upstream of bridges, sufficiently removed from the influence of any associated channel alterations. The entire sample is sieved using a #30 mesh sieve bucket, put into wide-mouthed (1-L) jars, and preserved with 5 to 10% formalin (to 20% in cases of excessive organic loading). Both the sieve bucket and net are examined for adhering organisms. Any found are removed with forceps and placed into the sample jar. During the field operations, qualitative observations of habitat, surrounding land use, potential pollution sources, and presence of other aquatic biota are recorded (Appendix D, Volume 2); a visual-based qualitative habitat assessment [6] is also performed (see Supplemental Analyses/Evaluation Methods). These observations/evaluations, however do not factor into the final bioassessment rating.

Sample Processing and Sorting

In the laboratory, after rinsing in a #30 mesh sieve to remove the preservative, the composited sample is evenly distributed in a light-colored pan marked with grids of equal size. Using low-power magnification

(6.3x), all organisms greater than 2mm in size are then removed from each randomly selected grid until a total of at least 100 organisms is obtained. Colonial groups (e.g. Bryozoa and Porifera), vertebrates, and terrestrial organisms are not included in the subsample. Organisms retained are reasonably intact to allow for accurate identification.

Macroinvertebrate Identification and Quality Control

The individuals from the subsample are identified to the lowest practicable taxonomic level, usually genus or species, using 7 to 30X stereozoom and 40 to 400X compound magnification. Leica Model MZ6 stereomicroscopes and Leica Models DMLS and DME compound microscopes are currently used. A computerized digital camera system projects and records microscope images of selected specimens to aid in their identification. A comprehensive collection of taxonomic keys and other references, including functional (or niche) descriptions and pollution tolerance classifications for most species, is maintained. An indexed list of these is given in the AMNET SOP [7]. Pertinent new reference material is added when available. Taxonomists confer with each other regarding species in question. The International Taxonomic Information System (ITIS) (www.itis.gov) is monitored for possible changes in nomenclature or groupings. Consultation with other scientists in the field, particularly from agencies involved in similar programs (e.g. New York Department of Environmental Conservation, USGS, USEPA), provides added assistance and confirmation when needed. For verification, 10% of the samples are sent to a qualified independent consultant for parallel identifications. A macroinvertebrate specimen reference collection is also maintained.

Data Analysis

Biological impairment may be caused by several major factors such as organic enrichment, habitat degradation, or toxicological effects. It may be manifested in several aspects of the benthic macroinvertebrate community; these include absence of pollution-sensitive taxa, especially the EPT group, i.e., Ephemeroptera (mayflies), Plecoptera (stoneflies) and Trichoptera (caddisflies); excessive dominance of pollution-tolerant taxa such as Chironomidae (midges) and Oligochaeta (worms); low overall taxa numbers, or other perceptible differences in community structure relative to a reference condition.

The data analysis is an important part of the RBP protocol. Developed under USEPA auspices as an expedient and cost-effective monitoring tool, it recognizes the use of community metrics and the pollution indicator concept. "Biometrics" measure different components of community structure, including population and functional parameters, each with a different range of sensitivity to pollution stresses [1, 10]. The use of a variety of biometrics assures a more robust or valid assessment; therefore, an anomaly in any one metric is less likely to invalidate the study findings. The results are integrated through common scoring criteria, derived from an established comparable database, to determine a final numerical rating and consequent biological assessment category (see Table 1). This provides the analyst with an easily communicated evaluation of relative impairment, referred to in this report as the "bioassessment rating." For RBP protocols, results are based on 100 organism sub-samples. Scoring criteria for RBP protocols [1] are calibrated for genus level taxonomy, giving four final rating categories ("excellent", "good", "fair", and "poor").

Multimetric Index Development

Previously, a single statewide index, the New Jersey Impairment Score (NJIS), was used in assigning one of three assessment ratings, non-impaired, moderately impaired, and severely impaired. The NJIS was limited in that it used family level taxonomic identification for calculating scores and did not account for geographical differences in macroinvertebrate community structures. To resolve these limitations, three indices are now used for assessments; High Gradient Macroinvertebrate Index (HGMI), Coastal Plain Macroinvertebrate Index (CPMI), and Pinelands Macroinvertebrate Index (PMI). These indices account

for the State's geographically different regions and use genus level taxonomic identification for calculating scores. For the Raritan Water Region assessments, HGMI was used. The higher level of identification allows for more resolute and accurate results at four assessment rating levels (rather than the three previously used); "excellent", "good", "fair", and "poor". The results are considered reflective of the water and/or habitat quality at each site. This information is used by the Department, primarily in assessing progress toward the goals of the Clean Water Act via the Integrated Water Quality Monitoring and Assessment Report. AMNET data are also integral for designation of Category 1 waters, based on exceptional ecological significance. New Jersey's benthic macroinvertebrate communities can be statistically grouped into three distinct structures based on geographical regions: high gradient (above the Fall Line), low gradient (Coastal Plain excluding the Pinelands), and Pinelands. To accurately assess biological conditions, a multimetric index was developed using genus-level taxonomic identifications for each distinct region using guidelines outlined in USEPA *Rapid Bioassessment Protocols(RBP) for Use in Wadeable Streams and Rivers* (see http://www.epa.gov/bioindicators/html/rbps.html) [6]. All current assessments use one of the three genus level indices. Each index is described below and is used in each water region in this manner (see Figure 1A, index boundary map): Northwest Region, HGMI & CPMI; Northeast Region, HGMI; Raritan Region, HGMI & CPMI; Atlantic Region, CPMI & PMI; Lower Delaware Region, CPMI & PMI. The final index scores were derived in coordination with professional staff from Water Monitoring and Standards' Bureau of Freshwater and Biological Monitoring, Water Monitoring and Standards' Bureau of Water Quality Standards and Assessment, USEPA, United States Geological Survey (USGS), and the Delaware River Basin Commission (DRBC).

High Gradient and Low Gradient Streams

Two of the indices (see Table 1) to be employed in New Jersey, the High Gradient Macroinvertebrate Index (**HGMI**) [11] and Coastal Plain Macroinvertebrate Index (**CPMI**) [12], were developed using guidelines outlined in USEPA *Rapid Bioassessment Protocols for Use in Wadeable Streams and Rivers* [6]. The resolution of index scoring thresholds was further enhanced by establishing a graphical relationship between the scores for each index and the tiers these scores represent in the context of a Biological Condition Gradient (BCG). The final index scoring thresholds serves to assess each site from two perspectives: the condition of the macroinvertebrate community and the regulatory use attainment.

For each index, four descriptive categories were established at break points along the statistical distribution of scores from reference to degraded conditions, coordinated to the BCG to increase the accuracy; "excellent", "good", "fair", and "poor" (see Table A1). "Excellent" and "good" fall into the acceptable regulatory range of fully attaining the aquatic life use. "fair" and "poor" fall below the acceptable regulatory range and are considered impaired, from a Federal Clean Water Act (CWA) perspective, and not attaining the use.

Pinelands Streams

The Pinelands Macroinvertebrate Index (**PMI**) [13] was developed using the same USEPA guidelines and professional coordination as above. However, since a BCG was not developed, and not necessary from a regulatory standpoint, a graphical relationship between index scores and the BCG tiers was not generated. As with the high and low gradient indices, four descriptive categories were established at break points along the statistical distribution of scores from reference to degraded conditions "excellent", "good", "fair", and "poor" (see Table A1). For waters with a Surface Water Classification of "PL", "excellent" and "good" are classified as reference or natural conditions of Pineland waters and fall into the acceptable regulatory range of fully attaining the aquatic life use. "Fair" and "poor" fall below the acceptable regulatory range of PL waters and are considered impaired, from a CWA perspective, and not attaining the use.

The unique chemical, physical, and biological properties characteristic of waters contained with the Pinelands area are also present for varying distances outside this jurisdictional delineation. To assess these Pinelands-like waters outside the Pinelands boundary, the Department delineated a 5 kilometer buffer around the Pinelands Area and will apply the PMI to this region. Pinelands-like waters outside the jurisdictional delineation, however, have a Surface Water Classification of FW2 and not PL. From a regulatory standpoint FW2 waters are held to a somewhat lower level of biological expectation than the Outstanding National Resource Waters (ONRW) waters contained within the PL designated area. Because of this lower regulatory expectation for FW2 waters, the PMI category of "fair" and above will be regarded as fully attaining the aquatic life use, i.e. biologically *nonimpaired* from a regulatory perspective. FW2 waters in this buffer region assessed as "poor" will be regarded as *impaired* and not supporting the aquatic life use.

Table A1: Descriptive and regulatory thresholds for Fresh Water High Gradient (Highlands, Ridge and Valley, Piedmont), Low Gradient (Coastal Plain, Excluding Pinelands Waters) and Pinelands Waters.

High Gradient Macroinvertebrate Index (HGMI) (Highlands, Ridge and Valley, Piedmont)		
Assessment category	**Index Score**	**Regulatory Threshold**
Excellent	63 - 100	Full Attainment
Good	<63-42	Full Attainment
Fair	<42-21	Non-Attainment
Poor	< 21	Non-Attainment
Coastal Plain Macroinvertebrate Index (CPMI)		
Assessment category	**Index Score**	**Regulatory Threshold**
Excellent	22 - 30	Full Attainment
Good	20 - 12	Full Attainment
Fair	10 - 6	Non-Attainment
Poor	< 6	Non-Attainment
Pinelands Macroinvertebrate Index (PMI)		
Assessment category	**Index Score**	**Regulatory Threshold**
Excellent	63 - 100	Full Attainment
Good	<63-56	Full Attainment
Fair	<56-34	Non-Attainment(PL) Full Attainment(FW2)
Poor	< 34	Non-Attainment

Trend Analysis

In evaluating the current AMNET data against that of the previous round, a significant improvement or decline is considered to have occurred if the difference in AMNET scores have changed the bioassessment rating. A complete list of site-by-site comparisons is presented in Table 2, Volume 2 where a (+) indicates a significant improvement, a (–) indicates a significant decline, and a (/) indicates no change in rating. If a site was only sampled once in concurrent rounds, the change will have "nd" meaning there was "no data" available for a comparison.

SUPPLEMENTAL ANALYSES / EVALUATION METHODS

Morphological Abnormalities

Occasionally, morphological abnormalities have been found in individual macroinvertebrates recovered in WM&S/BFBM's AMNET collections. These deformities have been most readily detected in the Chironomidae (midges), where they occur primarily in the head appendages (antennae) and mouth parts (mentum and mandibles). While the incidence has been most frequent in the chironomids (especially those species categorized as detritivores, herbivores or periphyton feeders), abnormalities have also been observed in individuals of other taxonomic groups. Although this is not a factor in the data analysis, such features are noted as they may signify possible contaminants or stressful conditions in the respective drainages.

Abnormalities observed in the course of identification are noted; these results are summarized by sample site in Table 3, Volume 2. For Chironomidae, the data are displayed as # of chironomids with abnormalities / # of chironomids examined. For all other taxa, just the number of individuals with abnormalities is presented. Photographic examples of abnormalities in midge larvae and amphipods (scuds) are presented in Appendix B, Volume 2.

Habitat Assessment

The physical attributes of habitat play an integral role in the health of the macroinvertebrate community. Where stations are physically comparable, differences in impairment can be attributed to water quality factors; however, physical habitat degradation alone can account for biological impairment in a stream [1]. Parameters evaluated include in-stream substrate, channel morphology, bank structural features, and riparian vegetation. The area evaluated includes the sample site and its immediate surroundings, particularly upstream, usually within a 100 – 200 foot radius. The visual-based qualitative habitat assessment results in one of four condition categories: optimal, suboptimal, marginal or poor, as outlined in the revised USEPA criteria [6].

The habitat assessment is separated into two basic approaches; one designed for high gradient streams and one designed for low gradient streams [6]. Examples of assessment forms for each approach can be found in Appendix C, Volume 2. Streams in the northern regions of New Jersey are generally considered to be "high gradient" streams, having substrates of rock and cobble of various sizes, and with relatively swift flow. Those in the Coastal Plain and Pinelands regions of southern New Jersey are considered as "low gradient" streams, having slower flow and more homogeneous substrates, primarily of sand or gravel and finer sediments. Habitat assessments may be temporarily downgraded by adverse weather conditions, such as excessive rainfall or prolonged drought. It should also be noted that habitat assessments are performed independently of the macroinvertebrate community analysis; thus, they do not factor into the final impairment score, but are used primarily as supplementary information.

Chemical Monitoring

The Bureau of Freshwater and Biological Monitoring (BFBM) has various chemical monitoring networks throughout the State. These networks emphasize emerging state and federal strategies to more realistically assess the success of State and Federal Clean Water Act Programs. The sampling stations include surfacewater as well as groundwater monitoring.

Chemical data and results from these networks are integrated with results from the BFBM's biological networks, such as AMNET, for water quality assessments reported through the New Jersey Integrated Water Quality Monitoring and Assessment Report (Integrated Report).

The Bureau of Water Quality Standards and Assessment (BWQSA) is responsible preparing the biennial Integrated Report and coordinating water quality assessments of all waters of the State, including assessment of data collected by non-departmental entities (e.g., regional and local government agencies and volunteer monitoring organizations). BWQSA is also responsible for the development, adoption, and administration of New Jersey's Surface Water Quality Standards and Ground Water Quality Standards.

The federal Clean Water Act mandates that states submit biennial reports to USEPA describing the quality of their waters. The biennial "Statewide Water Quality Inventory Report" or "305(b) Report" must include the status of principal waters in terms of overall water quality and support of designated uses, as well as strategies to maintain and improve water quality. The 305(b) reports are used by Congress and USEPA to establish program priorities and funding for federal and state water resource management programs. This report is also referred to as the "Integrated List of Waters" (Integrated List). The biennial List of Water Quality Limited Waters or "303(d) List" identifies waters that are not attaining designated uses because they do not meet surface water quality standards despite the implementation of technology-based effluent limits. States must prioritize waters on the 303(d) List of Water Quality Limited Waters for Total Maximum Daily Load (TMDL) development and identify those high priority waters for which they anticipate establishing TMDLs in the next two years.

The New Jersey Integrated Water Quality Monitoring and Assessment Reports (Integrated Reports) are intended to provide effective tools for maintaining high quality waters and improving the quality of waters that do not attain their designated uses. The Integrated Reports describe attainment of the designated uses specified in New Jersey's Surface Water Quality Standards (N.J.A.C. 7:9B), which include: aquatic life; recreation; drinking, industrial, and agricultural water supply; fish consumption; and shellfish harvest for consumption.

The Integrated Report process begins with the solicitation of water quality-related data to support the development of the 303(d) List. The Department then updates the Integrated Water Quality Monitoring and Assessment Methods Document (Methods Document), as needed**.** This document includes a description of quality assurance and other data requirements, as well as the scientific methods to be used to assess water quality and use support. The Methods Document also explains the rationale for placing waters on the 303(d) List, delisting waters from the 303(d) List, and ranking the priority of 303(d)-Listed waters for TMDL development. A notice of availability for public review of the draft Methods Document is published in the New Jersey Register and a thirty-day comment period is provided. After review and consideration of comments received on the proposed Methods Document, the Department finalizes the Methods Document and publishes it on the Department's Web site along with the agency responses to public comments received.

After the Methods Document is finalized, the Department compiles all readily available data that meets quality requirements and assesses the data to determine designated use support and compliance with surface water quality standards. The results of these assessments are presented in the Integrated List and the 303(d) List. The Department prepares these Lists as part of the Integrated Report, along with a

discussion of the assessment results, water quality trends, other water quality assessments, descriptions of water quality programs and actions taken and planned to restore water quality, including TMDL schedules, as well as monitoring needs and schedules, and makes it available for public review. The draft 303(d) List is submitted to USEPA for approval along with the two-year TMDL schedule and priority ranking.

The Department will attempt to identify the potential sources of impairment using the Stressor Identification (SI) process. The purpose of the Stressor Identification (SI) process is to identify the principle stressor(s), including but not limited to specific pollutants, responsible for the degraded biological condition. Identifying whether the principal stressor(s) is a *pollutant** or due to more generic landscape changes caused by human activities, is the first step towards deciding whether a pollutant(s) specific TMDL or other appropriate management measures will be taken to remediate the impairment. Five sites have been selected in this Water Region for initial Stressor Identification work. These sites are: AN0311 (Drakes Brook), AN0324 (Beaver Brook), AN0343 (Holland Brook) and AN0333 & AN0337 (Neshanic River).

* As defined in the N.J. Water Pollution Control Act (N.J.S.A. 58:10A-1 et seq.) and the Federal Water Pollution Control Act, aka "Clean Water Act" (33 U.S.C. 1251-1376)

RESULTS AND DISCUSSION

Summary of Statewide AMNET Data

The current study marks the fourth round of sampling for the Raritan Region AMNET study. For the purpose of comparing Rounds, Round 3 results were re-assessed using the new indices. The Raritan Region has shown considerable changes since the previous rounds by virtue of using the more geographically specific assessment. The number of "good" sites has shown a slight increase, while the number of "excellent" sites has shown a slight decline. The number of "fair" and "poor" sites has remained the same. The table below presents the proportions of "excellent", "good", "fair", and "poor" AMNET sites for all New Jersey Water Regions in the third AMNET round, plus the fourth round for the Raritan Water Region.

Region	**Number of sites (% of total)**				
Fourth round	**Excellent**	**Good**	**Fair**	**Poor**	**Total sites**
Raritan	19 (11.9%)	46 (28.7%)	64 (40.0%)	31 (19.4%)	160
Northeast	7 (6.9%)	19 (18.6%)	52 (51.0%)	24 (23.5%)	102
Upper Delaware	41 (29.7%)	49 (35.5%)	39(28.3%)	9 (6.5%)	138
Third round					
Upper Delaware	33 (23.4%)	48 (34.0%)	43 (30.5%)	17 (12.1%)	141
Northeast	8 (7.8%)	13 (12.7%)	56 (54.9%)	25 (24.5%)	102
Raritan	27 (16.9%)	38 (23.8%)	64 (40.0%)	31 (19.4%)	160
Atlantic	53 (27.0%)	44 (22.4%)	77 (39.3%)	22 (11.2%)	196
Lower Delaware	13 (8.1%)	35 (21.9%)	80 (50.0%)	32 (20.0%)	160

Results and Trends

Overall, the bioassessment ratings for each of the monitoring stations are best estimates of the in-stream biological impairment based upon the data obtained in the current AMNET survey. Detailed taxonomic and statistical data, bioassessment ratings, habitat assessment scores and observations for each AMNET site are given in Table 2 and Appendix D, Volume 2.

Figure 5 depicts the overall results for the Round 4 study in the Raritan Water Region. Of the 160 monitoring stations sampled during this study period, 19 (11.9%) were found "excellent", 46 (28.7%) "good", 64 (40.0%) "fair", and 31 (19.4%) "poor" (see Table 2, Volume 2).

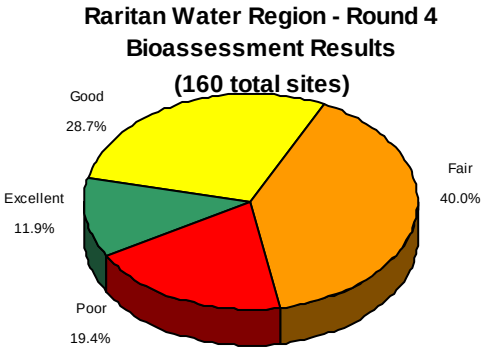


Figure 5

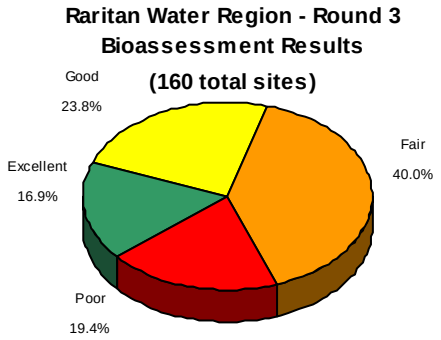


Figure 6

Figure 6 shows the results obtained from 160 AMNET sites within the Raritan Water Region that were sampled during the previous (Round 3) Raritan study (see "Site Selection" p.6 & Table 2, Volume 2). While the results for Round 4 were similar to those for Round 3, for the current sampling period the number of "good" and "fair" sites were slightly higher, and the number of "excellent" sites were slightly lower with the number of "poor" sites remaining constant. [4].

Figure 7 displays the percentage of change in rating among the same 157 AMNET sites in the Raritan Water Region that were sampled during the third round study period [4], and again during the current (Round 4) study period (see "Site Selection" & Table 2, Volume 2). The green indicates sites that have undergone a positive change, yellow indicates no change, and red indicates a negative change. Positive change is defined as an improved rating from the previous Round's rating, while a negative change is defined as a downgraded rating from the previous Round (see Table 2, Volume 2).

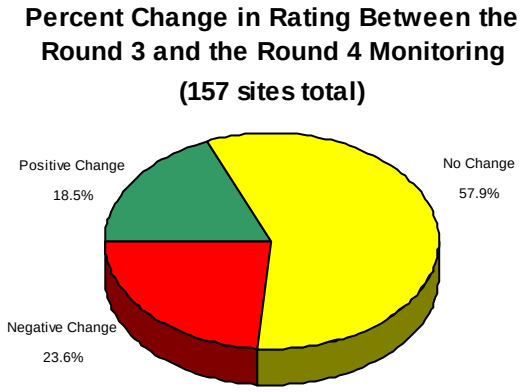


Figure 7

Regional Results

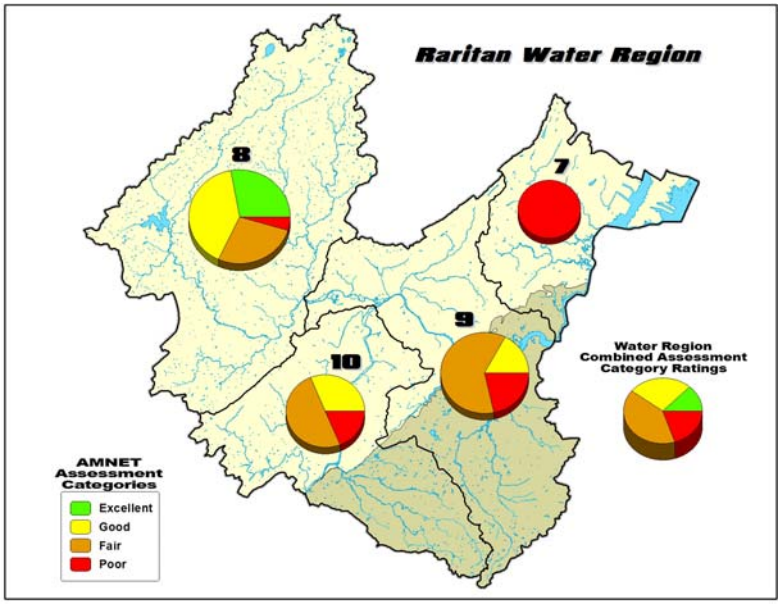


Figure 8

A USGS study, using data generated from NJDEP's AMNET program [15], statistically related levels of impairment to physiographic land types, corresponding land uses, and other anthropogenic factors on a statewide scale. A non-impaired community was most positively related to the area of forested and undeveloped land in its watershed upstream, and to the total underlying terrain in the steeper gradient ecoregions of northwestern New Jersey (i.e. Reading Prong/Highlands). Conversely, an impaired community was most positively related to the area of urban land, and to the total volume of wastewater (point source) discharge [15]. The table below presents the proportion of "excellent", "good", "fair", and "poor" AMNET sites, based on the current data, in each of the Raritan Watershed Management Areas.

WMA	Sub-basins	Excellent	Good	Fair	Poor	Total sites
7	Elizabeth / Rahway / Woodbridge Rivers system	--	--	--	12 (100%)	12
8	North and South Branch Raritan Rivers system	19 (27.9%)	27 (39.7%)	19 (27.9%)	3 (4.4%)	68
9	Lower Raritan / South Rivers system	--	7 (16.67%)	26 (61.9%)	9 (21.4%)	42
10	Millstone River system	--	12 (31.6%)	19 (50.0%)	7 (18.4%)	38
	Totals:	19 (11.9%)	46 (28.7%)	64 (40.0%)	31 (19.4%)	160

Figure 8 illustrates the proportions of "excellent", "good", "fair", and "poor" sites in each WMA of the Raritan Water Region for the current AMNET round.

Evaluation by WMA

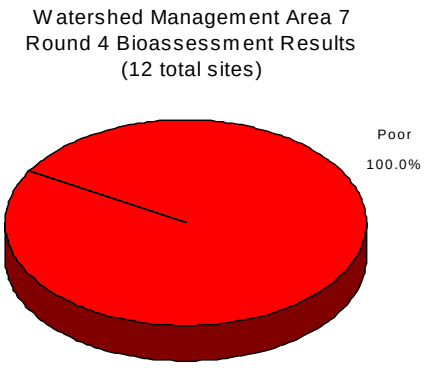


Figure 9

Watershed Management Area #7 includes a total of 12 AMNET sites in the Elizabeth and Rahway Rivers and several smaller streams in portions of Essex, Middlesex and Union Counties; these include Robinsons Branch and unnamed tributaries to Robinsons Branch (see Map 2, Volume 2). Figure 9 shows the current site rating summaries for WMA #7 with all 12 sites being "poor". Figure 10 depicts the results obtained from 11 sites sampled during the earlier (Round 3) survey [4]. Comparing the current results to the earlier results shows a significant decline at 3 sites (see Table 2, Volume 2). The number of "poor" sites is slightly higher than the earlier data with 8 sites showing no change. Site AN0202 was sampled this round but was not sampled in the previous round . The majority (83.3%) of habitat scores are in the suboptimal range, with 16.7% receiving a marginal score. Abnormalities in chironomid larvae and other invertebrate families were found at four sites (two on the Rahway River, one on South Br Rahway River and one on Robinsons Br) (see Map 2, Table 3, Volume 2). Three of these sites displayed chronic abnormalities The table below presents a synopsis of AMNET data for WMA #7; AMNET site locations and bioassessment ratings within WMA #7 are shown in Figure 11.

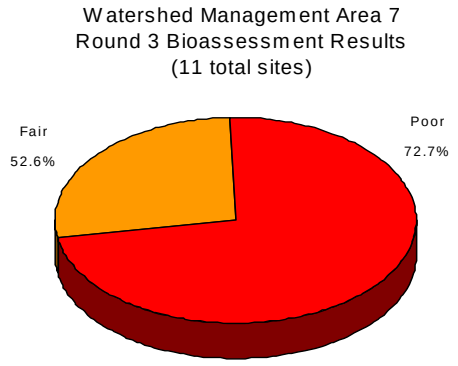


Figure 10

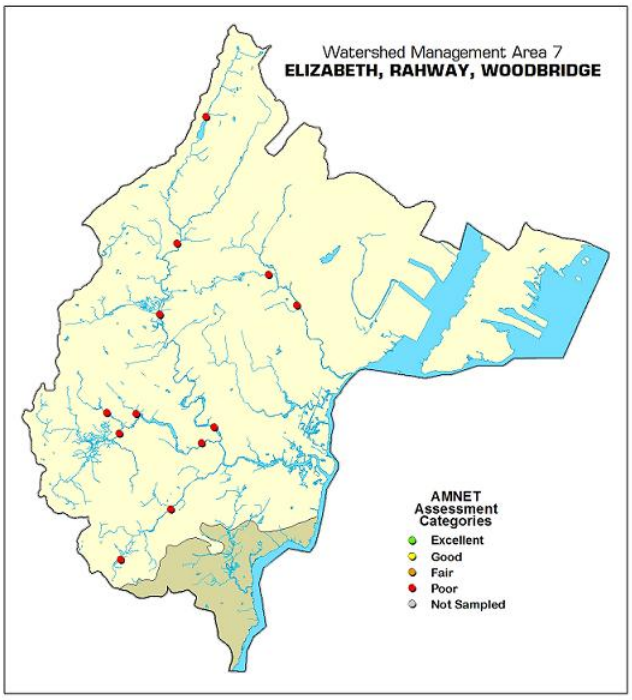


Figure 11

WMA # 7 Combined Results Table

Bio Rating	Round 3		Round 4			Habitat Assessment	Round 4	
Excellent	---	---	---	---		Optimal	---	---
Good	---	---	---	---		Suboptimal	10	83.3%
Fair	3	27.3%	---	---		Marginal	2	16.7%
Poor	8	72.7%	12	100%		Poor	---	---
Total sites	11		12				12	

Watershed Management Area #8 includes a total of 68 AMNET sites in the North and South Branch of the Raritan River, and its tributaries, in Hunterdon, Morris, and Somerset Counties (see Maps 3 & 4, Volume 2). Figure 12 shows the current site rating summaries for WMA # 8: 27.9% (19 sites) "excellent", 39.7% (27 site) "good", 27.9% (19 sites) "fair", and 4.4% (3 sites) "poor". Figure 13 depicts the results obtained from 68 sites sampled during the earlier (Round 3) survey [4]. Comparing the current (Round 4) impairment rating results to the earlier (Round 3) results, a significant improvement is apparent at 8 sites and a significant decline at 20 sites (see Table 2, Volume 2). The number of "excellent" sites decreased slightly, while the number of "good" and "fair" sites increased slightly, with the number of "poor' sites remaining the same since the earlier sampling (see Table 2, Volume 2). The majority (75.0%) of habitat scores are in the suboptimal range with 22.1% receiving an optimal score and only 2.9% receiving a marginal score. Abnormalities in chironomid larvae and other invertebrate families was found at seven sites (one each on Spruce Run, Willoughby Bk, Lamington River, Cold Bk, and 3 on the Neshanic Rivers) (see Maps 3 & 4, Table 3, Volume 2). One site (AN0356, Lamington River) displayed chronic abnormalities (see Table 3, Volume 2). The table below presents a synopsis of AMNET data for WMA #8; AMNET site locations and bioassessment ratings within WMA #8 are shown in Figure 14.

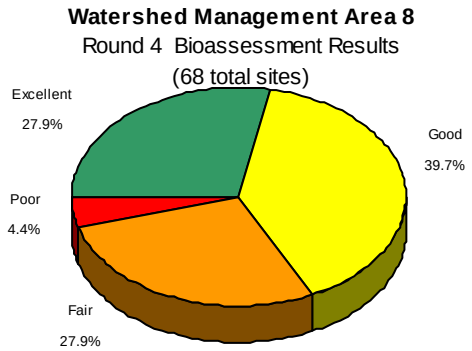


Figure 12

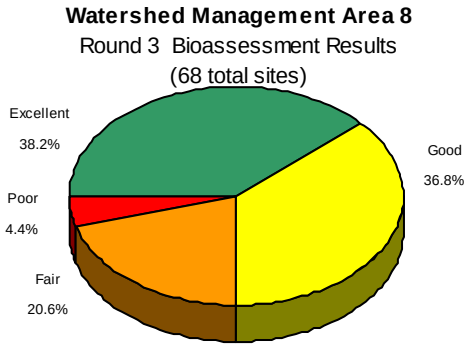


Figure 13

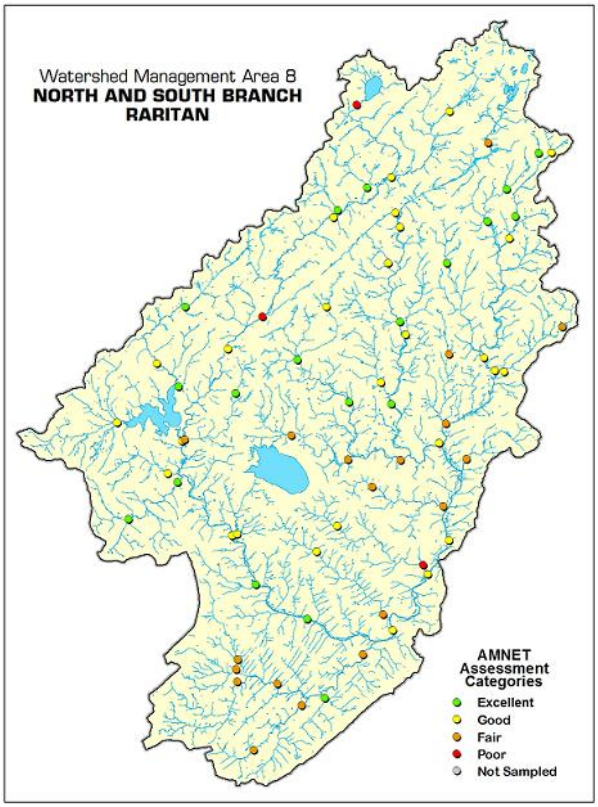


Figure 14

WMA # 8 Combined Results Table

Bio Rating	Round 3		Round 4			Habitat Assessment	Round 4	
Excellent	26	38.2%	19	27.9%		Optimal	15	22.1%
Good	25	36.8%	27	39.7%		Suboptimal	51	75.0%
Fair	14	20.6%	19	27.9%		Marginal	2	2.9%
Poor	3	4.4%	3	4.4%		Poor	---	---
Total sites	68		68				68	

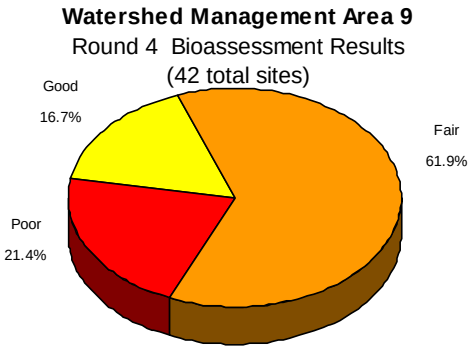


Figure 15

Watershed Management Area #9 includes a total of 42 AMNET sites in the Lower Raritan River, South River and Lawrence Brook and its tributaries in Middlesex, Monmouth, Somerset and Union Counties (see Map 5, Volume 2). Three sites (AN0424B, AN0435, and AN0443) were not sampled due to inaccessible site access (bridge construction or other obstacle). Figure 15 shows the current site rating summaries for WMA # 9: 16.7% (7 site) "good", 61.9% (26 sites) "fair", and 21.4% (9 sites) "poor". Figure 16 depicts the results obtained from 44 sites sampled during the earlier (Round 3) survey [4]. Comparing the current to the earlier results, a significant improvement is seen at 12 sites, and a significant decline, at 6 sites (see Table 2, Volume 2). The number of "good" sites increased slightly from that of the earlier sampling, and the number of "poor" sites is slightly decreased, with the number of "fair" sites remaining the same (see Table 2, Volume 2). The majority of sites (88.1%) received a suboptimal habitat score, with 2.4% receiving an optimal score and 9.5% receiving a marginal score. Abnormalities in chironomid larvae and other invertebrate families were found at three sites (Dukes Bk, Peters Bk, and Middle Bk) (Maps 5 & 6, Table 3, Volume 2). All three of these sites (AN0375, AN0376, and AN0420) displayed chronic abnormalities (see Table 3, Volume 2). The table below presents a synopsis of AMNET data for WMA #9; AMNET site locations and bioassessment ratings within WMA # 9 are shown in Figure 17.

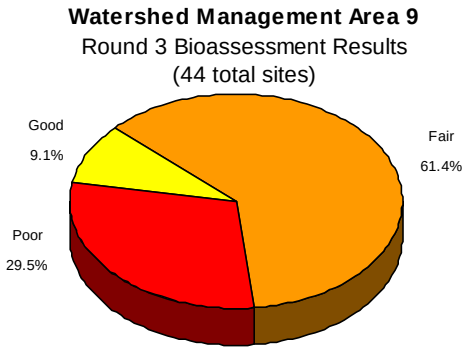


Figure 16

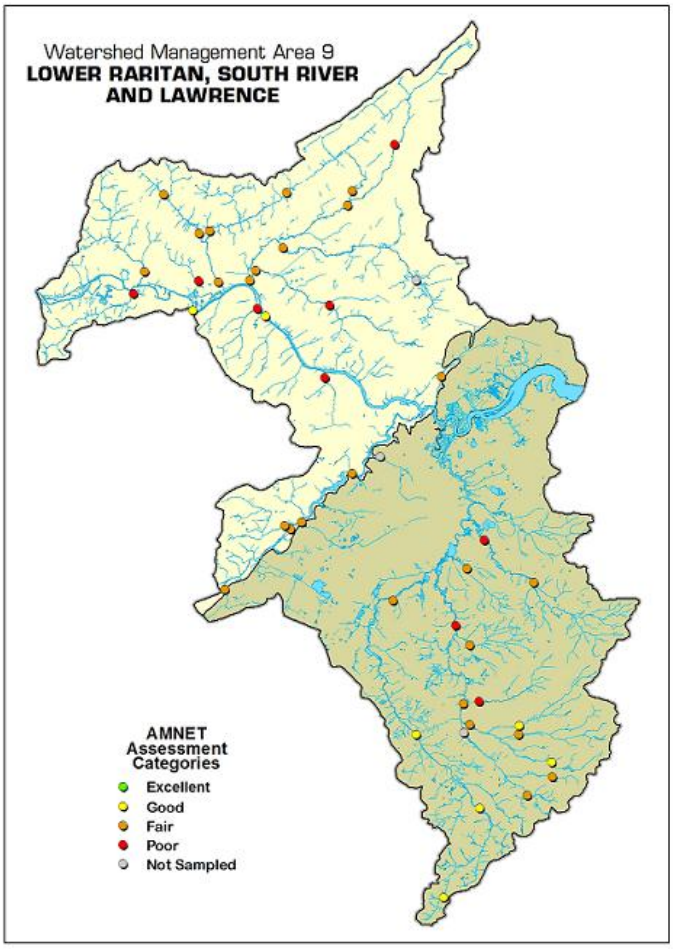


Figure 17

WMA # 9 Combined Results Table

Bio Rating	Round 3		Round 4			Habitat Assessment	Round 4	
Excellent	---	---	---	---		Optimal	1	2.4%
Good	4	9.1%	7	16.7%		Suboptimal	37	88.1%
Fair	27	61.4%	26	61.9%		Marginal	4	9.5%
Poor	13	29.5%	9	21.4%		Poor	---	---
Total sites	44		42				42	

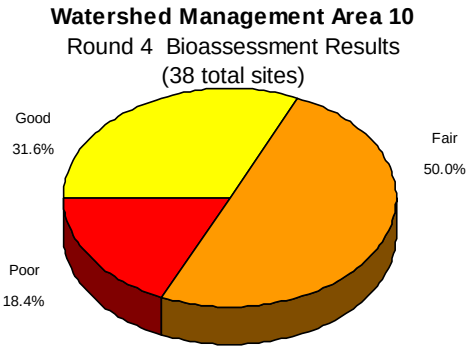


Figure 18

Watershed Management Area #10 includes a total of 38 AMNET sites in the Millstone River and its tributaries in Mercer, Middlesex, Monmouth and Somerset Counties (see Maps 6, 7, & 8, Volume 2). Site AN0389 (Devils Bk) was not sampled due to site no longer being accessible. This is the second time this site was inaccessible so it will be dropped from the program. Figure 18 shows the current site rating summaries for WMA # 10: 31.6% (12 sites) "good", 50.0% (19 sites) "fair", and 18.4% (7 sites) "poor". Figure 19 depicts the results obtained from 37 sites sampled during the earlier (Round 3) survey [4]. Comparing the current to the earlier results, a significant improvement is seen at 9 sites, and a significant decline, at 8 sites (see Table 2, Volume 2). The number of "good" sites increased slightly from that of the earlier sampling, and the number "excellent" and "fair" sites is slightly decreased, with the number of "poor" sites remaining the same (see Table 2, Volume 2). The majority of sites (86.8%) received a suboptimal habitat score, with 13.2% receiving an optimal score. Abnormalities in chironomid larvae and other invertebrate families were found at two sites (Back Bk and Royce Bk) (Map 7, Table 3, Volume 2). The table below presents a synopsis of AMNET data for WMA #10; AMNET site locations and bioassessment ratings within WMA # 10 are shown in Figure 20.

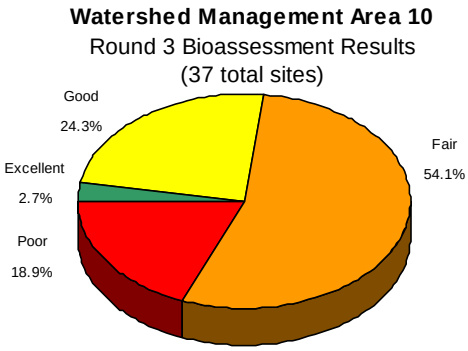


Figure 19

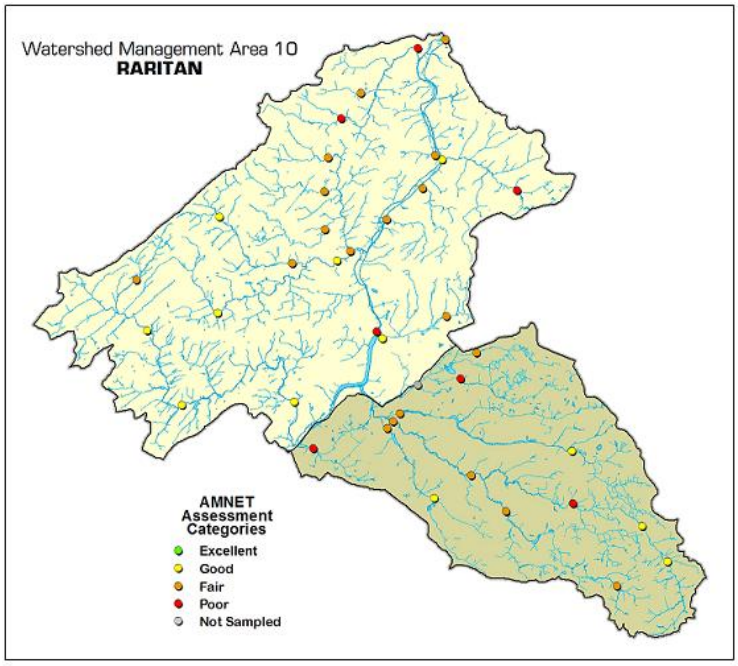


Figure 20

WMA # 10 Combined Results Table

Bio Rating	Round 3		Round 4			Habitat Assessment	Round 4	
Excellent	1	2.7%	---	---		Optimal	5	13.2%
Good	9	24.3%	12	31.6%		Suboptimal	33	86.8%
Fair	20	54.1%	19	50.0%		Marginal	---	---
Poor	7	18.9%	7	18.4%		Poor	---	---
Total sites	37		38				38	

Macroinvertebrate Abnormalities

Occasionally, morphological abnormalities have been found in individual macroinvertebrates recovered in WM&S/BFBM's AMNET collections. These deformities have been most often detected in larval organisms belonging to the insect family Chironomidae (midges), where they occur primarily in the head appendages (antennae) and mouthparts (mentum and mandibles). Abnormalities have also been observed in individuals of other taxonomic groups (such as Amphipoda), but they are most often noted in the mouthparts and antennae of Chironomidae because these features are key characteristics used in identification. Chironomidae larvae often comprise a large component of the benthic community of a stream or river, particularly in those affected by human disturbances, and they are part of the diet of predatory invertebrates and fish. As a result, chironomids are an important transfer vector linking the movement of contaminants from sediments to higher trophic levels [16].

Hamilton and Saether [17] noted deformed specimens (Chironomidae) occurred in areas of industrial or agricultural chemical input, but not in areas receiving only domestic effluents. Subsequent studies have supported this finding. But the presence of deformed organisms in a sample is difficult to interpret. Not all genera appear to react to the presence of contaminants in the same manner [18]. Most of the research has been focused on a few genera. The North Carolina Division of Environmental Management [19] has developed an index to evaluate deformities, using the frequency and severity of deformities observed in Chironomidae larvae of just the genus *Chironomus*. Secondly, morphological deformities undoubtedly occur in Chironomidae larvae living in uncontaminated environments. Even robust, healthy populations of any fauna are likely to include a certain proportion of physiologically weaker individuals which, for various reasons, may be more prone or genetically predisposed to malformation [18]. With a lack of baseline data of deformities in more pristine environments, the level at which these deformities becomes significant is somewhat uncertain. Currently, although not an indicator of specific contaminants, the occurrence of abnormal chironomid larvae can serve as an economical and long-term monitor of the benthic environment, and can suggest where more intensive bioassays and chemical testing would be most effectively employed [20].

Bearing in mind that the primary focus of the AMNET sampling is not to find morphological abnormalities, a listing of all AMNET sites in the Raritan Water Region exhibiting these deformities is presented in Table 3, Volume 2. The data are displayed as # of chironomids with abnormalities/# of chironomids examined. For all other taxa, just the number of individuals with abnormalities is presented. The significance of these abnormalities has not been statistically evaluated. Deformities are called "chronic" if they were observed in more than one round of sampling at a given site. Also, the presence of abnormalities is not factored into the index scoring, but used to identify sites where additional investigations are needed.

A decrease in the number of abnormalities are seen in the current sampling as compared to the previous (Round 3) sampling [4]. From the current sampling of 160 sites, 16 (10.0%) contained organisms with abnormalities (Maps 2 - 7 , Volume 2). Seven of the sites (AN0195, AN0199, AN0200, AN0356, AN0375, AN0376, and AN0420) exhibited a "chronic" presence of abnormalities (Table 3, Volume 2). Further study is needed to establish the significance of the presence of abnormalities.

Causes of Biological Impairment

Biological impairment, as determined through RBP analysis, is manifested by alterations or differences in macroinvertebrate community structure, compared to a reference or "ideal" condition. Although bioassessments are useful for identifying biological impairments, they do not identify the cause or causes of impairments. Linking biological effects with their causes is particularly complex when multiple stressors impact a waterbody [21]. A more intensive Stressor Identification (SI) study is necessary in order to pinpoint the probable cause or causes of the observed biological impairment.

Some common candidate causes which frequently appear on the USEPA's 303(d) list of impaired waterbodies include [22]:

Metals
Sediments
Nutrients
Dissolved Oxygen
Temperature
Ionic Strength
Flow Alteration
Unspecified Toxic Chemicals

Habitat Assessment vs. Biological Assessment

Generally, there is a correlation between habitat and biological impairment. However, definitive correlations can only be determined on a site specific basis. When assessing habitat degradation on an individual site, often the data suggests that other factors, which may include land use and/or water quality, are likely contributing to the observed biological assessments. Due to the prevalence of multiple stressors in areas of complex land use, sites with a "fair" or "poor" biological assessment, but with a relatively high habitat assessment score, could be impacted by point and/or nonpoint sources outside the range of the visual based habitat assessment. Also, an intermittent or short term impact may have occurred which left no obvious visual evidence at the site. In these cases, further investigation is needed to determine the source of impairment that is affecting the biota. Some sites assessed with an "excellent" or "good" biological assessment may have a relatively degraded habitat assessment. This could be due to a temporary degradation, such as drought or flooding (near to the time of the assessment), which was not severe enough to effect the biota. It is also possible that a temporary or recent degradation may not have immediate observable effects on the biota. In either case these sites should be studied further to avoid future impairment to the biota.

As reflected in the present study results, human land uses and practices, superimposed on the undisturbed physical terrain, play a major role in controlling the degree of pollution or degradation in a stream system [15]. The relationship between benthic macroinvertebrate community impairment has been statistically related to different physiographic land types, land uses and other anthropogenic factors, on a statewide basis [15]. These findings strongly indicate that human land uses and practices play a major role in the degree of pollution or degradation in a stream system. Data analysis from Ayers et al., 2000 [23] for instance, concludes the following:

1. Fish and invertebrate communities are commonly impaired in urban streams;
2. Invertebrate community impairment was related to total urban land and total wastewater flow upstream of a site;
3. Changes in aquatic community structure were statistically related to environmental variables along the urban gradient – that is to say that such things as impervious surfaces were related to a negative response in the aquatic invertebrate community.

Conversely, the same Ayers data analysis also demonstrated that the area of forest and wetland in a stream's drainage basin was a strong mitigating factor in protecting invertebrate community health.

Additional Information

Additional Information on the AMNET program can be obtained from the WM&S' Bureau of Freshwater & Biological Monitoring by calling 609-292-0427 or visiting its website at: http://www.state.nj.us/dep/wms/bfbm

Raw data is posted on this website by the end of the calendar year that the data is received and validated. GIS shapefiles will also be available on the NJDEP web site once all data is reviewed and finalized.

Additionally, raw data is submitted to WQX as soon as the data is received and validated. WQX is USEPA's repository and framework for water quality, biological, and physical data. It is used by state environmental agencies, EPA and other federal agencies, universities, private citizens, and many others to store data. The retrieval of the data is handled through the STORET interface and can be accessed at: http://www.epa.gov/storet

Comments are welcome and may be emailed to: bfbm@dep.state.nj.us.

For more information, please contact:

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http://www.state.nj.us/dep/wms/bfbm

REFERENCES

1. Plafkin, J.L., M.T. Barbour, K.D. Porter, S.K. Gross and R.M. Hughes, 1989. Rapid bioassessment protocols for use in streams and rivers—benthic macroinvertebrates and fish. EPA/44/4-89-002. US Environmental Protection Agency. Washington, D.C.
2. New Jersey Department of Environmental Protection. 2008. New Jersey integrated water quality monitoring and assessment report. Water Monitoring and Standards. Trenton, NJ.
3. New Jersey Department of Environmental Protection. Data report, 1998. New Jersey's modernized ambient chemical monitoring network. Division of Watershed Management. Trenton, NJ.
4. New Jersey Department of Environmental Protection. Data report, 2008. Ambient biomonitoring network, Raritan Region. Bureau of Water Monitoring. Trenton, NJ.
5. New Jersey Department of Environmental Protection. 2005. Field sampling procedures manual. NJDEP. Trenton, NJ.
6. Barbour, M.T., J. Gerritson, B.D. Snyder and J.B. Stribling. 1999. Rapid bioassessment protocols for use in wadeable streams and rivers: Periphyton, Benthic Macroinverbrates, and Fish, 2nd ed. USEPA 841-B-99-002. Chps. 1–11 and appendices.
7. New Jersey Department of Environmental Protection. Laboratory report, 2007. Standard operating procedures, Ambient biological monitoring using benthic macroinvertebrates, Field, lab, and assessment methods. Bureau of Freshwater & Biological Monitoring. Trenton, NJ.
8. New Jersey Department of Environmental Protection. Report, 2009. Work/quality assurance project plan: Ambient Biomonitoring Network (AMNET), Raritan Region, FY10. Bureau of Freshwater and Biological Monitoring. Trenton, NJ.
9. U.S. Environmental Protection Agency. 1997. Field and laboratory methods for macroinvertebrate and habitat assessment of low gradient nontidal streams. Mid-Atlantic Coastal Streams Workgroup, Environmental Services Division, Region 3. Wheeling, WV.
10. Klemm, D.J., P.A. Lewis, F. Fulk and J.M. Lazorchak. 1990. Macroinvertebrate field and laboratory methods for evaluating the biological integrity of surface waters. EPA/600/4-90/030. U.S. Environmental Protection Agency. Cincinnati, OH.
11. Jessup, B., 2007. Development of the New Jersey High Gradient Benthic Index (HGMI). Tetra Tech, Inc. Owings Mills, MD.
12. Maxted, J.R., M.T. Barbour, J. Gerritsen, 2000. Assessment framework for mid-Atlantic coastal plain streams using benthic macroinvertebrates, J.N. American Benthological Society, 19(1):128-144.
13. Jessup, B., S.Moegenburg, D.Bryson, V.Poretti, 2005. Development of the New Jersey Pinelands Macroinvertebrate Index (PMI). Tetra Tech, Inc. Owings Mills, MD & NJDEP. Trenton, NJ.
14. New Jersey Department of Environmental Protection. 2006. Surface and Ground Water Quality Standards. Water Monitoring and Standards. Trenton, NJ.
15. Kennen, J.G. 1998. Relation of benthic macroinvertebrate community impairment to basin characteristics in New Jersey streams. Fact Sheet FS-057-98. U.S. Geological Survey. West Trenton, NJ.
16. Dickman, M., I. Brindle, and M. Benson, 1992. Evidence of teratogens in sediments of the Niagara River Watershed as reflected by chironomid (Diptera: Chironomidae) deformities. Journal of Great Lakes Res. 18(3):467-480.
17. Hamilton, A.L. and O.A. Saether, 1971. The occurrence of characteristic deformities in the chironomid larvae of several Canadian lakes. Canadian Entomologist 103:363-368.
18. Warwick, W.F., 1985. Morphological abnormalities in Chironomidae (Diptera) larvae as measures of toxic stress in freshwater ecosystems: indexing antennal deformities in *Chironomus* Meigen. Canadian Journal of Fisheries and Aquatic Sciences 42:1881-1914.
19. Lenat, David R., 1993. Using mentum deformities of *Chironomus* larvae to evaluate the effects of toxicity and organic loading in streams. Journal of N. Am. Benthol. Soc. 12(3):265-269.
20. Diggins, T.P. and K.M. Stewart, 1993. Deformities of aquatic larval midges (Chironomidae: Diptera) in the sediments of the Buffalo River, New York. Journal of Great Lakes Res. 19(4):648-659
21. USEPA, 2000. Stressor identification guidance document. EPA 822-B-00-025. Office of Research and Development, Washington, D.C.
22. USEPA. Casual Analysis/Diagnosis Decision Information System (CADDIS) website, www.epa.gov/caddis
23. Ayers, M., Kennen, J., Stackleberg, P., Kauffman, L. 2000. Building a stronger scientific basis for landuse planning and watershed management effects on water quality and aquatic communities in NJ streams. USGS. West Trenton, NJ.

Table 1

Coastal Plain Macroinvertebrate Index (CPMI)[1]

Study area: southern New Jersey, below the geologic fall-line; Middle Atlantic Coastal Plain ecoregion, excluding the Pinelands National Reserve. See figure A1.

Index Metrics
1. Total number of genera
2. Total number of EPT genera
3. Percent Ephemeroptera genera
4. Hilsenhoff Biotic Index
5. Percent Clinger genera

	Score			
Index Metric	6	4	2	0
Number of genera	>25	17-25	9-16	<9
Number of EPT genera	>9	7-9	4-6	<4
% of Ephemeroptera	>29	20-29	10-19	<10
Hilsenhoff Biotic Index	<4.9	4.9-6.0	6.1-7.3	>7.3
% Clingers	>51	34-51	17-33	<17

Assessment Rating	Score
Excellent	22-30
Good	12-20
Fair	10-6
Poor	< 6

Reference

J.R. Maxted, et al. Assessment framework for mid-Atlantic coastal plain streams using benthic macroinvertebrates. J.N. Am. Benthol. Soc. 2000, 19(1):128-144.

Attributes

Excellent: Minimal changes in structure of biological community and minimal changes in ecosystem function. Virtually all native taxa are maintained with some changes to biomass and/or abundance; ecosystem functions are fully maintained within the range of natural variability.

Good: Some evident changes in structure of the biotic community and minimal changes in ecosystem function. Some changes in structure due to loss of some rare native taxa; shifts in relative abundance of taxa but sensitive-ubiquitous taxa are common and abundant; ecosystem functions are fully maintained.

Fair: **Moderate to major changes in structure of biological community and moderate changes in ecosystem function.** Sensitive taxa are markedly diminished; conspicuously unbalanced distribution of major groups from that expected; organism condition shows signs of physiological stress; system function shows reduced complexity.

Poor: Extreme changes in structure of biological community and major loss of ecosystem function. Extreme changes in structure; wholesale changes in taxonomic composition; extreme alterations from normal densities and distributions; organism condition is often poor; ecosystem functions are severely altered.

[1] Based on 100 organism subsample, genus level taxonomy

Table 1 (cont)

Pinelands Macroinvertebrate Index (PMI)[1]

Study area: southern New Jersey, below the geologic fall-line within the Pinelands National Reserve and extending 5 kilometers outside the Reserve boundary. See figure A1.

Index Metrics

1. Number of Insect genera
2. Number of Non-insect genera
3. Percent Plecoptera (P) and Trichoptera (T)
4. Percent Diptera genera excluding Tanytarsini
5. Percent Mollusca and Amphipoda
6. Beck's Biotic Index
7. Percent Filterers

Assessment Rating	Score
Excellent	≥ 63
Good	< 63-56
Fair	< 56-34
Poor	< 34

Reference

Benjamin Jessup, et al. Report. Development of the New Jersey Pinelands macroinvertebrate index (PMI). TetraTech, Inc. Owings Mills, MD. March, 2005.

Attributes

Excellent: Minimal changes in structure of biological community and minimal changes in ecosystem function. Virtually all native taxa are maintained with some changes to biomass and/or abundance; ecosystem functions are fully maintained within the range of natural variability.

Good: Some evident changes in structure of the biotic community and minimal changes in ecosystem function. Some changes in structure due to loss of some rare native taxa; shifts in relative abundance of taxa but sensitive-ubiquitous taxa are common and abundant; ecosystem functions are fully maintained.

Fair: **Moderate to major changes in structure of biological community and moderate changes in ecosystem function.** Sensitive taxa are markedly diminished; conspicuously unbalanced distribution of major groups from that expected; organism condition shows signs of physiological stress; system function shows reduced complexity.

Poor: Extreme changes in structure of biological community and major loss of ecosystem function. Extreme changes in structure; wholesale changes in taxonomic composition; extreme alterations from normal densities and distributions; organism condition is often poor; ecosystem functions are severely altered.

[1] Based on 100 organism subsample, genus level taxonomy

Table 1 (cont)

High Gradient Macroinvertebrate Index (HGMI)[1]

Study area: northern New Jersey, above the geologic fall-line including the following ecoregions:
North Central Appalachians, Central Appalachian Ridges and Valleys, Northeastern Highlands, Northeastern Coastal Zone, and Northern Piedmont. See figure A1.

Index Metrics

1. Total number of genera $_{adj}$ = 26.53 + Metric – [22.776 + 4.173*log10(areasqkm)]
2. Percent of genera that are not insects
3. Percent sensitive EPT (excluding Hydropyschidae, including Diplectrona) $_{adj}$
   = 37.49 + Metric – [49.922 – 13.800*log10(areasqkm)]
4. Number of scraper genera $_{adj}$ = 5.44 + Metric – [3.889 + 1.724*log10(areasqkm)]
5. Hilsenhoff Biotic Index $_{adj}$ = 4.23 + Metric – [3.407 + 0.918*log10(areasqkm)]
6. Number of New Jersey TALU attribute 2 genera
7. Number of New Jersey TALU attribute 3 genera

ADJ (Adjusted metric value) = Mean $_{reference}$ + Metric $_{observed}$ – Metric $_{predicted}$, where predictions are based on linear regression analysis of reference metric values on catchment size.

Assessment Rating	Score
Excellent	≥ 63
Good	< 63 - 42
Fair	< 42 - 21
Poor	< 21

Reference

Benjamin Jessup, et al. Report. Development of the New Jersey high gradient macroinvertebrate index (HGMI). TetraTech, Inc. Owings Mills, MD. February, 2007.

Attributes

Excellent: Minimal changes in structure of biological community and minimal changes in ecosystem function. Virtually all native taxa are maintained with some changes to biomass and/or abundance; ecosystem functions are fully maintained within the range of natural variability.

Good: Some evident changes in structure of the biotic community and minimal changes in ecosystem function. Some changes in structure due to loss of some rare native taxa; shifts in relative abundance of taxa but sensitive-ubiquitous taxa are common and abundant; ecosystem functions are fully maintained.

Fair: **Moderate to major changes in structure of biological community and moderate changes in ecosystem function.** Sensitive taxa are markedly diminished; conspicuously unbalanced distribution of major groups from that expected; organism condition shows signs of physiological stress; system function shows reduced complexity.

Poor: Extreme changes in structure of biological community and major loss of ecosystem function. Extreme changes in structure; wholesale changes in taxonomic composition; extreme alterations from normal densities and distributions; organism condition is often poor; ecosystem functions are severely altered.

[1] Based on 100 organism subsample, genus level taxonomy

Map of New Jersey Macroinvertebrate Indices

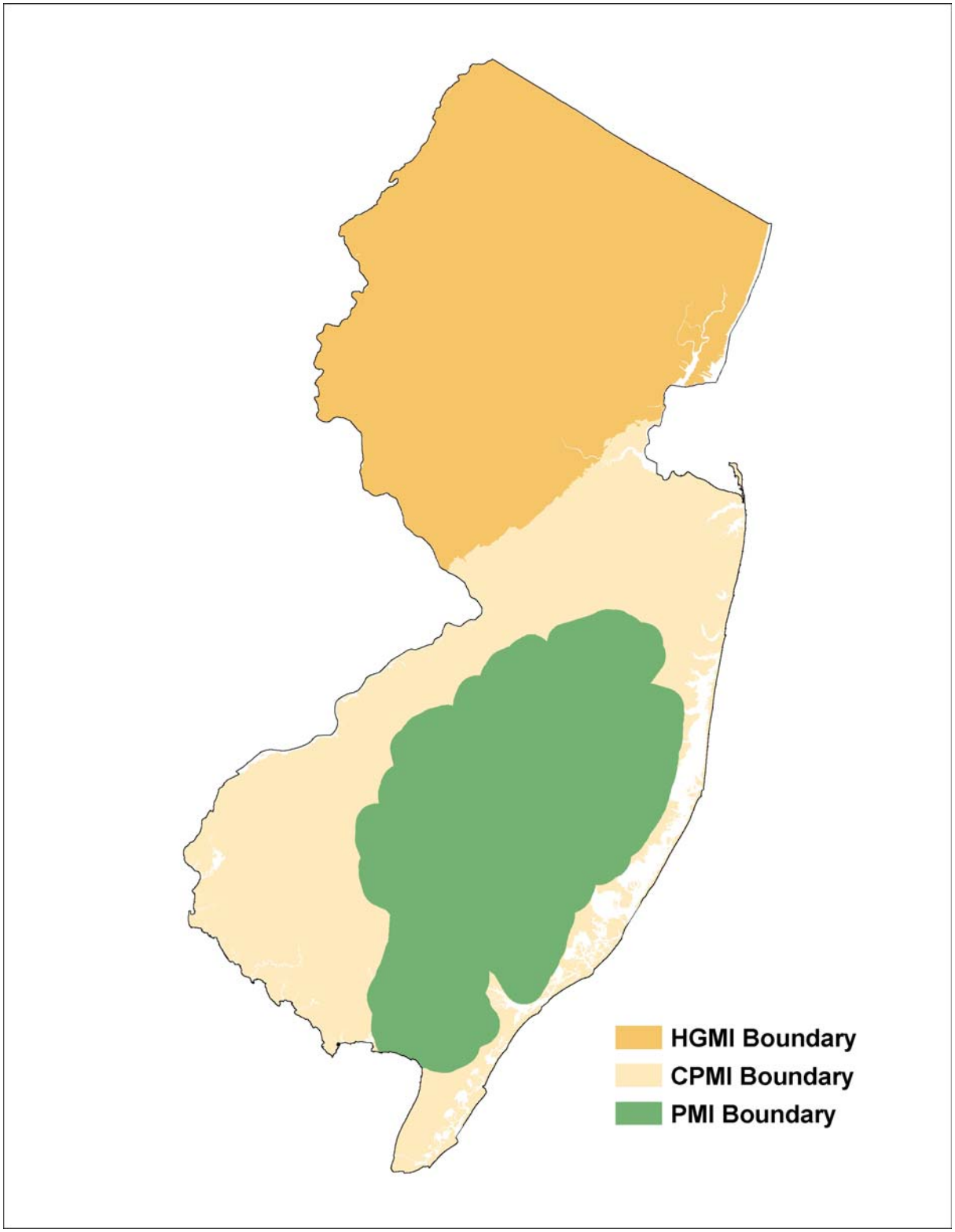

Figure A1. Boundaries for generic level index use.

NJ Department of Environmental Protection
Water Monitoring and Standards

AMBIENT BIOMONITORING NETWORK

Raritan Water Region

Watershed Management Areas 7, 8, 9, and 10
Round 4 Benthic Macroinvertebrate Data
Volume 2 of 2

December 2012

State of New Jersey
Chris Christie, Governor
Kim Guadagno, Lt. Governor

NJ Department of Environmental Protection
Bob Martin, Commissioner

NJ Department of Environmental Protection
Land Use Management
John Plonski, Assistant Commissioner

Water Monitoring and Standards
Jill Lipoti, Director

Bureau of Freshwater & Biological Monitoring
Leslie McGeorge, Administrator

December 2012

AMBIENT BIOMONITORING NETWORK

Raritan Water Region
Watershed Management Areas 7, 8, 9, and 10

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Volume 2 of 2

Water Monitoring Report Prepared By:
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[cover photo: Site AN0361, Lamington River tributary at Black River Rd, Somerset County, NJ.]

AMBIENT BIOMONITORING NETWORK

Watershed Management Areas 7, 8, 9, and 10

Raritan Water Region

Round 4 Benthic Macroinvertebrate Data

Volume 2 of 2

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Watershed Management Area # 8	Maps 3-4
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MAPS

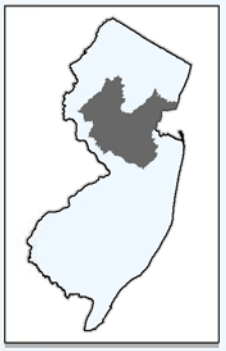
Round 4 Raritan Water Region AMNET Study
WMA's 7, 8, 9, & 10

AMNET site locations and their respective biological ratings, for each major sub-basin, are shown in maps 1-7. Also identified are sites that exhibited significant and chronic macroinvertebrate abnormalities.

Map 1
RARITAN WATER REGION

Watershed Management Area 8
NORTH AND SOUTH BRANCH RARITAN

Watershed Management Area 7
ARTHUR KILL



Watershed Management Area 9
LOWER RARITAN, SOUTH RIVER AND LAWRENCE

Watershed Management Area 10
MILLSTONE

AMNET Assessment Categories

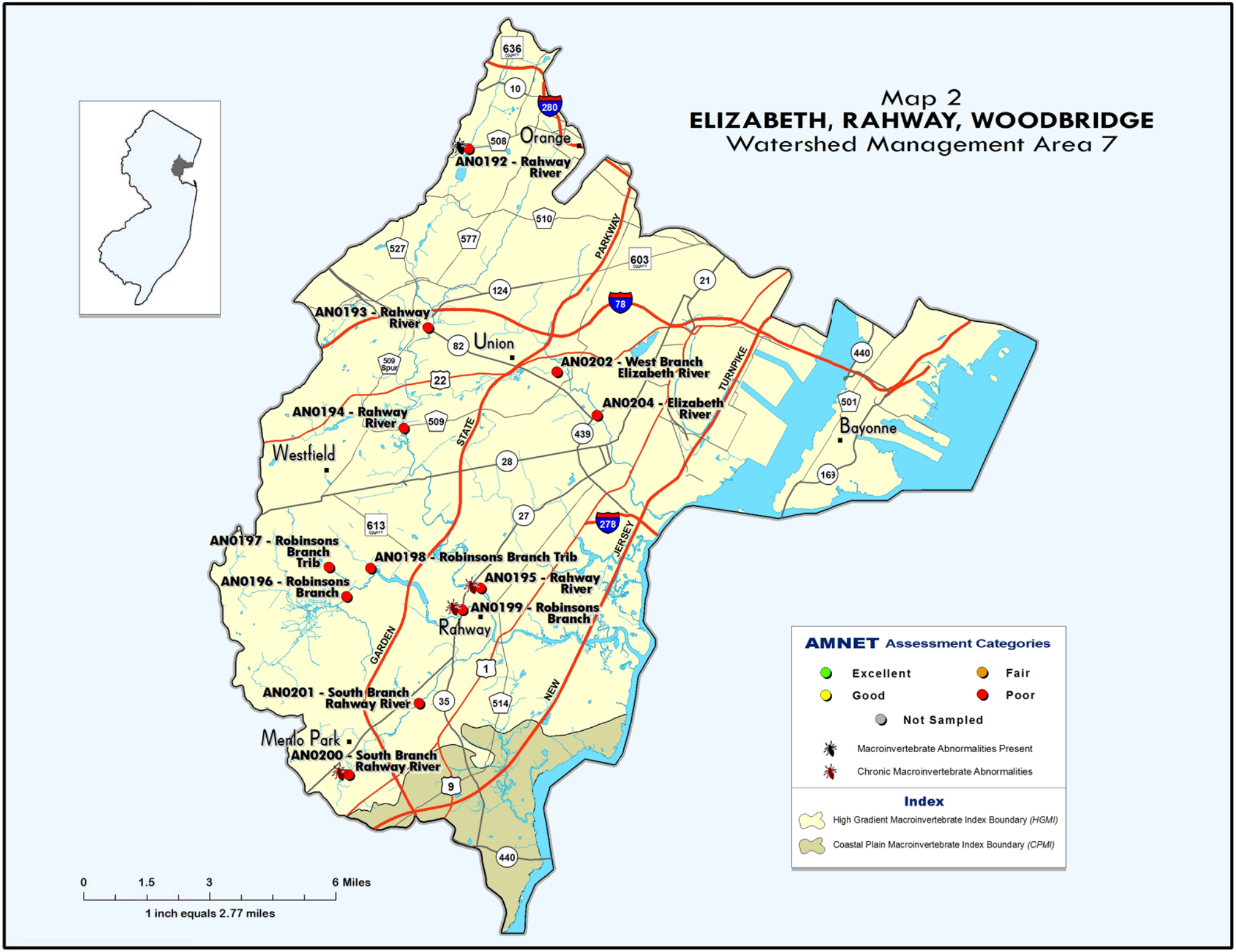
- Excellent
- Good
- Fair
- Poor
- Not Sampled

Index

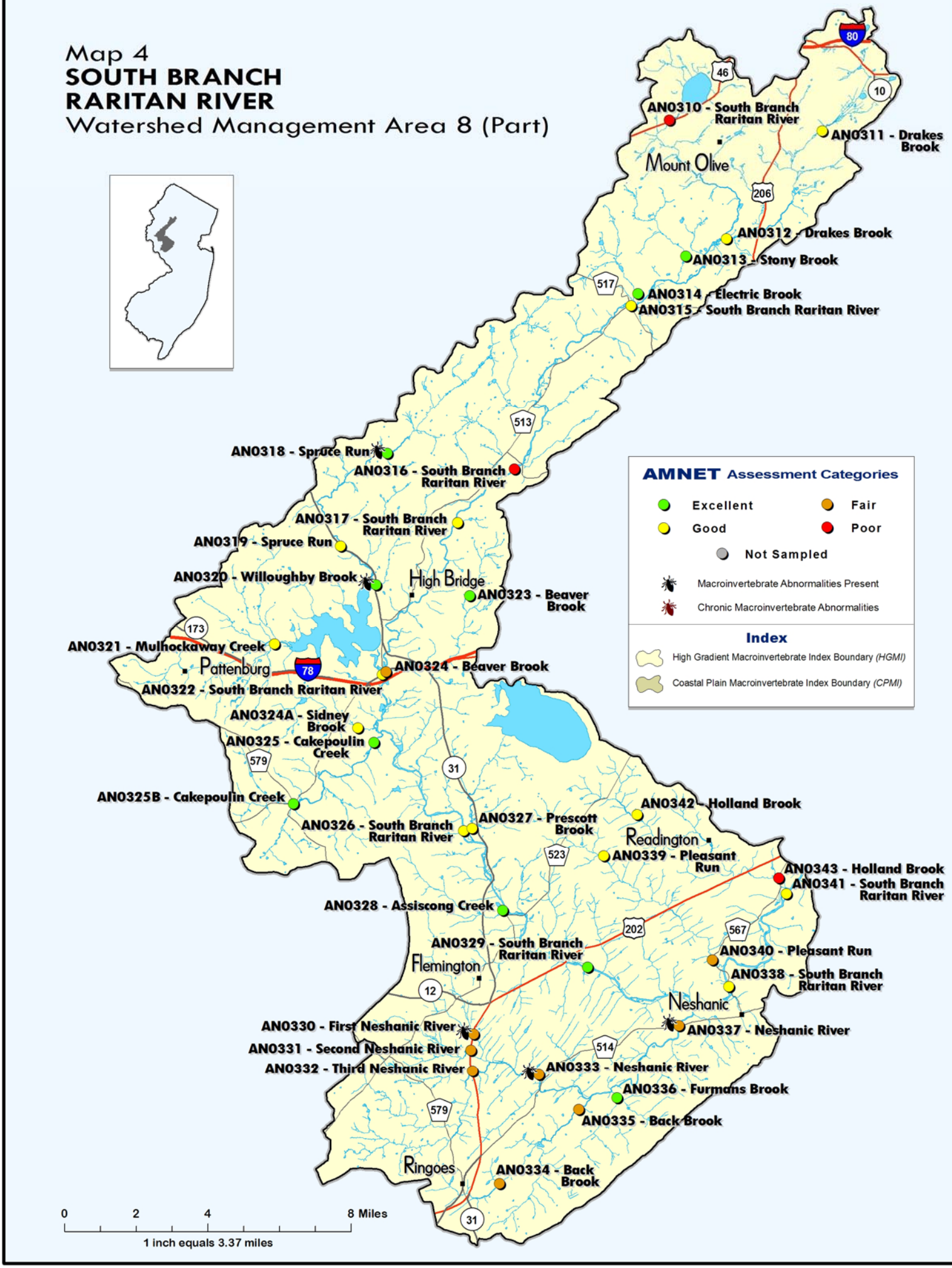
- High Gradient Macroinvertebrate Index Boundary (HGMI)
- Coastal Plain Macroinvertebrate Index Boundary (CPMI)
- Watershed Management Areas

0 3.5 7 14 Miles

1 inch equals 6.45 miles


Map 2
ELIZABETH, RAHWAY, WOODBRIDGE
Watershed Management Area 7
AN0192 - Rahway River
AN0193 - Rahway River
AN0194 - Rahway River
AN0202 - West Branch Elizabeth River
AN0204 - Elizabeth River
AN0197 - Robinsons Branch Trib
AN0198 - Robinsons Branch Trib
AN0196 - Robinsons Branch
AN0195 - Rahway River
AN0199 - Robinsons Branch
AN0201 - South Branch Rahway River
AN0200 - South Branch Rahway River
Orange
Union
Westfield
Rahway
Bayonne
Menlo Park
PARKWAY
STATE
GARDEN
TURNPIKE
JERSEY
NEW
AMNET Assessment Categories
Excellent
Fair
Good
Poor
Not Sampled
Macroinvertebrate Abnormalities Present
Chronic Macroinvertebrate Abnormalities
Index
High Gradient Macroinvertebrate Index Boundary (HGMI)
Coastal Plain Macroinvertebrate Index Boundary (CPMI)
0 1.5 3 6 Miles
1 inch equals 2.77 miles


Map 3
NORTH BRANCH
RARITAN RIVER
Watershed Management Area 8 (Part)
Kenvil
Milltown
Fairmount
Bernardsville
Oldwick
North Branch
AN0356 - Lamington River
AN0344A - India Brook
AN0344 - UNT to India Brook
AN0347 - Dawsons Brook
AN0357 - Tanners Brook
AN0348 - Burnett Brook
AN0345 - India Brook
AN0358 - Lamington River
AN0346 - Raritan River North Branch
AN0359 - Trout Brook
AN0349 - Peapack Brook
AN0364 - Rockaway Creek North Branch
AN0360 - Lamington River
AN0361 - UNT to Lamington River
AN0352 - Mine Brook
AN0365 - Rockaway Creek North Branch
AN0354 - Middle Brook
AN0350 - Peapack Brook
AN0351 - Raritan River North Branch
AN0353 - Mine Brook
AN0362 - Cold Brook
AN0366 - Rockaway Creek North Branch
AN0363 - Lamington River
AN0355 - Middle Brook
AN0367 - Rockaway Creek South Branch
AN0370 - Lamington River
AN0368 - Rockaway Creek South Branch
AN0369 - Rockaway Creek
AN0371 - Chambers Brook B
AN0372 - Chambers Brook A
AN0373 - Chambers Brook A
AN0374 - Raritan River North Branch
80
46
10
513
510
525
206
512
517
202
287
523
78
22
0 1.5 3 6 Miles
1 inch equals 2.58 miles
AMNET Assessment Categories
Excellent
Fair
Good
Poor
Not Sampled
Macroinvertebrate Abnormalities Present
Chronic Macroinvertebrate Abnormalities
Index
High Gradient Macroinvertebrate Index Boundary (HGMI)
Coastal Plain Macroinvertebrate Index Boundary (CPMI)


Map 4
SOUTH BRANCH
RARITAN RIVER
Watershed Management Area 8 (Part)
AN0310 - South Branch Raritan River
AN0311 - Drakes Brook
Mount Olive
AN0312 - Drakes Brook
AN0313 - Stony Brook
AN0314 - Electric Brook
AN0315 - South Branch Raritan River
AN0318 - Spruce Run
AN0316 - South Branch Raritan River
AN0317 - South Branch Raritan River
AN0319 - Spruce Run
AN0320 - Willoughby Brook
High Bridge
AN0323 - Beaver Brook
AN0321 - Mulhockaway Creek
Pattenburg
AN0324 - Beaver Brook
AN0322 - South Branch Raritan River
AN0324A - Sidney Brook
AN0325 - Cakepoulin Creek
AN0325B - Cakepoulin Creek
AN0326 - South Branch Raritan River
AN0327 - Prescott Brook
AN0342 - Holland Brook
Readington
AN0339 - Pleasant Run
AN0343 - Holland Brook
AN0341 - South Branch Raritan River
AN0328 - Assiscong Creek
AN0329 - South Branch Raritan River
Flemington
AN0340 - Pleasant Run
AN0338 - South Branch Raritan River
Neshanic
AN0330 - First Neshanic River
AN0337 - Neshanic River
AN0331 - Second Neshanic River
AN0332 - Third Neshanic River
AN0333 - Neshanic River
AN0336 - Furmans Brook
AN0335 - Back Brook
Ringoes
AN0334 - Back Brook
AMNET Assessment Categories
Excellent
Fair
Good
Poor
Not Sampled
Macroinvertebrate Abnormalities Present
Chronic Macroinvertebrate Abnormalities
Index
High Gradient Macroinvertebrate Index Boundary (HGMI)
Coastal Plain Macroinvertebrate Index Boundary (CPMI)
0 2 4 8 Miles
1 inch equals 3.37 miles

Map 5
LOWER RARITAN RIVER
Watershed Management Area 9 (Part)

AN0421 - Green Brook
Watchung
AN0416 - Middle Brook West Branch
AN0418 - Middle Brook East Branch
AN0422 - Stony Brook
AN0423 - Green Brook
AN0417 - Middle Brook West Branch
AN0419 - Middle Brook East Branch
Dunellen
AN0424 - Bound Brook
Somerville
AN0376 - Peters Brook
AN0425 - Ambrose Brook
AN0424B - Bound Brook
AN0415 - Cuckels Brook
AN0426 - Green Brook
AN0420 - Middle Brook
AN0375 - Dukes Brook
AN0425A - Ambrose Brook
Metuchen
AN0377 - Raritan River
AN0427 - Raritan River Trib
AN0428 - Raritan River
AN0429 - Mile Run
New Brunswick
78
655
525
22
531
529
202
28
527
567
287
206
533
501
514 Spur
27
18
1
514
171
95

AMNET Assessment Categories

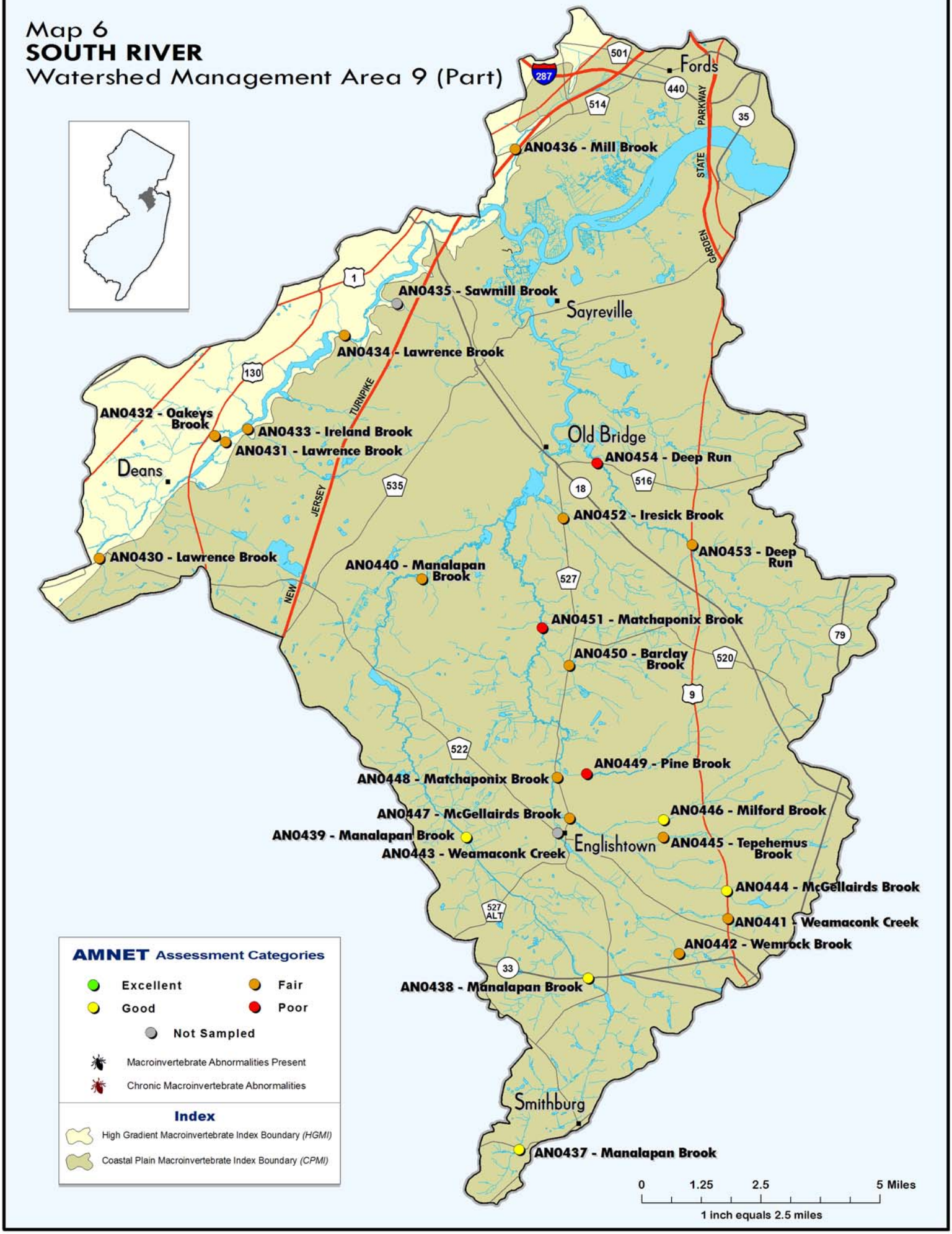
- Excellent
- Good
- Fair
- Poor
- Not Sampled
- Macroinvertebrate Abnormalities Present
- Chronic Macroinvertebrate Abnormalities

Index

- High Gradient Macroinvertebrate Index Boundary *(HGMI)*
- Coastal Plain Macroinvertebrate Index Boundary *(CPMI)*

0 1 2 4 Miles

1 inch equals 2.25 miles


Map 6
SOUTH RIVER
Watershed Management Area 9 (Part)
AN0436 - Mill Brook
AN0435 - Sawmill Brook
AN0434 - Lawrence Brook
AN0432 - Oakeys Brook
AN0433 - Ireland Brook
AN0431 - Lawrence Brook
AN0430 - Lawrence Brook
AN0440 - Manalapan Brook
AN0454 - Deep Run
AN0452 - Iresick Brook
AN0453 - Deep Run
AN0451 - Matchaponix Brook
AN0450 - Barclay Brook
AN0449 - Pine Brook
AN0448 - Matchaponix Brook
AN0447 - McGellairds Brook
AN0439 - Manalapan Brook
AN0443 - Weamaconk Creek
AN0446 - Milford Brook
AN0445 - Tepehemus Brook
AN0444 - McGellairds Brook
AN0441 - Weamaconk Creek
AN0442 - Wemrock Brook
AN0438 - Manalapan Brook
AN0437 - Manalapan Brook
Fords
Sayreville
Old Bridge
Deans
Englishtown
Smithburg
AMNET Assessment Categories
Excellent
Good
Fair
Poor
Not Sampled
Macroinvertebrate Abnormalities Present
Chronic Macroinvertebrate Abnormalities
Index
High Gradient Macroinvertebrate Index Boundary (HGMI)
Coastal Plain Macroinvertebrate Index Boundary (CPMI)
0 1.25 2.5 5 Miles
1 inch equals 2.5 miles


Map 7
MILLSTONE
Watershed Management Area 10
Manville
AN0414 - Millstone River
AN0413 - Royce Brook
AN0412 - Royce Brook Branch
AN0411 - Royce Brook
514
Hillsborough
AN0410 - Millstone River
AN0409 - Six Mile Run
AN0402 - Pike Run
206
533
AN0407 - Ten Mile Run
AN0408 - Six Mile Run
AN0403 - Cruser Brook
AN0399 - Rock Brook
AN0406 - Simonson Brook
AN0404 - Back Brook
AN0405 - Pike Run
AN0400 - Rock Brook
AN0401 - Bedens Brook
27
AN0390 - Camp Harmony Branch of Stony Bk
518
Hopewell
AN0395 - Heathcote Brook
579
AN0398 - Bedens Brook
AN0391 - Stony Brook
AN0397 - Millstone River
AN0396 - Heathcote Brook
522
569
AN0387 - Devils Brook
Princeton
1
AN0388 - Shallow Brook
32
31
AN0389 - Devils Brook
AN0392 - Stony Brook
AN0393 - Stony Brook
AN0386 - Cranbury Brook
AN0382 - Millstone River
AN0384 - Bear Brook
Pennington
Cranbury
TURNPIKE
AN0394 - Duck Pond Run
AN0385 - Cranbury Brook
535
130
NEW JERSEY
526
571
AN0382B - Millstone River
AN0383 - Big Bear Brook
AN0382D - Millstone River
AN0381 - Rocky Brook
33
AN0379 - Millstone River
539
Manalapan
571
AN0378 - Millstone River
AN0380 - Rocky Brook
AMNET Assessment Categories
Excellent
Fair
Good
Poor
Not Sampled
Macroinvertebrate Abnormalities Present
Chronic Macroinvertebrate Abnormalities
Index
High Gradient Macroinvertebrate Index Boundary (HGMI)
Coastal Plain Macroinvertebrate Index Boundary (CPMI)
0
2
4
8 Miles
1 inch equals 3.26 miles

Table 2

Comparative Scores / Ratings (see notes)

Watershed Management Areas 7, 8, 9, and 10

Station	Index name	Rnd 3 Score	Rnd 4 Score	Rnd 3 Rating	Rnd 4 Rating	Change in Rating	Rnd 4 Habitat Score	WMA	Station	Index name	Rnd 3 Score	Rnd 4 Score	Rnd 3 Rating	Rnd 4 Rating	Change in Rating	Rnd 4 Habitat Score	WMA
192	HGMI	18.25	18.52	Poor	Poor	/	105	07	336	HGMI	63.65	69.09	Excellent	Excellent	/	149	08
193	HGMI	24.19	8.92	Fair	Poor	—	121	07	337	HGMI	46.12	32.99	Good	Fair	—	149	08
194	HGMI	12.57	20.55	Poor	Poor	/	119	07	338	HGMI	54.86	51.60	Good	Good	/	140	08
195	HGMI	24.90	14.17	Fair	Poor	—	135	07	339	HGMI	52.90	46.49	Good	Good	/	131	08
196	HGMI	14.71	15.15	Poor	Poor	/	113	07	340	HGMI	50.32	24.20	Good	Fair	—	86	08
197	HGMI	20.78	18.79	Poor	Poor	/	120	07	341	HGMI	38.14	44.91	Fair	Good	+	120	08
198	HGMI	10.26	14.37	Poor	Poor	/	128	07	342	HGMI	68.00	57.47	Excellent	Good	—	118	08
199	HGMI	14.62	18.38	Poor	Poor	/	123	07	343	HGMI	28.78	20.24	Fair	Poor	—	85	08
200	HGMI	17.72	16.02	Poor	Poor	/	111	07	344	HGMI	53.30	73.78	Good	Excellent	+	159	08
201	HGMI	25.23	11.82	Fair	Poor	—	107	07	344A	HGMI	65.13	45.34	Excellent	Good	—	122	08
202	HGMI	nd	19.92	no sample	Poor	nd	126	07	345	HGMI	90.88	82.65	Excellent	Excellent	/	178	08
204	HGMI	20.86	9.59	Poor	Poor	/	119	07	346	HGMI	50.86	49.74	Good	Good	/	144	08
310	HGMI	23.01	20.10	Fair	Poor	—	125	08	347	HGMI	84.83	63.28	Excellent	Excellent	/	164	08
311	HGMI	51.23	52.62	Good	Good	/	143	08	348	HGMI	84.42	75.78	Excellent	Excellent	/	167	08
312	HGMI	44.32	45.04	Good	Good	/	157	08	349	HGMI	78.82	76.95	Excellent	Excellent	/	165	08
313	HGMI	76.19	79.13	Excellent	Excellent	/	159	08	350	HGMI	59.72	51.80	Good	Good	/	141	08
314	HGMI	36.70	74.95	Fair	Excellent	+	153	08	351	HGMI	55.85	60.35	Good	Good	/	157	08
315	HGMI	49.19	52.02	Good	Good	/	135	08	352	HGMI	18.91	33.32	Poor	Fair	+	134	08
316	HGMI	52.42	14.04	Good	Poor	—	111	08	353	HGMI	46.15	50.30	Good	Good	/	130	08
317	HGMI	68.82	46.73	Excellent	Good	—	172	08	354	HGMI	31.58	34.45	Fair	Fair	/	150	08
318	HGMI	73.04	71.28	Excellent	Excellent	/	177	08	355	HGMI	51.68	31.24	Good	Fair	—	135	08
319	HGMI	67.02	45.03	Excellent	Good	—	167	08	356	HGMI	8.95	26.53	Poor	Fair	+	140	08
320	HGMI	73.04	81.62	Excellent	Excellent	/	154	08	357	HGMI	52.51	51.19	Good	Good	/	147	08
321	HGMI	53.74	57.54	Good	Good	/	172	08	358	HGMI	36.39	46.02	Fair	Good	+	180	08
322	HGMI	50.19	51.26	Good	Good	/	126	08	359	HGMI	64.98	47.19	Excellent	Good	—	166	08
323	HGMI	73.54	74.81	Excellent	Excellent	/	170	08	360	HGMI	85.32	66.04	Excellent	Excellent	/	156	08
324	HGMI	37.04	38.66	Fair	Fair	/	134	08	361	HGMI	66.54	61.94	Excellent	Good	—	148	08
324A	HGMI	75.95	45.51	Excellent	Good	—	140	08	362	HGMI	60.89	42.01	Good	Good	/	153	08
325	HGMI	67.91	63.82	Excellent	Excellent	/	161	08	363	HGMI	80.06	73.73	Excellent	Excellent	/	149	08
325B	HGMI	69.00	74.36	Excellent	Excellent	/	138	08	364	HGMI	82.17	61.08	Excellent	Good	—	153	08
326	HGMI	64.80	45.10	Excellent	Good	—	157	08	365	HGMI	81.45	86.67	Excellent	Excellent	/	150	08
327	HGMI	61.50	48.74	Good	Good	/	157	08	366	HGMI	80.62	69.03	Excellent	Excellent	/	159	08
328	HGMI	63.30	66.54	Excellent	Excellent	/	147	08	367	HGMI	44.90	33.63	Good	Fair	—	160	08
329	HGMI	37.69	63.98	Fair	Excellent	+	122	08	368	HGMI	23.79	24.96	Fair	Fair	/	159	08
330	HGMI	25.07	23.75	Fair	Fair	/	130	08	369	HGMI	35.16	37.71	Fair	Fair	/	133	08
331	HGMI	51.04	36.46	Good	Fair	—	150	08	370	HGMI	62.58	47.81	Good	Good	/	157	08
332	HGMI	63.38	22.83	Excellent	Fair	—	117	08	371	HGMI	20.79	24.22	Poor	Fair	+	131	08
333	HGMI	36.52	26.76	Fair	Fair	/	111	08	372	HGMI	49.08	39.65	Good	Fair	—	126	08
334	HGMI	34.06	37.08	Fair	Fair	/	153	08	373	HGMI	28.48	41.97	Fair	Fair	/	139	08
335	HGMI	48.77	41.52	Good	Fair	—	149	08	374	HGMI	54.54	54.38	Good	Good	/	165	08

NOTES:

Comparison of NJ impairment score results between earliest and latest sampling dates:

nd no data
\+ indicates positive change in rating
— indicates negative change in rating
/ indicates no change in rating

CPMI	Value
Excellent	22.0-30.0
Good	11.0-21.0
Fair	6.0-10.0
Poor	0-5.99

PMI	Value
Excellent	63.0-100.0
Good	56.0-62.99
Fair	34.0-55.99
Poor	0-33.99

HGMI	Value
Excellent	63.0-100.0
Good	42.0-62.99
Fair	21.0-41.99
Poor	0-20.99

Habitat Score	Value
Optimal	160 - 200
Sub-optimal	110 - 159
Marginal	60 - 109
Poor	< 60

Table 2

Comparative Scores / Ratings (see notes)

Watershed Management Areas 7, 8, 9, and 10

Station	Index name	Rnd 3 Score	Rnd 4 Score	Rnd 3 Rating	Rnd 4 Rating	Change in Rating	Rnd 4 Habitat Score	WMA	Station	Index name	Rnd 3 Score	Rnd 4 Score	Rnd 3 Rating	Rnd 4 Rating	Change in Rating	Rnd 4 Habitat Score	WMA
375	HGMI	18.22	15.92	Poor	Poor	/	140	09	409	HGMI	29.70	43.70	Fair	Good	+	133	10
376	HGMI	21.62	26.97	Fair	Fair	/	126	09	410	HGMI	24.83	34.08	Fair	Fair	/	137	10
377	HGMI	28.30	53.62	Fair	Good	+	134	09	411	HGMI	25.99	19.40	Fair	Poor	—	149	10
378	CPMI	22	18	Excellent	Good	—	137	10	412	HGMI	18.46	24.08	Poor	Fair	+	125	10
379	CPMI	6	14	Fair	Good	+	112	10	413	HGMI	16.41	16.02	Poor	Poor	/	113	10
380	CPMI	12	10	Good	Fair	—	130	10	414	HGMI	35.25	26.65	Fair	Fair	/	142	10
381	CPMI	8	8	Fair	Fair	/	115	10	415	HGMI	31.84	20.69	Fair	Poor	—	125	09
382	CPMI	6	8	Fair	Fair	/	167	10	416	HGMI	32.35	27.63	Fair	Fair	/	157	09
382B	CPMI	6	6	Fair	Fair	/	149	10	417	HGMI	33.86	21.98	Fair	Fair	/	141	09
382D	CPMI	nd	4	no sample	Poor	nd	125	10	418	HGMI	22.73	32.48	Fair	Fair	/	141	09
383	CPMI	8	14	Fair	Good	+	163	10	419	HGMI	35.37	39.13	Fair	Fair	/	158	09
384	CPMI	10	10	Fair	Fair	/	159	10	420	HGMI	38.95	33.71	Fair	Fair	/	144	09
385	CPMI	4	12	Poor	Good	+	144	10	421	HGMI	26.40	20.68	Fair	Poor	—	122	09
386	CPMI	10	8	Fair	Fair	/	153	10	422	HGMI	27.47	34.99	Fair	Fair	/	146	09
387	CPMI	8	8	Fair	Fair	/	152	10	423	HGMI	30.39	30.78	Fair	Fair	/	129	09
388	CPMI	6	4	Fair	Poor	—	119	10	424	HGMI	16.55	24.58	Poor	Fair	+	131	09
389	CPMI	nd	nd	no sample	no sample	nd		10	424B	HGMI	9.15	nd	Poor	no sample	nd		09
390	HGMI	46.32	40.70	Good	Fair	—	166	10	425	HGMI	18.34	22.52	Poor	Fair	+	143	09
391	HGMI	51.97	47.33	Good	Good	/	147	10	425A	HGMI	23.66	10.37	Fair	Poor	—	102	09
392	HGMI	45.70	42.10	Good	Good	/	157	10	426	HGMI	14.58	23.01	Poor	Fair	+	117	09
393	HGMI	41.56	46.04	Fair	Good	+	154	10	427	HGMI	23.46	15.38	Fair	Poor	—	134	09
394	HGMI	15.83	20.02	Poor	Poor	/	116	10	428	HGMI	31.54	45.84	Fair	Good	+	156	09
395	HGMI	19.39	23.46	Poor	Fair	+	120	10	429	HGMI	8.72	17.87	Poor	Poor	/	128	09
396	HGMI	28.19	43.74	Fair	Good	+	140	10	430	HGMI	12.03	29.42	Poor	Fair	+	101	09
397	HGMI	18.86	18.81	Poor	Poor	/	169	10	431	HGMI	29.27	24.85	Fair	Fair	/	101	09
398	HGMI	30.76	43.73	Fair	Good	+	147	10	432	HGMI	43.60	31.87	Good	Fair	—	154	09
399	HGMI	48.92	57.95	Good	Good	/	176	10	433	HGMI	38.88	24.98	Fair	Fair	/	162	09
400	HGMI	44.48	41.56	Good	Fair	—	145	10	434	HGMI	26.64	27.19	Fair	Fair	/	113	09
401	HGMI	48.62	52.11	Good	Good	/	156	10	435	HGMI	16.52	nd	Poor	no sample	nd		09
402	HGMI	39.15	29.14	Fair	Fair	/	149	10	436	HGMI	27.64	32.18	Fair	Fair	/	130	09
403	HGMI	45.26	36.51	Good	Fair	—	143	10	437	CPMI	14	14	Good	Good	/	142	09
404	HGMI	36.63	35.66	Fair	Fair	/	137	10	438	CPMI	16	18	Good	Good	/	122	09
405	HGMI	41.88	33.27	Fair	Fair	/	131	10	439	CPMI	20	14	Good	Good	/	115	09
406	HGMI	24.29	34.83	Fair	Fair	/	128	10	440	CPMI	6	10	Fair	Fair	/	136	09
407	HGMI	45.09	41.05	Good	Fair	—	150	10	441	CPMI	6	10	Fair	Fair	/	117	09
408	HGMI	14.18	11.91	Poor	Poor	/	147	10	442	CPMI	6	10	Fair	Fair	/	118	09

NOTES:

Comparison of NJ impairment score results between earliest and latest sampling dates:

nd no data
\+ indicates positive change in rating
— indicates negative change in rating
/ indicates no change in rating

CPMI	Value
Excellent	22.0-30.0
Good	11.0-21.0
Fair	6.0-10.0
Poor	0-5.99

PMI	Value
Excellent	63.0-100.0
Good	56.0-62.99
Fair	34.0-55.99
Poor	0-33.99

HGMI	Value
Excellent	63.0-100.0
Good	42.0-62.99
Fair	21.0-41.99
Poor	0-20.99

Habitat Score	Value
Optimal	160 - 200
Sub-optimal	110 - 159
Marginal	60 - 109
Poor	< 60

Table 2

Comparative Scores / Ratings (see notes)

Watershed Management Areas 7, 8, 9, and 10

Station	Index name	Rnd 3 Score	Rnd 4 Score	Rnd 3 Rating	Rnd 4 Rating	Change in Rating	Rnd 4 Habitat Score	WMA	Station	Index name	Rnd 3 Score	Rnd 4 Score	Rnd 3 Rating	Rnd 4 Rating	Change in Rating	Rnd 4 Habitat Score	WMA
443	CPMI	8	nd	Fair	no sample	nd		09									
444	CPMI	10	18	Fair	Good	+	138	09									
445	CPMI	10	6	Fair	Fair	/	137	09									
446	CPMI	8	14	Fair	Good	+	141	09									
447	CPMI	4	6	Poor	Fair	+	125	09									
448	CPMI	10	6	Fair	Fair	/	146	09									
449	CPMI	2	0	Poor	Poor	/	132	09									
450	CPMI	4	6	Poor	Fair	+	133	09									
451	CPMI	8	2	Fair	Poor	—	100	09									
452	CPMI	4	8	Poor	Fair	+	110	09									
453	CPMI	4	10	Poor	Fair	+	144	09									
454	CPMI	nd	0	no sample	Poor	nd	149	09									

NOTES:

Comparison of NJ impairment score results between earliest and latest sampling dates:

nd no data
\+ indicates positive change in rating
— indicates negative change in rating
/ indicates no change in rating

CPMI	Value
Excellent	22.0-30.0
Good	11.0-21.0
Fair	6.0-10.0
Poor	0-5.99

PMI	Value
Excellent	63.0-100.0
Good	56.0-62.99
Fair	34.0-55.99
Poor	0-33.99

HGMI	Value
Excellent	63.0-100.0
Good	42.0-62.99
Fair	21.0-41.99
Poor	0-20.99

Habitat Score	Value
Optimal	160 - 200
Sub-optimal	110 - 159
Marginal	60 - 109
Poor	< 60

Table 3

Macroinvertebrate Abnormalities (see notes)

Watershed Management Areas 7, 8, 9, and 10

Station	Round 3	Round 4	WMA			Station	Round 3	Round 4	WMA				
192		1/31	07			426	3/70		09				
194	+1		07			427	1/19		09				
195	**+3**	**3/77**	**07**			435	1/14		09				
199	**+1**	**1**	**07**			436	1/26		09				
200	**1/8**	**3/45**	**07**			439	1/22		09				
316	1/48		08			440	1/59		09				
317	1/28		08			447	+1		09				
318		1/32	08			448	+2		09				
320		1/27	08			449	1/60		09				
326	+1		08			451	1/70		09				
330		1/63	08										
333		1/89	08										
337		+1	08										
349	1/9		08										
355	2/37		08										
356	**+2**	**1/37**	**08**										
358	1/38		08										
362		1/33	08										
366	1/15		08										
374	+1		08										
375	**+1**	**+1**	**09**										
376	**+1**	**+1**	**09**										
384	1/53		10										
385	3/114		10										
396	1/36		10										
397	1/58		10										
403	2/18		10										
404		2/23	10										
407	1/56		10										
409	+1		10										
413		1/5	10										
419	1/43		09										
420	**2/41**	**+1**	**09**										
421	+1, 3/19		09										
422	1/23		09										
423	1/43		09										

NOTES:

chironomids with deformities / # chironomids examined

+ — indicates the number of non-chironomids having abnormalities

abnormalities are considered chronic if they appear in both the Round 3 and the Round 4 columns

Table 4 — HABITAT ASSESSMENT FOR *HIGH* GRADIENT STREAMS

Habitat Parameter	Condition Category			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
1. Epifaunal Substrate/Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
3. Velocity/Depth Regimes	All 4 velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (slow is <0.3 m/s, deep is >0.5 m)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity / depth regime (usually slow-deep).
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% (<20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yrs.) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. In stream habitat greatly altered or removed entirely.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability (score each bank) Note: determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE ___ (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE ___ (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
9. Bank Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, under story shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE ___ (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE ___ (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE ___ (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE ___ (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0

HABITAT SCORES	VALUE
OPTIMAL	160 X 200
SUB-OPTIMAL	110 X 159
MARGINAL	60 X 109
POOR	< 60

Table 4 (cont.) — HABITAT ASSESSMENT FOR *LOW* GRADIENT STREAMS

Habitat Parameter	Condition Category			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
1. Epifaunal Substrate/Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
3. Pool Variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% (<20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yrs.) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. In stream habitat greatly altered or removed entirely.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.	The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.	The bends in the stream increase the stream length 2 to 1 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE ___ (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE ___ (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
9. Bank Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, under story shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE ___ (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE ___ (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE ___ (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE ___ (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0

HABITAT SCORES	VALUE
OPTIMAL	160 X 200
SUB-OPTIMAL	110 X 159
MARGINAL	60 X 109
POOR	< 60

Appendix A — Station Numbers and Locations for the Round 4 Raritan Region AMNET Study

Site	Stream	Latitude Longitude	Watershed Management Area
AN0192	Rahway River	40 46'11.022"N 74 16'59.605"W	7
AN0193	Rahway River	40 42'28.817"N 74 18'06.441"W	7
AN0194	Rahway River	40 40'24.010"N 74 18'46.508"W	7
AN0195	Rahway River	40 37'05.443"N 74 16'42.076"W	7
AN0196	Robinsons Br	40 36'55.135"N 74 20'20.659"W	7
AN0197	UNT to Robinsons Br	40 37'31.702"N 74 20'49.072"W	7
AN0198	UNT to Robinsons Br	40 37'29.941"N 74 19'41.278"W	7
AN0199	Robinsons Br	40 36'38.305"N 74 17'11.475"W	7
AN0200	South Br Rahway River	40 33'13.769"N 74 20'17.255"W	7
AN0201	South Br Rahway River	40 34'56.816"N 74 18'00.962"W	7
AN0202	West Br Elizabeth River	40 41'33.989"N 74 14'32.817"W	7
AN0204	Elizabeth River	40 40'39.173"N 74 13'32.202"W	7
AN0310	S Br Raritan River	40 51'37.094"N 74 45'35.854"W	8
AN0311	Drakes Bk	40 51'21.932"N 74 40'41.956"W	8
AN0312	Drakes Bk	40 48'43.555"N 74 43'45.689"W	8
AN0313	Stony Bk	40 48'18.444"N 74 45'03.008"W	8
AN0314	Electric Bk	40 47'23.423"N 74 46'34.952"W	8
AN0315	S Br Raritan River	40 47'06.051"N 74 46 48.068"W	8
AN0316	S Br Raritan River	40 43 07.160"N 74 50 30.437"W	8
AN0317	S Br Raritan River	40 41 48.921"N 74 52'18.904"W	8
AN0318	Spruce Run	40 43'29.440"N 74 54'33.994"W	8
AN0319	Spruce Run	40 41'13.965"N 74 56'02.431"W	8
AN0320	Willoughby Bk	40 40'17.910"N 74 54'54.388"W	8
AN0321	Mulhockaway Ck	40 38'50.889"N 74 58'07.677"W	8
AN0322	S Br Raritan River	40 38'06.966"N 74 54'41.665"W	8
AN0323	Beaver Bk	40 40'03.182"N 74 51'55.159"W	8
AN0324	Beaver Bk	40 38'10.799"N 74 54'34.759"W	8
AN0325	Cakepoulin Ck	40 36'28.147"N 74 54'56.769"W	8
AN0325B	Cakepoulin Ck	40 34'58.880"N 74 57'30.385"W	8
AN0326	S Br Raritan River	40 34'20.716"N 74 52'04.310"W	8
AN0327	Prescott Bk	40 34'24.249"N 74 51'48.234"W	8
AN0328	Assiscong Ck	40 32'23.181"N 74 50 49.303"W	8
AN0329	S Br Raritan River	40 31'01.180"N 74 48'06.911"W	8
AN0330	First Neshanic River	40 29'22.982"N 74 51'44.174"W	8
AN0331	Second Neshanic River	40 28'59.461"N 74 51'49.423"W	8
AN0332	Third Neshanic River	40 28'29.339"N 74 51'46.023"W	8
AN0333	Neshanic River	40 28'24.360"N 74 49'39.483"W	8
AN0334	Back Bk	40 25'46.280"N 74 50'50.907"W	8
AN0335	Back Bk	40 27'33.733"N 74 48'22.644"W	8
AN0336	Furmans Bk	40 27'50.648"N 74 47'09.998"W	8
AN0337	Neshanic River	40 29'36.452"N 74 45'11.866"W	8
AN0338	S Br Raritan River	40 30'33.765"N 74 43'37.036"W	8
AN0339	Pleasant Run	40 33'42.941"N 74 47'37.118"W	8
AN0340	Pleasant Run	40 31'12.166"N 74 44'08.481"W	8
AN0341	S Br Raritan River	40 32'48.659"N 74 41'47.348"W	8
AN0342	Holland Bk	40 34'44.840"N 74 46'33.607"W	8
AN0343	Holland Bk	40 33'11.473"N 74 42'01.971"W	8
AN0344	UNT to India Bk	40 49'41.598"N 74 36'00.921"W	8

Appendix A — Station Numbers and Locations for the Round 4 Raritan Region AMNET Study

Site	Stream	Latitude Longitude	Watershed Management Area
AN0344A	India Bk	40 49'42.514"N 74 35'20.931"W	8
AN0345	India Bk	40 47'10.332"N 74 37'13.896"W	8
AN0346	N Br Raritan River	40 46'16.431"N 74 37'32.833"W	8
AN0347	Dawsons Bk	40 48'15.845"N 74 37'41.071"W	8
AN0348	Burnett Bk	40 46'57.039"N 74 38'42.290"W	8
AN0349	Peapack Bk	40 45'16.418"N 74 40'50.428"W	8
AN0350	Peapack Bk	40 41'29.592"N 74 38'52.271"W	8
AN0351	N Br Raritan River	40 40'58.337"N 74 38'18.657"W	8
AN0352	Mine Bk	40 42'44.667"N 74 34'45.474"W	8
AN0353	Mine Bk	40 40'56.332"N 74 37'48.227"W	8
AN0354	Middle Bk	40 41'37.919"N 74 40'42.730"W	8
AN0355	Middle Bk	40 38'50.859"N 74 40'51.794"W	8
AN0356	Lamington River	40 50'06.932"N 74 38'40.546"W	8
AN0357	Tanners Bk	40 47'17.943"N 74 43'32.431"W	8
AN0358	Lamington River	40 46'43.453"N 74 43'18.019"W	8
AN0359	Trout Bk	40 45'16.396"N 74 43'55.187"W	8
AN0360	Lamington River	40 42'56.246"N 74 43'17.630"W	8
AN0361	UNT to Lamington River	40 42'24.643"N 74 42'59.361"W	8
AN0362	Cold Bk	40 40'30.024"N 74 44'16.069"W	8
AN0363	Lamington River	40 39'38.381"N 74 43'44.250"W	8
AN0364	N Br Rockaway Ck	40 43'31.244"N 74 47'10.077"W	8
AN0365	N Br Rockaway Ck	40 41'23.540"N 74 48'39.928"W	8
AN0366	N Br Rockaway Ck	40 39'42.387"N 74 45'57.240"W	8
AN0367	S Br Rockaway Ck	40 38'22.213"N 74 48'58.420"W	8
AN0368	S Br Rockaway Ck	40 37'24.551"N 74 45'59.963"W	8
AN0369	Rockaway Ck	40 37'23.975"N 74 43'15.131"W	8
AN0370	Lamington River	40 38'04.804"N 74 41'12.197"W	8
AN0371	Chambers(B) Bk	40 37'26.183"N 74 39'46.916"W	8
AN0372	Chambers(A) Bk	40 36'18.705"N 74 44'43.402"W	8
AN0373	Chambers(A) Bk	40 35'32.488"N 74 40'58.840"W	8
AN0374	N Br Raritan River	40 34'11.002"N 74 40'41.493"W	8
AN0375	Dukes Bk	40 33'14.314"N 74 36'48.227"W	9
AN0376	Peters Bk	40 34'01.277"N 74 36'18.868"W	9
AN0377	Raritan River	40 32'39.200"N 74 34'05.421"W	9
AN0378	Millstone River	40 14'28.495"N 74 24'04.832"W	10
AN0379	Millstone River	40 15'43.051"N 74 25'12.305"W	10
AN0380	Rocky Bk	40 13'38.371"N 74 26'22.149"W	10
AN0381	Rocky Bk	40 16'13.026"N 74 31'21.855"W	10
AN0382	Millstone River	40 19'19.653"N 74 36'28.695"W	10
AN0382B	Millstone River	40 17'27.435"N 74 32'58.014"W	10
AN0382D	Millstone River	40 16'28.620"N 74 28'20.525"W	10
AN0383	Big Bear Bk	40 16'41.201"N 74 34'36.982"W	10
AN0384	Bear Bk	40 19'05.323"N 74 36'44.554"W	10
AN0385	Cranbury Bk	40 18'18.858"N 74 28'23.669"W	10
AN0386	Cranbury Bk	40 19'35.979"N 74 36'09.714"W	10
AN0387	Devils Bk	40 21'42.428"N 74 32'42.028"W	10
AN0388	Shallow Bk	40 20'48.608"N 74 33'25.879"W	10
AN0389	Devils Bk	40 20'35.129"N 74 35'21.073"W	10

Appendix A — Station Numbers and Locations for the Round 4 Raritan Region AMNET Study

Site	Stream	Latitude Longitude	Watershed Management Area
AN0390	Camp Harmony Br of Stony Bk	40 24'12.202"N 74 48'06.008"W	10
AN0391	Stony Bk	40 22'26.598"N 74 47'37.479"W	10
AN0392	Stony Bk	40 19'52.630"N 74 46'01.800"W	10
AN0393	Stony Bk	40 19'59.682"N 74 40'55.949"W	10
AN0394	Duck Pond Run	40 18'23.496"N 74 40'04.668"W	10
AN0395	Heathcote Bk	40 22'57.502"N 74 34'04.740"W	10
AN0396	Heathcote Bk	40 22'11.952"N 74 36'56.978"W	10
AN0397	Millstone River	40 22'25.677"N 74 37'12.787"W	10
AN0398	Bedens Bk	40 23'03.999"N 74 44'25.474"W	10
AN0399	Rock Bk	40 26'23.130"N 74 44'21.646"W	10
AN0400	Rock Bk	40 24'46.881"N 74 41'02.493"W	10
AN0401	Bedens Bk	40 24'52.520"N 74 39 01.533"W	10
AN0402	Pike Run	40 28'26.673"N 74 39'25.494"W	10
AN0403	Cruser Bk	40 27'15.949"N 74 39'36.505"W	10
AN0404	Back Bk	40 25'57.702"N 74 39'34.796"W	10
AN0405	Pike Run	40 25'12.408"N 74 38'25.663"W	10
AN0406	Simonson Bk	40 26'18.513"N 74 36'46.689"W	10
AN0407	Ten Mile Run	40 27'23.093"N 74 35'08.581"W	10
AN0408	Six Mile Run	40 27'18.952"N 74 30'52.166"W	10
AN0409	Six Mile Run	40 28'22.389"N 74 34'16.033"W	10
AN0410	Millstone River	40 28'30.495"N 74 34'34.587"W	10
AN0411	Royce Bk	40 29'47.714"N 74 38'50.800"W	10
AN0412	Royce Bk Br	40 30'40.115"N 74 37'57.560"W	10
AN0413	Royce Bk	40 32'13.363"N 74 35'22.668"W	10
AN0414	Millstone River	40 32'30.924"N 74 34'07.554"W	10
AN0415	Cuckels Bk	40 34'07.355"N 74 34'10.841"W	9
AN0416	W Br Middle Bk	40 36'43.383"N 74 35'25.710"W	9
AN0417	W Br Middle Bk	40 35'21.701"N 74 33'48.395"W	9
AN0418	E Br Middle Bk	40 36'47.621"N 74 29'47.454"W	9
AN0419	E Br Middle Bk	40 35'29.891"N 74 33'18.072"W	9
AN0420	Middle Bk	40 34'05.056"N 74 33'12.661"W	9
AN0421	Green Bk	40 38'27.731"N 74 24'49.425"W	9
AN0422	Stony Bk	40 36'50.903"N 74 26'45.891"W	9
AN0423	Green Bk	40 36'19.635"N 74 26'59.268"W	9
AN0424	Bound Bk	40 34'50.497"N 74 29'57.414"W	9
AN0424B	Bound Bk	40 33'42.614"N 74 23'51.312"W	9
AN0425	Ambrose Bk	40 34'03.434"N 74 31'12.003"W	9
AN0425A	Ambrose Bk	40 32'50.115"N 74 27'51.059"W	9
AN0426	Green Bk	40 33'42.746"N 74 31'28.350"W	9
AN0427	UNT to Raritan River	40 32'43.133"N 74 31'08.009"W	9
AN0428	Raritan River	40 32'27.225"N 74 30'45.415"W	9
AN0429	Mile Run	40 30'20.042"N 74 28'02.071"W	9
AN0430	Lawrence Bk	40 22'51.506"N 74 32'37.700"W	9
AN0431	Lawrence Bk	40 24'58.850"N 74 29'36.930"W	9
AN0432	Oakeys Bk	40 25'06.100"N 74 29'52.230"W	9
AN0433	Ireland Bk	40 25'13.409"N 74 29'05.490"W	9
AN0434	Lawrence Bk	40 26'55.734"N 74 26'46.339"W	9
AN0435	Sawmill Bk	40 27'30.816"N 74 25'31.092"W	9

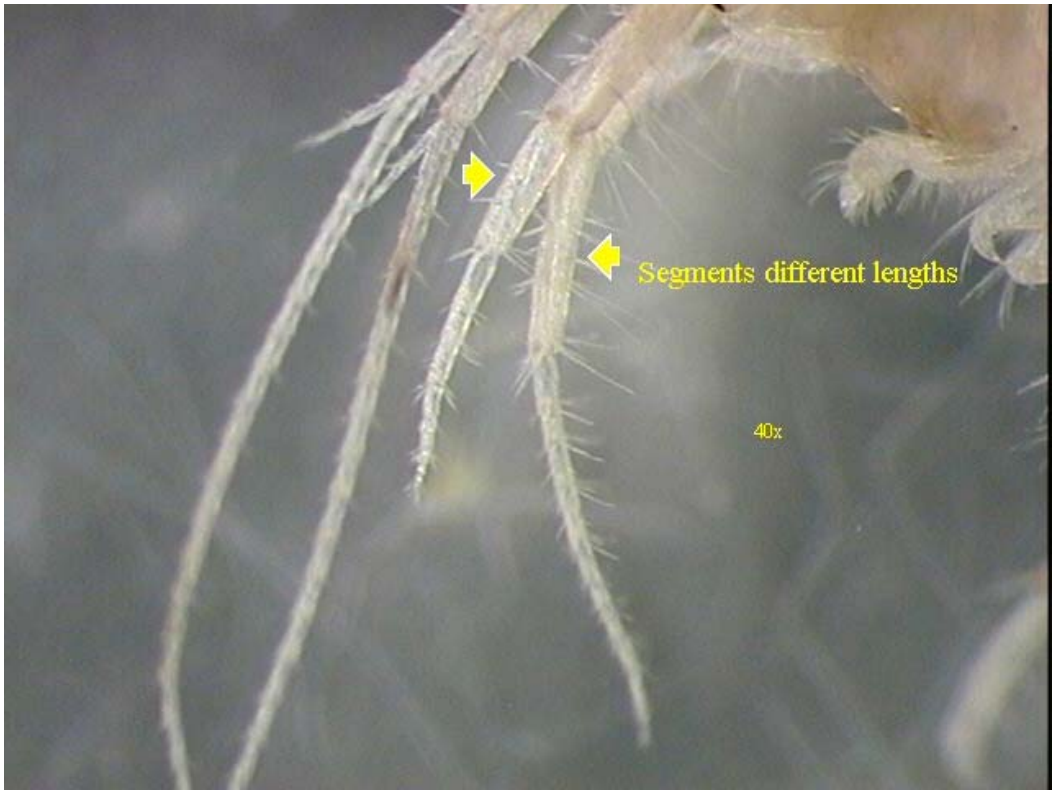
Appendix A — Station Numbers and Locations for the Round 4 Raritan Region AMNET Study

Site	Stream	Latitude Longitude	Watershed Management Area
AN0436	Mill Bk	40 30'19.531"N 74 22'41.572"W	9
AN0437	Manalapan Bk	40 12'03.912"N 74 22'37.976"W	9
AN0438	Manalapan Bk	40 15'11.336"N 74 20'58.593"W	9
AN0439	Manalapan Bk	40 17'46.133"N 74 23'52.302"W	9
AN0440	Manalapan Bk	40 22'29.077"N 74 24'55.526"W	9
AN0441	Weamaconk Ck	40 16'16.554"N 74 17'39.011"W	9
AN0442	Wemrock Bk	40 15'38.376"N 74 18'48.562"W	9
AN0443	Weamaconk Ck	40 17'50.467"N 74 21'41.881"W	9
AN0444	McGellairds Bk	40 16'46.999"N 74 17'40.200"W	9
AN0445	Tepehemus Bk	40 17'45.840"N 74 19'11.045"W	9
AN0446	Milford Bk	40 18'04.840"N 74 19'10.375"W	9
AN0447	McGellairds Bk	40 18'06.501"N 74 21'24.895"W	9
AN0448	Matchaponix Bk	40 18'51.593"N 74 21'42.425"W	9
AN0449	Pine Bk	40 18'55.566"N 74 21'00.198"W	9
AN0450	Barclay Bk	40 20'54.059"N 74 21'25.188"W	9
AN0451	Matchaponix Bk	40 21'35.558"N 74 22'03.691"W	9
AN0452	Iresick Bk	40 23'35.113"N 74 21'33.397"W	9
AN0453	Deep Run	40 23'05.771"N 74 18'28.741"W	9
AN0454	Deep Run	40 24'35.749"N 74 20'45.052"W	9

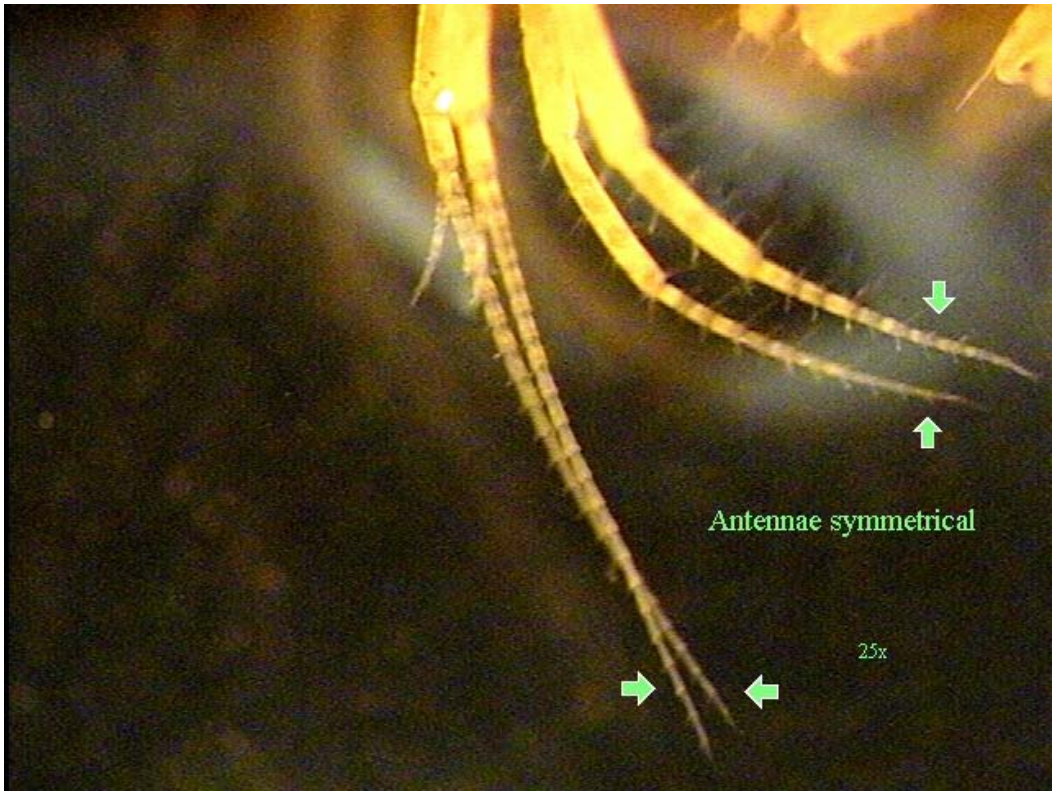
APPENDIX B

Pictures of Morphological Abnormalities in Larval Chironomidae and Amphipoda Recovered in Recent AMNET Surveys

Gammarus fasciatus with second antennae showing different lengths

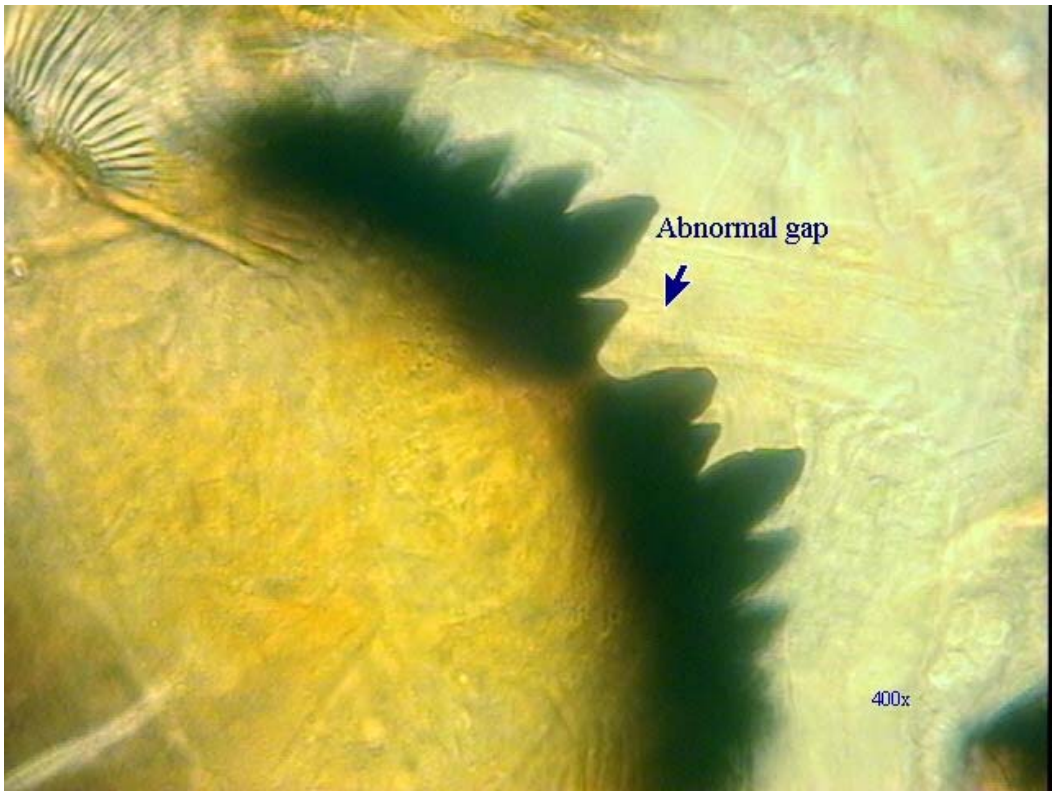


Gammarus fasciatus with normal antennae (showing antennal pairs of same length)

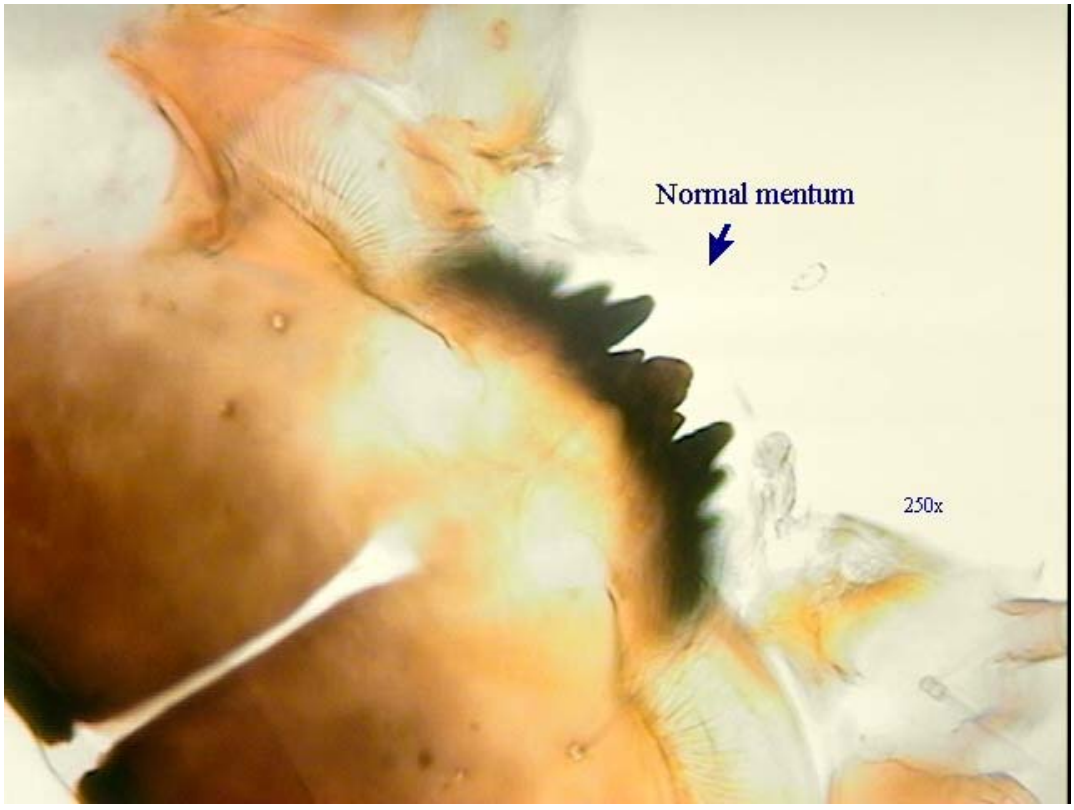


All photographs taken by D.Bryson, NJDEP

Chironomus species with mentum abnormality



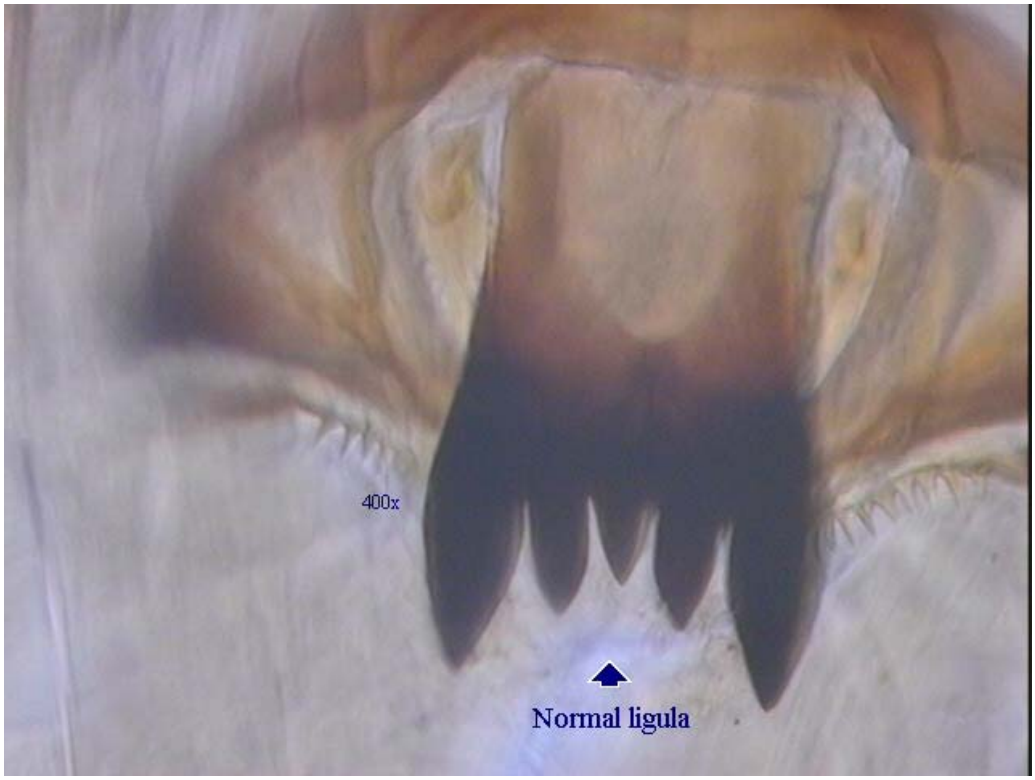
Chironomus species with normal mentum



All photographs taken by D.Bryson, NJDEP

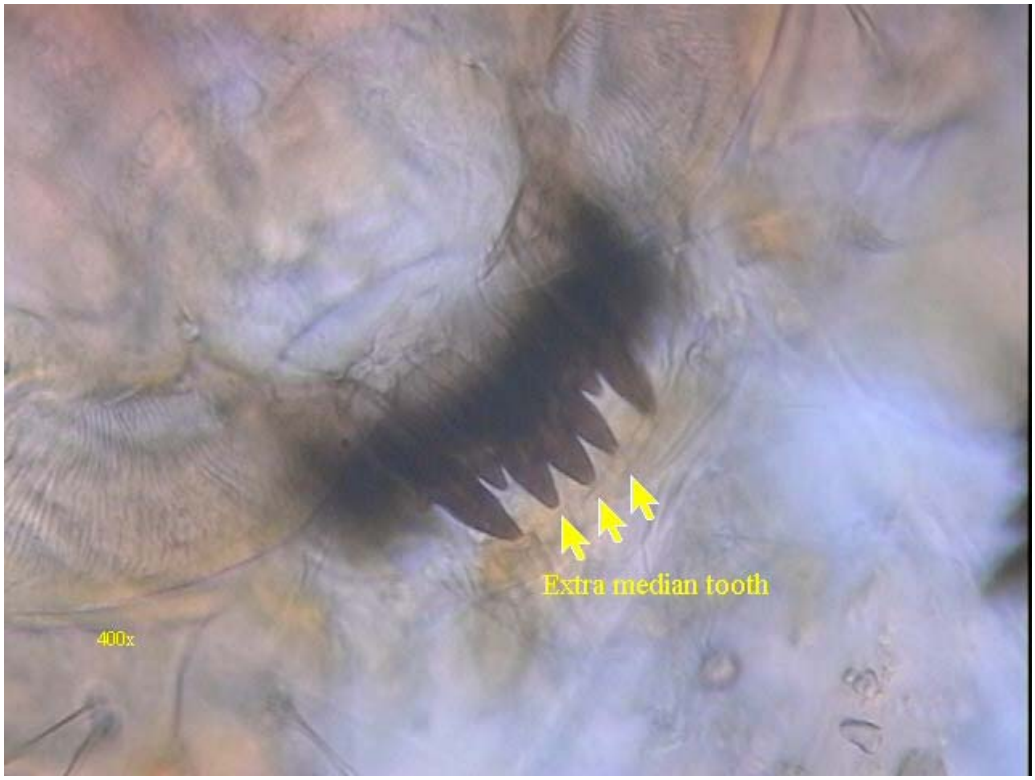
Procladius species with abnormal ligula

Procladius species with normal ligula

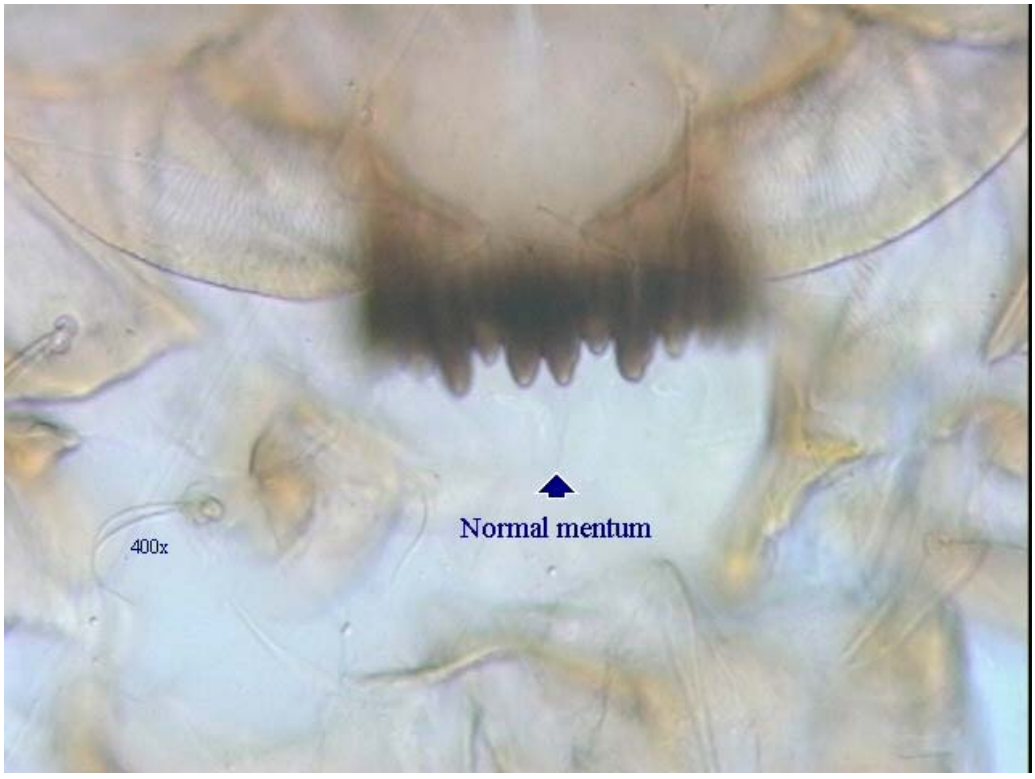


All photographs taken by D.Bryson, NJDEP

Polypedilum species with abnormal mentum



Polypedilum species with normal mentum



All photographs taken by D.Bryson, NJDEP

APPENDIX C

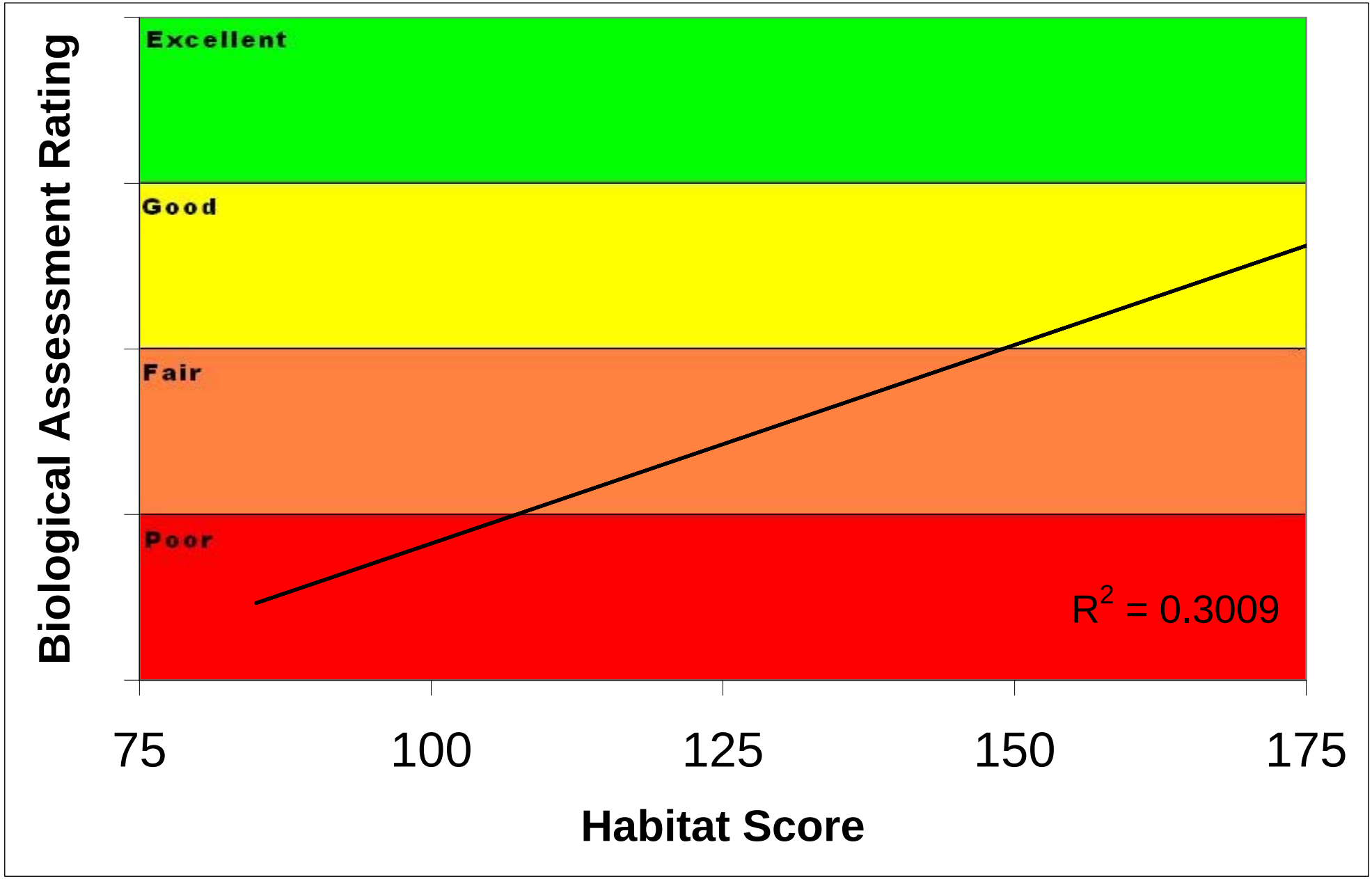
Graphical Comparison of Habitat Assessment Scores versus Biological Assessment Ratings from the Round 4 Raritan Water Region AMNET Study

Comparative Scores of

Biological Assessment Rating vs. Habitat Score

WMA 8

Round 4

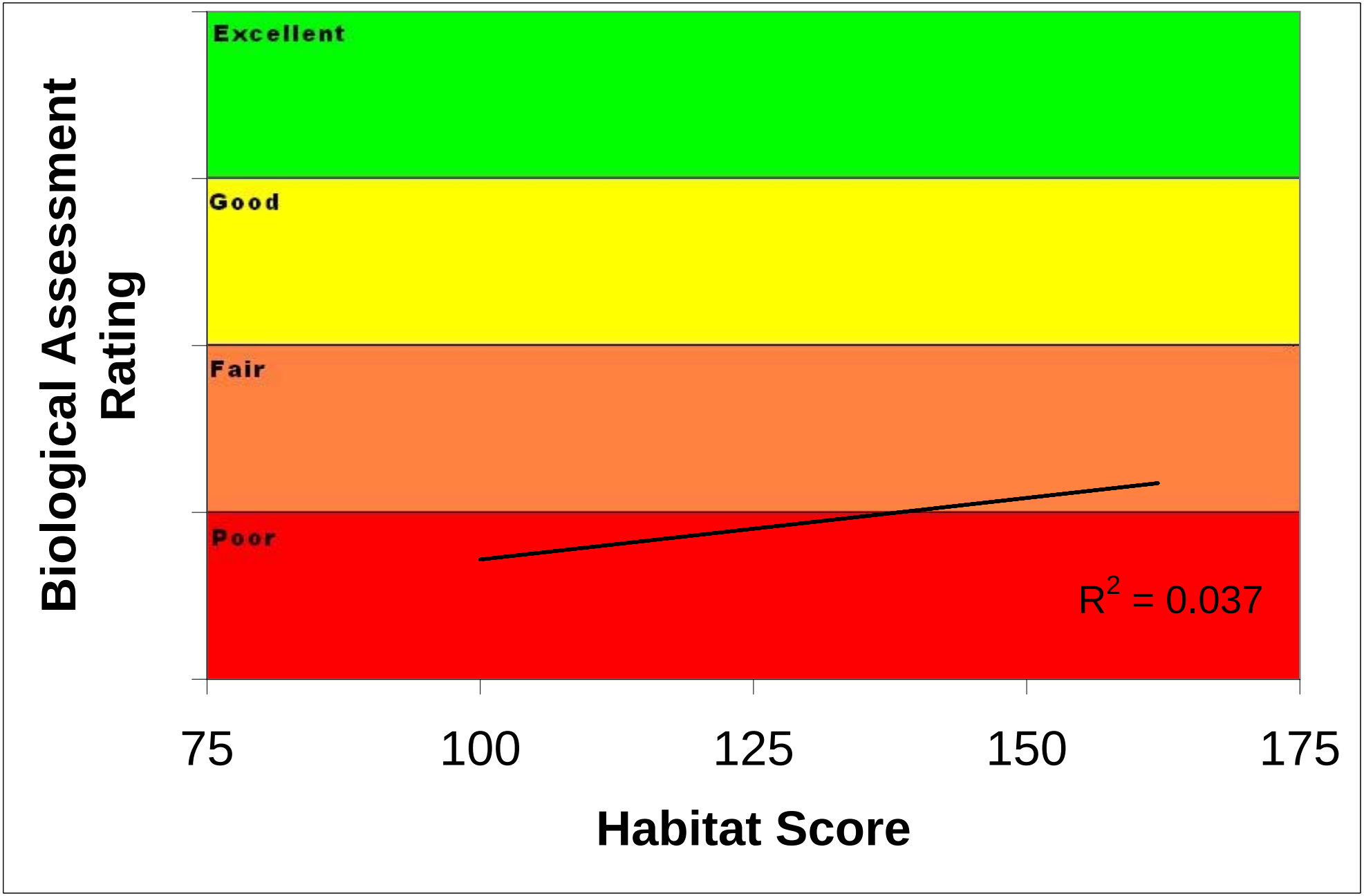


Comparative Scores of

Biological Assessment Rating vs. Habitat Score

WMA 9

Round 4

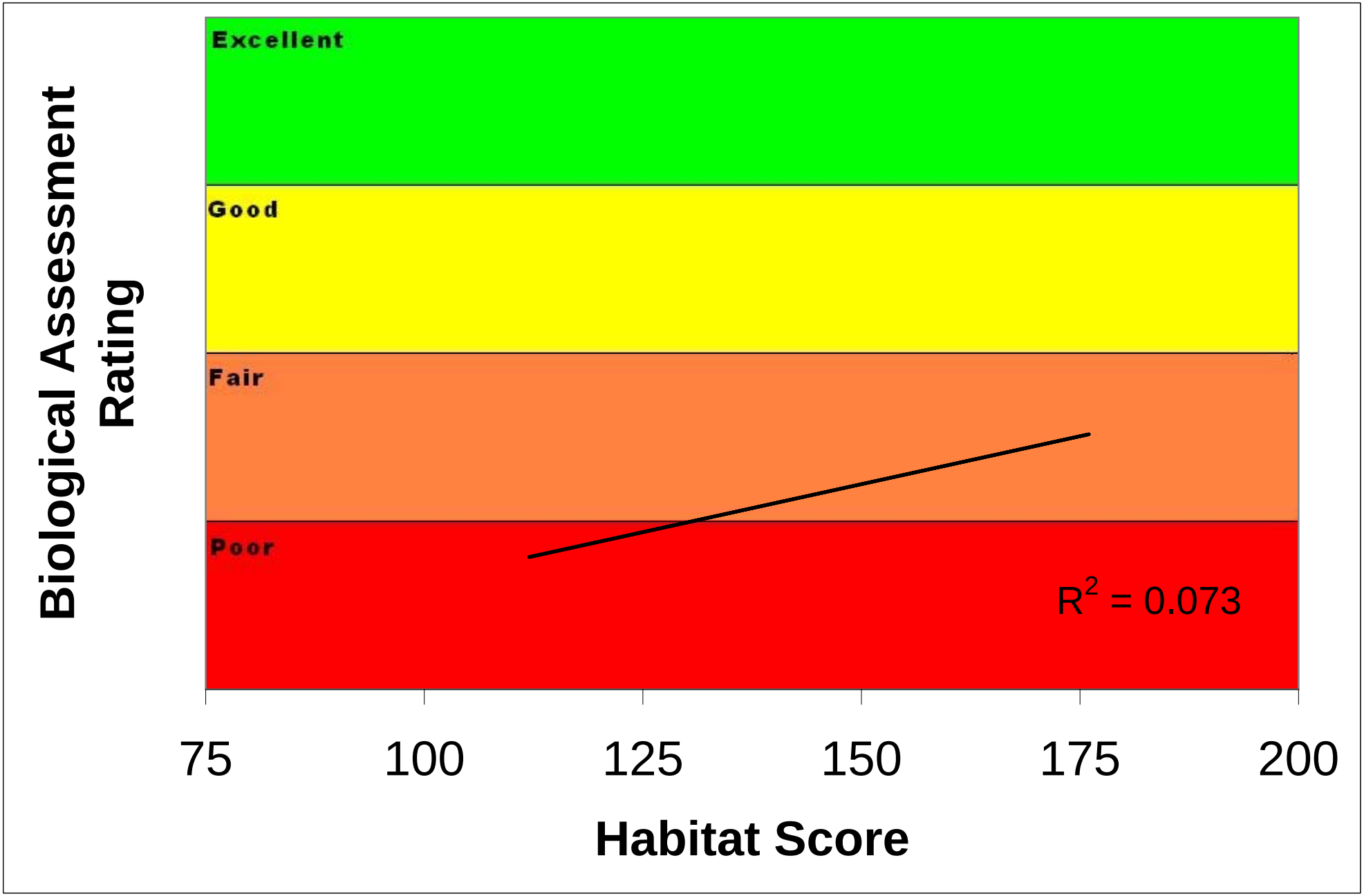


Comparative Scores of

Biological Assessment Rating vs. Habitat Score

WMA 10

Round 4

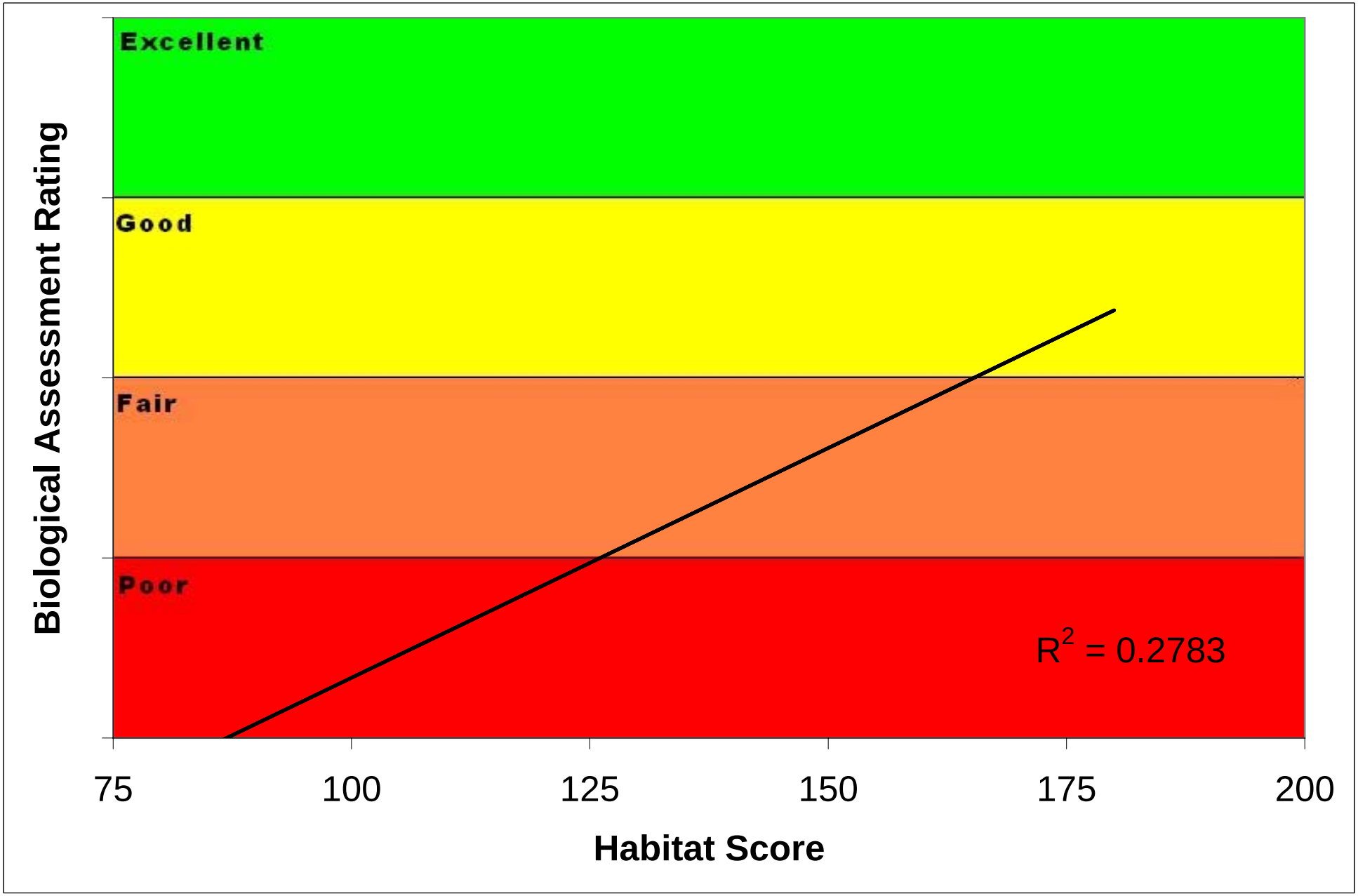


Comparative Scores of

Biological Assessment Rating vs. Habitat Score

Combined

Round 4



APPENDIX D

Taxonomic and Statistical Data, Biological Assessments, Habitat Assessment Scores and Observations from the Round 4 Raritan Water Region AMNET Study

(Site numbers, locations, sample dates, and USGS topographic quadrangle, top of page.)

Notes/Definitions:

Statistical data includes those biometric results that are applied to the following ratings.

CPMI	PMI	HGMI
1. Total # of Taxa 2. # of EPT taxa 3. % Ephemeroptera 4. Hilsenhoff Biotic Index (HBI) 5. % clingers	1. Insect taxa 2. Non-insect taxa 3. % Plecoptera + Trichoptera 4. % Diptera excluding Tanytarsini 5. % Mollusca + Amphipoda 6. Beck's Biotic Index (BBI) 7. % filterers	1. # of genera 2. % non-insect genera 3. % sensitive EPT 4. # of scraper genera 5. Hilsenhoff Biotic Index (HBI) 6. # of Attribute 2 genera 7. # of Attribute 3 genera

See METHODS, Table 1, Volume 1.

Other notes:

1. Ck – Creek, Bk – Brook, Br – Branch, R – River, UNT – un-named tributary
2. Habitat observations supplement the habitat assessment scores in Table 2 and Appendix C; Open Canopy = overhead vegetation; water quality measurements taken in field include temperature (°C), pH, dissolved oxygen, conductivity.

AMNET Site # **AN0192** *Stream Name:* **Rahway River**

Location: **Northfield Ave; West Orange; Essex County**

Collection Date: ***4/7/2009*** *USGS Topo Map:* **Caldwell**

	Genus	Tolerance Value	Amount
	Orthocladius	6	8
	Dicrotendipes	8	6
	Tanytarsus	6	6
	Ischnura	9	4
	Limnodrilus	10	4
	Planorbidae	6	3
	Caecidotea	8	2
	Hydrobaenus	8	2
	Nais	8	2
	Paratendipes	8	2
	Phaenopsectra	7	2
	Stictochironomus	9	2
	Cricotopus	7	1
	Enchytraeidae	10	1
	Gammarus	6	1
	Glyptotendipes	10	1
*	Hydropsyche	4	1
	Mooreobdella	7.8	1
	Polypedilum	6	1

** (EPT organism)* *Taxa Richness:* 19 *Population:* 50

Hilsenhoff Biotic Index (HBI):	7.46	*# Scrapers:*	3
% Sensitive EPT:	0.0%	*Attribute 2 genera:*	0
% Non-Insect Taxa:	36.8%	*Attribute 3 genera:*	0
HGMI Rating:	**18.52**	**Poor**	
Habitat Analysis:	105	Marginal	USEPA Protocol

Observations: Water temp: 7.74 C; Cond: 1327 umhos; DO: 10.03 mg/L; pH: 7.62 SU

Clarity: turbid; Flow Rate: slow; Width/Depth: 27' / 2 - 3'; Substrate: sand, mud, snags

Canopy: partly open; Bank Stability: poor; Bank Vegetation: trees, shrubs

Stream Gradient: Low Gradient Stream; Land Uses: urban

Pipes / Ditches: storm sewers

Other: trash; adjacent to Orange Reservoir

AMNET Site # **AN0193** *Stream Name:* **Rahway River**

Location: **Rt 82 (Morris Ave); Springfield Twp; Union County**

Collection Date: ***4/16/2009*** *USGS Topo Map:* **Roselle**

Genus	*Tolerance Value*	*Amount*
Limnodrilus	10	78
Polypedilum	6	7
Nais	8	5
Branchiura	10	3
Slavina	7	2
Tanytarsus	6	2
Chironomus	10	1
Rheotanytarsus	6	1
Stictochironomus	9	1

** (EPT organism)* *Taxa Richness:* 9 *Population:* 100

Hilsenhoff Biotic Index (HBI):	9.43	*# Scrapers:*	0
% Sensitive EPT:	0.0%	*Attribute 2 genera:*	0
% Non-Insect Taxa:	44.4%	*Attribute 3 genera:*	0

HGMI Rating: **8.92** **Poor**

Habitat Analysis: 121 Suboptimal USEPA Protocol

Observations: Water temp: 8.08 C; Cond: 920 umhos; DO: 11.25 mg/L; pH: 7.58 SU

Clarity: slightly turbid; Flow Rate: slow; Width/Depth: 40' / 3'; Substrate: mud, silt, undercut banks

Canopy: partly open; Bank Stability: poor; Bank Vegetation: trees, weeds, lawn

Stream Gradient: High Gradient Stream; Land Uses: suburban

Pipes / Ditches: storm sewers

Other: waterfowl, trash; "Trout stocked waters"

AMNET Site # **AN0194** *Stream Name:* **Rahway River**

Location: **Rt 509 Kenilworth Blvd; Cranford Twp; Union County**

Collection Date: ***4/16/2009*** *USGS Topo Map:* **Roselle**

	Genus	*Tolerance Value*	*Amount*
	Nais	8	29
	Cricotopus	7	18
	Polypedilum	6	17
	Limnodrilus	10	11
	Tanytarsus	6	7
	Saetheria	4	4
	Gammarus	6	3
	Dicrotendipes	8	2
	Stylodrilus	10	2
	Ancyronyx	2	1
*	Cheumatopsyche	5	1
	Cryptochironomus	8	1
	Nanocladius	3	1
	Paratendipes	8	1
	Rheotanytarsus	6	1
	Simulium	6	1

** (EPT organism)* *Taxa Richness:* 16 *Population:* 100

Hilsenhoff Biotic Index (HBI):	7.20	*# Scrapers:*	0
% Sensitive EPT:	0.0%	*Attribute 2 genera:*	0
% Non-Insect Taxa:	25.0%	*Attribute 3 genera:*	0
HGMI Rating:	**20.55**	**Poor**	
Habitat Analysis:	119	Suboptimal	USEPA Protocol

Observations: Water temp: 8.42 C; Cond: 751 umhos; DO: 11.82 mg/L; pH: 7.62 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 15' / < 1'; Substrate: cobble, gravel, sand, silt

Canopy: open; Bank Stability: poor; Bank Vegetation: trees, weeds

Stream Gradient: High Gradient Stream; Land Uses: suburban, community park

Other: macrophytes, great blue heron

AMNET Site # **AN0195** *Stream Name:* **Rahway River**

Location: **River Rd & Church St; Rahway; Union County**

Collection Date: ***4/20/2009*** *USGS Topo Map:* **Perth Amboy**

	Genus	Tolerance Value	Amount
	Cricotopus	7	68
	Nais	8	9
	Gammarus	6	6
	Caecidotea	8	4
	Slavina	7	3
	Stenelmis	5	3
	Polypedilum	6	2
	Prostoma	7	2
*	Hydroptila	6	1
	Rheotanytarsus	6	1
	Tanytarsus	6	1

** (EPT organism)* *Taxa Richness:* 11 *Population:* 100

Hilsenhoff Biotic Index (HBI):	6.96	*# Scrapers:*	2
% Sensitive EPT:	1.0%	*Attribute 2 genera:*	0
% Non-Insect Taxa:	45.5%	*Attribute 3 genera:*	0

HGMI Rating: **14.17** **Poor**

Habitat Analysis: 135 Suboptimal USEPA Protocol

Observations: Water temp: 13.17 C; Cond: 710 umhos; DO: 9.39 mg/L; pH: 7.99 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 37' / 2'; Substrate: cobble, gravel, sand

Canopy: mostly open; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: suburban

Pipes / Ditches: storm sewers

Other: fish, waterfowl, periphytes, filamentous algae; dead snapping turtle

AMNET Site # **AN0196** *Stream Name:* **Robinsons Br**

Location: **Goodmans Crossing; Scotch Plains Twp; Union County**

Collection Date: ***4/16/2009*** *USGS Topo Map:* **Perth Amboy**

Genus	*Tolerance Value*	*Amount*
Limnodrilus	10	28
Hydrolimax	4	14
Paratendipes	8	14
Polypedilum	6	12
Amnicola	4.8	6
Musculium	5	6
Phaenopsectra	7	5
Pisidium	6.8	5
Tanytarsus	6	3
Crangonyx	8	1
Cryptotendipes	6	1
Dicrotendipes	8	1
Menetus	6	1
Nematoda	6	1
Tipula	4	1
Tubifex	10	1

** (EPT organism)* *Taxa Richness:* 16 *Population:* 100

Hilsenhoff Biotic Index (HBI):	7.14	*# Scrapers:*	3
% Sensitive EPT:	0.0%	*Attribute 2 genera:*	0
% Non-Insect Taxa:	56.3%	*Attribute 3 genera:*	1

HGMI Rating: **15.15** **Poor**

Habitat Analysis: 113 Suboptimal USEPA Protocol

Observations: Water temp: 6.62 C; Cond: 435 umhos; DO: 9.54 mg/L; pH: 7.39 SU

Clarity: slightly turbid; Flow Rate: slow; Width/Depth: 26' / 2 - 3'; Substrate: cobble, gravel, silt, mud, snags

Canopy: partly open; Bank Stability: fair; Bank Vegetation: trees, shrubs, weeds, lawn

Stream Gradient: High Gradient Stream; Land Uses: urban

Pipes / Ditches: storm sewers

Other: periphytes, trash

AMNET Site # **AN0197** *Stream Name:* **UNT to Robinsons Br**

Location: **Raritan Rd (Terrell Rd) (Rt 611); Scotch Plains Twp; Union County**

Collection Date: ***4/16/2009*** *USGS Topo Map:* **Perth Amboy/Roselle**

	Genus	Tolerance Value	Amount
	Nais	8	56
	Polypedilum	6	7
	Slavina	7	5
	Caecidotea	8	4
	Cura	4	4
	Cricotopus	7	3
	Phaenopsectra	7	3
	Tanytarsus	6	3
	Orthocladius	6	2
*	Cheumatopsyche	5	1
	Diamesa	5	1
	Dicrotendipes	8	1
	Glyptotendipes	10	1
	Hemerodromia	6	1
	Limnodrilus	10	1
	Musculium	5	1
	Paratendipes	8	1
	Rheotanytarsus	6	1
	Tubificidae	10	1

** (EPT organism)* *Taxa Richness:* 19 *Population:* 97

Hilsenhoff Biotic Index (HBI):	7.40	*# Scrapers:*	1
% Sensitive EPT:	0.0%	*Attribute 2 genera:*	1
% Non-Insect Taxa:	36.8%	*Attribute 3 genera:*	0
HGMI Rating:	**18.79**	**Poor**	
Habitat Analysis:	120	Suboptimal	USEPA Protocol

Observations: Water temp: 12.20 C; Cond: 425 umhos; DO: 13.51 mg/L; pH: 8.30 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 10' / < 1'; Substrate: cobble, gravel, sand, silt

Canopy: mostly open; Bank Stability: poor; Bank Vegetation: trees, lawn

Stream Gradient: High Gradient Stream; Land Uses: suburban

Pipes / Ditches: storm sewers

Downstream of Impoundment: Shackamaxon Lake

Other: fish, periphytes, trash

AMNET Site # **AN0198** *Stream Name:* **UNT to Robinsons Br**

Location: **Lamberts Mill Rd (Rt 606); Westfield Twp; Union County**

Collection Date: ***4/16/2009*** *USGS Topo Map:* **Perth Amboy/Roselle**

Genus	*Tolerance Value*	*Amount*
Polypedilum	6	29
Limnodrilus	10	17
Nais	8	14
Cricotopus	7	8
Orthocladius	6	8
Pisidium	6.8	6
Tanytarsus	6	5
Diamesa	5	4
Eclipidrilus	8	3
Pristinella	10	2
Stylodrilus	10	2
Cryptochironomus	8	1
Tipula	4	1

** (EPT organism)* *Taxa Richness:* 13 *Population:* 100

Hilsenhoff Biotic Index (HBI):	7.27	*# Scrapers:*	0
% Sensitive EPT:	0.0%	*Attribute 2 genera:*	1
% Non-Insect Taxa:	46.2%	*Attribute 3 genera:*	1
HGMI Rating:	**14.37**	**Poor**	
Habitat Analysis:	128	Suboptimal	USEPA Protocol

Observations: Water temp: 12.55 C; Cond: 431 umhos; DO: 15.14 mg/L; pH: 8.28 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 12' / < 1'; Substrate: cobble, gravel, sand

Canopy: open; Bank Stability: poor; Bank Vegetation: trees, shrubs, weeds, vines, lawn

Stream Gradient: High Gradient Stream; Land Uses: suburban, forested

Other: fish; construction debris from old retaining wall in stream

AMNET Site # **AN0199** *Stream Name:* **Robinsons Br**

Location: **Rt 27; Rahway; Union County**

Collection Date: ***4/20/2009*** *USGS Topo Map:* **Perth Amboy**

	Genus	Tolerance Value	Amount
	Nais	8	64
	Polypedilum	6	14
	Caecidotea	8	3
*	Stenacron	4	3
	Dicrotendipes	8	2
	Gammarus	6	2
	Slavina	7	2
	Amnicola	4.8	1
*	Ceraclea	3	1
	Chironomus	10	1
	Cura	4	1
	Gyraulus	6	1
	Peltodytes	5	1
	Pisidium	6.8	1
	Prostoma	7	1
	Rheotanytarsus	6	1
	Stenelmis	5	1

** (EPT organism)* *Taxa Richness:* 17 *Population:* 100

Hilsenhoff Biotic Index (HBI):	7.32	*# Scrapers:*	4
% Sensitive EPT:	4.0%	*Attribute 2 genera:*	0
% Non-Insect Taxa:	52.9%	*Attribute 3 genera:*	1

HGMI Rating: **18.38** **Poor**

Habitat Analysis: 123 Suboptimal USEPA Protocol

Observations: Water temp: 12.20 C; Cond: 475 umhos; DO: 10.28 mg/L; pH: 8.01 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 31' / 1'; Substrate: cobble, gravel, sand, silt

Canopy: mostly open; Bank Stability: fair; Bank Vegetation: trees, grasses

Stream Gradient: High Gradient Stream; Land Uses: suburban

Pipes / Ditches: storm sewers

Other: fish, turtle, waterfowl, periphytes, filamentous algae, oil sheen, trash

AMNET Site # **AN0200** *Stream Name:* **South Br Rahway River**

Location: **Parsonage Rd; Edison Twp; Middlesex County**

Collection Date: ***4/20/2009*** *USGS Topo Map:* **Perth Amboy**

	Genus	Tolerance Value	Amount
	Nais	8	31
	Polypedilum	6	25
	Cricotopus	7	12
	Musculium	5	9
	Glyptotendipes	10	3
	Limnodrilus	10	3
	Alboglossiphonia	8	2
*	Cheumatopsyche	5	2
	Cura	4	2
	Orthocladius	6	2
	Amnicola	4.8	1
	Chironomus	10	1
	Eclipidrilus	8	1
	Enchytraeidae	10	1
*	Hydropsyche	4	1
	Muscidae	6	1
	Phaenopsectra	7	1
	Physella	9.1	1
	Stylaria	8	1

** (EPT organism)* *Taxa Richness:* 19 *Population:* 100

Hilsenhoff Biotic Index (HBI):	7.00	*# Scrapers:*	3
% Sensitive EPT:	0.0%	*Attribute 2 genera:*	0
% Non-Insect Taxa:	52.6%	*Attribute 3 genera:*	0

HGMI Rating: **16.02** **Poor**

Habitat Analysis: 111 Suboptimal USEPA Protocol

Observations: Water temp: 12.48 C; Cond: 1051 umhos; DO: 11.88 mg/L; pH: 9.24 SU

Clarity: clear, greenish; Flow Rate: moderate; Width/Depth: 15' / < 1'; Substrate: cobble, gravel, sand

Canopy: mostly open; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses

Stream Gradient: High Gradient Stream; Land Uses: suburban, County park

Downstream of Impoundment: lake

Other: periphytes, filamentous algae, waterfowl, trash, oil sheen & odor

AMNET Site # **AN0201** *Stream Name:* **South Br Rahway River**

Location: **in Merrill Park off Fairview Rd; Woodbridge Twp; Middlesex County**

Collection Date: ***4/20/2009*** *USGS Topo Map:* **Perth Amboy**

	Genus	Tolerance Value	Amount
	Nais	8	90
	Cricotopus	7	3
	Polypedilum	6	3
*	Cheumatopsyche	5	1
	Limnodrilus	10	1
	Orthocladius	6	1
	Tanytarsus	6	1

** (EPT organism)* *Taxa Richness:* 7 *Population:* 100

Hilsenhoff Biotic Index (HBI):	7.86	*# Scrapers:*	0
% Sensitive EPT:	0.0%	*Attribute 2 genera:*	0
% Non-Insect Taxa:	28.6%	*Attribute 3 genera:*	0
HGMI Rating:	**11.82**	**Poor**	
Habitat Analysis:	107	Marginal	USEPA Protocol

Observations: Water temp: 9.93 C; Cond: 683 umhos; DO: 12.53 mg/L; pH: 8.34 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 36' / 2'; Substrate: cobble, gravel, sand, silt

Canopy: open; Bank Stability: poor; Bank Vegetation: trees, shrubs, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: suburban, community park

Other: periphytes, filamentous algae, waterfowl, petting zoo

AMNET Site # **AN0202** *Stream Name:* **West Br Elizabeth River**

Location: **Vaux Hall Rd; Union Twp; Union County**

Collection Date: ***4/7/2009*** *USGS Topo Map:* **Elizabeth**

	Genus	Tolerance Value	Amount
	Tanytarsus	6	27
	Cricotopus	7	19
*	Cheumatopsyche	5	17
	Limnodrilus	10	10
	Pisidium	6.8	6
	Micropsectra	7	4
	Thienemannimyia	6	3
	Bezzia	6	2
	Lumbricidae	10	2
	Polypedilum	6	2
	Diamesa	5	1
	Gyraulus	6	1
	Hemerodromia	6	1
*	Hydropsyche	4	1
	Mooreobdella	7.8	1
	Phaenopsectra	7	1
	Prostoma	7	1
	Tubifex	10	1

** (EPT organism)* *Taxa Richness:* 18 *Population:* 100

Hilsenhoff Biotic Index (HBI):	6.64	*# Scrapers:*	2
% Sensitive EPT:	0.0%	*Attribute 2 genera:*	1
% Non-Insect Taxa:	38.9%	*Attribute 3 genera:*	0

HGMI Rating: **19.92** **Poor**

Habitat Analysis: 126 Suboptimal USEPA Protocol

Observations: Water temp: 9.98 C; Cond: 690 umhos; DO: 10.40 mg/L; pH: 7.58 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 6' / < 1.0'; Substrate: cobble, gravel, snags

Canopy: mostly open; Bank Stability: fair; Bank Vegetation: trees, weeds, lawn

Stream Gradient: High Gradient Stream; Land Uses: suburban, small ball park

Pipes / Ditches: storm sewers (18" concrete)

Other: trash

AMNET Site # **AN0204** *Stream Name:* **Elizabeth River**

Location: **North Ave; Union Twp; Union County**

Collection Date: ***4/7/2009*** *USGS Topo Map:* **Elizabeth**

Genus	*Tolerance Value*	*Amount*
Cricotopus	7	40
Nais	8	26
Limnodrilus	10	9
Polypedilum	6	7
Cura	4	3
Hemerodromia	6	3
Rheopelopia	4	3
Nematoda	6	2
Placobdella	8	2
Cryptochironomus	8	1
Enchytraeidae	10	1
Gloiobdella	6	1
Phaenopsectra	7	1
Stylodrilus	10	1

** (EPT organism)* *Taxa Richness:* 14 *Population:* 100

Hilsenhoff Biotic Index (HBI): 7.31 *# Scrapers:* 1

% Sensitive EPT: 0.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 57.1% *Attribute 3 genera:* 0

HGMI Rating: **9.59** **Poor**

Habitat Analysis: 119 Suboptimal USEPA Protocol

Observations: Water temp: 9.68 C; Cond: 572 umhos; DO: 8.85 mg/L; pH: 7.58 SU

Clarity: slightly turbid; Flow Rate: slow; Width/Depth: 42' / 1'; Substrate: cobble, gravel, sand

Canopy: open; Bank Stability: poor; Bank Vegetation: trees, grasses, weeds

Stream Gradient: Low Gradient Stream; Land Uses: urban, suburban

Other: periphytes, filamentous algae, trash

AMNET Site # **AN0310** *Stream Name:* **S Br Raritan River**

Location: **Smithtown Rd; Mt Olive Twp; Morris County**

Collection Date: ***4/22/2009*** *USGS Topo Map:* **Hackettstown**

	Genus	Tolerance Value	Amount
	Gammarus	6	21
	Nais	8	15
	Prostoma	7	13
	Caecidotea	8	8
	Limnodrilus	10	8
	Amnicola	4.8	6
	Musculium	5	4
	Heterotrissocladius	0	3
*	Caenis	7	2
	Cura	4	2
	Polypedilum	6	2
	Stenelmis	5	2
	Tubificidae	10	2
	Bezzia	6	1
	Chelifera	6	1
	Cladopelma	8	1
	Cricotopus	7	1
	Gyraulus	6	1
	Helisoma	7	1
	Helobdella	8	1
	Nematoda	6	1
	Orthocladius	6	1
	Physella	9.1	1
	Rheopelopia	4	1
	Stylodrilus	10	1

** (EPT organism)* *Taxa Richness:* 25 *Population:* 100

Hilsenhoff Biotic Index (HBI): 6.77 *# Scrapers:* 5

% Sensitive EPT: 2.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 60.0% *Attribute 3 genera:* 0

HGMI Rating: **20.10** **Poor**

Habitat Analysis: 125 Suboptimal USEPA Protocol

Observations: Water temp: 10.42 C; Cond: 370 umhos; DO: 9.00 mg/L; pH: 7.16 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 15' / 1'; Substrate: cobble, gravel, sand, silt, snags, root mats

Canopy: mostly open; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses

Stream Gradient: High Gradient Stream; Land Uses: rural

Pipes / Ditches: storm sewers

Downstream of Impoundment: Budd Lake

Other: periphytes

AMNET Site # **AN0311** ***Stream Name:*** **Drakes Bk**

Location: **Emmans Rd; Roxbury Twp; Morris County**

Collection Date: ***4/22/2009*** ***USGS Topo Map:*** **Chester**

	Genus	Tolerance Value	Amount
	Gammarus	6	9
	Tanytarsus	6	9
	Rheotanytarsus	6	8
	Cricotopus	7	7
*	Mystacides	4	6
	Macronychus	2	5
	Gomphus	5	4
*	Oecetis	8	4
*	Cheumatopsyche	5	3
	Dubiraphia	6	3
	Limnodrilus	10	3
	Amnicola	4.8	2
	Calopteryx	6	2
	Chelifera	6	2
	Cladotanytarsus	7	2
	Nigronia	2	2
	Promoresia	2	2
	Quistradrilus	10	2
	Stenelmis	5	2
*	Triaenodes	6	2
	Argia	6	1
*	Caenis	7	1
	Dicrotendipes	8	1
*	Eurylophella	4	1
	Hydrolimax	4	1
*	Hydropsyche	4	1
	Ischnura	9	1
*	Limnephilidae	4	1
	Limnophyes	8	1
	Manayunkia	6	1
	Nais	8	1
	Paratanytarsus	6	1
	Paratendipes	8	1
	Planorbidae	6	1
	Polypedilum	6	1
	Prosimulium	2	1
	Simulium	6	1
	Slavina	7	1
	Stylogomphus	1	1
	Thienemanniella	6	1
	Thienemannimyia	6	1

** (EPT organism)* *Taxa Richness:* 41 *Population:* 100

Hilsenhoff Biotic Index (HBI): 5.74 *# Scrapers:* 7

% Sensitive EPT: 15.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 22.0% *Attribute 3 genera:* 6

HGMI Rating: **52.62** **Good**

Habitat Analysis: 143 Suboptimal USEPA Protocol

Observations: Water temp: 11.02 C; Cond: 546 umhos; DO: 9.63 mg/L; pH: 7.70 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 17' / 2'; Substrate: cobble, gravel, sand, silt

Canopy: open; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: rural

Other: periphytes

AMNET Site # **AN0312** *Stream Name:* **Drakes Bk**

Location: **Bartley Rd; Washington Twp; Morris County**

Collection Date: ***4/22/2009*** *USGS Topo Map:* **Chester**

	Genus	Tolerance Value	Amount
	Nais	8	36
	Cricotopus	7	9
*	Micrasema	2	8
*	Hydropsyche	4	7
	Prosimulium	2	5
*	Neophylax	3	4
	Stenelmis	5	4
*	Cheumatopsyche	5	3
	Clinocera	6	3
	Polypedilum	6	3
	Rheotanytarsus	6	3
	Simulium	6	3
*	Ceratopsyche	4	2
*	Chimarra	4	2
*	Protoptila	1	2
	Tanytarsus	6	2
	Antocha	3	1
	Dugesia	4	1
	Macronychus	2	1
	Psephenus	4	1

** (EPT organism)* *Taxa Richness:* 20 *Population:* 100

Hilsenhoff Biotic Index (HBI):	5.67	*# Scrapers:*	5
% Sensitive EPT:	16.0%	*Attribute 2 genera:*	1
% Non-Insect Taxa:	10.0%	*Attribute 3 genera:*	3
HGMI Rating:	**45.04**	**Good**	
Habitat Analysis:	157	Suboptimal	USEPA Protocol

Observations: Water temp: 10.95 C; Cond: 408 umhos; DO: 12.47 mg/L; pH: 8.76 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 33' / 1'; Substrate: cobble, gravel, sand

Canopy: partly open; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: rural, forested

Other: fish, periphytes, filamentous algae; school on left bank

AMNET Site # **AN0313** *Stream Name:* **Stony Bk**

Location: **Fairview Ave; Washington Twp; Morris County**

Collection Date: ***4/22/2009*** *USGS Topo Map:* **Hackettstown**

	Genus	Tolerance Value	Amount
	Clinocera	6	14
*	Epeorus	0	13
	Micropsectra	7	7
	Prosimulium	2	7
	Polypedilum	6	6
*	Lepidostoma	1	5
	Microtendipes	7	4
*	Acroneuria	0	3
	Diamesa	5	3
	Hexatoma	2	3
	Stylogomphus	1	3
*	Taeniopteryx	2	3
*	Haploperla	1	2
	Lumbriculus	8	2
	Orthocladius	6	2
	Stenelmis	5	2
	Thienemannimyia	6	2
	Antocha	3	1
*	Baetis	6	1
*	Ceratopsyche	4	1
*	Cheumatopsyche	5	1
*	Diplectrona	0	1
*	Dolophilodes	0	1
	Eukiefferiella	8	1
*	Eurylophella	4	1
	Optioservus	4	1
	Oulimnius	4	1
	Pisidium	6.8	1
	Promoresia	2	1
	Rheocricotopus	6	1
	Rheotanytarsus	6	1
*	Rhyacophila	1	1
	Simulium	6	1
	Stempellinella	6	1
	Sublettea	6	1
*	Sweltsa	0	1

** (EPT organism)* *Taxa Richness:* 36 *Population:* 100

Hilsenhoff Biotic Index (HBI): 3.76 *# Scrapers:* 5

% Sensitive EPT: 32.0% *Attribute 2 genera:* 7

% Non-Insect Taxa: 5.6% *Attribute 3 genera:* 9

HGMI Rating: **79.13** **Excellent**

Habitat Analysis: 159 Suboptimal USEPA Protocol

Observations: Water temp: 9.67 C; Cond: 150 umhos; DO: 10.96 mg/L; pH: 7.82 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 19' / 1'; Substrate: cobble, gravel, sand

Canopy: partly open; Bank Stability: good; Bank Vegetation: trees, shrubs

Stream Gradient: High Gradient Stream; Land Uses: rural

Other: crayfish, periphytes

AMNET Site # **AN0314** *Stream Name:* **Electric Bk**

Location: **Fairview Ave; Washington Twp; Morris County**

Collection Date: ***5/13/2009*** *USGS Topo Map:* **Hackettstown**

	Genus	Tolerance Value	Amount
*	Dolophilodes	0	24
	Micropsectra	7	18
	Brillia	5	7
	Nais	8	6
*	Diplectrona	0	5
	Tvetenia	5	5
*	Baetis	6	4
*	Amphinemura	3	3
*	Eurylophella	4	3
*	Acentrella	4	2
	Gammarus	6	2
	Lumbriculus	8	2
*	Pycnopsyche	4	2
	Simulium	6	2
	Chelifera	6	1
	Enchytraeidae	10	1
	Hydrobaenus	8	1
*	Hydropsyche	4	1
*	Leuctra	0	1
*	Maccaffertium	3	1
	Microvelia	6	1
*	Neophylax	3	1
	Orthocladiinae	5	1
	Parametriocnemus	5	1
	Physella	9.1	1
	Polypedilum	6	1
*	Rhyacophila	1	1
	Stenelmis	5	1
	Stylogomphus	1	1

** (EPT organism)* *Taxa Richness:* 29 *Population:* 100

Hilsenhoff Biotic Index (HBI): 4.07 *# Scrapers:* 6

% Sensitive EPT: 47.0% *Attribute 2 genera:* 5

% Non-Insect Taxa: 17.2% *Attribute 3 genera:* 8

HGMI Rating: **74.95** **Excellent**

Habitat Analysis: 153 Suboptimal USEPA Protocol

Observations: Water temp: 12.42 C; Cond: 296 umhos; DO: 10.23 mg/L; pH: 7.70 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 12' / < 1'; Substrate: cobble, gravel, sand

Canopy: mostly closed; Bank Stability: good; Bank Vegetation: trees, shrubs

Stream Gradient: High Gradient Stream; Land Uses: suburban

Pipes / Ditches: storm sewers

Other: fish, periphytes; new home construction upstream and downstream of site

AMNET Site # **AN0315** *Stream Name:* **S Br Raritan River**

Location: **Rt 517; Washington Twp; Morris County**

Collection Date: ***5/13/2009*** *USGS Topo Map:* **Hackettstown**

	Genus	Tolerance Value	Amount
*	Ephemerella	1	20
	Gammarus	6	16
	Cricotopus	7	12
	Lumbriculus	8	12
	Micropsectra	7	8
*	Eurylophella	4	6
	Antocha	3	4
	Dugesia	4	4
	Nais	8	3
	Polypedilum	6	3
	Thienemannimyia	6	2
*	Acentrella	4	1
*	Acroneuria	0	1
	Brillia	5	1
*	Hydropsyche	4	1
*	Lepidostoma	1	1
*	Micrasema	2	1
*	Neophylax	3	1
	Optioservus	4	1
	Stenelmis	5	1
	Tvetenia	5	1

** (EPT organism)* *Taxa Richness:* 21 *Population:* 100

Hilsenhoff Biotic Index (HBI): 4.91 *# Scrapers:* 3

% Sensitive EPT: 31.0% *Attribute 2 genera:* 2

% Non-Insect Taxa: 19.0% *Attribute 3 genera:* 5

HGMI Rating: **52.02** **Good**

Habitat Analysis: 135 Suboptimal USEPA Protocol

Observations: Water temp: 11.46 C; Cond: 358 umhos; DO: 11.26 mg/L; pH: 7.82 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 40' / < 1'; Substrate: cobble, gravel, sand

Canopy: mostly open; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses

Stream Gradient: High Gradient Stream; Land Uses: suburban

Pipes / Ditches: storm sewers

Other: fish, crayfish, periphytes; parking lots adj to both stream banks

AMNET Site # **AN0316** *Stream Name:* **S Br Raritan River**

Location: **off Raritan River Rd (Rt 512); Califon Boro; Hunterdon County**

Collection Date: ***5/13/2009*** *USGS Topo Map:* **Califon**

Genus	*Tolerance Value*	*Amount*
Limnodrilus	10	21
Amnicola	4.8	16
Valvata	2	15
Chironomus	10	13
Specaria	7	8
Dicrotendipes	8	7
Tubifex	10	4
Gammarus	6	3
Lumbriculus	8	3
Paratendipes	8	2
Polypedilum	6	2
Musculium	5	1
Paratanytarsus	6	1
Physella	9.1	1
Prostoma	7	1
Stylaria	8	1
Tanytarsus	6	1

** (EPT organism)* *Taxa Richness:* 17 *Population:* 100

Hilsenhoff Biotic Index (HBI):	7.10	*# Scrapers:*	3
% Sensitive EPT:	0.0%	*Attribute 2 genera:*	0
% Non-Insect Taxa:	64.7%	*Attribute 3 genera:*	0
HGMI Rating:	**14.04**	**Poor**	
Habitat Analysis:	111	Suboptimal	USEPA Protocol

Observations: Water temp: 14.63 C; Cond: 334 umhos; DO: 9.28 mg/L; pH: 7.59 SU
Clarity: clear; Flow Rate: slow; Width/Depth: 138' / 2'; Substrate: cobble, silt
Canopy: open; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses
Stream Gradient: High Gradient Stream; Land Uses: suburban

Other: fish, macrophytes, waterfowl; upstream of a dam

AMNET Site # **AN0317** *Stream Name:* **S Br Raritan River**

Location: **River Rd; Lebanon Twp; Hunterdon County**

Collection Date: ***4/28/2009*** *USGS Topo Map:* **Califon**

	Genus	*Tolerance Value*	*Amount*
	Cricotopus	7	23
*	Acentrella	4	15
	Lumbriculus	8	9
	Nais	8	9
*	Cheumatopsyche	5	8
*	Ephemerella	1	5
	Psephenus	4	5
	Optioservus	4	4
	Diamesa	5	3
	Antocha	3	2
	Eukiefferiella	8	2
	Macronychus	2	2
*	Micrasema	2	2
	Orthocladius	6	2
	Prostoma	7	2
	Tanytarsus	6	2
*	Ceratopsyche	4	1
*	Chimarra	4	1
*	Hydropsyche	4	1
*	Serratella	2	1
	Stenelmis	5	1

** (EPT organism)* *Taxa Richness:* 21 *Population:* 100

Hilsenhoff Biotic Index (HBI): 5.48 *# Scrapers:* 3

% Sensitive EPT: 24.0% *Attribute 2 genera:* 2

% Non-Insect Taxa: 14.3% *Attribute 3 genera:* 3

HGMI Rating: **46.73** **Good**

Habitat Analysis: 172 Optimal USEPA Protocol

Observations: Water temp: 18.19 C; Cond: 312 umhos; DO: 9.30 mg/L; pH: 8.14 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 75' / <1'; Substrate: cobble, gravel, sand, snags

Canopy: mostly open; Bank Stability: fair; Bank Vegetation: trees, shrubs

Stream Gradient: High Gradient Stream; Land Uses: forested

Other: fish, crayfish, periphytes

AMNET Site # **AN0318** *Stream Name:* **Spruce Run**

Location: **Newport Rd; Lebanon Twp; Hunterdon County**

Collection Date: ***4/28/2009*** *USGS Topo Map:* **High Bridge**

	Genus	Tolerance Value	Amount
*	Amphinemura	3	14
	Cricotopus	7	11
*	Ephemerella	1	10
*	Drunella	1	9
*	Acentrella	4	8
	Orthocladius	6	8
	Nais	8	6
*	Hydropsyche	4	5
*	Isonychia	2	3
	Polypedilum	6	3
*	Cheumatopsyche	5	2
*	Heterocloeon	2	2
	Optioservus	4	2
	Simulium	6	2
	Thienemannimyia	6	2
*	Ameletus	0	1
	Antocha	3	1
*	Chimarra	4	1
*	Diplectrona	0	1
*	Epeorus	0	1
*	Eurylophella	4	1
	Musculium	5	1
	Planariidae	4	1
	Prostoma	7	1
	Rheotanytarsus	6	1
*	Rhyacophila	1	1
	Tanytarsus	6	1
	Tipula	4	1

** (EPT organism)* *Taxa Richness:* 28 *Population:* 100

Hilsenhoff Biotic Index (HBI): 4.00 *# Scrapers:* 3

% Sensitive EPT: 52.0% *Attribute 2 genera:* 7

% Non-Insect Taxa: 14.3% *Attribute 3 genera:* 5

HGMI Rating: **71.28** **Excellent**

Habitat Analysis: 177 Optimal USEPA Protocol

Observations: Water temp: 18.14 C; Cond: 141 umhos; DO: 9.75 mg/L; pH: 8.36 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 16' / < 1'; Substrate: cobble, gravel, sand

Canopy: mostly open; Bank Stability: good; Bank Vegetation: trees, shrubs, weeds

Stream Gradient: High Gradient Stream; Land Uses: forested

Other: fish, filamentous algae; gage: 3'

AMNET Site # **AN0319** *Stream Name:* **Spruce Run**

Location: **Rt 31; Glen Gardner Boro; Hunterdon County**

Collection Date: ***4/28/2009*** *USGS Topo Map:* **High Bridge**

	Genus	*Tolerance Value*	*Amount*
	Cricotopus	7	31
*	Acentrella	4	24
	Diamesa	5	11
	Orthocladius	6	8
	Clinocera	6	6
	Stylodrilus	10	5
	Cura	4	3
*	Ceratopsyche	4	2
*	Amphinemura	3	1
	Antocha	3	1
*	Baetis	6	1
*	Ephemerella	1	1
*	Maccaffertium	3	1
	Nais	8	1
	Polypedilum	6	1
	Prosimulium	2	1
	Rheopelopia	4	1
	Simulium	6	1

** (EPT organism)* *Taxa Richness:* 18 *Population:* 100

Hilsenhoff Biotic Index (HBI):	5.64	*# Scrapers:*	1
% Sensitive EPT:	28.0%	*Attribute 2 genera:*	2
% Non-Insect Taxa:	16.7%	*Attribute 3 genera:*	5
HGMI Rating:	**45.03**	**Good**	
Habitat Analysis:	167	Optimal	USEPA Protocol

Observations: Water temp: 17.04 C; Cond: 218 umhos; DO: 9.68 mg/L; pH: 7.97 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 24' / < 1'; Substrate: cobble, gravel, sand

Canopy: mostly open; Bank Stability: good; Bank Vegetation: trees, shrubs, vines

Stream Gradient: High Gradient Stream; Land Uses: forested

Other: crayfish, macrophytes, periphytes, trash; "trout stocked stream" sign

AMNET Site # **AN0320** *Stream Name:* **Willoughby Bk**

Location: **Rt 31; Clinton Twp; Hunterdon County**

Collection Date: ***4/28/2009*** *USGS Topo Map:* **High Bridge**

	Genus	Tolerance Value	Amount
*	Acentrella	4	14
	Cricotopus	7	11
*	Amphinemura	3	10
	Psephenus	4	7
*	Agapetus	0	6
*	Ephemerella	1	6
*	Eurylophella	4	6
	Lumbriculus	8	6
	Simulium	6	6
*	Drunella	1	3
*	Epeorus	0	3
	Clinocera	6	2
	Prostoma	7	2
	Thienemannimyia	6	2
*	Acroneuria	0	1
	Antocha	3	1
*	Ceratopsyche	4	1
*	Cheumatopsyche	5	1
	Diamesa	5	1
	Eukiefferiella	8	1
*	Glossosoma	0	1
*	Isonychia	2	1
*	Lepidostoma	1	1
	Micropsectra	7	1
*	Neophylax	3	1
	Orthocladiinae	5	1
	Polypedilum	6	1
*	Pteronarcys	0	1
*	Sweltsa	0	1
	Tanytarsus	6	1

** (EPT organism)* *Taxa Richness:* 30 *Population:* 100

Hilsenhoff Biotic Index (HBI):	4.01	*# Scrapers:*	6
% Sensitive EPT:	55.0%	*Attribute 2 genera:*	8
% Non-Insect Taxa:	6.7%	*Attribute 3 genera:*	6

HGMI Rating: **81.62** **Excellent**

Habitat Analysis: 154 Suboptimal USEPA Protocol

Observations: Water temp: 19.56 C; Cond: 178 umhos; DO: 7.80 mg/L; pH: 7.95 SU

Clarity: clear; Flow Rate: slow; Width/Depth: 29' / < 1'; Substrate: cobble, gravel, sand

Canopy: partly open; Bank Stability: fair; Bank Vegetation: trees, vines

Stream Gradient: High Gradient Stream; Land Uses: forested

Pipes / Ditches: storm sewers

Other: fish, salamander, waterfowl (nesting Canadian goose), macrophytes, filamentous algae, trash

AMNET Site # **AN0321** *Stream Name:* **Mulhockaway Ck**

Location: **Van Syckel Rd (Rt 635); Union Twp; Hunterdon County**

Collection Date: ***4/28/2009*** *USGS Topo Map:* **High Bridge**

	Genus	*Tolerance Value*	*Amount*
*	Amphinemura	3	17
	Nais	8	11
	Orthocladius	6	11
	Prosimulium	2	10
	Simulium	6	8
	Cricotopus	7	7
*	Glossosoma	0	4
	Stylodrilus	10	3
	Tvetenia	5	3
*	Cheumatopsyche	5	2
	Diamesa	5	2
	Dubiraphia	6	2
	Eclipidrilus	8	2
	Gammarus	6	2
*	Stenacron	4	2
	Tanytarsus	6	2
*	Acentrella	4	1
*	Baetis	6	1
	Caecidotea	8	1
*	Ceraclea	3	1
*	Ceratopsyche	4	1
	Clinocera	6	1
	Eukiefferiella	8	1
	Heterotrissocladius	0	1
	Limnodrilus	10	1
*	Maccaffertium	3	1
	Polypedilum	6	1
*	Rhyacophila	1	1

** (EPT organism)* *Taxa Richness:* 28 *Population:* 100

Hilsenhoff Biotic Index (HBI):	5.06	*# Scrapers:*	4
% Sensitive EPT:	28.0%	*Attribute 2 genera:*	4
% Non-Insect Taxa:	21.4%	*Attribute 3 genera:*	5
HGMI Rating:	**57.54**	**Good**	
Habitat Analysis:	172	Optimal	USEPA Protocol

Observations: Water temp: 19.72 C; Cond: 270 umhos; DO: 9.54 mg/L; pH: 8.16 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 24' / < 1'; Substrate: cobble, gravel, sand, root mats

Canopy: partly open; Bank Stability: good; Bank Vegetation: trees, shrubs, vines

Stream Gradient: High Gradient Stream; Land Uses: forested

Other: fish, periphytes, metal floc; USGS gage station: 0.70

AMNET Site # **AN0322** *Stream Name:* **S Br Raritan River**

Location: **Rt 173 (CR 513); Clinton; Hunterdon County**

Collection Date: ***5/13/2009*** *USGS Topo Map:* **High Bridge**

	Genus	*Tolerance Value*	*Amount*
*	Cheumatopsyche	5	25
*	Ephemerella	1	16
	Cura	4	9
	Nais	8	8
	Stenelmis	5	7
	Tvetenia	5	7
	Cricotopus	7	5
*	Baetis	6	4
	Orthocladius	6	4
*	Paragnetina	1	2
	Polypedilum	6	2
	Simulium	6	2
*	Acentrella	4	1
*	Ceratopsyche	4	1
	Dubiraphia	6	1
	Hemerodromia	6	1
*	Hydropsyche	4	1
*	Hydroptila	6	1
*	Micrasema	2	1
	Optioservus	4	1
	Pleurocera	7	1

** (EPT organism)* *Taxa Richness:* 21 *Population:* 100

Hilsenhoff Biotic Index (HBI): 4.63 *# Scrapers:* 4

% Sensitive EPT: 25.0% *Attribute 2 genera:* 2

% Non-Insect Taxa: 14.3% *Attribute 3 genera:* 3

HGMI Rating: **51.26** **Good**

Habitat Analysis: 126 Suboptimal USEPA Protocol

Observations: Water temp: 14.69 C; Cond: 305 umhos; DO: 11.28 mg/L; pH: 8.05 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 105' / 1'; Substrate: cobble, gravel, sand

Canopy: open; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses

Stream Gradient: High Gradient Stream; Land Uses: suburban

Downstream of Impoundment: dam

Other: fish, periphytes, waterfowl; parking lots on both banks

AMNET Site # **AN0323** *Stream Name:* **Beaver Bk**

Location: **Herman Thau Rd; Clinton Twp; Hunterdon County**

Collection Date: ***5/13/2009*** *USGS Topo Map:* **Califon**

	Genus	Tolerance Value	Amount
*	Ephemerella	1	47
*	Acentrella	4	11
*	Dolophilodes	0	6
*	Amphinemura	3	5
	Promoresia	2	4
*	Rhyacophila	1	4
*	Isoperla	2	3
	Tvetenia	5	3
	Lumbriculus	8	2
*	Acroneuria	0	1
*	Baetis	6	1
*	Diplectrona	0	1
	Gammarus	6	1
	Lumbricidae	10	1
	Micropsectra	7	1
	Nais	8	1
	Pisidium	6.8	1
	Polypedilum	6	1
	Psephenus	4	1
*	Pteronarcys	0	1
	Simulium	6	1
	Stylogomphus	1	1
	Thienemannimyia	6	1
	Tipula	4	1

** (EPT organism)* *Taxa Richness:* 24 *Population:* 100

Hilsenhoff Biotic Index (HBI): 2.26 *# Scrapers:* 2

% Sensitive EPT: 80.0% *Attribute 2 genera:* 6

% Non-Insect Taxa: 20.8% *Attribute 3 genera:* 6

HGMI Rating: **74.81** **Excellent**

Habitat Analysis: 170 Optimal USEPA Protocol

Observations: Water temp: 11.17 C; Cond: 181 umhos; DO: 11.01 mg/L; pH: 7.64 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 15' / < 1'; Substrate: cobble, gravel, sand

Canopy: closed; Bank Stability: good; Bank Vegetation: trees, shrubs

Stream Gradient: High Gradient Stream; Land Uses: rural

Pipes / Ditches: storm sewers

Other: periphytes

AMNET Site # **AN0324** *Stream Name:* **Beaver Bk**

Location: **Leigh St; Clinton; Hunterdon County**

Collection Date: ***5/13/2009*** *USGS Topo Map:* **High Bridge**

	Genus	Tolerance Value	Amount
	Nais	8	27
	Dicrotendipes	8	17
	Micropsectra	7	12
	Cricotopus	7	8
*	Hydroptila	6	7
	Simulium	6	5
	Brillia	5	3
	Crangonyx	8	3
*	Baetis	6	2
	Caecidotea	8	2
*	Ephemerella	1	2
	Gammarus	6	2
*	Mystacides	4	2
	Agabus	5	1
	Calopteryx	6	1
	Dubiraphia	6	1
*	Eurylophella	4	1
	Hemerodromia	6	1
	Parametriocnemus	5	1
	Psephenus	4	1
	Tanytarsus	6	1

** (EPT organism)* *Taxa Richness:* 21 *Population:* 100

Hilsenhoff Biotic Index (HBI): 6.95 *# Scrapers:* 4

% Sensitive EPT: 14.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 19.0% *Attribute 3 genera:* 5

HGMI Rating: **38.66** **Fair**

Habitat Analysis: 134 Suboptimal USEPA Protocol

Observations: Water temp: 13.39 C; Cond: 554 umhos; DO: 13.00 mg/L; pH: 8.37 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 13' / < 1'; Substrate: cobble, gravel, sand, root mats, undercut banks

Canopy: mostly open; Bank Stability: fair; Bank Vegetation: trees, shrubs

Stream Gradient: High Gradient Stream; Land Uses: suburban

Pipes / Ditches: storm sewers

Other: fish, periphytes, filamentous algae; "trout stocked" stream; parking lot and Rt 173 along banks

AMNET Site # **AN0324A** *Stream Name:* **Sidney Bk**

Location: **Rt. 617 (Sidney Rd); Franklin Twp; Hunterdon County**

Collection Date: ***5/19/2009*** *USGS Topo Map:* **Pittstown**

	Genus	Tolerance Value	Amount
	Nais	8	44
	Cricotopus	7	17
*	Baetis	6	9
*	Maccaffertium	3	5
	Microtendipes	7	3
	Rheotanytarsus	6	3
	Gammarus	6	2
*	Hydropsychidae	4	2
	Micropsectra	7	2
	Polypedilum	6	2
	Argia	6	1
*	Ceraclea	3	1
*	Ephemerella	1	1
*	Glossosoma	0	1
	Optioservus	4	1
*	Perlesta	4	1
	Psephenus	4	1
	Rheocricotopus	6	1
	Stenelmis	5	1
	Sublettea	6	1
	Tvetenia	5	1

** (EPT organism)* *Taxa Richness:* 21 *Population:* 100

Hilsenhoff Biotic Index (HBI):	6.69	*# Scrapers:*	4
% Sensitive EPT:	18.0%	*Attribute 2 genera:*	1
% Non-Insect Taxa:	9.5%	*Attribute 3 genera:*	6
HGMI Rating:	**45.51**	**Good**	
Habitat Analysis:	140	Suboptimal	USEPA Protocol

Observations: Water temp: 12.85 C; Cond: 260 umhos; DO: 11.51 mg/L; pH: 8.48 SU

Clarity: slightly turbid; Flow Rate: moderate; Width/Depth: 28' / < 1'; Substrate: cobble, gravel, sand

Canopy: mostly open; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses

Stream Gradient: High Gradient Stream; Land Uses: rural, forested

Other: fish, frogs, crayfish, periphytes, filamentous algae

AMNET Site # **AN0325** ***Stream Name:*** **Cakepoulin Ck**

Location: **Lower Lands Down Rd; Franklin Twp; Hunterdon County**

Collection Date: ***5/19/2009*** ***USGS Topo Map:*** **Pittstown**

	Genus	Tolerance Value	Amount
*	Ephemerella	1	58
	Lumbriculus	8	16
*	Cheumatopsyche	5	7
*	Glossosoma	0	3
	Psephenus	4	3
*	Ceratopsyche	4	2
*	Helicopsyche	3	2
	Stenelmis	5	2
*	Baetis	6	1
	Clinocera	6	1
	Diamesa	5	1
*	Drunella	1	1
*	Hydropsyche	4	1
	Optioservus	4	1
	Orthocladius	6	1

** (EPT organism)* *Taxa Richness:* 15 *Population:* 100

Hilsenhoff Biotic Index (HBI):	2.89	*# Scrapers:*	5
% Sensitive EPT:	65.0%	*Attribute 2 genera:*	3
% Non-Insect Taxa:	6.7%	*Attribute 3 genera:*	3
HGMI Rating:	**63.82**	**Excellent**	
Habitat Analysis:	161	Optimal	USEPA Protocol

Observations: Water temp: 10.20 C; Cond: 179 umhos; DO: 11.64 mg/L; pH: 8.15 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 33' / < 1'; Substrate: cobble, gravel, sand

Canopy: mostly open; Bank Stability: good; Bank Vegetation: trees, shrubs, weeds

Stream Gradient: High Gradient Stream; Land Uses: rural, forested

Other: macrophytes, fish; "trout stocked"

AMNET Site # **AN0325B** *Stream Name:* **Cakepoulin Ck**

Location: **Rt 513; Franklin Twp; Hunterdon County**

Collection Date: ***5/19/2009*** *USGS Topo Map:* **Pittstown**

	Genus	Tolerance Value	Amount
*	Ephemerella	1	24
*	Baetis	6	13
*	Maccaffertium	3	8
	Psephenus	4	8
	Micropsectra	7	6
	Nais	8	5
	Parametriocnemus	5	5
	Optioservus	4	3
	Stenelmis	5	3
	Cricotopus	7	2
	Rheotanytarsus	6	2
	Slavina	7	2
	Tvetenia	5	2
*	Acentrella	4	1
	Brillia	5	1
	Caecidotea	8	1
*	Ceraclea	3	1
*	Cheumatopsyche	5	1
*	Chimarra	4	1
*	Drunella	1	1
*	Glossosoma	0	1
	Lumbriculus	8	1
	Nematoda	6	1
	Oulimnius	4	1
*	Platycentropus	4	1
	Polypedilum	6	1
*	Psilotreta	0	1
*	Rhyacophila	1	1
	Simulium	6	1
	Tanytarsus	6	1

** (EPT organism)* *Taxa Richness:* 30 *Population:* 100

Hilsenhoff Biotic Index (HBI):	4.13	*# Scrapers:*	7
% Sensitive EPT:	53.0%	*Attribute 2 genera:*	5
% Non-Insect Taxa:	16.7%	*Attribute 3 genera:*	6
HGMI Rating:	**74.36**	**Excellent**	
Habitat Analysis:	138	Suboptimal	USEPA Protocol

Observations: Water temp: 12.19 C; Cond: 198 umhos; DO: 11.69 mg/L; pH: 7.72 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 24' / < 1'; Substrate: cobble, gravel, sand

Canopy: mostly closed; Bank Stability: fair; Bank Vegetation: trees, weeds, lawn

Stream Gradient: High Gradient Stream; Land Uses: suburban

Pipes / Ditches: storm sewers

Other: macrophytes, periphytes

AMNET Site # **AN0326** *Stream Name:* **S Br Raritan River**

Location: **Stanton Rd; Readington Twp; Hunterdon County**

Collection Date: ***5/19/2009*** *USGS Topo Map:* **Flemington**

	Genus	*Tolerance Value*	*Amount*
	Gammarus	6	26
	Optioservus	4	11
*	Agnetina	2	9
	Stylodrilus	10	9
*	Anthopotamus	4	7
	Musculium	5	5
*	Ephemerella	1	4
*	Perlesta	4	4
	Stenelmis	5	4
	Cura	4	3
	Prostoma	7	3
*	Cheumatopsyche	5	2
*	Glossosoma	0	2
	Physella	9.1	2
*	Ceratopsyche	4	1
	Gillia	8	1
	Nais	8	1
	Nematoda	6	1
	Ophiogomphus	1	1
	Paraponyx	5	1
	Pisidium	6.8	1
	Psephenus	4	1
*	Stenonema	3	1

** (EPT organism)* *Taxa Richness:* 23 *Population:* 100

Hilsenhoff Biotic Index (HBI):	5.08	*# Scrapers:*	5
% Sensitive EPT:	27.0%	*Attribute 2 genera:*	2
% Non-Insect Taxa:	43.5%	*Attribute 3 genera:*	3
HGMI Rating:	**45.10**	**Good**	
Habitat Analysis:	157	Suboptimal	USEPA Protocol

Observations: Water temp: 13.35 C; Cond: 262 umhos; DO: 12.19 mg/L; pH: 8.15 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 101' / 2'; Substrate: cobble, gravel, sand

Canopy: mostly open; Bank Stability: good; Bank Vegetation: trees, shrubs

Stream Gradient: High Gradient Stream; Land Uses: forested (So. Branch Reservation Nature Preserve)

Other: fish, macrophytes, periphytes, filamentous algae; "trout stocked"; USGS gage station

AMNET Site # **AN0327** *Stream Name:* **Prescott Bk**

Location: **Stanton Rd; Readington Twp; Hunterdon County**

Collection Date: ***5/19/2009*** *USGS Topo Map:* **Flemington**

	Genus	Tolerance Value	Amount
	Parametriocnemus	5	19
	Eukiefferiella	8	12
	Stenelmis	5	12
*	Ephemerella	1	10
	Tanytarsus	6	8
*	Baetis	6	5
*	Chimarra	4	5
	Polypedilum	6	5
	Psephenus	4	4
*	Acroneuria	0	3
*	Cheumatopsyche	5	3
	Nais	8	3
	Optioservus	4	3
*	Agnetina	2	2
	Gammarus	6	2
	Eclipidrilus	8	1
*	Maccaffertium	3	1
	Nematoda	6	1
*	Rhyacophila	1	1

** (EPT organism)* *Taxa Richness:* 19 *Population:* 100

Hilsenhoff Biotic Index (HBI):	4.90	*# Scrapers:*	3
% Sensitive EPT:	27.0%	*Attribute 2 genera:*	2
% Non-Insect Taxa:	21.1%	*Attribute 3 genera:*	5
HGMI Rating:	**48.74**	**Good**	
Habitat Analysis:	157	Suboptimal	USEPA Protocol

Observations: Water temp: 9.66 C; Cond: 246 umhos; DO: 11.83 mg/L; pH: 7.62 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 26' / < 1'; Substrate: cobble, gravel, sand

Canopy: mostly closed; Bank Stability: fair; Bank Vegetation: trees, shrubs

Stream Gradient: High Gradient Stream; Land Uses: forested

Pipes / Ditches: storm sewers

Other: fish, crayfish, salamander, periphytes

AMNET Site # **AN0328** *Stream Name:* **Assiscong Ck**

Location: **River Rd; Raritan Twp; Hunterdon County**

Collection Date: ***5/19/2009*** *USGS Topo Map:* **Flemington**

	Genus	Tolerance Value	Amount
*	Baetis	6	32
*	Amphinemura	3	9
*	Epeorus	0	6
	Micropsectra	7	6
	Tvetenia	5	6
*	Acentrella	4	5
	Lumbriculidae	8	4
*	Maccaffertium	3	3
	Nais	8	3
*	Polycentropus	6	3
	Psephenus	4	3
	Caecidotea	8	2
*	Cheumatopsyche	5	2
*	Isoperla	2	2
*	Leuctra	0	2
*	Alloperla	0	1
*	Caenis	7	1
*	Ceratopsyche	4	1
*	Chimarra	4	1
	Chironomini	6	1
	Cricotopus	7	1
	Gammarus	6	1
	Parametriocnemus	5	1
*	Perlesta	4	1
	Stenelmis	5	1
	Tanytarsus	6	1
	Thienemannimyia	6	1

** (EPT organism)* *Taxa Richness:* 27 *Population:* 100

Hilsenhoff Biotic Index (HBI):	4.96	*# Scrapers:*	3
% Sensitive EPT:	66.0%	*Attribute 2 genera:*	5
% Non-Insect Taxa:	14.8%	*Attribute 3 genera:*	5

HGMI Rating: **66.54** **Excellent**

Habitat Analysis: 147 Suboptimal USEPA Protocol

Observations: Water temp: 13.36 C; Cond: 307 umhos; DO: 9.42 mg/L; pH: 7.34 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 20' / < 1'; Substrate: cobble, gravel, sand

Canopy: partly open; Bank Stability: fair; Bank Vegetation: trees, shrubs, weeds

Stream Gradient: High Gradient Stream; Land Uses: forested, rural, agriculture-livestock

Pipes / Ditches: farm ditch flowing into stream

Other: fish, salamander, macrophytes

AMNET Site # **AN0329** *Stream Name:* **S Br Raritan River**

Location: **Rt 613 (Old York Rd); Readington Twp; Hunterdon County**

Collection Date: ***5/19/2009*** *USGS Topo Map:* **Flemington**

	Genus	Tolerance Value	Amount
*	Anthopotamus	4	26
	Gammarus	6	22
	Stenelmis	5	9
	Nais	8	6
*	Ephemerella	1	5
*	Agnetina	2	4
	Cricotopus	7	4
*	Helicopsyche	3	3
	Optioservus	4	3
*	Apatania	3	2
*	Baetis	6	2
	Microtendipes	7	2
	Psephenus	4	2
*	Ceraclea	3	1
	Fossaria	6	1
	Lanthus	5	1
	Limnodrilus	10	1
*	Maccaffertium	3	1
	Musculium	5	1
*	Perlinella	2	1
	Physella	9.1	1
*	Stenacron	4	1
	Stylaria	8	1

** (EPT organism)* *Taxa Richness:* 23 *Population:* 100

Hilsenhoff Biotic Index (HBI): 4.86 *# Scrapers:* 8

% Sensitive EPT: 46.0% *Attribute 2 genera:* 2

% Non-Insect Taxa: 30.4% *Attribute 3 genera:* 7

HGMI Rating: **63.98** **Excellent**

Habitat Analysis: 122 Suboptimal USEPA Protocol

Observations: Water temp: 18.81 C; Cond: 320 umhos; DO: 14.92 mg/L; pH: 9.17 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 93' / 1-2'; Substrate: cobble, gravel, sand

Canopy: open; Bank Stability: good; Bank Vegetation: trees, shrubs, weeds

Stream Gradient: High Gradient Stream; Land Uses: forested, rural (small farm on left bank)

Other: fish, clams, macrophytes, periphytes, filamentous algae, great blue heron; "South Branch Reservation" sign

AMNET Site # **AN0330** *Stream Name:* **First Neshanic River**

Location: **Rt 31; Raritan Twp; Hunterdon County**

Collection Date: ***7/9/2009*** *USGS Topo Map:* **Hopewell**

	Genus	Tolerance Value	Amount
	Stictochironomus	9	31
	Stenelmis	5	17
	Dicrotendipes	8	16
	Gammarus	6	7
	Limnodrilus	10	6
	Paratanytarsus	6	3
	Physella	9.1	3
	Planariidae	4	3
*	Mystacides	4	2
	Peltodytes	5	2
	Ablabesmyia	8	1
	Agabus	5	1
*	Lepidostoma	1	1
	Lumbricidae	10	1
	Lumbriculidae	8	1
	Ophidonais	7	1
	Phaenopsectra	7	1
	Sialis	4	1
	Tanytarsus	6	1
	Thienemannimyia	6	1

** (EPT organism)* *Taxa Richness:* 20 *Population:* 100

Hilsenhoff Biotic Index (HBI): 7.31 *# Scrapers:* 3

% Sensitive EPT: 3.0% *Attribute 2 genera:* 1

% Non-Insect Taxa: 35.0% *Attribute 3 genera:* 1

HGMI Rating: **23.75** **Fair**

Habitat Analysis: 130 Suboptimal USEPA Protocol

Observations: Water temp: 18.79 C; Cond: 462 umhos; DO: 7.09 mg/L; pH: 7.52 SU

Clarity: clear; Flow Rate: slow; Width/Depth: 24' / 1 - 4'; Substrate: cobble, gravel, sand, boulder

Canopy: partly open; Bank Stability: fair; Bank Vegetation: trees, shrubs

Stream Gradient: High Gradient Stream; Land Uses: commercial, forested

Other: fish, macrophytes

AMNET Site # **AN0331** *Stream Name:* **Second Neshanic River**

Location: **Rt 31; Raritan Twp; Hunterdon County**

Collection Date: *7/9/2009* *USGS Topo Map:* **Hopewell**

	Genus	Tolerance Value	Amount
	Stenelmis	5	24
	Rheotanytarsus	6	15
	Gammarus	6	8
*	Cheumatopsyche	5	6
	Polypedilum	6	6
	Tvetenia	5	6
	Psephenus	4	5
	Caecidotea	8	4
	Dugesia	4	4
	Stictochironomus	9	4
	Micropsectra	7	3
	Microtendipes	7	2
	Parametriocnemus	5	2
	Simulium	6	2
*	Baetis	6	1
	Cricotopus	7	1
	Dicrotendipes	8	1
	Hemerodromia	6	1
*	Hydropsyche	4	1
*	Hydroptila	6	1
	Lumbriculidae	8	1
	Thienemannimyia	6	1
	Tipula	4	1

** (EPT organism)* *Taxa Richness:* 23 *Population:* 100

Hilsenhoff Biotic Index (HBI): 5.70 *# Scrapers:* 3

% Sensitive EPT: 2.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 17.4% *Attribute 3 genera:* 3

HGMI Rating: **36.46** **Fair**

Habitat Analysis: 150 Suboptimal USEPA Protocol

Observations: Water temp: 18.55 C; Cond: 384 umhos; DO: 6.61 mg/L; pH: 7.64 SU

Clarity: clear; Flow Rate: slow; Width/Depth: 46' / 1- 3'; Substrate: cobble, gravel, sand, bedrock, boulder

Canopy: partly open; Bank Stability: good; Bank Vegetation: trees, shrubs

Stream Gradient: High Gradient Stream; Land Uses: commercial, suburban, forested

Other: fish, snapping turtle, periphytes

AMNET Site # **AN0332** *Stream Name:* **Third Neshanic River**

Location: **Rt 31; Raritan Twp; Hunterdon County**

Collection Date: ***7/9/2009*** *USGS Topo Map:* **Hopewell**

	Genus	*Tolerance Value*	*Amount*
	Microtendipes	7	24
	Aulodrilus	8	19
	Stictochironomus	9	12
	Limnodrilus	10	9
	Rheotanytarsus	6	9
	Helobdella	8	5
	Dicrotendipes	8	4
*	Cheumatopsyche	5	3
	Lumbriculus	8	2
	Tanytarsus	6	2
	Ancyronyx	2	1
	Caecidotea	8	1
*	Chimarra	4	1
	Cricotopus	7	1
*	Mystacides	4	1
	Natarsia	8	1
	Paratanytarsus	6	1
	Polypedilum	6	1
	Sialis	4	1
	Stenelmis	5	1
*	Tricorythodes	4	1

** (EPT organism)* *Taxa Richness:* 21 *Population:* 100

Hilsenhoff Biotic Index (HBI):	7.45	*# Scrapers:*	1
% Sensitive EPT:	3.0%	*Attribute 2 genera:*	0
% Non-Insect Taxa:	23.8%	*Attribute 3 genera:*	1
HGMI Rating:	**22.83**	**Fair**	
Habitat Analysis:	117	Suboptimal	USEPA Protocol

Observations: Water temp: 18.45 C; Cond: 248 umhos; DO: 8.96 mg/L; pH: 7.88 SU

Clarity: slightly turbid; Flow Rate: slow; Width/Depth: 46' / 1 - 2'; Substrate: mud, boulder

Canopy: partly open; Bank Stability: fair; Bank Vegetation: trees, weeds

Stream Gradient: High Gradient Stream; Land Uses: suburban

Pipes / Ditches: storm sewers

Other: fish, macrophytes, periphytes

AMNET Site # **AN0333** *Stream Name:* **Neshanic River**

Location: **Everitt Rd; East Amwell Twp; Hunterdon County**

Collection Date: *7/9/2009* *USGS Topo Map:* **Hopewell**

	Genus	Tolerance Value	Amount
	Rheotanytarsus	6	30
	Gammarus	6	12
	Cricotopus	7	10
	Paratanytarsus	6	10
	Dicrotendipes	8	8
	Polypedilum	6	7
	Aulodrilus	8	3
	Limnodrilus	10	3
	Tanytarsus	6	3
	Helisoma	7	2
*	Plauditus	4	2
	Stictochironomus	9	2
	Dubiraphia	6	1
	Micropsectra	7	1
	Microtendipes	7	1
	Musculium	5	1
	Nais	8	1
	Peltodytes	5	1
*	Stenacron	4	1
*	Tricorythodes	4	1

** (EPT organism)* *Taxa Richness:* 20 *Population:* 100

Hilsenhoff Biotic Index (HBI):	6.46	*# Scrapers:*	4
% Sensitive EPT:	4.0%	*Attribute 2 genera:*	0
% Non-Insect Taxa:	30.0%	*Attribute 3 genera:*	0

HGMI Rating: **26.76** **Fair**

Habitat Analysis: 111 Suboptimal USEPA Protocol

Observations: Water temp: 20.83 C; Cond: 299 umhos; DO: 12.60 mg/L; pH: 8.90 SU

Clarity: clear; Flow Rate: slow; Width/Depth: 69' / 2 - 3'; Substrate: cobble, gravel, sand, silt, boulder

Canopy: mostly open; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses

Stream Gradient: High Gradient Stream; Land Uses: agriculture-cropland (corn), suburban, forested

Pipes / Ditches: storm sewers

Other: fish, frogs, crayfish, tadpoles, macrophytes, filamentous algae; USGS gage: 2.64

AMNET Site # **AN0334** *Stream Name:* **Back Bk**

Location: **Wertsville Rd (Rt 602); East Amwell Twp; Hunterdon County**

Collection Date: ***8/5/2009*** *USGS Topo Map:* **Hopewell**

	Genus	Tolerance Value	Amount
*	Chimarra	4	23
	Stenelmis	5	19
	Dugesia	4	14
*	Cheumatopsyche	5	11
*	Hydropsyche	4	9
	Rheotanytarsus	6	7
	Polypedilum	6	6
*	Baetis	6	3
	Simulium	6	3
	Caecidotea	8	1
	Dubiraphia	6	1
	Paratanytarsus	6	1
	Psephenus	4	1
	Tanytarsus	6	1

** (EPT organism)* *Taxa Richness:* 14 *Population:* 100

Hilsenhoff Biotic Index (HBI): 4.78 *# Scrapers:* 3

% Sensitive EPT: 26.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 14.3% *Attribute 3 genera:* 1

HGMI Rating: **37.08** **Fair**

Habitat Analysis: 153 Suboptimal USEPA Protocol

Observations: Water temp: 20.16 C; Cond: 319 umhos; DO: 7.29 mg/L; pH: 7.04 SU

Clarity: slightly turbid, brown; Flow Rate: slow; Width/Depth: 20' / 2'; Substrate: cobble, gravel, sand, root mats

Canopy: mostly open; Bank Stability: good; Bank Vegetation: trees, grasses

Stream Gradient: High Gradient Stream; Land Uses: rural, agriculture-cropland

Other: fish, crayfish, macrophytes, periphytes, purple loosestrife; recent flooding

AMNET Site # **AN0335** *Stream Name:* **Back Bk**

Location: **Manners Rd (Rt 609); East Amwell Twp; Hunterdon County**

Collection Date: ***8/5/2009*** *USGS Topo Map:* **Hopewell**

	Genus	*Tolerance Value*	*Amount*
	Gammarus	6	14
*	Cheumatopsyche	5	12
*	Baetis	6	11
	Rheotanytarsus	6	7
	Stenelmis	5	7
	Microtendipes	7	6
	Polypedilum	6	6
	Simulium	6	6
	Crangonyx	8	4
	Paratanytarsus	6	4
	Caecidotea	8	2
*	Chimarra	4	2
	Dugesia	4	2
*	Hydroptila	6	2
*	Maccaffertium	3	2
	Stictochironomus	9	2
*	Caenis	7	1
*	Hydropsyche	4	1
	Ischnura	9	1
	Micropsectra	7	1
	Orconectes	6	1
	Physella	9.1	1
	Psephenus	4	1
*	Stenacron	4	1
	Stylogomphus	1	1
	Tanytarsus	6	1
	Unionidae	8	1

** (EPT organism)* *Taxa Richness:* 27 *Population:* 100

Hilsenhoff Biotic Index (HBI): 5.90 *# Scrapers:* 6

% Sensitive EPT: 19.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 25.9% *Attribute 3 genera:* 2

HGMI Rating: **41.52** **Fair**

Habitat Analysis: 149 Suboptimal USEPA Protocol

Observations: Water temp: 20.65 C; Cond: 245 umhos; DO: 7.67 mg/L; pH: 7.10 SU

Clarity: slightly turbid; Flow Rate: moderate; Width/Depth: 58' / 2'; Substrate: cobble, gravel, sand, root mats, undercut banks

Canopy: partly open; Bank Stability: good; Bank Vegetation: trees, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: rural, agriculture-cropland, nursery

Pipes / Ditches: storm sewers

Other: fish, crayfish, mussels, macrophytes, periphytes, purple loosestrife; recent flooding

AMNET Site # **AN0336** *Stream Name:* **Furmans Bk**

Location: **Welisewitz Rd; East Amwell Twp; Hunterdon County**

Collection Date: ***8/5/2009*** *USGS Topo Map:* **Hopewell**

	Genus	Tolerance Value	Amount
	Stenelmis	5	16
*	Cheumatopsyche	5	9
*	Baetis	6	7
*	Hydropsyche	4	6
	Micropsectra	7	6
	Simulium	6	5
	Rheotanytarsus	6	4
*	Chimarra	4	3
*	Maccaffertium	3	3
*	Neophylax	3	3
	Phaenopsectra	7	3
*	Polycentropus	6	3
	Polypedilum	6	3
	Psephenus	4	3
	Tipula	4	3
	Dicrotendipes	8	2
	Tanytarsus	6	2
	Thienemannimyia	6	2
*	Acentrella	4	1
*	Acroneuria	0	1
	Brillia	5	1
*	Centroptilum	2	1
	Chelifera	6	1
	Enchytraeidae	10	1
	Gammarus	6	1
	Gomphidae	1	1
	Hexatoma	2	1
*	Hydroptila	6	1
*	Leuctra	0	1
*	Mystacides	4	1
	Paratanytarsus	6	1
	Prostoma	7	1
*	Stenacron	4	1
	Stylogomphus	1	1
	Tvetenia	5	1

** (EPT organism)* *Taxa Richness:* 35 *Population:* 100

Hilsenhoff Biotic Index (HBI):	5.07	*# Scrapers:*	7
% Sensitive EPT:	26.0%	*Attribute 2 genera:*	3
% Non-Insect Taxa:	8.6%	*Attribute 3 genera:*	8

HGMI Rating: **69.09** **Excellent**

Habitat Analysis: 149 Suboptimal USEPA Protocol

Observations: Water temp: 20.07 C; Cond: 207 umhos; DO: 7.93 mg/L; pH: 7.21 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 15' / < 1'; Substrate: cobble, gravel, sand, shale, bedrock

Canopy: mostly closed; Bank Stability: poor; Bank Vegetation: trees, weeds

Stream Gradient: High Gradient Stream; Land Uses: rural, forested

Other: fish, crayfish, eel, periphytes; eroded banks; recent flooding

AMNET Site # **AN0337** *Stream Name:* **Neshanic River**

Location: **Rt 514 (Amwell Rd.); Hillsborough Twp; Somerset County**

Collection Date: ***8/5/2009*** *USGS Topo Map:* **Hopewell**

	Genus	*Tolerance Value*	*Amount*
	Gammarus	6	30
	Stenelmis	5	16
	Simulium	6	9
*	Cheumatopsyche	5	8
	Polypedilum	6	7
	Caecidotea	8	4
	Rheotanytarsus	6	4
*	Chimarra	4	3
*	Maccaffertium	3	3
*	Ceratopsyche	4	2
	Lumbriculus	8	2
	Ancyronyx	2	1
*	Baetis	6	1
*	Caenis	7	1
	Corbicula	4	1
	Dicrotendipes	8	1
	Menetus	6	1
	Microtendipes	7	1
	Mooreobdella	7.8	1
	Optioservus	4	1
	Paratanytarsus	6	1
	Pisidium	6.8	1
	Planariidae	4	1

** (EPT organism)* *Taxa Richness:* 23 *Population:* 100

Hilsenhoff Biotic Index (HBI): 5.66 *# Scrapers:* 3

% Sensitive EPT: 8.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 34.8% *Attribute 3 genera:* 2

HGMI Rating: **32.99** **Fair**

Habitat Analysis: 149 Suboptimal USEPA Protocol

Observations: Water temp: 21.17 C; Cond: 256 umhos; DO: 8.09 mg/L; pH: 7.30 SU

Clarity: clear; Flow Rate: fast; Width/Depth: 105' / 1 - 2'; Substrate: cobble, gravel, sand

Canopy: partly open; Bank Stability: fair; Bank Vegetation: trees

Stream Gradient: High Gradient Stream; Land Uses: rural, forested

Pipes / Ditches: ditches, storm sewers flowing

Other: fish, frogs, macrophytes, periphytes; recent flooding; new bridge 2009

AMNET Site # **AN0338** *Stream Name:* **S Br Raritan River**

Location: **Elm St; Hillsborough Twp; Somerset County**

Collection Date: ***5/21/2009*** *USGS Topo Map:* **Raritan**

	Genus	*Tolerance Value*	*Amount*
	Gammarus	6	43
	Stenelmis	5	16
	Polypedilum	6	6
	Psephenus	4	5
*	Agnetina	2	4
	Tanytarsus	6	4
*	Ceraclea	3	3
*	Anthopotamus	4	2
	Cricotopus	7	2
	Musculium	5	2
	Thienemanniella	6	2
*	Acentrella	4	1
*	Acroneuria	0	1
*	Baetis	6	1
	Berosus	5	1
	Dubiraphia	6	1
*	Helicopsyche	3	1
	Microtendipes	7	1
	Nais	8	1
*	Serratella	2	1
	Simulium	6	1
	Tvetenia	5	1

** (EPT organism)* *Taxa Richness:* 22 *Population:* 100

Hilsenhoff Biotic Index (HBI):	5.31	*# Scrapers:*	4
% Sensitive EPT:	14.0%	*Attribute 2 genera:*	2
% Non-Insect Taxa:	13.6%	*Attribute 3 genera:*	5
HGMI Rating:	**51.60**	**Good**	
Habitat Analysis:	140	Suboptimal	USEPA Protocol

Observations: Water temp: 18.14 C; Cond: 329 umhos; DO: 10.15 mg/L; pH: 8.78 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 100' / < 1'; Substrate: cobble, gravel, sand

Canopy: open; Bank Stability: fair; Bank Vegetation: trees, shrubs, grasses

Stream Gradient: High Gradient Stream; Land Uses: suburban

Pipes / Ditches: storm sewers (flowing)

Other: fish, crayfish, clams / mussels, macrophytes, periphytes

AMNET Site # **AN0339** *Stream Name:* **Pleasant Run**

Location: **Pleasant Run Rd (Rt 629); Readington Twp; Hunterdon County**

Collection Date: ***5/21/2009*** *USGS Topo Map:* **Flemington**

	Genus	*Tolerance Value*	*Amount*
	Simulium	6	14
	Nais	8	13
	Amnicola	4.8	9
	Gammarus	6	7
	Dicrotendipes	8	6
	Slavina	7	6
	Cricotopus	7	5
	Stenelmis	5	5
	Psephenus	4	4
	Stictochironomus	9	4
	Cura	4	3
	Physella	9.1	3
	Tanytarsus	6	3
*	Acentrella	4	2
*	Amphinemura	3	2
	Fossaria	6	2
	Menetus	6	2
*	Baetis	6	1
*	Caenis	7	1
	Diamesa	5	1
	Heterotrissocladius	0	1
*	Hydroptila	6	1
	Macronychus	2	1
	Orthocladius	6	1
	Paratanytarsus	6	1
*	Perlesta	4	1
	Tipula	4	1

** (EPT organism)* *Taxa Richness:* 27 *Population:* 100

Hilsenhoff Biotic Index (HBI): 6.16 *# Scrapers:* 8

% Sensitive EPT: 8.0% *Attribute 2 genera:* 2

% Non-Insect Taxa: 29.6% *Attribute 3 genera:* 4

HGMI Rating: **46.49** **Good**

Habitat Analysis: 131 Suboptimal USEPA Protocol

Observations: Water temp: 14.12 C; Cond: 258 umhos; DO: 11.15 mg/L; pH: 8.29 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 16' / < 1'; Substrate: cobble, gravel, sand, root mats

Canopy: mostly open; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: rural

Pipes / Ditches: storm sewers

Other: fish, water snake, periphytes, filamentous algae; lawn on RB

AMNET Site # **AN0340** *Stream Name:* **Pleasant Run**

Location: **South Branch Rd; Branchburg Twp; Somerset County**

Collection Date: ***5/21/2009*** *USGS Topo Map:* **Raritan**

	Genus	*Tolerance Value*	*Amount*
	Gammarus	6	21
	Nais	8	12
*	Caenis	7	11
	Enallagma	9	11
	Dicrotendipes	8	9
	Stictochironomus	9	7
	Limnodrilus	10	5
	Paratanytarsus	6	4
	Cura	4	3
	Stylodrilus	10	3
	Tanytarsus	6	3
	Tubifex	10	3
	Ancyronyx	2	1
	Bezzia	6	1
	Cricotopus	7	1
*	Maccaffertium	3	1
	Peltodytes	5	1
	Rheotanytarsus	6	1
	Stenelmis	5	1
	Thienemanniella	6	1

** (EPT organism)* *Taxa Richness:* 20 *Population:* 100

Hilsenhoff Biotic Index (HBI):	7.37	*# Scrapers:*	2
% Sensitive EPT:	12.0%	*Attribute 2 genera:*	0
% Non-Insect Taxa:	30.0%	*Attribute 3 genera:*	1
HGMI Rating:	**24.20**	**Fair**	
Habitat Analysis:	86	Marginal	USEPA Protocol

Observations: Water temp: 16.24 C; Cond: 289 umhos; DO: 11.00 mg/L; pH: 8.08 SU

Clarity: clear; Flow Rate: slow; Width/Depth: 23' / 1'; Substrate: cobble, silt, root mats, undercut banks

Canopy: open; Bank Stability: poor; Bank Vegetation: trees, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: agriculture-livestock (horses, cattle)

Other: fish, turtle, tadpoles, macrophytes, periphytes

AMNET Site # **AN0341** *Stream Name:* **S Br Raritan River**

Location: **Studdiford Drive; Hillsborough Twp; Somerset County**

Collection Date: ***5/21/2009*** *USGS Topo Map:* **Raritan**

	Genus	Tolerance Value	Amount
*	Anthopotamus	4	33
	Gammarus	6	24
	Stenelmis	5	7
*	Caenis	7	5
	Microtendipes	7	5
	Tanytarsus	6	5
	Cricotopus	7	3
	Limnodrilus	10	3
	Nais	8	2
	Tubifex	10	2
	Ablabesmyia	8	1
	Argia	6	1
	Caecidotea	8	1
*	Ceraclea	3	1
*	Hydropsyche	4	1
*	Maccaffertium	3	1
*	Perlinella	2	1
	Pleurocera	7	1
	Polypedilum	6	1
	Psephenus	4	1
	Stictochironomus	9	1

** (EPT organism)* *Taxa Richness:* 21 *Population:* 100

Hilsenhoff Biotic Index (HBI): 5.58 *# Scrapers:* 4

% Sensitive EPT: 41.0% *Attribute 2 genera:* 1

% Non-Insect Taxa: 28.6% *Attribute 3 genera:* 2

HGMI Rating: **44.91** **Good**

Habitat Analysis: 120 Suboptimal USEPA Protocol

Observations: Water temp: 18.29 C; Cond: 337 umhos; DO: 8.80 mg/L; pH: 8.41 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 159' / 1'; Substrate: cobble, gravel, sand

Canopy: open; Bank Stability: fair; Bank Vegetation: trees, shrubs, grasses

Stream Gradient: High Gradient Stream; Land Uses: agriculture (cropland, livestock), suburban

Pipes / Ditches: storm sewers

Other: fish, clams / mussels, waterfowl, macrophytes, periphytes; "trout stocked" waters

AMNET Site # **AN0342** *Stream Name:* **Holland Bk**

Location: **Holland Brook Rd; Readington Twp; Hunterdon County**

Collection Date: ***5/21/2009*** *USGS Topo Map:* **Flemington**

	Genus	Tolerance Value	Amount
*	Caenis	7	22
	Cricotopus	7	17
*	Baetis	6	13
	Micropsectra	7	8
*	Maccaffertium	3	6
	Nais	8	6
	Stenelmis	5	6
	Dicrotendipes	8	4
*	Hydroptila	6	4
*	Cheumatopsyche	5	3
*	Eurylophella	4	3
	Agabus	5	1
*	Amphinemura	3	1
	Boyeria	2	1
	Brillia	5	1
*	Isoperla	2	1
	Psephenus	4	1
	Stempellinella	6	1
	Tipula	4	1

** (EPT organism)* *Taxa Richness:* 19 *Population:* 100

Hilsenhoff Biotic Index (HBI):	6.17	*# Scrapers:*	5
% Sensitive EPT:	50.0%	*Attribute 2 genera:*	1
% Non-Insect Taxa:	5.3%	*Attribute 3 genera:*	7
HGMI Rating:	**57.47**	**Good**	
Habitat Analysis:	118	Suboptimal	USEPA Protocol

Observations: Water temp: 17.79 C; Cond: 279 umhos; DO: 11.65 mg/L; pH: 8.79 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 13' / < 1'; Substrate: cobble, gravel, sand, silt

Canopy: mostly open; Bank Stability: fair; Bank Vegetation: trees, grasses

Stream Gradient: High Gradient Stream; Land Uses: agriculture-livestock

Pipes / Ditches: storm sewers

Other: fish, salamander, macrophytes, periphytes, filamentous algae, waterfowl

AMNET Site # **AN0343** *Stream Name:* **Holland Bk**

Location: **South Branch Rd; Branchburg Twp; Somerset County**

Collection Date: ***5/21/2009*** *USGS Topo Map:* **Raritan**

	Genus	*Tolerance Value*	*Amount*
	Gammarus	6	21
	Cricotopus	7	14
	Nais	8	11
	Dicrotendipes	8	9
	Simulium	6	6
	Stictochironomus	9	6
	Tanytarsus	6	6
	Tubifex	10	6
	Limnodrilus	10	3
	Trichocorixa	9	3
	Eukiefferiella	8	2
	Musculium	5	2
	Rheotanytarsus	6	2
*	Caenis	7	1
	Orthocladius	6	1
	Parakiefferiella	4	1
	Paratanytarsus	6	1
	Peltodytes	5	1
	Pisidium	6.8	1
	Prostoma	7	1
*	Stenacron	4	1
	Thienemanniella	6	1

** (EPT organism)* *Taxa Richness:* 22 *Population:* 100

Hilsenhoff Biotic Index (HBI): 7.17 *# Scrapers:* 1

% Sensitive EPT: 2.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 31.8% *Attribute 3 genera:* 0

HGMI Rating: **20.24** **Poor**

Habitat Analysis: 85 Marginal USEPA Protocol

Observations: Water temp: 17.39 C; Cond: 357 umhos; DO: 10.87 mg/L; pH: 8.17 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 35' / 1'; Substrate: cobble, mud, silt

Canopy: open; Bank Stability: poor; Bank Vegetation: trees, shrubs, grasses

Stream Gradient: High Gradient Stream; Land Uses: agriculture-livestock

Pipes / Ditches: storm sewers

Other: fish, tadpoles, macrophytes, periphytes; stream flows through cow pasture

AMNET Site # **AN0344** *Stream Name:* **UNT to India Bk**

Location: **Calais Rd; Randolph Twp; Morris County**

Collection Date: ***5/7/2009*** *USGS Topo Map:* **Mendham**

	Genus	Tolerance Value	Amount
*	Eurylophella	4	13
	Cricotopus	7	11
	Eukiefferiella	8	11
	Nais	8	9
	Polypedilum	6	7
*	Baetis	6	5
	Chelifera	6	3
*	Chimarra	4	3
*	Haploperla	1	3
*	Pycnopsyche	4	3
	Simulium	6	3
*	Acerpenna	4	2
*	Acroneuria	0	2
	Diamesa	5	2
	Ectopria	5	2
	Parametriocnemus	5	2
	Promoresia	2	2
	Prosimulium	2	2
*	Allocapnia	3	1
	Anchytarsus	1	1
	Boyeria	2	1
	Calopteryx	6	1
	Clinocera	6	1
	Cordulegaster	3	1
	Corynoneura	4	1
	Enchytraeidae	10	1
	Heterotrissocladius	0	1
*	Hydropsyche	4	1
*	Maccaffertium	3	1
	Rheotanytarsus	6	1
*	Rhyacophila	1	1
*	Siphlonurus	7	1
	Stenelmis	5	1

** (EPT organism)* *Taxa Richness:* 33 *Population:* 100

Hilsenhoff Biotic Index (HBI):	5.31	*# Scrapers:*	6
% Sensitive EPT:	35.0%	*Attribute 2 genera:*	7
% Non-Insect Taxa:	6.1%	*Attribute 3 genera:*	10

HGMI Rating: **73.78** **Excellent**

Habitat Analysis: 159 Suboptimal USEPA Protocol

Observations: Water temp: 12.70 C; Cond: 173 umhos; DO: 9.69 mg/L; pH: 6.94 SU
Clarity: slightly turbid; Flow Rate: fast; Width/Depth: 15' / 1'; Substrate: cobble, snags
Canopy: closed; Bank Stability: good; Bank Vegetation: trees, shrubs, lawn
Stream Gradient: High Gradient Stream; Land Uses: forested
Pipes / Ditches: storm sewers
Downstream of Impoundment: Lake Cherokee
Other: periphytes

AMNET Site # **AN0344A** *Stream Name:* **India Bk**

Location: **Calais Rd; Randolph Twp; Morris County**

Collection Date: ***7/23/2009*** *USGS Topo Map:* **Mendham**

	Genus	Tolerance Value	Amount
	Tvetenia	5	19
	Parametriocnemus	5	9
	Prosimulium	2	8
	Micropsectra	7	7
	Simulium	6	7
*	Chimarra	4	6
	Polypedilum	6	6
	Tanytarsus	6	5
*	Cheumatopsyche	5	4
	Nais	8	4
	Pedicia	6	4
	Rheotanytarsus	6	4
*	Hydropsyche	4	3
	Optioservus	4	3
	Dubiraphia	6	2
	Gammarus	6	2
*	Acerpenna	4	1
	Corydalus	4	1
*	Glossosoma	0	1
*	Hydroptila	6	1
*	Leuctra	0	1
	Rheopelopia	4	1
	Stylodrilus	10	1

** (EPT organism)* *Taxa Richness:* 23 *Population:* 100

Hilsenhoff Biotic Index (HBI):	5.13	*# Scrapers:*	3
% Sensitive EPT:	10.0%	*Attribute 2 genera:*	3
% Non-Insect Taxa:	13.0%	*Attribute 3 genera:*	3
HGMI Rating:	**45.34**	**Good**	
Habitat Analysis:	122	Suboptimal	USEPA Protocol

Observations: Water temp: 17.20 C; Cond: 491 umhos; DO: 7.62 mg/L; pH: 6.96 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 18' / 1 - 2'; Substrate: cobble, gravel, sand, snags, root mats

Canopy: mostly closed; Bank Stability: good; Bank Vegetation: trees, shrubs, vines

Stream Gradient: High Gradient Stream; Land Uses: suburban

Pipes / Ditches: storm sewers

Other: fish, salamander, periphytes, filamentous algae

AMNET Site # **AN0345** ***Stream Name:*** **India Bk**

Location: **Mountainside Rd; Mendham Twp; Morris County**

Collection Date: ***5/7/2009*** ***USGS Topo Map:*** **Mendham**

	Genus	*Tolerance Value*	*Amount*
	Lumbriculus	8	24
*	Eurylophella	4	9
*	Lepidostoma	1	7
*	Ephemerella	1	6
*	Acentrella	4	5
*	Baetis	6	5
*	Ameletus	0	4
*	Maccaffertium	3	4
*	Amphinemura	3	3
	Polypedilum	6	3
	Caecidotea	8	2
*	Epeorus	0	2
*	Ephemerellidae	1	2
	Gammarus	6	2
	Thienemannimyia	6	2
	Clinocera	6	1
	Cricotopus	7	1
	Diamesa	5	1
*	Diplectrona	0	1
*	Dolophilodes	0	1
	Micropsectra	7	1
	Molophilus	3	1
*	Neophylax	3	1
	Orthocladiinae	5	1
	Promoresia	2	1
	Prosimulium	2	1
	Psephenus	4	1
*	Pycnopsyche	4	1
	Simulium	6	1
*	Siphlonurus	7	1
	Stempellinella	6	1
	Stylogomphus	1	1
*	Sweltsa	0	1
	Tanytarsus	6	1
	Tipula	4	1

** (EPT organism)* *Taxa Richness:* 35 *Population:* 100

Hilsenhoff Biotic Index (HBI): 4.50 *# Scrapers:* 5

% Sensitive EPT: 53.0% *Attribute 2 genera:* 8

% Non-Insect Taxa: 8.6% *Attribute 3 genera:* 11

HGMI Rating: **82.65** **Excellent**

Habitat Analysis: 178 Optimal USEPA Protocol

Observations: Water temp: 13.13 C; Cond: 133 umhos; DO: 9.76 mg/L; pH: 7.32 SU

Clarity: slightly turbid; Flow Rate: fast; Width/Depth: 21' / 1 - 2'; Substrate: cobble, gravel, sand

Canopy: partly open; Bank Stability: good; Bank Vegetation: trees, shrubs

Stream Gradient: High Gradient Stream; Land Uses: forested

Pipes / Ditches: storm sewers

AMNET Site # **AN0346** *Stream Name:* **N Br Raritan River**

Location: **Rt 24; Mendham Twp; Morris County**

Collection Date: ***5/27/2009*** *USGS Topo Map:* **Chester**

	Genus	*Tolerance Value*	*Amount*
*	Baetis	6	53
	Nais	8	12
	Cricotopus	7	11
*	Dolophilodes	0	9
	Parametriocnemus	5	3
	Diamesa	5	2
	Polypedilum	6	2
	Stenelmis	5	2
	Dicranota	3	1
*	Hydroptila	6	1
*	Maccaffertium	3	1
	Planariidae	4	1
	Rheocricotopus	6	1
	Tvetenia	5	1

** (EPT organism)* *Taxa Richness:* 14 *Population:* 100

Hilsenhoff Biotic Index (HBI): 5.65 *# Scrapers:* 3

% Sensitive EPT: 64.0% *Attribute 2 genera:* 2

% Non-Insect Taxa: 14.3% *Attribute 3 genera:* 3

HGMI Rating: **49.74** **Good**

Habitat Analysis: 144 Suboptimal USEPA Protocol

Observations: Water temp: 12.26 C; Cond: 288 umhos; DO: 10.24 mg/L; pH: 7.64 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 23' / 1'; Substrate: cobble, gravel, sand

Canopy: partly open; Bank Stability: fair; Bank Vegetation: trees, shrubs

Stream Gradient: High Gradient Stream; Land Uses: suburban

Pipes / Ditches: storm sewers

Other: fish, gage

AMNET Site # **AN0347** *Stream Name:* **Dawsons Bk**

Location: **Ironia Rd off South Rd; Mendham Twp; Morris County**

Collection Date: *5/7/2009* *USGS Topo Map:* **Chester**

	Genus	Tolerance Value	Amount
	Nais	8	17
*	Maccaffertium	3	9
*	Pycnopsyche	4	9
*	Acentrella	4	7
*	Chimarra	4	7
	Cricotopus	7	5
	Diamesa	5	5
*	Amphinemura	3	4
*	Baetis	6	4
*	Hydropsyche	4	4
	Psephenus	4	4
	Tanytarsus	6	4
*	Rhyacophila	1	3
	Enchytraeidae	10	2
	Orthocladius	6	2
	Polypedilum	6	2
*	Acroneuria	0	1
*	Alloperla	0	1
	Ectopria	5	1
	Eukiefferiella	8	1
	Parametriocnemus	5	1
	Pisidium	6.8	1
	Planorbula	7	1
	Pseudolimnophila	2	1
	Tipula	4	1

** (EPT organism)* *Taxa Richness:* 25 *Population:* 97

Hilsenhoff Biotic Index (HBI): 5.07 *# Scrapers:* 4

% Sensitive EPT: 46.4% *Attribute 2 genera:* 4

% Non-Insect Taxa: 16.0% *Attribute 3 genera:* 7

HGMI Rating: **63.28** **Excellent**

Habitat Analysis: 164 Optimal USEPA Protocol

Observations: Water temp: 15.36 C; Cond: 302 umhos; DO: 9.12 mg/L; pH: 7.41 SU

Clarity: clear; Flow Rate: fast; Width/Depth: 9'/ / 1'; Substrate: cobble, gravel

Canopy: partly open; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses

Stream Gradient: High Gradient Stream; Land Uses: rural, forested

Pipes / Ditches: storm sewers

Other: frogs, snake, periphytes

AMNET Site # **AN0348** *Stream Name:* **Burnett Bk**

Location: **Old Mill Rd; Mendham Twp; Morris County**

Collection Date: ***5/27/2009*** *USGS Topo Map:* **Chester**

	Genus	Tolerance Value	Amount
*	Baetis	6	23
	Lumbriculus	8	17
*	Dolophilodes	0	7
*	Ephemerella	1	6
	Psephenus	4	5
	Tvetenia	5	5
*	Dannella	2	3
	Micropsectra	7	3
	Oulimnius	4	3
	Parametriocnemus	5	3
*	Acentrella	4	2
	Diamesa	5	2
	Dicranota	3	2
*	Glossosoma	0	2
	Hexatoma	2	2
	Polypedilum	6	2
*	Alloperla	0	1
	Brillia	5	1
*	Centroptilum	2	1
*	Diplectrona	0	1
*	Hydroptila	6	1
*	Maccaffertium	3	1
	Nais	8	1
	Orthocladius	6	1
*	Perlidae	1	1
*	Polycentropus	6	1
	Prostoma	7	1
	Stenelmis	5	1
	Thienemannimyia	6	1

** (EPT organism)* *Taxa Richness:* 29 *Population:* 100

Hilsenhoff Biotic Index (HBI): 4.74 *# Scrapers:* 6

% Sensitive EPT: 50.0% *Attribute 2 genera:* 7

% Non-Insect Taxa: 10.3% *Attribute 3 genera:* 6

HGMI Rating: **75.78** **Excellent**

Habitat Analysis: 167 Optimal USEPA Protocol

Observations: Water temp: 11.70 C; Cond: 275 umhos; DO: 9.83 mg/L; pH: 7.57 SU
Clarity: clear; Flow Rate: moderate; Width/Depth: 24' / < 1'; Substrate: cobble, gravel, sand
Canopy: mostly closed; Bank Stability: good; Bank Vegetation: trees, shrubs, weeds, vines
Stream Gradient: High Gradient Stream; Land Uses: forested
Pipes / Ditches: storm sewers

AMNET Site # **AN0349** *Stream Name:* **Peapack Bk**

Location: **Fox Chase Rd; Chester Twp; Morris County**

Collection Date: ***5/27/2009*** *USGS Topo Map:* **Chester**

	Genus	Tolerance Value	Amount
*	Baetis	6	28
*	Dolophilodes	0	12
	Parametriocnemus	5	8
*	Glossosoma	0	6
	Lumbriculus	8	6
	Nais	8	6
	Tvetenia	5	5
	Micropsectra	7	4
*	Acentrella	4	2
*	Acroneuria	0	2
*	Hydroptila	6	2
*	Plauditus	4	2
*	Rhyacophila	1	2
	Simulium	6	2
*	Amphinemura	3	1
*	Apatania	3	1
	Brillia	5	1
	Cricotopus	7	1
	Diamesa	5	1
*	Diplectrona	0	1
*	Ephemerella	1	1
	Eukiefferiella	8	1
*	Lepidostoma	1	1
	Lumbricidae	10	1
	Oulimnius	4	1
	Polypedilum	6	1
	Stenelmis	5	1

** (EPT organism)* *Taxa Richness:* 27 *Population:* 100

Hilsenhoff Biotic Index (HBI): 4.57 *# Scrapers:* 6

% Sensitive EPT: 61.0% *Attribute 2 genera:* 7

% Non-Insect Taxa: 11.1% *Attribute 3 genera:* 6

HGMI Rating: **76.95** **Excellent**

Habitat Analysis: 165 Optimal USEPA Protocol

Observations: Water temp: 12.35 C; Cond: 322 umhos; DO: 10.18 mg/L; pH: 7.60 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 15' / < 1'; Substrate: cobble, gravel, sand

Canopy: mostly closed; Bank Stability: good; Bank Vegetation: trees, shrubs, weeds

Stream Gradient: High Gradient Stream; Land Uses: rural, forested

Pipes / Ditches: storm sewers

Other: fish, periphytes

AMNET Site # **AN0350** *Stream Name:* **Peapack Bk**

Location: **Old Dutch Rd off Rt 512; Bedminster Twp; Somerset County**

Collection Date: ***6/2/2009*** *USGS Topo Map:* **Gladstone**

	Genus	Tolerance Value	Amount
	Polypedilum	6	21
	Eukiefferiella	8	14
*	Baetis	6	11
	Stenelmis	5	11
	Optioservus	4	7
	Psephenus	4	6
*	Cheumatopsyche	5	4
	Bezzia	6	3
	Cardiocladius	5	3
*	Chimarra	4	3
*	Acroneuria	0	2
	Oulimnius	4	2
	Stylodrilus	10	2
*	Acentrella	4	1
	Antocha	3	1
	Cricotopus	7	1
	Cura	4	1
	Dubiraphia	6	1
*	Glossosoma	0	1
*	Hydropsyche	4	1
*	Perlesta	4	1
	Prosimulium	2	1
	Simulium	6	1
	Tanytarsus	6	1

** (EPT organism)* *Taxa Richness:* 24 *Population:* 100

Hilsenhoff Biotic Index (HBI): 5.50 *# Scrapers:* 5

% Sensitive EPT: 19.0% *Attribute 2 genera:* 2

% Non-Insect Taxa: 8.3% *Attribute 3 genera:* 4

HGMI Rating: **51.80** **Good**

Habitat Analysis: 141 Suboptimal USEPA Protocol

Observations: Water temp: 15.01 C; Cond: 347 umhos; DO: 8.92 mg/L; pH: 7.81 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 21' / < 1'; Substrate: cobble, gravel, sand

Canopy: mostly open; Bank Stability: fair; Bank Vegetation: trees, weeds, lawn

Stream Gradient: High Gradient Stream; Land Uses: rural, forested

AMNET Site # **AN0351** *Stream Name:* **N Br Raritan River**

Location: **Rt 202; Far Hills Boro; Somerset County**

Collection Date: *6/2/2009* *USGS Topo Map:* **Gladstone**

	Genus	Tolerance Value	Amount
*	Baetis	6	18
	Lumbriculus	8	11
	Polypedilum	6	11
	Tvetenia	5	6
	Gammarus	6	5
	Microtendipes	7	5
	Stenelmis	5	5
*	Hydropsychidae	4	4
*	Acentrella	4	3
*	Ceratopsyche	4	3
	Nais	8	3
	Cricotopus	7	2
	Oulimnius	4	2
	Prostoma	7	2
	Rheocricotopus	6	2
	Rheotanytarsus	6	2
	Bezzia	6	1
*	Cheumatopsyche	5	1
*	Helicopsyche	3	1
*	Isonychia	2	1
	Lumbricidae	10	1
*	Maccaffertium	3	1
	Micropsectra	7	1
	Nematoda	6	1
*	Neophylax	3	1
	Optioservus	4	1
*	Perlesta	4	1
	Promoresia	2	1
	Psephenus	4	1
	Simulium	6	1
	Synorthocladius	2	1
	Tanytarsus	6	1

** (EPT organism)* *Taxa Richness:* 32 *Population:* 100

Hilsenhoff Biotic Index (HBI):	5.79	*# Scrapers:*	7
% Sensitive EPT:	26.0%	*Attribute 2 genera:*	1
% Non-Insect Taxa:	18.8%	*Attribute 3 genera:*	7
HGMI Rating:	**60.35**	**Good**	
Habitat Analysis:	157	Suboptimal	USEPA Protocol

Observations: Water temp: 16.53 C; Cond: 269 umhos; DO: 8.90 mg/L; pH: 7.75 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 45' / < 1' - 1'; Substrate: cobble, gravel, sand

Canopy: mostly open; Bank Stability: fair; Bank Vegetation: trees, shrubs, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: suburban, adj to community park

Pipes / Ditches: storm sewers

Other: fish; "trout stocked" stream

AMNET Site # **AN0352** *Stream Name:* **Mine Bk**

Location: **Bernardsville Rd (Old Quarry Rd); Bernardsville Boro; Somerset County**

Collection Date: ***5/27/2009*** *USGS Topo Map:* **Bernardsville**

	Genus	Tolerance Value	Amount
	Polypedilum	6	20
	Cura	4	13
	Gammarus	6	7
	Rheotanytarsus	6	7
	Nais	8	5
	Parametriocnemus	5	5
	Simulium	6	5
	Tanytarsus	6	5
*	Cheumatopsyche	5	4
	Microtendipes	7	4
	Stenelmis	5	4
*	Baetis	6	3
	Cricotopus	7	3
	Stylodrilus	10	3
	Rheocricotopus	6	2
	Rheopelopia	4	2
	Agabus	5	1
*	Ceraclea	3	1
	Diamesa	5	1
	Dicrotendipes	8	1
	Enchytraeidae	10	1
*	Hydropsyche	4	1
	Nematoda	6	1
	Tvetenia	5	1

** (EPT organism)* *Taxa Richness:* 24 *Population:* 100

Hilsenhoff Biotic Index (HBI):	5.84	*# Scrapers:*	1
% Sensitive EPT:	4.0%	*Attribute 2 genera:*	1
% Non-Insect Taxa:	25.0%	*Attribute 3 genera:*	3

HGMI Rating: **33.32** **Fair**

Habitat Analysis: 134 Suboptimal USEPA Protocol

Observations: Water temp: 17.20 C; Cond: 607 umhos; DO: 8.84 mg/L; pH: 7.31 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 15' / < 1'; Substrate: cobble, gravel, bedrock

Canopy: mostly closed; Bank Stability: fair; Bank Vegetation: trees, shrubs, weeds, vines

Stream Gradient: High Gradient Stream; Land Uses: agriculture-livestock, industrial (rock quarry)

Pipes / Ditches: STP, storm sewers

AMNET Site # **AN0353** *Stream Name:* **Mine Bk**

Location: **Far Hills Rd (Rt 512); Far Hills Boro; Somerset County**

Collection Date: ***6/2/2009*** *USGS Topo Map:* **Gladstone**

	Genus	Tolerance Value	Amount
	Polypedilum	6	24
*	Hydropsychidae	4	10
*	Cheumatopsyche	5	8
	Stenelmis	5	8
	Psephenus	4	4
	Slavina	7	4
	Thienemannimyia	6	4
	Brillia	5	3
*	Dolophilodes	0	3
	Tvetenia	5	3
*	Chimarra	4	2
	Eukiefferiella	8	2
*	Hydropsyche	4	2
*	Maccaffertium	3	2
	Microtendipes	7	2
	Nais	8	2
	Optioservus	4	2
	Phaenopsectra	7	2
	Prostoma	7	2
	Tanytarsus	6	2
*	Baetis	6	1
	Bezzia	6	1
	Cricotopus	7	1
	Micropsectra	7	1
	Oulimnius	4	1
*	Paraleptophlebia	1	1
	Parametriocnemus	5	1
	Rheocricotopus	6	1
	Stylogomphus	1	1

** (EPT organism)* *Taxa Richness:* 29 *Population:* 100

Hilsenhoff Biotic Index (HBI): 5.21 *# Scrapers:* 5

% Sensitive EPT: 9.0% *Attribute 2 genera:* 2

% Non-Insect Taxa: 10.3% *Attribute 3 genera:* 3

HGMI Rating: **50.30** **Good**

Habitat Analysis: 130 Suboptimal USEPA Protocol

Observations: Water temp: 15.47 C; Cond: 246 umhos; DO: 8.27 mg/L; pH: 7.57 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 5' / < 1'; Substrate: cobble, gravel, sand, silt

Canopy: partly open; Bank Stability: good; Bank Vegetation: trees, grasses, lawn

Stream Gradient: High Gradient Stream; Land Uses: agriculture-livestock (horse farm)

Other: fish, filamentous algae

AMNET Site # **AN0354** *Stream Name:* **Middle Bk**

Location: **Spook Hollow Rd; Bedminster Twp; Somerset County**

Collection Date: ***6/2/2009*** *USGS Topo Map:* **Gladstone**

	Genus	Tolerance Value	Amount
*	Cheumatopsyche	5	18
	Polypedilum	6	17
	Nais	8	16
	Cricotopus	7	15
	Tvetenia	5	8
	Simulium	6	6
	Micropsectra	7	4
	Tanytarsus	6	3
	Dicranota	3	2
	Phaenopsectra	7	2
*	Amphinemura	3	1
*	Hydroptila	6	1
	Oulimnius	4	1
	Parametriocnemus	5	1
	Rheocricotopus	6	1
	Rheotanytarsus	6	1
	Slavina	7	1
	Thienemannimyia	6	1
	Tipula	4	1

** (EPT organism)* *Taxa Richness:* 19 *Population:* 100

Hilsenhoff Biotic Index (HBI): 6.14 *# Scrapers:* 3

% Sensitive EPT: 2.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 10.5% *Attribute 3 genera:* 3

HGMI Rating: **34.45** **Fair**

Habitat Analysis: 150 Suboptimal USEPA Protocol

Observations: Water temp: 15.77 C; Cond: 217 umhos; DO: 6.79 mg/L; pH: 7.61 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 10' / < 1'; Substrate: cobble, gravel, sand, silt

Canopy: mostly closed; Bank Stability: good; Bank Vegetation: trees, shrubs, weeds

Stream Gradient: High Gradient Stream; Land Uses: forested

Other: fish, periphytes, filamentous algae

AMNET Site # **AN0355** *Stream Name:* **Middle Bk**

Location: **Cutting Witney Rd (River Rd); Bedminster Twp.; Somerset County**

Collection Date: ***6/2/2009*** *USGS Topo Map:* **Gladstone**

	Genus	*Tolerance Value*	*Amount*
	Stenelmis	5	31
	Lumbriculus	8	9
	Gammarus	6	8
	Optioservus	4	7
*	Perlesta	4	7
*	Cheumatopsyche	5	5
	Planariidae	4	5
	Psephenus	4	5
	Corynoneura	4	3
	Microtendipes	7	3
	Cricotopus	7	2
	Dicrotendipes	8	2
	Limnodrilus	10	2
	Nais	8	2
	Antocha	3	1
*	Ceratopsyche	4	1
*	Chimarra	4	1
	Micropsectra	7	1
	Procladius	9	1
	Rheotanytarsus	6	1
	Slavina	7	1
	Stictochironomus	9	1
	Tanytarsus	6	1

** (EPT organism)* *Taxa Richness:* 23 *Population:* 100

Hilsenhoff Biotic Index (HBI): 5.50 *# Scrapers:* 2

% Sensitive EPT: 8.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 26.1% *Attribute 3 genera:* 1

HGMI Rating: **31.24** **Fair**

Habitat Analysis: 135 Suboptimal USEPA Protocol

Observations: Water temp: 17.73 C; Cond: 279 umhos; DO: 5.92 mg/L; pH: 7.46 SU

Clarity: clear; Flow Rate: slow; Width/Depth: 29' / < 1'; Substrate: cobble, sand, silt, snags

Canopy: mostly open; Bank Stability: fair; Bank Vegetation: trees, shrubs, weeds

Stream Gradient: High Gradient Stream; Land Uses: rural, forested

Other: fish, macrophytes, periphytes, filamentous algae

AMNET Site # **AN0356** *Stream Name:* **Lamington River**

Location: **Ironia Rd; Chester Twp; Morris County**

Collection Date: ***4/29/2009*** *USGS Topo Map:* **Chester**

	Genus	Tolerance Value	Amount
	Gammarus	6	16
	Amnicola	4.8	12
	Cricotopus	7	12
	Polypedilum	6	8
	Caecidotea	8	7
	Limnodrilus	10	6
	Chironomus	10	5
	Gyraulus	6	5
	Phaenopsectra	7	4
	Tribelos	5	4
	Ischnura	9	3
	Macronychus	2	2
*	Oecetis	8	2
	Paratendipes	8	2
	Tubifex	10	2
*	Cheumatopsyche	5	1
	Clinotanypus	8	1
	Dugesia	4	1
	Empididae	6	1
	Hydrolimax	4	1
*	Ironoquia	3	1
	Physella	9.1	1
	Pisidium	6.8	1
	Thienemannimyia	6	1
	Valvata	2	1

** (EPT organism)* *Taxa Richness:* 25 *Population:* 100

Hilsenhoff Biotic Index (HBI):	6.66	*# Scrapers:*	6
% Sensitive EPT:	3.0%	*Attribute 2 genera:*	0
% Non-Insect Taxa:	44.0%	*Attribute 3 genera:*	0

HGMI Rating: **26.53** **Fair**

Habitat Analysis: 140 Suboptimal USEPA Protocol

Observations: Water temp: 19.25 C; Cond: 591 umhos; DO: 9.63 mg/L; pH: 7.51 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 25' / 2.0'; Substrate: silt

Canopy: mostly open; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses

Stream Gradient: High Gradient Stream; Land Uses: suburban, forested

Pipes / Ditches: Roxbury Twp - Ajax Terrace STP discharge upstream

Other: site located in Wildlife Management Area

AMNET Site # **AN0357** *Stream Name:* **Tanners Bk**

Location: **Tanners Brook Rd; Chester Twp; Morris County**

Collection Date: ***5/28/2009*** *USGS Topo Map:* **Chester**

	Genus	*Tolerance Value*	*Amount*
	Gammarus	6	26
	Cricotopus	7	22
	Eukiefferiella	8	7
*	Glossosoma	0	4
	Nais	8	4
	Simulium	6	4
	Tanytarsus	6	4
*	Amphinemura	3	3
*	Pycnopsyche	4	3
	Optioservus	4	2
	Pisidium	6.8	2
	Polypedilum	6	2
	Prosimulium	2	2
*	Apatania	3	1
*	Baetis	6	1
	Boyeria	2	1
	Brillia	5	1
*	Chimarra	4	1
	Corydalus	4	1
	Cryptochironomus	8	1
	Eclipidrilus	8	1
*	Maccaffertium	3	1
	Parametriocnemus	5	1
	Paratendipes	8	1
	Promoresia	2	1
	Prostoma	7	1
	Rheotanytarsus	6	1
	Stylodrilus	10	1

** (EPT organism)* *Taxa Richness:* 28 *Population:* 100

Hilsenhoff Biotic Index (HBI): 5.86 *# Scrapers:* 4

% Sensitive EPT: 14.0% *Attribute 2 genera:* 1

% Non-Insect Taxa: 21.4% *Attribute 3 genera:* 10

HGMI Rating: **51.19** **Good**

Habitat Analysis: 147 Suboptimal USEPA Protocol

Observations: Water temp: 15.03 C; Cond: 208 umhos; DO: 8.35 mg/L; pH: 8.00 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 8' / 1'; Substrate: cobble, gravel, sand, silt

Canopy: mostly open; Bank Stability: good; Bank Vegetation: trees, shrubs, weeds

Stream Gradient: High Gradient Stream; Land Uses: rural, forested

Other: fish, macrophytes, purple loosestrife

AMNET Site # **AN0358** *Stream Name:* **Lamington River**

Location: **Rt 24 (Cooper Mill Park); Chester Twp; Morris County**

Collection Date: ***5/28/2009*** *USGS Topo Map:* **Chester**

	Genus	Tolerance Value	Amount
	Rheotanytarsus	6	14
*	Baetis	6	13
	Gammarus	6	13
*	Micrasema	2	8
	Polypedilum	6	8
	Eukiefferiella	8	6
	Cardiocladius	5	5
	Simulium	6	5
*	Heterocloeon	2	4
	Microtendipes	7	4
	Prosimulium	2	4
	Cricotopus	7	3
*	Brachycentrus	1	2
	Caecidotea	8	2
	Tanytarsus	6	2
*	Apatania	3	1
	Cura	4	1
*	Hydropsyche	4	1
	Pisidium	6.8	1
	Planariidae	4	1
	Stenelmis	5	1
	Stylodrilus	10	1

** (EPT organism)* *Taxa Richness:* 22 *Population:* 100

Hilsenhoff Biotic Index (HBI): 5.39 *# Scrapers:* 3

% Sensitive EPT: 28.0% *Attribute 2 genera:* 2

% Non-Insect Taxa: 27.3% *Attribute 3 genera:* 4

HGMI Rating: **46.02** **Good**

Habitat Analysis: 180 Optimal USEPA Protocol

Observations: Water temp: 16.11 C; Cond: 405 umhos; DO: 7.45 mg/L; pH: 7.21 SU

Clarity: clear; Flow Rate: fast; Width/Depth: 15' / 1'; Substrate: boulder, cobble, gravel, sand

Canopy: mostly closed; Bank Stability: good; Bank Vegetation: trees, weeds

Stream Gradient: High Gradient Stream; Land Uses: suburban, forested

Other: water snake, periphytes, brown foam; "trout stocked waters"

AMNET Site # **AN0359** *Stream Name:* **Trout Bk**

Location: **State Pk Rd; Chester Twp; Morris County**

Collection Date: ***5/28/2009*** *USGS Topo Map:* **Chester**

	Genus	Tolerance Value	Amount
	Parametriocnemus	5	24
	Nais	8	18
*	Hydroptila	6	10
*	Dolophilodes	0	9
	Pagastia	1	8
	Gammarus	6	6
	Micropsectra	7	4
	Tvetenia	5	4
*	Baetis	6	2
	Brillia	5	2
*	Dannella	2	2
*	Eurylophella	4	2
	Simulium	6	2
*	Cheumatopsyche	5	1
	Lumbriculus	8	1
*	Plauditus	4	1
	Stylogomphus	1	1
	Tanytarsus	6	1
	Thienemanniella	6	1
	Thienemannimyia	6	1

** (EPT organism)* *Taxa Richness:* 20 *Population:* 100

Hilsenhoff Biotic Index (HBI):	4.98		*# Scrapers:*	3
% Sensitive EPT:	26.0%		*Attribute 2 genera:*	2
% Non-Insect Taxa:	15.0%		*Attribute 3 genera:*	4
HGMI Rating:	**47.19**	**Good**		
Habitat Analysis:	166	Optimal	USEPA Protocol	

Observations: Water temp: 13.55 C; Cond: 265 umhos; DO: 8.95 mg/L; pH: 7.63 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 12' / < 1'; Substrate: cobble, gravel

Canopy: mostly closed; Bank Stability: good; Bank Vegetation: trees, shrubs, weeds, vines

Stream Gradient: High Gradient Stream; Land Uses: rural, forested

Other: periphytes, salamander

AMNET Site # **AN0360** *Stream Name:* **Lamington River**

Location: **Rt 512; Tewksbury Twp; Hunterdon & Somerset County**

Collection Date: ***5/28/2009*** *USGS Topo Map:* **Gladstone**

	Genus	*Tolerance Value*	*Amount*
*	Brachycentrus	1	28
	Tanytarsus	6	12
	Nais	8	8
	Brillia	5	7
	Parametriocnemus	5	6
	Gammarus	6	5
	Eukiefferiella	8	4
*	Lepidostoma	1	4
*	Cheumatopsyche	5	3
*	Paragnetina	1	3
*	Apatania	3	2
*	Baetis	6	2
	Microtendipes	7	2
	Musculium	5	2
*	Pteronarcys	0	2
	Rheotanytarsus	6	2
	Stenelmis	5	2
*	Acentrella	4	1
*	Acroneuria	0	1
*	Ephemerella	1	1
*	Hydropsyche	4	1
*	Micrasema	2	1
	Polypedilum	6	1

** (EPT organism)* *Taxa Richness:* 23 *Population:* 100

Hilsenhoff Biotic Index (HBI): 3.94 *# Scrapers:* 2

% Sensitive EPT: 45.0% *Attribute 2 genera:* 5

% Non-Insect Taxa: 13.0% *Attribute 3 genera:* 6

HGMI Rating: **66.04** **Excellent**

Habitat Analysis: 156 Suboptimal USEPA Protocol

Observations: Water temp: 15.65 C; Cond: 339 umhos; DO: 9.14 mg/L; pH: 8.04 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 40' / 1'; Substrate: cobble, gravel, sand

Canopy: mostly open; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses

Stream Gradient: High Gradient Stream; Land Uses: suburban

Pipes / Ditches: storm sewers

Other: periphytes

AMNET Site # **AN0361** ***Stream Name:*** **UNT to Lamington River**

Location: **Black River Rd; Bedminster Twp; Somerset County**

Collection Date: ***5/28/2009*** ***USGS Topo Map:*** **Gladstone**

	Genus	*Tolerance Value*	*Amount*
	Cricotopus	7	25
	Tvetenia	5	8
	Nais	8	6
	Parametriocnemus	5	6
*	Baetis	6	4
*	Eurylophella	4	4
	Simulium	6	4
	Prostoma	7	3
	Rheotanytarsus	6	3
	Stenelmis	5	3
	Bezzia	6	2
*	Ceratopsyche	4	2
*	Chimarra	4	2
*	Hydroptila	6	2
	Orthocladius	6	2
	Promoresia	2	2
	Rheocricotopus	6	2
	Thienemanniella	6	2
*	Apatania	3	1
	Dubiraphia	6	1
*	Glossosoma	0	1
	Hemerodromia	6	1
*	Hydropsyche	4	1
*	Isoperla	2	1
	Limnodrilus	10	1
	Lumbriculus	8	1
	Micropsectra	7	1
	Microtendipes	7	1
	Ophiogomphus	1	1
	Optioservus	4	1
	Oulimnius	4	1
	Polypedilum	6	1
*	Rhyacophila	1	1
	Tanytarsus	6	1
	Thienemannimyia	6	1
	Tipula	4	1

** (EPT organism)* *Taxa Richness:* 36 *Population:* 100

Hilsenhoff Biotic Index (HBI): 5.76 *# Scrapers:* 8

% Sensitive EPT: 16.0% *Attribute 2 genera:* 3

% Non-Insect Taxa: 11.1% *Attribute 3 genera:* 6

HGMI Rating: **61.94** **Good**

Habitat Analysis: 148 Suboptimal USEPA Protocol

Observations: Water temp: 14.95 C; Cond: 232 umhos; DO: 9.24 mg/L; pH: 7.95 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 22' / < 1'; Substrate: cobble, gravel, sand, silt

Canopy: mostly open; Bank Stability: fair; Bank Vegetation: trees, shrubs, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: agriculture-cropland, rural

Pipes / Ditches: storm sewers

Other: fish, macrophytes, filamentous algae

AMNET Site # **AN0362** *Stream Name:* **Cold Bk**

Location: **Vliettown Rd; Tewksbury Twp; Hunterdon County**

Collection Date: ***6/2/2009*** *USGS Topo Map:* **Gladstone**

	Genus	*Tolerance Value*	*Amount*
	Simulium	6	24
	Stenelmis	5	12
	Polypedilum	6	9
	Cricotopus	7	7
	Gammarus	6	7
	Micropsectra	7	5
*	Baetis	6	4
	Nais	8	4
*	Ephemerella	1	3
	Tvetenia	5	3
	Antocha	3	2
	Microtendipes	7	2
	Optioservus	4	2
	Psephenus	4	2
*	Tricorythodes	4	2
	Bezzia	6	1
*	Ceratopsyche	4	1
	Cladotanytarsus	7	1
	Eukiefferiella	8	1
	Hemerodromia	6	1
*	Hydropsyche	4	1
*	Hydroptila	6	1
	Phaenopsectra	7	1
	Potthastia	2	1
	Rheocricotopus	6	1
	Tanytarsus	6	1
	Thienemanniella	6	1

** (EPT organism)* *Taxa Richness:* 27 *Population:* 100

Hilsenhoff Biotic Index (HBI): 5.70 *# Scrapers:* 4

% Sensitive EPT: 10.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 7.4% *Attribute 3 genera:* 2

HGMI Rating: **42.01** **Good**

Habitat Analysis: 153 Suboptimal USEPA Protocol

Observations: Water temp: 15.72 C; Cond: 270 umhos; DO: 9.29 mg/L; pH: 8.03 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 22' / < 1'; Substrate: cobble, gravel, sand, root mats

Canopy: partly open; Bank Stability: good; Bank Vegetation: trees, shrubs, weeds

Stream Gradient: High Gradient Stream; Land Uses: rural, forested

Other: fish

AMNET Site # **AN0363** *Stream Name:* **Lamington River**

Location: **Rt 523; Bedminster Twp; Somerset & Hunterdon County**

Collection Date: ***6/2/2009*** *USGS Topo Map:* **Gladstone**

	Genus	*Tolerance Value*	*Amount*
	Microtendipes	7	17
*	Baetis	6	11
	Tvetenia	5	11
	Polypedilum	6	10
*	Brachycentrus	1	9
	Cricotopus	7	4
	Optioservus	4	4
*	Helicopsyche	3	3
	Lumbriculus	8	3
	Potthastia	2	3
*	Serratella	2	3
*	Ceratopsyche	4	2
*	Glossosoma	0	2
*	Perlesta	4	2
*	Acentrella	4	1
	Antocha	3	1
	Blepharicera	0	1
*	Chimarra	4	1
	Cladotanytarsus	7	1
	Eukiefferiella	8	1
	Gammarus	6	1
*	Isonychia	2	1
*	Lepidostoma	1	1
*	Leucrocuta	1	1
*	Maccaffertium	3	1
*	Micrasema	2	1
	Nais	8	1
*	Plauditus	4	1
	Prostoma	7	1
	Stenelmis	5	1

** (EPT organism)* *Taxa Richness:* 30 *Population:* 100

Hilsenhoff Biotic Index (HBI): 4.79 *# Scrapers:* 7

% Sensitive EPT: 38.0% *Attribute 2 genera:* 5

% Non-Insect Taxa: 13.3% *Attribute 3 genera:* 7

HGMI Rating: **73.73** **Excellent**

Habitat Analysis: 149 Suboptimal USEPA Protocol

Observations: Water temp: 18.51 C; Cond: 261 umhos; DO: 8.98 mg/L; pH: 8.20 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 70' / < 1'; Substrate: cobble, gravel, sand, root mats

Canopy: mostly open; Bank Stability: good; Bank Vegetation: trees, shrubs, weeds

Stream Gradient: High Gradient Stream; Land Uses: agriculture-cropland, rural, forested

Other: fish, macrophytes

AMNET Site # **AN0364** *Stream Name:* **N Br Rockaway Ck**

Location: **Fairmount Rd (Rt 512); Tewksbury Twp; Hunterdon County**

Collection Date: *6/8/2009* *USGS Topo Map:* **Califon**

	Genus	Tolerance Value	Amount
	Tvetenia	5	10
	Nais	8	8
	Rheocricotopus	6	7
	Rheotanytarsus	6	7
*	Baetis	6	6
*	Hydropsyche	4	5
	Parametriocnemus	5	5
*	Chimarra	4	4
*	Leuctra	0	4
	Macronychus	2	4
*	Serratella	2	4
	Optioservus	4	3
	Pristinella	10	3
	Stempellinella	6	3
	Ancyronyx	2	2
	Antocha	3	2
*	Apatania	3	2
	Cricotopus	7	2
	Microtendipes	7	2
	Polypedilum	6	2
	Stylodrilus	10	2
	Cardiocladius	5	1
*	Ceratopsyche	4	1
	Chelifera	6	1
	Corynoneura	4	1
	Cura	4	1
	Dubiraphia	6	1
*	Ephemerella	1	1
*	Glossosoma	0	1
	Heterotrissocladius	0	1
*	Isoperla	2	1
*	Pteronarcys	0	1
	Simulium	6	1
	Stylogomphus	1	1

** (EPT organism)* *Taxa Richness:* 34 *Population:* 100

Hilsenhoff Biotic Index (HBI): 4.86 *# Scrapers:* 4

% Sensitive EPT: 24.0% *Attribute 2 genera:* 4

% Non-Insect Taxa: 11.8% *Attribute 3 genera:* 6

HGMI Rating: **61.08** **Good**

Habitat Analysis: 153 Suboptimal USEPA Protocol

Observations: Water temp: 15.68 C; Cond: 162 umhos; DO: 7.34 mg/L; pH: 6.78 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 9' / < 1'; Substrate: cobble, gravel, sand, snags

Canopy: mostly open; Bank Stability: good; Bank Vegetation: trees, shrubs, weeds

Stream Gradient: High Gradient Stream; Land Uses: agriculture-livestock (horses), rural

Other: fish, periphytes

AMNET Site # **AN0365** ***Stream Name:*** **N Br Rockaway Ck**

Location: **Rockaway Rd; Tewksbury Twp; Hunterdon County**

Collection Date: ***6/8/2009*** ***USGS Topo Map:*** **Califon**

	Genus	*Tolerance Value*	*Amount*
	Polypedilum	6	12
	Lumbriculus	8	9
	Brillia	5	5
	Micropsectra	7	5
*	Dolophilodes	0	4
*	Lepidostoma	1	4
	Microtendipes	7	4
	Psephenus	4	4
*	Acroneuria	0	3
*	Apatania	3	3
*	Baetis	6	3
*	Ephemerella	1	3
*	Mystacides	4	3
*	Perlesta	4	3
	Tvetenia	5	3
	Diamesa	5	2
*	Eurylophella	4	2
	Nais	8	2
	Optioservus	4	2
	Phaenopsectra	7	2
*	Polycentropus	6	2
	Stenelmis	5	2
	Tanytarsus	6	2
*	Agapetus	0	1
*	Chimarra	4	1
*	Dannella	2	1
*	Diplectrona	0	1
*	Drunella	1	1
*	Glossosoma	0	1
	Gomphidae	1	1
*	Hydropsyche	4	1
*	Leuctra	0	1
*	Maccaffertium	3	1
*	Nyctiophylax	5	1
	Parametriocnemus	5	1
	Planorbidae	6	1
	Prostoma	7	1
	Stylogomphus	1	1
	Sublettea	6	1

** (EPT organism)* *Taxa Richness:* 39 *Population:* 100

Hilsenhoff Biotic Index (HBI): 4.56 *# Scrapers:* 10

% Sensitive EPT: 39.0% *Attribute 2 genera:* 8

% Non-Insect Taxa: 10.3% *Attribute 3 genera:* 12

HGMI Rating: **86.67** **Excellent**

Habitat Analysis: 150 Suboptimal USEPA Protocol

Observations: Water temp: 16.49 C; Cond: 134 umhos; DO: 8.59 mg/L; pH: 7.46 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 44' / < 1'; Substrate: cobble, gravel, sand

Canopy: mostly closed; Bank Stability: good; Bank Vegetation: trees, shrubs, lawn

Stream Gradient: High Gradient Stream; Land Uses: suburban

Pipes / Ditches: storm sewers

Other: fish, periphytes

AMNET Site # **AN0366** ***Stream Name:*** **N Br Rockaway Ck**

Location: **Rockaway Rd (@Taylor's Mill Rd); Readington Twp; Hunterdon County**

Collection Date: ***6/8/2009*** ***USGS Topo Map:*** **Califon**

	Genus	*Tolerance Value*	*Amount*
	Polypedilum	6	11
	Gammarus	6	9
	Psephenus	4	8
	Lumbriculus	8	7
*	Baetis	6	6
	Caecidotea	8	5
*	Eurylophella	4	5
	Stenelmis	5	5
*	Acentrella	4	4
*	Ephemerella	1	4
	Tvetenia	5	4
*	Maccaffertium	3	3
	Optioservus	4	3
*	Perlidae	1	3
	Argia	6	2
*	Glossosoma	0	2
	Antocha	3	1
	Bezzia	6	1
	Calopteryx	6	1
*	Cheumatopsyche	5	1
	Corixidae	9	1
*	Dolophilodes	0	1
	Dubiraphia	6	1
	Erpobdellidae	8	1
	Hydroporus	5	1
*	Hydroptila	6	1
	Micropsectra	7	1
	Microtendipes	7	1
	Oulimnius	4	1
*	Paragnetina	1	1
	Physella	9.1	1
	Pisidium	6.8	1
*	Serratella	2	1
	Simulium	6	1
*	Tricorythodes	4	1

** (EPT organism)* *Taxa Richness:* 35 *Population:* 100

Hilsenhoff Biotic Index (HBI): 5.06 *# Scrapers:* 9

% Sensitive EPT: 32.0% *Attribute 2 genera:* 4

% Non-Insect Taxa: 17.1% *Attribute 3 genera:* 5

HGMI Rating: **69.03** **Excellent**

Habitat Analysis: 159 Suboptimal USEPA Protocol

Observations: Water temp: 16.78 C; Cond: 152 umhos; DO: 8.83 mg/L; pH: 7.60 SU

Clarity: clear; Flow Rate: fast; Width/Depth: 25' / < 1'; Substrate: cobble, gravel, sand, root mats

Canopy: open; Bank Stability: good; Bank Vegetation: trees, weeds

Stream Gradient: High Gradient Stream; Land Uses: forested, industrial (Oldwich Materials Corp)

Pipes / Ditches: storm sewers; pipe flowing

Other: fish, crayfish, filamentous algae; foam

AMNET Site # **AN0367** *Stream Name:* **S Br Rockaway Ck**

Location: **Windy Acres Farm; Lebanon Boro; Hunterdon County**

Collection Date: ***5/12/2009*** *USGS Topo Map:* **Califon**

	Genus	*Tolerance Value*	*Amount*
	Nais	8	34
	Tanytarsus	6	19
	Gammarus	6	7
	Optioservus	4	7
	Parametriocnemus	5	5
	Stylodrilus	10	5
	Chaetogaster	6	3
	Cricotopus	7	3
*	Chimarra	4	2
	Stenelmis	5	2
	Tvetenia	5	2
*	Baetis	6	1
*	Ceratopsyche	4	1
	Dicrotendipes	8	1
	Endochironomus	10	1
*	Eurylophella	4	1
*	Hydropsyche	4	1
	Limnodrilus	10	1
	Macronychus	2	1
	Psectrocladius	8	1
	Psephenus	4	1
	Rheopelopia	4	1

** (EPT organism)* *Taxa Richness:* 22 *Population:* 100

Hilsenhoff Biotic Index (HBI): 6.62 *# Scrapers:* 4

% Sensitive EPT: 4.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 22.7% *Attribute 3 genera:* 3

HGMI Rating: **33.63** **Fair**

Habitat Analysis: 160 Optimal USEPA Protocol

Observations: Water temp: 11.95 C; Cond: 384 umhos; DO: 10.65 mg/L; pH: 8.25 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 8-10' / 1'; Substrate: cobble, gravel, sand, bedrock

Canopy: partly open; Bank Stability: fair; Bank Vegetation: trees, shrubs

Stream Gradient: High Gradient Stream; Land Uses: agriculture-cropland, forested

Other: crayfish, fish, salamanders

AMNET Site # **AN0368** *Stream Name:* **S Br Rockaway Ck**

Location: **Rt 22; Readington Twp; Hunterdon County**

Collection Date: ***5/12/2009*** *USGS Topo Map:* **Flemington**

	Genus	*Tolerance Value*	*Amount*
	Stenelmis	5	20
	Polypedilum	6	8
	Gammarus	6	7
	Nais	8	7
	Tvetenia	5	7
	Ophidonais	7	6
	Psephenus	4	6
	Rheotanytarsus	6	6
	Cricotopus	7	4
	Elimia	2	4
	Slavina	7	4
	Corbicula	4	3
	Dugesia	4	3
	Limnodrilus	10	3
	Simulium	6	3
	Caecidotea	8	2
*	Cheumatopsyche	5	2
*	Chimarra	4	2
	Physella	9.1	2
*	Perlesta	4	1

** (EPT organism)* *Taxa Richness:* 20 *Population:* 100

Hilsenhoff Biotic Index (HBI):	5.75	*# Scrapers:*	4
% Sensitive EPT:	3.0%	*Attribute 2 genera:*	0
% Non-Insect Taxa:	50.0%	*Attribute 3 genera:*	1
HGMI Rating:	**24.96**	**Fair**	
Habitat Analysis:	174	Optimal	USEPA Protocol

Observations: Water temp: 18.2 C; Cond: 369 umhos; DO: 9.19 mg/L; pH: 8.1 SU

Clarity: slightly turbid; Flow Rate: moderate; Width/Depth: 20' / 1.5'; Substrate: cobble, gravel, sand, silt

Canopy: partly open; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses

Stream Gradient: High Gradient Stream; Land Uses: suburban, forested

Pipes / Ditches: storm sewers

Other: clams / mussels, filamentous algae

AMNET Site # **AN0369** *Stream Name:* **Rockaway Ck**

Location: **Island Rd; Readington Twp; Hunterdon County**

Collection Date: ***6/8/2009*** *USGS Topo Map:* **Raritan**

	Genus	Tolerance Value	Amount
	Gammarus	6	20
*	Anthopotamus	4	17
	Dicrotendipes	8	10
	Dubiraphia	6	10
	Microtendipes	7	9
	Physella	9.1	7
	Caecidotea	8	4
	Limnodrilus	10	4
*	Tricorythodes	4	4
*	Perlesta	4	3
	Cryptochironomus	8	2
	Macronychus	2	2
	Cladotanytarsus	7	1
	Ischnura	9	1
	Lumbriculidae	8	1
	Phaenopsectra	7	1
	Pisidium	6.8	1
	Psephenus	4	1
*	Stenacron	4	1
	Stenelmis	5	1

** (EPT organism)* *Taxa Richness:* 20 *Population:* 100

Hilsenhoff Biotic Index (HBI): 6.25 *# Scrapers:* 7

% Sensitive EPT: 25.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 30.0% *Attribute 3 genera:* 1

HGMI Rating: **37.71** **Fair**

Habitat Analysis: 133 Suboptimal USEPA Protocol

Observations: Water temp: 19.68 C; Cond: 244 umhos; DO: 9.14 mg/L; pH: 7.89 SU

Clarity: slightly turbid; Flow Rate: slow; Width/Depth: 67' / 1 - 2'; Substrate: cobble, gravel, sand, silt

Canopy: mostly open; Bank Stability: fair; Bank Vegetation: trees, shrubs, grasses

Stream Gradient: High Gradient Stream; Land Uses: agriculture-cropland, agriculture-livestock (cows)

Other: fish, macrophytes; eroded banks

AMNET Site # **AN0370** *Stream Name:* **Lamington River**

Location: **Cowperthwaite Rd; Branchburg Twp; Somerset County**

Collection Date: ***6/8/2009*** *USGS Topo Map:* **Gladstone**

	Genus	*Tolerance Value*	*Amount*
	Gammarus	6	36
*	Anthopotamus	4	15
*	Perlesta	4	7
	Caecidotea	8	5
	Limnodrilus	10	5
	Stenelmis	5	5
	Microtendipes	7	4
	Physella	9.1	4
*	Ephemerella	1	3
	Phaenopsectra	7	2
	Pisidium	6.8	2
*	Caenis	7	1
	Cambaridae	5	1
*	Ceraclea	3	1
*	Cheumatopsyche	5	1
	Crangonyx	8	1
*	Dannella	2	1
*	Maccaffertium	3	1
*	Neoperla	1	1
*	Plauditus	4	1
	Slavina	7	1
	Thienemannimyia	6	1
	Tipula	4	1

** (EPT organism)* *Taxa Richness:* 23 *Population:* 100

Hilsenhoff Biotic Index (HBI): 5.69 *# Scrapers:* 5

% Sensitive EPT: 31.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 34.8% *Attribute 3 genera:* 6

HGMI Rating: **47.81** **Good**

Habitat Analysis: 157 Suboptimal USEPA Protocol

Observations: Water temp: 20.01 C; Cond: 240 umhos; DO: 9.10 mg/L; pH: 7.96 SU

Clarity: slightly turbid; Flow Rate: moderate; Width/Depth: 72' / 1'; Substrate: cobble, gravel, sand

Canopy: open; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses

Stream Gradient: High Gradient Stream; Land Uses: rural, forested

Other: macrophytes; "Trout stocked" waters; USGS gage station

AMNET Site # **AN0371** *Stream Name:* **Chambers(B) Bk**

Location: **Love Rd; Bedminster Twp; Somerset County**

Collection Date: ***6/4/2009*** *USGS Topo Map:* **Raritan**

	Genus	*Tolerance Value*	*Amount*
	Dicrotendipes	8	31
	Gammarus	6	18
	Physella	9.1	6
	Stictochironomus	9	6
	Ischnura	9	5
	Rheotanytarsus	6	4
	Argia	6	3
	Nais	8	3
	Polypedilum	6	3
	Aulodrilus	8	2
*	Caenis	7	2
	Curculionidae	7	2
	Psephenus	4	2
	Ablabesmyia	8	1
	Caecidotea	8	1
	Hydra	5	1
	Lumbriculus	8	1
	Mooreobdella	7.8	1
	Paratendipes	8	1
*	Perlesta	4	1
	Phaenopsectra	7	1
	Prostoma	7	1
	Slavina	7	1
	Stenelmis	5	1
	Tanytarsus	6	1

** (EPT organism)* *Taxa Richness:* 25 *Population:* 99

Hilsenhoff Biotic Index (HBI): 7.34 *# Scrapers:* 4

% Sensitive EPT: 3.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 40.0% *Attribute 3 genera:* 1

HGMI Rating: **24.22** **Fair**

Habitat Analysis: 131 Suboptimal USEPA Protocol

Observations: Water temp: 16.73 C; Cond: 503 umhos; DO: 8.00 mg/L; pH: 7.47 SU

Clarity: turbid, brown; Flow Rate: moderate; Width/Depth: 20' / 1'; Substrate: gravel, sand, mud, undercut banks

Canopy: partly open; Bank Stability: fair; Bank Vegetation: trees, shrubs, weeds

Stream Gradient: High Gradient Stream; Land Uses: rural, forested

Pipes / Ditches: ditches

Other: macrophytes, filamentous algae

AMNET Site # **AN0372** *Stream Name:* **Chambers(A) Bk**

Location: **Coddington Rd; Readington Twp; Hunterdon County**

Collection Date: ***6/4/2009*** *USGS Topo Map:* **Raritan**

	Genus	*Tolerance Value*	*Amount*
	Nais	8	12
	Tanytarsus	6	11
*	Cheumatopsyche	5	8
	Aulodrilus	8	7
	Stenelmis	5	7
	Micropsectra	7	5
*	Perlesta	4	5
	Polypedilum	6	5
	Bezzia	6	4
	Microtendipes	7	4
*	Caenis	7	3
	Physella	9.1	3
*	Amphinemura	3	2
	Paratanytarsus	6	2
	Pisidium	6.8	2
	Stictochironomus	9	2
	Stylogomphus	1	2
	Thienemannimyia	6	2
	Tvetenia	5	2
	Chironomus	10	1
	Corixidae	9	1
	Corynoneura	4	1
	Dubiraphia	6	1
	Hydroporus	5	1
	Ischnura	9	1
	Phaenopsectra	7	1
	Prostoma	7	1
	Pseudochironomus	5	1
	Rheotanytarsus	6	1
	Slavina	7	1
*	Stenacron	4	1

** (EPT organism)* *Taxa Richness:* 31 *Population:* 100

Hilsenhoff Biotic Index (HBI): 6.31 *# Scrapers:* 5

% Sensitive EPT: 11.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 19.4% *Attribute 3 genera:* 2

HGMI Rating: **39.65** **Fair**

Habitat Analysis: 126 Suboptimal USEPA Protocol

Observations: Water temp: 14.92 C; Cond: 190 umhos; DO: 8.68 mg/L; pH: 7.18 SU

Clarity: turbid, brown; Flow Rate: slow; Width/Depth: 12' / < 1 - 1.5'; Substrate: cobble, gravel, sand, mud, root mats

Canopy: partly open; Bank Stability: fair; Bank Vegetation: trees, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: suburban

Other: crayfish, macrophytes, periphytes, salamander; dead deer in stream

AMNET Site # **AN0373** *Stream Name:* **Chambers(A) Bk**

Location: **Station Rd; Branchburg Twp; Somerset County**

Collection Date: ***6/4/2009*** *USGS Topo Map:* **Raritan**

	Genus	Tolerance Value	Amount
*	Cheumatopsyche	5	29
	Gammarus	6	20
	Polypedilum	6	8
	Stenelmis	5	6
	Nais	8	4
	Stictochironomus	9	4
*	Chimarra	4	3
	Simulium	6	3
*	Baetis	6	2
	Lumbricina	6	2
	Physella	9.1	2
	Rheotanytarsus	6	2
	Stylogomphus	1	2
	Aulodrilus	8	1
	Bezzia	6	1
*	Caenis	7	1
	Corbicula	4	1
	Dubiraphia	6	1
*	Isonychia	2	1
	Lymnaeidae	6	1
*	Maccaffertium	3	1
	Microtendipes	7	1
*	Perlesta	4	1
	Prostoma	7	1
	Psephenus	4	1
	Tvetenia	5	1

** (EPT organism)* *Taxa Richness:* 26 *Population:* 100

Hilsenhoff Biotic Index (HBI): 5.66 *# Scrapers:* 6

% Sensitive EPT: 9.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 30.8% *Attribute 3 genera:* 4

HGMI Rating: **41.97** **Fair**

Habitat Analysis: 139 Suboptimal USEPA Protocol

Observations: Water temp: 15.21 C; Cond: 209 umhos; DO: 8.48 mg/L; pH: 7.34 SU

Clarity: turbid, brown; Flow Rate: moderate; Width/Depth: 20' / 1'; Substrate: cobble, gravel, sand, snags

Canopy: partly open; Bank Stability: fair; Bank Vegetation: trees, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: suburban, forested

Pipes / Ditches: storm sewers

Other: fish, periphytes, filamentous algae

AMNET Site # **AN0374** *Stream Name:* **N Br Raritan River**

Location: **Rt 202; Branchburg Twp; Somerset County**

Collection Date: ***6/16/2009*** *USGS Topo Map:* **Raritan**

	Genus	Tolerance Value	Amount
*	Anthopotamus	4	37
	Gammarus	6	13
	Stenelmis	5	11
	Tvetenia	5	6
	Psephenus	4	5
*	Cheumatopsyche	5	4
	Cricotopus	7	3
	Musculium	5	3
*	Perlesta	4	3
	Physella	9.1	3
	Eclipidrilus	8	2
*	Agnetina	2	1
	Amnicola	4.8	1
*	Baetis	6	1
	Corydalus	4	1
	Cura	4	1
	Optioservus	4	1
	Prosimulium	2	1
*	Serratella	2	1
	Stagnicola	7	1
*	Stenacron	4	1

** (EPT organism)* *Taxa Richness:* 21 *Population:* 100

Hilsenhoff Biotic Index (HBI):	4.82	*# Scrapers:*	6
% Sensitive EPT:	44.0%	*Attribute 2 genera:*	1
% Non-Insect Taxa:	33.3%	*Attribute 3 genera:*	5
HGMI Rating:	**54.38**	**Good**	
Habitat Analysis:	165	Optimal	USEPA Protocol

Observations: Water temp: 18.05 C; Cond: 273 umhos; DO: 7.22 mg/L; pH: 7.53 SU

Clarity: slightly turbid; Flow Rate: moderate; Width/Depth: 120' / < 1'; Substrate: cobble, gravel, sand, mud

Canopy: mostly open; Bank Stability: good; Bank Vegetation: trees, shrubs, weeds

Stream Gradient: High Gradient Stream; Land Uses: forested

Pipes / Ditches: storm sewers

Other: fish, macrophytes, periphytes, filamentous algae; trash; USGS gage: 1.3

AMNET Site # **AN0375** *Stream Name:* **Dukes Bk**

Location: **Dukes Pkwy; Hillsborough Twp; Somerset County**

Collection Date: ***6/4/2009*** *USGS Topo Map:* **Bound Brook**

Genus	*Tolerance Value*	*Amount*
Gammarus	6	44
Caecidotea	8	23
Stenelmis	5	7
Pisidium	6.8	5
Polypedilum	6	4
Crangonyx	8	3
Physella	9.1	3
Dugesia	4	2
Corbicula	4	1
Dubiraphia	6	1
Limnodrilus	10	1
Lumbricina	6	1
Microtendipes	7	1
Nais	8	1
Paratanytarsus	6	1
Paratendipes	8	1
Tipula	4	1

** (EPT organism)* *Taxa Richness:* 17 *Population:* 100

Hilsenhoff Biotic Index (HBI):	6.59	*# Scrapers:*	3
% Sensitive EPT:	0.0%	*Attribute 2 genera:*	0
% Non-Insect Taxa:	58.8%	*Attribute 3 genera:*	1

HGMI Rating: **15.92** **Poor**

Habitat Analysis: 140 Suboptimal USEPA Protocol

Observations: Water temp: 16.62 C; Cond: 198 umhos; DO: 8.27 mg/L; pH: 7.28 SU

Clarity: turbid, brown; Flow Rate: moderate; Width/Depth: 29' / 1-2'; Substrate: gravel, sand, silt, snags, root mats

Canopy: partly open; Bank Stability: fair; Bank Vegetation: trees, weeds

Stream Gradient: High Gradient Stream; Land Uses: suburban, forested

Pipes / Ditches: ditch

Other: macrophytes, periphytes, filamentous algae

AMNET Site # **AN0376** *Stream Name:* **Peters Bk**

Location: **Rt 28 (E. Main St); Somerville Boro; Somerset County**

Collection Date: ***6/16/2009*** *USGS Topo Map:* **Bound Brook**

	Genus	*Tolerance Value*	*Amount*
	Gammarus	6	23
	Nais	8	17
	Stenelmis	5	9
	Chironomus	10	7
	Paratendipes	8	6
	Dicrotendipes	8	4
	Limnodrilus	10	4
	Physella	9.1	4
	Stictochironomus	9	4
	Aulodrilus	8	3
	Polypedilum	6	3
	Ischnura	9	2
	Pisidium	6.8	2
*	Baetis	6	1
	Crangonyx	8	1
	Hemerodromia	6	1
*	Hydroptila	6	1
	Macronychus	2	1
	Micropsectra	7	1
	Ophidonais	7	1
	Paratanytarsus	6	1
	Peltodytes	5	1
	Phaenopsectra	7	1
	Slavina	7	1
	Tanytarsus	6	1

** (EPT organism)* *Taxa Richness:* 25 *Population:* 100

Hilsenhoff Biotic Index (HBI): 7.28 *# Scrapers:* 5

% Sensitive EPT: 2.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 36.0% *Attribute 3 genera:* 1

HGMI Rating: **26.97** **Fair**

Habitat Analysis: 126 Suboptimal USEPA Protocol

Observations: Water temp: 17.59 C; Cond: 699 umhos; DO: 7.00 mg/L; pH: 7.54 SU

Clarity: clear; Flow Rate: slow; Width/Depth: 22' / < 1' - 2'; Substrate: cobble, gravel, sand, mud, root mats

Canopy: mostly closed; Bank Stability: fair; Bank Vegetation: trees, weeds

Stream Gradient: High Gradient Stream; Land Uses: suburban

Pipes / Ditches: storm sewers

Other: fish, periphytes; trash

AMNET Site # **AN0377** *Stream Name:* **Raritan River**

Location: **abv. Millstone Confl. @ Rt 206; Manville Boro; Somerset County**

Collection Date: ***7/9/2009*** *USGS Topo Map:* **Bound Brook**

	Genus	Tolerance Value	Amount
*	Anthopotamus	4	34
	Gammarus	6	9
	Microtendipes	7	9
	Stenelmis	5	6
	Elimia	2	4
	Pisidium	6.8	4
*	Caenis	7	3
	Dubiraphia	6	3
*	Hydropsyche	4	3
*	Lepidostoma	1	3
	Limnodrilus	10	3
*	Maccaffertium	3	2
*	Mystacides	4	2
	Optioservus	4	2
	Thienemannimyia	6	2
	Ablabesmyia	8	1
*	Baetis	6	1
	Caecidotea	8	1
*	Cheumatopsyche	5	1
	Corbicula	4	1
*	Leucrocuta	1	1
	Rheotanytarsus	6	1
	Tanytarsus	6	1
	Tribelos	5	1
*	Tricorythodes	4	1
	Tvetenia	5	1

** (EPT organism)* *Taxa Richness:* 26 *Population:* 100

Hilsenhoff Biotic Index (HBI): 4.94 *# Scrapers:* 5

% Sensitive EPT: 47.0% *Attribute 2 genera:* 1

% Non-Insect Taxa: 23.1% *Attribute 3 genera:* 3

HGMI Rating: **53.62** **Good**

Habitat Analysis: 134 Suboptimal USEPA Protocol

Observations: Water temp: 22.43 C; Cond: 319 umhos; DO: 7.26 mg/L; pH: 7.87 SU

Clarity: slightly turbid; Flow Rate: moderate; Width/Depth: 126' / 3 - 4'; Substrate: cobble, gravel, sand

Canopy: open; Bank Stability: fair; Bank Vegetation: trees, shrubs, grasses

Stream Gradient: High Gradient Stream; Land Uses: suburban, forested

Other: fish, macrophytes

AMNET Site # **AN0378** *Stream Name:* **Millstone River**

Location: **Baird Rd; Millstone Twp; Monmouth County**

Collection Date: ***8/25/2009*** *USGS Topo Map:* **Roosevelt**

	Genus	Tolerance Value	Amount
	Polypedilum	6	16
*	Cheumatopsyche	5	14
*	Maccaffertium	3	11
	Sphaeriidae	8	11
	Macronychus	2	10
	Simulium	6	7
*	Hydropsyche	4	6
	Nais	8	6
	Dubiraphia	6	4
	Aulodrilus	8	2
	Brillia	5	2
	Calopteryx	6	2
	Rheocricotopus	6	2
	Stenelmis	5	2
	Ancyronyx	2	1
*	Lype	2	1
	Phaenopsectra	7	1
	Rheotanytarsus	6	1
	Thienemannimyia	6	1

** (EPT organism)* *Taxa Richness:* 19 *Population:* 100

%Dominance / Dominant Taxon(s): 16.0% Polypedilum

Hilsenhoff Biotic Index (HBI): 5.28 *%Clingers:* 58.00%

** E+P+T:* 4 (1) Ephemeroptera, ( ) Plecoptera, (3) Trichoptera *%Ephemeroptera:* 11.00%

CPMI Rating: **18 Good**

Habitat Analysis: 137 Suboptimal USEPA Protocol

Observations: Water temp: 21.57 C; Cond: 155 umhos; DO: 7.02 mg/L; pH: 6.65 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 11' / < 1'; Substrate: sand, silt, snags, root mats, undercut banks

Canopy: mostly closed; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses

Stream Gradient: Low Gradient Stream; Land Uses: rural

Other: crayfish

AMNET Site # **AN0379** *Stream Name:* **Millstone River**

Location: **Rt 33; Millstone Twp; Monmouth County**

Collection Date: ***8/25/2009*** *USGS Topo Map:* **Jamesburg**

	Genus	*Tolerance Value*	*Amount*
	Polypedilum	6	15
	Spirosperma	10	12
	Pisidium	6.8	11
*	Maccaffertium	3	10
	Caecidotea	8	7
	Simulium	6	5
	Tanytarsus	6	5
	Macronychus	2	4
	Brillia	5	3
	Gomphus	5	3
*	Hydropsyche	4	3
	Prostoma	7	3
*	Cheumatopsyche	5	2
	Dubiraphia	6	2
	Phaenopsectra	7	2
	Rheopelopia	4	2
	Tubifex	10	2
	Cardiocladius	5	1
	Cryptochironomus	8	1
	Cura	4	1
	Hemerodromia	6	1
	Nais	8	1
*	Oecetis	8	1
	Oulimnius	4	1
*	Polycentropus	6	1
	Rhagovelia	9	1

** (EPT organism)* *Taxa Richness:* 26 *Population:* 100

%Dominance / Dominant Taxon(s): 15.0% Polypedilum

Hilsenhoff Biotic Index (HBI): 6.24 *%Clingers:* 31.00%

** E+P+T:* 5 (1) Ephemeroptera, ( ) Plecoptera, (4) Trichoptera *%Ephemeroptera:* 10.00%

CPMI Rating: **14 Good**

Habitat Analysis: 112 Suboptimal USEPA Protocol

Observations: Water temp: 20.83 C; Cond: 169 umhos; DO: 6.41 mg/L; pH: 6.42 SU

Clarity: turbid; Flow Rate: slow; Width/Depth: 21' / 2'; Substrate: sand, mud, silt, snags, root mats

Canopy: mostly closed; Bank Stability: fair; Bank Vegetation: trees, shrubs, grasses

Stream Gradient: Low Gradient Stream; Land Uses: rural

Other: crayfish, beaver dam

AMNET Site # **AN0380** *Stream Name:* **Rocky Bk**

Location: **Perrineville Rd (Sweetman's Ln); Millstone Twp; Monmouth County**

Collection Date: ***8/25/2009*** *USGS Topo Map:* **Roosevelt**

	Genus	*Tolerance Value*	*Amount*
	Amnicola	4.8	21
	Gammarus	6	21
	Dugesia	4	13
	Polypedilum	6	9
	Musculium	5	6
*	Cheumatopsyche	5	5
*	Hydroptila	6	4
	Tanytarsus	6	4
*	Caenis	7	2
	Nais	8	2
	Stylaria	8	2
*	Callibaetis	9	1
	Campeloma	7	1
	Dero	10	1
	Dicrotendipes	8	1
	Hyalella	8	1
	Lirceus	8	1
*	Mystacides	4	1
*	Oxyethira	3	1
	Pedicia	6	1
	Prostoma	7	1
	Slavina	7	1

** (EPT organism)* *Taxa Richness:* 22 *Population:* 100

%Dominance / Dominant Taxon(s): 21.0% Amnicola & Gammarus

Hilsenhoff Biotic Index (HBI): 5.59 *%Clingers:* 9.00%

** E+P+T:* 6 (2) Ephemeroptera, ( ) Plecoptera, (4) Trichoptera *%Ephemeroptera:* 3.00%

CPMI Rating: **10 Fair**

Habitat Analysis: 130 Suboptimal USEPA Protocol

Observations: Water temp: 26.40 C; Cond: 169 umhos; DO: 7.58 mg/L; pH: 7.01 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 22' / < 1'; Substrate: cobble, gravel, sand, root mats, undercut banks

Canopy: mostly closed; Bank Stability: fair; Bank Vegetation: trees, shrubs

Stream Gradient: Low Gradient Stream; Land Uses: rural, forested

Downstream of Impoundment: below dam

Other: fish, frogs, clams / mussels, macrophytes

AMNET Site # **AN0381** ***Stream Name:*** **Rocky Bk**

Location: **Main St; Hightstown Boro; Mercer County**

Collection Date: ***9/22/2009*** ***USGS Topo Map:*** **Hightstown**

	Genus	*Tolerance Value*	*Amount*
	Gammarus	6	19
	Amnicola	4.8	16
	Pisidium	6.8	14
	Musculium	5	13
	Dugesia	4	10
	Rheotanytarsus	6	7
*	Cheumatopsyche	5	5
	Corbicula	4	5
	Hemerodromia	6	2
	Limnodrilus	10	2
	Coenagrionidae	9	1
	Dero	10	1
*	Hydropsyche	4	1
	Menetus	6	1
	Paratanytarsus	6	1
	Planorbidae	6	1
	Prostoma	7	1

** (EPT organism)* *Taxa Richness:* 17 *Population:* 100

%Dominance / Dominant Taxon(s): 19.0% Gammarus

Hilsenhoff Biotic Index (HBI): 5.58 *%Clingers:* 13.00%

** E+P+T:* 2 ( ) Ephemeroptera, ( ) Plecoptera, (2) Trichoptera *%Ephemeroptera:* 0.00%

CPMI Rating: **8 Fair**

Habitat Analysis: 115 Suboptimal USEPA Protocol

Observations: Water temp: 18.99 C; Cond: 217 umhos; DO: 8.73 mg/L; pH: 7.08 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 27' / < 1'; Substrate: cobble, gravel, sand

Canopy: mostly closed; Bank Stability: fair; Bank Vegetation: trees, shrubs, grasses

Stream Gradient: Low Gradient Stream; Land Uses: urban

Pipes / Ditches: storm sewers

Downstream of Impoundment: Peddie Lake

Other: fish, clams / mussels, macrophytes, periphytes, waterfowl (ducks); parking lots on both banks

AMNET Site # **AN0382** *Stream Name:* **Millstone River**

Location: **Grovers Mill Rd; West Windsor Twp; Mercer & Middlesex County**

Collection Date: ***9/29/2009*** *USGS Topo Map:* **Hightstown**

	Genus	Tolerance Value	Amount
	Gammarus	6	40
	Planorbidae	6	9
	Dubiraphia	6	8
	Amnicola	4.8	5
	Corbicula	4	4
	Ischnura	9	4
	Physella	9.1	4
*	Pseudocloeon	4	4
	Argia	6	3
	Paraponyx	5	3
*	Acentrella	4	2
	Calopteryx	6	2
	Pisidium	6.8	2
	Tribelos	5	2
	Labrundinia	7	1
	Libellulidae	9	1
	Limnodrilus	10	1
	Macronychus	2	1
*	Nectopsyche	3	1
	Paratanytarsus	6	1
	Prostoma	7	1
	Tubifex	10	1

** (EPT organism)* *Taxa Richness:* 22 *Population:* 100

%Dominance / Dominant Taxon(s): 40.0% Gammarus

Hilsenhoff Biotic Index (HBI): 6.01 *%Clingers:* 12.00%

** E+P+T:* 3 (2) Ephemeroptera, ( ) Plecoptera, (1) Trichoptera *%Ephemeroptera:* 6.00%

CPMI Rating: **8 Fair**

Habitat Analysis: 167 Optimal USEPA Protocol

Observations: Water temp: 17.23 C; Cond: 190 umhos; DO: 5.97 mg/L; pH: 6.59 SU

Clarity: turbid; Flow Rate: moderate; Width/Depth: 90' / > 3'; Substrate: gravel, sand, undercut banks

Canopy: mostly open; Bank Stability: good; Bank Vegetation: trees, shrubs, weeds

Stream Gradient: Low Gradient Stream; Land Uses: forested

Other: turtle, macrophytes; flooded banks, Gage: 3.70

AMNET Site # **AN0382B** *Stream Name:* **Millstone River**

Location: **Rt 535; East Windsor Twp; Mercer & Middlesex County**

Collection Date: ***9/29/2009*** *USGS Topo Map:* **Hightstown**

	Genus	*Tolerance Value*	*Amount*
	Limnodrilus	10	21
	Gammarus	6	17
	Dubiraphia	6	13
	Tribelos	5	10
	Amnicola	4.8	5
	Corbicula	4	5
	Tubifex	10	5
	Ischnura	9	3
	Pisidium	6.8	3
	Corixidae	9	2
	Dugesia	4	2
	Quistradrilus	10	2
*	Triaenodes	6	2
*	Cheumatopsyche	5	1
	Chrysops	6	1
	Clinotanypus	8	1
	Erpobdellidae	8	1
	Lumbriculidae	8	1
	Lymnaeidae	6	1
	Macronychus	2	1
*	Oecetis	8	1
	Paraponyx	5	1
	Planorbidae	6	1

** (EPT organism)* *Taxa Richness:* 23 *Population:* 100

%Dominance / Dominant Taxon(s): 21.0% Limnodrilus

Hilsenhoff Biotic Index (HBI): 7.01 *%Clingers:* 16.00%

** E+P+T:* 3 ( ) Ephemeroptera, ( ) Plecoptera, (3) Trichoptera *%Ephemeroptera:* 0.00%

CPMI Rating: **6 Fair**

Habitat Analysis: 149 Suboptimal USEPA Protocol

Observations: Water temp: 16.46 C; Cond: 183 umhos; DO: 5.93 mg/L; pH: 6.47 SU

Clarity: turbid; Flow Rate: moderate; Width/Depth: 61' / > 4'; Substrate: mud

Canopy: mostly closed; Bank Stability: fair; Bank Vegetation: trees, weeds, vines

Stream Gradient: Low Gradient Stream; Land Uses: rural

Pipes / Ditches: storm sewers

Other: macrophytes; trash, floatables

AMNET Site # **AN0382D** *Stream Name:* **Millstone River**

Location: **Applegarth Rd; Monroe Twp; Middlesex County**

Collection Date: ***9/22/2009*** *USGS Topo Map:* **Jamesburg**

	Genus	*Tolerance Value*	*Amount*
	Ischnura	9	19
	Sphaeriidae	8	17
	Culicoides	10	12
	Limnodrilus	10	11
	Tribelos	5	8
	Clinotanypus	8	4
	Dugesia	4	4
	Libellulidae	9	4
	Berosus	5	3
	Tubifex	10	3
	Aulodrilus	8	1
	Caecidotea	8	1
	Cladopelma	8	1
	Corixidae	9	1
	Cryptochironomus	8	1
	Culex	8	1
	Dicrotendipes	8	1
	Dubiraphia	6	1
	Nanocladius	3	1
*	Neureclipsis	7	1
	Perithemis	4	1
	Physella	9.1	1
	Prostoma	7	1
	Tanytarsus	6	1
	Tetragoneuria	8.5	1

** (EPT organism)* *Taxa Richness:* 25 *Population:* 100

%Dominance / Dominant Taxon(s): 19.0% Ischnura

Hilsenhoff Biotic Index (HBI): 8.14 *%Clingers:* 2.00%

** E+P+T:* 1 ( ) Ephemeroptera, ( ) Plecoptera, (1) Trichoptera *%Ephemeroptera:* 0.00%

CPMI Rating: **4 Poor**

Habitat Analysis: 125 Suboptimal USEPA Protocol

Observations: Water temp: 16.03 C; Cond: 204 umhos; DO: 7.45 mg/L; pH: 6.28 SU

Clarity: turbid; Flow Rate: slow; Width/Depth: 33' / > 3'; Substrate: sand, silt, snags, root mats

Canopy: partly open; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses

Stream Gradient: Low Gradient Stream; Land Uses: rural

Other: macrophytes, waterfowl (geese); Fire station on left bank

AMNET Site # **AN0383** ***Stream Name:*** **Big Bear Bk**

Location: **Old Trenton Rd; West Windsor Twp; Mercer County**

Collection Date: ***9/29/2009*** ***USGS Topo Map:*** **Hightstown**

	Genus	Tolerance Value	Amount
*	Cheumatopsyche	5	35
	Amnicola	4.8	12
	Valvata	2	12
*	Hydropsyche	4	10
*	Mystacides	4	6
	Enallagma	9	4
	Stenelmis	5	4
	Cura	4	3
	Tribelos	5	3
	Polypedilum	6	2
	Tipula	4	2
	Berosus	5	1
	Chironomus	10	1
	Cryptochironomus	8	1
	Helisoma	7	1
	Limnodrilus	10	1
	Microtendipes	7	1
	Rheotanytarsus	6	1

** (EPT organism)* *Taxa Richness:* 18 *Population:* 100

%Dominance / Dominant Taxon(s): 35.0% Cheumatopsyche

Hilsenhoff Biotic Index (HBI): 4.77 *%Clingers:* 51.00%

** E+P+T:* 3 ( ) Ephemeroptera, ( ) Plecoptera, (3) Trichoptera *%Ephemeroptera:* 0.00%

CPMI Rating: **14 Good**

Habitat Analysis: 163 Optimal USEPA Protocol

Observations: Water temp: 15.65 C; Cond: 160 umhos; DO: 6.74 mg/L; pH: 6.69 SU

Clarity: slightly turbid; Flow Rate: moderate; Width/Depth: 22' / < 1'; Substrate: cobble, gravel, sand, mud

Canopy: mostly closed; Bank Stability: good; Bank Vegetation: trees, grasses, weeds

Stream Gradient: Low Gradient Stream; Land Uses: suburban, forested, agriculture-cropland

Pipes / Ditches: storm sewers

Other: macrophytes, periphytes; new bridge in 2008

AMNET Site # **AN0384** *Stream Name:* **Bear Bk**

Location: **Cranbury Rd (Rt 615); West Windsor Twp; Mercer County**

Collection Date: ***9/29/2009*** *USGS Topo Map:* **Hightstown**

	Genus	*Tolerance Value*	*Amount*
	Gammarus	6	44
*	Cheumatopsyche	5	17
	Rheotanytarsus	6	11
	Corbicula	4	5
	Glyptotendipes	10	3
	Musculium	5	3
	Pisidium	6.8	3
	Amnicola	4.8	2
	Caecidotea	8	2
	Stenelmis	5	2
	Clinocera	6	1
	Cura	4	1
	Gloiobdella	6	1
*	Hydropsyche	4	1
	Limnodrilus	10	1
	Menetus	6	1
	Physa	8	1
	Polypedilum	6	1

** (EPT organism)* *Taxa Richness:* 18 *Population:* 100

%Dominance / Dominant Taxon(s): 44.0% Gammarus

Hilsenhoff Biotic Index (HBI): 5.86 *%Clingers:* 32.00%

** E+P+T:* 2 ( ) Ephemeroptera, ( ) Plecoptera, (2) Trichoptera *%Ephemeroptera:* 0.00%

CPMI Rating: **10 Fair**

Habitat Analysis: 159 Suboptimal USEPA Protocol

Observations: Water temp: 18.06 C; Cond: 148 umhos; DO: 7.11 mg/L; pH: 6.56 SU

Clarity: slightly turbid; Flow Rate: fast; Width/Depth: 30' / < 1'; Substrate: cobble, gravel, sand

Canopy: partly open; Bank Stability: good; Bank Vegetation: trees, weeds, vines, lawn

Stream Gradient: Low Gradient Stream; Land Uses: suburban, forested

Pipes / Ditches: storm sewers

Other: macrophytes

AMNET Site # **AN0385** ***Stream Name:*** **Cranbury Bk**

Location: **Applegarth Rd; Monroe Twp; Middlesex County**

Collection Date: ***9/22/2009*** ***USGS Topo Map:*** **Jamesburg**

	Genus	*Tolerance Value*	*Amount*
	Tribelos	5	36
	Stylaria	8	25
	Phaenopsectra	7	6
	Microtendipes	7	3
	Ancyronyx	2	2
	Caecidotea	8	2
	Coenagrionidae	9	2
	Cricotopus	7	2
	Dubiraphia	6	2
*	Mystacides	4	2
*	Oecetis	8	2
	Ablabesmyia	8	1
	Brillia	5	1
	Calopteryx	6	1
*	Cheumatopsyche	5	1
	Dicrotendipes	8	1
	Glyptotendipes	10	1
	Hyalella	8	1
	Polypedilum	6	1
	Procladius	9	1
*	Pseudocloeon	4	1
*	Ptilostomis	5	1
	Rheotanytarsus	6	1
	Sphaeriidae	8	1
	Stenochironomus	5	1
	Tanytarsus	6	1
	Thienemannimyia	6	1

** (EPT organism)* *Taxa Richness:* 27 *Population:* 100

%Dominance / Dominant Taxon(s): 36.0% Tribelos

Hilsenhoff Biotic Index (HBI): 6.36 *%Clingers:* 19.00%

** E+P+T:* 5 (1) Ephemeroptera, ( ) Plecoptera, (4) Trichoptera *%Ephemeroptera:* 1.00%

CPMI Rating: **12 Good**

Habitat Analysis: 144 Suboptimal USEPA Protocol

Observations: Water temp: 15.50 C; Cond: 227 umhos; DO: 8.19 mg/L; pH: 6.35 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 14' / < 1'; Substrate: gravel, sand

Canopy: closed; Bank Stability: good; Bank Vegetation: trees, shrubs

Stream Gradient: Low Gradient Stream; Land Uses: rural

Pipes / Ditches: storm sewers

Other: frogs, macrophytes, periphytes, filamentous algae, orange floc

AMNET Site # **AN0386** ***Stream Name:*** **Cranbury Bk**

Location: **Maple Ave; Plainsboro Twp; Middlesex County**

Collection Date: ***9/29/2009*** ***USGS Topo Map:*** **Hightstown**

	Genus	*Tolerance Value*	*Amount*
	Glyptotendipes	10	27
	Rheotanytarsus	6	20
	Cura	4	11
	Nais	8	9
	Prostoma	7	6
	Gammarus	6	4
	Nematoda	6	4
	Simulium	6	4
	Amnicola	4.8	3
	Musculium	5	3
	Tubifex	10	2
*	Cheumatopsyche	5	1
	Dicrotendipes	8	1
	Helisoma	7	1
	Phaenopsectra	7	1
	Pristina	8	1
	Sphaerium	8	1
	Stenelmis	5	1

** (EPT organism)* *Taxa Richness:* 18 *Population:* 100

%Dominance / Dominant Taxon(s): 27.0% Glyptotendipes

Hilsenhoff Biotic Index (HBI): 7.17 *%Clingers:* 27.00%

** E+P+T:* 1 ( ) Ephemeroptera, ( ) Plecoptera, (1) Trichoptera *%Ephemeroptera:* 0.00%

CPMI Rating: **8** **Fair**

Habitat Analysis: 153 Suboptimal USEPA Protocol

Observations: Water temp: 17.69 C; Cond: 181 umhos; DO: 7.30 mg/L; pH: 6.48 SU

Clarity: turbid; Flow Rate: moderate; Width/Depth: 23' / 2-3'; Substrate: gravel

Canopy: open; Bank Stability: good; Bank Vegetation: trees, shrubs, weeds

Stream Gradient: Low Gradient Stream; Land Uses: suburban, park

Downstream of Impoundment: Plainsboro Pond

Other: macrophytes; fishermen, flooded banks, gabion along LB

AMNET Site # **AN0387** ***Stream Name:*** **Devils Bk**

Location: **New Rd; South Brunswick Twp; Middlesex County**

Collection Date: ***9/22/2009*** ***USGS Topo Map:*** **Hightstown**

	Genus	*Tolerance Value*	*Amount*
	Gammarus	6	23
	Caecidotea	8	16
	Paratanytarsus	6	12
	Pristina	8	10
	Rheotanytarsus	6	8
	Stylaria	8	5
	Tanytarsus	6	5
	Dubiraphia	6	4
*	Cheumatopsyche	5	3
	Tribelos	5	3
	Musculium	5	2
	Nais	8	2
	Ablabesmyia	8	1
*	Caenis	7	1
	Enallagma	9	1
	Microtendipes	7	1
	Rheopelopia	4	1
	Stenelmis	5	1
	Stenochironomus	5	1

** (EPT organism)* *Taxa Richness:* 19 *Population:* 100

%Dominance / Dominant Taxon(s): 23.0% Gammarus

Hilsenhoff Biotic Index (HBI): 6.61 *%Clingers:* 17.00%

** E+P+T:* 2 (1) Ephemeroptera, ( ) Plecoptera, (1) Trichoptera *%Ephemeroptera:* 1.00%

CPMI Rating: **8 Fair**

Habitat Analysis: 152 Suboptimal USEPA Protocol

Observations: Water temp: 14.92 C; Cond: 136 umhos; DO: 2.12 mg/L; pH: 6.36 SU

Clarity: clear, cedar brown; Flow Rate: slow; Width/Depth: 5' / < 1'; Substrate: gravel, sand

Canopy: mostly closed; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses

Stream Gradient: Low Gradient Stream; Land Uses: rural, forested, "South Brunswick Open Space"

Other: fish, frogs, macrophytes, periphytes; gravel parking lot on LB; baseball field on RB

AMNET Site # **AN0388** *Stream Name:* **Shallow Bk**

Location: **Scotts Corner Rd; South Brunswick Twp; Middlesex County**

Collection Date: ***9/22/2009*** *USGS Topo Map:* **Hightstown**

	Genus	Tolerance Value	Amount
	Hyalella	8	37
	Enallagma	9	16
	Chironomus	10	9
	Polypedilum	6	6
	Aedes	8	3
	Erythemis	10	3
	Nais	8	3
	Sympetrum	4	3
*	Baetis	6	2
	Bezzia	6	2
	Dero	10	2
	Musculium	5	2
	Tubifex	10	2
	Alboglossiphonia	8	1
*	Caenis	7	1
	Helobdella	8	1
	Nematoda	6	1
	Omisus	6	1
	Peltodytes	5	1
	Pisidium	6.8	1
	Pristinella	10	1
	Procladius	9	1
	Tanytarsus	6	1

** (EPT organism)* *Taxa Richness:* 23 *Population:* 100

%Dominance / Dominant Taxon(s): 37.0% Hyalella

Hilsenhoff Biotic Index (HBI): 8.02 *%Clingers:* 0.00%

** E+P+T:* 2 (2) Ephemeroptera, ( ) Plecoptera, ( ) Trichoptera *%Ephemeroptera:* 3.00%

CPMI Rating: **4 Poor**

Habitat Analysis: 119 Suboptimal USEPA Protocol

Observations: Water temp: 17.14 C; Cond: 107 umhos; DO: 0.36 mg/L; pH: 5.91 SU

Clarity: clear, cedar brown; Flow Rate: slow; Width/Depth: 12' / 2'; Substrate: gravel, sand, silt, snags

Canopy: mostly open; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses

Stream Gradient: Low Gradient Stream; Land Uses: rural, forested

Pipes / Ditches: storm sewers

Downstream of Impoundment: small dam

Other: macrophytes; surrounded by wetlands, power line easement crosses stream

AMNET Site # **AN0390** *Stream Name:* **Camp Harmony Br of Stony Bk**

Location: **VanDyke Rd; Hopewell Twp; Mercer County**

Collection Date: ***10/19/2009*** *USGS Topo Map:* **Hopewell**

	Genus	Tolerance Value	Amount
	Sphaeriidae	8	27
*	Cheumatopsyche	5	14
	Psephenus	4	11
	Stenelmis	5	9
	Tipulidae	3	5
	Microtendipes	7	4
*	Hydropsyche	4	3
	Limnodrilus	10	3
*	Stenacron	4	3
	Thienemannimyia	6	3
*	Centroptilum	2	2
	Chironomini	6	2
	Nigronia	2	2
	Tanytarsini	6	2
	Tvetenia	5	2
	Brillia	5	1
*	Chimarra	4	1
	Crangonyx	8	1
	Lumbriculidae	8	1
*	Lype	2	1
*	Paraleptophlebia	1	1
	Parametriocnemus	5	1
	Sialis	4	1

** (EPT organism)* *Taxa Richness:* 23 *Population:* 100

Hilsenhoff Biotic Index (HBI):	5.69	*# Scrapers:*	3
% Sensitive EPT:	8.0%	*Attribute 2 genera:*	2
% Non-Insect Taxa:	17.4%	*Attribute 3 genera:*	3
HGMI Rating:	**40.70**	**Fair**	
Habitat Analysis:	166	Optimal	USEPA Protocol

Observations: Water temp: 6.72 C; Cond: 186 umhos; DO: 7.82 mg/L; pH: 8.07 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 18' / < 1'; Substrate: cobble, gravel, sand

Canopy: mostly closed; Bank Stability: good; Bank Vegetation: trees, shrubs, weeds

Stream Gradient: High Gradient Stream; Land Uses: forested

Other: macrophytes, periphytes

AMNET Site # **AN0391** *Stream Name:* **Stony Bk**

Location: **Mine Rd; Hopewell Twp; Mercer County**

Collection Date: ***10/19/2009*** *USGS Topo Map:* **Pennington**

	Genus	Tolerance Value	Amount
*	Chimarra	4	25
	Dugesia	4	17
*	Baetis	6	15
*	Cheumatopsyche	5	13
	Stenelmis	5	8
*	Hydropsyche	4	7
	Microtendipes	7	2
	Antocha	3	1
*	Ceratopsyche	4	1
	Crangonyx	8	1
	Cricotopus	7	1
	Gammarus	6	1
	Hemerodromia	6	1
*	Heptageniidae	4	1
*	Maccaffertium	3	1
	Nais	8	1
	Psephenus	4	1
	Simulium	6	1
*	Stenacron	4	1
	Tvetenia	5	1

** (EPT organism)* *Taxa Richness:* 20 *Population:* 100

Hilsenhoff Biotic Index (HBI): 4.73 *# Scrapers:* 5

% Sensitive EPT: 43.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 20.0% *Attribute 3 genera:* 2

HGMI Rating: **47.33** **Good**

Habitat Analysis: 147 Suboptimal USEPA Protocol

Observations: Water temp: 6.69 C; Cond: 220 umhos; DO: 10.87 mg/L; pH: 7.24 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 58' / 1'; Substrate: cobble, gravel, sand

Canopy: mostly open; Bank Stability: fair; Bank Vegetation: trees, shrubs, grasses

Stream Gradient: High Gradient Stream; Land Uses: rural (horse farm on RB)

Other: crayfish, periphytes, filamentous algae

AMNET Site # **AN0392** *Stream Name:* **Stony Bk**

Location: **Old Mill Rd; Pennington Boro; Mercer County**

Collection Date: ***10/19/2009*** *USGS Topo Map:* **Pennington**

	Genus	Tolerance Value	Amount
*	Cheumatopsyche	5	22
*	Hydropsyche	4	18
*	Chimarra	4	15
	Stenelmis	5	10
*	Maccaffertium	3	8
	Cura	4	6
	Psephenus	4	4
	Pisidium	6.8	3
*	Baetis	6	2
	Gammarus	6	2
*	Isonychia	2	2
	Dicrotendipes	8	1
	Eclipidrilus	8	1
	Helobdella	8	1
	Laevapex	6	1
	Orthocladiinae	5	1
*	Polycentropus	6	1
	Polypedilum	6	1
	Simulium	6	1

** (EPT organism)* *Taxa Richness:* 19 *Popou Population:* 100

Hilsenhoff Biotic Index (HBI): 4.57 *# Scrapers:* 4

% Sensitive EPT: 28.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 31.6% *Attribute 3 genera:* 3

HGMI Rating: **42.10** **Good**

Habitat Analysis: 157 Suboptimal USEPA Protocol

Observations: Water temp: 7.36 C; Cond: 267 umhos; DO: 9.99 mg/L; pH: 7.79 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 56' / < 1'; Substrate: cobble, gravel, sand

Canopy: partly open; Bank Stability: good; Bank Vegetation: trees, shrubs, weeds, lawn

Stream Gradient: High Gradient Stream; Land Uses: forested

Other: fish, crayfish, waterfowl (ducks); "trout stocked" stream sign, bridge closed to traffic

AMNET Site # **AN0393** *Stream Name:* **Stony Bk**

Location: **Rt 206; Princeton Twp; Mercer County**

Collection Date: ***10/19/2009*** *USGS Topo Map:* **Princeton**

	Genus	Tolerance Value	Amount
*	Cheumatopsyche	5	22
	Cricotopus	7	15
*	Baetis	6	11
*	Maccaffertium	3	10
*	Chimarra	4	9
	Stenelmis	5	8
	Simulium	6	6
*	Hydropsyche	4	4
*	Isonychia	2	2
	Rheotanytarsus	6	2
	Amnicola	4.8	1
	Argia	6	1
*	Ceratopsyche	4	1
	Dugesia	4	1
	Gammarus	6	1
	Optioservus	4	1
	Pisidium	6.8	1
	Psephenus	4	1
*	Stenacron	4	1
	Stylaria	8	1
	Tvetenia	5	1

** (EPT organism)* *Taxa Richness:* 21 *Population:* 100

Hilsenhoff Biotic Index (HBI): 5.12 *# Scrapers:* 5

% Sensitive EPT: 33.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 23.8% *Attribute 3 genera:* 3

HGMI Rating: **46.04** **Good**

Habitat Analysis: 154 Suboptimal USEPA Protocol

Observations: Water temp: 7.27 C; Cond: 264 umhos; DO: 11.48 mg/L; pH: 7.64 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 69' / < 1 - 1'; Substrate: cobble, gravel, sand

Canopy: mostly open; Bank Stability: poor; Bank Vegetation: trees, shrubs, weeds

Stream Gradient: High Gradient Stream; Land Uses: suburban

Other: periphytes; USGS gage station

AMNET Site # **AN0394** *Stream Name:* **Duck Pond Run**

Location: **Rt 1; West Windsor Twp; Mercer County**

Collection Date: ***10/8/2009*** *USGS Topo Map:* **Princeton**

	Genus	Tolerance Value	Amount
	Gammarus	6	59
*	Cheumatopsyche	5	16
	Rheotanytarsus	6	8
	Amnicola	4.8	6
	Calopteryx	6	5
	Polypedilum	6	3
	Stenelmis	5	2
	Simulium	6	1

** (EPT organism)* *Taxa Richness:* 8 *Population:* 100

Hilsenhoff Biotic Index (HBI):	5.75	*# Scrapers:*	2
% Sensitive EPT:	0.0%	*Attribute 2 genera:*	0
% Non-Insect Taxa:	25.0%	*Attribute 3 genera:*	0
HGMI Rating:	**20.02**	**Poor**	
Habitat Analysis:	116	Suboptimal	USEPA Protocol

Observations: Water temp: 13.20 C; Cond: 271 umhos; DO: 7.20 mg/L; pH: 6.58 SU

Clarity: clear; Flow Rate: slow; Width/Depth: 15' / 1'; Substrate: cobble, gravel, sand, silt

Canopy: partly open; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses

Stream Gradient: High Gradient Stream; Land Uses: urban

Other: fish, salamander, macrophytes, periphytes, heron

AMNET Site # **AN0395** *Stream Name:* **Heathcote Bk**

Location: **Stouts Ln; South Brunswick Twp; Middlesex County**

Collection Date: ***10/29/2009*** *USGS Topo Map:* **Monmouth Junction**

	Genus	Tolerance Value	Amount
*	Hydropsyche	4	51
*	Cheumatopsyche	5	19
*	Chimarra	4	10
	Gammarus	6	7
	Physella	9.1	5
	Tipula	4	4
	Lumbricidae	10	3
	Microvelia	6	1

** (EPT organism)* *Taxa Richness:* 8 *Population:* 100

Hilsenhoff Biotic Index (HBI):	4.79	*# Scrapers:*	1
% Sensitive EPT:	10.0%	*Attribute 2 genera:*	0
% Non-Insect Taxa:	37.5%	*Attribute 3 genera:*	2
HGMI Rating:	**23.46**	**Fair**	
Habitat Analysis:	120	Suboptimal	USEPA Protocol

Observations: Water temp: 13.23 C; Cond: 370 umhos; DO: 9.17 mg/L; pH: 7.35 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 11' / < 1'; Substrate: cobble, gravel, sand

Canopy: mostly open; Bank Stability: fair; Bank Vegetation: trees, shrubs, grasses

Stream Gradient: High Gradient Stream; Land Uses: urban

Pipes / Ditches: storm sewers

Other: salamander, periphytes, filamentous algae; site adjacent to new shopping center

AMNET Site # **AN0396** *Stream Name:* **Heathcote Bk**

Location: **Academy St; South Brunswick Twp; Middlesex County**

Collection Date: ***10/29/2009*** *USGS Topo Map:* **Hightstown**

	Genus	*Tolerance Value*	*Amount*
	Gammarus	6	20
	Stenelmis	5	14
*	Hydropsyche	4	11
*	Cheumatopsyche	5	9
*	Chimarra	4	9
	Amnicola	4.8	7
	Nais	8	5
	Dugesia	4	3
	Dubiraphia	6	2
*	Glossosoma	0	2
*	Lepidostoma	1	2
	Microtendipes	7	2
	Optioservus	4	2
	Rheotanytarsus	6	2
	Caecidotea	8	1
	Corynoneura	4	1
	Naididae	7	1
	Orthocladiinae	5	1
	Oulimnius	4	1
	Planorbidae	6	1
	Psephenus	4	1
	Tanytarsini	6	1
	Tipula	4	1
	Tribelos	5	1

** (EPT organism)* *Taxa Richness:* 24 *Population:* 100

Hilsenhoff Biotic Index (HBI):	5.02	*# Scrapers:*	7
% Sensitive EPT:	13.0%	*Attribute 2 genera:*	2
% Non-Insect Taxa:	29.2%	*Attribute 3 genera:*	1
HGMI Rating:	**43.74**	**Good**	
Habitat Analysis:	140	Suboptimal	USEPA Protocol

Observations: Water temp: 12.32 C; Cond: 161 umhos; DO: 7.23 mg/L; pH: 6.43 SU

Clarity: clear, brownish; Flow Rate: fast; Width/Depth: 35' / 3'; Substrate: cobble, gravel, sand, root mats

Canopy: mostly open; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses

Stream Gradient: High Gradient Stream; Land Uses: suburban

Pipes / Ditches: storm sewers

Other: clams / mussels, macrophytes; USGS gage

AMNET Site # **AN0397** *Stream Name:* **Millstone River**

Location: **outlet of Carnegie Lake off Rt 27; South Brunswick Twp; Middlesex & Mercer County**

Collection Date: ***11/17/2009*** *USGS Topo Map:* **Hightstown**

	Genus	Tolerance Value	Amount
	Gammarus	6	38
	Lirceus	8	16
	Musculium	5	15
*	Cheumatopsyche	5	7
*	Hydropsyche	4	6
	Dugesia	4	3
	Rheotanytarsus	6	3
	Corbicula	4	2
	Menetus	6	2
	Stenelmis	5	2
	Caecidotea	8	1
	Glyptotendipes	10	1
	Hemerodromia	6	1
	Laevapex	6	1
	Ripistes	8	1
	Simulium	6	1

** (EPT organism)* *Taxa Richness:* 16 *Population:* 100

Hilsenhoff Biotic Index (HBI):	5.94	*# Scrapers:*	3
% Sensitive EPT:	0.0%	*Attribute 2 genera:*	0
% Non-Insect Taxa:	56.3%	*Attribute 3 genera:*	0
HGMI Rating:	**18.81**	**Poor**	
Habitat Analysis:	169	Optimal	USEPA Protocol

Observations: Water temp: 11.27 C; Cond: 267 umhos; DO: 10.59 mg/L; pH: 6.75 SU

Clarity: slightly turbid; Flow Rate: fast; Width/Depth: 30' / 2 - 3'; Substrate: cobble, gravel, sand, mud, snags, root mats

Canopy: partly open; Bank Stability: fair; Bank Vegetation: trees, shrubs, grasses, weeds, vines

Stream Gradient: High Gradient Stream; Land Uses: rural, forested

Downstream of Impoundment: Carnegie Lake

Other: fish, turtle, clams / mussels

AMNET Site # **AN0398** *Stream Name:* **Bedens Bk**

Location: **Aunt Molly Rd; Hopewell Twp; Mercer County**

Collection Date: ***10/19/2009*** *USGS Topo Map:* **Rocky Hill**

	Genus	*Tolerance Value*	*Amount*
*	Cheumatopsyche	5	12
	Rheotanytarsus	6	12
	Microtendipes	7	10
	Cricotopus	7	8
*	Hydropsyche	4	7
	Micropsectra	7	7
*	Stenacron	4	7
	Simulium	6	6
*	Baetis	6	3
	Nais	8	3
	Parametriocnemus	5	3
	Polypedilum	6	3
	Bezzia	6	2
	Branchiura	10	2
*	Chimarra	4	2
	Psephenus	4	2
	Tvetenia	5	2
*	Caenis	7	1
*	Ceratopsyche	4	1
	Dicrotendipes	8	1
	Eclipidrilus	8	1
*	Eurylophella	4	1
*	Maccaffertium	3	1
	Planariidae	4	1
	Stictochironomus	9	1
	Tanytarsus	6	1

** (EPT organism)* *Taxa Richness:* 26 *Population:* 100

Hilsenhoff Biotic Index (HBI): 5.85 *# Scrapers:* 4

% Sensitive EPT: 15.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 15.4% *Attribute 3 genera:* 4

HGMI Rating: **43.73** **Good**

Habitat Analysis: 147 Suboptimal USEPA Protocol

Observations: Water temp: 7.41 C; Cond: 258 umhos; DO: 10.48 mg/L; pH: 7.48 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 22' / < 1'; Substrate: cobble, gravel, sand

Canopy: open; Bank Stability: fair; Bank Vegetation: trees, shrubs, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: rural, forested

Other: fish, crayfish, macrophytes, periphytes, filamentous algae; near STP

AMNET Site # **AN0399** *Stream Name:* **Rock Bk**

Location: **Long Hill Rd; Montgomery Twp; Somerset County**

Collection Date: ***8/5/2009*** *USGS Topo Map:* **Rocky Hill**

	Genus	Tolerance Value	Amount
*	Hydropsyche	4	30
	Stenelmis	5	11
*	Acroneuria	0	10
	Psephenus	4	10
*	Cheumatopsyche	5	8
	Simulium	6	5
*	Maccaffertium	3	4
	Polypedilum	6	4
*	Chimarra	4	3
*	Baetis	6	2
	Cambarus	6	2
	Antocha	3	1
	Eclipidrilus	8	1
	Eukiefferiella	8	1
*	Glossosoma	0	1
	Hemerodromia	6	1
*	Leuctra	0	1
*	Micrasema	2	1
*	Mystacides	4	1
	Pisidium	6.8	1
	Rhagovelia	9	1
	Tipula	4	1

** (EPT organism)* *Taxa Richness:* 22 *Population:* 100

Hilsenhoff Biotic Index (HBI):	4.08	*# Scrapers:*	4
% Sensitive EPT:	23.0%	*Attribute 2 genera:*	2
% Non-Insect Taxa:	13.6%	*Attribute 3 genera:*	7
HGMI Rating:	**57.95**	**Good**	
Habitat Analysis:	176	Optimal	USEPA Protocol

Observations: Water temp: 20.82 C; Cond: 115 umhos; DO: 8.41 mg/L; pH: 7.45 SU

Clarity: clear; Flow Rate: fast; Width/Depth: 10' / < 1'; Substrate: cobble, gravel, sand

Canopy: partly open; Bank Stability: good; Bank Vegetation: trees, grasses

Stream Gradient: High Gradient Stream; Land Uses: rural, forested

Other: fish, crayfish, periphytes, "trout stocked" water; recent flooding

AMNET Site # **AN0400** *Stream Name:* **Rock Bk**

Location: **Burnt Mill Rd; Montgomery Twp; Somerset County**

Collection Date: ***8/5/2009*** *USGS Topo Map:* **Rocky Hill**

	Genus	Tolerance Value	Amount
	Gammarus	6	18
	Polypedilum	6	13
	Rheotanytarsus	6	8
*	Caenis	7	5
	Menetus	6	5
	Caecidotea	8	4
	Dubiraphia	6	4
	Trichocorixa	9	4
	Dicrotendipes	8	3
	Ischnura	9	3
*	Maccaffertium	3	3
	Stenelmis	5	3
	Trepobates	8	3
*	Cheumatopsyche	5	2
*	Hydropsyche	4	2
	Phaenopsectra	7	2
*	Stenacron	4	2
	Curculionidae	7	1
	Eclipidrilus	8	1
	Enchytraeidae	10	1
	Hemerodromia	6	1
	Hydrovatus	5	1
	Musculium	5	1
*	Mystacides	4	1
	Nais	8	1
	Prostoma	7	1
	Psephenus	4	1
	Somatochlora	1	1

** (EPT organism)* *Taxa Richness:* 28 *Population:* 95

Hilsenhoff Biotic Index (HBI): 6.26 *# Scrapers:* 7

% Sensitive EPT: 11.6% *Attribute 2 genera:* 1

% Non-Insect Taxa: 28.6% *Attribute 3 genera:* 2

HGMI Rating: **41.56** **Fair**

Habitat Analysis: 145 Suboptimal USEPA Protocol

Observations: Water temp: 23.21 C; Cond: 190 umhos; DO: 7.54 mg/L; pH: 7.27 SU

Clarity: slightly turbid; Flow Rate: slow; Width/Depth: 77' / 1 - 3'; Substrate: cobble, gravel, sand, root mats

Canopy: partly open; Bank Stability: good; Bank Vegetation: trees, grasses

Stream Gradient: High Gradient Stream; Land Uses: suburban

Pipes / Ditches: ditches

Other: fish (large carp), macrophytes; recent flooding

AMNET Site # **AN0401** *Stream Name:* **Bedens Bk**

Location: **Rt 206; Montgomery Twp; Somerset County**

Collection Date: ***8/5/2009*** *USGS Topo Map:* **Rocky Hill**

	Genus	Tolerance Value	Amount
*	Chimarra	4	33
	Stenelmis	5	24
	Simulium	6	8
	Cura	4	6
*	Cheumatopsyche	5	4
	Gammarus	6	4
	Hemerodromia	6	3
	Caecidotea	8	2
	Optioservus	4	2
	Prostoma	7	2
	Psephenus	4	2
	Rheotanytarsus	6	2
*	Caenis	7	1
*	Lepidostoma	1	1
*	Maccaffertium	3	1
	Parametriocnemus	5	1
	Polypedilum	6	1
	Prosimulium	2	1
	Rhagovelia	9	1
*	Stenonema	3	1

** (EPT organism)* *Taxa Richness:* 20 *Population:* 100

Hilsenhoff Biotic Index (HBI): 4.80 *# Scrapers:* 4

% Sensitive EPT: 37.0% *Attribute 2 genera:* 1

% Non-Insect Taxa: 20.0% *Attribute 3 genera:* 5

HGMI Rating: **52.11** **Good**

Habitat Analysis: 156 Suboptimal USEPA Protocol

Observations: Water temp: 22.71 C; Cond: 243 umhos; DO: 8.92 mg/L; pH: 7.38 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 53' / 1 - 2'; Substrate: cobble, gravel, sand

Canopy: mostly open; Bank Stability: good; Bank Vegetation: trees, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: suburban, forested

Pipes / Ditches: storm sewers

Other: fish, macrophytes, filamentous algae; recent flooding

AMNET Site # **AN0402** *Stream Name:* **Pike Run**

Location: **Rt 206; Montgomery Twp; Somerset County**

Collection Date: ***6/16/2009*** *USGS Topo Map:* **Rocky Hill**

	Genus	Tolerance Value	Amount
	Physella	9.1	28
	Gammarus	6	10
	Micropsectra	7	7
	Pisidium	6.8	7
	Ophidonais	7	5
	Polypedilum	6	5
	Stenelmis	5	5
	Caecidotea	8	4
	Tvetenia	5	4
*	Cheumatopsyche	5	2
	Lumbricina	6	2
	Musculium	5	2
	Parametriocnemus	5	2
	Psephenus	4	2
	Ancyronyx	2	1
	Brillia	5	1
*	Chimarra	4	1
	Corbicula	4	1
	Dicrotendipes	8	1
	Dugesia	4	1
	Enchytraeidae	10	1
	Eukiefferiella	8	1
	Nais	8	1
	Orthocladius	6	1
	Phaenopsectra	7	1
	Rheotanytarsus	6	1
	Simulium	6	1
	Thienemannimyia	6	1
	Tipula	4	1

** (EPT organism)* *Taxa Richness:* 29 *Population:* 100

Hilsenhoff Biotic Index (HBI): 6.91 *# Scrapers:* 4

% Sensitive EPT: 1.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 37.9% *Attribute 3 genera:* 2

HGMI Rating: **29.14** **Fair**

Habitat Analysis: 149 Suboptimal USEPA Protocol

Observations: Water temp: 17.04 C; Cond: 224 umhos; DO: 8.87 mg/L; pH: 7.12 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 18' / < 1'; Substrate: gravel, sand, snags, root mats, undercut banks

Canopy: mostly closed; Bank Stability: good; Bank Vegetation: trees, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: agriculture-cropland, suburban, forested

Pipes / Ditches: ditches

Other: mussels, periphytes; adj to pumping station

AMNET Site # **AN0403** *Stream Name:* **Cruser Bk**

Location: **Rt 206; Montgomery Twp; Somerset County**

Collection Date: ***6/16/2009*** *USGS Topo Map:* **Rocky Hill**

	Genus	Tolerance Value	Amount
	Gammarus	6	41
*	Perlesta	4	15
	Stictochironomus	9	11
*	Cheumatopsyche	5	6
	Corixidae	9	5
	Dicrotendipes	8	3
	Macronychus	2	2
	Ophidonais	7	2
	Peltodytes	5	2
	Ancyronyx	2	1
	Caecidotea	8	1
*	Caenis	7	1
	Ectopria	5	1
	Erpobdellidae	8	1
	Ischnura	9	1
	Lymnaeidae	6	1
	Microtendipes	7	1
	Phaenopsectra	7	1
	Physella	9.1	1
	Planorbidae	6	1
	Psephenus	4	1
	Stenelmis	5	1

** (EPT organism)* *Taxa Richness:* 22 *Population:* 100

Hilsenhoff Biotic Index (HBI): 6.15 *# Scrapers:* 8

% Sensitive EPT: 16.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 31.8% *Attribute 3 genera:* 1

HGMI Rating: **36.51** **Fair**

Habitat Analysis: 143 Suboptimal USEPA Protocol

Observations: Water temp: 16.72 C; Cond: 157 umhos; DO: 9.28 mg/L; pH: 7.24 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 10' / 1'; Substrate: gravel, sand, mud

Canopy: mostly open; Bank Stability: fair; Bank Vegetation: trees, shrubs, weeds

Stream Gradient: High Gradient Stream; Land Uses: suburban

Pipes / Ditches: ditches

Other: crayfish

AMNET Site # **AN0404** *Stream Name:* **Back Bk**

Location: **Rt 206; Montgomery Twp; Somerset County**

Collection Date: ***6/16/2009*** *USGS Topo Map:* **Rocky Hill**

	Genus	Tolerance Value	Amount
	Amnicola	4.8	23
	Stenelmis	5	18
	Caecidotea	8	10
	Polypedilum	6	7
	Pisidium	6.8	6
*	Chimarra	4	4
	Micropsectra	7	4
	Microtendipes	7	4
	Argia	6	2
*	Cheumatopsyche	5	2
	Gammarus	6	2
	Psephenus	4	2
*	Stenacron	4	2
	Stictochironomus	9	2
*	Caenis	7	1
	Dugesia	4	1
	Ectopria	5	1
	Gomphidae	1	1
	Ischnura	9	1
	Macronychus	2	1
	Nais	8	1
	Orthocladiinae	5	1
	Physella	9.1	1
	Prostoma	7	1
	Slavina	7	1
	Tanytarsus	6	1

** (EPT organism)* *Taxa Richness:* 26 *Population:* 100

Hilsenhoff Biotic Index (HBI): 5.73 *# Scrapers:* 7

% Sensitive EPT: 7.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 34.6% *Attribute 3 genera:* 1

HGMI Rating: **35.66** **Fair**

Habitat Analysis: 137 Suboptimal USEPA Protocol

Observations: Water temp: 17.36 C; Cond: 235 umhos; DO: 9.19 mg/L; pH: 7.17 SU

Clarity: slightly turbid; Flow Rate: moderate; Width/Depth: 15' / < 1'; Substrate: cobble, gravel, sand, mud, snags, root mats

Canopy: mostly closed; Bank Stability: fair; Bank Vegetation: trees, weeds

Stream Gradient: High Gradient Stream; Land Uses: agriculture-cropland, forested

Pipes / Ditches: ditch

Other: fish, eels, salamander, periphytes

AMNET Site # **AN0405** *Stream Name:* **Pike Run**

Location: **Rt 533; Montgomery Twp; Somerset County**

Collection Date: *8/6/2009* *USGS Topo Map:* **Rocky Hill**

	Genus	Tolerance Value	Amount
	Gammarus	6	62
	Polypedilum	6	6
*	Maccaffertium	3	5
	Stenelmis	5	5
*	Stenacron	4	3
	Caecidotea	8	2
	Corbicula	4	2
	Dubiraphia	6	2
	Dugesia	4	2
	Tanytarsus	6	2
	Amnicola	4.8	1
	Ancyronyx	2	1
	Argia	6	1
	Aulodrilus	8	1
*	Cheumatopsyche	5	1
	Helisoma	7	1
	Phaenopsectra	7	1
	Rheotanytarsus	6	1
	Tetragoneuria	8.5	1

** (EPT organism)* *Taxa Richness:* 19 *Population:* 100

Hilsenhoff Biotic Index (HBI): 5.70 *# Scrapers:* 7

% Sensitive EPT: 8.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 36.8% *Attribute 3 genera:* 1

HGMI Rating: **33.27** **Fair**

Habitat Analysis: 131 Suboptimal USEPA Protocol

Observations: Water temp: 20.45 C; Cond: 292 umhos; DO: 8.46 mg/L; pH: 7.31 SU

Clarity: slightly turbid; Flow Rate: moderate; Width/Depth: 42' / 1 - 2'; Substrate: cobble, gravel, sand, mud

Canopy: mostly open; Bank Stability: poor; Bank Vegetation: trees, grasses

Stream Gradient: High Gradient Stream; Land Uses: suburban, forested

Pipes / Ditches: storm sewers, ditch on RB

Other: clams / mussels

AMNET Site # **AN0406** *Stream Name:* **Simonson Bk**

Location: **Canal Rd; Franklin Twp; Somerset County**

Collection Date: ***8/6/2009*** *USGS Topo Map:* **Monmouth Junction**

	Genus	*Tolerance Value*	*Amount*
	Stenelmis	5	36
	Caecidotea	8	13
	Gammarus	6	11
	Tubifex	10	7
	Physella	9.1	4
*	Stenacron	4	4
*	Lepidostoma	1	3
	Pisidium	6.8	3
*	Cheumatopsyche	5	2
	Phaenopsectra	7	2
	Trichocorixa	9	2
*	Chimarra	4	1
	Cryptochironomus	8	1
	Dicrotendipes	8	1
	Eclipidrilus	8	1
	Hetaerina	6	1
	Menetus	6	1
	Parametriocnemus	5	1
*	Phryganeidae	4	1
	Polypedilum	6	1
	Prostoma	7	1
	Rheocricotopus	6	1
	Rheotanytarsus	6	1
	Stylogomphus	1	1

** (EPT organism)* *Taxa Richness:* 24 *Population:* 100

Hilsenhoff Biotic Index (HBI): 6.13 *# Scrapers:* 5

% Sensitive EPT: 9.0% *Attribute 2 genera:* 1

% Non-Insect Taxa: 33.3% *Attribute 3 genera:* 2

HGMI Rating: **34.83** **Fair**

Habitat Analysis: 128 Suboptimal USEPA Protocol

Observations: Water temp: 18.97 C; Cond: 225 umhos; DO: 8.75 mg/L; pH: 7.27 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 16' / < 1'; Substrate: cobble, gravel, sand

Canopy: partly open; Bank Stability: fair; Bank Vegetation: trees, shrubs, lawn

Stream Gradient: High Gradient Stream; Land Uses: rural, agriculture-livestock (alpacas, llamas)

Pipes / Ditches: storm sewers

Other: fish, periphytes

AMNET Site # **AN0407** *Stream Name:* **Ten Mile Run**

Location: **Canal Rd; Franklin Twp; Somerset County**

Collection Date: ***8/6/2009*** *USGS Topo Map:* **Monmouth Junction**

	Genus	*Tolerance Value*	*Amount*
	Gammarus	6	22
	Stenelmis	5	18
	Psephenus	4	8
*	Caenis	7	6
*	Stenonema	3	5
	Tanytarsus	6	4
*	Cheumatopsyche	5	3
	Cura	4	3
*	Lepidostoma	1	3
	Rheotanytarsus	6	3
*	Stenacron	4	3
	Caecidotea	8	2
*	Chimarra	4	2
	Dubiraphia	6	2
	Paratanytarsus	6	2
	Prostoma	7	2
	Corynoneura	4	1
	Dicrotendipes	8	1
	Limnodrilus	10	1
	Microtendipes	7	1
*	Nyctiophylax	5	1
	Polypedilum	6	1
	Slavina	7	1
	Stylodrilus	10	1
	Stylogomphus	1	1
	Trepobates	8	1
	Trichocorixa	9	1
	Tubificidae	10	1

** (EPT organism)* *Taxa Richness:* 28 *Population:* 100

Hilsenhoff Biotic Index (HBI): 5.42 *# Scrapers:* 5

% Sensitive EPT: 20.0% *Attribute 2 genera:* 1

% Non-Insect Taxa: 28.6% *Attribute 3 genera:* 1

HGMI Rating: **41.05** **Fair**

Habitat Analysis: 150 Suboptimal USEPA Protocol

Observations: Water temp: 19.61 C; Cond: 280 umhos; DO: 8.37 mg/L; pH: 7.41 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 25' / < 1'; Substrate: cobble, gravel, sand

Canopy: partly open; Bank Stability: poor; Bank Vegetation: trees, weeds

Stream Gradient: High Gradient Stream; Land Uses: forested, agriculture-cropland

Other: fish, periphytes

AMNET Site # **AN0408** *Stream Name:* **Six Mile Run**

Location: **Rt 27; Franklin Twp; Somerset & Middlesex County**

Collection Date: ***8/13/2009*** *USGS Topo Map:* **Monmouth Junction**

	Genus	*Tolerance Value*	*Amount*
	Limnodrilus	10	43
	Gammarus	6	23
	Aulodrilus	8	8
	Paratanytarsus	6	6
	Paratendipes	8	3
	Polypedilum	6	2
	Ablabesmyia	8	1
	Brillia	5	1
	Caecidotea	8	1
*	Caenis	7	1
	Dero	10	1
	Dicrotendipes	8	1
	Helobdella	8	1
	Lumbriculus	8	1
	Pisidium	6.8	1
	Planariidae	4	1
	Planorbidae	6	1
	Prostoma	7	1
	Rheotanytarsus	6	1
	Trepobates	8	1
	Tubifex	10	1

** (EPT organism)* *Taxa Richness:* 21 *Population:* 100

Hilsenhoff Biotic Index (HBI): 8.14 *# Scrapers:* 1

% Sensitive EPT: 1.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 57.1% *Attribute 3 genera:* 0

HGMI Rating: **11.91** **Poor**

Habitat Analysis: 147 Suboptimal USEPA Protocol

Observations: Water temp: 21.43 C; Cond: 370 umhos; DO: 6.01 mg/L; pH: 7.15 SU

Clarity: clear; Flow Rate: slow; Width/Depth: 22' / < 1'; Substrate: cobble, gravel, sand

Canopy: mostly open; Bank Stability: good; Bank Vegetation: trees, shrubs, weeds

Stream Gradient: High Gradient Stream; Land Uses: commercial, suburban, forested, adj to graveyard

Pipes / Ditches: storm sewers

Other: fish, turtle, periphytes; sewage odor from adj pumping station

AMNET Site # **AN0409** *Stream Name:* **Six Mile Run**

Location: **Canal Rd; Franklin Twp; Somerset County**

Collection Date: ***8/6/2009*** *USGS Topo Map:* **Monmouth Junction**

	Genus	*Tolerance Value*	*Amount*
	Gammarus	6	45
	Paratanytarsus	6	9
	Rheotanytarsus	6	6
	Tanytarsus	6	6
	Phaenopsectra	7	5
	Dicrotendipes	8	3
	Stenelmis	5	3
*	Stenonema	3	3
	Ancyronyx	2	2
*	Lepidostoma	1	2
	Oulimnius	4	2
	Prostoma	7	2
	Amnicola	4.8	1
	Caecidotea	8	1
*	Cheumatopsyche	5	1
	Fossaria	6	1
*	Maccaffertium	3	1
	Macronychus	2	1
	Micropsectra	7	1
*	Mystacides	4	1
	Nais	8	1
	Optioservus	4	1
	Stylodrilus	10	1
	Thienemanniella	6	1

** (EPT organism)* *Taxa Richness:* 24 *Population:* 100

Hilsenhoff Biotic Index (HBI): 5.75 *# Scrapers:* 8

% Sensitive EPT: 7.0% *Attribute 2 genera:* 1

% Non-Insect Taxa: 29.2% *Attribute 3 genera:* 3

HGMI Rating: **43.70** **Good**

Habitat Analysis: 133 Suboptimal USEPA Protocol

Observations: Water temp: 19.44 C; Cond: 281 umhos; DO: 8.28 mg/L; pH: 7.28 SU

Clarity: slightly turbid; Flow Rate: moderate; Width/Depth: 25' / 1'; Substrate: cobble, gravel, sand, mud

Canopy: partly open; Bank Stability: poor; Bank Vegetation: trees, weeds

Stream Gradient: High Gradient Stream; Land Uses: forested, open field

Other: fish, clams / mussels, purple loosestrife; trash; eroded banks

AMNET Site # **AN0410** *Stream Name:* **Millstone River**

Location: **Blackwells Mills Rd; Hillsborough Twp; Somerset County**

Collection Date: ***8/6/2009*** *USGS Topo Map:* **Monmouth Junction**

	Genus	*Tolerance Value*	*Amount*
	Gammarus	6	27
	Valvata	2	11
	Limnodrilus	10	9
	Polypedilum	6	9
	Sphaerium	8	8
	Caecidotea	8	5
	Corbicula	4	3
	Procladius	9	3
	Tubifex	10	3
	Corydalus	4	2
	Dubiraphia	6	2
	Elimia	2	2
	Gillia	8	2
	Macronychus	2	2
	Stenochironomus	5	2
	Tanytarsus	6	2
	Ancyronyx	2	1
	Brillia	5	1
	Dicrotendipes	8	1
	Menetus	6	1
	Parametriocnemus	5	1
*	Phylocentropus	5	1
*	Stenacron	4	1
	Tribelos	5	1

** (EPT organism)* *Taxa Richness:* 24 *Population:* 100

Hilsenhoff Biotic Index (HBI):	6.07	*# Scrapers:*	6
% Sensitive EPT:	2.0%	*Attribute 2 genera:*	0
% Non-Insect Taxa:	41.7%	*Attribute 3 genera:*	2

HGMI Rating: **34.08** **Fair**

Habitat Analysis: 137 Suboptimal USEPA Protocol

Observations: Water temp: 23.44 C; Cond: 215 umhos; DO: 5.37 mg/L; pH: 6.88 SU

Clarity: turbid; Flow Rate: fast; Width/Depth: 101' / 3 - 4'; Substrate: mud

Canopy: open; Bank Stability: fair; Bank Vegetation: trees, shrubs, weeds

Stream Gradient: High Gradient Stream; Land Uses: rural, forested, Blackwells Mills Park

Pipes / Ditches: storm sewers

Other: macrophytes, garter snake, purple loosestrife; USGS gage: 2.20

AMNET Site # **AN0411** *Stream Name:* **Royce Bk**

Location: **Rt 206; Hillsborough Twp; Somerset County**

Collection Date: ***6/16/2009*** *USGS Topo Map:* **Rocky Hill**

	Genus	Tolerance Value	Amount
	Gammarus	6	43
*	Cheumatopsyche	5	15
	Polypedilum	6	11
	Stenelmis	5	8
	Caecidotea	8	4
	Physella	9.1	4
	Ferrissia	7	3
	Simulium	6	3
	Menetus	6	2
	Rheotanytarsus	6	2
	Cambaridae	5	1
*	Hydropsyche	4	1
	Nais	8	1
	Tanytarsus	6	1
	Tvetenia	5	1

** (EPT organism)* *Taxa Richness:* 15 *Population:* 100

Hilsenhoff Biotic Index (HBI):	5.98	*# Scrapers:*	4
% Sensitive EPT:	0.0%	*Attribute 2 genera:*	0
% Non-Insect Taxa:	46.7%	*Attribute 3 genera:*	0
HGMI Rating:	**19.40**	**Poor**	
Habitat Analysis:	149	Suboptimal	USEPA Protocol

Observations: Water temp: 18.04 C; Cond: 285 umhos; DO: 8.27 mg/L; pH: 7.19 SU

Clarity: slightly turbid; Flow Rate: moderate; Width/Depth: 15' / < 1'; Substrate: cobble, gravel, sand, mud, snags

Canopy: mostly closed; Bank Stability: fair; Bank Vegetation: trees, weeds

Stream Gradient: High Gradient Stream; Land Uses: suburban

Pipes / Ditches: storm sewers

Other: crayfish, clams / mussels, periphytes, geese

AMNET Site # **AN0412** *Stream Name:* **Royce Bk Br**

Location: **Rt 206; Hillsborough Twp; Somerset County**

Collection Date: ***6/16/2009*** *USGS Topo Map:* **Raritan**

	Genus	*Tolerance Value*	*Amount*
	Gammarus	6	44
	Tanytarsus	6	9
	Nais	8	6
	Paratanytarsus	6	6
	Stictochironomus	9	6
	Physella	9.1	3
	Ischnura	9	2
	Limnodrilus	10	2
	Micropsectra	7	2
	Parametriocnemus	5	2
	Polypedilum	6	2
	Slavina	7	2
*	Anthopotamus	4	1
	Aulodrilus	8	1
	Chironomus	10	1
	Cladotanytarsus	7	1
	Dero	10	1
	Dicrotendipes	8	1
	Dugesia	4	1
	Lumbricina	6	1
	Paratendipes	8	1
	Phaenopsectra	7	1
	Pisidium	6.8	1
	Prostoma	7	1
	Psephenus	4	1
	Trepobates	8	1

** (EPT organism)* *Taxa Richness:* 26 *Population:* 100

Hilsenhoff Biotic Index (HBI): 6.69 *# Scrapers:* 3

% Sensitive EPT: 1.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 42.3% *Attribute 3 genera:* 1

HGMI Rating: **24.08** **Fair**

Habitat Analysis: 125 Suboptimal USEPA Protocol

Observations: Water temp: 16.93 C; Cond: 448 umhos; DO: 7.18 mg/L; pH: 7.40 SU

Clarity: slightly turbid; Flow Rate: slow; Width/Depth: 17' / 1'; Substrate: gravel, sand, silt, root mats, undercut banks

Canopy: mostly closed; Bank Stability: fair; Bank Vegetation: trees, shrubs, weeds, lawn

Stream Gradient: High Gradient Stream; Land Uses: suburban, forested

Pipes / Ditches: ditches

Other: fish, macrophytes

AMNET Site # **AN0413** *Stream Name:* **Royce Bk**

Location: **Rt 533; Manville Boro; Somerset County**

Collection Date: ***8/6/2009*** *USGS Topo Map:* **Bound Brook**

	Genus	Tolerance Value	Amount
	Gammarus	6	42
	Limnodrilus	10	19
	Stenelmis	5	19
	Amnicola	4.8	6
	Corbicula	4	3
	Paratendipes	8	3
	Pisidium	6.8	2
	Crangonyx	8	1
	Dubiraphia	6	1
	Dugesia	4	1
	Physella	9.1	1
*	Stenacron	4	1
	Xylotopus	2	1

** (EPT organism)* *Taxa Richness:* 13 *Population:* 100

Hilsenhoff Biotic Index (HBI):	6.49	*# Scrapers:*	5
% Sensitive EPT:	1.0%	*Attribute 2 genera:*	0
% Non-Insect Taxa:	61.5%	*Attribute 3 genera:*	0
HGMI Rating:	**16.02**	**Poor**	
Habitat Analysis:	113	Suboptimal	USEPA Protocol

Observations: Water temp: 21.42 C; Cond: 338 umhos; DO: 7.96 mg/L; pH: 7.35 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 26' / < 1 - 1'; Substrate: cobble, gravel, sand, undercut banks

Canopy: mostly closed; Bank Stability: poor; Bank Vegetation: trees, weeds

Stream Gradient: High Gradient Stream; Land Uses: urban

Pipes / Ditches: storm sewers

Other: fish, crayfish, clams / mussels, waterfowl (ducks), periphytes, trash

AMNET Site # **AN0414** *Stream Name:* **Millstone River**

Location: **abv. Raritan Confl.; Manville Boro; Somerset County**

Collection Date: ***7/8/2009*** *USGS Topo Map:* **Bound Brook**

	Genus	*Tolerance Value*	*Amount*
	Limnodrilus	10	18
	Dubiraphia	6	12
	Pisidium	6.8	10
	Caecidotea	8	8
	Chironomus	10	8
	Gammarus	6	7
	Polypedilum	6	7
	Amnicola	4.8	6
	Tanytarsus	6	6
	Physella	9.1	4
	Aulodrilus	8	2
	Tubifex	10	2
*	Acentrella	4	1
	Corbicula	4	1
*	Oecetis	8	1
	Phaenopsectra	7	1
*	Phylocentropus	5	1
	Placobdella	8	1
	Procladius	9	1
	Sialis	4	1
*	Stenacron	4	1
	Stenelmis	5	1

** (EPT organism)* *Taxa Richness:* 22 *Population:* 100

Hilsenhoff Biotic Index (HBI): 7.43 *# Scrapers:* 6

% Sensitive EPT: 4.0% *Attribute 2 genera:* 1

% Non-Insect Taxa: 45.5% *Attribute 3 genera:* 0

HGMI Rating: **26.65** **Fair**

Habitat Analysis: 142 Suboptimal USEPA Protocol

Observations: Water temp: 23.66 C; Cond: 247 umhos; DO: 5.36 mg/L; pH: 6.92 SU

Clarity: slightly turbid; Flow Rate: moderate; Width/Depth: 90' / 3'; Substrate: cobble, mud, silt

Canopy: open; Bank Stability: good; Bank Vegetation: trees, weeds, lawn

Stream Gradient: High Gradient Stream; Land Uses: forested

Other: turtle (red bellied), clams / mussels

AMNET Site # **AN0415** *Stream Name:* **Cuckels Bk**

Location: **E. Main St; Bridgewater Twp; Somerset County**

Collection Date: ***7/8/2009*** *USGS Topo Map:* **Bound Brook**

	Genus	*Tolerance Value*	*Amount*
	Limnodrilus	10	12
	Menetus	6	12
	Slavina	7	12
	Nais	8	10
	Stylodrilus	10	8
	Physella	9.1	6
	Helobdella	8	4
	Pristinella	10	4
	Argia	6	3
	Enallagma	9	3
	Stenelmis	5	3
	Branchiura	10	2
	Chironomus	10	2
*	Hydropsyche	4	2
	Musculium	5	2
	Ophidonais	7	2
	Rheopelopia	4	2
	Rheotanytarsus	6	2
	Tribelos	5	2
	Tubifex	10	2
*	Baetis	6	1
	Caecidotea	8	1
	Erpobdellidae	8	1
	Phaenopsectra	7	1
	Tanytarsus	6	1

** (EPT organism)* *Taxa Richness:* 25 *Population:* 100

Hilsenhoff Biotic Index (HBI):	7.80	*# Scrapers:*	4
% Sensitive EPT:	1.0%	*Attribute 2 genera:*	0
% Non-Insect Taxa:	56.0%	*Attribute 3 genera:*	1

HGMI Rating: **20.69** **Poor**

Habitat Analysis: 125 Suboptimal USEPA Protocol

Observations: Water temp: 19.21 C; Cond: 570 umhos; DO: 5.49 mg/L; pH: 7.17 SU

Clarity: clear; Flow Rate: slow; Width/Depth: 13' / < 1'; Substrate: cobble, gravel, sand, silt

Canopy: mostly closed; Bank Stability: fair; Bank Vegetation: trees, weeds, vines

Stream Gradient: High Gradient Stream; Land Uses: commercial

Pipes / Ditches: storm sewers

Other: fish, crayfish, periphytes, filamentous algae; trash

AMNET Site # **AN0416** *Stream Name:* **W Br Middle Bk**

Location: **Crim Rd; Bridgewater Twp; Somerset County**

Collection Date: ***7/8/2009*** *USGS Topo Map:* **Bound Brook**

	Genus	*Tolerance Value*	*Amount*
	Dicrotendipes	8	34
	Micropsectra	7	11
*	Baetis	6	7
	Polypedilum	6	6
*	Cheumatopsyche	5	5
	Cricotopus	7	5
	Paratanytarsus	6	5
	Chironomus	10	3
	Dugesia	4	3
	Stictochironomus	9	3
	Nais	8	2
	Phaenopsectra	7	2
	Planorbidae	6	2
	Tanytarsus	6	2
	Tipula	4	2
	Gerris	8	1
	Hydrobaenus	8	1
	Limnodrilus	10	1
	Lumbricina	6	1
	Lumbriculus	8	1
	Peltodytes	5	1
	Physella	9.1	1
	Slavina	7	1

** (EPT organism)* *Taxa Richness:* 23 *Population:* 100

Hilsenhoff Biotic Index (HBI): 7.09 *# Scrapers:* 4

% Sensitive EPT: 7.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 34.8% *Attribute 3 genera:* 2

HGMI Rating: **27.63** **Fair**

Habitat Analysis: 157 Suboptimal USEPA Protocol

Observations: Water temp: 16.72 C; Cond: 352 umhos; DO: 7.74 mg/L; pH: 7.24 SU
Clarity: clear; Flow Rate: slow; Width/Depth: 16' / < 1'; Substrate: cobble, gravel, sand
Canopy: mostly open; Bank Stability: good; Bank Vegetation: trees, shrubs, lawn
Stream Gradient: High Gradient Stream; Land Uses: suburban, school, community park
Pipes / Ditches: storm sewers

Other: fish, tadpoles, periphytes, filamentous algae; USGS gage: 2.2

AMNET Site # **AN0417** *Stream Name:* **W Br Middle Bk**

Location: **Chimney Rock Rd; Bridgewater Twp; Somerset County**

Collection Date: ***7/8/2009*** *USGS Topo Map:* **Bound Brook**

	Genus	Tolerance Value	Amount
	Gammarus	6	28
	Caecidotea	8	20
	Rheotanytarsus	6	10
	Physella	9.1	8
	Musculium	5	7
	Psephenus	4	6
	Amnicola	4.8	4
	Polypedilum	6	4
	Helisoma	7	3
	Gyraulus	6	2
	Prostoma	7	2
	Dubiraphia	6	1
	Helobdella	8	1
	Limnodrilus	10	1
*	Mystacides	4	1
	Optioservus	4	1
	Stenelmis	5	1

** (EPT organism)* *Taxa Richness:* 17 *Population:* 100

Hilsenhoff Biotic Index (HBI): 6.47 *# Scrapers:* 7

% Sensitive EPT: 1.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 58.8% *Attribute 3 genera:* 1

HGMI Rating: **21.98** **Fair**

Habitat Analysis: 141 Suboptimal USEPA Protocol

Observations: Water temp: 22.85 C; Cond: 268 umhos; DO: 5.94 mg/L; pH: 7.64 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 24' / < 1'; Substrate: cobble, gravel, undercut banks

Canopy: partly open; Bank Stability: fair; Bank Vegetation: trees, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: forested

Downstream of Impoundment: small lake

Other: fish, garter snake, snails, macrophytes, purple loosestrife; "Active Quarry" sign

AMNET Site # **AN0418** *Stream Name:* **E Br Middle Bk**

Location: **Top of the World Way; Warren Twp; Somerset County**

Collection Date: ***8/18/2009*** *USGS Topo Map:* **Bound Brook**

	Genus	Tolerance Value	Amount
	Gammarus	6	30
	Paratanytarsus	6	11
*	Hydroptila	6	10
	Cura	4	8
	Cricotopus	7	7
*	Hydropsyche	4	5
	Polypedilum	6	4
	Tanytarsus	6	3
	Chironomus	10	2
	Dicrotendipes	8	2
	Enallagma	9	2
	Physella	9.1	2
	Rheopelopia	4	2
	Stenelmis	5	2
*	Baetis	6	1
*	Cheumatopsyche	5	1
	Eukiefferiella	8	1
	Ferrissia	7	1
	Helisoma	7	1
	Limnodrilus	10	1
	Microtendipes	7	1
	Prostoma	7	1
	Stenochironomus	5	1
	Tribelos	5	1

** (EPT organism)* *Taxa Richness:* 24 *Population:* 100

Hilsenhoff Biotic Index (HBI): 6.06 *# Scrapers:* 5

% Sensitive EPT: 11.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 29.2% *Attribute 3 genera:* 1

HGMI Rating: **32.48** **Fair**

Habitat Analysis: 141 Suboptimal USEPA Protocol

Observations: Water temp: 20.43 C; Cond: 760 umhos; DO: 8.19 mg/L; pH: 7.56 SU

Clarity: clear; Flow Rate: slow; Width/Depth: 5' / < 1'; Substrate: cobble, gravel, sand, mud, root mats

Canopy: mostly closed; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses

Stream Gradient: High Gradient Stream; Land Uses: suburban

Pipes / Ditches: storm sewers

Other: fish, snapping turtle, macrophytes, filamentous algae, waterfowl (ducks), trash

AMNET Site # **AN0419** *Stream Name:* **E Br Middle Bk**

Location: **Gilbride Rd; Bridgewater Twp; Somerset County**

Collection Date: ***7/8/2009*** *USGS Topo Map:* **Bound Brook**

	Genus	*Tolerance Value*	*Amount*
	Cricotopus	7	21
	Gammarus	6	17
	Polypedilum	6	9
	Tanytarsus	6	9
	Dicrotendipes	8	7
	Rheotanytarsus	6	6
*	Cheumatopsyche	5	4
*	Chimarra	4	4
	Phaenopsectra	7	3
*	Baetis	6	2
	Limnodrilus	10	2
	Nais	8	2
	Promoresia	2	2
	Prostoma	7	2
	Slavina	7	2
*	Ceratopsyche	4	1
*	Heterocloeon	2	1
*	Hydropsyche	4	1
*	Lepidostoma	1	1
	Peltodytes	5	1
	Rheopelopia	4	1
	Stylogomphus	1	1
	Tipula	4	1

** (EPT organism)* *Taxa Richness:* 23 *Population:* 100

Hilsenhoff Biotic Index (HBI): 6.11 *# Scrapers:* 3

% Sensitive EPT: 8.0% *Attribute 2 genera:* 2

% Non-Insect Taxa: 21.7% *Attribute 3 genera:* 3

HGMI Rating: **39.13** **Fair**

Habitat Analysis: 158 Suboptimal USEPA Protocol

Observations: Water temp: 18.45 C; Cond: 410 umhos; DO: 7.97 mg/L; pH: 7.77 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 24' / < 1'; Substrate: cobble, gravel, sand, undercut banks, bedrock

Canopy: mostly open; Bank Stability: fair; Bank Vegetation: trees, weeds, vines

Stream Gradient: High Gradient Stream; Land Uses: forested

Other: fish, frogs, crayfish, periphytes, filamentous algae; "trout stocked waters"

AMNET Site # **AN0420** *Stream Name:* **Middle Bk**

Location: **Talmadge Ave (Rt 533) near Tea St; Bridgewater Twp; Somerset County**

Collection Date: ***8/6/2009*** *USGS Topo Map:* **Bound Brook**

	Genus	Tolerance Value	Amount
	Gammarus	6	36
	Dugesia	4	34
	Stenelmis	5	12
	Hemerodromia	6	5
*	Cheumatopsyche	5	2
*	Baetis	6	1
	Caecidotea	8	1
*	Caenis	7	1
	Erpobdellidae	8	1
*	Hydropsyche	4	1
*	Lepidostoma	1	1
*	Leucotrichia	3	1
	Physella	9.1	1
	Psephenus	4	1
*	Stenacron	4	1
	Stylogomphus	1	1

** (EPT organism)* *Taxa Richness:* 16 *Population:* 100

Hilsenhoff Biotic Index (HBI):	5.07	*# Scrapers:*	5
% Sensitive EPT:	5.0%	*Attribute 2 genera:*	1
% Non-Insect Taxa:	31.3%	*Attribute 3 genera:*	1

HGMI Rating: **33.71** **Fair**

Habitat Analysis: 144 Suboptimal USEPA Protocol

Observations: Water temp: 22.46 C; Cond: 367 umhos; DO: 8.99 mg/L; pH: 8.25 SU

Clarity: slightly turbid, milky; Flow Rate: fast; Width/Depth: 15' / < 1'; Substrate: cobble, gravel, sand

Canopy: open; Bank Stability: fair; Bank Vegetation: trees, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: urban

Pipes / Ditches: storm sewers

Other: crayfish, periphytes, purple loosestrife, egret

AMNET Site # **AN0421** *Stream Name:* **Green Bk**

Location: **Raymond Ave; Watchung Twp; Somerset & Union County**

Collection Date: ***8/18/2009*** *USGS Topo Map:* **Chatham**

	Genus	*Tolerance Value*	*Amount*
	Polypedilum	6	35
	Gammarus	6	25
	Rheotanytarsus	6	14
	Rhagovelia	9	6
	Cricotopus	7	4
	Tanytarsus	6	4
	Stenelmis	5	3
*	Ceratopsyche	4	2
	Phaenopsectra	7	2
	Corynoneura	4	1
	Eclipidrilus	8	1
	Limnodrilus	10	1
	Lumbriculus	8	1
	Prostoma	7	1

** (EPT organism)* *Taxa Richness:* 14 *Population:* 100

Hilsenhoff Biotic Index (HBI):	6.24	*# Scrapers:*	2
% Sensitive EPT:	0.0%	*Attribute 2 genera:*	0
% Non-Insect Taxa:	35.7%	*Attribute 3 genera:*	1
HGMI Rating:	**20.68**	**Poor**	
Habitat Analysis:	122	Suboptimal	USEPA Protocol

Observations: Water temp: 22.51 C; Cond: 762 umhos; DO: 6.27 mg/L; pH: 7.59 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 2' / < 1'; Substrate: cobble, gravel, sand

Canopy: closed; Bank Stability: poor; Bank Vegetation: trees, weeds

Stream Gradient: High Gradient Stream; Land Uses: suburban

Pipes / Ditches: storm sewers

Other: fish, crayfish, periphytes; trash

AMNET Site # **AN0422** *Stream Name:* **Stony Bk**

Location: **West End Ave; North Plainfield Boro; Union County**

Collection Date: ***8/13/2009*** *USGS Topo Map:* **Plainfield**

	Genus	Tolerance Value	Amount
*	Hydropsyche	4	29
	Stenelmis	5	15
*	Ceratopsyche	4	11
	Polypedilum	6	10
	Dugesia	4	9
*	Glossosoma	0	3
	Limnodrilus	10	3
	Microtendipes	7	3
*	Baetis	6	2
*	Cheumatopsyche	5	2
	Rheotanytarsus	6	2
	Stictochironomus	9	2
	Antocha	3	1
*	Chimarra	4	1
	Gammarus	6	1
	Lumbricina	6	1
	Nematoda	6	1
	Parametriocnemus	5	1
	Paratanytarsus	6	1
	Prostoma	7	1
	Tanytarsus	6	1

** (EPT organism)* *Taxa Richness:* 21 *Population:* 100

Hilsenhoff Biotic Index (HBI): 4.83 *# Scrapers:* 2

% Sensitive EPT: 6.0% *Attribute 2 genera:* 1

% Non-Insect Taxa: 28.6% *Attribute 3 genera:* 2

HGMI Rating: **34.99** **Fair**

Habitat Analysis: 146 Suboptimal USEPA Protocol

Observations: Water temp: 22.19 C; Cond: 371 umhos; DO: 7.56 mg/L; pH: 7.45 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 37' / < 1'; Substrate: cobble, gravel, sand

Canopy: partly open; Bank Stability: fair; Bank Vegetation: trees, shrubs, weeds

Stream Gradient: High Gradient Stream; Land Uses: suburban

Other: trash, invasive plants

AMNET Site # **AN0423** *Stream Name:* **Green Bk**

Location: **Clinton Ave; Plainfield; Union & Somerset County**

Collection Date: ***8/13/2009*** *USGS Topo Map:* **Plainfield**

	Genus	Tolerance Value	Amount
	Cricotopus	7	18
*	Ceratopsyche	4	16
	Polypedilum	6	11
	Stenelmis	5	9
	Microtendipes	7	6
	Tanytarsus	6	6
	Hemerodromia	6	4
	Stictochironomus	9	4
	Gammarus	6	3
*	Baetis	6	2
	Cryptochironomus	8	2
	Lumbricina	6	2
	Paratanytarsus	6	2
	Pisidium	6.8	2
	Rheotanytarsus	6	2
	Saetheria	4	2
	Antocha	3	1
*	Cheumatopsyche	5	1
	Dicrotendipes	8	1
	Dolichopodidae	4	1
	Erpobdella	7.8	1
*	Hydroptila	6	1
	Limnodrilus	10	1
	Lumbriculidae	8	1
	Stratiomyidae	10	1

** (EPT organism)* *Taxa Richness:* 25 *Population:* 100

Hilsenhoff Biotic Index (HBI): 6.04 *# Scrapers:* 2

% Sensitive EPT: 3.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 24.0% *Attribute 3 genera:* 1

HGMI Rating: **30.78** **Fair**

Habitat Analysis: 129 Suboptimal USEPA Protocol

Observations: Water temp: 21.91 C; Cond: 380 umhos; DO: 7.30 mg/L; pH: 7.35 SU
Clarity: turbid; Flow Rate: moderate; Width/Depth: 42' / 2'; Substrate: gravel, sand, silt
Canopy: mostly open; Bank Stability: poor; Bank Vegetation: trees, shrubs, weeds, lawn
Stream Gradient: High Gradient Stream; Land Uses: suburban, Green Brook Park

Other: trash, large concrete blocks

AMNET Site # **AN0424** *Stream Name:* **Bound Bk**

Location: **Bound Brook Rd (Rt 28); Middlesex Boro; Middlesex County**

Collection Date: ***8/18/2009*** *USGS Topo Map:* **Plainfield**

	Genus	Tolerance Value	Amount
	Gammarus	6	24
	Tanytarsus	6	17
	Polypedilum	6	16
	Paratanytarsus	6	15
	Rheotanytarsus	6	10
	Gyraulus	6	4
	Laevapex	6	2
	Pisidium	6.8	2
	Ancyronyx	2	1
	Boyeria	2	1
*	Cheumatopsyche	5	1
	Chironomus	10	1
	Dicrotendipes	8	1
	Menetus	6	1
	Musculium	5	1
	Prostoma	7	1
	Rheumatobates	8	1
	Stenochironomus	5	1

** (EPT organism)* *Taxa Richness:* 18 *Population:* 100

Hilsenhoff Biotic Index (HBI): 6.00 *# Scrapers:* 3

% Sensitive EPT: 0.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 38.9% *Attribute 3 genera:* 1

HGMI Rating: **24.58** **Fair**

Habitat Analysis: 131 Suboptimal USEPA Protocol

Observations: Water temp: 24.81 C; Cond: 533 umhos; DO: 5.82 mg/L; pH: 7.33 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 35' / < 1'; Substrate: cobble, gravel, sand, mud, snags, undercut banks

Canopy: partly open; Bank Stability: fair; Bank Vegetation: trees, grasses, weeds

Stream Gradient: High Gradient Stream; Land Uses: suburban

Pipes / Ditches: storm sewers

Other: fish, crayfish, clams / mussels, periphytes, filamentous algae

AMNET Site # **AN0425** *Stream Name:* **Ambrose Bk**

Location: **Raritan Ave (Rt 514 spur); Middlesex Boro; Middlesex County**

Collection Date: ***8/13/2009*** *USGS Topo Map:* **Bound Brook**

	Genus	*Tolerance Value*	*Amount*
	Gammarus	6	30
	Limnodrilus	10	12
	Valvata	2	12
	Cura	4	7
	Amnicola	4.8	5
	Elimia	2	5
	Musculium	5	5
*	Hydropsyche	4	3
	Stenelmis	5	3
	Caecidotea	8	2
	Pisidium	6.8	2
	Rheotanytarsus	6	2
	Slavina	7	2
	Tubifex	10	2
	Antocha	3	1
*	Cheumatopsyche	5	1
	Chironomus	10	1
	Menetus	6	1
	Nematoda	6	1
	Paratanytarsus	6	1
	Prostoma	7	1
	Tanytarsus	6	1

** (EPT organism)* *Taxa Richness:* 22 *Population:* 100

Hilsenhoff Biotic Index (HBI): 5.63 *# Scrapers:* 5

% Sensitive EPT: 0.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 63.6% *Attribute 3 genera:* 0

HGMI Rating: **22.52** **Fair**

Habitat Analysis: 143 Suboptimal USEPA Protocol

Observations: Water temp: 24.30 C; Cond: 583 umhos; DO: 5.59 mg/L; pH: 7.35 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 48' / < 1'; Substrate: cobble, gravel, sand

Canopy: mostly closed; Bank Stability: fair; Bank Vegetation: trees, shrubs, weeds, lawn

Stream Gradient: High Gradient Stream; Land Uses: suburban, forested

Pipes / Ditches: storm sewers

Other: fish, clams, periphytes, purple loosestrife; trash

AMNET Site # **AN0425A** *Stream Name:* **Ambrose Bk**

Location: **Behmer Rd; Piscataway Twp; Middlesex County**

Collection Date: ***8/18/2009*** *USGS Topo Map:* **Plainfield**

Genus	*Tolerance Value*	*Amount*
Gammarus	6	57
Limnodrilus	10	13
Pisidium	6.8	8
Polypedilum	6	5
Caecidotea	8	3
Ferrissia	7	3
Helobdella	8	3
Dubiraphia	6	2
Tubifex	10	2
Nais	8	1
Paratanytarsus	6	1
Paratendipes	8	1
Tanytarsus	6	1

** (EPT organism)* *Taxa Richness:* 13 *Population:* 100

Hilsenhoff Biotic Index (HBI):	6.85	*# Scrapers:*	2
% Sensitive EPT:	0.0%	*Attribute 2 genera:*	0
% Non-Insect Taxa:	61.5%	*Attribute 3 genera:*	0
HGMI Rating:	**10.37**	**Poor**	
Habitat Analysis:	102	Marginal	USEPA Protocol

Observations: Water temp: 25.56 C; Cond: 585 umhos; DO: 5.87 mg/L; pH: 7.43 SU

Clarity: clear; Flow Rate: slow; Width/Depth: 20' / 1- 2'; Substrate: cobble, silt, snags, undercut banks

Canopy: mostly closed; Bank Stability: fair; Bank Vegetation: trees, shrubs

Stream Gradient: High Gradient Stream; Land Uses: suburban

Pipes / Ditches: storm sewers

Downstream of Impoundment: golf course pond

Other: fish, crayfish, clams / mussels, periphytes, filamentous algae; trash

AMNET Site # **AN0426** *Stream Name:* **Green Bk**

Location: **Lincoln Blvd (Rt 607); Bound Brook Boro; Somerset & Middlesex County**

Collection Date: ***8/13/2009*** *USGS Topo Map:* **Bound Brook**

Genus	*Tolerance Value*	*Amount*
Limnodrilus	10	22
Tanytarsus	6	21
Polypedilum	6	16
Gammarus	6	9
Paratendipes	8	5
Phaenopsectra	7	5
Microtendipes	7	4
Paratanytarsus	6	4
Dicrotendipes	8	2
Tribelos	5	2
Caecidotea	8	1
Cricotopus	7	1
Cura	4	1
Empididae	6	1
Ferrissia	7	1
Leptoxis	1.6	1
Musculium	5	1
Optioservus	4	1
Paralauterborniella	8	1
Parametriocnemus	5	1

** (EPT organism)* *Taxa Richness:* 20 *Population:* 100

Hilsenhoff Biotic Index (HBI): 7.05 *# Scrapers:* 2

% Sensitive EPT: 0.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 35.0% *Attribute 3 genera:* 1

HGMI Rating: **23.01** **Fair**

Habitat Analysis: 117 Suboptimal USEPA Protocol

Observations: Water temp: 22.21 C; Cond: 329 umhos; DO: 6.24 mg/L; pH: 7.15 SU

Clarity: turbid; Flow Rate: moderate; Width/Depth: 63' / 2 - 3'; Substrate: gravel, sand, silt, snags

Canopy: open; Bank Stability: fair; Bank Vegetation: trees, shrubs, weeds

Stream Gradient: High Gradient Stream; Land Uses: suburban, community park (RB)

Pipes / Ditches: storm sewers

Other: waterfowl, purple loosestrife, trash,

AMNET Site # **AN0427** *Stream Name:* **UNT to Raritan River**

Location: **Rt 527 (Main St); South Bound Brook Boro; Somerset County**

Collection Date: ***8/13/2009*** *USGS Topo Map:* **Bound Brook**

	Genus	*Tolerance Value*	*Amount*
	Gammarus	6	37
	Caecidotea	8	18
	Stenelmis	5	13
*	Cheumatopsyche	5	11
*	Chimarra	4	5
	Cura	4	5
	Polypedilum	6	4
	Corbicula	4	1
	Eclipidrilus	8	1
	Erpobdella	7.8	1
*	Hydropsyche	4	1
	Laevapex	6	1
	Menetus	6	1
	Pisidium	6.8	1

** (EPT organism)* *Taxa Richness:* 14 *Population:* 100

Hilsenhoff Biotic Index (HBI): 5.93 *# Scrapers:* 3

% Sensitive EPT: 5.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 64.3% *Attribute 3 genera:* 0

HGMI Rating: **15.38** **Poor**

Habitat Analysis: 134 Suboptimal USEPA Protocol

Observations: Water temp: 23.24 C; Cond: 488 umhos; DO: 5.82 mg/L; pH: 7.24 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 17' / < 1'; Substrate: cobble, gravel, sand

Canopy: mostly closed; Bank Stability: fair; Bank Vegetation: trees, weeds

Stream Gradient: High Gradient Stream; Land Uses: suburban, forested, open field

Pipes / Ditches: storm sewers

Other: fish; trash

AMNET Site # **AN0428** *Stream Name:* **Raritan River**

Location: **Bakelite Park; Edison Twp; Middlesex & Somerset County**

Collection Date: ***8/18/2009*** *USGS Topo Map:* **Bound Brook**

	Genus	Tolerance Value	Amount
	Gammarus	6	22
	Elimia	2	16
*	Glossosomatidae	0	12
	Stenelmis	5	11
*	Cheumatopsyche	5	6
	Corbicula	4	6
*	Hydroptila	6	4
	Polypedilum	6	4
*	Leucrocuta	1	3
	Optioservus	4	3
	Ancylidae	6	2
*	Plauditus	4	2
*	Stenacron	4	2
	Collembola	10	1
	Hemerodromia	6	1
*	Hydropsyche	4	1
	Petrophila	5	1
	Physella	9.1	1
	Rheotanytarsus	6	1
	Simulium	6	1

** (EPT organism)* *Taxa Richness:* 20 *Population:* 100

Hilsenhoff Biotic Index (HBI): 4.10 *# Scrapers:* 10

% Sensitive EPT: 23.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 30.0% *Attribute 3 genera:* 0

HGMI Rating: **45.84** **Good**

Habitat Analysis: 156 Suboptimal USEPA Protocol

Observations: Water temp: 28.02 C; Cond: 437 umhos; DO: 8.24 mg/L; pH: 7.60 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 210' / 1 - 3'; Substrate: cobble, gravel, sand, bedrock

Canopy: open; Bank Stability: fair; Bank Vegetation: trees, shrubs, grasses

Stream Gradient: High Gradient Stream; Land Uses: suburban, community park

Other: fish, frogs, toad, clams / mussels, macrophytes, periphytes

AMNET Site # **AN0429** *Stream Name:* **Mile Run**

Location: **Franklin Blvd & Easton Ave; New Brunswick; Middlesex & Somerset County**

Collection Date: ***8/13/2009*** *USGS Topo Map:* **Plainfield**

	Genus	Tolerance Value	Amount
	Gammarus	6	19
	Eclipidrilus	8	15
	Polypedilum	6	12
	Prostoma	7	10
*	Hydropsyche	4	7
*	Cheumatopsyche	5	6
	Cura	4	6
	Nais	8	5
	Caecidotea	8	4
	Limnodrilus	10	4
	Pentaneura	6	3
	Tanytarsus	6	2
	Antocha	3	1
*	Baetis	6	1
	Batracobdella	8	1
	Erpobdella	7.8	1
	Hemerodromia	6	1
	Nematoda	6	1
	Parametriocnemus	5	1

** (EPT organism)* *Taxa Richness:* 19 *Population:* 100

Hilsenhoff Biotic Index (HBI):	6.42	*# Scrapers:*	0
% Sensitive EPT:	1.0%	*Attribute 2 genera:*	0
% Non-Insect Taxa:	52.6%	*Attribute 3 genera:*	2
HGMI Rating:	**17.87**	**Poor**	
Habitat Analysis:	128	Suboptimal	USEPA Protocol

Observations: Water temp: 21.61 C; Cond: 513 umhos; DO: 7.18 mg/L; pH: 7.55 SU

Clarity: clear; Flow Rate: slow; Width/Depth: 21' / < 1'; Substrate: cobble, gravel, sand, red shale

Canopy: mostly closed; Bank Stability: poor; Bank Vegetation: trees, weeds

Stream Gradient: High Gradient Stream; Land Uses: urban

Pipes / Ditches: storm sewers

Other: snapping turtle, trash

AMNET Site # **AN0430** *Stream Name:* **Lawrence Bk**

Location: **Ridge Rd / Rt 522; South Brunswick Twp; Middlesex County**

Collection Date: ***8/19/2009*** *USGS Topo Map:* **Monmouth Junction**

	Genus	Tolerance Value	Amount
*	Callibaetis	9	29
	Nais	8	12
	Stylaria	8	7
*	Caenis	7	6
	Limnodrilus	10	6
	Naididae	7	6
	Corixidae	9	4
	Thienemannimyia	6	4
	Peltodytes	5	3
	Tanypus	10	3
	Dero	10	2
	Planorbidae	6	2
	Polypedilum	6	2
	Stenelmis	5	2
	Ablabesmyia	8	1
	Amnicola	4.8	1
	Ancyronyx	2	1
	Aulodrilus	8	1
	Caecidotea	8	1
	Coenagrionidae	9	1
	Culicidae	8	1
	Ectopria	5	1
	Gammarus	6	1
	Simulium	6	1
	Sphaeriidae	8	1
	Tanypodinae	7	1

** (EPT organism)* *Taxa Richness:* 26 *Population:* 100

Hilsenhoff Biotic Index (HBI): 7.96 *# Scrapers:* 4

% Sensitive EPT: 35.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 42.3% *Attribute 3 genera:* 0

HGMI Rating: **29.42** **Fair**

Habitat Analysis: 101 Marginal USEPA Protocol

Observations: Water temp: 22.64 C; Cond: 100 umhos; DO: 0.98 mg/L; pH: 6.73 SU

Clarity: turbid, brown; Flow Rate: slow; Width/Depth: 100' / 3'; Substrate: gravel, sand, mud

Canopy: open; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses

Stream Gradient: High Gradient Stream; Land Uses: suburban, forested

Other: turtle, macrophytes, filamentous algae, waterfowl

AMNET Site # **AN0431** *Stream Name:* **Lawrence Bk**

Location: **Davidson Mill Rd; South Brunswick Twp; Middlesex County**

Collection Date: ***8/19/2009*** *USGS Topo Map:* **New Brunswick**

	Genus	Tolerance Value	Amount
	Caecidotea	8	27
	Hydrolimax	4	12
	Ablabesmyia	8	6
	Amnicola	4.8	6
*	Caenis	7	6
	Polypedilum	6	6
	Sphaeriidae	8	5
	Limnodrilus	10	4
	Tanypus	10	3
	Campeloma	7	2
*	Cheumatopsyche	5	2
	Planariidae	4	2
	Procladius	9	2
	Tanytarsus	6	2
	Tribelos	5	2
	Aulodrilus	8	1
	Cladopelma	8	1
	Clinotanypus	8	1
	Corbicula	4	1
	Corixidae	9	1
	Gammarus	6	1
	Microtendipes	7	1
	Naididae	7	1
	Nanocladius	3	1
	Paratendipes	8	1
	Physella	9.1	1
	Stenelmis	5	1
	Tubifex	10	1

** (EPT organism)* *Taxa Richness:* 28 *Population:* 100

Hilsenhoff Biotic Index (HBI): 6.93 *# Scrapers:* 4

% Sensitive EPT: 6.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 46.4% *Attribute 3 genera:* 0

HGMI Rating: **24.85** **Fair**

Habitat Analysis: 101 Marginal USEPA Protocol

Observations: Water temp: 26.56 C; Cond: 221 umhos; DO: 3.36 mg/L; pH: 6.48 SU

Clarity: slightly turbid, brown; Flow Rate: slow; Width/Depth: 120' / 4'; Substrate: mud, silt

Canopy: mostly open; Bank Stability: good; Bank Vegetation: trees, shrubs, weeds

Stream Gradient: High Gradient Stream; Land Uses: suburban, forested

Other: macrophytes, filamentous algae

AMNET Site # **AN0432** *Stream Name:* **Oakeys Bk**

Location: **Davidson Mill Rd; South Brunswick Twp; Middlesex County**

Collection Date: ***8/19/2009*** *USGS Topo Map:* **New Brunswick**

	Genus	Tolerance Value	Amount
	Stenelmis	5	68
	Cura	4	6
	Rheotanytarsus	6	6
*	Hydropsyche	4	4
	Optioservus	4	3
	Simulium	6	2
	Calopteryx	6	1
*	Cheumatopsyche	5	1
	Ectopria	5	1
	Erpobdellidae	8	1
	Gerris	8	1
	Hemerodromia	6	1
	Microvelia	6	1
	Nematoda	6	1
	Prostoma	7	1
*	Stenacron	4	1
	Tipula	4	1

** (EPT organism)* *Taxa Richness:* 17 *Population:* 100

Hilsenhoff Biotic Index (HBI): 5.05 *# Scrapers:* 3

% Sensitive EPT: 1.0% *Attribute 2 genera:* 0

% Non-Insect Taxa: 23.5% *Attribute 3 genera:* 2

HGMI Rating: **31.87** **Fair**

Habitat Analysis: 154 Suboptimal USEPA Protocol

Observations: Water temp: 23.97 C; Cond: 386 umhos; DO: 5.97 mg/L; pH: 7.15 SU

Clarity: clear; Flow Rate: slow; Width/Depth: 25' / 1 - 2'; Substrate: cobble, gravel, sand

Canopy: closed; Bank Stability: fair; Bank Vegetation: trees, shrubs, grasses

Stream Gradient: High Gradient Stream; Land Uses: suburban, forested

Pipes / Ditches: storm sewers (flowing)

Other: fish, periphytes

AMNET Site # **AN0433** *Stream Name:* **Ireland Bk**

Location: **Riva Rd; North Brunswick Twp; Middlesex County**

Collection Date: ***8/19/2009*** *USGS Topo Map:* **New Brunswick**

	Genus	*Tolerance Value*	*Amount*
	Stenelmis	5	51
*	Hydropsyche	4	18
*	Cheumatopsyche	5	12
	Simulium	6	4
	Planariidae	4	3
	Calopteryx	6	2
	Polypedilum	6	2
	Tvetenia	5	2
	Lumbriculidae	8	1
	Nais	8	1
	Rhagovelia	9	1
	Rheotanytarsus	6	1
	Stylaria	8	1
	Tanytarsus	6	1

** (EPT organism)* *Taxa Richness:* 14 *Population:* 100

Hilsenhoff Biotic Index (HBI):	5.02	*# Scrapers:*	1
% Sensitive EPT:	0.0%	*Attribute 2 genera:*	0
% Non-Insect Taxa:	28.6%	*Attribute 3 genera:*	1
HGMI Rating:	**24.98**	**Fair**	
Habitat Analysis:	162	Optimal	USEPA Protocol

Observations: Water temp: 22.05 C; Cond: 318 umhos; DO: 7.69 mg/L; pH: 6.39 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 25' / < 1'; Substrate: cobble, gravel, sand, bedrock

Canopy: mostly closed; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses

Stream Gradient: High Gradient Stream; Land Uses: forested

Other: periphytes

AMNET Site # **AN0434** *Stream Name:* **Lawrence Bk**

Location: **Riva Rd; Milltown Boro; Middlesex County**

Collection Date: ***8/19/2009*** *USGS Topo Map:* **New Brunswick**

	Genus	Tolerance Value	Amount
*	Cheumatopsyche	5	33
	Cura	4	25
	Glyptotendipes	10	15
	Rheotanytarsus	6	7
	Polypedilum	6	6
	Cricotopus	7	4
	Dicrotendipes	8	3
*	Hydropsyche	4	3
	Hemerodromia	6	1
	Microtendipes	7	1
	Parachironomus	10	1
	Tanytarsus	6	1

** (EPT organism)* *Taxa Richness:* 12 *Population:* 100

Hilsenhoff Biotic Index (HBI):	5.86	*# Scrapers:*	0
% Sensitive EPT:	0.0%	*Attribute 2 genera:*	0
% Non-Insect Taxa:	8.3%	*Attribute 3 genera:*	0

HGMI Rating: **27.19** **Fair**

Habitat Analysis: 113 Suboptimal USEPA Protocol

Observations: Water temp: 28.20 C; Cond: 193 umhos; DO: 4.74 mg/L; pH: 6.96 SU

Clarity: turbid, brown; Flow Rate: slow; Width/Depth: 45' / < 1'; Substrate: cobble, gravel, sand, mud

Canopy: partly open; Bank Stability: fair; Bank Vegetation: trees, shrubs

Stream Gradient: High Gradient Stream; Land Uses: suburban, forested

Pipes / Ditches: storm sewers

Other: fish, macrophytes, waterfowl (geese)

AMNET Site # **AN0436** *Stream Name:* **Mill Bk**

Location: **nr. Rt 514 (Woodbridge Ave); Edison Twp; Middlesex County**

Collection Date: ***8/19/2009*** *USGS Topo Map:* **Plainfield**

	Genus	Tolerance Value	Amount
*	Hydropsyche	4	39
*	Baetis	6	16
	Lumbriculidae	8	13
	Prostoma	7	10
	Antocha	3	6
	Polypedilum	6	4
*	Cheumatopsyche	5	3
	Cricotopus	7	2
	Tanytarsini	6	2
	Coenagrionidae	9	1
	Parametriocnemus	5	1
	Simulium	6	1
	Stenelmis	5	1
	Thienemannimyia	6	1

** (EPT organism)* *Taxa Richness:* 14 *Population:* 100

Hilsenhoff Biotic Index (HBI):	5.40	*# Scrapers:*	1
% Sensitive EPT:	16.0%	*Attribute 2 genera:*	0
% Non-Insect Taxa:	14.3%	*Attribute 3 genera:*	2

HGMI Rating: **32.18** **Fair**

Habitat Analysis: 130 Suboptimal USEPA Protocol

Observations: Water temp: 22.43 C; Cond: 520 umhos; DO: 7.54 mg/L; pH: 7.30 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 15' / < 1'; Substrate: cobble, gravel, sand

Canopy: closed; Bank Stability: poor; Bank Vegetation: trees, shrubs, weeds

Stream Gradient: High Gradient Stream; Land Uses: forested, suburban

Pipes / Ditches: storm sewers, ditches

Other: fish, periphytes, filamentous algae; trailer park on RB

AMNET Site # **AN0437** *Stream Name:* **Manalapan Bk**

Location: **Rt 524; Millstone Twp; Monmouth County**

Collection Date: ***8/25/2009*** *USGS Topo Map:* **Roosevelt**

	Genus	*Tolerance Value*	*Amount*
	Simulium	6	25
	Musculium	5	21
	Pisidium	6.8	10
	Limnodrilus	10	5
	Polypedilum	6	4
	Trichocorixa	9	4
	Procladius	9	3
	Cura	4	2
	Helisoma	7	2
*	Hydropsyche	4	2
	Nais	8	2
*	Phryganeidae	4	2
	Prostoma	7	2
	Slavina	7	2
	Spirosperma	10	2
	Corynoneura	4	1
	Cricotopus	7	1
	Gomphus	5	1
*	Neureclipsis	7	1
*	Oecetis	8	1
*	Paraleptophlebia	1	1
*	Polycentropus	6	1
	Prosimulium	2	1
	Rheotanytarsus	6	1
*	Siphlonurus	7	1
	Stagnicola	7	1
	Stylodrilus	10	1

** (EPT organism)* *Taxa Richness:* 27 *Population:* 100

%Dominance / Dominant Taxon(s): 25.0% Simulium

Hilsenhoff Biotic Index (HBI): 6.32 *%Clingers:* 33.00%

** E+P+T:* 7 (2) Ephemeroptera, ( ) Plecoptera, (5) Trichoptera *%Ephemeroptera:* 2.00%

CPMI Rating: **14 Good**

Habitat Analysis: 142 Suboptimal USEPA Protocol

Observations: Water temp: 18.99 C; Cond: 283 umhos; DO: 6.54 mg/L; pH: 5.77 SU

Clarity: clear, cedar brown; Flow Rate: slow; Width/Depth: 11' / < 1'; Substrate: gravel, sand, mud, snags, root mats

Canopy: closed; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses

Stream Gradient: Low Gradient Stream; Land Uses: rural, forested

Other: fish, frogs, macrophytes, wild turkeys

AMNET Site # **AN0438** *Stream Name:* **Manalapan Bk**

Location: **Rt 33; Manalapan Twp; Monmouth County**

Collection Date: ***8/25/2009*** *USGS Topo Map:* **Freehold**

	Genus	Tolerance Value	Amount
	Tribelos	5	44
*	Maccaffertium	3	19
	Polypedilum	6	8
	Macronychus	2	3
	Pisidium	6.8	3
	Rheotanytarsus	6	3
	Simulium	6	3
	Aulodrilus	8	2
*	Cheumatopsyche	5	2
	Dubiraphia	6	2
	Ischnura	9	2
	Argia	6	1
*	Caenis	7	1
	Dineutus	4	1
	Dugesia	4	1
	Gomphus	5	1
	Limnodrilus	10	1
*	Oecetis	8	1
	Prostoma	7	1
	Tanytarsus	6	1

** (EPT organism)* *Taxa Richness:* 20 *Population:* 100

%Dominance / Dominant Taxon(s): 44.0% Tribelos

Hilsenhoff Biotic Index (HBI): 5.00 *%Clingers:* 34.00%

** E+P+T:* 4 (2) Ephemeroptera, ( ) Plecoptera, (2) Trichoptera *%Ephemeroptera:* 20.00%

CPMI Rating: **18** **Good**

Habitat Analysis: 122 Suboptimal USEPA Protocol

Observations: Water temp: 24.52 C; Cond: 257 umhos; DO: 6.29 mg/L; pH: 6.71 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 15' / < 1'; Substrate: cobble, snags, root mats

Canopy: closed; Bank Stability: fair; Bank Vegetation: trees, shrubs

Stream Gradient: Low Gradient Stream; Land Uses: rural, agriculture-cropland, nursery

Other: iron floc

AMNET Site # **AN0439** *Stream Name:* **Manalapan Bk**

Location: **Federal Rd; Monroe Twp; Middlesex County**

Collection Date: ***8/25/2009*** *USGS Topo Map:* **Jamesburg**

	Genus	Tolerance Value	Amount
	Polypedilum	6	24
*	Hydroptila	6	11
*	Maccaffertium	3	8
	Macronychus	2	7
	Rheotanytarsus	6	7
	Tribelos	5	7
	Thienemannimyia	6	6
*	Cheumatopsyche	5	5
	Calopteryx	6	4
	Ancyronyx	2	3
	Prostoma	7	3
*	Hydropsyche	4	2
	Simulium	6	2
	Tanytarsus	6	2
	Aulodrilus	8	1
	Boyeria	2	1
	Gomphus	5	1
	Nigronia	2	1
*	Oecetis	8	1
	Paratanytarsus	6	1
	Paratendipes	8	1
	Physella	9.1	1
	Sphaeriidae	8	1

** (EPT organism)* *Taxa Richness:* 23 *Population:* 100

%Dominance / Dominant Taxon(s): 24.0% Polypedilum

Hilsenhoff Biotic Index (HBI): 5.25 *%Clingers:* 48.00%

** E+P+T:* 5 (1) Ephemeroptera, ( ) Plecoptera, (4) Trichoptera *%Ephemeroptera:* 8.00%

CPMI Rating: **14 Good**

Habitat Analysis: 115 Suboptimal USEPA Protocol

Observations: Water temp: 22.14 C; Cond: 264 umhos; DO: 7.47 mg/L; pH: 6.75 SU

Clarity: slightly turbid; Flow Rate: moderate; Width/Depth: 19' / < 1'; Substrate: gravel, sand, silt, root mats, undercut banks

Canopy: mostly closed; Bank Stability: fair; Bank Vegetation: trees, shrubs, grasses, weeds

Stream Gradient: Low Gradient Stream; Land Uses: agriculture-cropland, agriculture-livestock

Pipes / Ditches: ditches, flowing

Other: frogs, macrophytes

AMNET Site # **AN0440** *Stream Name:* **Manalapan Bk**

Location: **Old Forge Rd; Helmetta Boro; Middlesex County**

Collection Date: ***9/1/2009*** *USGS Topo Map:* **Jamesburg**

	Genus	*Tolerance Value*	*Amount*
	Tribelos	5	24
	Sphaeriidae	8	20
*	Cheumatopsyche	5	10
	Limnodrilus	10	8
	Dugesia	4	7
	Lumbriculus	8	7
	Polypedilum	6	6
	Ablabesmyia	8	3
	Ancyronyx	2	2
	Dubiraphia	6	2
	Rheotanytarsus	6	2
	Simulium	6	2
	Hemerodromia	6	1
*	Hydropsyche	4	1
*	Lype	2	1
*	Maccaffertium	3	1
	Macromia	2	1
	Nigronia	2	1
*	Triaenodes	6	1

** (EPT organism)* *Taxa Richness:* 19 *Population:* 100

%Dominance / Dominant Taxon(s): 24.0% Tribelos

Hilsenhoff Biotic Index (HBI): 6.19 *%Clingers:* 23.00%

** E+P+T:* 5 (1) Ephemeroptera, ( ) Plecoptera, (4) Trichoptera *%Ephemeroptera:* 1.00%

CPMI Rating: **10 Fair**

Habitat Analysis: 136 Suboptimal USEPA Protocol

Observations: Water temp: 18.61 C; Cond: 227 umhos; DO: 7.70 mg/L; pH: 6.21 SU

Clarity: turbid; Flow Rate: moderate; Width/Depth: 35' / 1'; Substrate: sand, mud, silt, root mats

Canopy: mostly closed; Bank Stability: fair; Bank Vegetation: trees, weeds

Stream Gradient: Low Gradient Stream; Land Uses: suburban, forested

Pipes / Ditches: storm sewers

Other: frogs

AMNET Site # **AN0441** *Stream Name:* **Weamaconk Ck**

Location: **Rt 9 (South); Freehold; Middlesex County**

Collection Date: ***9/1/2009*** *USGS Topo Map:* **Freehold**

Genus	*Tolerance Value*	*Amount*
Polypedilum	6	21
Simulium	6	19
Rheotanytarsus	6	14
Tanytarsus	6	7
Hemerodromia	6	6
Rhagovelia	9	6
Limnodrilus	10	5
Gammarus	6	4
Tipulidae	3	4
Thienemannimyia	6	3
Aulodrilus	8	1
Brillia	5	1
Calopteryx	6	1
Enchytraeidae	10	1
Natarsia	8	1
Parametriocnemus	5	1
Physella	9.1	1
Rheocricotopus	6	1

** (EPT organism)* *Taxa Richness:* 18 *Population:* 97

%Dominance / Dominant Taxon(s): 21.6% Polypedilum

Hilsenhoff Biotic Index (HBI): 6.36 *%Clingers:* 34.02%

** E+P+T:* 0 ( ) Ephemeroptera, ( ) Plecoptera, ( ) Trichoptera *%Ephemeroptera:* 0.00%

CPMI Rating: **10 Fair**

Habitat Analysis: 117 Suboptimal USEPA Protocol

Observations: Water temp: 16.60 C; Cond: 301 umhos; DO: 9.09 mg/L; pH: 6.66 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 8' / < 1'; Substrate: gravel, sand, snags, undercut banks

Canopy: closed; Bank Stability: poor; Bank Vegetation: trees, weeds

Stream Gradient: Low Gradient Stream; Land Uses: commercial (Rt 9), forested

Other: frogs; trash, extensive bank erosion

AMNET Site # **AN0442** *Stream Name:* **Wemrock Bk**

Location: **Wemrock Rd; Freehold Twp; Monmouth County**

Collection Date: ***8/25/2009*** *USGS Topo Map:* **Freehold**

	Genus	*Tolerance Value*	*Amount*
	Rheotanytarsus	6	22
	Pisidium	6.8	12
	Calopteryx	6	10
	Gammarus	6	9
	Aulodrilus	8	8
	Limnodrilus	10	4
	Polypedilum	6	4
	Rhagovelia	9	4
	Boyeria	2	3
	Campeloma	7	3
	Dineutus	4	2
	Hemerodromia	6	2
	Macronychus	2	2
	Paratanytarsus	6	2
	Thienemannimyia	6	2
	Ancyronyx	2	1
	Caecidotea	8	1
	Gomphus	5	1
*	Hydropsyche	4	1
	Lumbriculus	8	1
	Paratendipes	8	1
	Prostoma	7	1
	Simulium	6	1
	Tanytarsus	6	1
	Tipula	4	1
	Tribelos	5	1

** (EPT organism)* *Taxa Richness:* 26 *Population:* 100

%Dominance / Dominant Taxon(s): 22.0% Rheotanytarsus

Hilsenhoff Biotic Index (HBI): 6.30 *%Clingers:* 27.00%

** E+P+T:* 1 ( ) Ephemeroptera, ( ) Plecoptera, (1) Trichoptera *%Ephemeroptera:* 0.00%

CPMI Rating: **10 Fair**

Habitat Analysis: 118 Suboptimal USEPA Protocol

Observations: Water temp: 21.29 C; Cond: 411 umhos; DO: 5.63 mg/L; pH: 6.64 SU

Clarity: slightly turbid; Flow Rate: moderate; Width/Depth: 9' / < 1'; Substrate: sand, silt, root mats, undercut banks

Canopy: mostly closed; Bank Stability: fair; Bank Vegetation: trees, shrubs, weeds

Stream Gradient: Low Gradient Stream; Land Uses: rural, forested, agriculture-cropland (orchards)

Other: fish, crayfish

AMNET Site # **AN0444** *Stream Name:* **McGellairds Bk**

Location: **Rt 9 (South); Freehold Twp; Monmouth County**

Collection Date: ***9/1/2009*** *USGS Topo Map:* **Freehold**

	Genus	Tolerance Value	Amount
*	Cheumatopsyche	5	39
	Rheotanytarsus	6	8
	Polypedilum	6	7
	Stenelmis	5	4
	Amnicola	4.8	3
	Hetaerina	6	3
	Simulium	6	3
	Tubifex	10	3
	Cura	4	2
	Dubiraphia	6	2
	Gyraulus	6	2
	Nais	8	2
	Phaenopsectra	7	2
	Prostoma	7	2
*	Stenonema	3	2
	Tanytarsus	6	2
	Tribelos	5	2
	Campeloma	7	1
	Helisoma	7	1
	Hydrobaenus	8	1
*	Hydropsyche	4	1
	Limnodrilus	10	1
	Musculium	5	1
	Oulimnius	4	1
	Pisidium	6.8	1
*	Polycentropodidae	6	1
	Prosimulium	2	1
	Rheopelopia	4	1
	Slavina	7	1

** (EPT organism)* *Taxa Richness:* 29 *Population:* 100

%Dominance / Dominant Taxon(s): 39.0% Cheumatopsyche

Hilsenhoff Biotic Index (HBI): 5.60 *%Clingers:* 64.00%

** E+P+T:* 4 (1) Ephemeroptera, ( ) Plecoptera, (3) Trichoptera *%Ephemeroptera:* 2.00%

CPMI Rating: **18** **Good**

Habitat Analysis: 138 Suboptimal USEPA Protocol

Observations: Water temp: 22.51 C; Cond: 225 umhos; DO: 6.64 mg/L; pH: 6.80 SU

Clarity: slightly turbid, milky-white; Flow Rate: moderate; Width/Depth: 20' / < 1'; Substrate: gravel, sand

Canopy: closed; Bank Stability: poor; Bank Vegetation: trees, shrubs, weeds

Stream Gradient: Low Gradient Stream; Land Uses: forested, commercial

Other: trash

AMNET Site # **AN0445** *Stream Name:* **Tepehemus Bk**

Location: **Tennent Rd; Manalapan Twp; Monmouth County**

Collection Date: ***10/8/2009*** *USGS Topo Map:* **Freehold**

	Genus	*Tolerance Value*	*Amount*
	Tribelos	5	23
	Limnodrilus	10	17
	Calopteryx	6	12
	Hetaerina	6	7
	Tubifex	10	7
	Enallagma	9	5
	Prostoma	7	5
	Ancyronyx	2	4
	Pisidium	6.8	4
	Trichocorixa	9	3
	Argia	6	2
*	Cheumatopsyche	5	1
	Cricotopus	7	1
	Cura	4	1
	Curculionidae	7	1
	Dubiraphia	6	1
*	Hydropsyche	4	1
	Macromia	2	1
	Menetus	6	1
	Microvelia	6	1
	Nanocladius	3	1
	Rheotanytarsus	6	1

** (EPT organism)* *Taxa Richness:* 22 *Population:* 100

%Dominance / Dominant Taxon(s): 23.0% Tribelos

Hilsenhoff Biotic Index (HBI): 6.79 *%Clingers:* 12.00%

** E+P+T:* 2 ( ) Ephemeroptera, ( ) Plecoptera, (2) Trichoptera *%Ephemeroptera:* 0.00%

CPMI Rating: **6 Fair**

Habitat Analysis: 137 Suboptimal USEPA Protocol

Observations: Water temp: 13.43 C; Cond: 271 umhos; DO: 8.61 mg/L; pH: 6.69 SU

Clarity: clear; Flow Rate: slow; Width/Depth: 12' / 1'; Substrate: gravel, sand, silt, root mats, undercut banks

Canopy: partly open; Bank Stability: fair; Bank Vegetation: trees, shrubs

Stream Gradient: Low Gradient Stream; Land Uses: suburban

Pipes / Ditches: storm sewers

Other: fish, macrophytes

AMNET Site # **AN0446** ***Stream Name:*** **Milford Bk**

Location: **Pease Rd; Manalapan Twp; Monmouth County**

Collection Date: ***10/8/2009*** ***USGS Topo Map:*** **Freehold**

	Genus	*Tolerance Value*	*Amount*
*	Hydropsyche	4	70
*	Cheumatopsyche	5	18
	Calopteryx	6	3
	Polypedilum	6	2
	Simulium	6	2
	Ancyronyx	2	1
	Boyeria	2	1
	Curculionidae	7	1
	Nais	8	1
	Rhagovelia	9	1

** (EPT organism)* *Taxa Richness:* 10 *Population:* 100

%Dominance / Dominant Taxon(s): 70.0% Hydropsyche

Hilsenhoff Biotic Index (HBI): 4.40 *%Clingers:* 92.00%

** E+P+T:* 2 ( ) Ephemeroptera, ( ) Plecoptera, (2) Trichoptera *%Ephemeroptera:* 0.00%

CPMI Rating: **14 Good**

Habitat Analysis: 141 Suboptimal USEPA Protocol

Observations: Water temp: 13.14 C; Cond: 271 umhos; DO: 9.16 mg/L; pH: 5.93 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 11' / < 1'; Substrate: cobble, gravel, sand, root mats, undercut banks

Canopy: mostly closed; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses

Stream Gradient: Low Gradient Stream; Land Uses: suburban

Pipes / Ditches: storm sewers

Other: macrophytes, periphytes; house on left bank, invasive plants

AMNET Site # **AN0447** *Stream Name:* **McGellairds Bk**

Location: **Rt 527; Englishtown Boro; Monmouth County**

Collection Date: ***10/26/2009*** *USGS Topo Map:* **Freehold**

	Genus	*Tolerance Value*	*Amount*
	Amnicola	4.8	32
	Limnodrilus	10	19
	Sphaerium	8	7
*	Cheumatopsyche	5	6
	Eclipidrilus	8	5
	Calopteryx	6	4
	Prostoma	7	3
	Ancyronyx	2	2
	Argia	6	2
	Boyeria	2	2
	Cura	4	2
	Nais	8	2
	Spirosperma	10	2
	Tribelos	5	2
	Tubifex	10	2
	Dromogomphus	4	1
	Dubiraphia	6	1
	Hetaerina	6	1
	Macromia	2	1
	Paratendipes	8	1
	Physella	9.1	1
	Rheotanytarsus	6	1
	Stylodrilus	10	1

** (EPT organism)* *Taxa Richness:* 23 *Population:* 100

%Dominance / Dominant Taxon(s): 32.0% Amnicola

Hilsenhoff Biotic Index (HBI): 6.60 *%Clingers:* 12.00%

** E+P+T:* 1 ( ) Ephemeroptera, ( ) Plecoptera, (1) Trichoptera *%Ephemeroptera:* 0.00%

CPMI Rating: **6 Fair**

Habitat Analysis: 125 Suboptimal USEPA Protocol

Observations: Water temp: 11.08 C; Cond: 226 umhos; DO: 8.44 mg/L; pH: 6.79 SU

Clarity: turbid; Flow Rate: slow; Width/Depth: 30' / 1'; Substrate: sand, mud, silt, root mats

Canopy: mostly closed; Bank Stability: poor; Bank Vegetation: trees, weeds

Stream Gradient: Low Gradient Stream; Land Uses: suburban

AMNET Site # **AN0448** *Stream Name:* **Matchaponix Bk**

Location: **Rt 527; Manalapan Twp; Monmouth County**

Collection Date: ***10/26/2009*** *USGS Topo Map:* **Freehold**

	Genus	Tolerance Value	Amount
	Amnicola	4.8	16
	Physella	9.1	16
	Campeloma	7	13
	Limnodrilus	10	11
	Sphaeriidae	8	10
	Tribelos	5	9
	Aulodrilus	8	5
	Ancyronyx	2	4
	Gammarus	6	3
	Calopteryx	6	2
*	Cheumatopsyche	5	2
	Macronychus	2	2
	Coenagrionidae	9	1
*	Hydropsyche	4	1
	Lumbriculidae	8	1
	Macromia	2	1
	Orconectes	6	1
	Prostoma	7	1
	Tubifex	10	1

** (EPT organism)* *Taxa Richness:* 19 *Population:* 100

%Dominance / Dominant Taxon(s): 16.0% Amnicola & Physella

Hilsenhoff Biotic Index (HBI): 6.86 *%Clingers:* 9.00%

** E+P+T:* 2 ( ) Ephemeroptera, ( ) Plecoptera, (2) Trichoptera *%Ephemeroptera:* 0.00%

CPMI Rating: **6 Fair**

Habitat Analysis: 146 Suboptimal USEPA Protocol

Observations: Water temp: 11.76 C; Cond: 222 umhos; DO: 8.17 mg/L; pH: 6.66 SU

Clarity: turbid; Flow Rate: moderate; Width/Depth: 28' / 2'; Substrate: sand, mud, root mats

Canopy: mostly closed; Bank Stability: fair; Bank Vegetation: trees, shrubs, weeds

Stream Gradient: Low Gradient Stream; Land Uses: forested, wetlands

Other: crayfish, invasive plants, trash; adj to flea market

AMNET Site # **AN0449** ***Stream Name:*** **Pine Bk**

Location: **Pension Rd; Manalapan Twp; Monmouth County**

Collection Date: ***10/26/2009*** ***USGS Topo Map:*** **Freehold**

Genus	*Tolerance Value*	*Amount*
Limnodrilus	10	3
Lumbriculus	8	2
Tribelos	5	2
Amnicola	4.8	1
Chironomus	10	1
Polypedilum	6	1

** (EPT organism)* *Taxa Richness:* 6 *Population:* 10

%Dominance / Dominant Taxon(s): 30.0% Limnodrilus

Hilsenhoff Biotic Index (HBI): 7.68 *%Clingers:* 0.00%

** E+P+T:* 0 ( ) Ephemeroptera, ( ) Plecoptera, ( ) Trichoptera *%Ephemeroptera:* 0.00%

CPMI Rating: **0 Poor**

Habitat Analysis: 132 Suboptimal USEPA Protocol

Observations: Water temp: 11.74 C; Cond: 259 umhos; DO: 8.52 mg/L; pH: 5.02 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 19' / < 1'; Substrate: sand, silt

Canopy: mostly closed; Bank Stability: poor; Bank Vegetation: trees, shrubs, weeds

Stream Gradient: Low Gradient Stream; Land Uses: rural, forested

Pipes / Ditches: storm sewers (flowing)

Other: orange colored silt

AMNET Site # **AN0450** ***Stream Name:*** **Barclay Bk**

Location: **Rt 527; Madison Twp; Middlesex County**

Collection Date: ***10/8/2009*** ***USGS Topo Map:*** **Freehold**

	Genus	*Tolerance Value*	*Amount*
	Tribelos	5	74
*	Polycentropus	6	5
	Limnodrilus	10	4
	Calopteryx	6	3
	Polypedilum	6	3
	Ceratopogonidae	6	2
	Microvelia	6	2
	Sialis	4	2
	Cricotopus	7	1
	Hydroporus	5	1
	Stenochironomus	5	1
	Thienemannimyia	6	1
	Tropisternus	10	1

** (EPT organism)* *Taxa Richness:* 13 *Population:* 100

%Dominance / Dominant Taxon(s): 74.0% Tribelos

Hilsenhoff Biotic Index (HBI): 5.41 *%Clingers:* 6.00%

** E+P+T:* 1 ( ) Ephemeroptera, ( ) Plecoptera, (1) Trichoptera *%Ephemeroptera:* 0.00%

CPMI Rating: **6 Fair**

Habitat Analysis: 133 Suboptimal USEPA Protocol

Observations: Water temp: 13.56 C; Cond: 241 umhos; DO: 7.84 mg/L; pH: 3.95 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 17' / < 1'; Substrate: gravel, sand, mud

Canopy: mostly closed; Bank Stability: good; Bank Vegetation: trees, shrubs, grasses

Stream Gradient: Low Gradient Stream; Land Uses: rural

Other: fish, macrophytes; sheen on surface

AMNET Site # **AN0451** *Stream Name:* **Matchaponix Bk**

Location: **Texas Rd; Madison Twp; Middlesex County**

Collection Date: ***10/8/2009*** *USGS Topo Map:* **Freehold**

Genus	*Tolerance Value*	*Amount*
Limnodrilus	10	43
Tribelos	5	26
Tubifex	10	6
Gammarus	6	4
Rheotanytarsus	6	4
Stylodrilus	10	4
Cricotopus	7	3
Dromogomphus	4	2
Prostoma	7	2
Argia	6	1
Dubiraphia	6	1
Fossaria	6	1
Menetus	6	1
Musculium	5	1
Paratendipes	8	1

** (EPT organism)* *Taxa Richness:* 15 *Population:* 100

%Dominance / Dominant Taxon(s): 43.0% Limnodrilus

Hilsenhoff Biotic Index (HBI): 7.88 *%Clingers:* 9.00%

** E+P+T:* 0 ( ) Ephemeroptera, ( ) Plecoptera, ( ) Trichoptera *%Ephemeroptera:* 0.00%

CPMI Rating: **2 Poor**

Habitat Analysis: 100 Marginal USEPA Protocol

Observations: Water temp: 15.11 C; Cond: 454 umhos; DO: 8.13 mg/L; pH: 6.81 SU

Clarity: clear, milky color; Flow Rate: slow; Width/Depth: 45' / 1'; Substrate: gravel, sand, silt

Canopy: mostly open; Bank Stability: fair; Bank Vegetation: trees, grasses

Stream Gradient: Low Gradient Stream; Land Uses: suburban

Pipes / Ditches: storm sewers

Other: crayfish, macrophytes; powerline easement near RB, invasive plants along banks

AMNET Site # **AN0452** ***Stream Name:*** **Iresick Bk**

Location: **Rt 527; Madison Twp; Middlesex County**

Collection Date: ***10/8/2009*** ***USGS Topo Map:*** **South Amboy**

	Genus	Tolerance Value	Amount
	Tribelos	5	44
	Sialis	4	7
	Calopteryx	6	5
	Enchytraeidae	10	5
	Apsectrotanypus	5	4
	Cryptochironomus	8	4
	Lumbriculus	8	4
*	Ptilostomis	5	4
	Tipula	4	4
	Ablabesmyia	8	3
	Polypedilum	6	3
	Bezzia	6	2
	Phaenopsectra	7	2
	Caecidotea	8	1
	Ceratopogonidae	6	1
	Chironomus	10	1
	Glyptotendipes	10	1
*	Leptophlebia	4	1
	Limnodrilus	10	1
	Orthocladiinae	5	1
	Sphaeriidae	8	1
	Thienemannimyia	6	1

** (EPT organism)* *Taxa Richness:* 22 *Population:* 100

%Dominance / Dominant Taxon(s): 44.0% Tribelos

Hilsenhoff Biotic Index (HBI): 5.83 *%Clingers:* 2.00%

** E+P+T:* 2 (1) Ephemeroptera, ( ) Plecoptera, (1) Trichoptera *%Ephemeroptera:* 1.00%

CPMI Rating: **8 Fair**

Habitat Analysis: 110 Suboptimal USEPA Protocol

Observations: Water temp: 12.02 C; Cond: 155 umhos; DO: 5.68 mg/L; pH: 6.04 SU

Clarity: clear; Flow Rate: moderate; Width/Depth: 10' / < 1'; Substrate: cobble, gravel, sand, silt

Canopy: mostly closed; Bank Stability: poor; Bank Vegetation: trees, shrubs, grasses

Stream Gradient: Low Gradient Stream; Land Uses: suburban

Other: periphytes, orange floc, trash; parking lot on RB, auto repair shop and houses on LB

AMNET Site # **AN0453** *Stream Name:* **Deep Run**

Location: **Rt 9; Madison Twp; Middlesex County**

Collection Date: ***9/1/2009*** *USGS Topo Map:* **South Amboy**

	Genus	Tolerance Value	Amount
	Rheopelopia	4	21
	Limnodrilus	10	12
	Calopteryx	6	11
	Hetaerina	6	8
*	Phryganeidae	4	8
	Tribelos	5	7
*	Polycentropus	6	5
	Polypedilum	6	5
	Corydalus	4	3
	Lumbriculus	8	3
*	Mystacides	4	3
	Enallagma	9	2
	Tubifex	10	2
	Ablabesmyia	8	1
	Ancyronyx	2	1
	Bezzia	6	1
	Cryptochironomus	8	1
	Erythemis	10	1
	Gerris	8	1
	Nematoda	6	1
*	Ptilostomis	5	1
	Stenochironomus	5	1
	Tanytarsus	6	1

** (EPT organism)* *Taxa Richness:* 23 *Population:* 100

%Dominance / Dominant Taxon(s): 21.0% Rheopelopia

Hilsenhoff Biotic Index (HBI): 5.95 *%Clingers:* 9.00%

** E+P+T:* 4 ( ) Ephemeroptera, ( ) Plecoptera, (4) Trichoptera *%Ephemeroptera:* 0.00%

CPMI Rating: **10 Fair**

Habitat Analysis: 144 Suboptimal USEPA Protocol

Observations: Water temp: 17.24 C; Cond: 343 umhos; DO: 8.66 mg/L; pH: 4.37 SU

Clarity: slightly turbid, brown; Flow Rate: slow; Width/Depth: 31' / 2'; Substrate: gravel, sand, root mats, undercut banks

Canopy: mostly closed; Bank Stability: poor; Bank Vegetation: trees, weeds

Stream Gradient: Low Gradient Stream; Land Uses: commercial, suburban

Pipes / Ditches: storm sewers, ditches (from adj parking lot)

AMNET Site # **AN0454** ***Stream Name:*** **Deep Run**

Location: **Rt 516; Madison Twp; Middlesex County**

Collection Date: ***9/1/2009*** ***USGS Topo Map:*** **South Amboy**

Genus	*Tolerance Value*	*Amount*
Limnodrilus	10	57
Tribelos	5	28
Tubifex	10	9
Ischnura	9	2
Polypedilum	6	2
Rheotanytarsus	6	2

** (EPT organism)* *Taxa Richness:* 6 *Population:* 100

%Dominance / Dominant Taxon(s): 57.0% Limnodrilus

Hilsenhoff Biotic Index (HBI): 8.42 *%Clingers:* 2.00%

** E+P+T:* 0 ( ) Ephemeroptera, ( ) Plecoptera, ( ) Trichoptera *%Ephemeroptera:* 0.00%

CPMI Rating: **0 Poor**

Habitat Analysis: 149 Suboptimal USEPA Protocol

Observations: Water temp: 18.37 C; Cond: 255 umhos; DO: 7.29 mg/L; pH: 4.96 SU

Clarity: turbid; Flow Rate: slow; Width/Depth: 34' / > 4'; Substrate: mud, silt

Canopy: open; Bank Stability: good; Bank Vegetation: trees, weeds

Stream Gradient: Low Gradient Stream; Land Uses: suburban, forested

Other: macrophytes, purple loosestrife, metal floc, gabion on bank

A-3
TOTAL MINIMUM DAILY LOADS FOR FECAL COLIFORM TO ADDRESS 48 STREMS IN THE RARITAN WATER REGION

Amendment to the Lower Raritan/Middlesex Water Quality Management Plan, Mercer County Water Quality Management Plan, Monmouth County Water Quality Management Plan, Northeast Water Quality Management Plan, Upper Raritan Water Quality Management Plan, and Sussex County Water Quality Management Plan

Total Maximum Daily Loads for Fecal Coliform to Address 48 Streams in the Raritan Water Region

Watershed Management Area 7
(Arthur Kill, Newark Bay, Elizabeth River,
Rahway River/Woodbridge Creek, Morses Creek)
Watershed Management Area 8
(North and South Branch Raritan)
Watershed Management Area 9
(Lower Raritan, South River, and Lawrence and Manalapan Brooks)
Watershed Management Area 10
(Stony Brook, Millstone River)

Proposed:	April 21, 2003
Established:	June 27, 2003
Approved (by EPA Region 2):	September 29, 2003
Adopted:	

New Jersey Department of Environmental Protection
Division of Watershed Management
P.O. Box 418
Trenton, New Jersey 08625-0418

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1.0 Executive Summary

In accordance with Section 305(b) of the Federal Clean Water Act (CWA), the State of New Jersey developed the *2002 Integrated List of Waterbodies*, addressing the overall water quality of the State's waters and identifying impaired waterbodies for which Total Maximum Daily Loads (TMDLs) may be necessary. The *2002 Integrated List of Waterbodies* identified several waterbodies in the Raritan Water Region as being impaired by pathogens, as indicated by the presence of fecal coliform concentrations in excess of standards. This report, developed by the New Jersey Department of Environmental Protection (NJDEP), establishes 48 TMDLs addressing fecal coliform loads to the waterbodies identified in Table 1.

Table 1 Fecal coliform-impaired stream segments in the Raritan Water Region, identified in Sublist 5 of the 2002 Integrated List of Waterbodies, for which fecal coliform TMDLs are being established.

TMDL Number	WMA	Station Name/Waterbody	Site ID	County(s)	River Miles
1	7	WB Elizabeth River near Union	01393350	Essex Union	4.2
2	7	Elizabeth River at Ursino Lake at Elizabeth	01393450	Union	5.7
3	7	West Branch Rahway River at Northfield Ave. at West Orange	01393960	Essex	4.4
4	7	Rahway River near Springfield	01394500	Essex	26.3
5	7	Rahway River at Rahway	01395000	Union	8.6
6	7	Robinson Branch at Scotch Plains	01395200	Union	3.3
7	7	Robinson Branch at St. Georges Ave at Rahway	01396003	Middlesex Union	20.7
8	8	Stony Brook at Fairview Avenue at Naughright	01396219	Morris	3.4
9	8	South Branch Raritan River at Middle Valley	01396280	Morris	15.2
10	8	South Branch Raritan River Arch St. at High Bridge	01396535	Hunterdon	4.3
11	8	Spruce Run at Newport	01396550	Hunterdon	8.6
12	8	Spruce Run near Glen Gardner	01396588	Hunterdon	3.6
13	8	Mulhockaway Creek at Van Syckel	01396660	Hunterdon	16.5
14	8	South Branch Raritan River at Stanton Station	01397000	Hunterdon	8.3
15	8	South Branch Raritan River at Three Bridges	01397400	Hunterdon	7.4
16	8	Neshanic River at Reaville	01398000	Hunterdon	37.0
17	8	South Branch Raritan River at South Branch	01398102	Somerset	7.1
18	8	North Branch Raritan River near Chester	01398260	Morris	8.5
19	8	North Branch Raritan River at Burnt Mills	01399120	Somerset	5.8
20	8	Lamington River near Ironia	01399200	Morris	2.7
21	8	Lamington River near Pottersville	01399500	Morris	12.8
22	8	Rockaway Creek at Whitehouse	01399700	Hunterdon	3.6
23	8	Lamington River at Burnt Mills	01399780	Somerset	10.0
24	8	Chambers Brook at North Branch Depot	01399900	Somerset	8.5
25	8	North Branch Raritan River near Raritan	01400000	Somerset	7.9
26	9	Peters Brook at Rt. 28 at Somerville	01400395	Somerset	12.2
27	9	Raritan River at Manville	01400500	Somerset	10.8
28	9	Raritan River at Queens Bridge	01403300	Somerset	12.0

TMDL Number	WMA	Station Name/Waterbody	Site ID	County(s)	River Miles
29	9	Bound Brook at Route 28 at Middlesex	01403385	Middlesex	17.8
30	9	Green Brook at North Plainfield	01403470	Middlesex Somerset	17.8
31	9	Bound Brook at Middlesex	01403900	Somerset	2.8
32	9	Matchaponix Brook at Englishtown	01405195	Middlesex Monmouth	4.9
33	9	Manalapan Brook at Federal Rd. near Manalapan	01405340	Middlesex Monmouth	14.6
34	9	Manalapan Brook near Spotswood	01405400[a]	Middlesex Monmouth	5.7
35	9	McGolliard Brook at Main St. in Englishtown	22	Middlesex Monmouth	1.1
36	9	Lake Topanemus at Pond Rd. in Freehold	61	Middlesex Monmouth	5.7
37	9	Wemrock Brook at Rt #9 (Before Pipes) in Freehold	68	Middlesex Monmouth	2.9
38	9	Weemaconk Creek at Main St In Manalapan	9	Middlesex Monmouth	6.7
39	10	Millstone River near Manalapan	01400540	Mercer Middlesex Monmouth	11.3
40	10	Millstone River at Grovers Mill	01400650	Mercer Middlesex Monmouth	27.3
41	10	Cranbury Book near Prospect Plains	01400690	Middlesex Monmouth	13.9
42	10	Stony Brook at Princeton	01401000	Mercer	8.3
43	10	Duck Pond Run at Clarksville	01401200	Mercer	2.8
44	10	Heathcote Brook at Kingston	01401400	Middlesex Somerset	13.7
45	10	Bedens Brook near Rocky Hill	01401600	Somerset	2.4
46	10	Pike Run near Rocky Hill	01401700	Somerset	2.8
47	10	Millstone River at Blackwells Mills	01402000	Somerset	10.5
48	10	Millstone River at Weston	01402540	Somerset	1.5
Total River Miles:					453.9

[a] This station was incorrectly labeled "01405440" in the *2002 Integrated List of Waterbodies*.

These forty-eight TMDLs will serve as management approaches or restoration plans aimed at identifying the sources of fecal coliform and for setting goals for fecal coliform load reductions in order to attain applicable surface water quality standards (SWQS).

As stated in N.J.A.C. 7:9B-1.14(c) of the New Jersey Surface Water Quality Standards, "Fecal coliform levels shall not exceed a geometric average of 200 CFU/100 ml nor should more than 10 percent of the total sample taken during any 30-day period exceed 400 CFU/100 ml in FW2 waters." Nonpoint and stormwater point sources are the primary contributors to fecal coliform loads in these streams and can include storm-driven loads transporting fecal coliform from sources such as geese, farms, and domestic pets to the receiving water. Nonpoint sources also include steady-inputs from sources such as failing sewage conveyance systems and failing or inappropriately located septic systems. Because the total point source contribution other than stormwater (i.e. Publicly-Owned Treatment Works, POTWs) is an insignificant fraction of a percent of the total load, these fecal coliform TMDLs will not impose any change in current practices for POTWs and will not result in changes to existing effluent limits.

Using ambient water quality data monitoring conducted by USGS/NJDEP and the Monmouth County Health Department during water years 1994-2002, summer and all season geometric means were determined for each Category 5 listed segment. Given the two surface

water quality criteria of 200 CFU/100 ml and 400 CFU/100 ml in FW2 waters, computations were necessary for both criteria and resulted in two values for percent reduction for each stream segment. The higher (more stringent) percent reduction value was selected as the TMDL and will be applied to nonpoint and stormwater point sources as a whole or apportioned to categories of nonpoint and stormwater point sources within the study area. The extent to which nonpoint and stormwater point sources have been identified and the process by which they will become identified or need to be identified or verified varies by segment based on data availability, watershed size and complexity, and pollutant sources. Implementation strategies to achieve SWQS are addressed in this report.

Each TMDL shall be proposed and adopted by the Department as an amendment to the appropriate area wide water quality management plan(s) in accordance with N.J.A.C. 7:15-3.4(g).

This TMDL Report is consistent with the United States Environmental Protection Agency's (USEPA's) May 20, 2002 guidance document entitled: "Guidelines for Reviewing TMDLs under Existing Regulations issued in 1992," (Suftin, 2002) which describes the statutory and regulatory requirements for approvable TMDLs.

2.0 Introduction

Sublist 5 (also known as List 5 or, traditionally, the 303(d) List) of the State of New Jersey's proposed *2002 Integrated List of Waterbodies* identified several waterbodies in the Raritan Water Region as being impaired by pathogens, as evidenced by the presence of high fecal coliform concentrations. This report establishes forty-eight TMDLs, which address fecal coliform loads to the identified waterbodies. These TMDLs serve as management approaches or restoration plans aimed toward reducing loadings of fecal coliform from various sources in order to attain applicable surface water quality standards for the pathogen indication. Several of these waterbodies are listed in Sublist 5 for impairment caused by other pollutants. These TMDLs address only fecal coliform impairments. Separate TMDL evaluations will be developed to address the other pollutants of concern. The waterbodies will remain on Sublist 5 with respect to these pollutants until such time as TMDL evaluations for all pollutants have been completed and approved by USEPA. With respect to the fecal coliform impairment, the waterbodies will be moved to Sublist 4 following approval of the TMDLs by USEPA.

3.0 Background

In accordance with Section 305(b) of the Federal Clean Water Act (CWA) (33 U.S.C. 1315(B)), the State of New Jersey is required to biennially prepare and submit to the USEPA a report addressing the overall water quality of the State's waters. This report is commonly referred to as the 305(b) Report or the Water Quality Inventory Report. In November 2001, USEPA issued guidance that encouraged states to integrate the 305(b) Report and the 303(d) List into one report. This integrated report assigns waterbodies to one of five categories. In general, Sublists 1 through 4 include waterbodies that are unimpaired, have limited assessment or

data availability or have a range of designated use impairments, whereas Sublist 5 constitutes the traditional 303(d) List for waters impaired or threatened by one or more pollutants. The Department chose to develop an Integrated Report for New Jersey. New Jersey's proposed *2002 Integrated List of Waterbodies* is based upon these five categories and identifies water quality limited surface waters in accordance with N.J.A.C. 7:15-6 and Section 303(d) of the CWA. Water quality limited waterbodies require total maximum daily load (TMDL) evaluations.

A Total Maximum Daily Load (TMDL) represents the assimilative or carrying capacity of a waterbody, taking into consideration point and nonpoint sources of pollutants of concern, natural background and surface water withdrawals. A TMDL quantifies the amount of a pollutant a water body can assimilate without violating a state's water quality standards and allocates that load capacity to known point and nonpoint sources in the form of wasteload allocations (WLAs), load allocations (LAs), and a margin of safety. A TMDL is developed as a mechanism for identifying all the contributors to surface water quality impacts and setting goals for load reductions for pollutants of concern as necessary to meet the SWQS.

Recent EPA guidance (Suftin, 2002) describes the statutory and regulatory requirements for approvable TMDLs, as well as additional information generally needed for USEPA to determine if a submitted TMDL fulfills the legal requirements for approval under Section 303(d) and EPA regulations. The Department believes that the TMDLs in this report address the following items in the May 20, 2002 guideline document:

1. Identification of waterbody(ies), pollutant of concern, pollutant sources and priority ranking.
2. Description of applicable water quality standards and numeric water quality target(s).
3. Loading capacity – linking water quality and pollutant sources.
4. Load allocations.
5. Wasteload allocations.
6. Margin of safety.
7. Seasonal variation.
8. Reasonable assurances.
9. Monitoring plan to track TMDL effectiveness.
10. Implementation (USEPA is not required to and does not approve TMDL implementation plans).
11. Public Participation.

4.0 Pollutant of Concern and Area of Interest

The pollutant of concern for these TMDLs is pathogens, the presence of which is indicated by elevated concentrations of fecal coliform bacteria. Fecal coliform concentrations were found to exceed New Jersey's Surface Water Quality Standards (SWQS), published at N.J.A.C. 7-9B et seq., for the segments in the Raritan Water Region identified in Table 2. As reported in the proposed 2002 Integrated List of Waterbodies, also identified in Table 2 are the river miles and management response associated with each listed segment. All of these waterbodies have a high priority ranking, as described in the *2002 Integrated List of Waterbodies*.

Table 2 Abridged Sublist 5 of the 2002 Integrated List of Waterbodies, listed for fecal coliform impairment in the Raritan Water Region.

TMDL No.	WMA	Station Name/Waterbody	Site ID	River Miles	Management Response
1	7	WB Elizabeth River near Union	1393350	4.2	establish TMDL
2	7	Elizabeth River at Ursino Lake at Elizabeth	1393450	5.7	establish TMDL
3	7	WB Rahway River at Northfield Ave. at West Orange	1393960	4.4	establish TMDL
4	7	Rahway River near Springfield	1394500	26.3	establish TMDL
5	7	Rahway River at Rahway	1395000	8.6	establish TMDL
6	7	Robinson Branch at Scotch Plains	1395200	3.3	establish TMDL
7	7	Robinson Branch at St. Georges Ave. at Rahway	1396003	20.7	establish TMDL
8	8	Stony Brook at Fairview Avenue at Naughright	1396219	3.4	establish TMDL
9	8	South Branch Raritan River at Middle Valley	1396280	15.2	establish TMDL
10	8	South Branch Raritan River Arch St at High Bridge	1396535	4.3	establish TMDL
11	8	Spruce Run at Newport	1396550	8.6	establish TMDL
12	8	Spruce Run near Glen Gardner	1396588	3.6	establish TMDL
13	8	Mulhockaway Creek at Van Syckel	1396660	16.5	establish TMDL
14	8	South Branch Raritan River at Stanton Station	1397000	8.3	establish TMDL
15	8	South Branch Raritan River at Three Bridges	1397400	7.4	establish TMDL
16	8	Neshanic River at Reaville	1398000	37.0	establish TMDL
17	8	South Branch Raritan River at South Branch	1398102	7.1	establish TMDL
18	8	North Branch Raritan River near Chester	1398260	8.5	establish TMDL
19	8	North Branch Raritan River at Burnt Mills	1399120	5.8	establish TMDL
20	8	Lamington River near Ironia	1399200	2.7	establish TMDL
21	8	Lamington River near Pottersville	1399500	12.8	establish TMDL
22	8	Rockaway Creek at Whitehouse	1399700	3.6	establish TMDL
23	8	Lamington River at Burnt Mills	1399780	10.0	establish TMDL
24	8	Chambers Brook at North Branch Depot	1399900	8.5	establish TMDL
25	8	North Branch Raritan River near Raritan	1400000	7.9	establish TMDL
26	9	Peters Brook at Rt. 28 at Somerville	1400395	12.2	establish TMDL
27	9	Raritan River at Manville	1400500	10.8	establish TMDL
28	9	Raritan River at Queens Bridge	1403300	12.0	establish TMDL
29	9	Bound Brook at Route 28 at Middlesex	1403385	17.8	establish TMDL
30	9	Green Brook at North Plainfield	1403470	17.8	establish TMDL

TMDL No.	WMA	Station Name/Waterbody	Site ID	River Miles	Management Response
31	9	Bound Brook at Middlesex	1403900	2.8	establish TMDL
32	9	Matchaponix Brook at Englishtown	1405195	4.9	establish TMDL
33	9	Manalapan Brook at Federal Rd. near Manalapan	1405340	14.6	establish TMDL
34	9	Manalapan Brook near Spotswood	1405400[a]	5.9	establish TMDL
35	9	McGolliard Brook at Main St. in Englishtown	22	1.1	establish TMDL
36	9	Lake Topanemus at Pond Rd. in Freehold	61	5.7	establish TMDL
37	9	Wemrock Brook at Rt #9 (Before Pipes) in Freehold	68	2.9	establish TMDL
38	9	Weemaconk Creek at Main St. in Manalapan	9	6.7	establish TMDL
39	10	Millstone River near Manalapan	1400540	11.3	establish TMDL
40	10	Millstone River at Grovers Mill	1400650	27.3	establish TMDL
41	10	Cranbury Book near Prospect Plains	1400690	13.9	establish TMDL
42	10	Stony Brook at Princeton	1401000	8.3	establish TMDL
43	10	Duck Pond Run at Clarksville	1401200	2.8	establish TMDL
44	10	Heathcote Brook at Kingston	1401400	13.7	establish TMDL
	10	Millstone River at Kingston	1401440	3.8	water quality monitoring needed to identify if an impairment exists; move to Sublist 3.
45	10	Bedens Brook near Rocky Hill	1401600	2.4	establish TMDL
46	10	Pike Run near Rocky Hill	1401700	2.8	establish TMDL
47	10	Millstone River at Blackwells Mills	1402000	10.5	establish TMDL
48	10	Millstone River at Weston	1402540	1.5	establish TMDL

[a] This station was incorrectly labeled "01405440" in the *2002 Integrated List of Waterbodies.*

These forty-eight TMDLs will address 454 river miles or approximately 99% of the total river miles listed as impaired relative to fecal coliform (458 total fecal coliform impaired river miles) in the Raritan watershed region. Based on the detailed county hydrography stream coverage, 1151 stream miles, or 53% of the stream segments in the Raritan region (2168 total miles) are directly affected by the 48 TMDLs due to the fact that the implementation plans cover entire watersheds; not just impaired waterbody segments.

Table 2 identifies one segment for which a TMDL will not be developed at this time based on investigations following the *2002 Integrated List of Waterbodies* proposal. The Millstone River at Kingston, station #01401440, is identified as needing further monitoring to confirm impairment and will be moved to Sublist 3 of the 2002 Integrated List of Waterbodies. A further discussion can be found in Appendix A.

4.1. Description of the Raritan Water Region and Sublist 5 Waterbodies

4.1.1. Watershed Management Area 7

Watershed Management Area 7 includes large portions of Essex, Union, and Middlesex counties. The mainstem of the Rahway River is 24 miles long, flowing from Union into the Arthur Kill near Linden and is tidal from the Pennsylvania Railroad Bridge at Rahway down to the mouth. Major tributaries include the East Branch Rahway River, Woodbridge River and Robinsons Branch and major impoundments are the Middlesex Reservoir, Orange Reservoir, Lower and Upper Echo Lakes and Diamond Mill Pond. The Elizabeth River is 11 miles long and much of it channelized for flood control purposes. Land uses in the Rahway and Elizabeth Watersheds are principally residential, commercial and industrial. There are 50 NJPDES permitted discharges and 12 biological monitoring stations in these watersheds.

Sublist 5 Waterbodies in WMA 7

Seven river segments of the forty-eight impaired segments addressed in this report, the West Branch Elizabeth River (#01393350), Elizabeth River (#01393450), West Branch Rahway River (#01393960), Rahway River (#01394500, #01395000), Robinson Branch (#01395200, #01396003) are located in WMA 7. Several of these stream segments are geographically located in close proximity, thus, when these segments were found to contain similar levels of bacteria contamination (geometric means value), water quality data from these segments were grouped when calculating the TMDL. The spatial extent of each segment is identified in Figure 1 and described in Table 3. River miles, watershed sizes and land use/land cover by percent area associated with each segment are listed in Table 4.

Figure 1 Spatial extent of Sublist 5 segments for which TMDLs are being developed in WMA 7

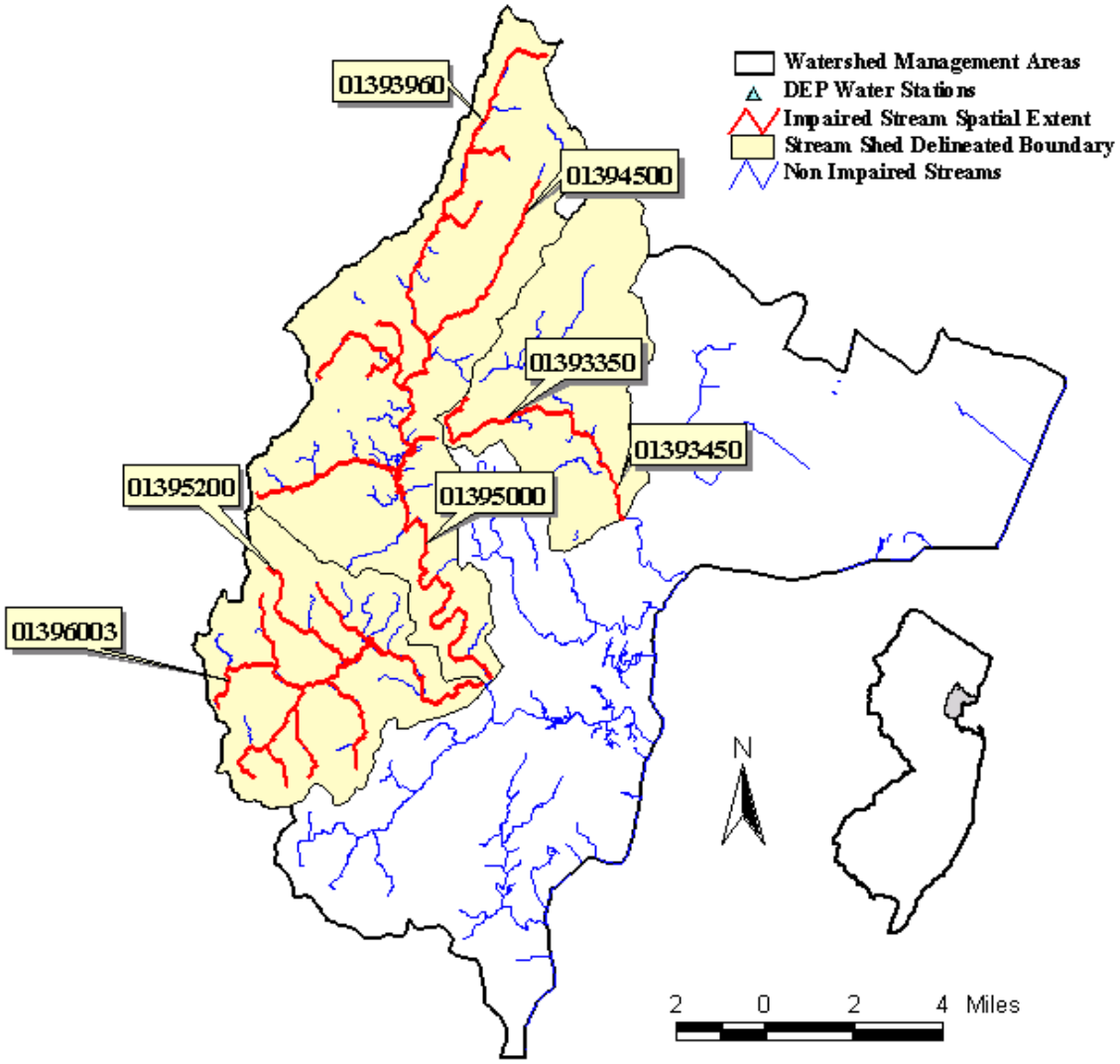


Table 3 Description of the spatial extent for each Sublist 5 segment, listed for fecal coliform, in WMA 7.

Segment ID	Watershed area associated with impaired stream segments
1393350, 1393450	Elizabeth River watershed upstream of the head of tide; located near Elizabeth. Includes Irvington Brook, Lightening Brook, Maplewood Brook, and the West Branch Elizabeth River tributaries.
1393960, 1394500, 1395000	Rahway River watershed upstream of the Rahway River/Robinsons Branch confluence. Includes the following tributaries: Nomagegan Brook, Turtle Brook, Van Winkle Brook, and the West Branch Rahwah River
1395200, 1396003	Robinsons Branch watershed upstream of the Rahway River/Robinsons Branch confluence. Tributaries in this watershed include Ash Brook,

	Pumpkin Patch Brook, and Winding Brook.

Table 4 River miles, Watershed size, and Anderson Land Use classification for seven Sublist 5 segments, listed for fecal coliform, in WMA 7.

	Segment ID		
	1393350, 1393450	**1393960, 1394500, 1395000**	**1395200, 1396003**
Sublist 5 impaired river miles (miles)	9.9	39.3	24.1
Total river miles within watershed and included in the implementation plan (miles)	20.9	61	33.4
Watershed size (acres)	13247	27006	14152
Landuse\Landcover			
Agriculture	0.1%	0.2%	0.3%
Barren Land	0.1%	0.6%	0.3%
Forest	4.0%	16.2%	8.2%
Urban	93.6%	79.2%	79.1%
Water	0.3%	1.1%	0.9%
Wetlands	2.1%	2.8%	11.1%

4.1.2. Watershed Management Area 8

Watershed Management Area 8 includes the North and South Branches of the Raritan River and their tributaries. Large portions of Somerset, Hunterdon, and Morris counties are included in this land area.

The North Branch of the Raritan River is 23 miles long and flows from northwestern Morris County through Somerset County to the confluence with the South Branch between the towns of Branchburg and Raritan. Major tributaries include the Peapack Brook, Rockaway Creek, and Lamington River and the only major impoundment is the Ravine Lake. Land use in the North Branch Raritan River Watershed is primarily rural, woodland, and agricultural with scattered areas of commercial and residential but there is intense development along the major road corridors. There are over 20 NJPDES permitted discharges and 51 biological monitoring stations in this watershed.

The South Branch of the Raritan River is 51 miles long and flows from western Morris County through central Hunterdon County and into western Somerset County before joining the North Branch. Major tributaries include the Neshanic River, Spruce Run Creek, Mulhockaway Creek, and Cakepoulin Creek and major impoundments are the Spruce Run and Round Valley Reservoirs. Land use in the South Branch Raritan River Watershed is mostly agricultural, but suburban-industrial development is increasing at a rapid rate. There

are approximately 23 NJPDES permitted discharges and 51 biological monitoring stations in this watershed.

Sublist 5 Waterbodies in WMA 8

Eighteen of the forty-eight TMDLs in the Raritan region are located in WMA 8. Included are several segments of the Chambers Brook (#01399900), Lamington River (#01399780, #01399200, #01399500), Mulhockaway Creek (#01396660), North Branch Raritan River (#01399120, #01398260, 01400000), Neshanic River (#01398000), Rockaway Creek (#01399700), South Branch Raritan River (#01396535, #01396280, #01398102, #01397000, #01397400), Spruce Run (#01396550, 01396588), and Stony Brook (#01396219). The spatial extent of each segment is identified in Figure 2 and described in Table 5. River miles, watershed sizes and land use/land cover by percent area associated with each segment are listed in Table 6.

Figure 2 **Spatial extent of Sublist 5 segments for which TMDLs are being developed in WMA 8**

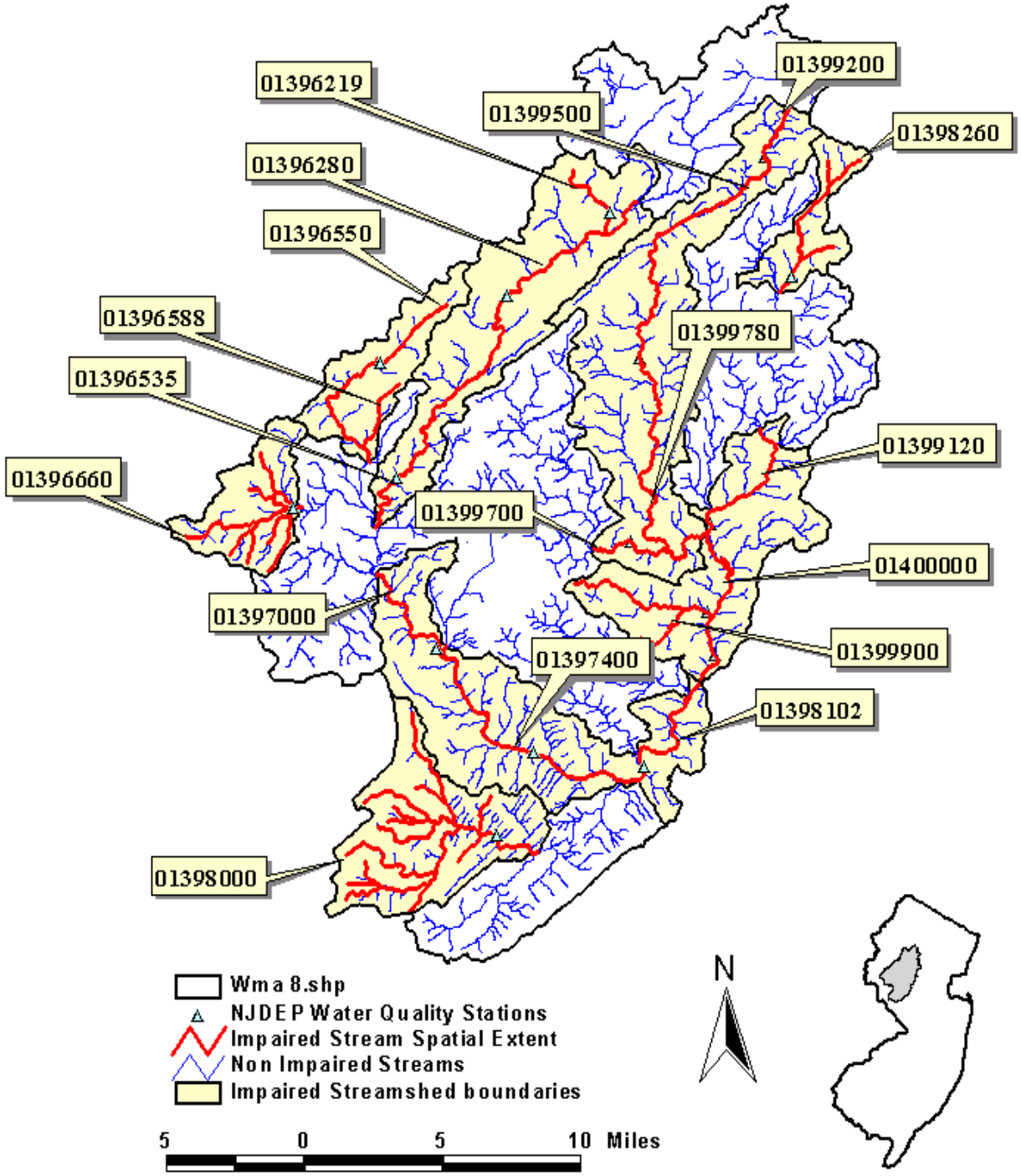


Table 5 Description of the spatial extent for each Sublist 5 segment, listed for fecal coliform, in WMA 8.

Segment ID	Watershed area associated with impaired stream segments
1396219, 1396280, 1396535	Raritan River watershed upstream of the Raritan River/Spruce Run confluence. Excludes upstream portions of the Rocky Brook based on distance from impaired stream segment. Tributaries in this watershed included: Stony Brook, Electric Brook, and Little Brook.
1396550, 1396588	Spruce Run Watershed upstream of the Spruce Run/Willoughby Brook confluence. Included also is Rocky Run watershed.
1396660	Mulhockaway Creek upper watershed to approximately 1500 ft downstream of USGS station #01396660
1398000	Neshanic River watershed upstream of Neshanic River/Back Brook confluence. Tributary included in this area is Wallnut Brook
1397000, 1397400, 1398102	Raritan River watershed beginning at the Raritan River/Grandin Stream confluence and extending to 3000 ft downstream of the Raritan River/Holland Brook confluence. Included the following tributaries: Pleasant Run, Bushkill Creek, Minneakoning Creek, Assicong Creek, Lower Prescott Brook, Allerton Creek, and Cramers Creek.
1398260	North Branch Raritan River upstream of Raritan River/McVickers Brook confluence. Included are the lower portions of Burnett Brook, and India Brook watersheds
1399200, 1399500, 1399700, 1399780	Laminton River watershed upstream of the Lamington River/North Branch Raritan River confluence. Included are the following tributaries: Muddy Run, Rockaway Creek below the Rockaway Creek/South Branch Rockaway Creek confluence, Cold Brook, Herzog Brook, Rinehart Brook, Trout Brook, and Tanners Brook.
1399120, 1399900, 1400000	North Branch Raritan River watershed from the North Branch Raritan River/Peapack Brook confluence to the North Branch Raritan River/Raritan River confluence. Excludes Lamington River watershed. Included are Chambers Brook, River Brook, and Moggy Brook watersheds.

Table 6 River miles, Watershed size, and Anderson Landuse classification for eighteen Sublist 5 segments, listed for fecal coliform, in WMA 8.

	Segment ID							
	1396219 1396280 1396535	**1396550 1396588**	**1396660**	**1398000**	**1397000 1397400 1398102**	**1398260**	**1399200 1399500 1399700 1399780**	**1399120 1399900 1400000**
Sublist 5 impaired river miles (miles)	22.9	12.3	16.5	37.0	22.8	8.5	29.1	22.2
Total river miles within watershed and included in the implementation	59	12.3	30.9	62.7	98.8	17.4	111.8	65.2

plan (miles)	Segment ID 1396219 1396280 1396535	 1396550 1396588	 1396660	 1398000	 1397000 1397400 1398102	 1398260	1399200 1399500 1399700 1399780	 1399120 1399900 1400000
Watershed size (acres)	27308	9973	58	19909	122	6106	37534	22432
Landuse\ Landcover								
Agriculture	16.9%	19.6%	19.5%	43.4%	33.8%	5.7%	25.1%	19.0%
Barren Land	0.5%	0.7%	0.8%	0.3%	0.7%	0.3%	0.5%	1.3%
Forest	43.9%	52.6%	46.3%	20.3%	21.1%	44.9%	42.6%	28.5%
Urban	25.7%	17.5%	22.0%	25.3%	32.3%	38.2%	20.2%	41.1%
Water	0.9%	0.5%	0.3%	0.2%	1.3%	0.4%	0.8%	0.9%
Wetlands	12.2%	9.2%	11.1%	10.5%	10.8%	10.5%	11.0%	9.2%

4.1.3. Watershed Management Area 9

Watershed Management Area 9 includes the mainstem of the Raritan River, the South River, and the Lawrence Brook. Middlesex, Somerset, and Monmouth Counties make up most of the political geography of this WMA.

The Mainstem of the Raritan River spans from the confluence of the North and South Branches to the Raritan Bay. For the most part, this drainage area is densely populated. There are two low dams in this river, Fieldsville Dam and Calco Dam. Among the many small recreational lakes and ponds in this area are Watchung Lake, Surprise Lake, Spring Lake and Green Brook Pond (all manmade). Land use in the mainstem Raritan River Watershed is primarily urban/suburban, with industrial and commercial centers throughout. There are about 73 NJPDES permitted dischargers and about 29 biological monitoring stations in this watershed.

The South River begins at Duhernal Lake in Spotswood and flows to the Raritan River at Sayreville. It is formed by the confluence of Manalapan and Matchaponix Brooks. Other tributaries include Deep River and Tennants Brook and major impoundments are Duhernal Lake and Lake Manalapan. The South River Watershed is made up of three subwatersheds, the Manalapan and Matchaponix Brooks and South River. Land use in the upper part of this area, the Manalapan and Matchaponix Brook subwatersheds, is predominantly agriculture and forests. New industrial and residential development are becoming incorporated into these areas and there is existing, older development in the South River subwatershed. There are about 5 NJPDES permitted discharges in the South River Watershed and 11 biological monitoring stations in the South River and Lawrence Brook Watersheds combined.

Sublist 5 Waterbodies in WMA 9

Thirteen of the forty-eight TMDLs in this report are located in WMA 9. Included are segments in Bound Brook (#01403385, #01403900), Green Brook (#01403470), Lake Topanemus (#61), Manalapan Brook (#01405340, #01405400), Matchaponix Brook (#01405195), McGolliard Brook (#22), Peters Brook (#01400395), Raritan River (#01400500, #01403300), Weemaconk Creek (#9), and Wemrock Brook (#68). The spatial extent of each segment is identified in Figure 3 and described in Table 7. River miles, watershed sizes and land use/land cover by percent area associated with each segment are listed in Table 8.

Figure 3 **Spatial extent of Sublist 5 segments for which TMDLs are being developed in WMA 9**

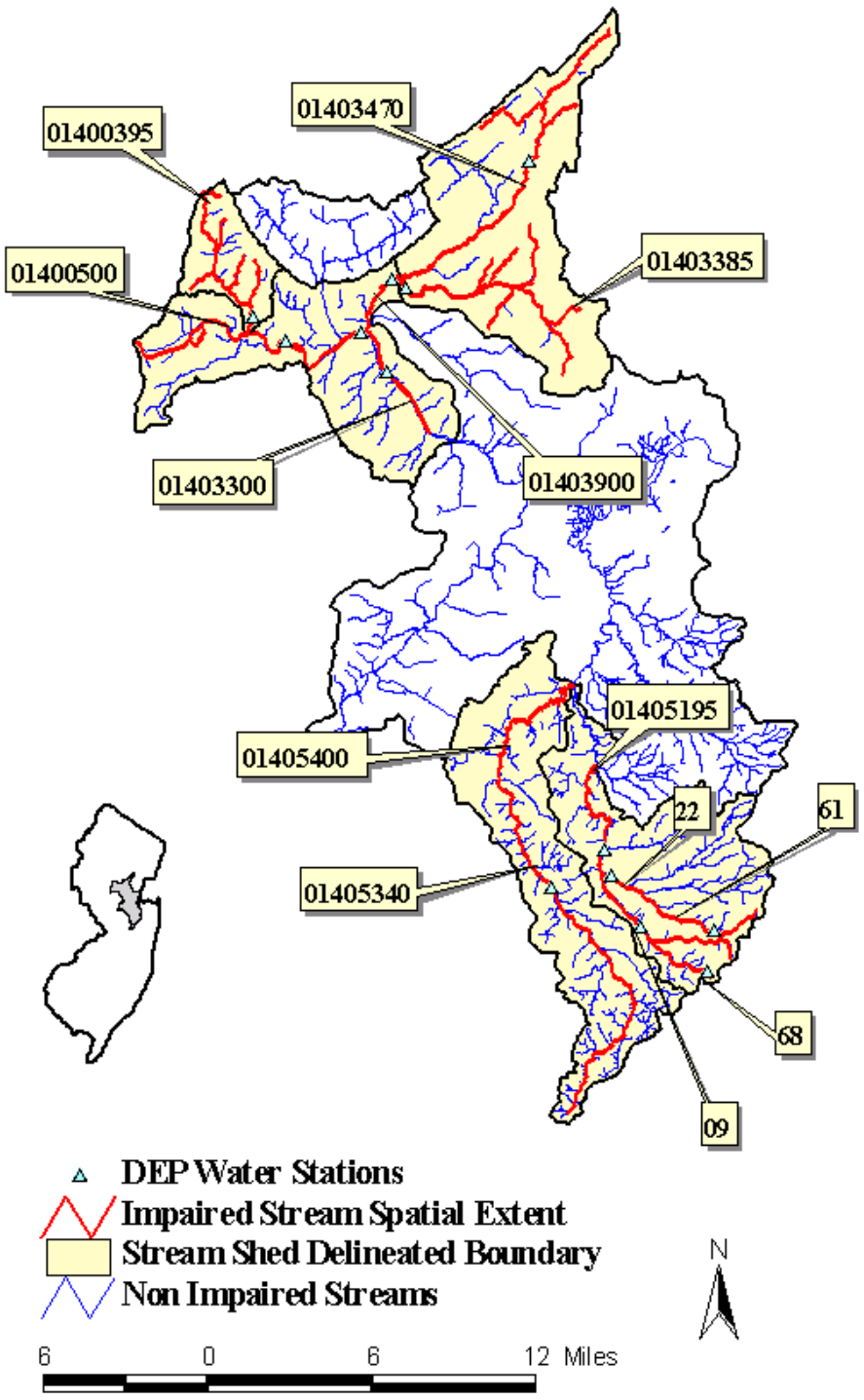


Table 7 Description of the spatial extent for each Sublist 5 segment, listed for fecal coliform, in WMA 9.

Segment ID	Watershed area associated with impaired stream segments
1400395	Peters Brook Watershed upstream of the confluence of Peters Brook with the Raritan River. Additional tributaries in the watershed include Macs Brook and Ross Brook.
1403385, 1403470	Green Brook and Bound Brook watersheds upstream of the confluence of Green Brook and Brown Brook. Tributaries include Blue Brook, Cedar Brook, Bonygut Brook, Bound Brook, Crab Brook, East Branch Green Brook, Green Brook, Stony Brook, and West Branch Stony Brook.
1400500, 1403300, 1403900	Raritan River watershed, from the confluence on the Raritan and Millstone Rivers, including the northwest branch of the Raritan River, the Raritan River to the confluence of Mile Run with the Raritan River, and Green Brook downstream of the confluence of Green Brook and Bound Brook. Additional tributaries in this watershed include: Cuckels Brook, Dukes Brook, and Randolph Brook.
1405195, 9, 22, 61, 68	Matchaponix Brook watershed upstream of confluence of Manalapan Brook with Matchaponix Brook at Duhernat Lake. Tributaries include McGellairds Brook, Milford Brook, Pine Brook, South Branch Tepehemus Brook, Tepehemus Brook, Weamaconk Brook, and Wemrock Brook
1405340, 1405400	Impaired grouped segments include upstream portions of Manalapan Brook from the headwaters of Manalapan Brook extending to the confluence of Manalapan Brook with Matchaponix Brook at Duhernat Lake. Tributaries included in the watershed include Cedar Brook, Gander Brook, South River, Wigwam Brook, and Stillhouse Brook.

Table 8 River miles, Watershed size, and Anderson Land Use classification for thirteen Sublist 5 segments, listed for fecal coliform, in WMA 9.

	Segment ID				
	1400395	**1403385, 1403470**	**1400500, 1403300, 1403900**	**1405195, 9, 22, 61, 68**	**1405340, 1405400**
Sublist 5 impaired river miles (miles)	12.2	35.6	25.8	21.4	20.4
Total river miles within watershed and included in the implementation plan (miles)	16.6	54.4	75.1	90.7	105.2
Watershed size (acres)	6358	30796	25864	24416	28110
Landuse\Landcover					
Agriculture	0.1%	0.4%	10.5%	11.0%	17.8%
Barren Land	0.5%	1.0%	1.4%	2.0%	2.1%
Forest	17.8%	15.2%	13.2%	16.7%	25.7%
Urban	72.5%	70.8%	54.4%	46.5%	27.9%
Water	0.3%	0.5%	3.0%	0.5%	1.1%
Wetlands	8.9%	12.2%	17.6%	23.3%	25.3%

4.1.4. Watershed Management Area 10

Watershed Management Area 10 includes the Millstone River and its tributaries. The Millstone River itself is a tributary to the Raritan River. This watershed lies in parts of Hunterdon, Somerset, Middlesex, Mercer, and Monmouth Counties.

The Millstone River is 38 miles long and flows from Millstone Township in Monmouth County to the Raritan River near Manville and Bound Brook. Major tributaries include Stony Brook, Cranbury Brook, Bear Brook, Ten Mile River, Six Mile River, and Bedens Brook and the largest impoundment is Carnegie Lake. Land use in the Millstone Watershed is primarily suburban development with scattered agricultural areas although there is extensive, recent development present in the upper portion. There are over 40 NJPDES permitted discharges and 81 biological monitoring sites in WMA 10.

Sublist 5 Waterbodies WMA 10

Ten of the forty-eight TMDLs in this report are located in WMA 10. Included are segments in Bedens Brook (#01401600), Cranbury Book (#01400690), Duck Pond Run (#01401200), Heathcote Brook (#01401400), Millstone River (#01402000, #01400650, #01402540, #01400540), Pike Run (#01401700), Stony Brook (#01401000) The spatial extent of each segment is identified in Figure 4 and described in Table 9. River miles, watershed sizes and land use/land cover by percent area associated with each segment are listed in Table 10.

Figure 4 **Spatial extent of Sublist 5 segments for which TMDLs are being developed in WMA 10**

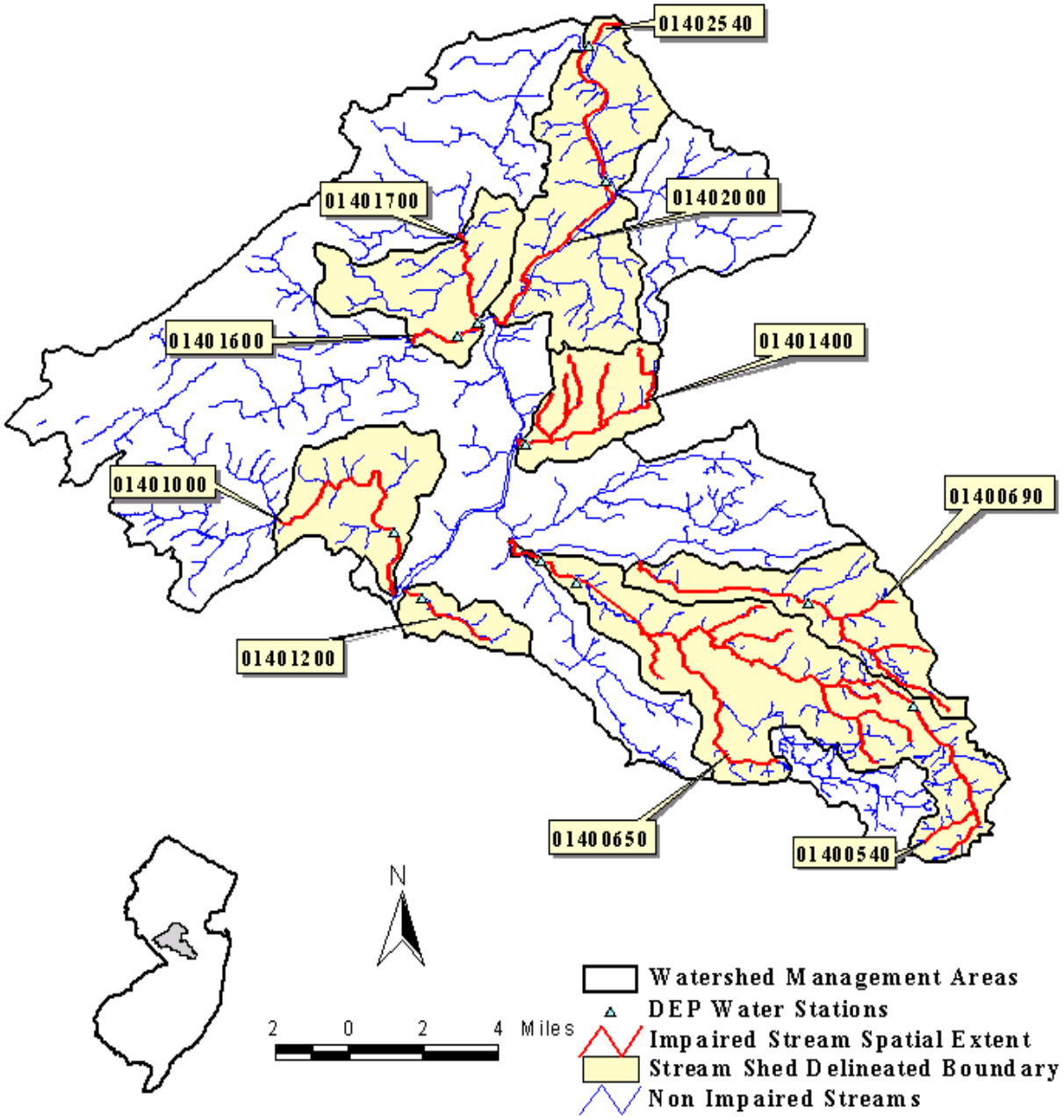


Table 9 Description of the spatial extent for each Sublist 5 segment, listed for fecal coliform, in WMA 10.

Segment ID	Watershed area associated with impaired stream segments
1400540, 1400650	Millstone river watershed upstream of the Millstone River/Devils Brook confluence. Excludes upstream portions of the Rocky Brook based on distance from impaired stream segment.
1400690	Cranbury Brook watershed upstream of its confluence with Cedar Brook.
1401000	Watershed area begins at the confluence of Honey Branch with Stoney Brook and continues to the confluence of the Stoney Brook with the Delaware and Raritan Canal near Port Mercer.
1401200	Duck Pond Run watershed upstream of its confluence with the Delaware and Raritan Canal
1401400	Heathcote and Carters Brooks watershed to the confluence of Heathcote Brook with Carnegie Lake.
1401600, 1401700	Impaired watersheds include portions of Benden Brook and Pike Run. The impaired watershed associated with the Benden Brook begins at the confluence of Rock Brook and Benden Brook and extends downstream to the confluence of Benden Brook and Pike Run. The impaired watershed associated with Pike Run begins at confluence of Pike Run and Cruser Brook and extends downstream to the confluence of Pike Run and Rock Brook.
1402000, 1402540	Portions of the Millstone River watershed. Impaired watershed associated with these segments begins at the confluence of Benden Brook and Millstone River and continues north to its confluence with the Raritan River. Excludes subwatersheds associated with Royce Brook and Six Mile Run

Table 10 River miles, Watershed size, and Anderson Land Use classification for ten Sublist 5 segments, listed for fecal coliform, in WMA 10.

	Segment ID						
	1400540, 1400650	**1400690**	**1401000**	**1401200**	**1401400**	**1401600, 1401700**	**1402000, 1402540**
Sublist 5 impaired river miles (miles)	38.6	13.9	8.3	2.8	13.7	5.2	12.1
Total river miles within watershed and included in the implementation plan (miles)	78.0	27.6	19.5	9.11	17.1	26.7	58
Watershed size (acres)	23502	9390	8169	2677	5857	8334	16325
Landuse\ Landcover							
Agriculture	33.7%	34.7%	11.5%	17.6%	13.9%	26.4%	27.7%

	Segment ID						
	1400540, 1400650	**1400690**	**1401000**	**1401200**	**1401400**	**1401600, 1401700**	**1402000, 1402540**
Barren Land	1.3%	1.8%	1.0%	0.5%	0.6%	2.8%	1.0%
Forest	13.0%	7.0%	35.4%	9.5%	24.9%	19.5%	19.3%
Urban	22.0%	26.3%	38.7%	40.9%	29.8%	38.5%	31.5%
Water	0.7%	1.2%	1.2%	0.4%	0.3%	0.5%	2.3%
Wetlands	29.3%	29.0%	12.2%	31.2%	30.7%	12.4%	18.3%

4.2. Data Sources

The Department's Geographic Information System (GIS) was used extensively to describe Raritan watershed characteristics. In concert with USEPA's November 2001 listing guidance, the Department is using Reach File 3 (RF3) in the 2002 Integrated Report to represent rivers and streams. The following is general information regarding the data used to describe the watershed management area:

- Land use/Land cover information was taken from the 1995/1997 Land Use/Land cover Updated for New Jersey DEP, published 12/01/2000 by Office of Information Resources Management (OIRM), Bureau of Geographic Information and Analysis (BGIA), delineated by watershed management area.
- 2002 Assessed Rivers coverage, NJDEP, Watershed Assessment Group, unpublished coverage.
- County Boundaries: Published 11/01/1998 by the NJDEP, Office of Information Resources Management (OIRM), Bureau of Geographic Information and Analysis (BGIA), "NJDEP County Boundaries for the State of New Jersey." Online at: http://www.state.nj.us/dep/gis/digidownload/zips/statewide/stco.zip
- Detailed stream coverage (RF3) by County: Published 11/01/1998 by the NJDEP, Office of Information Resources Management (OIRM), Bureau of Geographic Information and Analysis (BGIA). "Hydrography of XXX County, New Jersey (1:24000)." Online at: http://www.state.nj.us/dep/gis/digidownload/zips/strm/
- NJDEP 14 Digit Hydrologic Unit Code delineations (DEPHUC14), published 4/5/2000 by Department of Environmental Protection (NJDEP), New Jersey Geological Survey (NJGS) Online at: http://www.state.nj.us/dep/gis/digidownload/zips/statewide/dephuc14.zip
- NJPDES Surface Water Discharges in New Jersey, (1:12,000), published 02/02/2002 by Division of Water Quality (DWQ), Bureau of Point Source Permitting - Region 1 (PSP-R1).
- Dams statewide coverage. Published 5/16/2000 by Dam Safety Section. Titled "NJDEP Dams for the State of New Jersey." New Jersey Department of Environmental Protection(NJDEP). Online at: http://www.state.nj.us/dep/gis/digidownload/zips/statewide/dams.zip

5.0 Applicable Water Quality Standards

5.1. New Jersey Surface Water Quality Standards for Fecal Coliform

As stated in N.J.A.C. 7:9B-1.14(c) of the New Jersey SWQS, the following are the criteria for freshwater fecal coliform:

> "Fecal coliform levels shall not exceed a geometric average of 200 CFU/100 ml nor should more than 10 percent of the total samples taken during any 30-day period exceed 400 CFU/100 ml in FW2 waters".

All of the waterbodies covered under these TMDLs have a FW2 classification (NJAC 7:9B-1.12). The designated use, i.e. surface water uses, both existing and potential, that have been established by the Department for waters of the State, for all of the waterbodies in the Raritan Water Region is as stated below:

In all FW2 waters, the designated uses are:

1. Maintenance, migration and propagation of the natural and established aquatic biota;
2. Primary and secondary contact recreation;
3. Industrial and agricultural water supply;
4. Public potable water supply after conventional filtration treatment (a series of processes including filtration, flocculation, coagulation and sedimentation, resulting in substantial particulate removal but no consistent removal of chemical constituents) and disinfection; and
5. Any other reasonable uses.

5.2. Pathogen Indicators in New Jersey's Surface Water Quality Standards (SWQS)

A subset of total coliform, fecal coliform originates from the intestines of warm-blooded animals. Therefore, because they do not include organisms found naturally in soils, fecal coliform is preferred over total coliform as a pathogen indicator. In 1986, USEPA published a document entitled *"Implementation Guidance for Ambient Water Quality Criteria for Bacteria – 1986"* that contained their recommendations for water quality criteria for bacteria to protect bathers from gastrointestinal illness in recreational waters. The water quality criteria established levels of indicator bacteria *Escherichia coli* (*E. coli*) for fresh recreational water and enterococci for fresh and marine recreational waters in lieu of fecal coliforms. Historically, New Jersey has listed water bodies for exceedances of the fecal coliform criteria. Therefore, the Department is obligated to develop TMDLs for Sublist 5 water bodies based upon fecal coliform, until New Jersey makes the transition to *E. coli* and enterococci in its SWQS and sufficient data have been collected to assess impairment in accordance with the revised indicators.

6.0 Source Assessment

In order to evaluate and characterize fecal coliform loadings in the waterbodies of interest in these TMDLs, and thus propose proper management responses, source assessments are warranted. Source assessments include identifying the types of sources and their relative contributions to fecal coliform loadings, in both time and space variables.

6.1. Assessment of Point Sources other than Stormwater

Point sources of fecal coliform, namely sewage treatment discharges, for these TMDLs are listed in Appendix B. Sewage treatment plants, whether municipal or industrial, are required to disinfect effluent prior to discharge and to meet surface water quality criteria for fecal coliform in their effluent. In addition, New Jersey's Surface Water Quality Standards at N.J.A.C. 7:9B-1.5(c)4 reads "No mixing zones shall be permitted for indicators of bacterial quality including, but not limited to, fecal coliforms and enterococci". This mixing zone policy is applicable to both municipal and industrial sewage treatment plants.

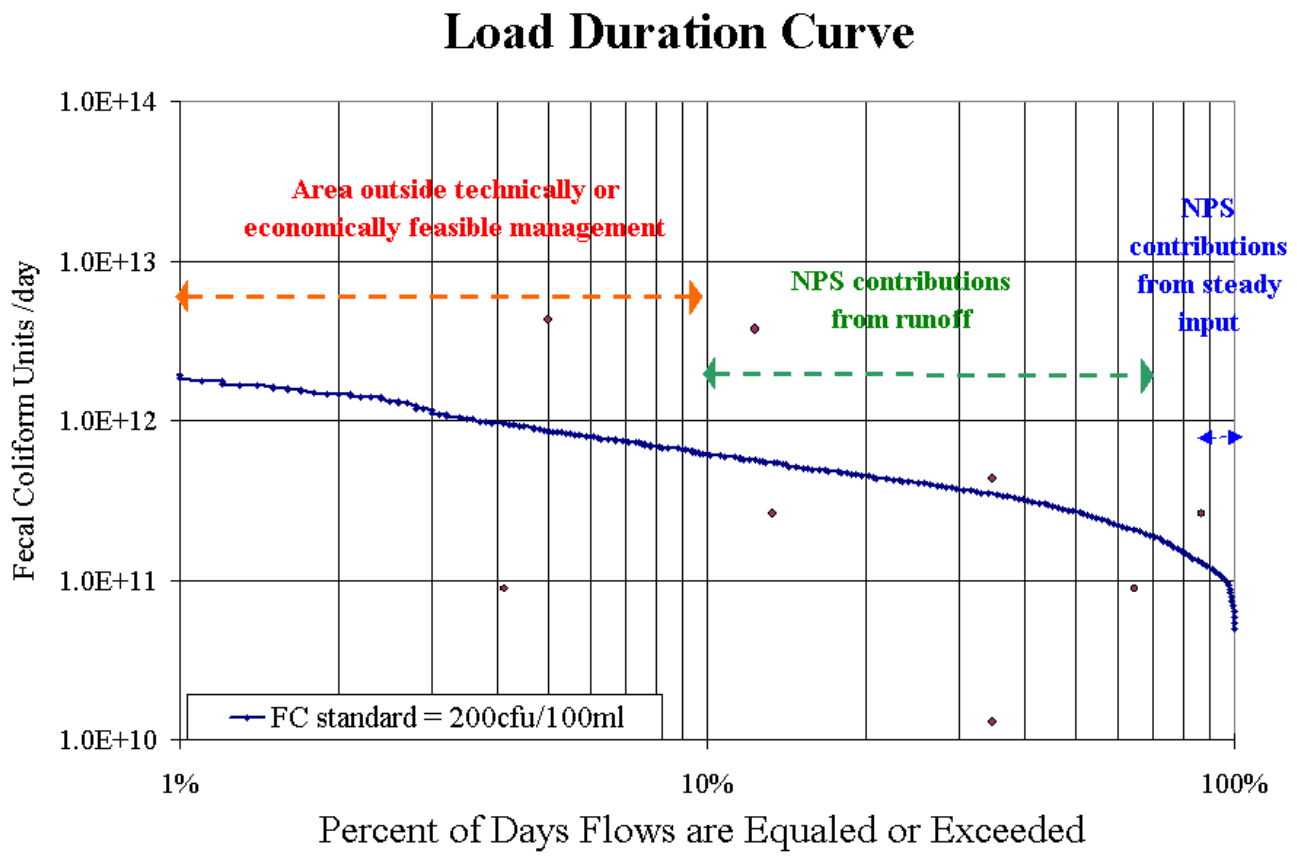
Since sewage treatment plants routinely achieve essentially complete disinfection (less than 20 CFU/100ml), the requirement to disinfect results in fecal coliform concentrations well below the criteria and permit limit. The percent of the total point source contribution is an insignificant fraction of the total load. Consequently, these fecal coliform TMDLs will not impose any change in current practices for POTWs and industrial treatment plants and will not result in changes to existing effluent limits.

6.2. Assessment of Nonpoint and Stormwater Point Sources

Nonpoint and stormwater point sources include storm-driven loads such as runoff from various land uses that transport fecal coliform from sources such as geese, farms, and domestic pets to the receiving water. Domestic pet waste, geese waste, as well as loading from storm water detention basins will be addressed by the Phase II MS4 program. Nonpoint sources also include steady-inputs from "illicit" sources such as failing sewage conveyance systems, sanitary sewer overflows (SSOs), and failing or inappropriately located septic systems. When "illicit" sources are identified, either through the Phase II MS4 requirements or trackdown studies conducted by the Department, appropriate enforcement measures will be taken to eliminate them.

When streamflow gage information is available, a load duration curve (LDC) is useful in identifying and differentiating between storm-driven and steady-input sources. As an example, Figure 5 represents a LDC using the 200 CFU/100 ml criterion.

Figure 5 Example Load Duration Curve (LDC)



The load duration curve method is based on comparison of the frequency of a given flow event with its associated water quality load. A LDC can be developed using the following steps:

1. Plot the Flow Duration Curve, Flow vs. % of days flow exceeded.
2. Translate the flow-duration curve into a LDC by multiplying the water quality standard, the flow and a conversion factor; the result of this multiplication is the maximum allowable load associated with each flow.
3. Graph the LDC, maximum allowable load vs. percent of time flow is equaled or exceeded.
4. Water quality samples are converted to loads (sample water quality data multiplied by daily flow on the date of sample).
5. Plot the measured loads on the LDC.

Values that plot below the LDC represent samples below the concentration threshold whereas values that plot above represent samples that exceed the concentration threshold. Loads that plot above the curve and in the region between 85 and 100 percent of days in which flow is exceeded indicate a steady-input source contribution. Loads that plot in the region between 10 and 70 percent suggest the presence of storm-driven source contributions. A combination of both storm-driven and steady-input sources occurs in the transition zone between 70 and 85 percent. Loads that plot above 99 percent or below 10 percent represent values occurring during either extreme low or high flows conditions and are thus considered

to be outside the region of technically and economically feasible management. In this report, LDCs are used only for TMDL implementation and not in calculating TMDLs.

LDCs for listed segments in the Raritan region are located in Appendix D. In each case, thirty (30) years of USGS gage flow data (water years 1970-2000), from the listed station, were used in generating the curve. When a recent 30-year period was not available at the listed station, an adjacent station was selected based on station correlation information in US Geological Survey Open File Report 81-1110 (USGS, 1982). When an adjacent station was used in the manner, flows were adjusted to the station of interest based on a ratio of watershed size. LDCs were not developed for stations in which a satisfactory correlation could not be found.

7.0 Water Quality Analysis

Relating pathogen sources to in-stream concentrations is distinguished from quantifying that relationship for other pollutants given the inherent variability in population size and dependence not only on physical factors such as temperature and soil characteristics, but also on less predictable factors such as re-growth media. Since fecal coliform loads and concentrations can vary many orders of magnitude over short distances and over time at a single location, dynamic model calibrations can be very difficult to calibrate. Options available to control non-point sources of fecal coliform typically include measures such as goose management strategies, pet waste ordinances, agricultural conservation management plans, and septic system replacement and maintenance. Given these considerations, detailed water quality modeling may not provide adequate insight or guidance toward the development of implementation plans for fecal coliform reductions.

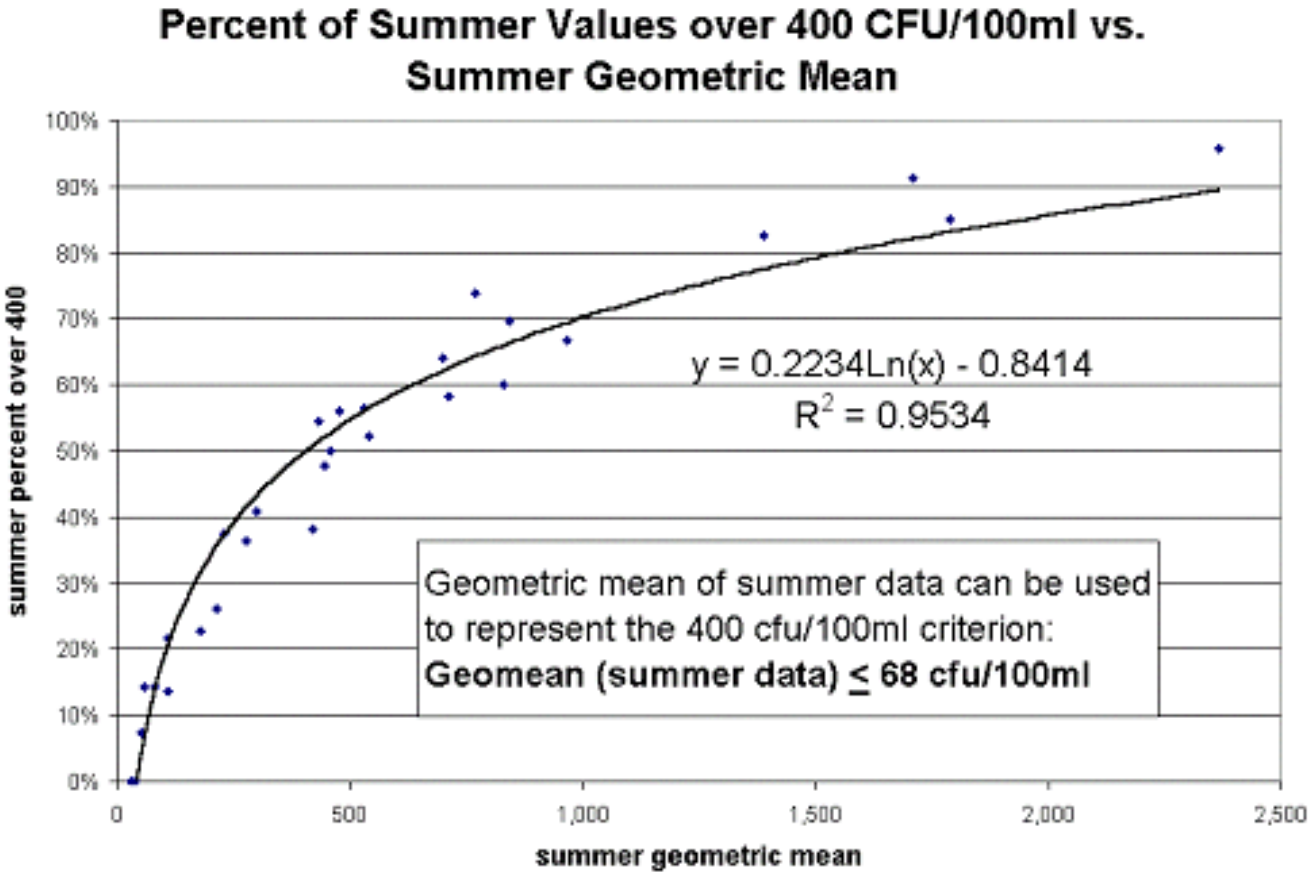
As described in EPA guidance, a TMDL identifies the loading capacity of a waterbody for a particular pollutant. EPA regulations define loading capacity as the greatest amount of loading that a waterbody can receive without violating water quality standards (40 C.F.R. 130.2). The loadings are required to be expressed as either mass-per-time, toxicity, or other appropriate measures (40 C.F.R. 130.2(i)). For these TMDLs, the load capacity is expressed as a concentration set to meet the state water quality standard. For bacteria, it is appropriate and justifiable to express the components of a TMDL as percent reduction based on concentration. The rationale for this approach is that:

- expressing a bacteria TMDL in terms of concentration provides a direct link between existing water quality and the numeric target;
- using concentration in a bacteria TMDL is more relevant and consistent with the water quality standards, which apply for a range of flow and environmental conditions; and
- follow-up monitoring will compare concentrations to water quality standards.

Given the two criteria of 200 CFU/100 ml and 400 CFU/100 ml in FW2 waters, computations were necessary for both criteria and resulted in two percent reduction values. The higher percent reduction value was applied in the TMDL so that both the 200 CFU/100 ml and 400 CFU/100 ml criteria were satisfied.

To satisfy the 200 CFU/100ml criteria, the geometric mean of all available data between water years 1994-2002 was compared to an adjusted target concentration. The adjusted target accounts for an explicit margin of safety and is equal to 200 minus the margin of safety. A calculation incorporating all available data is generally conservative since most samples are taken during the summer when fecal coliform is generally higher. A geometric mean of summer data was used to develop a percent reduction to satisfy the 400 CFU/100 ml criteria. A summer geometric mean can be used to represent the 400 criteria by regressing the percent over 400 CFU/100 ml against the geometric mean (Figure 6). Thus, each datapoint on Figure 6 represents all the data from one individual monitoring station. Sites with 20 or more summer data points were used to develop this regression, in order to make use of more significant values for percent exceedance. A statewide regression was used rather than regional regressions because the regression shape was not region-specific and the strength of the correlation was highest when all statewide data were included. The resulting regression has an r-squared value of 0.9534. Solving for X when Y is equal to 10% yields a geometric mean threshold of 68 CFU/100ml. This means that, using summer data, a geometric mean of 68 can be used to represent the 400 CFU/100ml criterion. Since the geometric mean is a more reliable statistic than percentile when limited data are available, 68 CFU/100ml was used to represent the 400 CFU/100ml criterion for all sites. The inclusion of all data from summer months (May through September) to compare with the 30-day criterion is justified because summer represents the critical period when primary and secondary contact with water bodies is most prevalent. A more detailed justification for using summer data can be found in Section 7.1,"Seasonal Variation and Critical Conditions."

Figure 6 **Percent of summer values over 400 CFU/100ml as a function of summer geometric mean values**


Percent of Summer Values over 400 CFU/100ml vs. Summer Geometric Mean
summer percent over 400
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0
500
1,000
1,500
2,000
2,500
summer geometric mean
y = 0.2234Ln(x) - 0.8414
R2 = 0.9534
Geometric mean of summer data can be used to represent the 400 cfu/100ml criterion:
Geomean (summer data) ≤ 68 cfu/100ml

$y = 0.2234\text{Ln}(x) - 0.8414$ Equation 1
$R^2 = 0.9534$

Geometric mean, and summer geometric mean, and percent reductions were determined at each location for both criteria using Equations 2 through 4. To satisfy the 200 CFU/100ml criteria, equations 2 and 3 were applied. Equations 2 and 4 were used in satisfying the 400 CFU/100ml criteria.

$$Geometric\ Mean\ for\ 200 CFU\ criteria = \sqrt[n]{y_1 y_2 y_3 y_4 .... y_n} \quad \text{Equation 2}$$

where:
y = sample measurement
n = total number of samples

$$200\ CFU\ criteria\ Percent\ \text{Re}duction = \frac{(Geometric\ mean - (200 - e))}{Geometric\ mean} \times 100\,\% \quad \text{Equation 3}$$

$$400\ CFU\ criteria\ Percent\ \text{Re}duction = \frac{(SummerGeometric\ mean - (68 - e))}{SummerGeometric\ mean} \times 100\,\% \quad \text{Equation 4}$$

where:
e = (margin of safety)

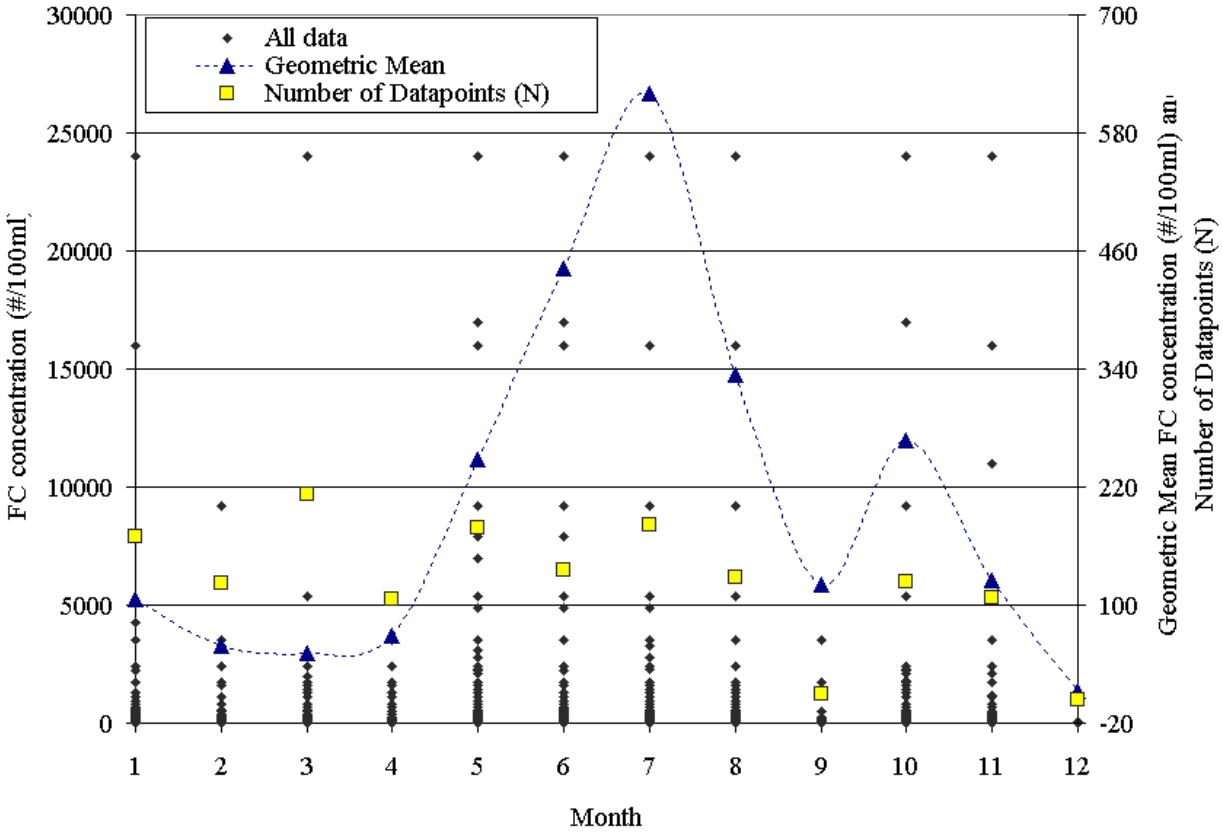
This percent reduction can be applied to nonpoint and stormwater point sources as a whole or be apportioned to categories of nonpoint and stormwater point sources within the study area. The extent to which nonpoint and stormwater point sources have been identified or need to be identified varies by study area based on data availability, watershed size and complexity, and pollutant sources.

7.1. Seasonal Variation/Critical Conditions

These TMDLs will attain applicable surface water quality standards year round. The approach outlined in this paper is conservative given that in most cases fecal coliform data were collected during the summer months, a time when in-stream concentrations are typically the highest. This relationship is evidenced when calculating, on a monthly basis, the geometric mean of fecal coliform data collected statewide. Statewide fecal coliform geometric means during water years 1994-1997 were compared on a month basis and are shown in Figure 7. The 1994-1997 period was chosen for this analysis so that the significance of the number of individual datapoints for any given month was minimized. During the 1994-1997 period year-round sampling for fecal coliform was conducted by sampling four times throughout the year. Following 1997, the fecal coliform sampling protocol was changed to five samples during a 30-day period in the summer months. As evident in Figure 7, higher monthly geometric means are observed between May and September with the highest values occurring during mid-summer. This relationship is also evident when using the entire 1994-2002 dataset or datasets from individual water years. Given this relationship, summer is considered the critical period for violating fecal coliform SWQS and, as such,

sampling during this period is considered adequate for meeting year round protections and designated uses.

Figure 7 Statewide monthly fecal coliform geometric means during water years 1994-1997 using USGS/NJDEP data.



7.2. Margin of Safety

A Margin of Safety (MOS) is provided to account for "lack of knowledge concerning the relationship between effluent limitations and water quality" (40 CFR 130.7(c)). For these TMDLs calculations, both an implicit and explicit Margin of Safety (MOS) are incorporated. Implicitly, a MOS is inherent in the estimates of current pollutant loadings, the targeted water quality goals (New Jersey's SWQS) and the allocations of loading. This was accomplished by taking conservative assumptions throughout the TMDL evaluation and development. Examples of some of the conservative assumptions include treating fecal coliform as a conservative substance, applying the fecal coliform criteria to stormwater point sources, and applying the fecal coliform criteria to the stream during all weather conditions. Fecal coliforms decay in the environment (i.e. outside the fecal tract) relatively rapidly, yet this analysis assumes a linear relationship between fecal load and instream concentration. Furthermore, it is generally recognized that fecal contamination from stormwater poses much less risk of illness than fecal contamination from sewage or septic system effluent (Cabelli, 1989). Finally, much of the fecal coliform is flushed into the system during rainfall

events and passes through the system in a short time. Primary and secondary recreation generally occur during dry periods.

An explicit MOS is provided by incorporating a confidence level multiplier associated with log-normal distributions in the calculation of the load reduction for both the 200 and 400 standards. Using this method, the 200 and 400 targets are reduced based on the number of data points and the variability within each data set. For these TMDLs, a confidence level of 90% was used in calculating the MOS. As a result, and as identified in Appendix C, the target value will be different for each stream segment or grouped segments. The explicit margin of safety is calculated using the following steps:

1- FC data (x) will transformed to Log form data (y),
2- the mean of the Log- transformed data (y) is determined, $\bar{y}$
3- Determine the standard deviation of the Log-transformed data, S_y using the following equation:

$$S_y = \sqrt{\frac{\sum_i (y_i - \bar{y})^2}{N-1}}$$

4- Determine the Geometric mean of the FC data (GM)
5- Determine the standard deviation of the mean (standard error of the mean), $s_{\bar{y}}$, using the following equation:

$$s_{\bar{y}} = \frac{s_y}{\sqrt{N}}$$

6- For the 200 standard ($x_{standard}$), $y_{standard} = \text{Log}(200) = 2.301$, thus for a confidence level of 90%, the target value will be the lower confidence limit (n= -1.64), $y_{target} = y_{std} - n \cdot s_{\bar{y}}$, for example, the 200 criteria: $y_{target} = 2.301 - n^* s_{\bar{y}}$
7- The target value for x, $x_{target} = 10^{y\ target}$
8- The margin of safety (e) therefore will be $e = x_{standard} - x_{target}$
9- Finally, the load reduction = $\frac{GM - x_{target}}{GM} \cdot 100\%$, for example the 200 criteria will be defined as: $\frac{(GM - (200 - e))}{GM} \cdot 100\%$

The 400 criteria would be defined as: $\frac{(GM - (68 - e))}{GM} \cdot 100\%$

8.0 TMDL Calculations

Because these TMDLs are calculated based on ambient water quality data, the allocations are provided in terms of percent reductions. In the same way, the loading capacity of each stream is expressed as a function of the current load:

$LC = (1 - PR) \times L_o$, where

LC = loading capacity for a particular stream;

PR = percent reduction as specified in Tables 7-10;
L_o = current load.

8.1. Wasteload Allocations and Load Allocations

For the reasons discussed previously, these TMDLs do not include WLAs for traditional point sources (POTWs, industrial, etc.). WLAs are hereby established for all NJPDES-regulated point sources (including NJPDES-regulated stormwater), while LAs are established for all stormwater sources that are not subject to NJPDES regulation, and for all nonpoint sources. Both WLAs and LAs are expressed as percentage reductions for particular stream segments.

Table 11 identifies the required percent reduction necessary for each stream segment or group of segments to meet the fecal coliform SWQS. The reductions reported in these tables include a margin of safety factor and represent the higher percent reduction (more stringent) required of the two criteria. Reductions that are required under each criteria are located in Appendix C. In all cases, the 400 CFU/100ml criteria was the more stringent of the two criteria, thus values reported in Table 11 were equal to the percent required to meet the 400 CFU/100ml criteria.

Table 11 TMDLs for fecal coliform-impaired stream segments in the Raritan Water Region as identified in Sublist 5 of the 2002 Integrated List of Waterbodies. The reductions reported in this table represent the higher, or more stringent, percent reduction required of the two fecal colifom criteria.

TMDL Number	WMA	303(d) Category 5 Segments	Water Quality Stations	Station Names	Load Allocation (LA) and Margin of Safety (MOS)					Wasteload Allocation (WLA)
					Summer N	Summer geometric mean CFU/100ml	MOS as a percent of the target concentration	Percent reduction without MOS	Percent reduction with MOS	
1 2	7	01393350, 01393450	01393350, 01393450	WB Elizabeth River near Union, Elizabeth River at Ursino Lake at Elizabeth	13	2340	42%	97%	98%	98%
3 4 5	7	01393960, 01394500, 01395000	01393960, 01394500, 01395000	WB Rahway River at Northfield Ave. at West Orange, Rahway River near Springfield, Rahway River at Rahway	63	1680	23%	96%	97%	97%
6 7	7	01395200, 01396003	01395200, 01396003	Robinson Branch at Scotch Plains, Robinson Branch at St. Georges Ave. at Rahway	10	626	60%	89%	96%	96%
8 9 10	8	01396219, 01396280, 01396535	01396219, 01396280, 01396535	Stony Brook at Fairview Avenue at Naughright, South Branch Raritan River at Middle Valley, South Branch Raritan River Arch	21	809	34%	92%	94%	94%

				St. at High Bridge						
11 12	8	01396550, 01396588	01396550, 01396588	Spruce Run at Newport, Spruce Run near Glen Gardner	28	99	32%	31%	53%	53%
13	8	01396660	01396660	Mulhockaway Creek at Van Syckel	29	464	36%	85%	91%	91%
14	8	01398000	01398000	Neshanic River at Reaville	28	313	40%	78%	87%	87%
15 16 17	8	01397000, 01397400, 01398102	01397000, 01397400, 01398070, 01398102	South Branch Raritan River at Stanton Station, South Branch Raritan River at Three Bridges, South Branch Raritan River at Elm St. at Neshanic Station, South Branch Raritan River at South Branch	43	261	25%	74%	80%	80%
18	8	01398260	01398260	North Branch Raritan River near Chester	8	138	37%	51%	69%	69%
19 20 21 22	8	01399200, 01399500, 01399700, 01399780	01399200, 01399500, 01399700, 01399780	Lamington River near Ironia, Lamington River near Pottersville, Rockaway Creek at Whitehouse, Lamington River at Burnt Mills	48	531	25%	87%	90%	90%
23 24 25	8	01399120, 01399900, 01400000	01399120, 01399900, 01400000	North Branch Raritan River at Burnt Mills, Chambers Brook at North Branch Depot, North Branch Raritan River near Raritan	34	487	28%	86%	90%	90%
26	9	01400395	01400395	Peters Brook at Rt. 28 at Somerville	5	1952	47%	97%	98%	98%
27 28	9	01403385, 01403470	01403385, 01403470	Bound Brook at Route 28 at Middlesex, Green Brook at North Plainfield	25	1503	43%	95%	97%	97%
29 30 31	9	01400500, 01403300, 01403900	01400500, 01403300, 01403900	Raritan River at Manville, Raritan River at Queens Bridge, Bound Brook at Middlesex	16	549	36%	88%	92%	92%
32 33 34 35 36	9	01405195, 9, 22, 61, 68	01405302, 01405195, 9, 22, 61, 68, 69	Matchaponix Brook at Mundy Ave. at Spotswood, Matchaponix Brook at Englishtown, Weemaconk Creek at Main St. in Manalapan, McGolliard Brook at Main St. in Englishtown, Lake Topanemus at Pond Rd. in Freehold, Wemrock Brook at Rt. #9 in Freehold, Wemrock Brook at Rt. #9	54	188	20%	64%	71%	71%
37 38	9	01405340, 01405400	01405340, 01405400	Manalapan Brook at Federal Rd. near Manalapan, Manalapan Brook near Spotswood	28	403	37%	83%	89%	89%
39 40	10	01400540, 01400650	01400540, 01400650, 5	Millstone River near Manalapan, Millstone River at Grovers Mill, Millstone River at Route 33 in Millstone	36	453	27%	85%	89%	89%
41	10	01400690	01400690	Cranbury Book near Prospect Plains	5	269	50%	75%	87%	87%

42	10	01401000	01401000	Stony Brook at Princeton	8	840	52%	92%	96%	96%
43	10	01401200	01401200	Duck Pond Run at Clarksville	5	2019	75%	97%	99%	99%
44	10	01401400	01401400	Heathcote Brook at Kingston	19	746	36%	91%	94%	94%
45 46	10	01401600, 01401700	01401600, 01401700	Bedens Brook near Rocky Hill, Pike Run near Rocky Hill	15	1499	44%	95%	97%	97%
47 48	10	01402000, 01402540	01402000, 01402540	Millstone River at Blackwells Mills, Millstone River at Weston	30	527	35%	87%	92%	92%

[1] MOS as a percent of target is equal to: $\frac{e}{200\ CFU/100ml}$ or $\frac{e}{68\ CFU/100ml}$ where "e" is defined as the MOS in Section 7.2

8.2. Reserve Capacity

Reserve capacity is an optional means of reserving a portion of the loading capacity to allow for future growth. Reserve capacities are not included at this time. The loading capacity of each stream is expressed as a function of the current load (Section 8.0), and both WLAs and LAs are expressed as percentage reductions for particular stream segments (Section 8.1). Therefore, the percent reductions from current levels must be attained in consideration of any new sources that may accompany future development. Strategies for source reduction will apply equally well to new development as to existing development.

9.0 Follow - up Monitoring

In association with the Water Resources Division of the U.S. Geological Survey, the NJDEP have cooperatively operated the Ambient Stream Monitoring Network (ASMN) in New Jersey since the 1970s. The ASMN currently includes approximately 115 stations that are routinely monitored on a quarterly basis. Bacteria monitoring, as part of the ASMN network, are conducted five times during a consecutive 30-day summer period each year. The data from this network has been used to assess the quality of freshwater streams and percent load reductions. Although other units also perform monitoring functions, the ASMN will remain a principal source of fecal coliform monitoring.

10.0 Implementation

Management measures are "economically achievable measures for the control of the addition of pollutants from existing and new categories and classes of nonpoint and stormwater sources of pollution, which reflect the greatest degree of pollutant reduction achievable through the application of the best available nonpoint and stormwater source pollution control practices, technologies, processes, siting criteria, operating methods, or other alternatives" (USEPA, 1993).

Development of effective management measures depends on accurate source assessment. Fecal coliform is contributed to the environment from a number of categories of sources including human, domestic or captive animals, agricultural practices, and wildlife. Fecal

coliform from these sources can reach waterbodies directly, through overland runoff, or through sewage or stormwater conveyance facilities. Each potential source will respond to one or more management strategies designed to eliminate or reduce that source of fecal coliform. Each management strategy has one or more entities that can take lead responsibility to effect the strategy. Various funding sources are available to assist in accomplishing the management strategies. The Department will address the sources of impairment through systematic source trackdown, matching strategies with sources, selecting responsible entities and aligning available resources to effect implementation.

For example, the stormwater discharged to the impaired segments through "small municipal separate storm sewer systems" (small MS4s) will be regulated under the Department's proposed Phase II NJPDES stormwater rules for the Municipal Stormwater Regulation Program. Under those proposed rules and associated draft general permits, many municipalities (and various county, State, and other agencies) in the Raritan Region will be required to implement various control measures that should substantially reduce bacteria loadings, including measures to eliminate "illicit connections" of domestic sewage and other waste to the small MS4, adopt and enforce a pet waste ordinance, prohibit feeding of unconfined wildlife on public property, clean catch basins, perform good housekeeping at maintenance yards, and provide related public education and employee training. Sewage conveyance facilities are potential sources of fecal coliform in that equipment failure or operational problems may result in the release of untreated sewage. Once identified, these sources can be eliminated through the appropriate corrective measures undertaken through the Department's enforcement authority.. Inadequate on-site sewage disposal can also be a source of fecal coliform. Systems that were improperly designed, located or maintained may result in surfacing of effluent and illicit remedies such as connections to storm sewers or streams add human waste directly to waterbodies. Once these problems have been identified through local health departments, sanitary surveys or other means, alternatives to address the problems can be evaluated and the best solution implemented. The Department has committed a portion of its CWA 319(h) pass through grant funds to assist municipalities in meeting Phase II requirements. In addition, The New Jersey Environmental Infrastructure Financing Program, which includes New Jersey's State Revolving Fund, provides low interest loans to assist in correction of water quality problems related to stormwater and wastewater management.

Agricultural activities are another example of potential sources of fecal coliform. Possible contributors are direct contributions from livestock permitted to traverse streams and stream corridors, manure management from feeding operations, or use of manure as a soil fertilizer/amendment. Implementation of conservation management plans and best management practices are the best means of controlling agricultural sources of fecal coliform. Several programs are available to assist farmers in the development and implementation of conservation management plans and best management practices. The Natural Resource Conservation Service is the primary source of assistance for landowners in the development of resource management pertaining to soil conservation, water quality improvement, wildlife habitat enhancement, and irrigation water management. The USDA Farm Services Agency performs most of the funding assistance. All agricultural technical assistance is coordinated through the locally led Soil Conservation Districts. The funding programs include:

- **The Environmental Quality Incentive Program (EQIP)** is designed to provide technical, financial, and educational assistance to farmers/producers for conservation practices that address natural resource concerns, such as water quality. Practices under this program include integrated crop management, grazing land management, well sealing, erosion control systems, agri-chemical handling facilities, vegetative filter strips/riparian buffers, animal waste management facilities and irrigation systems.

- **The Conservation Reserve Program (CRP)** is designed to provide technical and financial assistance to farmers/producers to address the agricultural impacts on water quality and to maintain and improve wildlife habitat. CRP practices include the establishment of filter strips, riparian buffers and permanent wildlife habitats. This program provides the basis for the Conservation Reserve Enhancement Program (CREP). The New Jersey Departments of Environmental Protection and Agriculture, in partnership with the Farm Service Agency and Natural Resources Conservation Service, has recently submitted a proposal to the USDA to offer financial incentives for agricultural landowners to voluntarily implement conservation practices on agricultural lands through CREP. NJ CREP will be part of the USDA's Conservation Reserve Program (CRP). The enrollment of farmland into CREP in New Jersey is expected to improve stream health through the installation of water quality conservation practices on New Jersey farmland.

- **The Soil & Water Conservation Cost-Sharing Program** is available to participants in a Farmland Preservation Program pursuant to the Agriculture Retention and Development Act. A Farmland Preservation Program (FPP) means any voluntary FPP or municipally approved FPP, the duration of which is at least 8 years, which has as its principal purpose as long term preservation of significant masses of reasonably contiguous agricultural land within agricultural development areas. The maintenance and support of increased agricultural production must be the first priority use of the land. Eligible practices include erosion control, animal waste control facilities, and water management practices. Cost sharing is provided for up to 50% of the cost to establish eligible practices.

10.1. Source Trackdown

Through the watershed management process and the New Jersey Watershed Ambassador Program, river assessments and visual surveys of the impaired segment watersheds were conducted to identify potential sources of fecal coliform. Watershed partners, who are intimately familiar with local land use practices, were able to share information relative to potential fecal coliform sources. The New Jersey Watershed Ambassadors Program is a community-oriented AmeriCorps environmental program designed to raise awareness about watershed issues in New Jersey. Through this program, AmeriCorps members are placed in watershed management areas across the state to serve their local communities. Watershed

Ambassadors monitor the rivers of New Jersey through River Assessment Teams (RATs) and Biological Assessment Teams (BATs) volunteer monitoring programs. Supplemental training was provided through the fall/winter of 2002 to prepare the members to perform river assessments on the impaired segments. Each member was provided with detailed maps of the impaired segments within their watershed management area. The Department worked with and through watershed partners and AmeriCorps members to conduct RATs surveys in fall of 2002. The Department reviewed monitoring data, RATs surveys, other information supplied by watershed partners, load duration curves, and aerial photography of the impaired segments to formulate segment specific strategies. Segment specific monitoring strategies in combination with generic strategies appropriate to the sources in each segment will lead to reductions in fecal coliform loads in order to attain SWQS.

10.2. Short Term Management Strategies

Short-term management measures include projects recently completed, underway and planned which will result in reductions in fecal coliform load. Pertinent projects in the Raritan region are as follows:

WMA 7

- **Warinaco Park Lake and Lagoon Restoration Project**
  Union County was awarded $99,000 to complete a restoration of a pond and Stream Bank stabilization in Warinaco Park

- **Robinson's Branch stream stabilization and rehabilitation**
  The Rahwah River Association was awarded $110,000 to complete this project. The project involves Phase 2 of the Robinsons Branch rehabilitation. The establishment of a riparian buffer and bank stabilization for this stream appears to be primarily focused on erosion control and biostabization.

- **Flood Plain Restoration at Union and Allen Streets, City of Rahway, Union County, NJ**
  The City of Rahway received $147,5000 to restore flood plain habitat and improve water quality of the Rahway River Watershed. The City of Rahway has already purchased 11 flood prone properties and razed the houses that occupied these properties. With funding assistance from the New Jersey Wetland Mitigation Council, the City has completed the final design for the project and has applied for permits. The restoration site will encompass approximately 4-½ acres in the Rahway River flood plain. Historic maps of the area and geologic sampling indicate that this site was once a riparian wetland until it was filled and developed as residential homes. This project will restore this riparian wetland to provide wildlife habitat and help filter pollutants from stormwater runoff. The site will provide for stormwater retention to help minimize flooding in the area and provide for public access for recreation and public education on wetlands and watershed management.

- **Rahway River Watershed NP Pollution Implementation Project Milton Lake & Robinson's Branch, Rahway River Watershed**

The NY/NJ Bay Keeper was awarded $112, 000 to complete this project. The project is in an urban area and offers an opportunity to demonstrate stream restoration to city residents. It is in a highly visible location and will help promote good watershed management. The project also intends to utilize volunteers from the city's schools and will help promote environmental education.

WMA 8

- **Restoring Our Rivers**
  Restoration of a 1000 foot long reach of 10 foot high vertical stream bank adjacent to the South Branch just below its confluence with the Neshanic River. The project utilized a combination of hard engineering stabilization techniques and softer soil bioengineering techniques on agricultural land in Hillsborough Township, Somerset County. This project provided a reduction on sediment loads to streams, improvement of fisheries and aquatic resources, improvement of riparian resources habitat and the creation of a filter adjacent to the river.

- **Stormwater Management Plan for the Mulhockaway Creek Watershed**
  This project will produce a stormwater management plan to reduce nonpoint source pollution impacts on the Spruce Run Reservoir located in Union Township, Hunterdon County. This project is critical to the protection of a major regional water supply resource and will produce a significant regional benefit.

- **Peapack Brook Water Quality Assessment**
  The Peapack Brook is a trout production stream that flows through Chester Boro, Chester Township and the Boro of Peapack-Gladstone and Bedminster Township. This project will assess causes of the current quality of the Peapack Brook subwatershed, develop management strategies to protect and restore areas of the subwatershed, implement BMP's to address nonpoint source pollution and increase public knowledge of NPS pollution and participation in watershed conservation activities.

- **South Branch Raritan River Remediation Project**
  The project assessed pollution from stormwater runoff and septic systems and developed an education program. The project also retrofitted stormwater drains and implemented BMP's to reduce the impact on the waterway.

- **Action Plan Presentations to Communities to Address NPS Pollution**
  The project implemented a NPS pollution educational outreach program that encouraged municipal officials and residents to protect their water resources and reduce the amount of NPS pollution entering the surface and ground water supplies of the South Branch Raritan River.

WMA 9

- **Restoration of Victor Crowell Park**
  Restoration of the Middlesex Borough Park along with the lake which will be dredged. The project installed BMP's on several stormwater discharge points, utilized swales and structural solutions and created a dense landscape buffer along the banks. The project

stabilized the eroding lake shore and reduced the input of sediment to the lake, reduced nutrient loadings and NPS pollutants, aided in the control of geese and mosquitoes, and provided quality open space for the community.

- **Stream Bank Stabilization and Riparian Buffer Restoration of Cedar Brook**
  This project located in the City of Plainfield, Union County offers the potential to remove prior "hard" stream bank stabilization and replace it with bioengineering mechanisms in order to restore the stream habitat. The project is in an urban area in a highly visible location and offers an opportunity to demonstrate stream restoration to city residents.

WMA 10

- **Riparian Wetland Restoration Powder Mill Pond**
  This project is located within Colonial Park in Franklin Township, Somerset County. The project will construct a riparian buffer to improve water quality within the pond which is a headwaters tributary of the Millstone River. In addition, a long term monitoring program and educational program will be implemented.

- **Clean Water Action Watershed Restoration Program**
  This project performed a characterization and assessment of two subwatersheds within the Millstone Watershed named the Bedens Brook and Rocky Brook. The project also developed action plans and implementations of nonpoint source pollution reduction programs, such as watershed restoration and reforestation projects and execution of a River Friendly Program designed to educate targeted audiences such as golf courses.

- **Nonpoint Source Pollution Control and Management for the Stony Brook-Millstone Watershed**
  This project is a continuation of an existing watershed plan. The main focus will be the restoration of Amwell Lake and Stony Brook headwaters including restoring stream banks, stabilizing eroding shorelines and replanting.

10.3. Long–Term Management Strategies

Long term strategies include source trackdown as well as selection and implementation of specific management measures that will address the identified sources. Source categories and responses are summarized below:

Source Category	Responses	Potential Responsible Entity	Funding options
Human Sources			
Inadequate (per design, operation, maintenance, location, density) on-site disposal	Confirm inadequate condition; evaluate and select cost effective alternative, such as rehabilitation or	Municipality, MUA, RSA	CWA 604(b) for confirmation of inadequate condition; Environmental

Source Category	Responses	Potential Responsible Entity	Funding options
systems	replacement of systems, or connection to centralized treatment system		Infrastructure Financing Program for construction of selected option
Inadequate or improperly maintained stormwater facilities; illicit connections	Measures required under Phase II Stormwater permitting program plus Alternative measures as determined needed through TMDL process	Municipalty, State and County regulated entities, stormwater utilities	CWA 319(h)
Malfunctioning sewage conveyance facilities	Identify through source trackdown	Owner of malfunctioning facility--compliance issue	User fees
Domestic/captive animal sources			
Pets	Pet waste ordinances	Municipalities for ordinance adoption and compliance	
Horses, livestock, zoos	Confirm through source trackdown: SCD/NRCS develop conservation management plans	Property owner	EQIP, CRP, CREP (when approved),
Agricultural practices	Confirm through source trackdown; SCD/NRCS develop conservation management plans	Property owner	EQIP, CRP, CREP (when approved)
Wildlife			
Nuisance concentrations, eg resident Canada geese	Feeding ordinances; Goose Management BMPs	Municipalities for ordinance; Community Plans for BMPs	CBT, CWA 319(h)
Indigenous wildlife	Confirm through trackdown; consider revising designated uses	State	NA

10.4. Segment Specific Recommendations

10.4.1. Watershed Management Area 7

West Branch Elizabeth River near Union (Site ID #01393350)

Two golf courses are within the watershed of the impaired segment. Geese were observed at both golf courses. Three stormwater outfalls are located at the headwaters of the segment. The streamshed drains a large urbanized area to the north. The majority of immediate area contains urbanized land use that has many detention basins, pets, and geese. Strategies: organize local community based goose management programs; Phase II stormwater program.

Elizabeth River At Ursino Lake at Elizabeth (Site ID #01393450)

This station is located at the beginning of the channelization of the Elizabeth River and is at the site of a dam. Canada geese were observed at the park and lawns where the station is located. The majority of immediate area contains urbanized land use that has many detention basins, stormwater outfalls, pets, and geese. Strategies: organize local community based goose management programs; Phase II stormwater program.

West Branch Rahway River at Northfield Ave. (Site ID #01393960)

The site is located at the head of Orange Reservoir and South Mountain Reservation. The South Mountain Reservation and two area golf courses are potential sources for fecal coliform because of the wildlife, including geese. Strategies: organize local community based goose management programs; Phase II stormwater program.

Rahway River near Springfield (Site ID #01394500)

Potential sources for fecal coliform for include golf courses and parks at which geese were observed. The majority of immediate area contains urbanized land use that has many detention basins, pets, and geese. Strategies: organize local community based goose management programs; Phase II stormwater program.

Rahway River at Rahway (Site ID #01395000)

The headwaters of this segment contain golf courses, large parks and reservations that contribute to the fecal coliform impairment. The majority of immediate area contains urbanized land use that has many detention basins, pets, and geese. Strategies: organize local community based goose management programs; Phase II stormwater program.

Robinson Branch At Scotch Plains (Site ID #01395200)

The site is located about 200 yards down stream of a golf course where geese are a contributing factor. Most of the runoff drains directly to the stream with no filtration. This site is also located in the Ash Brook Reservation were wildlife, including deer, are probably a contributing factor to the impairment of this stream for fecal coliform. Strategies: organize local community based goose management programs; Phase II stormwater program.

Robinson Branch at St. Georges Ave. at Rahway (Site ID #01396003)

The headwaters of this station are located in the Ash Brook Reservation where there are large numbers of geese and wildlife. Also within the headwaters of this segment there are several golf courses that are home to geese and have little or no treatment of runoff, which drains directly to the headwaters of the Robinson Branch. There are three stormwater outfalls located in the headwaters of the impaired segment; the majority of the immediate area contains urbanized land use, with many detention basins, pets, and geese. Strategies: organize local community based goose management programs; Phase II stormwater program.

10.4.2. Watershed Management Area 8

SB Raritan River at Stanton Station (#1397000), SB Raritan River at Three Bridges (#1397400), and SB Raritan River at South Branch (#1398102)

Land uses include agriculture and residential. Possible sources of fecal coliform include geese, deer and other wildlife, and agricultural operations, including livestock, poultry and equine areas. Strategies: prioritize for EQIP funds to install agricultural BMPs; organize local community based goose management programs; Phase II stormwater program.

Chambers Brook at North Branch Depot (#1399900)

Land uses in this area include mostly agriculture and residential. There is a golf course in this watershed. Possible sources of fecal coliform contamination include equine, cattle, geese, deer, and suburban development. Monitoring: coliphage to determine presence of any human sources. Strategies: prioritize for EQIP funds to install agricultural BMPS; Phase II stormwater program.

NB Raritan River at Burnt Mills (#1399120)

Land uses in this area include agriculture, including hobby farms (equine), residential, commercial, and an industrial park. Riparian buffer is lacking or disturbed and frequented by geese and deer. Load duration curve is consistent with a mix of steady state and storm driven sources. Strategies: prioritize for EQIP funds to install agricultural BMPs; Phase II stormwater program.

North Branch Raritan River near Raritan (#1400000)

Land use suggests sources include suburban stormwater at Far Hills, Bridgewater and Bedminster Village. Geese, equine, and bovine sources present on tributaries, especially Middle Brook. Crop farming and loss of riparian buffer occurs along with bovine activity near mouth of Chambers Brook-Bridgewater/Bedminster border; sheep are managed at the mouth of Lamington River. Geese are present at North Branch Park. Load duration curve is consistent with a mix of steady state and storm driven sources. Strategies: prioritize for EQIP funds to install agricultural BMPs; organize local community based goose management programs; Phase II stormwater program.

Rockaway Creek at Whitehouse (#1399700)

Land uses in the area include forest, agriculture, field & pasture, residential, some industry and golf courses. Riparian buffers are poor. Horse, cattle and crop farming occurs downstream of New Bromley Road to mouth. Dairy farming is also found within this area. Cushetunk Lake has a noticeable goose population. Load duration curve is consistent with a mix of steady state and storm driven sources, with a tendency toward storm driven sources. Strategies: prioritize for EQIP funds to install agricultural BMPs; organize local community based goose management programs; Phase II stormwater program.

Lamington (Black) River near Pottersville (#1399500)

Land uses in the area include forest, field & pasture, commercial, and residential. Potential sources of fecal coliform include geese, wildlife, agriculture and domestic pets. Load duration curve is consistent with a mix of steady state and storm driven sources, with a tendency toward storm driven sources. Strategies: prioritize for EQIP funds to install agricultural BMPs; organize local community based goose management programs; Phase II stormwater program.

Lamington River near Ironia (#1399200)

Land use suggests sources including suburban development and geese. Load duration curve is consistent with a mix of steady state and storm driven sources, with a tendency toward storm driven sources. Strategies: prioritize for EQIP funds to install agricultural BMPs; organize local community based goose management programs; Phase II stormwater program.

Lamington River at Burnt Mills (#1399780)

Land uses in this area include residential, forest and agriculture. Geese populations are a potential source with large populations found throughout the area on golf courses and parks. In addition, heavy residential areas are a source of pet waste. There are also potential fecal coliform sources from agriculture. These include horses, manure spreading, and cattle. There are heavy deer populations throughout this area. Load duration curve is consistent with a mix of steady state and storm driven sources, with a tendency toward storm driven sources. Strategies: prioritize for EQIP funds to install agricultural BMPs; organize local community based goose management programs; Phase II stormwater program.

NB Raritan River near Chester (#1398260)

Assessing sources from the headwaters downstream: stormwater from suburban development is a source in the Morris Turnpike area; Combes Hollow/Randolph/Mendham Township border has geese and heavy deer populations. North of Mendham Boro has suburban development. Downstream of Route 24 to #1399120 has sheep; pigs; small livestock operations. The Pleasant Valley area has cattle and horses. There are many small impoundments in the

watershed. Monitoring: a fecal coliform survey is recommended to focus on the sources of impairment. Strategies: prioritize for EQIP funds to install agricultural BMPs; organize local community based goose management programs; Phase II stormwater program.

Mulhockaway Creek at Van Syckel (#1396660)

Land use is primarily forest and agriculture. Sources are deer and large geese populations in ponds. Load duration curve is consistent with steady state sources. Monitoring: a fecal coliform survey is recommended to focus on the sources of impairment. Strategies: prioritize for EQIP funds to install agricultural BMPs; organize local community based goose management programs; Phase II stormwater program.

Spruce Run near Glen Gardner (#1396588) and at Newport (#1396550)

Land use is agricultural and residential. Sources also include deer and geese in the parks, which have ponds. Load duration curve is consistent with a mix of sources, with a tendency toward storm driven sources. Monitoring: a fecal survey to focus on the sources of impairment and coliphage to determine if human sources are present. Strategies: prioritize for EQIP funds to install agricultural BMPs; organize local community based goose management programs

SB Raritan River Arch Street at High Bridge (#1396535)

This area is predominantly residential; Califon Borough is served by septic systems. Potential sources of fecal coliform include failing septic systems and domestic pet waste. There are also horses in this area. Monitoring: Coliphage sampling is recommended to determine if there are human sources. Strategies: prioritize for EQIP funds to install agricultural BMPs; organize local community based goose management programs; Phase II stormwater program.

Stony Brook at Fairview Avenue at Naughtbright (#1396219)

Land uses in this area are primarily forest, agriculture and residential. Riparian buffers are lacking in some areas. Strategies: prioritize for EQIP funds to install agricultural BMPs; organize local community based goose management programs.

SB Raritan River at Middle Valley (#1396280)

This area is predominantly residential with some agriculture. Domestic pet waste and horses are potential sources of fecal coliform. Load duration curve is consistent with a mix of steady state and storm driven sources. Strategies: prioritize for EQIP funds to install agricultural BMPs; Phase II stormwater program.

Neshanic River at Reaville (#1398000)

Land uses in this area are predominantly agriculture with some residential. Potential sources of fecal coliform include domestic pet waste, horses, geese, cattle, and sheep. There are large deer populations in this area. Strategies: prioritize for

EQIP funds to install agricultural BMPs; organize local community based goose management programs; Phase II stormwater program.

10.4.3. Watershed Management Area 9

Raritan River at Manville (#1400500)

The area consists of mainly agricultural and residential areas. Some possible sources of fecal contamination include suburban stormwater, agriculture and wildlife, including deer and geese. Strategies: prioritize for EQIP funds to install agricultural BMPs; organize local community based goose management programs; Phase II stormwater program.

Wemrock Brook at Route #9 (Before Pipes) in Freehold (Segment #68)

Primary land uses in this area are residential and commercial, including Freehold Borough. Possible sources of fecal contamination are suburban stormwater, geese and other wildlife. Strategies: prioritize for EQIP funds to install agricultural BMPs; organize local community based goose management programs; Phase II stormwater program.

Weemaconk Creek at Main Street in Manalapan (Segment #9)

This is primarily a residential area; suburban stormwater is the prime source. Strategies: prioritize for EQIP funds to install agricultural BMPs; organize local community based goose management programs; Phase II stormwater program.

Lake Topanemus at Pond Road in Freehold (Segment #61)

Topanemus Brook from Taylors Mills Road to Dam on Pond Road: Land uses in the watershed include primarily agriculture and residential. Possible sources in this area include livestock and geese and other wildlife. Strategies: prioritize for EQIP funds to install agricultural BMPs; organize local community based goose management programs; Phase II stormwater program.

Mc Golliard Brook at Main Street in Englishtown (Segment #22)

Pine Brook/McGallard Brook Tributary beginning at Wilson Ave ending at Sobecko Road. Possible sources of fecal coliform are geese and wildlife. Wilson Ave. to Taylors Mills Road: Primary land use is residential. Possible sources of fecal coliform are geese, wildlife and suburban runoff. Strategies: organize local community based goose management programs; Phase II stormwater program.

Manalapan Brook at Federal Road near Manalapan (#1405340) and at Spotswood (#1405400)

The primary land use in this area is residential with some agricultural and forested areas. A prime source of contamination is suburban stormwater. Other sources are wildlife, especially geese. Strategies: organize local community based goose management programs; Phase II stormwater program.

Bound Brook at Middlesex (#1403900)

This area consists of commercial, warehouse, and industrial land uses. There is also an urban residential area, and some forested areas. Primary sources of contamination include suburban stormwater and geese populations. Strategies: organize local community based goose management programs; Phase II stormwater program.

Green Brook at North Plainfield (#1403470)

The primary land uses in this area are sewered residential, commercial and forest. Possible sources of fecal contamination include suburban stormwater, horses from stables in the area, and geese and ducks by lakes. Strategies: organize local community based goose management programs; prioritize for EQIP funds to install agricultural BMPs Phase II stormwater program.

Bound Brook at Route 28 at Middlesex (#1403385)

This area consists of commercial and residential land. Possible contamination sources include suburban stormwater, and wildlife (including geese) around lakes and swamps. Strategies: organize local community based goose management programs; Phase II stormwater program.

Raritan River at Fieldsville Dam (#1403300)

Primary land uses in the area are commercial and warehouse. There are also sewered residential and septic residential areas. Possible sources of fecal contamination include suburban stormwater and geese. Strategies: organize local community based goose management programs; Phase II stormwater program.

Peters Brook at Route 28 at Somerville (#01400395)

Land uses are commercial, industrial, and residential. The area is mostly sewered. The prime source of contamination is suburban stormwater. Strategies: Phase II stormwater program.

Matchaponix Brook at Englishtown (#01405195)

This are is primarily forest and residential and suburban stormwater is the principle source of contamination. Strategies: Phase II stormwater program.

10.4.4. Watershed Management Area 10

Bedens Brook near Rocky Hill (#1401600)

Land uses include forest, fields, agriculture, and residential. Potential sources of contamination include livestock, suburban stormwater, kennels, very old residential sections on septic systems as well as golf courses due to geese, and riding facilities.

Strategies: organize local community based goose management programs; prioritize for EQIP funds to install agricultural BMPs Phase II stormwater program.

Millstone River at Weston (#1402540)

This area of the watershed is very flat and has shale soils. There are large deer and geese populations located throughout the area, particularly where there are large tracts of green lawns (sod farms, parks, golf courses). Griggs Street Area: Land uses in the area include forest, fields, and residential. Possible sources in this area include domestic pets, geese, and wildlife. Wilhousky Street Area: Land uses in the area include forest, fields, agriculture, and residential. Possible sources of fecal coliform include geese, wildlife, and domestic pets. Monitoring: confirm impairment. Strategies: prioritize for EQIP funds to install agricultural BMPs; organize local community based goose management programs; Phase II stormwater program.

Pike Run near Rocky Hill (#1401700)

This area is largely residential, both sewered and on individual septic systems. There are a large number of condo and townhouse complexes that are a source of domestic pet waste and geese. Possible sources of fecal coliform include geese, domestic pets, old septic systems, and some livestock. Harlingen Road Bridge area: land uses include forest, agriculture, wetlands, and residential. This section contains a township dog park. The Township does have a Dog Litter Ordinance (ORD #99-965). Strategies: organize local community based goose management programs; Phase II stormwater program.

Heathcote Brook at Kingston (#1401400)

This area has many corporate commercial establishments with geese populations. Possible fecal coliform sources within this area include horse, sheep, crop farms, geese, wildlife (mostly deer), and domestic pets. Cook Natural Area, by Ridge Road Bridge: land uses in this area are forest and agriculture. Stouts Lane: land uses in the area are forest and agriculture. Ridge Road: predominant land uses in the area include forest and residential. Beginning at Route 1 just before Raymond Road and ending at Promenade Boulevard: predominant land uses in the area include forest and agriculture. Commercial land uses are also found throughout this area. There is one residential community with a dog-walking path, however no pet waste was evident along this path. However, domestic pet waste could be a potential source in other residential areas. Promenade Boulevard: Land uses in this area are forest and agricultural uses. Strategies: prioritize for EQIP funds to install agricultural BMPs; organize local community based goose management programs; Phase II stormwater program.

Duck Pond Run at Clarksville (#1401200)

This area is predominately residential, agricultural and forested. Possible sources of fecal coliform include domestic pets, livestock, horses, manure handling. Strategies: Phase II stormwater program.

Stony Brook at Princeton (#1401000)

Bridge on Mercer Road to Bridge on Rosedale Road (Route 604): Forest and residential are the predominant land uses in the area. There was also a golf course observed on the left bank. Geese, wildlife and domestic pets are potential sources of fecal coliform contamination. Bridge on Quaker Road to Bridge on Mercer Road (Princeton Pike): Predominant land uses along this segment include agriculture and urban. Riparian areas are a mixture of wetlands and forest and successional areas with sparse trees and herbaceous vegetation. Potential sources of fecal coliform include geese and other wildlife, horses, and domestic pets. Strategies: prioritize for EQIP funds to install agricultural BMPs; organize local community based goose management programs; Phase II stormwater program.

Cranbury Brook near Prospect Plains (#1400690)

Federal Road, just east of intersection with England Road ending at Perrineville Road, approximately 1800 feet south of Federal Road: Wildlife and domestic animals are a potential source of fecal coliform in this area. Main Street to 200 feet downstream of Bridge: Predominant land uses in the watershed include agriculture and urban. Possible sources of fecal coliform contamination include geese, wildlife, and domestic pets. Applegarth Road Bridge to approximately 100 feet upstream of Applegarth Road Bridge: Predominant land uses in this watershed are forest and agriculture. Possible sources of contamination are geese, wildlife and domestic pets. Approximately 100 feet upstream of County Route 615 Bridge to approximately 100 feet downstream of County Route 615 Bridge: Land uses in the area include: forest, agriculture and residential. Potential sources include agricultural runoff, wildlife and geese frequenting the agricultural fields. There is a farm along Federal Road with chickens, goats, ducks and guinea fowl. George Davison Road Bridge to dam upstream: Forest and agriculture are the predominant land use in the area. There are large open fields suitable for geese and a few farms that may be applying manure. Perrineville Road to North Bergen Mills Road: There is a large horse farm in this area on North Bergen Mills Road near Federal Road. The land uses in this area are residential, agricultural and forested. Other sources of fecal coliform are domestic pets and geese. Strategies: prioritize for EQIP funds to install agricultural BMPs; organize local community based goose management programs; Phase II stormwater program.

Millstone River at Grovers Mill (#1400650)

Area of Bentley Road: Predominant land uses in the area include forest, agriculture, and residential. Possible sources of fecal coliform include geese, wildlife and

domestic pets. Area around Cranbury Road: Land uses in the area include agriculture and forest. Possible sources of fecal coliform include domestic pets, geese, deer, and other wildlife. Strategies: prioritize for EQIP funds to install agricultural BMPs; organize local community based goose management programs; Phase II stormwater program.

Millstone River near Manalapan (#1400540)

Baird Road Area: Land uses in the area include forest and agriculture. Possible sources in this area include horses, wildlife and geese. Bergen Mills Road: Land uses in this area include forest and residential. Possible sources of fecal coliform include geese, wildlife, and domestic pets. Strategies: prioritize for EQIP funds to install agricultural BMPs; organize local community based goose management programs; Phase II stormwater program.

Millstone River at Blackwells Mills (#1402000)

Between Blackwells Mills Road and Route 632 Causeway: This stretch contains fields and pastures along the right bank of the stream. There was also a horse trail that ran along the stream. The predominant land uses in this watershed are agriculture and urban. Geese, wildlife, and domestic pets can be found throughout the watershed. Possible sources of fecal coliform within this segment include geese, poultry, wildlife, domestic pets, and horses. Monitoring: a fecal coliform survey is recommended to focus on the significant sources of contamination. Strategies: organize local community based goose management programs; prioritize for EQIP funds to install agricultural BMPs Phase II stormwater program.

10.5. Pathogen Indicators and Bacterial Source Tracking

Advances in microbiology and molecular biology have produced several methodologies that discriminate among sources of fecal coliform and thus more accurately identify pathogen sources. The numbers of pathogenic microbes present in polluted waters are few and not readily isolated nor enumerated. Therefore, analyses related to the control of these pathogens must rely upon indicator microorganisms. The commonly used pathogen indicator organisms are the coliform groups of bacteria, which are characterized as gram-negative, rod-shaped bacteria. Coliform bacteria are suitable indicator organism because they are generally not found in unpolluted water, are easily identified and quantified, and are generally more numerous and more resistant than pathogenic bacteria (Thomann and Mueller, 1987).

Tests for fecal organisms are conducted at an elevated temperature (44.5°C), where the growth of bacteria of non-fecal origin is suppressed. While correlation between indicator organisms and diseases can vary greatly, as seen in several studies performed by the EPA and others, two indicator organisms *Esherichia coli* (*E. coli*) and enterococci species showed stronger correlation with incidence of disease than fecal coliform (USEPA, 2001). Recent advances have allowed for more accurate identification of pathogen sources. A few of these

methods, including, molecular, biochemical, and chemical are briefly described in the following paragraph.

Molecular (genotype) methods are based on the unique genetic makeup of different strains, or subspecies, of fecal bacteria (Bowman et al, 2000). An example of this method includes "DNA fingerprinting" (i.e., a ribotype analysis which involves analyzing genomic DNA from fecal *E. coli* to distinguish human and non-human specific strains of *E. coli*.). Biochemical (phenotype) methods include those based on the effect of an organism's genes actively producing a biochemical substance (Graves et al., 2002; Goya et al 1987). An example of this method is multiple antibiotic resistance (MAR) testing of fecal *E. coli*. In MAR testing, *E. coli* are isolated from fecal samples and exposed to 10-15 different antibiotics. In theory, *E. coli* originating from wild animals should show resistance to a smaller number of antibiotics than *E. coli* originating from humans or pets. Given this general trend, MAR patterns or '"signatures" can be defined for each class of *E. coli* species. Chemical methods are based on finding chemical compounds associated with human wastewater, and useful in determining if the sources are human or non-human. Such methods measure the presence of optical brighteners, which are contained in all laundry detergents, and soap surfactants in the water column. Unlike the optical brightener method, the measurement of surfactants may allow for some quantification of the source.

BST methods have already been successfully employed at the NJDEP in the past decade. Since 1988, the Department's Bureau of Marine Water Monitoring has worked cooperatively with the University of North Carolina in developing and determining the application of RNA coliphage as a pathogen indicator. This research was funded through USEPA and Hudson River Foundation grants. These studies showed that the RNA coliphages are useful as an indicator of fecal contamination, particularly in chlorinated effluents and that they can be serotyped to distinguish human and animal fecal contamination. Through these studies, the Department has developed an extensive database of the presence of coliphages in defined contaminated areas (point human, non-point human, point animal, and non-point animal). More recently, MAR and DNA fingerprinting analyses of *E. coli* are underway in the Manasquan estuary to identify potential pathogen sources (Palladino and Tiedemann, 2002). These studies along with additional sampling within the watershed will be used to implement the necessary percent load reduction.

10.6. Reasonable Assurance

With the implementation of follow-up monitoring, source identification and source reduction as described for each segment, the Department has reasonable assurance that New Jersey's Surface Water Quality Standards will be attained for fecal coliform. The Department proposes to undertake the identified monitoring responses beginning in 2003-2004. As a generalized strategy, the Department proposes the following with regard to categorical sources: 1) As septic system sources are identified through the monitoring responses, municipalities will be encouraged to enter the Environmental Infrastructure Financing Program, which includes New Jersey's State Revolving Fund, to evaluate, select and implement the best overall solution to such problems; 2) To address storm water point sources, the Phase II stormwater permitting program will require control measures to be

phased in from the effective date of authorization to 60 months from that date; 3) The locations of impaired segments with significant agricultural land uses will be provided to the State Technical Committee for consideration in the FFY 2004 round of EQIP project selection; 4) Through continuing engagement of watershed partners, measures to identify and address other sources will be pursued, including encouragement and support of community based goose management programs, where appropriate. The Department has dedicated a portion of its Corporate Business Tax and FY 2002 Clean Water Act Section 319(h) funds to carry out the segment specific source trackdown recommendations. A portion of FY 2003 319(h) funds will be dedicated to assisting municipalities in implementing the requirements of the Phase II municipal stormwater permitting program.

The fecal coliform reductions proposed in these TMDLs assume that existing NJPDES permitted municipal facilities will continue to meet New Jersey's Surface Water Quality Standard requirements for disinfection. Any future facility will be required to meet water quality standards for disinfection.

The Department's ambient monitoring network will be the means to determine if the strategies identified have been effective. Where trackdown monitoring has been recommended, the results of this monitoring as well as ambient monitoring will be evaluated to determine if additional strategies for source reduction are needed.

11.0 Public Participation

The Water Quality Management Planning Rules NJAC 7:15-7.2 require the Department to initiate a public process prior to the development of each TMDL and to allow public input to the Department on policy issues affecting the development of the TMDL. Further, the Department shall propose each TMDL as an amendment to the appropriate areawide water quality management plan in accordance with procedures at N.J.A.C. 7:15-3.4(g). As part of the public participation process for the development and implementation of the TMDLs for fecal coliform in the Raritan Water Region, the Department worked collaboratively with a series of stakeholder groups as part of the Department's ongoing watershed management efforts.

The Department's watershed management process includes a comprehensive stakeholder process that includes of members from major stakeholder groups, (agricultural, business and industry, academia, county and municipal officials, commerce and industry, purveyors and dischargers, and environmental groups). As part of this watershed management planning process, Public Advisory Committees (PACs) and Technical Advisory Committees (TACs) were created in all 20 WMAs. The PACs serve in an advisory capacity to the Department, examining and commenting on a myriad of issues in the watersheds. The TACs are focused on scientific, ecological, and engineering issues relevant to the issues of the watershed, including water quality impairments and management responses to address them.

The Department shared the TMDL process with the WMA 7, WMA 8, WMA 9, and WMA 10 PAC and TAC members through a series of presentations and discussions as described below. The Department has also engaged the public by meeting with Environmental

Commissions and local Watershed Associations. In September 2002, the Department met with Environmental Commission Chairmen from 2 townships in Hunterdon County to discuss the TMDL process and impaired surface water bodies in their areas. On November 7, 2002, the Department met with approximately 8 Environmental Commisisions in Union County to discuss the TMDL process and the Phase II Stormwater Regulations.

The TMDL process and mapping was discussed with the WMA 7 steering committee at meetings held on October 11th 2002, February 7th 2003, March 7th 2003 and April 11th 2003. During the October 11th meeting a presentation was made about the TMDL processes, addressing the basic background of TMDLs, how the TMDLs are established and the process for adopting TMDLs. The TMDL Video "A Local Official's Guide to TMDLs" was presented which explained TMDLs in practical terms. The Department also provided the public with the finalized Category 5 list, a fact sheet titled "TMDLs in the Metropolitan Watershed", and the Memorandum of Agreement between the Department and EPA Region 2. During the Feb. 7th meeting the protocol for listing waterbodies and the public comment process was discussed. At the March the 7th meeting the impaired segments were presented. There were several comments made by the steering committee on possible causes of the impairments. During the April 11th meeting the discussion revolved around public notification, the steering committees roles in TMDLs and any other possible sources for the impaired segments.

Expedited Fecal Coliform presentation was given at the WMA#10 Millstone Watershed Steering Committee on October 17th, 2002 and to the TAC on November 4, 2002. The TMDL Video "A Local Official's Guide to TMDLs" was shown, which explained TMDLs in practical terms. The Department also provided the public with the finalized Category 5 list, a fact sheet titled "TMDLs in the Millstone Watershed", and the Memorandum of Agreement between the Department and EPA Region 2.

On February 19, 2003, during the Raritan TAC Meeting (WMAs 8, 9 and 10), the committee was asked to review and comment on the sections of the TMDL that were specific to the Raritan Region, including the description of the Raritan Region, point sources in region, nonpoint sources of fecal coliform in the region, potential sources of fecal coliform contamination and the public participation section. This committee suggested that the NJDEP should meet with representatives of the region's watershed associations and Soil Conservation Districts to obtain information on sources of contamination. At the TAC's recommendation, a meeting was held on February 20, 2003 with representatives of the Raritan Basin's Watershed Associations and Soil Conservation Districts. At this meeting the representatives were asked to identify potential sources of fecal coliform. The information provided was then drafted and sent back out to attendees for comment.

Additional input was received through the NJ EcoComplex (NJEC). The Department contracted with NJEC in July 2001. The NJEC consists of a review panel of New Jersey University professors whose role is to provide comments on the Department's technical approaches for development of TMDLs and management strategies. The New Jersey Statewide Protocol for Developing Fecal TMDLs was presented to NJEC on August 7, 2002 and was subsequently reviewed and approved. The protocol was also presented at the SETAC Fall Workshop on September 13, 2002 and met with approval.

Amendment Process

In accordance with N.J.A.C. 7:15–7.2(g), these TMDLs are hereby proposed by the Department as an amendment to Lower Raritan Water Quality Management Plan (WQMP), Mercer and Monmouth Counties WQMP, Northeast WQMP, Upper Raritan WQMP and Sussex County WQMP.

Notice proposing these TMDLs was published April 21, 2003 in the New Jersey Register and in newspapers of general circulation in the affected area in order to provide the public an opportunity to review the TMDLs and submit comments. In addition, a public hearing will be held on May 22, 2003. Notice of the proposal and the hearing has also been provided to applicable designated planning agencies and to affected municipalities.

References

Bowman, A.M., C. Hagedorn, and K. Hix. 2000. Determining sources of fecal pollution in the Blackwater River watershed. p. 44-54. *In* T. Younos and J. Poff (ed.), Abstracts, Virginia Water Research Symposium 2000, VWRRC Special Report SR-19-2000, Blacksburg.

Cabelli, V. 1989. Swimming-associated illness and recreational water quality criteria. Wat. Sci. Tech. 21:17.

Alexandria K. Graves, Charles Hagedorn, Alison Teetor, Michelle Mahal, Amy M. Booth, and Raymond B. Reneau, Jr. Antibiotic Resistance Profiles to Determine Sources of Fecal Contamination in a Rural Virginia Watershed. Journal of Environmental Quality. 2002 31: 1300-1308.

National Research Council. 2001. Assessing the TMDL Approach to water quality management. National Academy Press, Washington, D.C.

New Jersey Department of Environmental Protection. 1998. Identification and Setting of Priorities for Section 303(d) Water Quality Limited Waters in New Jersey, Office of Environmental Planning

New Mexico Environmental Department. 2002. TMDL for Fecal Coliform on three Cimarron River Tributaries in New Mexico.
Online at: http://www.nmenv.state.nm.us/swqb/CimarronTMDL.html

Palladino, M. A., and Tiedemann, J. (2001) Differential Identification of *E. coli* in the Manasquan River Estuary by Multiple Antibiotic Resistance Testing and DNA Fingerprinting Analysis. Monmouth University, NJ

Goyal, S.M. 1987. Methods in Phage Ecology. pp. 267-287. In: Phage Ecology, S.M. Goyal, C.P. Gerba and G. Bitton (Eds.) John Wiley and Sons, New York.

Saunders, William and Maidment, David. 1996. A GIS Assessment of Nonpoint Source Pollution in the San Antonio- Nueces Coastal Basin. Center for Research in Water Resources. Online Report 96-1:

Stiles, Thomas C. (2001). A Simple Method to Define Bacteria TMDLs in Kansas. Presented at the WEF/ASIWPCA TMDL Science Issues Conference, March 7, 2001.

Sutfin, C.H. May, 2002. Memo: EPA Review of 2002 Section 303(d) Lists and Guidelines for Reviewing TMDLs under Existing Regulations issued in 1992. Office of Wetlands, Oceans and Watersheds, USEPA.

Thomann, R.V. and J.A. Mueller. 1987. Principles of Surface Water Quality Modeling and Control, Harper & Row, Publishers, New York.

USEPA. 1986. Implementation Guidance for Ambient Water Quality Criteria for Bacteria. EPA-823-D-00-001. U.S. Environmental Protection Agency, Office of Water, Washington, DC.

USEPA. 1993. Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters. EPA-840-B-92-002. Washington, DC.

USEPA. 1997. Compendium of tools for watershed assessment and TMDL development. EPA841-B-97-006. U.S. Environmental Protection Agency, Office of Water, Washington, DC.

USEPA. 2001. Protocol for Developing Pathogen TMDLs. EPA841-R-00-002. U.S. Environmental Protection Agency, Office of Water, Washington, DC.

U.S. Geological Survey. 1982. Low - Flow Characteristics and Flow Duration of New Jersey Streams. Open-File Report 81-1110.

Appendix A: Explanation of stream segments in Sublist 5 of the *2002 Integrated List of Waterbodies* for which TMDLs will not be developed in this report.

River segments to be moved from Sublist 5 to Sublist 3 for fecal coliform.

- **Station #01401440, the Millstone River at Kingston**

Table 2 identifies one segment for which a TMDL will not be developed at this time based on investigations following the *2002 Integrated List of Waterbodies* proposal. The Millstone River at Kingston, station #01401440, was included on Sublist 5 based on its listing on previous 303(d) lists with no recent data to assess their current attainment status. Therefore, a TMDL will not be developed for this location until and unless recent data indicates a violation of the surface water quality standards.

Appendix B: Municipal POTWs Located in the TMDLs' Project Areas

WMA	Station #	NJPDES	Facility Name	Discharge Type[a]	Receiving waterbody
7	1393450	NJ0020648.005A	Elizabeth City	MMJ	Elizabeth River
7	1393450	NJ0020648.041A	Elizabeth City	MMJ	Elizabeth River
7	1393450	NJ0020648.003A	Elizabeth City	MMJ	Elizabeth River
7	1393450	NJ0020648.006A	Elizabeth City	MMJ	Elizabeth River
7	1393450	NJ0020648.007A	Elizabeth City	MMJ	Elizabeth River
7	1393450	NJ0020648.008A	Elizabeth City	MMJ	Elizabeth River
7	1393450	NJ0020648.008A	Elizabeth City	MMJ	Elizabeth River
7	1393450	NJ0020648.011A	Elizabeth City	MMJ	Elizabeth River
7	1393450	NJ0020648.012A	Elizabeth City	MMJ	Elizabeth River
7	1393450	NJ0020648.036A	Elizabeth City	MMJ	Elizabeth River
7	1393450	NJ0020648.009A	Elizabeth City	MMJ	Elizabeth River
8	1399120	NJ0033995.001A	Environmental Disposal Corp	MMJ	Raritan River North Branch via unnamed trib
8	1399900	NJ0020362.001A	Branchburg Twp - Central School	MMI	Chambers Brook
8	1399120	NJ0028495.001A	Bedminster Twp	MMI	Raritan River North Branch
8	1399500	NJ0022675.001A	Roxbury Twp - Ajax Terrace	MMJ	Lamington River
8	1399500	NJ0026824.001A	Chester Shopping Center	MMI	Tiger Brook (Lamington R) via ditch
8	1399780	NJ0022781.001A	Valley Rd Sewer Co - Pottersville STP	MMI	Lamington River
8	1399780	NJ0021865.001A	Fiddler's Elbow CC - Reynwood Inc	MMI	Lamington River
8	1399780	NJ0020338.001A	Branchburg Twp - Fox Hollow STP	MMI	Lamington River
8	1398260	NJ0021334.001A	Mendham Boro	MMI	India Brook (Raritan River North Branch)
8	1397000	NJ0100528.001A	Glen Meadows/Twin Oaks	MMI	Raritan River S B via unnamed trib
8	1397400	NJ0022047.001A	Raritan Twp MUA	MMJ	Raritan River South Branch
8	1397400	NJ0028436.002A	Flemington Boro	MMJ	Bushkill Brook
8	1398102	NJ0020354.001A	Branchburg Twp - Neshanic Station	MMI	Raritan River South Branch
8	1397400	NJ0022047.SL3A	Raritan Twp MUA	MMJ	Sludge Application
8	1397400	NJ0022047.SL3B	Raritan Twp MUA	MMJ	Sludge Application
8	1397400	NJ0022047.SL3M	Raritan Twp MUA	MMJ	Sludge Application
8	1396660	NJ0024091.001A	Union Twp BOE	MMI	Mulhocaway Creek via unnamed trib
8	1396588	NJ0022144.001A	NJDHS - Hagadorn Center	MMI	Rocky Run via unnamed trib
8	1396280	NJ0023493.002A	Washington Twp SA - Schooley's Mt STP	MMI	Raritan River S B

8	1396280	NJ0109061.001A	Washington Twp - Long Valley Village	MMI	Raritan River South Branch
9	1405195	NJ0028479.001A	NJDC - Jamesburg	MMI	Matchaponix Brook
9	1405195	NJ0023728.001A	Western Monmouth UA	MMJ	Pine Brook
9	1403470	NJ0026727.001A	Colorado Cafe WTP	MMI	Green Brook
9	1400500	NJ0024864.001A	Somerset Raritan SA	MMJ	Cuckels Bk (Raritan R) via unnmd trib
9	1403300	NJ0024864.002A	Somerset Raritan SA	MMJ	Raritan River
10	1402000	NJ0050130.001A	Montgomery Twp - Riverside	MMI	Millstone River (Raritan R)
10	1402000	NJ0022764.001A	Valley Rd Sewer Co - River Rd Stp	MMI	Millstone River
10	1400650	NJ0023787.001A	East Windsor Twp MUA	MMJ	Millstone River (Raritan R)
10	1400650	NJ0029475.001A	Hightstown Advanced WTP	MMJ	Rocky Brook
10	1400650	NJ0067211.001A	East Windsor - 2	MMJ	Millstone River (Raritan R)
10	1401000	NJ0022110.001A	Educational Testing Service	MMI	Stony Brook
10	1401000	NJ0020770.001A	Princeton Sewer Oper Commission	MMI	Stony Brook
10	1401700	NJ0023124.001A	Montgomery Twp - High School	MMI	Back Brook (Millstone R)
10	1401700	NJ0026891.001A	Montgomery Twp - Burnt Hill STP 1	MMI	Back Brook
10	1401700	NJ0060038.001A	Montgomery Twp - Pike Brook	MMI	Pike Run
10	1401700	NJ0067733.001A	Montgomery Twp - Oxbridge	MMI	Pike Run

[a] "MMI" indicates a Municipal Minor discharge and "MMJ" indicates Municipal Major discharge.

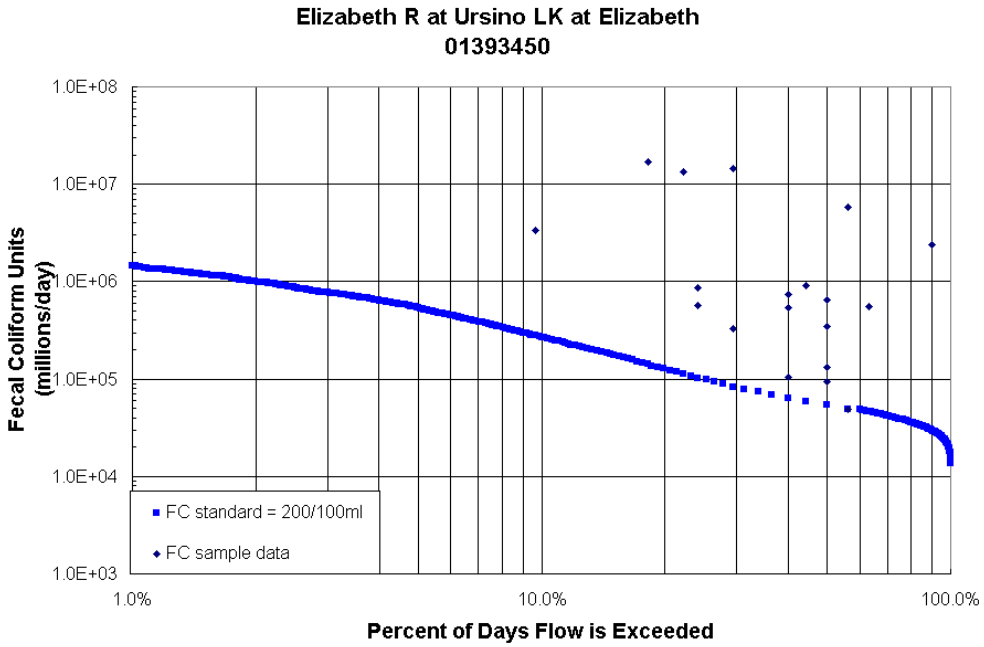
Appendix C: TMDL Calculations

WMA	303(d) Category 5 Segments	Water Quality Stations	Station Names	Load Allocation (LA) and Margin of Safety (MOS)										Wasteload Allocation (WLA)	Period of record used in analysis
				200 FC/100ml Standard					400 FC/100ml Standard						
				N (# of values)	Geometric mean CFU/100ml	MOS as a percent of the target concentration	Percent reduction without MOS	Percent reduction with MOS	Summer N	Summer geometric mean CFU/100ml	MOS as a percent of the target concentration	Percent reduction without MOS	Percent reduction with MOS		
7	01393350, 01393450	01393350, 01393450	WB Elizabeth River near Union, Elizabeth River at Ursino Lake at Elizabeth	24	2006	42%	90%	94%	13	2340	42%	97%	98%	98%	2/16/94 - 8/17/99
7	01393960, 01394500, 01395000	01393960, 01394500, 01395000	WB Rahway River at Northfield Ave. at West Orange, Rahway River near Springfield, Rahway River at Rahway	85	1568	23%	87%	90%	63	1680	23%	96%	97%	97%	2/14/94 - 8/2/01
7	01395200, 01396003	01395200, 01396003	Robinson Branch at Scotch Plains, Robinson Branch at St Georges Ave at Rahway	10	626	60%	68%	87%	10	626	60%	89%	96%	96%	6/2/98 - 8/30/00
8	01396219, 01396280, 01396535	01396219, 01396280, 01396535	Stony Brook at Fairview Avenue at Naughright, SB Raritan River at Middle Valley, SB Raritan River Arch St at	43	272	34%	26%	52%	21	809	34%	92%	94%	94%	1/25/94 - 8/26/99
8	01396550, 01396588	01396550, 01396588	Spruce Run at Newport, Spruce Run near Glen	39	110	32%	-82%	-24%	28	99	32%	31%	53%	53%	2/1/94 - 8/9/01
8	01396660	01396660	Mulhockaway Creek at Van Syckel	40	330	36%	39%	61%	29	464	36%	85%	91%	91%	2/1/94 - 8/9/01
8	01398000	01398000	Neshanic River at Reaville	39	288	40%	31%	58%	28	313	40%	78%	87%	87%	2/1/94 - 8/9/01

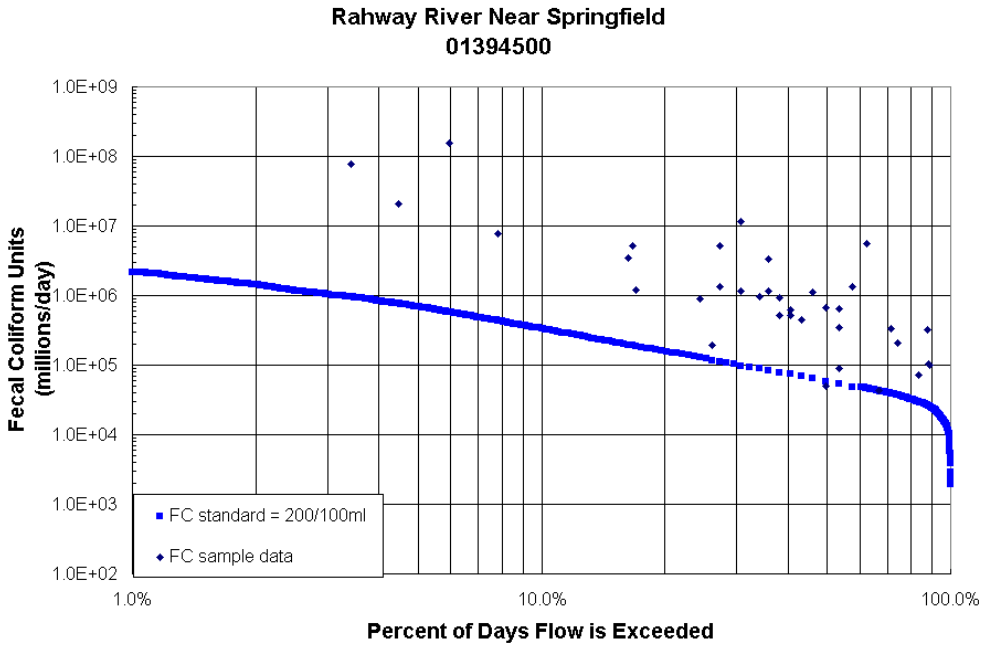
WMA	303(d) Category 5 Segments	Water Quality Stations	Station Names	Load Allocation (LA) and Margin of Safety (MOS)										Wasteload Allocation (WLA)	Period of record used in analysis
				200 FC/100ml Standard					400 FC/100ml Standard						
				N (# of values)	Geometric mean CFU/100ml	MOS as a percent of the target concentration	Percent reduction without MOS	Percent reduction with MOS	Summer N	Summer geometric mean CFU/100ml	MOS as a percent of the target concentration	Percent reduction without MOS	Percent reduction with MOS		
8	01397000, 01397400, 01398102	01397000, 01397400, 01398070, 01398102	SB Raritan River at Stanton Station, SB Raritan River at Three Bridges, SB Raritan River at Elm St. at Neshanic	64	259	25%	23%	42%	43	261	25%	74%	80%	80%	1/31/94 - 6/19/01
8	01398260	01398260	NB Raritan River near Chester	19	112	37%	-79%	-13%	8	138	37%	51%	69%	69%	1/24/94 - 7/30/97
8	01399200, 01399500, 01399700, 01399780	01399200, 01399500, 01399700, 01399780	Lamington River near Ironia, Lamington River near Pottersville, Rockaway Creek at Whitehouse, Lamington	81	243	25%	18%	38%	48	531	25%	87%	90%	90%	1/31/94 - 6/19/01
8	01399120, 01399900, 01400000	01399120, 01399900, 01400000	NB Raritan River at Burnt Mills, Chambers Brook at North Branch Depot, NB Raritan River near Raritan	45	331	28%	40%	57%	34	487	28%	86%	90%	90%	1/31/94 - 6/19/01
9	01400395	01400395	Peters Brook at Rt 28 at Somerville	5	1952	47%	90%	95%	5	1952	47%	97%	98%	98%	6/3/98 - 8/6/98
9	01403385, 01403470	01403385, 01403470	Bound Brook at Route 28 at Middlesex, Green Brook at North Plainfield	25	1503	43%	87%	92%	25	1503	43%	95%	97%	97%	6/4/98 - 8/29/01
9	01400500, 01403300, 01403900	01400500, 01403300, 01403900	Raritan River at Manville, Raritan River at Queens Bridge, Bound Brook at	36	234	36%	14%	45%	16	549	36%	88%	92%	92%	2/2/94 - 7/31/97

WMA	303(d) Category 5 Segments	Water Quality Stations	Station Names	Load Allocation (LA) and Margin of Safety (MOS)											Wasteload Allocation (WLA)	Period of record used in analysis
				200 FC/100ml Standard					400 FC/100ml Standard							
				N (# of values)	Geometric mean CFU/100ml	MOS as a percent of the target concentration	Percent reduction without MOS	Percent reduction with MOS	Summer N	Summer geometric mean CFU/100ml	MOS as a percent of the target concentration	Percent reduction without MOS	Percent reduction with MOS		
9	01405195, 9, 22, 61, 68	01405302, 01405195, 9, 22, 61, 68, 69	Matchaponix Bk at Mundy Ave, Matchaponix Bk at Englishtown, Weemaconk Ck at Main St, McGolliard Bk at Main St, Lake Topanemus at Pond Rd, Wemrock Bk at Rt #9, Wemrock Bk at Rt #9	171	57	20%	-252%	-181%	54	188	20%	64%	71%	71%	2/3/94 - 10/1/02
9	01405340, 01405400	01405340, 01405400	Manalapan Brook at Federal Rd near Manalapan, Manalapan Brook near Spotswood	39	192	37%	-4%	35%	28	403	37%	83%	89%	89%	2/3/94 - 8/29/01
10	01400540, 01400650	01400540, 01400650, 5	Millstone River near Manalapan, Millstone River at Grovers Mill, Millstone River at Route 33 In Millstone	77	110	27%	-83%	-32%	36	453	27%	85%	89%	89%	2/2/94 - 12/18/02
10	01400690	01400690	Cranbury Book near Prospect Plains	5	269	50%	26%	63%	5	269	50%	75%	87%	87%	7/1/99 - 7/29/99
10	01401000	01401000	Stony Brook at Princeton	19	255	52%	22%	62%	8	840	52%	92%	96%	96%	1/24/94 - 7/30/97
10	01401200	01401200	Duck Pond Run at Clarksville	5	2019	75%	90%	98%	5	2019	75%	97%	99%	99%	6/27/00 - 7/25/00
10	01401400	01401400	Heathcote Brook at Kingston	19	746	36%	73%	83%	19	746	36%	91%	94%	94%	6/3/98 - 8/29/01
10	01401600, 01401700	01401600, 01401700	Bedens Brook near Rocky Hill, Pike Run near Rocky Hill	26	569	44%	65%	80%	15	1499	44%	95%	97%	97%	1/24/94 - 7/21/99
10	01402000, 01402540	01402000, 01402540	Millstone River at Blackwells Mills, Millstone River at Weston	41	363	35%	45%	64%	30	527	35%	87%	92%	92%	2/2/94 - 6/19/01

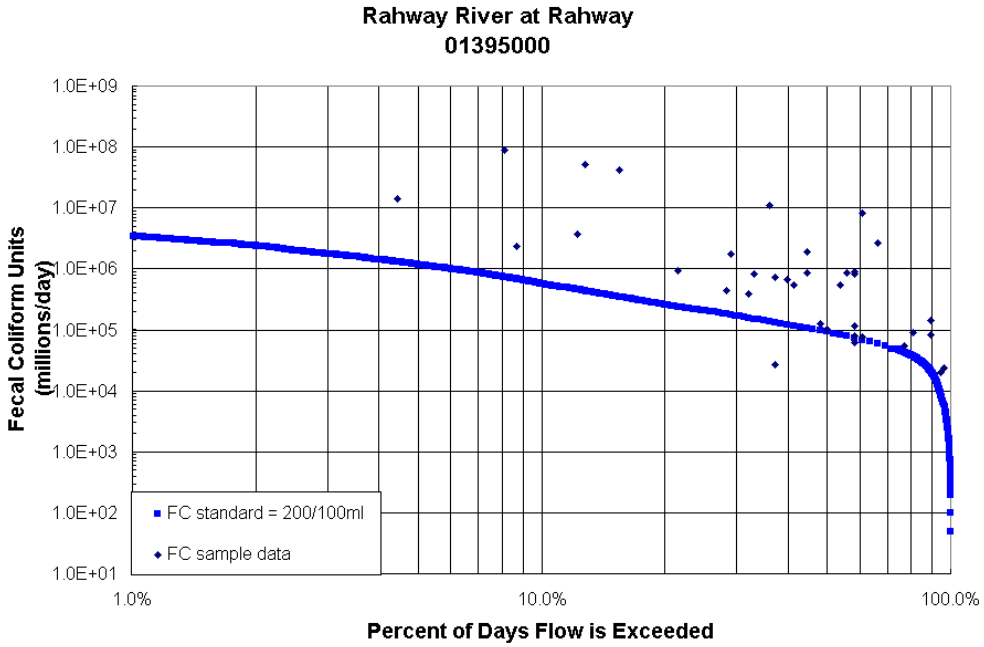
Appendix D: Load Duration Curves for selected listed waterbodies



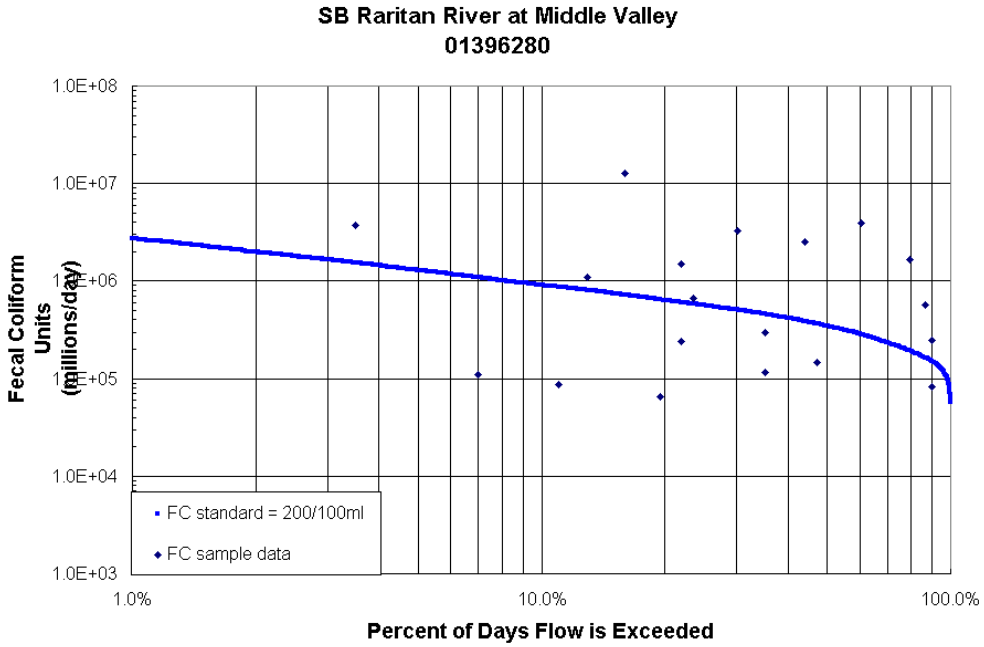
Load Duration Curve for Elizabeth River at Ursino Lake At Elizabeth. Fecal coliform data from USGS station # 01393450 during the period 2/16/94 through 7/29/97. Water years 1970-2001 from USGS station # 01393450 were used in generating the FC standard curve.



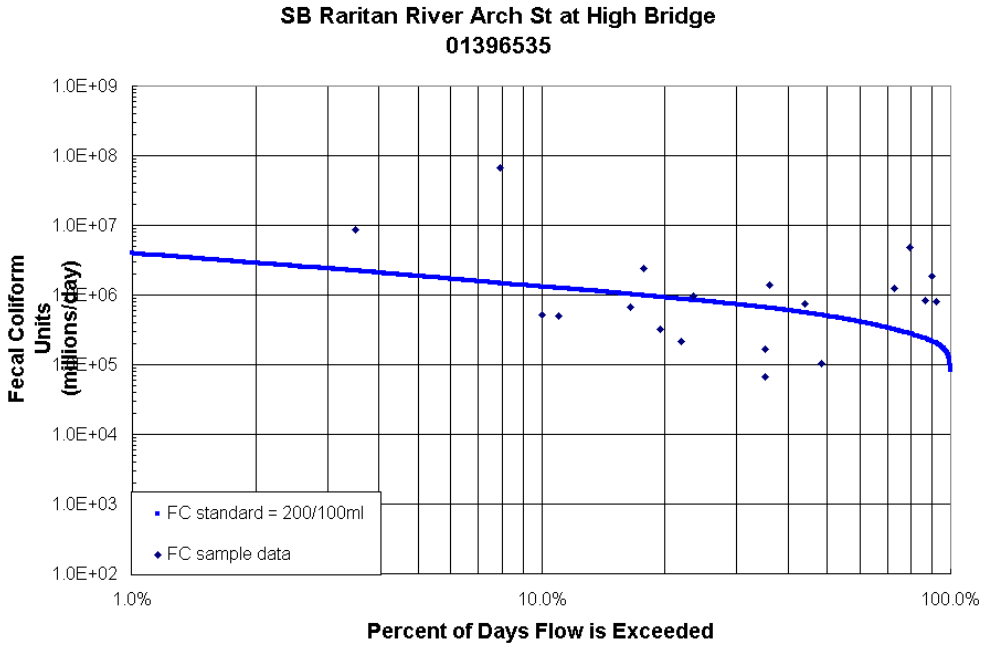
Load Duration Curve for Rahway River near Springfield. Fecal coliform data from USGS station # 01394500 during the period 2/14/94 through 7/10/01. Water years 1970-2001 from USGS station # 01394500 were used in generating the FC standard curve.



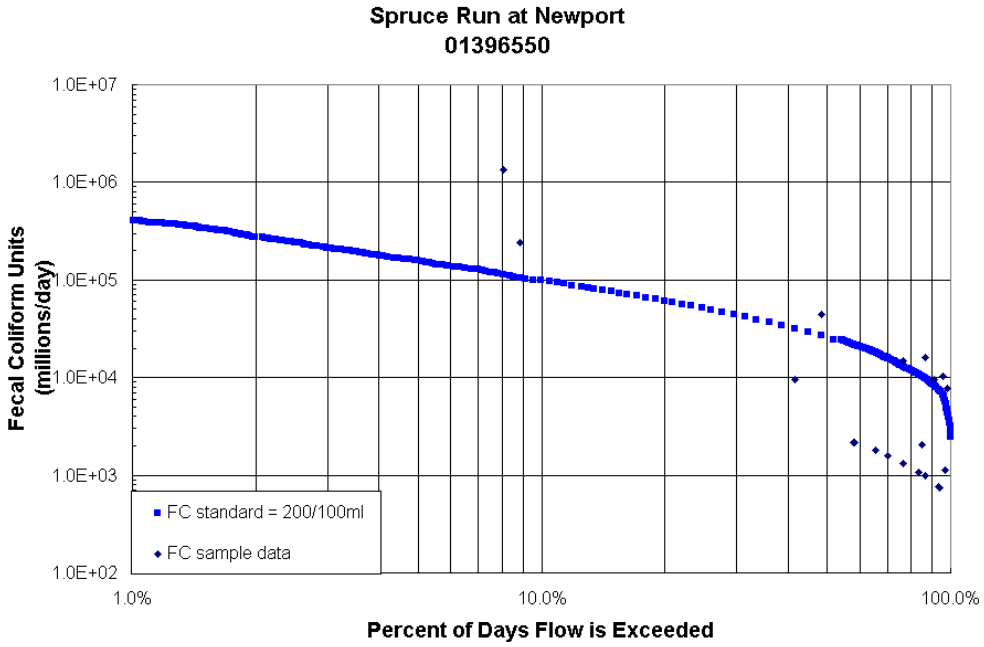
Load Duration Curve for Rahway River at Rahway. Fecal coliform data from USGS station # 01395000 during the period 2/15/94 through 7/6/01. Water years 1970-2001 from USGS station # 01395000 were used in generating the FC standard curve.



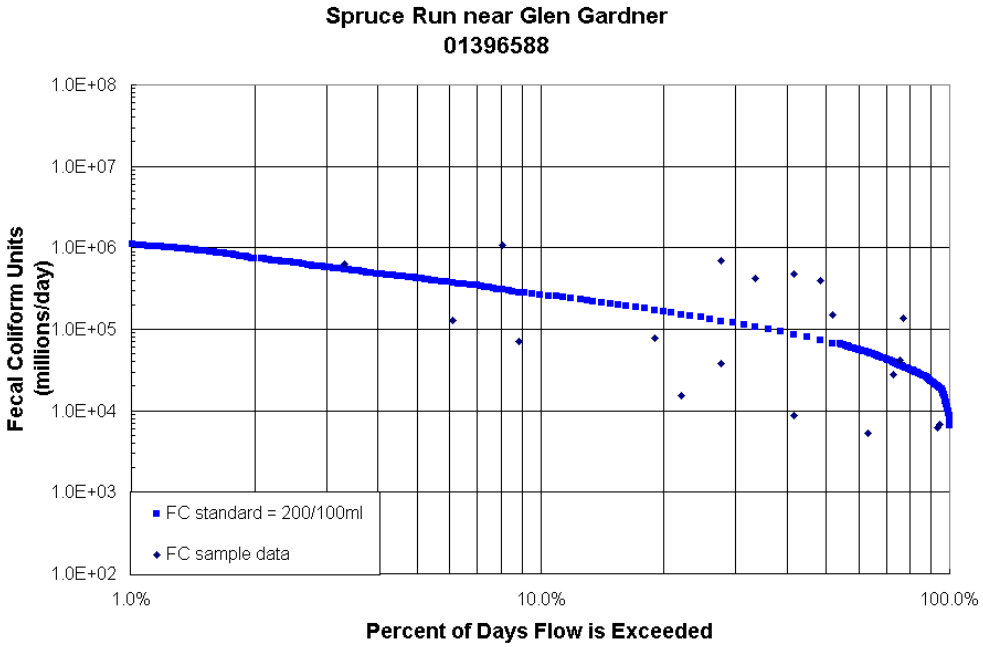
Load Duration Curve for SB Raritan River at Middle Valley. Fecal coliform data from USGS station # 01396280 during the period 1/15/94 through 7/15/97. Water years 1970-2001 from USGS station # 01396500 (SB Raritan River Near High Bridge) were used in generating the FC standard curve.



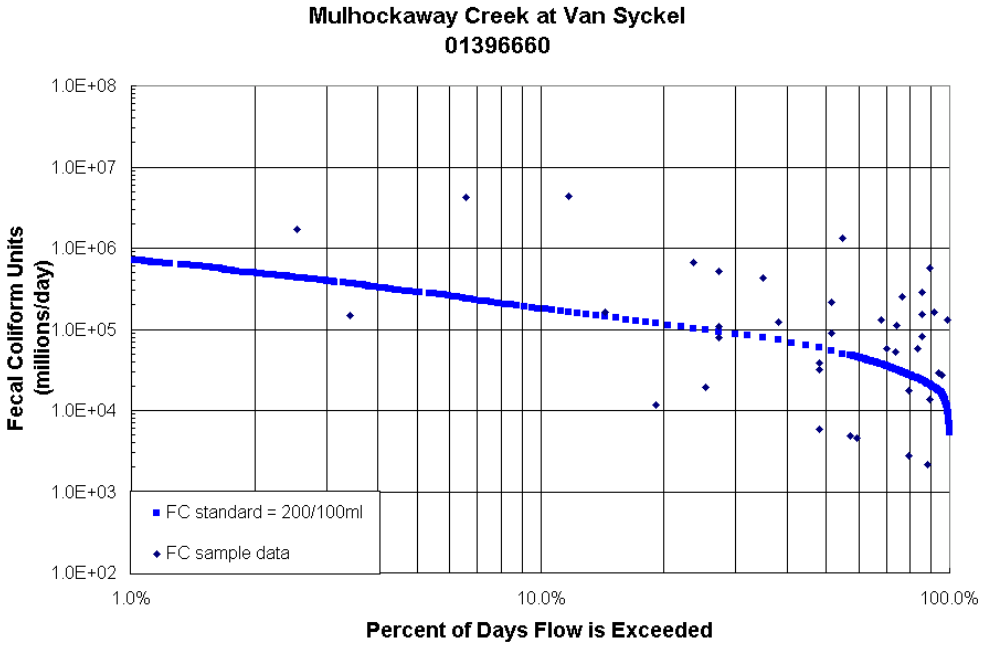
Load Duration Curve for SB Raritan River Arch St. at High Bridge. Fecal coliform data from USGS station # 01396535 during the period 1/25/94 through 7/15/97. Water years 1970-2001 from USGS station # 01396500 (SB Raritan River Near High Bridge) were used in generating the FC standard curve.



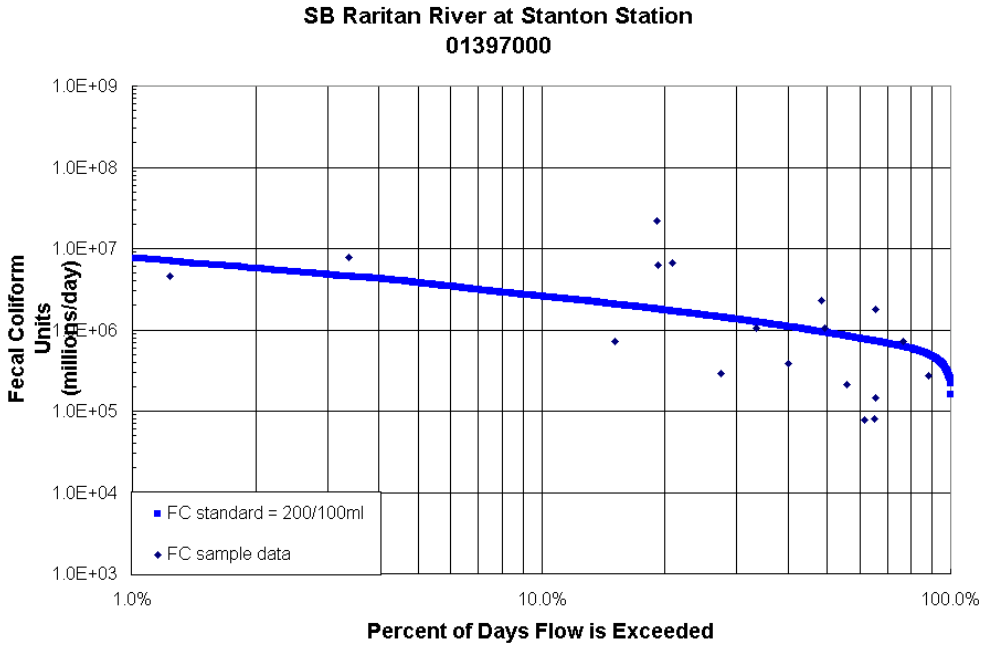
Load Duration Curve for Spruce Run at Newport. Fecal coliform data from USGS station # 01396550 during the period 6/8/98 through 8/9/01. Water years 1978-2001 from USGS station # 01396580 (Spruce Run At Glen Gardner) were used in generating the FC standard curve.



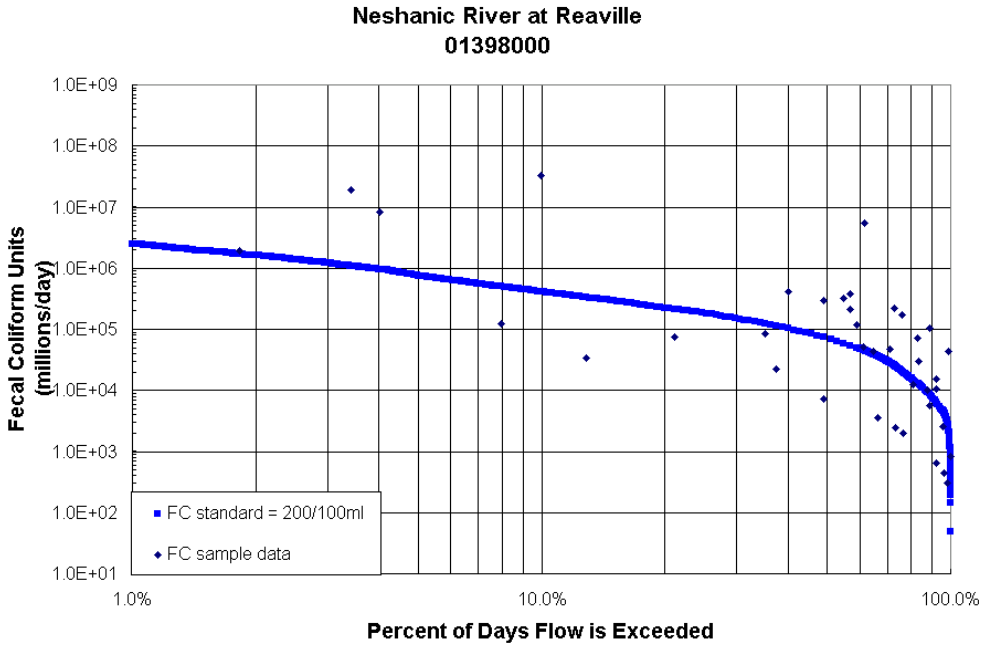
Load Duration Curve for Spruce Run near Glen Gardner. Fecal coliform data from USGS station # 01396588 during the period 2/1/94 through 7/17/97. Water years 1978-2001 from USGS station # 01396580 (Spruce Run At Glen Gardner) were used in generating the FC standard curve.



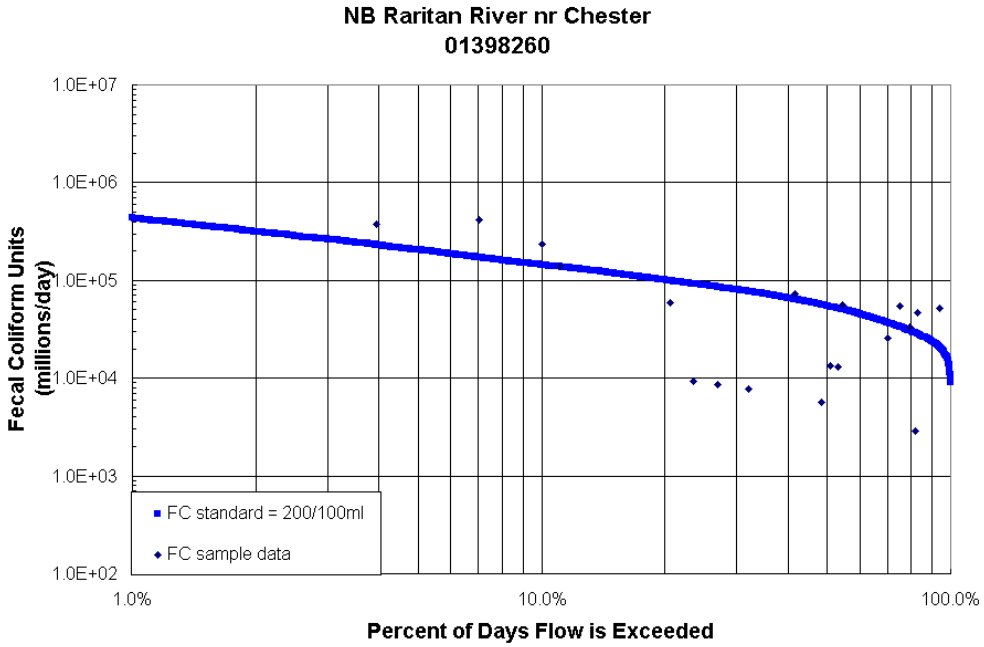
Load Duration Curve for Mulhockaway Creek at Van Syckel. Fecal coliform data from USGS station # 01396660 during the period 2/1/94 through 8/9/01. Water years 1977-2001 from USGS station # 01396660 were used in generating the FC standard curve.



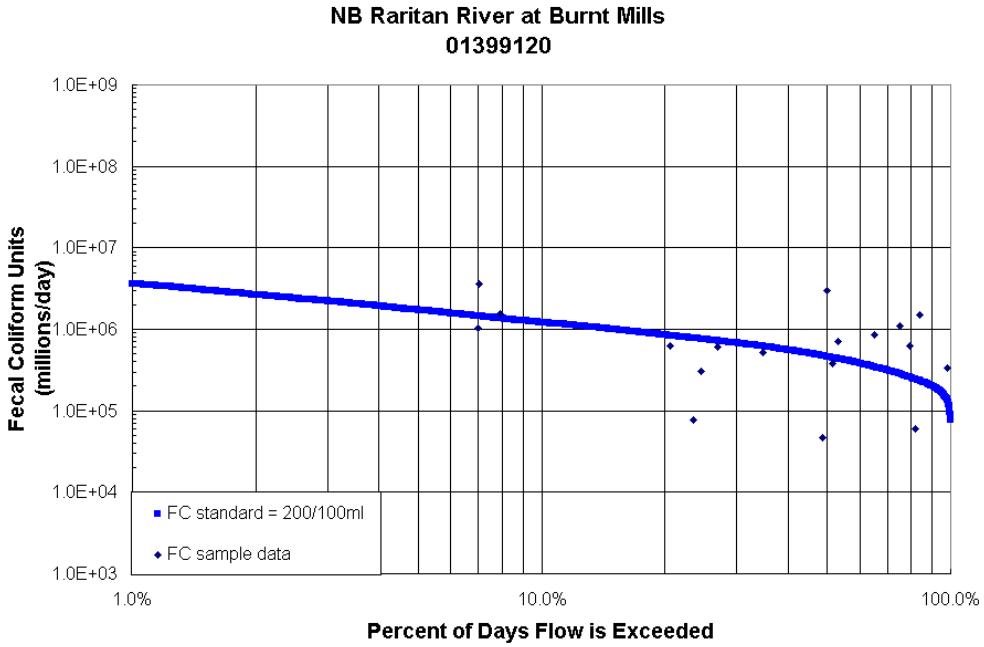
Load Duration Curve for SB Raritan River at Stanton Station. Fecal coliform data from USGS station # 01397000 during the period 1/31/94 through 7/16/97. Water years 1970-2001 from USGS station # 01397000 were used in generating the FC standard curve.



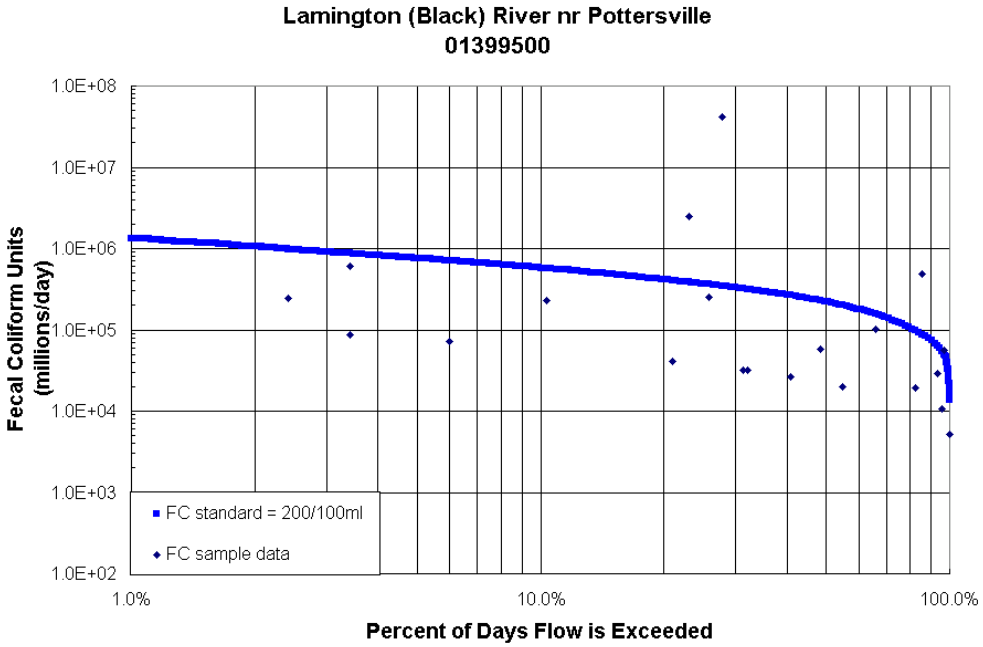
Load Duration Curve for Neshanic River at Reaville. Fecal coliform data from USGS station # 01398000 during the period 2/1/94 through 8/9/01. Water years 1970-2001 from USGS station # 01398000 were used in generating the FC standard curve.



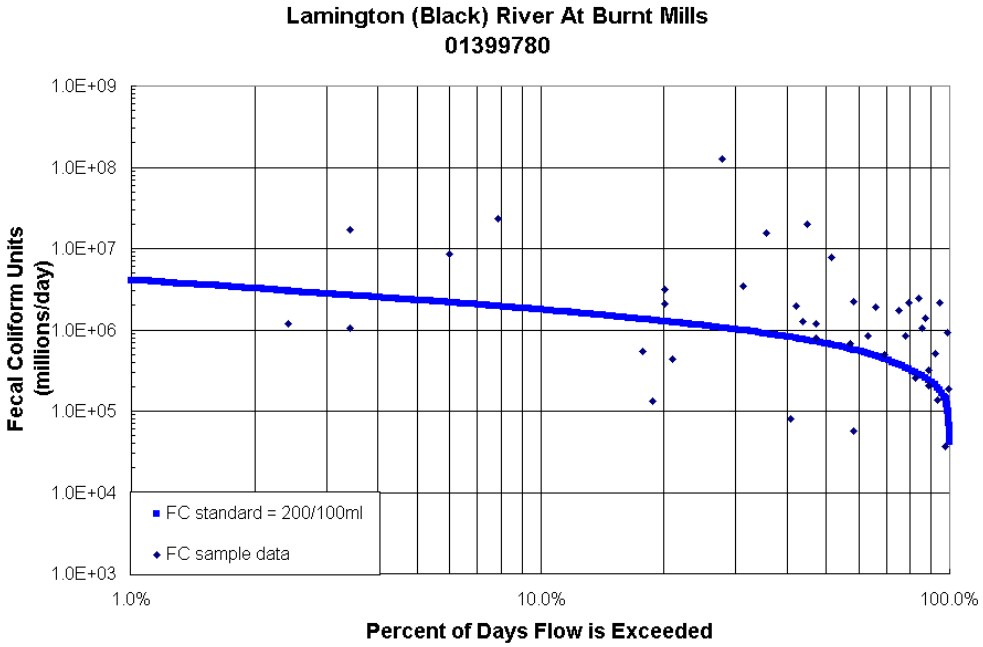
Load Duration Curve for NB Raritan River near Chester. Fecal coliform data from USGS station # 01398260 during the period 1/24/94 through 7/30/97. Water years 1970-2001 from USGS station # 01396500 (SB Raritan River Near High Bridge) were used in generating the FC standard curve.



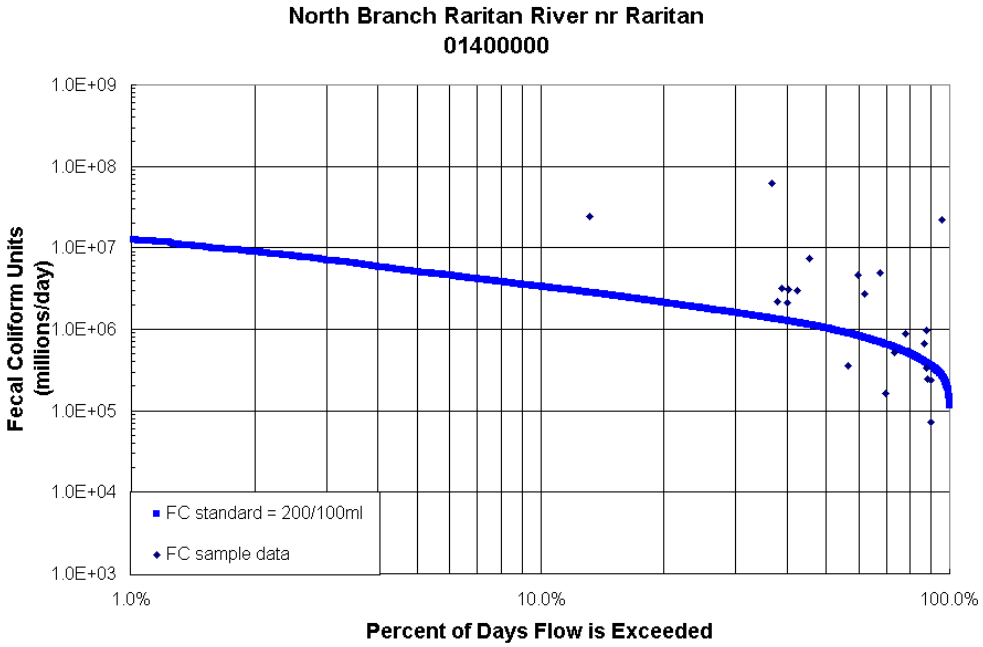
Load Duration Curve for NB Raritan River at Burnt Mills. Fecal coliform data from USGS station # 01399120 during the period 1/31/94 through 7/29/97. Water years 1970-2001 from USGS station # 01396500 (SB Raritan River Near High Bridge) were used in generating the FC standard curve.



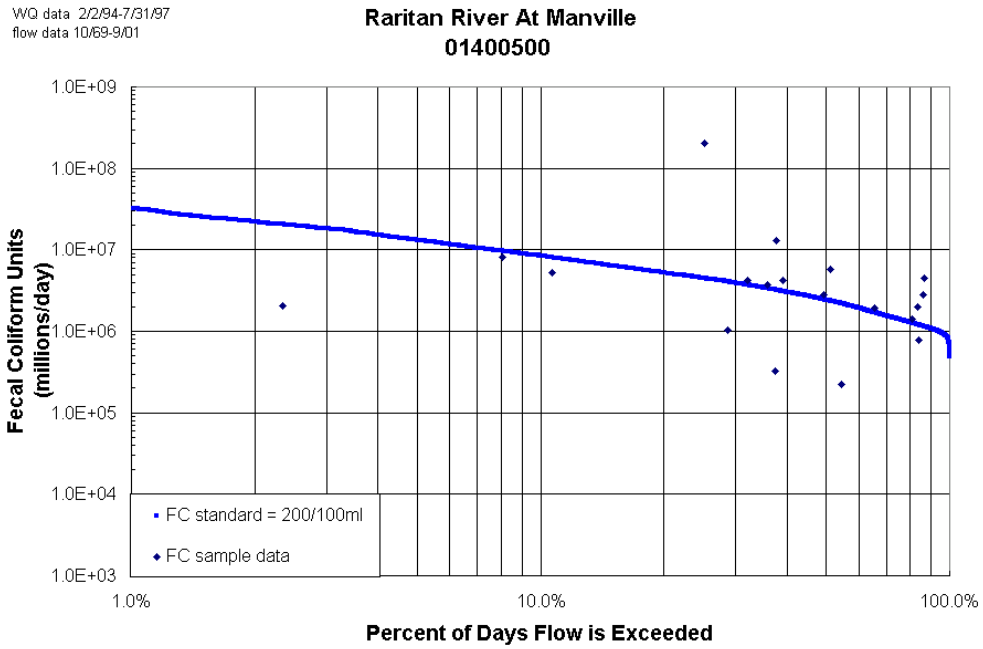
Load Duration Curve for Lamington (Black) River near Pottersville. Fecal coliform data from USGS station # 01399500 during the period 1/31/94 through 8/02/99. Water years 1970-2001 from USGS station # 01399500 were used in generating the FC standard curve.



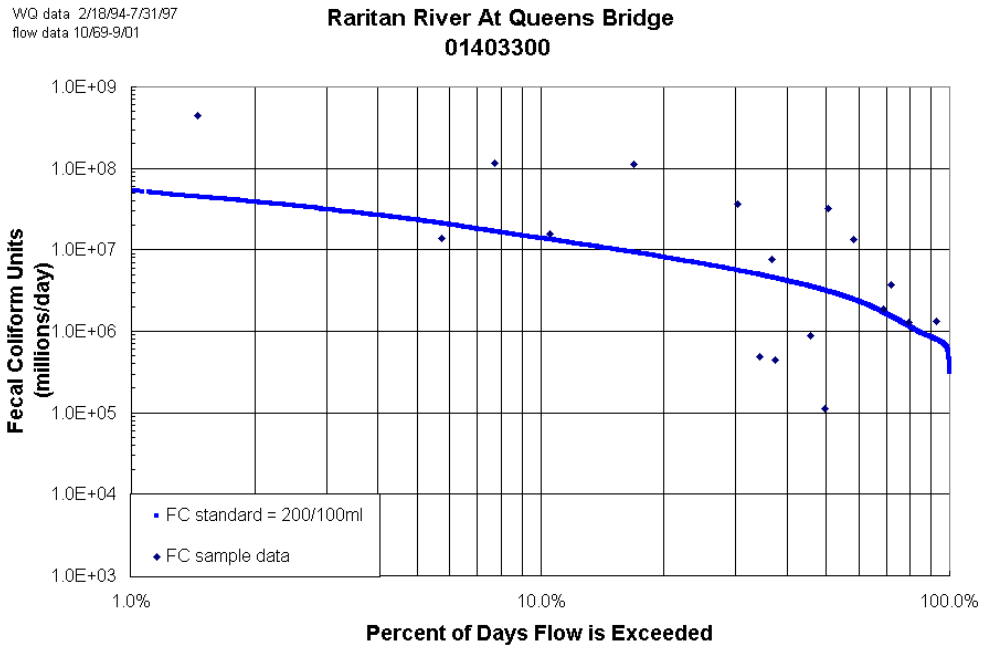
Load Duration Curve for Lamington (Black) River at Burnt Mills. Fecal coliform data from USGS station # 01399780 during the period 1/31/94 through 6/19/01. Water years 1970-2001 from USGS station # 01399500 (Lamington (Black) River Near Pottersville) were used in generating the FC standard curve.



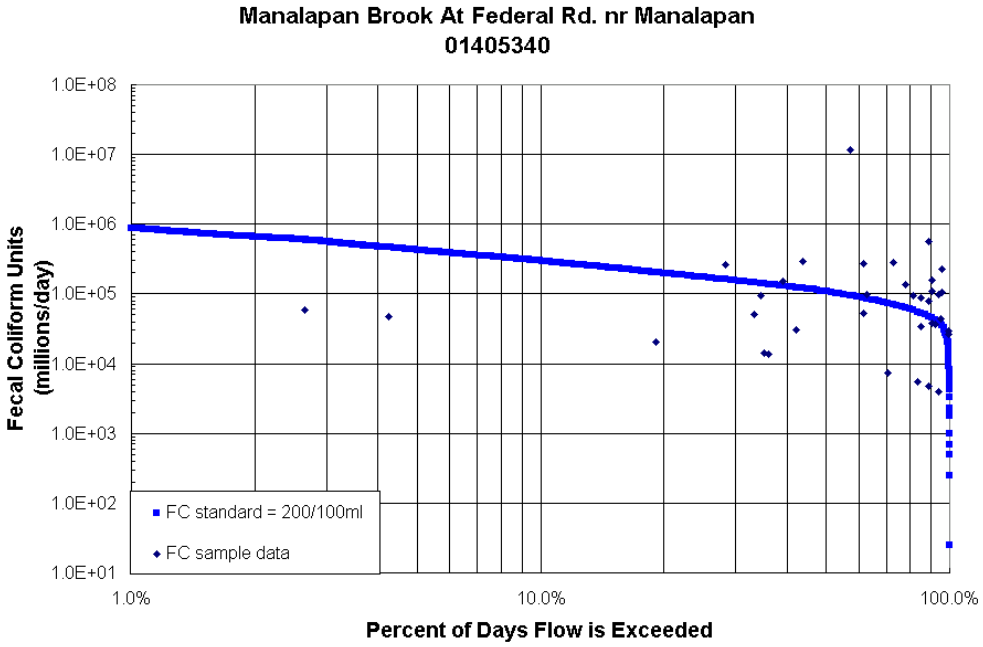
Load Duration Curve for North Branch Raritan River Near Raritan. Fecal coliform data from USGS station # 01400000 during the period 6/4/98 through 6/19/01. Water years 1970-2001 from USGS station # 01400000 were used in generating the FC standard curve.



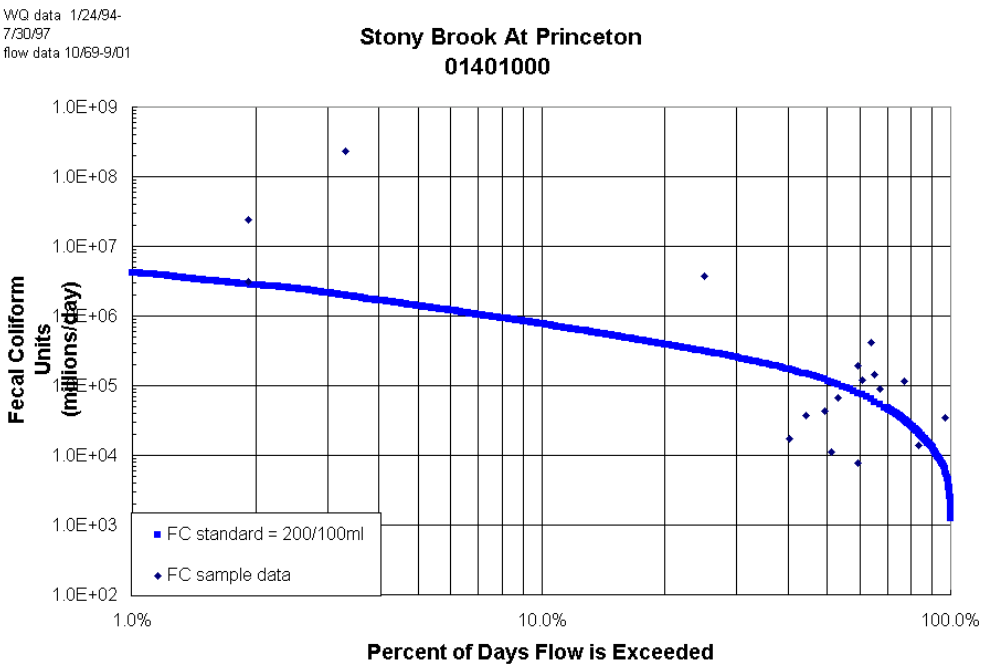
Load Duration Curve for Raritan River at Manville. Fecal coliform data from USGS station # 01400500 during the period 2/2/94 through 7/31/97. Water years 1970-2001 from USGS station # 01400500 were used in generating the FC standard curve.



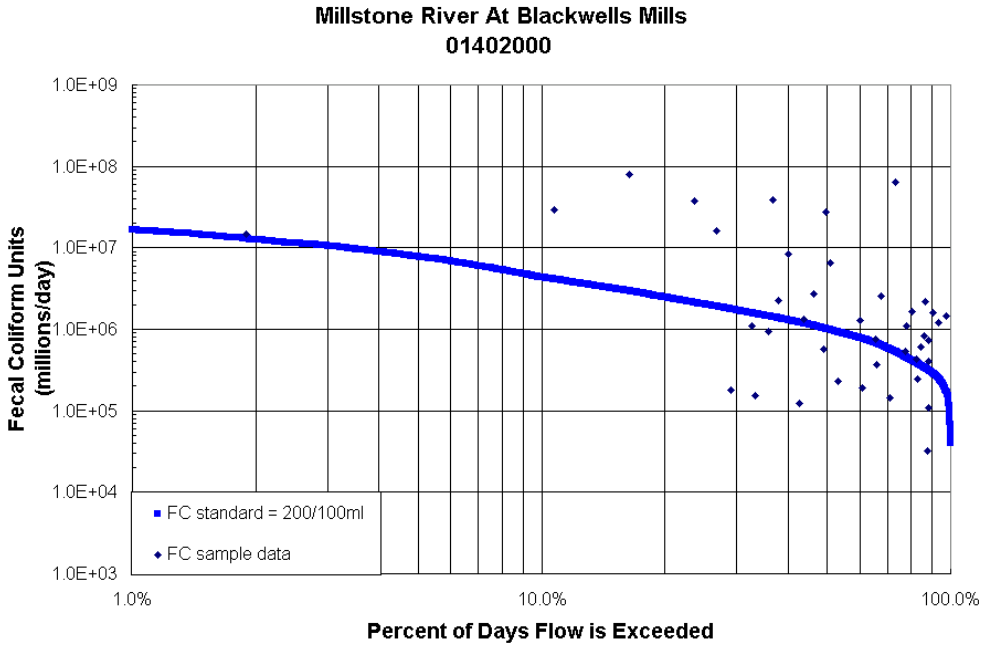
Load Duration Curve for Raritan River at Manville. Fecal coliform data from USGS station # 01403300 during the period 2/18/94 through 7/31/97. Water years 1970-2001 from USGS station # 01403060 (Raritan River Below Calco Dam At Bound Brook) were used in generating the FC standard curve.



Load Duration Curve for Manalapan Brook at Federal Rd. near Manalapan. Fecal coliform data from USGS station # 01405340 during the period 2/3/94 through 8/29/01. Water years 1970-2001 from USGS station # 01405400 (Manalapan Brook At Spotswood) were used in generating the FC standard curve.



Load Duration Curve for Stony Brook at Princeton. Fecal coliform data from USGS station # 01401000 during the period 1/24/94 through 7/30/97. Water years 1970-2001 from USGS station # 01401000 were used in generating the FC standard curve.



Load Duration Curve for Millstone River at Blackwells Mills. Fecal coliform data from USGS station # 01402000 during the period 2/2/94 through 6/19/01. Water years 1970-2001 from USGS station # 01402000 were used in generating the FC standard curve.

A-4
MUNICIPAL STORMWATER CONTROL ORDINANCE

Municipal Stormwater Control Ordinance

- **Amendment to Chapter 361 STORMWATER RUNOFF**
- **Chapter 362 STORMWATER CONTROL ORDINANCE FOR NON-RESIDENTIAL MAJOR DEVELOPMENT**

Adopted March 2006

AN ORDINANCE AMENDING AND SUPPLEMENTING CHAPTER 361 STORMWATER RUNOFF OF THE CODE OF THE CITY OF RAHWAY

BE IT ORDAINED, by the Municipal Council of the City of Rahway, County of Union, State of New Jersey, that Chapter 361 Stormwater Runoff, of the Code of the City of Rahway, be and hereby is amended and supplemented to ensure compliance with New Jersey Department of Environmental Protection ("NJDEP") permit's requirements to (1) ensure that residential developments and redevelopments are subject to the Residential Site Improvement Standards (N.J.A.C. 5:21-7); and (2) to enforce compliance with the standards set forth in Attachment C of the NJDEP permit to control passage of solid and floatable materials through storm drain inlets as follows:

Chapter 361

STORMWATER RUNOFF

§ 361-1. Short title.
§ 361-2. Purpose.
§ 361-3. Definitions.
§ 361-4. General Requirements.
§ 361-5. Design of Stormwater Detention Facilities.
§ 361-6. Exclusions.
§ 361-7. Provisions to Take Precedence.
§ 361-8. Violations and Penalties.

§ 361-1. Short title.

This chapter shall be known and may be cited as the "Stormwater Runoff Control Ordinance of the City of Rahway."

§ 361-2. Purpose.

A. It is the purpose of the Ordinance to establish minimum stormwater requirements and controls for projects (residential and non-residential) that fall below the threshold of major development.

All non-residential major development site plans and non-residential major development subdivisions shall confirm with the City of Rahway's Stormwater Control Ordinance for Non-Residential Major Development, Chapter 362.

All residential major development site plans and residential major development subdivisions shall conform with the latest version of the Residential Site Improvement Standards ("RSIS").

B. It is hereby found that areas within the municipality of Rahway are subject to recurrent flooding, that such flooding endangers life and damages public and private property and facilities, that this condition is aggravated by developments, that all developments contribute to the condition by increasing local stormwater runoff and erosion and that the most appropriate means of alleviating such condition is through the regulation of such developments.

C. It is, therefore, determined that a special and paramount public interest in the control of storm drainage justifies the regulation of storm drainage for the entire municipal area as provided in this chapter, which is in the exercise of the police power of the municipality, for the protection of the persons and property of its inhabitants and for the preservation of the health, safety and general welfare.

D. Among the purposes of this chapter are:

(1) To prevent loss of life.

(2) To protect the public health and promote public safety and welfare.

(3) To minimize losses and damages to public and private property due to stormwater runoff.

(4) To prevent an increase in volume and rate of surface runoff due to development.

(5) To reduce public expenditures for emergency operations, evacuations and restorations.

(6) To prevent damage to transportation and utility systems.

§ 361-3. Definitions.

For the purposes of this chapter, unless the context clearly indicates otherwise, the following words shall mean as indicated:

DEVELOPMENT – means 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 structure, any mining excavation or landfill and any use or change in the use of any building or other structure, or land or extension of use of land, by any person, for which permission is required under the Municipal Land Use Law, N.J.S.A. 40:55-D-1 et seq. In the case of development of agricultural lands, development means: any activity that requires a State permit; any activity reviewed by the County Agricultural Board ("CAB") and the State Agricultural Development Committee ("SADC"), and municipal review of any activity not exempted by the Right to Farm Act, N.J.S.A 4L1C-1 et seq.

MAJOR DEVELOPMENT – means any "development" that provides for ultimately disturbing one or more acres of land. Disturbance for the purpose of this rule is the placement of impervious surface or exposure and/or movement of soil or bedrock or clearing, cutting, or removing of vegetation.

PERMEABILITY TEST -- A test designed to determine the ability of the ground to absorb water. The test shall be performed by a licensed professional engineer with proven competency in the field of soils engineering and shall be in accordance with acceptable engineering standards and practices. A detailed report of the test shall be submitted to the Planning Board and City Engineer for review.

PERSON -- Corporations, companies, associations, societies, firms, partnerships, and joint-stock companies, as well as individuals, the state and all political subdivisions of the state or any agencies or instrumentalities thereof.

RAINFALL EXCESS -- The portion of rainfall which becomes direct surface runoff.

STORMWATER DETENTION -- Any storm drainage technique which retards or detains runoff, such as a detention basin, parking lot storage, rooftop storage, porous pavement, dry wells or any combination thereof.

§ 361-4. General requirements.

A. No construction or development shall take place on any site within the municipal boundaries unless a site plan and any other required information shall have been submitted to the Planning Board for its review and approval. Said site plan shall meet the requirements of §213-4A of the Code of the City of Rahway, except that proof of stream encroachment lines shall not be required if the entire site is not in the floodplain.

B. In reviewing any proposed construction or development, the Planning Board shall be reasonably assured that any structure, when built or altered, can be occupied without peril to the health or safety of the occupants and that the proposed land use does not increase local runoff and does not increase erosion.

C. No land area shall be developed by any person such that:

(1) The volume and/or rate of stormwater runoff occurring at the area is increased over what occurs there under existing conditions;

(2) The drainage of adjacent areas is adversely affected;

(3) Soil erosion during and after development is increased over what naturally occurs there;

(4) Soil absorption and groundwater recharge capacity of the area is decreased below what occurs there under existing conditions; and/or

(5) The natural drainage pattern of the area is significantly altered.

D. In order to duplicate as nearly as possible natural drainage conditions, regulation and control of stormwater runoff and erosion for any land area to be developed, except for any existing one-family or existing two-family house constructed on an individual lot not part of a major subdivision and except for any addition to a future one-family or two-family house constructed on an individual lot not part of a major subdivision, shall be through on-site stormwater detention and/or ground absorption systems, which include, but are not limited to, the following:

(1) Detention areas which may be depressions in parking areas, excavated basins, basins created through use of curbs, stabilized earth berms or dikes or any other form of grading which serves to impound and store water temporarily.

(2) Rooftop storage through temporary impoundment and storage of stormwater on flat or slightly pitched building rooftops by the use of drain outlets which restrict the stormwater runoff from the roof surface.

(3) Drywells or leaching basins which control stormwater runoff through ground absorption and temporary storage.

(4) Porous asphaltic pavement, which preserves the natural ground absorption capacity of a site and provides a subsurface reservoir for temporary storage of stormwater.

(5) Any system of porous media, such as gravel trenches drained by porous wall or perforated pipe, which temporarily store and dissipate stormwater through ground absorption.

(6) Any combination of the above-mentioned techniques which serve to limit stormwater runoff from a given site to what presently occurs there.

(7) To the maximum extent possible, stormwater management standards shall be met by incorporating non-structural strategies into a design, which shall conform the Chapter 362, Section 4:E.2.

§ 361-5. Design of stormwater detention facilities.

A. Stormwater detention facilities shall be designed to contain an amount equal to the increase in volume of runoff which would result from the development of any site. The volume of runoff shall be computed on the basis of the total rainfall which produced the flood of record for the area involved and shall be equivalent to the rainfall excess (i.e., the portion of rainfall which becomes direct surface runoff). The total rainfall which produced the flood of record shall be determined from records of the United States Department of Commerce, National Weather Services.

B. The rainfall excess shall be computed for each site using accepted, published runoff coefficients which reflect land use and topography. Acceptable runoff coefficients currently in practice include, but are not limited to, the following:

Land Use Type	**Runoff Coefficients**
Business:	
Downtown areas	0.70 to 0.95
Neighborhood areas	0.50 to 0.70
Residential:	
Single-family areas	0.30 to 0.50
Multi-units, detached	0.40 to 0.60
Multi-units, attached	0.60 to 0.75
Residential (suburban)	0.25 to 0.40
Apartment dwelling areas	0.50 to 0.70
Industrial:	
Light areas	0.50 to 0.80
Heavy areas	0.60 to 0.90
Parks; cemeteries	0.10 to 0.25
Playgrounds	0.20 to 0.35
Railroad yard areas	0.20 to 0.40
Unimproved areas	0.10 to 0.30

Surface Type	**Runoff Coefficients**
Streets:	
Asphaltic	0.70 to 0.95
Concrete	0.80 to 0.96
Brick	0.70 to 0.85
Drives and walks	0.75 to 0.85

Roofs	0.75 to 0.95
Lawns; sandy soil:	
Flat, 2%	0.05 to 0.10
Average, 2% to 7%	0.10 to 0.15
Steep, 7%	0.15 to 0.20
Lawns; heavy soil:	
Flat, 2%	0.13 to 0.17
Average, 2% to 7%	0.18 to 0.22
Steep, 7%	0.25 to 0.35

The range of coefficients for each land use and surface type reflects differences in land slope, intensity of development, amount of impervious surface and degree of ground saturation due to antecedent precipitation.

C. The runoff coefficients shall be determined for each site for both existing and proposed conditions, and the difference in the two shall be used to compute the volume of rainfall excess for design of stormwater detention facilities. The volume for the design is equal to the depth of the rainfall excess multiplied by the area of the site.

D. If, in the opinion of the City Engineer, the proposed development is too small to warrant professional engineering services or if, in the opinion of the City Engineer, the cost of securing professional engineering services would impose an undue economic hardship on the developer, the City Engineer shall determine the required type and size of stormwater detention facilities. This would not guarantee adequate performance of such systems, since it is for the convenience of the developer and is based on conditions that may vary.

E. In the case of detention facilities utilizing porous media for ground absorption, such as dry wells, porous pavement or the like, the volume of the porous media shall be large enough to contain the total volume of rainfall excess within the voids. Ground absorption systems shall be used only where the infiltration rate of the receiving soil is acceptable as determined by percolation tests and soil borings or as determined by the City Engineer. Provisions shall be made to contain overflow of such systems on site or to surface drain the overflow in such a way as not to affect adversely any other property.

F. If detention facilities utilizing surface impoundment, such as detention basins or rooftop storage, are used, sufficient volume to contain fully the total volume of rainfall excess shall be provided. The outlets of such facilities shall be designed to limit the maximum discharge rate of stormwater runoff to what occurs at the site under existing conditions and shall discharge in such a way as not to affect adversely other property. If rooftop storage is proposed, the weight of the impounded water on the roof shall be accounted for in the structural design of the building, and the roof shall be designed to provide maximum protection against leakage. If earth berms or dikes are used to create the

impounding area, they shall be stabilized adequately and the slopes protected with vegetative cover, paving or riprap to protect against failure or breaching.

G. If a combination of different stormwater detention techniques is used, the combined volume of the systems shall be large enough to fully contain the total volume of rainfall excess.

H. Stormwater detention facilities shall be maintained regularly by the owner to ensure continual functioning of the systems at design capacity and to prevent the health hazards associated with debris buildup and stagnant water. In no case shall water be allowed to remain in any facility long enough to constitute a mosquito-breeding disease or any other type of health problem. If the land containing the stormwater detention facility or facilities is dedicated to the municipality, then the municipality shall be responsible for maintenance.

I. In accordance with the New Jersey Soil Erosion and Sediment Control Act (Chapter 251, Public Law 1975), sediment and erosion control measures shall be installed prior to any other site development, shall apply to all aspects of the proposed development and shall be in operation during all stages of development. Increased runoff and sediment, resulting from modified soil and surface conditions caused by the proposed development, shall be minimized and, where possible, retained on site. Detention and sediment and erosion control facilities shall be designed in conformance with the Standard for Soil Erosion and Sediment Control in New Jersey of the New Jersey State Soil Conservation Committee and administered by the Somerset-Union Soil Conservation District.

J. Site Design features identified under §361-4(D) shall conform with Chapter 362, Section 4:E.3.

§ 361-6. Exclusions.

A. All development in those areas of the City of Rahway which fall within the limits of the tidal influence according to the United States Army Corps of Engineers' New Jersey Special Flood Hazard Information Report, 1971, shall be exempt from the requirements of this chapter, unless otherwise stated in the following subsections:

(1) Development within those areas of the City of Rahway which fall within the limits of the tidal influence area shall only be exempt if the increased volume of stormwater runoff shall not increase flood damage below the point of discharge.

(2) Areas along the westerly fringe which fall within the limits of tidal influence according the U.S. Army Corps. of Engineers Mapping are not exempt since sewer separation has taken place and is therefore not tidally influenced.

B. For the purpose of this exclusion, the area excluded shall adjoin the current Federal Emergency Management Agency (FEMA) flood hazard area, as adopted by the City of Rahway, and be downstream from the limits of tidal influence and within the downstream limits of the one-hundred-year flood as indicated on the attached map

entitled "Map of Drainage Area Affected by Army Corps of Engineers' Tidal Limits and Adjoining Flood Hazard Area," dated March 1, 1983, prepared by the Division of Engineering, City of Rahway.

§ 361-7. Provisions to take precedence.

Should the provisions of this chapter conflict with the provisions of any other ordinance of the City of Rahway, the provisions of this chapter shall take precedence.

§ 361-8. Violations and penalties.

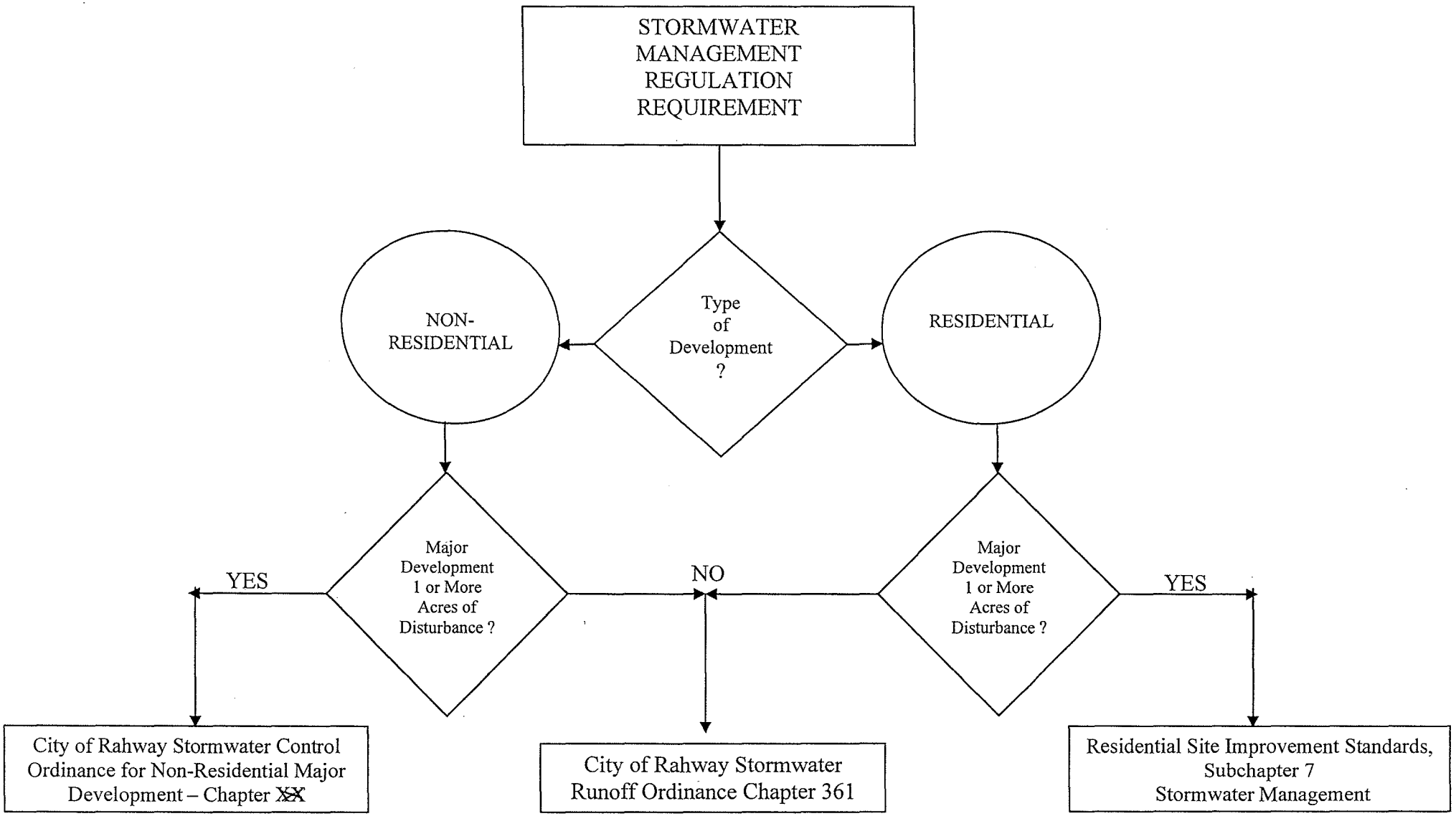
Any person who violates any provisions of this chapter shall, upon conviction thereof, be liable for a fine not exceeding $2,000.00 or imprisonment for a term not exceeding 90 days, or both. Each day in which such violation continues shall constitute a separate violation or offense.

BE IT FURTHER ORDAINED, that if any paragraph, section, subsection, sentence, clause, phrase or portion of this Ordinance is for any reason held invalid or unconstitutional by any Court or administrative agency of competent jurisdiction, such portion shall be deemed a separate, distinct and independent provision and such holding shall not affect the validity of the remaining paragraphs or sections hereof.

BE IT FURTHER ORDAINED, that all ordinances or parts of ordinances inconsistent with this Ordinance are hereby repealed to the extent of such inconsistency.

BE IT FURTHER ORDAINED, this Ordinance shall take effect following final adoption and publication in accordance with applicable law.

STORMWATER MANAGEMENT REGULATION REQUIREMENTS FLOWCHART



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Redevelopment? — YES — Recharge NOT req'd
NO — Recharge req'd → depends on soil type

Quality — more than 1/4 acre add'l imp? — YES? — quality req'd
NO — quality not req'd

Quantity — req'd.

AN ORDINANCE CREATING AND ESTABLISHING A NEW CHAPTER 362 OF THE CODE OF THE CITY OF RAHWAY ENTITLED STORMWATER CONTROL ORDINANCE FOR NON-RESIDENTIAL MAJOR DEVELOPMENT

WHEREAS, the New Jersey Department of Environmental Protection ("NJDEP") has granted the City of Rahway Authorization to Discharge under the New Jersey Pollutant Discharge Elimination System (NJPDES) Tier A Municipal Stormwater General Permit; and

WHEREAS, the NJPDES Permit requires the City to adopt and implement a municipal stormwater control ordinance or ordinances in accordance with N.J.A.C. 7:8-4, which will control stormwater from non-residential development and redevelopment projects (NJPDES Requirement F.3.a.ii).

NOW, THEREFORE, BE IT ORDAINED, by the Municipal Council of the City of Rahway, County of Union, State of New Jersey, that a new Chapter 362 entitled Stormwater Control for non-Residential Major Development of the Code of the City of Rahway, be and is hereby created and established in accordance with NJDEP Regulations as follows:

Chapter 362

STORMWATER CONTROL ORDINANCE FOR NON-RESIDENTIAL MAJOR DEVELOPMENT

§ 362-1. Scope and Purpose.
§ 362-2. Definitions.
§ 362-3. General Standards
§ 362-4. Stormwater Management Requirements for Major Development
§ 362-5. Calculation of Stormwater Runoff And Groundwater Recharge
§ 362-6. Standards for Structural Stormwater Management Measures
§ 362-7. Sources for Technical Guidance
§ 362-8. Safety Standards for Stormwater Management Basins
§ 362-9. Requirements for a Site Development Stormwater Plan
§ 362-10. Maintenance and Repair
§ 362-11. Penalties

Section 1: Scope and Purpose

A. Policy Statement

Flood control, groundwater recharge, and pollutant reduction through nonstructural or low impact techniques shall be explored before relying on structural BMPs. Structural BMPs should be integrated with nonstructural stormwater management strategies and proper maintenance plans. Nonstructural strategies include both environmentally sensitive site design and source controls that prevent pollutants from being placed on the site or from being exposed to stormwater. Source control plans should be developed based upon physical site conditions and the origin, nature, and the anticipated quantity or amount of potential pollutants. Multiple stormwater management BMPs may be necessary to achieve the established performance standards for water quality, quantity, and groundwater recharge.

B. Purpose

It is the purpose of this ordinance to establish minimum stormwater management requirements and controls for "major development," as defined in Section 2.

C. Applicability

1. This ordinance shall be applicable to all site plans and subdivisions for the following major developments that require preliminary or final site plan or subdivision review:

a. Non-residential major developments; and

b. Aspects of residential major developments that are not pre-empted by the Residential Site Improvement Standards at N.J.A.C. 5:21.

2. This ordinance shall also be applicable to all major developments undertaken by the City of Rahway.

D. Compatibility with Other Permit and Ordinance Requirements

Development approvals issued for subdivisions and site plans pursuant to this ordinance are to be considered an integral part of development approvals under the subdivision and site plan review process and do not relieve the applicant of the responsibility to secure required permits or approvals for activities regulated by any other applicable code, rule, act, or ordinance. In their interpretation and application, the provisions of this ordinance shall be held to be the minimum requirements for the promotion of the public health, safety, and general welfare. This ordinance is not intended to interfere with, abrogate, or annul any other ordinances, rule or regulation, statute, or other provision of law except that, where any provision of this ordinance imposes restrictions different from those imposed by any other ordinance, rule or regulation, or other provision of law, the more restrictive provisions or higher standards shall control.

Section 2: Definitions

Unless specifically defined below, words or phrases used in this ordinance shall be interpreted so as to give them the meaning they have in common usage and to give this ordinance its most reasonable application. The definitions below are the same as or based on the corresponding definitions in the Stormwater Management Rules at N.J.A.C. 7:8-1.2.

"CAFRA Planning Map" means the geographic depiction of the boundaries for Coastal Planning Areas, CAFRA Centers, CAFRA Cores and CAFRA Nodes pursuant to N.J.A.C. 7:7E-5B.3.

"CAFRA Centers, Cores or Nodes" means those areas within boundaries accepted by the Department pursuant to N.J.A.C. 7:8E-5B.

"Compaction" means the increase in soil bulk density.

"Core" means a pedestrian-oriented area of commercial and civic uses serving the surrounding municipality, generally including housing and access to public transportation.

"County review agency" means an agency designated by the County Board of Chosen Freeholders to review municipal stormwater management plans and implementing ordinance(s). The county review agency may either be:

A county planning agency; or

A county water resource association created under N.J.S.A 58:16A-55.5, if the ordinance or resolution delegates authority to approve, conditionally approve, or disapprove municipal stormwater management plans and implementing ordinances.

"Department" means the New Jersey Department of Environmental Protection.

"Designated Center" means a State Development and Redevelopment Plan Center as designated by the State Planning Commission such as urban, regional, town, village, or hamlet.

"Design engineer" means a person professionally qualified and duly licensed in New Jersey to perform engineering services that may include, but not necessarily be limited to, development of project requirements, creation and development of project design and preparation of drawings and specifications.

"Development" means 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 structure, any mining excavation or landfill, and any use or change in the use of any building or other structure, or land or extension of use of land, by any person, for which permission is required under the Municipal Land Use Law , N.J.S.A. 40:55D-1 et seq. In the case of development of agricultural lands, development means: any activity that requires a State permit; any activity reviewed by the County Agricultural Board (CAB) and the State Agricultural Development Committee (SADC), and municipal review of any activity not exempted by the Right to Farm Act , N.J.S.A 4:1C-1 et seq.

"Drainage area" means a geographic area within which stormwater, sediments, or dissolved materials drain to a particular receiving waterbody or to a particular point along a receiving waterbody.

"Environmentally critical areas" means an area or feature which is of significant environmental value, including but not limited to: stream corridors; natural heritage priority sites; habitat of endangered or threatened species; large areas of contiguous open space or upland forest; steep slopes; and well head protection and groundwater recharge areas. Habitats of endangered or threatened species are identified using the Department's Landscape Project as approved by the Department's Endangered and Nongame Species Program.

"Empowerment Neighborhood" means a neighborhood designated by the Urban Coordinating Council "in consultation and conjunction with" the New Jersey Redevelopment Authority pursuant to N.J.S.A 55:19-69.

"Erosion" means the detachment and movement of soil or rock fragments by water, wind, ice or gravity.

"Impervious surface" means a surface that has been covered with a layer of material so that it is highly resistant to infiltration by water.

"Infiltration" is the process by which water seeps into the soil from precipitation.

"Major development" means any "development" that provides for ultimately disturbing one or more acres of land. Disturbance for the purpose of this rule is the placement of impervious surface or exposure and/or movement of soil or bedrock or clearing, cutting, or removing of vegetation.

"Municipality" means any city, borough, town, township, or village.

"Node" means an area designated by the State Planning Commission concentrating facilities and activities which are not organized in a compact form.

"Nutrient" means a chemical element or compound, such as nitrogen or phosphorus, which is essential to and promotes the development of organisms.

"Person" means any individual, corporation, company, partnership, firm, association, the City of Rahway, or political subdivision of this State subject to municipal jurisdiction pursuant to the Municipal Land Use Law , N.J.S.A. 40:55D-1 et seq.

"Pollutant" means any dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, refuse, oil, grease, sewage sludge, munitions, chemical wastes, biological materials, medical wastes, radioactive substance (except those regulated under the Atomic Energy Act of 1954, as amended (42 U.S.C. 2011 et seq.), thermal waste, wrecked or discarded equipment, rock, sand, cellar dirt, industrial, municipal, agricultural, and construction waste or runoff, or other residue discharged directly or indirectly to the land, ground waters or surface waters of the State, or to a domestic treatment works. "Pollutant" includes both hazardous and nonhazardous pollutants.

"Recharge" means the amount of water from precipitation that infiltrates into the ground and is not evapotranspired.

"Sediment" means solid material, mineral or organic, that is in suspension, is being transported, or has been moved from its site of origin by air, water or gravity as a product of erosion.

"Site" means the lot or lots upon which a major development is to occur or has occurred.

"Soil" means all unconsolidated mineral and organic material of any origin.

"State Development and Redevelopment Plan Metropolitan Planning Area (PA1)" means an area delineated on the State Plan Policy Map and adopted by the State Planning Commission that is intended to be the focus for much of the state's future redevelopment and revitalization efforts.

"State Plan Policy Map" is defined as the geographic application of the State Development and Redevelopment Plan's goals and statewide policies, and the official map of these goals and policies.

"Stormwater" means water resulting from precipitation (including rain and snow) that runs off the land's surface, is transmitted to the subsurface, or is captured by separate storm sewers or other sewage or drainage facilities, or conveyed by snow removal equipment.

"Stormwater runoff" means water flow on the surface of the ground or in storm sewers, resulting from precipitation.

"Stormwater management basin" means an excavation or embankment and related areas designed to retain stormwater runoff. A stormwater management basin may either be normally dry (that is, a detention basin or infiltration basin), retain water in a permanent pool (a retention basin), or be planted mainly with wetland vegetation (most constructed stormwater wetlands).

"Stormwater management measure" means any structural or nonstructural strategy, practice, technology, process, program, or other method intended to control or reduce stormwater runoff and associated pollutants, or to induce or control the infiltration or groundwater recharge of stormwater or to eliminate illicit or illegal non-stormwater discharges into stormwater conveyances.

"Tidal Flood Hazard Area" means a flood hazard area, which may be influenced by stormwater runoff from inland areas, but which is primarily caused by the Atlantic Ocean.

"Urban Coordinating Council Empowerment Neighborhood" means a neighborhood given priority access to State resources through the New Jersey Redevelopment Authority.

"Urban Enterprise Zones" means a zone designated by the New Jersey Enterprise Zone Authority pursuant to the New Jersey Urban Enterprise Zones Act, N.J.S.A. 52:27H-60 et. seq.

"Urban Redevelopment Area" is defined as previously developed portions of areas:

(1)Delineated on the State Plan Policy Map (SPPM) as the Metropolitan Planning Area (PA1), Designated Centers, Cores or Nodes;

(2)Designated as CAFRA Centers, Cores or Nodes;

(3)Designated as Urban Enterprise Zones; and

(4)Designated as Urban Coordinating Council Empowerment Neighborhoods.

"Waters of the State" means the ocean and its estuaries, all springs, streams, wetlands, and bodies of surface or ground water, whether natural or artificial, within the boundaries of the State of New Jersey or subject to its jurisdiction.

"Wetlands" or "wetland" means an area that is inundated or saturated by surface water or ground water at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions, commonly known as hydrophytic vegetation.

Section 3: General Standards

A. Design and Performance Standards for Stormwater Management Measures

1. Stormwater management measures for major development shall be developed to meet the erosion control, groundwater recharge, stormwater runoff quantity, and stormwater runoff quality standards in Section 4. To the maximum extent practicable, these standards shall be met by incorporating nonstructural stormwater management strategies into the design. If these strategies alone are not sufficient to meet these standards, structural stormwater management measures necessary to meet these standards shall be incorporated into the design.

2. The standards in this ordinance apply only to new major development and are intended to minimize the impact of stormwater runoff on water quality and water quantity in receiving water bodies and maintain groundwater recharge. The standards do not apply to new major development to the extent that alternative design and performance standards are applicable under a regional stormwater management plan or Water Quality Management Plan adopted in accordance with Department rules.

Note: Alternative standards shall provide at least as much protection from stormwater-related loss of groundwater recharge, stormwater quantity and water quality impacts of major development projects as would be provided under the standards in N.J.A.C. 7:8-5.

Section 4: Stormwater Management Requirements for Major Development

A. The development shall incorporate a maintenance plan for the stormwater management measures incorporated into the design of a major development in accordance with Section 10.

B. Stormwater management measures shall avoid adverse impacts of concentrated flow on habitat for threatened and endangered species as documented in the Department' Landscape Project or Natural Heritage Database established under N.J.S.A. 13:1B-15.147 through 15.150, particularly *Helonias bullata* (swamp pink) and/or *Clemmys muhlnebergi* (bog turtle).

C. The following linear development projects are exempt from the groundwater recharge, stormwater runoff quantity, and stormwater runoff quality requirements of Sections 4.F and 4.G:

1. The construction of an underground utility line provided that the disturbed areas are revegetated upon completion;

2. The construction of an aboveground utility line provided that the existing conditions are maintained to the maximum extent practicable; and

3. The construction of a public pedestrian access, such as a sidewalk or trail with a maximum width of 14 feet, provided that the access is made of permeable material.

D. A waiver from strict compliance from the groundwater recharge, stormwater runoff quantity, and stormwater runoff quality requirements of Sections 4.F and 4.G may be obtained for the enlargement of an existing public roadway or railroad; or the construction or enlargement of a public pedestrian access, provided that the following conditions are met:

1. The applicant demonstrates that there is a public need for the project that cannot be accomplished by any other means;

2. The applicant demonstrates through an alternatives analysis, that through the use of nonstructural and structural stormwater management strategies and measures, the option selected complies with the requirements of Sections 4.F and 4.G to the maximum extent practicable;

3. The applicant demonstrates that, in order to meet the requirements of Sections 4.F and 4.G, existing structures currently in use, such as homes and buildings, would need to be condemned; and

4. The applicant demonstrates that it does not own or have other rights to areas, including the potential to obtain through condemnation lands not falling under D.3 above within the upstream drainage area of the receiving stream, that would provide additional opportunities to mitigate the requirements of Sections 4.F and 4.G that were not achievable on-site.

E. Nonstructural Stormwater Management Strategies

1. To the maximum extent practicable, the standards in Sections 4.F and 4.G shall be met by incorporating nonstructural stormwater management strategies set forth at Section 4.E into the design. The applicant shall identify the nonstructural measures incorporated into the design of the project. If the applicant contends that it is not feasible for engineering, environmental, or safety reasons to incorporate any nonstructural stormwater management measures identified in Paragraph 2 below into the design of a particular project, the applicant shall identify the strategy considered and provide a basis for the contention.

2. Nonstructural stormwater management strategies incorporated into site design shall:

   a. Protect areas that provide water quality benefits or areas particularly susceptible to erosion and sediment loss;

   b. Minimize impervious surfaces and break up or disconnect the flow of runoff over impervious surfaces;

   c. Maximize the protection of natural drainage features and vegetation;

   d. Minimize the decrease in the "time of concentration" from pre-construction to post construction. "Time of concentration" is defined as the time it takes for runoff to travel from the hydraulically most distant point of the watershed to the point of interest within a watershed;

   e. Minimize land disturbance including clearing and grading;

   f. Minimize soil compaction;

   g. Provide low-maintenance landscaping that encourages retention and planting of native vegetation and minimizes the use of lawns, fertilizers and pesticides;

   h. Provide vegetated open-channel conveyance systems discharging into and through stable vegetated areas;

   i. Provide other source controls to prevent or minimize the use or exposure of pollutants at the site, in order to prevent or minimize the release of those pollutants into stormwater runoff. Such source controls include, but are not limited to:

      (1) Site design features that help to prevent accumulation of trash and debris in drainage systems, including features that satisfy Section 4.E.3. below;

      (2) Site design features that help to prevent discharge of trash and debris from drainage systems;

      (3) Site design features that help to prevent and/or contain spills or other harmful accumulations of pollutants at industrial or commercial developments; and

      (4) When establishing vegetation after land disturbance, applying fertilizer in accordance with the requirements established under the Soil Erosion and Sediment Control Act, N.J.S.A. 4:24-39 et seq., and implementing rules.

3. Site design features identified under Section 4.E.2.i.(2) above shall comply with the following standard to control passage of solid and floatable materials through storm drain inlets. For purposes of this paragraph, "solid and floatable materials" means sediment, debris, trash, and other floating, suspended, or settleable solids. For exemptions to this standard see Section 4.E.3.c below.

   a. Design engineers shall use either of the following grates whenever they use a grate in pavement or another ground surface to collect stormwater from that surface into a storm drain or surface water body under that grate:

(1) The New Jersey Department of Transportation (NJDOT) bicycle safe grate, which is described in Chapter 2.4 of the NJDOT Bicycle Compatible Roadways and Bikeways Planning and Design Guidelines (April 1996); or

(2) A different grate, if each individual clear space in that grate has an area of no more than seven (7.0) square inches, or is no greater than 0.5 inches across the smallest dimension.

Examples of grates subject to this standard include grates in grate inlets, the grate portion (non-curb-opening portion) of combination inlets, grates on storm sewer manholes, ditch grates, trench grates, and grates of spacer bars in slotted drains. Examples of ground surfaces include surfaces of roads (including bridges), driveways, parking areas, bikeways, plazas, sidewalks, lawns, fields, open channels, and stormwater basin floors.

b. Whenever design engineers use a curb-opening inlet, the clear space in that curb opening (or each individual clear space, if the curb opening has two or more clear spaces) shall have an area of no more than seven (7.0) square inches, or be no greater than two (2.0) inches across the smallest dimension.

c. This standard does not apply:

(1) Where the review agency determines that this standard would cause inadequate hydraulic performance that could not practicably be overcome by using additional or larger storm drain inlets that meet these standards;

(2) Where flows from the water quality design storm as specified in Section 4.G.1 are conveyed through any device (e.g., end of pipe netting facility, manufactured treatment device, or a catch basin hood) that is designed, at a minimum, to prevent delivery of all solid and floatable materials that could not pass through one of the following:

(a) A rectangular space four and five-eighths inches long and one and one-half inches wide (this option does not apply for outfall netting facilities); or

(b) A bar screen having a bar spacing of 0.5 inches.

(3) Where flows are conveyed through a trash rack that has parallel bars with one-inch (1") spacing between the bars, to the elevation of the water quality design storm as specified in Section 4.G.1; or

(4) Where the New Jersey Department of Environmental Protection determines, pursuant to the New Jersey Register of Historic Places Rules at N.J.A.C. 7:4-7.2(c), that action to meet this standard is an undertaking that constitutes an encroachment or will damage or destroy the New Jersey Register listed historic property.

4. Any land area used as a nonstructural stormwater management measure to meet the performance standards in Sections 4.F and 4.G shall be dedicated to a government agency, subjected to a conservation restriction filed with the appropriate County Clerk's office, or subject to an approved equivalent restriction that ensures that measure or an equivalent stormwater management measure approved by the reviewing agency is maintained in perpetuity.

5. Guidance for nonstructural stormwater management strategies is available in the New Jersey Stormwater Best Management Practices Manual. The BMP Manual may be obtained from the address identified in Section 7, or found on the Department's website at www.njstormwater.org.

F. Erosion Control, Groundwater Recharge and Runoff Quantity Standards

1. This subsection contains minimum design and performance standards to control erosion, encourage and control infiltration and groundwater recharge, and control stormwater runoff quantity impacts of major development.

   a. The minimum design and performance standards for erosion control are those established under the Soil Erosion and Sediment Control Act, N.J.S.A. 4:24-39 et seq. and implementing rules.

   b. The minimum design and performance standards for groundwater recharge are as follows:

      (1) The design engineer shall, using the assumptions and factors for stormwater runoff and groundwater recharge calculations at Section 5, either:

         (a) Demonstrate through hydrologic and hydraulic analysis that the site and its stormwater management measures maintain 100 percent of the average annual pre-construction groundwater recharge volume for the site; or

         (b) Demonstrate through hydrologic and hydraulic analysis that the increase of stormwater runoff volume from pre-construction to post-construction for the 2-year storm is infiltrated.

      (2) This groundwater recharge requirement does not apply to projects within the "urban redevelopment area," or to projects subject to (3) below.

      (3) The following types of stormwater shall not be recharged:

         (a) Stormwater from areas of high pollutant loading. High pollutant loading areas are areas in industrial and commercial developments where solvents and/or petroleum products are loaded/unloaded, stored, or applied, areas where pesticides are loaded/unloaded or stored; areas where hazardous materials are expected to be present in greater than "reportable quantities" as defined by the United States Environmental Protection Agency (EPA) at 40 CFR 302.4; areas where recharge would be inconsistent with Department approved remedial action work plan or landfill closure plan and areas with high risks for spills of toxic materials, such as gas stations and vehicle maintenance facilities; and

         (b) Industrial stormwater exposed to "source material." "Source material" means any material(s) or machinery, located at an industrial facility, that is directly or indirectly related to process, manufacturing or other industrial activities, which could be a source of pollutants in any industrial stormwater discharge to groundwater. Source materials include, but are not limited to, raw materials; intermediate products; final products; waste materials; by-products; industrial machinery and fuels, and lubricants, solvents, and detergents that are related to process, manufacturing, or other industrial activities that are exposed to stormwater.

      (4) The design engineer shall assess the hydraulic impact on the groundwater table and design the site so as to avoid adverse hydraulic impacts. Potential adverse hydraulic impacts include, but are not limited to, exacerbating a naturally or seasonally high water table so as to cause surficial ponding, flooding of basements, or interference with the proper

operation of subsurface sewage disposal systems and other subsurface structures in the vicinity or downgradient of the groundwater recharge area.

c. In order to control stormwater runoff quantity impacts, the design engineer shall, using the assumptions and factors for stormwater runoff calculations at Section 5, complete one of the following:

(1) Demonstrate through hydrologic and hydraulic analysis that for stormwater leaving the site, post-construction runoff hydrographs for the two, 10, and 100-year storm events do not exceed, at any point in time, the pre-construction runoff hydrographs for the same storm events;

(2) Demonstrate through hydrologic and hydraulic analysis that there is no increase, as compared to the pre-construction condition, in the peak runoff rates of stormwater leaving the site for the two, 10, and 100-year storm events and that the increased volume or change in timing of stormwater runoff will not increase flood damage at or downstream of the site. This analysis shall include the analysis of impacts of existing land uses and projected land uses assuming full development under existing zoning and land use ordinances in the drainage area;

(3) Design stormwater management measures so that the post-construction peak runoff rates for the 2, 10 and 100 year storm events are 50, 75 and 80 percent, respectively, of the pre-construction peak runoff rates. The percentages apply only to the post-construction stormwater runoff that is attributable to the portion of the site on which the proposed development or project is to be constructed. The percentages shall not be applied to post-construction stormwater runoff into tidal flood hazard areas if the increased volume of stormwater runoff will not increase flood damages below the point of discharge; or

(4) In tidal flood hazard areas, stormwater runoff quantity analysis in accordance with (1), (2) and (3) above shall only be applied if the increased volume of stormwater runoff could increase flood damages below the point of discharge.

2. Any application for a new agricultural development that meets the definition of major development at Section 2 shall be submitted to the appropriate Soil Conservation District for review and approval in accordance with the requirements of this section and any applicable Soil Conservation District guidelines for stormwater runoff quantity and erosion control. For the purposes of this section, "agricultural development" means land uses normally associated with the production of food, fiber and livestock for sale. Such uses do not include the development of land for the processing or sale of food and the manufacturing of agriculturally related products.

G. Stormwater Runoff Quality Standards

1. Stormwater management measures shall be designed to reduce the post-construction load of total suspended solids (TSS) in stormwater runoff by 80 percent of the anticipated load from the developed site, expressed as an annual average. Stormwater management measures shall only be required for water quality control if an additional 1/4 acre of impervious surface is being proposed on a development site. The requirement to reduce TSS does not apply to any stormwater runoff in a discharge regulated under a numeric effluent limitation for TSS imposed under the New Jersey Pollution Discharge Elimination System (NJPDES) rules, N.J.A.C. 7:14A, or in a discharge specifically exempt under a NJPDES permit from this requirement. The water

quality design storm is 1.25 inches of rainfall in two hours. Water quality calculations shall take into account the distribution of rain from the water quality design storm, as reflected in Table 1. The calculation of the volume of runoff may take into account the implementation of non-structural and structural stormwater management measures.

Table 1: Water Quality Design Storm Distribution

Time (Minutes)	Cumulative Rainfall (Inches)	Time (Minutes)	Cumulative Rainfall (Inches)
0	0.0000	65	0.8917
5	0.0083	70	0.9917
10	0.0166	75	1.0500
15	0.0250	80	1.0840
20	0.0500	85	1.1170
25	0.0750	90	1.1500
30	0.1000	95	1.1750
35	0.1330	100	1.2000
40	0.1660	105	1.2250
45	0.2000	110	1.2334
50	0.2583	115	1.2417
55	0.3583	120	1.2500
60	0.6250		

2. For purposes of TSS reduction calculations, Table 2 below presents the presumed removal rates for certain BMPs designed in accordance with the New Jersey Stormwater Best Management Practices Manual. The BMP Manual may be obtained from the address identified in Section 7, or found on the Department's website at www.njstormwater.org. The BMP Manual and other sources of technical guidance are listed in Section 7. TSS reduction shall be calculated based on the removal rates for the BMPs in Table 2 below. Alternative removal rates and methods of calculating removal rates may be used if the design engineer provides documentation demonstrating the capability of these alternative rates and methods to the review agency. A copy of any approved alternative rate or method of calculating the removal rate shall be provided to the Department at the following address: Division of Watershed Management, New Jersey Department of Environmental Protection, PO Box 418 Trenton, New Jersey, 08625-0418.

3. If more than one BMP in series is necessary to achieve the required 80 percent TSS reduction for a site, the applicant shall utilize the following formula to calculate TSS reduction:

$$R = A + B - (AXB)/100$$

Where

R = total TSS percent load removal from application of both BMPs, and
A = the TSS percent removal rate applicable to the first BMP
B = the TSS percent removal rate applicable to the second BMP

Table 2: TSS Removal Rates for BMPs

Best Management Practice	TSS Percent Removal Rate
Bioretention Systems	90
Constructed Stormwater Wetland	90
Extended Detention Basin	40-60
Infiltration Structure	80
Manufactured Treatment Device	See Section 6.C
Sand Filter	80
Vegetative Filter Strip	60-80
Wet Pond	50-90

4. If there is more than one onsite drainage area, the 80 percent TSS removal rate shall apply to each drainage area, unless the runoff from the subareas converge on site in which case the removal rate can be demonstrated through a calculation using a weighted average.

5. Stormwater management measures shall also be designed to reduce, to the maximum extent feasible, the post-construction nutrient load of the anticipated load from the developed site in stormwater runoff generated from the water quality design storm. In achieving reduction of nutrients to the maximum extent feasible, the design of the site shall include nonstructural strategies and structural measures that optimize nutrient removal while still achieving the performance standards in Sections 4.F and 4.G.

6. Additional information and examples are contained in the New Jersey Stormwater Best Management Practices Manual, which may be obtained from the address identified in Section 7.

7. In accordance with the definition of FW1 at N.J.A.C. 7:9B-1.4, stormwater management measures shall be designed to prevent any increase in stormwater runoff to waters classified as FW1.

8. Special water resource protection areas shall be established along all waters designated Category One at N.J.A.C. 7:9B, and perennial or intermittent streams that drain into or upstream of the Category One waters as shown on the USGS Quadrangle Maps or in the County Soil Surveys, within the associated HUC14 drainage area. These areas shall be established for the protection of water quality, aesthetic value, exceptional ecological significance, exceptional recreational

significance, exceptional water supply significance, and exceptional fisheries significance of those established Category One waters. These areas shall be designated and protected as follows:

a. The applicant shall preserve and maintain a special water resource protection area in accordance with one of the following:

(1) A 300-foot special water resource protection area shall be provided on each side of the waterway, measured perpendicular to the waterway from the top of the bank outwards or from the centerline of the waterway where the bank is not defined, consisting of existing vegetation or vegetation allowed to follow natural succession is provided.

(2) Encroachment within the designated special water resource protection area under Subsection (1) above shall only be allowed where previous development or disturbance has occurred (for example, active agricultural use, parking area or maintained lawn area). The encroachment shall only be allowed where applicant demonstrates that the functional value and overall condition of the special water resource protection area will be maintained to the maximum extent practicable. In no case shall the remaining special water resource protection area be reduced to less than 150 feet as measured perpendicular to the top of bank of the waterway or centerline of the waterway where the bank is undefined. All encroachments proposed under this subparagraph shall be subject to review and approval by the Department.

b. All stormwater shall be discharged outside of and flow through the special water resource protection area and shall comply with the Standard for Off-Site Stability in the "Standards For Soil Erosion and Sediment Control in New Jersey," established under the Soil Erosion and Sediment Control Act , N.J.S.A. 4:24-39 et seq.

c. If stormwater discharged outside of and flowing through the special water resource protection area cannot comply with the Standard For Off-Site Stability in the "Standards for Soil Erosion and Sediment Control in New Jersey," established under the Soil Erosion and Sediment Control Act , N.J.S.A. 4:24-39 et seq., then the stabilization measures in accordance with the requirements of the above standards may be placed within the special water resource protection area, provided that:

(1) Stabilization measures shall not be placed within 150 feet of the Category One waterway;

(2) Stormwater associated with discharges allowed by this section shall achieve a 95 percent TSS post-construction removal rate;

(3) Temperature shall be addressed to ensure no impact on the receiving waterway;

(4) The encroachment shall only be allowed where the applicant demonstrates that the functional value and overall condition of the special water resource protection area will be maintained to the maximum extent practicable;

(5) A conceptual project design meeting shall be held with the appropriate Department staff and Soil Conservation District staff to identify necessary stabilization measures; and

(6) All encroachments proposed under this section shall be subject to review and approval by the Department.

d. A stream corridor protection plan may be developed by a regional stormwater management planning committee as an element of a regional stormwater management plan, or by a municipality through an adopted municipal stormwater management plan. If a stream corridor

protection plan for a waterway subject to Section 4.G(8) has been approved by the Department of Environmental Protection, then the provisions of the plan shall be the applicable special water resource protection area requirements for that waterway. A stream corridor protection plan for a waterway subject to G.8 shall maintain or enhance the current functional value and overall condition of the special water resource protection area as defined in G.8.a.(1) above. In no case shall a stream corridor protection plan allow the reduction of the Special Water Resource Protection Area to less than 150 feet as measured perpendicular to the waterway subject to this subsection.

e. Paragraph G.8 does not apply to the construction of one individual single family dwelling that is not part of a larger development on a lot receiving preliminary or final subdivision approval on or before February 2, 2004, provided that the construction begins on or before February 2, 2009.

Section 5: Calculation of Stormwater Runoff and Groundwater Recharge

A. Stormwater runoff shall be calculated in accordance with the following:

1. The design engineer shall calculate runoff using one of the following methods:

   a. The USDA Natural Resources Conservation Service (NRCS) methodology, including the NRCS Runoff Equation and Dimensionless Unit Hydrograph, as described in the NRCS National Engineering Handbook Section 4 – Hydrology and Technical Release 55 – Urban Hydrology for Small Watersheds; or

   b. The Rational Method for peak flow and the Modified Rational Method for hydrograph computations.

2. For the purpose of calculating runoff coefficients and groundwater recharge, there is a presumption that the pre-construction condition of a site or portion thereof is a wooded land use with good hydrologic condition. The term "runoff coefficient" applies to both the NRCS methodology at Section 5.A.1.a and the Rational and Modified Rational Methods at Section 5.A.1.b. A runoff coefficient or a groundwater recharge land cover for an existing condition may be used on all or a portion of the site if the design engineer verifies that the hydrologic condition has existed on the site or portion of the site for at least five years without interruption prior to the time of application. If more than one land cover have existed on the site during the five years immediately prior to the time of application, the land cover with the lowest runoff potential shall be used for the computations. In addition, there is the presumption that the site is in good hydrologic condition (if the land use type is pasture, lawn, or park), with good cover (if the land use type is woods), or with good hydrologic condition and conservation treatment (if the land use type is cultivation).

3. In computing pre-construction stormwater runoff, the design engineer shall account for all significant land features and structures, such as ponds, wetlands, depressions, hedgerows, or culverts that may reduce pre-construction stormwater runoff rates and volumes.

4. In computing stormwater runoff from all design storms, the design engineer shall consider the relative stormwater runoff rates and/or volumes of pervious and impervious surfaces separately to accurately compute the rates and volume of stormwater runoff from the site. To calculate

runoff from unconnected impervious cover, urban impervious area modifications as described in the NRCS Technical Release 55 – Urban Hydrology for Small Watersheds and other methods may be employed.

5. If the invert of the outlet structure of a stormwater management measure is below the flood hazard design flood elevation as defined at N.J.A.C. 7:13, the design engineer shall take into account the effects of tailwater in the design of structural stormwater management measures.

B. Groundwater recharge may be calculated in accordance with the following:

1. The New Jersey Geological Survey Report GSR-32 A Method for Evaluating Ground-Water Recharge Areas in New Jersey, incorporated herein by reference as amended and supplemented. Information regarding the methodology is available from the New Jersey Stormwater Best Management Practices Manual; at http://www.state.nj.us/dep/njgs/; or at New Jersey Geological Survey, 29 Arctic Parkway, P.O. Box 427 Trenton, New Jersey 08625-0427; (609) 984-6587.

Section 6: Standards for Structural Stormwater Management Measures

A. Standards for structural stormwater management measures are as follows:

1. Structural stormwater management measures shall be designed to take into account the existing site conditions, including, for example, environmentally critical areas, wetlands; flood-prone areas; slopes; depth to seasonal high water table; soil type, permeability and texture; drainage area and drainage patterns; and the presence of solution-prone carbonate rocks (limestone).

2. Structural stormwater management measures shall be designed to minimize maintenance, facilitate maintenance and repairs, and ensure proper functioning. Trash racks shall be installed at the intake to the outlet structure as appropriate, and shall have parallel bars with one-inch (1") spacing between the bars to the elevation of the water quality design storm. For elevations higher than the water quality design storm, the parallel bars at the outlet structure shall be spaced no greater than one-third (1/3) the width of the diameter of the orifice or one-third (1/3) the width of the weir, with a minimum spacing between bars of one-inch and a maximum spacing between bars of six inches. In addition, the design of trash racks must comply with the requirements of Section 8.D.

3. Structural stormwater management measures shall be designed, constructed, and installed to be strong, durable, and corrosion resistant. Measures that are consistent with the relevant portions of the Residential Site Improvement Standards at N.J.A.C. 5:21-7.3, 7.4, and 7.5 shall be deemed to meet this requirement. (See RSIS page 95 for design storms)

4. At the intake to the outlet from the stormwater management basin, the orifice size shall be a minimum of two and one-half inches in diameter.

5. Stormwater management basins shall be designed to meet the minimum safety standards for stormwater management basins at Section 8.

B. Stormwater management measure guidelines are available in the New Jersey Stormwater Best Management Practices Manual. Other stormwater management measures may be utilized provided the design engineer demonstrates that the proposed measure and its design will accomplish the

required water quantity, groundwater recharge and water quality design and performance standards established by Section 4 of this ordinance.

C. Manufactured treatment devices may be used to meet the requirements of Section 4 of this ordinance, provided the pollutant removal rates are verified by the New Jersey Corporation for Advanced Technology and certified by the Department.

Section 7: Sources for Technical Guidance

A. Technical guidance for stormwater management measures can be found in the documents listed at 1 and 2 below, which are available from Maps and Publications, New Jersey Department of Environmental Protection, 428 East State Street, P.O. Box 420, Trenton, New Jersey, 08625; telephone (609) 777-1038.

1. Guidelines for stormwater management measures are contained in the New Jersey Stormwater Best Management Practices Manual, as amended. Information is provided on stormwater management measures such as: bioretention systems, constructed stormwater wetlands, dry wells, extended detention basins, infiltration structures, manufactured treatment devices, pervious paving, sand filters, vegetative filter strips, and wet ponds.

2. The New Jersey Department of Environmental Protection Stormwater Management Facilities Maintenance Manual, as amended.

B. Additional technical guidance for stormwater management measures can be obtained from the following:

1. The "Standards for Soil Erosion and Sediment Control in New Jersey" promulgated by the State Soil Conservation Committee and incorporated into N.J.A.C. 2:90. Copies of these standards may be obtained by contacting the State Soil Conservation Committee or any of the Soil Conservation Districts listed in N.J.A.C. 2:90-1.3(a)4. The location, address, and telephone number of each Soil Conservation District may be obtained from the State Soil Conservation Committee, P.O. Box 330, Trenton, New Jersey 08625; (609) 292-5540;

2. The Rutgers Cooperative Extension Service, 732-932-9306; and

3. The Soil Conservation Districts listed in N.J.A.C. 2:90-1.3(a)4. The location, address, and telephone number of each Soil Conservation District may be obtained from the State Soil Conservation Committee, P.O. Box 330, Trenton, New Jersey, 08625, (609) 292-5540.

Section 8: Safety Standards for Stormwater Management Basins

A. This section sets forth requirements to protect public safety through the proper design and operation of stormwater management basins. This section applies to any new stormwater management basin.

B. Requirements for Trash Racks, Overflow Grates and Escape Provisions

1. A trash rack is a device designed to catch trash and debris and prevent the clogging of outlet structures. Trash racks shall be installed at the intake to the outlet from the stormwater management basin to ensure proper functioning of the basin outlets in accordance with the following:

   a. The trash rack shall have parallel bars, with no greater than six inch spacing between the bars.

   b. The trash rack shall be designed so as not to adversely affect the hydraulic performance of the outlet pipe or structure.

   c. The average velocity of flow through a clean trash rack is not to exceed 2.5 feet per second under the full range of stage and discharge. Velocity is to be computed on the basis of the net area of opening through the rack.

   d. The trash rack shall be constructed and installed to be rigid, durable, and corrosion resistant, and shall be designed to withstand a perpendicular live loading of 300 lbs/ft sq.

2. An overflow grate is designed to prevent obstruction of the overflow structure. If an outlet structure has an overflow grate, such grate shall meet the following requirements:

   a. The overflow grate shall be secured to the outlet structure but removable for emergencies and maintenance.

   b. The overflow grate spacing shall be no less than two inches across the smallest dimension.

   c. The overflow grate shall be constructed and installed to be rigid, durable, and corrosion resistant, and shall be designed to withstand a perpendicular live loading of 300 lbs./ft sq.

3. For purposes of this paragraph 3, escape provisions means the permanent installation of ladders, steps, rungs, or other features that provide easily accessible means of egress from stormwater management basins. Stormwater management basins shall include escape provisions as follows:

   a. If a stormwater management basin has an outlet structure, escape provisions shall be incorporated in or on the structure. With the prior approval of the reviewing agency identified in Section 8.C a free-standing outlet structure may be exempted from this requirement.

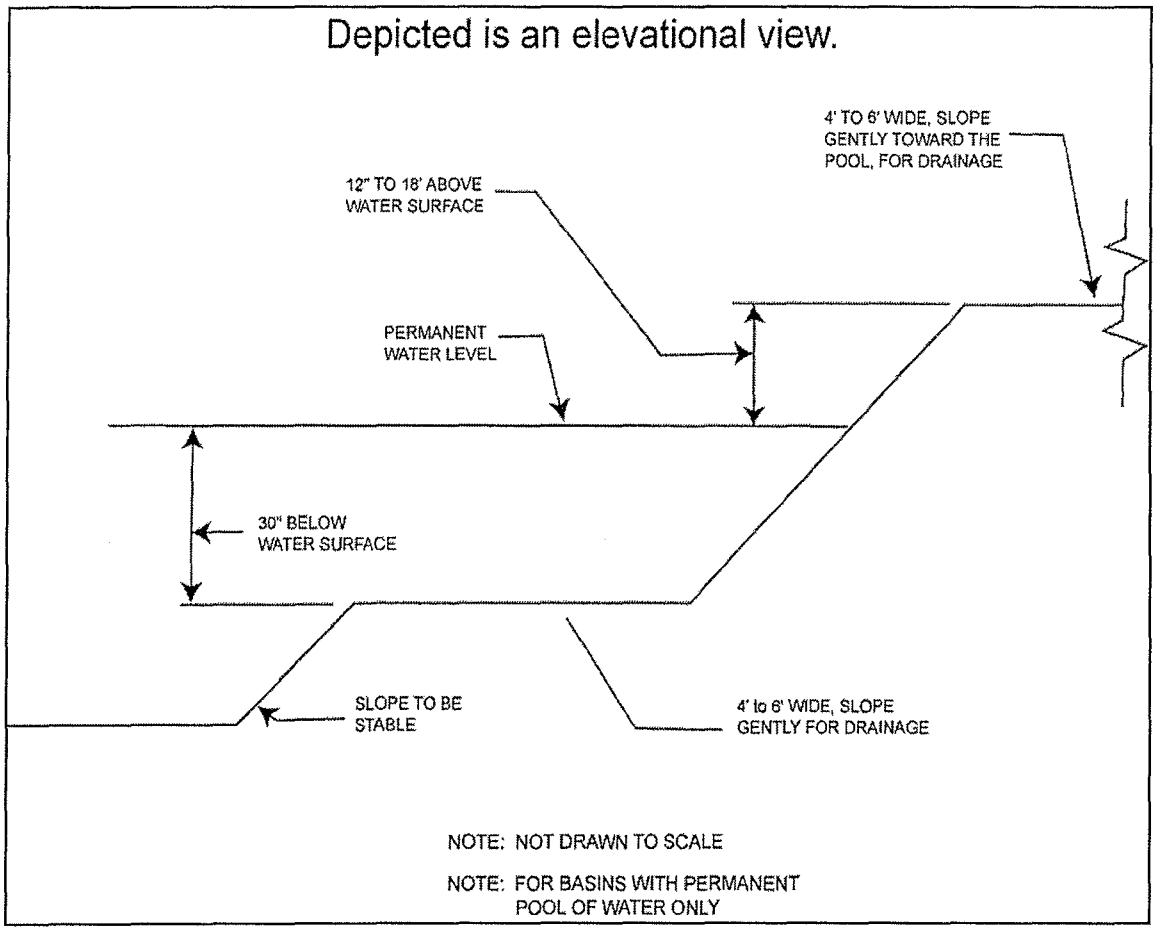
   b. Safety ledges shall be constructed on the slopes of all new stormwater management basins having a permanent pool of water deeper than two and one-half feet. Such safety ledges shall be comprised of two steps. Each step shall be four to six feet in width. One step shall be located approximately two and one-half feet below the permanent water surface, and the second step shall be located one to one and one-half feet above the permanent water surface. See Section 8.D for an illustration of safety ledges in a stormwater management basin.

   c. In new stormwater management basins, the maximum interior slope for an earthen dam, embankment, or berm shall not be steeper than 3 horizontal to 1 vertical.

C. Variance or Exemption from Safety Standards

1. A variance or exemption from the safety standards for stormwater management basins may be granted only upon a written finding by the appropriate reviewing agency (municipality, county or Department) that the variance or exemption will not constitute a threat to public safety.

D. Illustration of Safety Ledges in a New Stormwater Management Basin



Section 9: Requirements for a Site Development Stormwater Plan

A. Submission of Site Development Stormwater Plan

1. Whenever an applicant seeks municipal approval of a development subject to this ordinance, the applicant shall submit all of the required components of the Checklist for the Site Development Stormwater Plan at Section 9.C below as part of the submission of the applicant's application for subdivision or site plan approval.

2. The applicant shall demonstrate that the project meets the standards set forth in this ordinance.

3. The applicant shall submit eighteen (18) copies of the materials listed in the checklist for site development stormwater plans in accordance with Section 9.C of this ordinance.

B. Site Development Stormwater Plan Approval

The applicant's Site Development project shall be reviewed as a part of the subdivision or site plan review process by the municipal board or official from which municipal approval is sought. That

municipal board or official shall consult the engineer retained by the Planning and/or Zoning Board (as appropriate) to determine if all of the checklist requirements have been satisfied and to determine if the project meets the standards set forth in this ordinance.

C. Checklist Requirements

The following information shall be required:

1. Topographic Base Map

The reviewing engineer may require upstream tributary drainage system information as necessary. It is recommended that the topographic base map of the site be submitted which extends a minimum of 200 feet beyond the limits of the proposed development, at a scale of 1"=200' or greater, showing 2-foot contour intervals. The map as appropriate may indicate the following: existing surface water drainage, shorelines, steep slopes, soils, erodible soils, perennial or intermittent streams that drain into or upstream of the Category One waters, wetlands and flood plains along with their appropriate buffer strips, marshlands and other wetlands, pervious or vegetative surfaces, existing man-made structures, roads, bearing and distances of property lines, and significant natural and manmade features not otherwise shown.

2. Environmental Site Analysis

A written and graphic description of the natural and man-made features of the site and its environs. This description should include a discussion of soil conditions, slopes, wetlands, waterways and vegetation on the site. Particular attention should be given to unique, unusual, or environmentally sensitive features and to those that provide particular opportunities or constraints for development.

3. Project Description and Site Plan(s)

A map (or maps) at the scale of the topographical base map indicating the location of existing and proposed buildings, roads, parking areas, utilities, structural facilities for stormwater management and sediment control, and other permanent structures. The map(s) shall also clearly show areas where alterations occur in the natural terrain and cover, including lawns and other landscaping, and seasonal high ground water elevations. A written description of the site plan and justification of proposed changes in natural conditions may also be provided.

4. Land Use Planning and Source Control Plan

This plan shall provide a demonstration of how the goals and standards of Sections 3 through 6 are being met. The focus of this plan shall be to describe how the site is being developed to meet the objective of controlling groundwater recharge, stormwater quality and stormwater quantity problems at the source by land management and source controls whenever possible.

5. Stormwater Management Facilities Map

The following information, illustrated on a map of the same scale as the topographic base map, shall be included:

a. Total area to be paved or built upon, proposed surface contours, land area to be occupied by the stormwater management facilities and the type of vegetation thereon, and details of the proposed plan to control and dispose of stormwater.

b. Details of all stormwater management facility designs, during and after construction, including discharge provisions, discharge capacity for each outlet at different levels of detention and emergency spillway provisions with maximum discharge capacity of each spillway.

6. Calculations

a. Comprehensive hydrologic and hydraulic design calculations for the pre-development and post-development conditions for the design storms specified in Section 4 of this ordinance.

b. When the proposed stormwater management control measures (e.g., infiltration basins) depends on the hydrologic properties of soils, then a soils report shall be submitted. The soils report shall be based on onsite boring logs or soil pit profiles. The number and location of required soil borings or soil pits shall be determined based on what is needed to determine the suitability and distribution of soils present at the location of the control measure.

7. Maintenance and Repair Plan

The design and planning of the stormwater management facility shall meet the maintenance requirements of Section 10.

8. Waiver from Submission Requirements

The municipal official or board reviewing an application under this ordinance may, in consultation with the municipal engineer, waive submission of any of the requirements in Sections 9.C.1 through 9.C.6 of this ordinance when it can be demonstrated that the information requested is impossible to obtain or it would create a hardship on the applicant to obtain and its absence will not materially affect the review process.

Section 10: Maintenance and Repair

A. Applicability

1. Projects subject to review as in Section 1.C of this ordinance shall comply with the requirements of Sections 10.B and 10.C.

B. General Maintenance

1. The design engineer shall prepare a maintenance plan for the stormwater management measures incorporated into the design of a major development.

2. The maintenance plan shall contain specific preventative maintenance tasks and schedules; cost estimates, including estimated cost of sediment, debris, or trash removal; and the name, address, and telephone number of the person or persons responsible for preventative and corrective maintenance (including replacement). Maintenance guidelines for stormwater management measures are available in the New Jersey Stormwater Best Management Practices Manual. If the maintenance plan identifies a person other than the developer (for example, a public agency or homeowners' association) as having the responsibility for maintenance, the plan shall include documentation of such person's agreement to assume this responsibility, or of the developer's obligation to dedicate a stormwater management facility to such person under an applicable ordinance or regulation.

3. Responsibility for maintenance shall not be assigned or transferred to the owner or tenant of an individual property in a residential development or project, unless such owner or tenant owns or leases the entire residential development or project.

4. If the person responsible for maintenance identified under Section 10.B.2 above is not a public agency, the maintenance plan and any future revisions based on Section 10.B.7 below shall be recorded upon the deed of record for each property on which the maintenance described in the maintenance plan must be undertaken.

5. Preventative and corrective maintenance shall be performed to maintain the function of the stormwater management measure, including repairs or replacement to the structure; removal of sediment, debris, or trash; restoration of eroded areas; snow and ice removal; fence repair or replacement; restoration of vegetation; and repair or replacement of nonvegetated linings.

6. The person responsible for maintenance identified under Section 10.B.2 above shall maintain a detailed log of all preventative and corrective maintenance for the structural stormwater management measures incorporated into the design of the development, including a record of all inspections and copies of all maintenance-related work orders.

7. The person responsible for maintenance identified under Section 10.B.2 above shall evaluate the effectiveness of the maintenance plan at least once per year and adjust the plan and the deed as needed.

8. The person responsible for maintenance identified under Section 10.B.2 above shall retain and make available, upon request by any public entity with administrative, health, environmental, or safety authority over the site, the maintenance plan and the documentation required by Sections 10.B.6 and 10.B.7 above.

9. The requirements of Sections 10.B.3 and 10.B.4 do not apply to stormwater management facilities that are dedicated to and accepted by the municipality or another governmental agency.

10. In the event that the stormwater management facility becomes a danger to public safety or public health, or if it is in need of maintenance or repair, the municipality shall so notify the responsible person in writing. Upon receipt of that notice, the responsible person shall have fourteen (14) days to effect maintenance and repair of the facility in a manner that is approved by the municipal engineer or his designee. The municipality, in its discretion, may extend the time allowed for effecting maintenance and repair for good cause. If the responsible person fails or refuses to perform such maintenance and repair, the municipality or County may immediately proceed to do so and shall bill the cost thereof to the responsible person.

B. Nothing in this section shall preclude the municipality in which the major development is located from requiring the posting of a performance or maintenance guarantee in accordance with N.J.S.A. 40:55D-53.

Section 11: Penalties

Any person who erects, constructs, alters, repairs, converts, maintains, or uses any building, structure or land in violation of this ordinance shall be subject to a fine not exceeding $500.00 to $2,000.00 or imprisonment for a term not exceeding ninety (90) days, or both. Each day in which

such violation continues shall constitute a separate violation of offense. Nothing herein contained shall prevent the City of Rahway from taking such other lawful action as is necessary to prevent or remedy any violation.

BE IT FURTHER ORDAINED, that this ordinance shall take effect immediately upon the approval by the county review agency, or sixty (60) days from the receipt of the ordinance by the county review agency if the county review agency should fail to act.

BE IT FURTHER ORDAINED, that if any paragraph, section, subsection, sentence, clause, phrase or portion of this Ordinance is for any reason held invalid or unconstitutional by any Court or administrative agency of competent jurisdiction, such portion shall be deemed a separate, distinct and independent provision and such holding shall not affect the validity of the remaining paragraphs or sections hereof.

BE IT FURTHER ORDAINED, that all ordinances or parts of ordinances inconsistent with this Ordinance are hereby repealed to the extent of such inconsistency.