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NONPOINT SOURCE ASSESSMENT AND MANAGEMENT PROGRAM

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Chapter I. Introduction

Nonpoint source water pollution (NPS) has become a public policy issue in New Jersey and throughout the nation, as NPS affects public health, safety and welfare, endangers the marine ecosystem and water quality, and creates other damaging environmental effects. For regulatory purposes, NPS is defined in New Jersey as "a contributing factor to water pollution that cannot be traced to a specific discernible confined and discrete conveyance" (N.J.A.C. 7:14A-1.9, N.J.A.C. 7:15-1.5). Generally speaking, NPS includes any pollution which comes from a variety of diffuse sources, rather than from a specific source such as an outfall pipe from an industrial or sewage treatment plant. Direct overland runoff into streams is an example of NPS. Urban stormwater runoff, sanitary landfills, and certain other pollution sources are often discussed with NPS even though the pollutants are frequently discharged through specific conveyances that constitute "point sources" under the federal Clean Water Act (CWA) and State law.

(The formal determination of whether a particular activity is a "point" or "nonpoint" source can involve various legal considerations, and this report is not intended to guide such determinations. Because State law provides broad authority for NPS control, the distinction between "point" and "nonpoint" sources is less significant in State law than it is in the CWA. The fundamental issue is not how to make the distinction but how to control the pollution.)

In response to the growing national concern for NPS pollution, section 319 of the CWA directs each State to develop programs for controlling NPS. The State of New Jersey submits this report in response

to the CWA's requirements and United States Environmental Protection Agency (USEPA) guidance for a State Assessment Report describing the State's NPS problems and a State Management Program explaining what New Jersey intends to do in the next four fiscal years to address its NPS problems.

Chapter II of this report describes New Jersey's existing NPS pollution problems and includes a statewide NPS assessment. In that assessment, the State determined that interstate NPS pollution is an area where initiatives must be developed. Particular concerns include estuary protection as well as controlling floatables in the New York - New Jersey Harbor area and along the coastal regions of the State. This chapter also addresses existing legal controls and management programs that authorize NPS control in the State and serve as the foundation from which this plan was developed.

Chapter III presents a general strategy which outlines the phases of investigation, survey, planning and implementation that will initiate the State NPS Program. Also included, is a discussion of strategies the State plans to develop into programs for controlling NPS. It addresses mechanisms to control pollution at the source, prior to entering or within a conveyance or discharge system, and at the point of discharge. The chapter discusses controls, such as water quality management plans with mandatory Best Management Practices (BMPs), and emphasizes urban runoff control. Urban runoff represents a serious and most challenging NPS pollution problem in the State because of the lack of information on the subject and the difficulties expected to be encountered while attempting to control it. Despite these difficulties, the plan does discuss

innovative methods and practices for controlling this type of NPS pollution. This chapter also describes technical considerations that must be addressed if an effective statewide NPS control program is to succeed.

Chapter IV includes a phased approach for implementing the NPS program and addresses institutional, economic and other considerations. Chapter V discusses the relation of the NPS program to other programs within the Division of Water Resources as well as outside the Division. Chapter VI addresses mechanisms for local agency and public involvement in the NPS program.

The State has recently developed a statewide NPS education program to make the public aware of its role in creating and preventing NPS pollution. The program, which is targeted towards all sectors of the community, seeks to educate the public on the benefits and importance of reducing pollution and to promote public involvement in voluntary and regulatory NPS prevention and control programs. Appendix A includes a discussion of the NPS education program.

Chapter II. The Existing Nonpoint Source Control Situation in New Jersey

This chapter discusses the impacts of NPS on water quality. Also included are discussions of the impacts of NPS to the State's streams, lakes, and ground water; interstate waters; and the ocean. The chapter concludes with a discussion of the existing legal authorities and controls for the management of NPS.

A. Water Quality Impacts from Nonpoint Sources of Pollution

The impact of NPS on a receiving water is significant. Nonpoint sources can potentially contribute such pollutants as sediment, nutrients, pesticides, salts, fecal bacteria and other organisms, ammonia, toxic substances, organic chemicals, metals, oil and grease, and miscellaneous solid wastes. They can also adversely affect stream temperatures and deplete dissolved oxygen levels.

The impacts on water quality from NPS-derived pollutants range from threats to human health to degradation and elimination of designated water uses (e.g., swimming, fishing, recreation) and loss of aesthetics. For example, metals and organic chemicals which may run off from urban areas or land disposal areas and reach surface waters or ground waters serving as water supplies can make them unfit for human consumption. The hydrocarbons in urban runoff, which are approximately 90% in particulate form, are believed to adversely affect filter feeding organisims, which are an important part of the food chain in small streams. High bacteria levels which may arise from urban areas or agricultural areas can introduce pathogenic organisms, can preclude primary contact recreation, and can contaminate shellfish. Nutrients running off from agriculture,

silviculture, or private lawns and gardens can cause eutrophication of water bodies, can introduce nitrates into water supplies and thus threaten infant health, and can reduce dissolved oxygen levels posing a threat to desirable fish species. Coastal algal blooms may also result from nutrient inputs from NPS.

The USEPA's Nationwide Urban Runoff Program determined mean concentrations of various contaminants found in urban runoff nationwide (USEPA, 1983). When it is realized that these are mean values nationwide and that New Jersey with its high population density may be expected to have values higher than the mean, it becomes apparent that much urban runoff is of a quality detrimental to aquatic life and unacceptable as it affects ground water quality.

The importance of NPS as pollutant sources has been documented in national studies as well as those of other states. For example, the importance of agricultural NPS was noted in a USEPA report which stated that agricultural NPS pollution adversely affects portions of more than two-thirds of the nation's river basins (USEPA, 1984). That report also indicated that urban NPS problems affect more than 50% of the nation's drainage basins. These NPS categories are of special importance to New Jersey which is highly urbanized yet has an important agricultural segment. All of the NPS categories have to varying degrees some significance in New Jersey.

The effects of NPS as contributors to water quality degradation in New Jersey are significant. Both surface water and ground water are affected. It is explained, for example, in the New Jersey 1988 State Water Quality Inventory Report that 69 percent of the monitored freshwater rivers and streams do not meet both the swimmable and fish

propagation/maintenance clean water goals. Only a small minority of these segments can be clearly identified as contaminated solely by point sources. Therefore, the remainder are substantially affected by NPS.

The report also states that lake quality throughout the State has generally deteriorated or is threatened and that NPS pollution is the primary cause of the degradation. NPS pollution is the major reason for bathing beach closures and restrictions in New Jersey's shellfish growing areas in backbays and estuaries. Recent research has shown that in environmentally sensitive waterways, such as those of the Pinelands, contaminated stormwater from developed areas severely degrades the natural aquatic system by destroying the indigenous plant and animal communities.

Nonpoint contributions to lake tributaries will ultimately impact the downstream lakes. Because lakes behave as sinks trapping sediments, nutrients, as well as water-borne chemicals, sediments, toxics, etc. gradually build up in lake bottoms. At the same time excessive nutrient inputs accelerate photosynthetic activity and, therefore, the process of lake eutrophication (aging). As with rivers and streams, the degree of impact upon a lake is proportional to the degree of urban/suburban development or the intensity of agricultural activity within the watershed. In addition, NPS contamination in ground water in certain areas such as Edgewater Park Township, Delanco Township, Dennis Township, Winslow Township, Howell Township, and Monroe Township (Gloucester County), has impacted water quality which may render them unsuitable for potable purposes.

New Jersey's active program for remediation of contaminated well fields has investigated the extent and sources of contamination in many different sites. Of the more than seventy cases investigated so far,

approximately 50% are believed to have been contaminated by identifiable major sources of pollution such as major landfills, large industries, or hazardous waste disposal sites; the remainder were contaminated by NPS or by sources unknown. This shows the relative importance which must be given to controlling diffuse and dispersed pollution sources as far as ground water is concerned.

B. Nonpoint Sources of Pollution in New Jersey

This section discusses the present state of water quality in the State's surface and ground waters as they are affected by NPS. The section is subdivided into separate sections discussing streams, lakes (excluding interstate waters), and ground water; interstate waters; and ocean waters. The discussion of ocean water quality and nonpoint sources is extensive due to the special concern which the public has expressed with the problem of ocean and coastal pollution.

1. Streams, Lakes, and Ground Water (excluding interstate surface waters):

The occurrence of NPS in New Jersey was preliminarily determined through the use of a questionnaire which was sent to various agencies and government bodies for completion. Information was obtained from county planning departments, the State's soil conservation districts, the N.J. Division of Fish Game and Wildlife, and the Division of Water Resources' (DWR) Bureau of Marine Water Classification and Analysis. The questionnaire asked these bodies to specify the suspected sources of nonpoint pollution and types of pollutants believed to be impacting the various waterbodies in the State. This information was incorporated into the New Jersey 1988 State Water Quality Inventory Report, presently in

draft form. The nonpoint source evaluations are based upon the best professional judgment of the assessor and not, necessarily, actual monitoring data. Appendices B, C, and D summarize, in tabular form, the waterbodies suspected of being impaired by NPS.

In completing the questionnaires, these agencies focused upon pollution sources, rather than pollution cause categories (types of pollutants). As a result of the different focus, pollutant types were not reported in aproximately forty percent of the questionnaires. If pollution cause categories were not provided in the evaluations, cause categories based upon what would be expected from the source category listed in the evaluations were added to the table by the Bureau of Water Quality Planning. For example, if a local planning department reported that a stream was affected by construction activity, siltation was listed as the probable pollutant. Therefore, the nonpoint source and cause category information is considered preliminary.

The most commonly reported NPS included agricultural runoff, road runoff, and runoff from construction activities and urban/suburban surfaces. These sources are ubiquitous because land use in New Jersey is principally either agricultural, urban/suburban, or a mixture of both. Table 1 lists the USEPA source categories identified as significant to some degree in New Jersey. The most common pollutant categories encountered in the evaluations were sediment loading, nutrient loading and bacterial contamination. The severity of the pollution problem is generally proportional to the regional population density and/or the intensity of local agricultural activity. Regions where NPS pollution is minimal or water quality effects are not apparent are limited to the

Table 1.

Nonpoint Source Pollution Categories and Subcategories

Urban Runoff
- Storm sewers (source control)
- Combined sewers (source control)
- Surface runoff

Construction
- Highway/road/bridge
- Land development

Agriculture
- Non-irrigated crop production
- Irrigated crop production
- Specialty crop production e.g., truck farming and orchards)
- Pasture land
- Feedlots-all types
- Animal holding/management areas

Resource Extraction/ Exploration/Development
- Surface mining
- Subsurface mining
- Dredge mining
- Petroleum activities

Land Disposal (Runoff/ Leachate from Permitted Areas
- Sludge
- Wastewater
- Landfills
- Industrial land treatment
- On-site wastewater systems (septic tanks, etc.)
- Hazardous waste

Hydrologic/Habitat Modification
- Channelization
- Dredging
- Dam Construction
- Flow regulation/ modification
- Bridge
- Removal of riparian vegetation
- Streambank modification/ destabilization contaminants

Other
- Highway maintenance and runoff
- Natural

Source Unknown

Source: USEPA. April 1, 1987. Guidelines for the Preparation of the 1988 State Water Quality Assessment (305(b) Report), p. 19.

northwest corner of Sussex County in the Flatbrook watershed, and in State-owned forests of the Pinelands region.

This relationship between NPS pollution severity and population density applies to its impact on ground water as well as surface water; however, the assessments of impacts to ground water are complicated by local geologic and soil characteristics. Areas such as the coastal plain have very porous soils; hence, this region contains aquifers which are highly susceptible to contamination even though they often underlie relatively undeveloped areas. Also highly susceptible to contamination are the limestone aquifers in parts of northwest New Jersey.

Specific sources of agricultural pollution include runoff from croplands and animal holding areas. Cropland runoff is often laden with sediment, as well as herbicides, pesticides, and inorganic fertilizers initially applied to the fields by the farmers. Animal waste accumulation areas which generate significant quantities of manure are responsible for excessive nutrient and bacterial loadings. This latter category (animal holding) includes feedlots, dairies, and horsefarms. Also within this category are horse racetracks which often stockpile large quantities of horse manure.

Nonpoint pollution sources in urban/suburban regions are diverse. The most significant perhaps is runoff from paved surfaces such as roads, highways, parking lots and various commercial and industrial sites. Another significant source is lawns. Most of this runoff ends up as stormsewer effluent; however, any land surface which drains into storm sewers can have the potential for contaminating runoff. Urban/suburban runoff often contains lawn fertilizers, sediment, heavy metals, fecal bacteria, animal wastes, organic and inorganic debris, and household

chemicals as well as oils and grease from motor vehicles. Another possible pollution source, difficult to track, is leakage and overflow from sanitary sewer systems.

Construction site runoff is a significant source of pollution because of its transport of sediment loads and, in certain areas, the exposure of acid-producing deposits. Such sites include the construction of roads, bridges, homes, and commercial buildings. This problem is especially visible in regions undergoing rapid population growth and suburbanization. An additional pollution source associated with suburban development is septic tank leachate which can contaminate waters with bacteria, household chemicals, and nutrients. The cause of this problem is usually poor tank maintenance, installation, and/or too many tanks in a region. Results are most immediately damaging in small lot subdivisions served by individual wells.

Other sources of NPS pollution have been reported which are not necessarily associated with intensity of agriculture or urbanization. These sources are hydrologic habitat modification, leachate from landfills, hazardous waste sites, and sludge disposal activities. Also included here are sporadic spills which can occur during chemical transport and storage.

Not all NPS pollution is necessarily due to man's activities. Natural sources are also reported to be important contributors to bacteria and nutrient loadings. For example, the extensive waterfowl populations which inhabit the State's lakes, bays and estuaries can have a significant affect upon water quality.

The New Jersey 1988 State Water Quality Inventory Report (draft) lists nearly eighty streams believed to be impaired by NPS. The actual

number is probably much higher. The appendix summarizes, by waterway, the nonpoint source categories and pollution sources as presented in the 1988 305(b) report. At this time, information is not presented in USEPA Water Body System (WBS) format. Division staff are presently adapting the watershed data scheme to WBS. Detailed watershed by watershed assessments are presented in the 305(b) report. Although NPS has been identified in the 1988 State Water Quality Inventory Report as a significant impediment to achieving designated water uses and water quality objectives of the Clean Water Act, little NPS-related monitoring has been performed in New Jersey.

2. Interstate Waters:

Delaware River and Bay: Water pollution control in the Delaware River and Bay is the joint responsibility of the federal government, the four Delaware River basin states (New Jersey, New York, Pennsylvania, and Delaware) and the Delaware River Basin Commission (DBRC). The DRBC conducts monitoring, regulatory and other water quality management functions as part of its basinwide responsibilities. The DRBC prepared the 1986-1987 305(b) report that assessed the water quality of the Delaware River, Delaware Bay, and the interstate portion of the West Branch Delaware River. Of the total 339 miles, 88 percent met the federal fishable goal and 89 percent met the federal swimmable goal; however, 9 percent (30.5 miles) were severely impaired by nonpoint sources of pollution. In addition, DRBC showed concern for NPS impacts on the pristine waters of the northern Delaware River due to accelerated development and recreational usage.

New Jersey/New York Metropolitan Area: Seventy-two square miles of New Jersey's tidal surface waters in the NJ-NY metropolitan area fall under the jurisdiction of the Interstate Sanitation Commission. Fifty-four square miles are Class A waters designated for primary contact recreation, shellfish culture and development of fish life; nine square miles are designated for secondary contact recreation and fishing (Class B-1); and nine square miles have been identified for fish passage and maintenance (Class B-2). Based on monitoring data, none of these waters meet the federal fishable or swimmable goals. For 18 square miles, these goals are deemed unattainable by the Interstate Sanitation Commission.

The New York-New Jersey Harbor and the Delaware Bay have been declared estuaries of national significance and have been accepted for the National Estuary Program. The New Jersey Department of Environmental Protection (NJDEP) is working with USEPA Regions II and III, Delaware, Pennsylvania, and New York to develop comprehensive management plans which include recommendations for pollution control in both the New York-New Jersey Harbor and the Delaware Bay.

3. Ocean Waters:

Potential water quality problems associated with the condition of New Jersey's coastal water quality and beaches received a great deal of publicity in the summers of 1987 and 1988. The major complaints by beach-goers and local residents included health risk concerns, garbage floating in the water, and litter on the beaches. From unexplained dolphin deaths to hospital wastes washing onshore, it appeared to the public that the complaints were not unfounded (NJDEP, January 1988e).

At the same time, the NJDEP and the USEPA reported that their routine monitoring programs indicated excellent ocean water quality. The state and federal scientists were recording high dissolved oxygen levels, good water clarity and generally low bacterial counts (NJDEP, 1988e).

The apparent ability of the Atlantic Ocean to dilute and assimilate a large quantity of solid and liquid waste has designated it as a major disposal site for modern society. The ocean does have a remarkable ability to process some kinds of waste naturally without harm to living marine resources or its recreational value. The pollution problems visible to all this summer indicate that this ability has its limits and does not apply to all kinds of wastes. These limits cannot be abused without detrimental effects.

The necessity to close beaches in the summers of 1987 and 1988 indicated areas and times when the ocean environment was stressed beyond its limit for supporting primary contact recreation. The Coastal Cooperative Monitoring Program identified 12 short term and 3 extended ocean beach closings in 1987 (see section D of Chapter III of Report 305b for a more detailed description of estuarine and ocean water quality). The causes of the periodic short term beach closings in the ocean were land-based and usually associated with rainfall. The three extended closings were in Atlantic City, Monmouth County, and Seaside Heights. The mechanism for bacterial transport to beaches during one closing in Atlantic City was considered to be contaminated flow from the stormwater pipes discharging to the ocean. A damaged valve in a sewage line at the Ocean Township Sewerage Authority facility was the cause of an August closing in Monmouth County. In Seaside Heights, the beach was closed on either side of the Casino Pier as fecal coliform concentrations were

elevated above the standard. The bacterial contamination was attributed to the presence of the bird populations roosting under the pier (NJDEP, 1988a).

The Jersey Shore also suffered beach closings in the summer of 1987 due to other causes than high bacterial levels. Discretionary beach closings from Point Pleasant through Long Beach Island in Ocean County from May 27 through May 29 were invoked during an extensive washup of floatables which included plastics (condoms and tampon applicators), grease-coated organic particles of varying size and the decomposing remnants of an major algal bloom which had extended from Sandy Hook to Long Beach Island. From August 13 and August 16, 1987, a period preceded by extreme tides, heavy rains and northeast winds, another major floatables washup caused beach closings from southern Monmouth County through Long Beach Island. The presence of medical waste (syringes, needles, intravenous tubing), wood and glass required major cleanup efforts prior to the reopening of the beaches (NJDEP, 1988a).

The NJDEP, New Jersey Department of Health and the USEPA initiated and continued a number of programs and studies addressing ocean and beach pollution. A floatables study to identify sources and determine the distribution of solid wastes that float or remain suspended in the water column was continued by the NJDEP and USEPA (Science Applications International Corp., 1987). The concern over gastrointestinal, respiratory and skin infections reported by visitors and residents of the shore during the summer of 1987 initiated a health study by the NJDOH (NJDOH, 1988). The NJDEP and the USEPA are analyzing phytoplankton and chlorophyll "a" concentrations in the New York Bight area. The NJDEP and the coastal county health departments have a program to monitor ocean

water quality as related to fecal coliform concentrations at bathing beaches (NJDEP, 1988a).

The Commissioner of NJDEP initiated a study by scientific, governmental, and environmental professionals to review the events of the summer of 1987 in the context of the larger issues of coastal development, water quality and marine resources. This "Blue Ribbon Panel" submitted a written report addressing the pollution events of last summer that includes recommendations of actions to avoid similar occurrences in the future. These recommendations are discussed in the management section of this report.

i. Nonpoint Sources of Pollution: Eighty to ninety percent of the coastal beach closings are attributable to localized sources of elevated bacterial pollution from stormwater runoff. With one exception, during the past two summers there have been no pollution incidents that can be conclusively attributed to sewage treatment plants along the coast. The bacteria comes from leaky sanitary sewer lines, cross connections of sanitary lines into storm sewers, bird populations, and pet droppings. Excess fertilizers from agricultural lands and suburban lawns likely contribute nutrients that sometimes trigger algal blooms in the ocean. Floatables of wood, plastic, paper, metal and glass originate from a variety of sources including landfills, marine transfer stations, primary sewage treatment plants, combined sewer overflows, boating and beach activities and stormdrains. The lack of distinguishing physical or chemical features on floatables does not allow sources to be clearly identified (Science Applications International Corp., 1987). However, another study suggests that the majority of floating litter and debris that has plagued the

beaches of New Jersey comes from stormwater runoff and flushing of storm water pipes after heavy rainfalls (NJDEP, January 1988e).

ii. Municipal Sewage Sludge: Sewage sludge is the solid portion of waste that has settled to the bottom of tanks during the wastewater treatment process at municipally operated sewage plants. Three New York and six New Jersey sewerage agencies dispose approximately 6.8 million wet tons of sludge into ocean. Over 150 smaller New Jersey communities have stopped ocean disposal of sewage sludge since 1976.

In 1984, the USEPA denied petitions from the ocean dumpers to continue to use a USEPA designated site located 12 miles off shore in shallow water. At present all sludge dumping is to be done at a 106 mile site in deep water off the continental shelf (NJDEP, January 1988e). ?

Both the State of New Jersey and the US Congress have passed legislation that calls for the cessation of all dumping in the ocean. The State of New Jersey has set March 17, 1991 as the date that ocean dumping of sludge generated by municipal sewerage agencies in the State is prohibited. Federal legislation allows permits for dumping to be effective until December 31, 1991. After that date, penalties will be assessed for those violators who continue ocean dumping.

Two alternative disposal options to ocean dumping for sludge are incineration and composting with land application. While these options would stop ocean disposal they could cause air or ground water pollution that also must be considered.

iii. Dredged Material: Sand, silt, and mud must be removed from navigational channels and docking areas throughout the port of New York

and New Jersey. Some of these sediments come from industrial and sewer outfall areas which contain pollutants such as heavy metals, PCBs, oil and grease. The Army Corps of Engineers (Corps) is responsible for the transportation and dumping of the dredged material at a site (Mud Dumping Site) six miles east of Sea Bright. The Corps is responsible for determining the suitability of dredge material for dumping by running bioassay and bioaccumulation tests. In 1986 a law was enacted by Congress which requires the USEPA and the Corps to find a new site at least 20 miles offshore and relocate the dredge material disposal from the Mud Dump Site. Promising alternatives to dumping the dredged material include the creation of a containment island in Lower New York Bay or in Raritan Bay, filling existing holes in the harbor area and using clean sand to re-establish eroded beaches (NJDEP, January 1988e).

iv. Industrial Waste Disposal: Only two companies are authorized to barge a portion of their wastes for disposal in the ocean under permit authority of the USEPA. The USEPA's regulations state that ocean disposal can only be considered if land-based alternatives do not exist. Allied Corporation is authorized to dispose of dilute hydrochloric acid at a site approximately 20 miles east of Asbury Park. DuPont in Delaware withdrew its permit application in August 1988 which would have allowed it to continue ocean dumping of dilute iron-acid waste at the 106 mile site. All ocean disposal of industrial waste is expected to be curtailed as soon as these companies begin to utilize land based disposal alternatives (NJDEP, January 1988e).

Ciba - Geigy Corporation operates a chemical manufacturing plant in Toms River and discharges its treated wastewater to the ocean one - half

mile offshore through an outfall pipeline. It is New Jersey's only industrial discharge directly into the ocean. The discharge is regulated through a permit issued by the NJDEP.

v. Wood Burning: A New Jersey/New York Harbor clean-up program exists in cooperation with the Corps of Engineers. This program is designed to remove old piers, pilings, bulkheads, and abandoned vessels. Wooden debris and charred timbers which drift in the harbor and are found on beaches are collected. The wood is collected to minimize hazards to boat navigation. The collected material is burned in special steel barges at a site approximately 20 miles east of Point Pleasant, New Jersey.

Public concerns center around the poor record of operations by certain burn barge contractors. Timbers have fallen overboard in transit to the burn site and washed onto beaches or caused hazards to fishing and recreational boats. The NJDEP has been authorized by the USEPA to monitor all burn operations involving New Jersey originated material. In 1986 and 1987, USEPA imposed conditions on burning including fewer burns, no overloading of barges, trailing vessels to pick up fallen material and increased monitoring. Air pollution and water pollution by soot and ash are also concerns which need to be addressed (NJDEP, January 1988e).

vi. Boat litter: There are laws which prohibit the discharge of oil or oily substances in the ocean. The Coast Guard is responsible for ensuring that the merchant marine laws are enforced. At the present time, commercial vessels can legally dispose of garbage generated aboard ship in the ocean beyond three miles from shore. This practice has become a major issue nationally. A recent NJDEP study concluded that there is a

significant potential for wash up of garbage plastics and floatables from offshore vessels including recreational craft, fishing boats, and merchant marine vessels.

The problem of plastics and marine garbage generated by ships is addressed in the international agreement, Annex V of the International Convention for the Prevention of Pollution by Ships, 1973 (MARPOL 73/78), entitled "Regulations for the Prevention of Pollution by Garbage by Ships, signed August 29, 1988. The agreement, which is effective December 31, 1988, no longer allows ships to dispose of plastic wastes overboard and regulates other types of solid waste disposal (NJDEP, January 1988e).

C. Existing Legal Control/Authority and Management Programs

Currently, authority for NPS pollution control in New Jersey is included in a broad range of both regulatory and voluntary programs at all levels of government. To a great extent, NPS control programs which currently exist in the State are voluntary. However, regulatory programs do exist. These programs focus primarily on soil erosion control during new construction activities, coastal water protection and stormwater management in developing areas.

State and local governments, as well as the Federal government, have broad legal authority for NPS control. This authority has often not been exercised because of uncertainty about what NPS controls to require, limited funds and staff available for NPS control programs, and concern about NPS control costs. Because of uncertainty and the immensity of the task, there has been no clear-cut action program at any level. Some of the more important State and Federal statutes are noted below with general provisions discussed before specific NPS categories. The Federal

government has legal authority for certain specific NPS controls such as pesticide control (the Federal Insecticide, Fungicide, and Rodenticide Act), conservation provisions in agricultural commodity programs (the Food Security Act of 1985), discharge permits for stormwater and dredged or fill material (Sections 402(p) and 404 of the Clean Water Act), and management of solid or hazardous wastes (the Resource Conservation and Recovery Act; the Comprehensive Environmental Response, Compensation, and Liability Act).

The Water Pollution Control Act, N.J.S.A. 58:10A-1 et seq., gives the Department of Environmental Protection broad authority to regulate any NPS category for any water pollution control purpose. To date, the Department has applied this authority to a limited number of NPS categories (e.g., industrial stormwater discharges, landfills, land disposal of wastewater and sludge). The Water Quality Planning Act, N.J.S.A. 58:11A-1 et seq., expressly requires areawide plans to control several NPS categories, but existing areawide plans generally include no mandatory NPS controls. Although the County Environmental Health Act, N.J.S.A. 26:3A2-21 et seq., provides for water pollution control (not limited to public health protection) through environmental health ordinances, environmental health services, and delegation of Department environmental health powers to county health departments, present NPS control under that Act is generally limited to monitoring programs and enforcement of existing Department rules. The Home Rule Act, N.J.S.A. 40:48-1 et seq., authorizes municipalities to adopt ordinances to protect public health, safety and welfare, but use of such powers for NPS control has been slight.

Agriculture is exempt from the State Soil Erosion and Sediment Control Act, N.J.S.A. 4:24-39 et seq., but agricultural and other

pesticide users are subject to the Pesticide Control Act of 1971, N.J.S.A. 13:1F-1 et seq. The Right to Farm Act, N.J.S.A. 4:1C-1 through 10, directs the State Agriculture Development Committee to recommend agricultural management practices for water quality control, pesticide control, and fertilizer application. If State regulations conflict with those practices, State agencies must consider the Committee's recommendations. The Right to Farm Act may preempt local powers to independently regulate agricultural NPS.

Existing urban runoff is uncontrolled in most respects, although authority for such control is available under the Water Pollution Control Act and Water Quality Planning Act (which expressly refer to stormwater), the Storm Water Management Plan article of the Municipal Land Use Law (N.J.S.A. 40:55D-1 et seq.), the municipal sewerage and drainage statutes (N.J.S.A. 40:63-1 et seq.), the municipal street cleaning statute (N.J.S.A. 40:66-1), the Home Rule Act and public health statutes (e.g., N.J.S.A. 26:3-31) that authorize local ordinances to control animal waste, anti-litter statutes (N.J.S.A. 13:1E-92 through 99.10), and statutes authorizing construction and maintenance of streets and highways (N.J.S.A. 27). The recently approved Sewage Infrastructure Improvement Act (L. 1988, c. 90) requires abatement of contaminated stormwater discharges and nonpoint source pollutants to coastal waters in Monmouth, Ocean, Atlantic and Cape May counties, as well as Statewide abatement of combined sewer overflows. Local stormwater management ordinances are required under the Municipal Land Use Law (N.J.S.A. 40:55D-1 et seq) only when there is State funding for development of such ordinances. Because of this approach, these regulatory programs do not contain provisions for identifying

specific pollutants to control and waterways to be improved but are implemented with what can be considered technology-based standards.

Most present urban runoff control applies to new construction only; additional authority for such control is provided by the subdivision and site plan provisions of the Municipal Land Use Law and the county planning statute, N.J.S.A. 40:27-1 et seq. The Sewage Infrastructure Improvement Act requires that stormwater collection systems built by state agencies be designed to abate adverse surface water quality impacts to the greatest extent feasible. The Soil Erosion and Sediment Control Act requires erosion and sediment control for land disturbance of more than 5,000 square feet (agriculture and horticulture are exempt).

Many hydrologic and habitat modifications are controlled under the Flood Hazard Area Control Act (N.J.S.A. 58:16A-50 et seq.), the Freshwater Wetlands Protection Act (N.J.S.A. 13:9B-1 et seq.), the Water Pollution Control Act, and, in coastal areas, the Wetlands Act of 1970 (N.J.S.A. 13:9A-1 et seq.) and the Waterfront Development Law (N.J.S.A. 12:5-3). CAFRA* Construction of individual subsurface sewage disposal systems is regulated under the Realty Improvement Sewerage and Facilities Act (1954), N.J.S.A. 58:11-23 through 48; control of malfunctioning existing systems is authorized by the Water Pollution Control Act and public health statutes (e.g., N.J.S.A. 26:3-31).

Land disposal NPS such as land application of municipal wastewater and sludge, sanitary landfills, undergound storage tanks, hazardous waste facilities, and hazardous discharge sites are regulated by one or more statutes such as the Solid Waste Management Act (N.J.S.A. 13:1E-1 et seq.), the Water Pollution Control Act, the Spill Compensation and Control

Act (N.J.S.A. 58:10-23.11 et seq.), and the Environmental Cleanup Responsibility Act (N.J.S.A. 13:1K-6 et seq.).

In specific regions of the State, some additional authority for NPS control is available under the Pinelands Protection Act (N.J.S.A. 13:18A-1 et seq.), the Hackensack Meadowlands Reclamation and Development Act (N.J.S.A. 13:17-1 et seq.), the Coastal Area Facilities Review Act (N.J.S.A. 13:19-1 et seq.), and the Delaware and Raritan Canal State Park Law of 1974 (N.J.S.A. 13:13A-1 et seq.).

Obviously both Federal and State statutes have provided ample authority to control NPS; but from a practical viewpoint relatively little has been accomplished in New Jersey (and other states). In many instances nonpoint source control has been authorized through existing regulatory programs which were originally created to primarily control point sources of pollution. Given the emphasis that has been placed on point source control both nationally and statewide, these programs have not fully exercised their regulatory authority to control nonpoint source pollution. Appendix E is a summary of existing State and local programs for the provision of nonpoint source management.

Chapter III. Nonpoint Source Control Plan

The NJDEP recognizes that clean water goals for surface and ground waters of the State cannot be attained without an active program for the control of NPS. With the substantial funding which has been provided for point source control since passage of the Clean Water Act in 1972, major progress has been made in reducing point source pollution. It is now necessary to remedy nonpoint source pollution if environmental goals are to be attained. Although the importance of NPS has been known for a number of years, limited action has been taken at the State or federal level. The complete implementation of NPS control throughout the State will be a task for many years. New Jersey's general strategy is intended to chart, at this time, the phases of investigation, survey, planning and implementation that will initiate the State NPS Program.

Cultivating public and legislative support for NPS control through an awareness and education program is critical. Equally important is the need for the NJDEP to prepare statewide regulations and guidelines for the development and implementation of control programs. Moreover, better information must be provided as to the specific origins of NPS pollution. The actual implementation of any program must be accomplished with the involvement of state, county and municipal agencies.

The specific origin of NPS pollution will be investigated through storm sewer surveys, monitoring programs, research projects, and demonstration projects. Investigation of sources of NPS pollution will precede any attempt to mandate general remedial action with Best Management Practices (BMPs). When sources and impacts of NPS are better

understood and BMP effectiveness has been established, implementation plans need to be developed on a watershed/municipal scale.

NPS controls using BMPs are to be based on a combination of programs dealing with minimizing pollutant input at the source (source controls), treatment prior to entering or within a conveyance system and a program that controls the location and quality of discharges to selected waterways. Controls would be primarily of a regulatory nature, however voluntary controls may still continue for certain activities.

BMPs are officially approved procedures for reducing NPS through structural and nonstructural controls, including operation and maintenance procedures. Selection of suitable BMPs for each category of NPS will require extensive coordination between various agencies at all levels of government, as well as assistance and cooperation from the general public. For some of these categories, available BMPs have already been identified and their selection processes established through existing regulatory programs. In effect, these programs represent the BMPs that are utilized for various activities, which ultimately may become legal requirements.

The following chapter discusses strategies the State plans to develop into programs for reducing NPS pollution from a number of sources. Nonpoint source pollution from urban and suburban sources are the least understood yet most extensive NPS problem facing New Jersey. Although the management program will concentrate on the challenge of reducing urban and suburban NPS pollution, the NJDEP will not ignore other NPS sources. A number of already existing programs can be modified to integrate BMPs in water quality management planning requirements. These programs are discussed in Chapter V.

A. Urban and Developing Areas

The intensity of the impacts of urban and suburban NPS pollution varies geographically throughout the State. Initially, the resources of the New Jersey NPS Management Program will concentrate on investigating urban and suburban NPS control in high priority areas of the State. As the program evolves, the technical information and successful management practices developed for these high priority areas will be applied statewide.

All developing and developed areas will be classified on a priority basis, relative to NPS pollution affects upon waters that are impacted as determined in the State's NPS assessment including coastal waters, reservoirs and lakes. In each case, it is considered that a phase of storm sewer surveys, monitoring and identification of NPS would precede any attempt to mandate general remedial action with BMPs. In this way, the sources of pollution could be identified and a coherent program outlined. Such a program will serve to identify and designate responsible parties, either specifically or generically. These parties could then be required to take remedial action, as well as identify residual sources of pollution.

Designated high priority areas, as rapidly as resources permit, will be the subject of amendments to water quality management plans and will be implemented by NJPDES permits to responsible governmental entities. (It must be recognized that these WQM plan amendments and NJPDES permits will be of very different character to those currently used which refer to wastewater facilities only.) These plans and permits may make mandatory certain BMPs which, for the time being, remain voluntary in other areas.

The source control of NPS before they enter an urban or suburban drainage system must be considered. This can involve both regulatory and voluntary initiatives. Intensive land activities, such as large shopping center parking lots, may require permits on an individual basis. Land uses that are known to be significant contributors of pollutants need to be identified. Such land uses may be required to get a permit demanding specific water quality limitations, management practices or structures much in the same way industrial pretreatment programs are intended to work in relation to sewage treatment plants.

OUTFALLS ONLY

The NJDEP will pursue a program of selective permitting of NPS discharges from specific sites or facilities. This program could be related to specific water quality goals of waterways or ground waters * (environmentally sensitive and valuable habitat areas), in waters with violations of water quality standards, or to areas of a certain population size or density.

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The NJDEP will pursue permitting of stormwater discharge quality through the NJPDES program on a priority basis in areas where water quality protection is most important. A system of general permits or areawide permits may be applicable. The permitting program will need to be closely coordinated with stormwater permitting regulations currently being developed by the USEPA under Section 405 of the Clean Water Act amendments. A program of system inspection and maintenance involving local management agencies would be needed.

1. Existing Developed Urban and Suburban Areas:

In developed urban and suburban areas, infrastructures are in place and land use established. NPS control in these areas will stress source

ONLY EFFECTIVE for LARGE CONTRIBUTORS AT WATERS EDGE. MULTI USERS OF SINGLE PUBLIC OUTFALL. URBAN AREAS COST MUST BE A CONSIDERATION (STATE ASSISTANCE?)

control through permitting of high intensity land uses. In addition, treatment requirements for discharges will be implemented through permits where feasible. Before such controls can be implemented, existing discharge systems need to be surveyed and analyzed to identify NPS pollution.

As resources become available, storm sewer surveys will be conducted with state aid. The NJDEP will institute a program that will require sanitary surveys for the removal of illegal connections into storm drainage systems. In addition, the program will identify the occurrence of hazardous materials in storm drainage systems, will locate and control the sources of the materials and have the materials removed from the systems. For example, a portion of the $33.5 million appropriated in the recently signed Sewage Infrastructure Improvement Act will be available to map, inventory, plan and design stormwater and sewage facilities to reduce NPS pollution entering critical coastal waters in four counties. Under this Act, the bulk of the planning implementation is the responsibility of municipal governments using state funds available from cost share grants. Most of the corrective action taken by the NJDEP will be to require elimination of illegal connections and to promote improvements in sanitary and combined sewer systems. The methodology for such surveys remains to be developed.

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Among the developed areas will be large municipalities expected to be designated for stormwater controls by the USEPA under section 402(p) of the Clean Water Act. The initial regulations will address separate storm water systems of municipalities with populations greater than 250,000 and between 100,000 and 250,000 or where water quality standards have been violated. In New Jersey, municipalities meeting these population criteria

have combined sewer systems rather than separate systems and, therefore, may not be generally covered by the initial USEPA regulations. ?

Consequently, the initial USEPA regulations will more likely be applied to storm water systems where violations of water quality standards occur or where significant contributions to pollution are determined.

As in all developed urban and suburban areas, high intensity land uses and other sources in densely populated areas will be subjected to NJPDES permits. The permit conditions will be set in part by WQM plan provisions. It is easy enough to determine that the storm runoff of any large city is of undesirable quality; but, unless information is available as to the origins of the pollution in question it will be very difficult to require remedial action with any assurance of success. As in other high priority areas, State-supported storm sewer surveys and monitoring will be required in these USEPA-designated municipalities.

The combined sewer systems will be dealt with through programs mandated by the Sewage Infrastructure Improvement Act where a portion of the $33.5 million which has been appropriated in that Act will be available for planning and design work required for the abatement of combined sewer overflows. This will need to be coordinated with other State and federal programs related to CSOs.

2. Developing Suburban Areas:

In developing areas, NPS controls can be implemented before construction begins. Unlike developed areas, location as well as quality of discharge can be controlled through land use and stormwater management plans in developing areas. Source control will be anticipatory in nature through BMPs, land use planning and zoning. Intense pollutant-producing

activities will be subjected to site plan review by municipalities and may require NJPDES permits. At a minimum, stormwater regulations under the Municipal Land Use Law will be mandatorily applied.

3. Urban and Suburban Best Management Practices (BMPs):

BMPs in high priority areas may be implemented through NJPDES permit conditions, a variety of existing regulatory programs, new NPS programs yet to be initiated, or through county and municipal action, under the Municipal Land Use Law and the County Environmental Health Act.

INTERIM PLAN?

Selection of specific BMPs will depend primarily upon the type of pollutant affecting the nearby waterways or attributable to particular land use. The physical conditions of the site including accessibility for maintenance and enforcement as well as soil type and slope for design will play a role in BMP selection. In addition, environmental costs and benefits will be considered. As discussed previously, BMPs can be implemented at the source, collection, and discharge points into surface and ground waters. A number of technical references for planning and designing urban BMPs feasible for use in New Jersey are available. NJDEP, 1986a; MDDOE 1987a and MDDOE 1987b provide details on construction design of storm water BMPs. USEPA, 1984 and USEPA, 1983 give an overview of the nature of urban NPS from a national perspective. Shueler, 1987 discusses planning as well as design of urban BMPs. BMPs may be made mandatory in the high priority areas or on a statewide basis for high priority problems. Because of practical limitations, full implementation of high priority area controls will be initiated on a phased basis.

B. Statewide Strategy

Statewide BMP controls will require local action regarding approval and operation of facilities such as automobile body shops, filling stations, car wash establishments, and supermarkets, as well as provisions regarding deposition of used crankcase oil, used household chemicals, care of private lawns and gardens, soil erosion and sediment control, construction disturbance and animal waste management. These BMPs will be enforced partly through other regulatory controls such as facility permit action, and partly on a voluntary basis; however, specific authority will be sought to require municipalities to consider such BMPs in subdivision and site plan approvals under the Municipal Land Use Law.

While the management program will initially concentrate on controlling urban and suburban NPS on a priority basis, the NJDEP also plans to pursue a number of measures to reduce NPS pollution statewide. These are discussed below in terms of NPS source category.

1. Household Hazardous Wastes:

The proper disposal and reduction of household hazardous wastes will be addressed in many of the activities within the NPS education program. Along with these educational efforts, each municipality would be required to have a collection point for unused household chemicals. Inquiry indicates that most municipalities either have no such facility or that its existence is not generally known. In addition, municipalities should be required to develop alternative source control programs to control NPS caused by improperly disposed of household chemical wastes. Special attention will focus on the use of septic tank cleaners and the disposal of used crankcase oil.

PAINTS + THINNERS

Some enforcement or an implementing regulation will be required. Such a program will require the cooperation of the Divisions of Hazardous Waste, Water Resources and Solid Waste within NJDEP as well as county and municipal agencies. Collection at a local level can be costly and a long-term source of funding needs to be identified to implement such a program.

2. Road and Highway Runoff:

The control of road runoff must be addressed. Runoff structures are important along the larger highways and state/local roads, particularly in areas with high incidence of spills. Programs of highway drainage should be adjusted to NPS objectives and priorities so as to reduce contamination not only of small streams but also of surface aquifers. The increased priority now given to ground water quality necessitates that all processes involving infiltration of runoff into ground water conform to the State's ground water quality standards. As an additional source BMP, road salting practices can be modified to minimize water quality impacts.

Implementation of BMPs may begin on state roads and used as demonstration projects to encourage local transportation agencies to adopt these practices. This will require an interdepartmental agreement with the Department of Transportation and also an agreement on infiltration with Soil Erosion and Sediment Control agencies. Technical information concerning the design of highway stormwater runoff BMPs is available (USDOT, 1985).

3. Agriculture:

The control of agricultural-related NPS must be addressed, particularly in areas of concentrated crop production, animal feeding and animal waste accumulation, where potential agricultural NPS problems exist and in areas where surface or ground waters are of special concern. The Department of Agriculture (DOA), through the State Soil Conservation Committee (SSCC) and the local conservation districts, has general responsibility for implementation of agricultural BMPs. The DOA will strengthen its existing programs in consultation and coordination with the NJDEP, which is the Statewide water quality management agency, to achieve greater BMP implementation. In addition, the NJDEP will work with the DOA to formulate new and innovative approaches designed to maximize pollutant reductions from farmland.

The State's Farmland Preservation Program provides cost/share incentives for implementation of soil and water conservation practices whereby up to 50% of the cost for installing approved practices is provided by the state to the farmland owners who agree to at least an eight year development restriction easement on their lands. Most of the conservation practices that have been approved by the State Soil Conservation Committee for inclusion in the cost/share program have both direct and indirect water quality benefits. Additional emphasis will be placed on implementing those practices as an element of the Preservation Program. In addition, the DOA will seek the necessary funding to implement a separate generic statewide agricultural cost/share program that will be available to all farm operations for a more limited scope of BMPs having direct water quality improvement impact.

As an integral partner in this effort, the federal Soil Conservation Service (SCS) is expected to continue its ongoing program of providing technical assistance through the 16 local conservation districts to farmers. However, to accelerate BMP implementation, the DOA will attempt to supplement the SCS field conservationists with State personnel to be assigned to areas of high priority as described above. Continued assistance will be required to instruct farmers on the proper use and application of fertilizers and pesticides. Also, it is anticipated that application of sewage sludge to farmlands will become one of the few remaining disposal alternatives and that increased technical assistance will be required for installations of BMP land treatment practices. The DOA will seek additional funding required to support this work. Considerable SCS staff resources will be required to implement the conservation compliance provisions of the federal Food Security Act of 1985. This Act requires that conservation plans (BMPs) be developed and implemented by 1995 on farms containing highly erodible land, under the threat of losing eligibility for all USDA assistance programs. Priority will be placed on ensuring that all relevant water quality factors are reflected in the development of the conservation plans which will be required on at least 130,000 acres.

The DOA and the soil conservation districts (SCD), working in cooperation with the SCS and the NJDEP, will also be focusing on watershed-wide approaches to correcting significant agricultural NPS problems where potential exists for group support by landowners and the federal watershed protection program (P.L. 566) can apply. Innovative approaches to BMP implementation will be evaluated through demonstration

projects such as providing 100% of the cost to farm landowners for implementing water quality control BMPs in targeted drainage areas.

There is a need to strengthen the education program administered by the Cooperative Extension Service (CES) by developing additional NPS education tools and improving the existing outreach program. The DOA will work with the CES and the NJDEP to prepare for this initiative in a manner that is complementary with the NPS Education Plan developed by the NJDEP.

A unique situation which frequently results in inadequate utilization of BMPs and increased potential for NPS pollution involves farmland leased by tenant farmers from absentee landowners. There has been limited success in securing full participation of absentee landowners in NPS control and conservation programs. This has been generally attributed to the unwillingness of land speculators or the tenant farm operators to make the additional investments for BMP implementation when the land may be sold for development purposes at any time. Initiatives which will develop appropriate measures to resolve this problem will be pursued.

4. Construction and Resource Extraction:

New Jersey has an established and progressive program for managing soil erosion and sedimentation associated with these activities throughout the State. Virtually all land disturbance activities such as construction, quarrying and landfill capping are all subject to the requirements for soil erosion and sediment controls by local SCDs in accordance with standards promulgated by the SSCC under the authority of the state Soil Erosion and Sediment Control Act of 1975. Prior to commencement of such activities, technical plans to control soil erosion and sedimentation must be certified by the local SCD or municipality.

Projects also may not be occupied until all permanent controls are in place. These plans identify the BMPs that will be utilized including both vegetative and structural controls as required on a site specific basis.

This program is administered by the SSCC, the sixteen SCDs and the exempt municipalities and is an ongoing program within the DOA. Because implementation is primarily at the local district level, there is significant variation in local procedures for approval of control plans and establishment of fee schedules among the districts. This variation results to some extent in differing levels of soil erosion and sedimentation control measures. The State Soil Conservation Committee proposes to provide additional professional and technical staff necessary to coordinate and assist local districts to achieve basic statewide uniformity. Expanded and revised procedural standards and rules have been initiated but additional staffing and funding are needed to achieve these goals.

In addition, to strengthen the local district enforcement process, additional training and technical support programs are proposed. A regimen of training for professionals servicing the regulated community including construction officials, engineering firms, developers and installers/construction workers will be expanded. In addition, a state recognized program of proficiency certificates for district technical personnel will be initiated. This will provide enhanced program credibility and eliminate challenges from the regulated community where registered professional engineers and architects object to non-licensed professionals evaluating their designs.

To coincide with the NPS Management Program, a process for prioritizing specific control measures in high priority pollution control

areas such as those draining to sensitive waters will be formulated. In addition, a monitoring program to evaluate the effectiveness of BMP control measures will be established as a part of this process.

The full implementation of this soil erosion and sedimentation program for construction activities is currently impaired because of conflicting requirements of other state regulatory programs. re To ensure against erosion and sedimentation resulting from storm drainage from such construction sites, an agreement and technical requirement for erosion control is needed. An interagency memorandum of understanding has been initiated and will be adopted to prevent such conflict. The above mentioned monitoring program will assist in the elimination of such conflicts.

The SSCC has initiated a program to digitize existing soil survey data. This will enable planners, landowners, and those agencies concerned with implementation of regulatory NPS programs to quickly retrieve data and evaluate land uses in relation to soil capabilities and limitations which must be overcome for land use to be compatible with the environment. Substantial costs are involved in the completion of this project which is proposed as a cooperative effort between the SSCC, USDA, NJDEP and other state agencies.

C. Technical Considerations

Many technical questions about the nature of NPS pollution need to be addressed to build a sound management program. Particular concerns include monitoring techniques, NPS toxicity on aquatic organisms and the behavior of hydrocarbons in ground water.

Current monitoring techniques and sampling data statewide are inadequate for NPS evaluation. Without an entirely different kind and scale of monitoring efforts, it will be impossible, in most cases, to identify specific sources of NPS pollution and make informed decisions on controlling the problem. Also, improved monitoring will provide an assessment of BMP effectiveness after implementation. It will be necessary to develop methodologies and information that can predict BMP effectiveness for both preventive and remedial applications without requiring extensive monitoring. This can be accomplished utilizing available information and technologies obtained from existing literature sources and through actual data gathered from monitoring programs designed for targeted waterbodies. It will be necessary for the State to develop sampling methodology for application in high priority areas as the program is implemented.

The most difficult technical problem to resolve is the toxicity of various types of NPS pollution to various organisms. Toxicity data available and methods of evaluating availability are not adequate. The chemical characteristics of urban runoff are only imperfectly known, and data are not adapted to determine effects on the ecology of small streams. The observed severe environmental damage to most urban streams is not fully explained by existing data and theory. In particular, the effects of particulate pollution upon filter feeders such as mayfly and caddisfly larvae does not appear to be correlated with the characteristics of urban runoff. Some controlled experiments will be necessary before the relative effectiveness of various control alternatives can be evaluated. Therefore, an aquatic toxicity research project of this nature will be

necessary unless adequate information can be obtained elsewhere. It would be appropriate for the USEPA to fund such research.

Another important technical problem is the fate of particulate hydrocarbons when trapped in wet or dry detention basins. The extent to which such contaminants biodegrade in place without contaminating ground water needs to be determined. Again, this is a problem of national rather than state impact. However, New Jersey will need to make decisions relative to such processes, and will have to fund a study if no information is forthcoming.

Chapter IV. Program Implementation

A. A Phased Approach

The NJDEP anticipates that implementation of the NPS program will occur through a phased approach. Four phases of implementing NPS controls are discussed below.

Phase I will be a period of planning for future program implementation and is expected to require two years. Initiating this phase is an education program, beginning with the public involvement used in finalizing this strategy as described in Chapter VI, which will continue as the preparation and implementation phases of the NPS management program proceeds. The NJDEP will concentrate on developing new and revising existing regulations to address NPS as an adjunct to other programs. Financing of the NPS program will need to be established in this phase which will enable the NJDEP to develop procedures for issuing grants. As NPS involves considerable interagency coordination, agreements between NJDEP and the Departments of Transportation and Agriculture will be negotiated.

Also, during this phase, Statewide initiatives establishing programs and BMPs for the control and disposal of used crankcase oil, household chemicals, pesticides, and lawn and garden fertilizing will be prepared and, where necessary, additional statutory authority will be sought. Stormwater management requirements currently implemented on a voluntary basis under the Municipal Land Use Law will become mandatory in developing areas and for stormwater discharges into environmentally sensitive waters where water quality control is critical. Preparations

will be made to implement USEPA's regulations for storm water control, when issued.

During Phase I, the NJDEP will develop a methodology to determine priority areas for monitoring and source control that will be addressed in Phase II. This second phase will begin with intensive surveys of existing stormwater sewerage systems in high priority areas to identify illegal sanitary sewer connections as well as significant nonpoint sources of pollution. In addition, a system for monitoring which will involve appropriate governmental agencies at various levels will be developed and initiated. As the results of these surveys and monitoring activities become available, Water Quality Management Plans for NPS control will be required of responsible management agencies. The NJDEP will require additional Statewide water quality BMPs in developing areas as technical information becomes available. Phase II is also predicted to last two years.

Phase III will begin with the implementation of control practices in developed urban areas with priority placed on meeting water quality standards in identified important waterways. Selective retrofitting of stormwater sewerage systems in areas draining to environmentally sensitive waters in conjunction with remedial abatment actions at significant sources will be the focus of this phase. As source and discharge permit programs are implemented, enforcement will begin to assume a greater prominence through its function of ensuring permit compliance.

Phase IV of the NPS Management Program will continue implementation with additional focus on operation and maintenance of management practices. Phase IV will involve continued program implementation, assessment of progress, and adaptation of programs, where necessary.

B. Institutional and Economic Considerations

Developing an effective institutional arrangement for NPS management is as important as the actual management practices. Because of the potential number of programs and agencies that may be involved in NPS management, definitions of programs and objectives and means of coordination are critical. It is important that criteria be established for determining which categories of NPS may be subject to regulatory requirements through the issuance of either individual or general permits and which categories will only need to comply on a voluntary basis or under local control; determine if new rules need to be developed or existing rules should be modified; establish enforcement and maintenance requirements; and determine which responsibilities and authority can be delegated to county and municipal agencies.

The general planning and much of the regulatory action of the NPS control program will be by the Division of Water Resources. The Hazardous Waste and Coastal Resources Divisions will play appropriate roles in the programs for which they are responsible. Interdepartmental agreements will be necessary with Departments of Transportation and Agriculture to obtain essential compliance with NPS objectives, both as regards ground and surface water. Additional regulatory authority will be needed to establish that municipal and county planning agencies consider NPS criteria and standards in their decision making. An advisory council will be constituted including representatives of various affected interests, and participated in by staff of the major state agencies concerned. Most of the regulatory and funding action will be carried by existing agencies.

Because of the broad based nature of NPS pollution, implementing an effective control program will require significant amounts of funding.

For example, a portion of the $33.5 million which has been appropriated in the recently enacted Sewage Infrastructure Improvement Act will be available for storm sewer mapping and monitoring for NPS control in four coastal counties.

Additional funding for NPS surveys and planning throughout the State could originate through a bond issue. These types of programs could make funds available to county and municipal governments for the development of local NPS management programs. In addition, consideration must also be given to the development of other funding sources to guarantee continued implementation of these management programs. This may be accomplished through fee generating mechanisms such as permitting programs, user fees for storm sewer systems or special taxes either independently or in combination. The complete implementation of NPS control throughout the state will be a task for many years.

C. Education Program

A portion of NPS pollution originates from the activities of the ordinary citizen. Therefore, the need is inherent for public awareness and education in the identification and implementation of BMP's and other NPS reducing practices. Educational efforts currently being developed by the Department will stress good housekeeping practices that will help reduce runoff pollutants. Requiring good housekeeping at commercial and industrial establishments could be a local tool for minimizing contaminated runoff.

The education program is designed to address various audiences including the media, business community, elected local officials, formal education and adult education. Coordination of this education effort will

involve watershed associations, environmental commissions, health departments, soil conservation districts and other organizations interested in improving water quality.

As an integral part of this education program, New Jersey Water Watch is a fast-growing citizen participation network that can, at the very least, visually identify local NPS problems and sources and potentially serve as a monitoring arm of state and local government. Presently there are fifty organized Water Watch groups that have "adopted" local streams, ponds or lakes. By coordinating Water Watch groups closely with county and municipal officials, NJDEP can aid in convincing local governments to utilize accepted BMPs to resolve identified problems.

D. State Demonstration Projects

The NJDEP is involved in a number of new and continuing demonstration projects which will provide baseline data and information for implementing the State NPS Management Program. The projects will be used to determine which BMPs are most effective for controlling specific categories of NPS pollution for different waterbody types. These projects will also focus on developing new monitoring programs, identifying pollution sources and impacts, and recommending management options for the protection of priority waterbodies. NPS control programs will be prepared in many cases through results of federal and state funded demonstration projects.

1. 1988 Toms River Bacteriological Study:

The objective of this study is to evaluate the bacterial water quality of the Toms River estuary and identify possible sources of bacterial contamination that kept several bathing beaches in the estuary

closed during the summers of 1986 and 1987. The study is a cooperative effort of the NJDEP, Ocean County Health Department and seven municipalities in Ocean County. Water samples collected in the Toms River, and in Barnegat Bay will be analyzed for fecal coliform concentrations. Sampling was completed in August of 1988.

2. Navesink River Shellfish Pollution Control Project:

All 2,662 acres of shellfish harvesting areas in the Navesink River (Monmouth County) have been closed to direct harvest and marketing of clams, oysters and mussels for more than twenty years. This is a result of high bacterial levels in excess of the standard limits set for shellfish growing waters in New Jersey. Since no significant point sources of bacterial pollution exist in the Navesink River watershed, the present study was initiated to identify and isolate probable NPS contamination to the estuary. The findings of this study indicate that the primary bacterial loading originates from animal, rather than human, feces that emanate from horse farm operations proximal to upstream tributaries of the Navesink River, as well as from urban/suburban stormwater runoff. Appropriate Best Management Practices (BMPs) for control of identified bacterial sources are identified by the project.

The Navesink River project is a continuing cooperative effort of inter-governmental agencies. The project's latest phase is a stormwater survey. The purpose of this study is to measure fecal coliform concentrations over time in stormwater outfalls to the Navesink River. Selected stormwater outfalls will be sampled when storm events begin and at short intervals thereafter to establish concentration versus time

curves. The data will be used to evaluate stormwater impacts to the Navesink River.

3. Tidal Tuckahoe River:

This project involves coordination and assistance with the Atlantic and Cape May County Health Departments in studying high bacteria levels in the Tuckahoe River. Twenty-nine stations have been sampled four times per month between June and September 1988 for temperature, pH, fecal coliform, and fecal streptococci. Dye testing will be conducted in areas with high bacteria concentrations to determine potential sources.

4. Coastal Water Quality Management Project:

Degradation of estuarine water quality is the result of increased residential and commercial development throughout New Jersey's coastal region. Nonpoint sources and stormwater runoff are the primary pollutant sources from this development, as point sources have generally been eliminated in the back bays. This has resulted in the restriction of important water uses such as shellfish harvesting and primary contact recreation in waterways that were formerly of great economic and recreational value. Therefore, the NJDEP realized that existing water quality management programs were not adequate from the standpoint of controlling stormwater runoff and other nonpoint sources. The NJDEP has developed a water quality and shellfish resource assessment methodology that defines past and current conditions of specific estuarine waterways. The results are used to determine the degree and type of water quality and designated uses. Management programs are coordinated through State, county and municipal planning activities. The assessment methodology can be applied to a variety of water uses and waterbody types.

5. Cook College Study on Watershed Protection:

The Cook College study on watershed protection is investigating the relationship between land uses and surface waters in the state of New Jersey. The final report due this December will make clear concise recommendations to NJDEP on various mechanisms for abating nonpoint source pollution. The research team is examining the merits of buffer areas or setbacks around headwater areas and reservoirs that are above the lowest intake pipe of water companies for water source protection for drinking water purposes and for water quality purposes. It is expected that the draft report will include information on what is available from other states in terms of watershed management.

The report will also include information on best management practices in urban areas. The study will explore stormwater detention, retention, and infiltration basins; identify watershed-sensitive land, which includes bedrock, soil conditions and slope; make recommendations on stormwater management districts and look at the best institutional arrangement for working with septic systems. This study is being funded by the Water Supply Bond Act of 1981.

6. New Jersey Floatables Study:

Floatables are solid wastes that float or remain suspended in the water column. When these wastes are inadvertently or purposefully disposed of and transported in open waterways, they represent a source of pollution that degrades the aesthetic quality of waterways and may become stranded on beaches. Sources of floatables may include beach use, overflows from sewage treatment plants, combined sewer overflows,

commercial shipping and recreational boating, illegal dumping, marine municipal refuse transfer, ocean dumping, wharf decay and natural sources.

Because of this problem, the NJDEP and the USEPA have collaborated to design and implement a floatables study. The objectives of the four tasks of the study are to:

i. Determine the distribution of floatables on selected beaches by categorizing and quantifying the types and numbers of objects on each beach
ii. Identify possible sources of these materials
iii. Identify specific sources of floatables as accurately as possible for each beach through assessments of potential transport routes based on circulation patterns and currents in the New York Bight
iv. Test the probability of potential floatable transport routes by releasing identifiable surface drifters which passively indicate water current pathways from possible floatables sources to target beaches (NJDEP and USEPA, 1987).

7. New Jersey/New York Harbor Clean-up Program:

The New Jersey/New York Harbor Clean-up Program is a cooperative program with the Corps of Engineers designed to remove shoreline blight and potential sources of wooden drift before it breaks loose and floats out into the harbor. New Jersey's harbor clean-up has been a massive undertaking with over $50 million being spent over the last ten years to remove old piers, pilings, bulkheads, and abandoned vessels. Much of the material has been burned at the woodburning site. The State of New Jersey views the harbor clean-up as a vital element and a catalyst to the economic rebirth of the State's urban waterfronts (NJDEP, January 1988e).

8. County Demonstration Studies:

A number of county demonstration studies are also in progress. Like the Cook College study on watershed protection, they are all funded by the Water Supply Bond Act of 1981.

Mercer County:

Mercer County is investigating how to control NPS runoff in the Shabankunk Creek which drains into the Delaware River. Chemical samples taken at storm sewer outfalls will be analyzed. The composition of the macroinvertebrate community will be analyzed to gauge the health of the stream. Mercer County will analyze urban best management practices (means or performance standards) which prevent or reduce impacts upon surface waters will help identify the appropriate techniques for this stream type. The most important aspect of this program may be NPS education directed at grades K-6 , the media and government officials.

Sussex County:

Sussex County is working on a septic system study involving new Chapter 199 regulations. New septic systems will have to meet Chapter 199 requirements for design, inspection and maintenance. An institutional framework for maintaining septic systems will be explored by three municipalities which are currently using different institutional scenarios for managing residential septic systems. Sussex County was selected because of its past history of failing and chemically contaminated septic systems. Septic system discharge is a nonpoint source of pollution. High loads of nitrates and phosphates and doses of chemical contaminants like trichloroethane are nonpoint sources of pollution that have proven to be health hazards to the residents of Sussex County.

Ocean County

Ocean County is studying the long term maintenance of stormwater detention/retention/infiltration basins. The project will look into

strategies that will explore the financing possibilities and institutional framework for long-term care and maintenance of the basins. Chromium, oil and grease, and animal feces that enter the detention basins contribute to the NPS problem.

Middlesex County

An Aquifer Recharge Protection Study is being completed in Middlesex County. A consultant will produce a manual for statewide application describing appropriate techniques for protecting aquifers from NPS contamination. The County has investigated the bedrock and aquifer conditions that underlie different soils. The County is also updating maps showing which aquifers are used for various wells. Rooftop runoff, drainage from residential, commercial, agricultural land, and the proximity of chemical spills to recharge areas and well heads are sources of NPS pollution that have been identified in the study.

Barnegat Bay

The purpose of this project is to initiate the development of a comprehensive land use and environmental management plan for Barnegat Bay. The intent is to develop a management strategy or alternative strategies, for consideration by all levels of government within the state. The objectives are to:

- Plan for and manage population growth and development in a manner compatible with preserving the natural environment;
- Identify, assess, and protect natural and manmade coastal resources;
- Improve the process of evaluating development and redevelopment projects in order to achieve environmentally sensitive land uses which are coordinated with any services these development projects may require;

-Protect and enhance the quality of life for the residents and visitors to the Barnegat Bay Area.

Chapter V. Integration of the Nonpoint Source Program with Other Programs

A. Division of Water Resources Programs

The NPS management program will be an important adjunct to other programs within the Division of Water Resources. Among these programs are stormwater management, lakes management, ground water protection (including wellhead and aquifer protection), toxics control, estuaries management, and ocean management. The NJDEP intends to coordinate NPS program activities with these other programs to assist in achieving their objectives.

The Division of Water Resources (Division) is the Statewide WQM planning agency, and will be the lead agency responsible for developing NPS policies and incorporating those policies into WQM Plans. In this effort, the Division will coordinate with the seven designated areawide water quality management planning agencies: the Delaware Valley Regional Planning Commission, and the boards of chosen freeholders of Atlantic County, Cape May County, Mercer County, Middlesex County, Ocean County, and Sussex County. The Division will also be responsible for incorporating the other programs outside the Division of Water Resources as part of the nonpoint source program.

1. Stormwater Management:

Stormwater management is presently applied primarily to the control of runoff from new development. Applying proper stormwater management practices to developing and already developed areas will be highly beneficial for the control of urban runoff. Currently, stormwater management controls in New Jersey are implemented at the time of new

development and are voluntary. The NJDEP intends to make the stormwater management regulations mandatory in developing and other high priority areas of the State; it has already identified priority municipalities for stormwater management.

WHY NOT STATEWIDE?

In New Jersey, the Stormwater Management Program has detailed procedures for identifying and implementing BMPs for water quality control for new development (NJDEP, 1986a); yet this continues to be primarily a voluntary program. The BMPs outlined in this program include water quality controls. The rate and volume management techniques are adapted to reduce NPS pollutants from entering waterways and minimize impacts on ground water. Volume control through infiltration can reduce NPS in streams to an even greater extent, though concern for ground water contamination must be addressed in each situation. Therefore, NPS BMPs for infiltration should be defined.

A change in regulations will be considered to require a somewhat higher degree of water quality control by detention/retention or other means in areas of high environmental sensitivity. Instituting a program of maintenance, construction and inspection of stormwater management facilities is essential in the long term. This may be accomplished by using local management districts or public utilities for the management of stormwater drainage systems as described in the general strategy in Chapter III.

Stormwater management ordinances have primarily addressed peak flow attenuation on a site-by-site basis; however, stormwater planning may be more effective on a regional basis. To facilitate regional stormwater planning, funding will be necessary to extend the present system of state matching grants for regional stormwater management planning. Grants may

be given to conduct and ultimately implement regional stormwater planning studies. Such planning requires the cooperation of county government agencies as well as municipal government officials.

2. Lakes Management:

The NJDEP's Clean Lakes Program is funded by both federal and State appropriations. Grants are issued by the State to local government bodies (e.g., counties and municipalities) for work related to the restoration of publicly-owned freshwater lakes. As part of the grant application review process, the NJDEP considers the following factors: present trophic state, lake use and recreation potential, population served by the lake, local interest and involvement, pollutant loading sources, areawide planning priority, and cost-effectiveness and likelihood of success.

The Clean Lakes Program consists of two phases, and grants may be issued for either one phase or both. The first phase has three objectives: to accurately define the trophic state of the lake, to determine the cause of the trophic condition, and to recommend a long-term management and restoration plan. The second phase consists of implementation of the controls determined during the first phase of the program. This phase may last several years.

The NPS management program will be directly involved in two aspects of the Clean Lakes Program: grant application review, and lakes management and restoration. In determining those lakes for which a grant will be issued, additional resources may be directed to those lakes having water quality problems due to nonpoint sources. Nonpoint source strategies which may be implemented during the implementation phase include erosion controls, shoreline stabilization, etc. The general public will also have

the opportunity to help restore the lake through such practices as controlling the rate of lawn fertilization, proper disposal of household chemicals and detergents in their septic tanks, etc.

3. Ground Water Protection:

In the New Jersey 1988 State Water Quality Inventory Report, the effect of NPS on ground water quality is recognized as important (NJDEP, 1988d). Such NPS as underground storage tanks, surface runoff, pesticides, and polluted surface water were cited as probable causes of ground water degradation. The report cites such municipalities as Edgewater Park, Delanco, Dennis, Winslow, Howell, and Monroe (Gloucester County) as believed to have ground water contamination (unacceptable nitrate levels) due to agricultural fertilizers and/or septic tanks.

To provide ground water quality protection, the Department is developing a "Ground Water Strategy for New Jersey." That document, presently in draft form, states that "Best Management Practices must be established, providing as far as practicable, corresponding levels of protection for septic tank management, agricultural practices, home lawn care, nonpoint source pollution control, stormwater management, and other drainage practices (NJDEP, 1988c)." It is planned that appropriate NJDEP activities will incorporate the concept of NPS control into their activities and requirements.

One such example is the wellhead protection program. Among the NPS controls which may be applied is the restriction of potentially pollution-causing sources and activities (e.g., gas stations) from the vicinity of public water supply wells in surface aquifers. Other potential sources and land uses will also be controlled through the

application of BMPs. The NJDEP is also in the early stages of its plan to map and control the ground water recharge areas of the State. It is expected that it will take approximately two years to develop a methodology to map the recharge areas with the actual mapping occurring thereafter. When this future work is completed, NPS controls will be given priority for application in these areas, which are vital in the protection of ground water quality. Although no special regulatory program will be instituted, water supply sources will also be protected from NPS through controls integrated into existing programs.

4. Toxics Control:

Section 304(l) of the federal Water Quality Act requires that the State prepare lists of impaired waterbodies (i.e., mini list, short list, and long list). The waterbodies in those lists are impaired, in part, due to the toxic effects of nonpoint sources on water quality. Waterbodies impaired by nonpoint sources of toxics will be considered for higher priority in NJDEP permitting and NPS management efforts. As discussed in Chapter III, the toxicity of urban contaminants to the aquatic ecosystem needs to be better understood. Research addressing this question is a vital technical component of the NPS Management Program.

5. Estuaries Management:

Under the provisions of section 320 of the Clean Water Act, the Governor of a State may nominate estuaries of national significance to the program, or the USEPA Administrator may convene a five year Management Conference in order to develop a Comprehensive Conservation and Management Plan (CCMP) for the estuary. On July 18, 1988, Administrator Thomas, at

the request of Governor Kean, designated the New York-New Jersey Harbor Estuary and the Delaware Estuary to the program.

One of the purposes of the Management Conference will be to bring together the government and the public in order to :

> "...develop the relationship between the inplace loads and point and nonpoint loadings of pollutants to the estuarine zone and the potential uses of the zone, water quality, and natural resources" (33 U.S.C. 1330(b)(3)).

The CCMP will include recommendations regarding:

> "... priority corrective actions and compliance schedules addressing point and nonpoint sources of pollution in order to restore and maintain the chemical, physical, and biological integrity of the estuary, including restoration and maintenance of water quality, a balanced indigenous population of shellfish, fish and wildlife, and recreational activities in the estuary, and assure that the designated uses of the estuary are protected..." (33 U.S.C. 1330 (b)(4).

Both point and NPS pollution have been identified as problems in the New Jersey/New York Harbor (Harbor) and Delaware estuaries. Although the goals and objectives for the programs have not yet been determined, both the Harbor and Delaware Estuary programs will be addressing this task in the next year. The nonpoint source/stormwater quality management planning may include program development with an assessment of nonpoint sources, general and site/watershed-specific assessment, in-field monitoring for nonpoint source identification, and permitting nonpoint sources/stormwater facilities. With regard to these goals, the areas which may be impacted by this program are defined below.

The core area of the Harbor study in New Jersey will include the upper and lower bay of the Harbor, Newark Bay, Raritan Bay, Sandy Hook Bay, the Bight Apex, Hackensack River, Raritan River, Passaic River, Arthur Kill, Kill Van Kull, Hudson River to Piermont Marsh, Navesink, and Shrewsbury Rivers.

In the Harbor, biological and physio-chemical water quality parameters associated with point and nonpoint sources of pollution include coliform, biochemical oxygen demand, dissolved oxygen, nitrogen, phosphorus, residual chlorine, toxic compounds, and hydrocarbons. These pollutants emanate from numerous sources such as wastewater treatment plants, combined sewer overflows, urban runoff, and landfill leachate (NJDEP, October 1987b).

In the Delaware, the study area may include the Delaware Bay, the Delaware River up to Trenton, and all the major tributaries to the head of tide in the entire basin from Trenton to Cape May. Nonpoint sources such as contaminated precipitation, hazardous waste sites, ground-water discharge, spills, and combined sewer overflows also may contribute to riverine nutrient inputs on the lower estuary and toxic contamination in the water column of the Delaware Estuary and its tributaries from Trenton to Liston Point. (NJDEP, May 1988b).

6. Ocean Management:

As discussed in the assessment chapter of this report, the ocean pollution plaguing the New Jersey shore is a special State concern that has prompted action from the Legislature and the Governor's Office, as well as within NJDEP. Since much of the degradation stems from NPS pollution, coordination between the overall statewide NPS management program and the Governor's plan is essential.

In his 1987 State of the State Address, Governor Kean announced his proposal of a 14-point Action Plan to preserve the quality of New Jersey's ocean and beaches. The proposal is the Governor's response to the

environmental management and economic development needs which have been brought into focus by pollution problems along the New Jersey Shore.

The Governor identified fourteen measures that municipalities, the State and Congress must do to stop the degradation of the ocean and beaches of New Jersey; these are outlined below:

A. Municipal Action
   1. Control beach litter
   2. Sweep streets and clean stormsewers
B. State Action
   1. Increase funding for marine police
   2. Control stormwater pollution
   3. Improve operation and maintenance of sewage treatment plants
   4. Extend Monmouth County sewage outfalls
   5. Fix combined sewer overfalls
   6. Accelerate Industrial Pretreatment Program
C. Congressional Action
   1. End ocean dumping of sludge in five years
   2. Immediately close six-mile dredge spoil site
   3. Deny approval of commercial woodburning site
   4. Implement MARPOL (an international agreement regulating solid waste disposal, originating from ships, into the ocean)
   5. Require manifest system for hospital waste
   6. Increase Coast Guard funding.

According to the Governor the effectiveness of these 14 measures would be compromised without comprehensive coastal management. The establishment of a New Jersey Coastal Commission is an essential element of the Governor's proposal. The Coastal Commission would have jurisdiction over the entire coastal region as defined in New Jersey Coastal Facility Review Act. The appropriate Division of Coastal Resources personnel and functions will be transferred to the Commission. The Commission would develop a comprehensive Shore Master Plan which can streamline the regulatory and planning framework for the coast, address water quality and shore protection, and delegate permitting authority to localities. The Commission would also be responsible for the funding needed to support necessary programs (NJ Office of the Governor, 1987).

Reporting to the Commissioner of NJDEP on the ocean pollution events of 1987, the "Blue Ribbon Panel" described a number of recommendations to abate ocean pollution emphasizing control of development and other potential nonpoint sources. The Panel recognized intensive public education as the long-term solution to the problems of the State's coastal zone. The Panel suggested that a number of its recommendations be addressed by the proposed Coastal Commission. As such, the proposed New Jersey Coastal Commission will provide the regulatory framework for the long-term protection of our beaches and water. However, the preparation of an NPS control strategy must be initiated, as a means of accomplishing these objectives not only for the coast but for elsewhere in the State.

7. Total Maximum Daily Load Program

In order to attain and maintain the Surface Water Quality Standards, the total maximum daily loads (TMDLs) need to be developed for both conventional and toxic pollutants. TMDLs must eventually be developed for waterway segments within the state. In setting TMDLs for a waterbody, recognition must be given to nonpoint, as well as point, sources of pollution. As a part of the process of setting TMDLs, the assimilative capacity of the waterbody must be determined by an integrated assessment of the point and nonpoint source contributions of the pollutant of concern. Depending on the pollutant of interest, a major portion of, and, in some cases, the entire background loading of a waterbody, may be due to nonpoint sources of pollution. This program will help to identify and quantify these background sources of nonpont pollution.

B. <u>Programs Outside of the Division of Water Resources</u>

1. Stream Encroachment Program:

This program regulates construction and other developmental activities in stream channels and in areas subject to flooding. The regulations which govern this program were established to protect private and public interests by controlling land uses and channel modification activities that result in increased flooding; by protecting against damages caused by materials being swept onto nearby or downstream lands during times of flooding; by minimizing the degradation of stream quality from point and nonpoint source pollution, and by protecting wildlife and fisheries through the preservation and enhancement of water quality and the environment within stream channels and flood plains in the State.

Should Require S.W. MGMT. IN ALL PERMITS.

The mechanisms and BMPs that are utilized to attain these goals are set forth in the NJDEP's Technical Manual for Stream Encroachment (NJDEP, August 1984). This manual contains general provisions for protecting and minimizing impacts to the environment during all stream encroachment activities as well as specific requirements for activities occurring in areas of special concern such as trout associated waters, wetlands and acid producing soils. The manual also discusses mitigation methods when habitat destruction is unavoidable.

2. Freshwater Wetlands Permit Program:

Effective July 1, 1988, activities proposed in or around freshwater wetlands that are determined to be regulated under the terms of the Freshwater Wetlands Protection Act (N.J.S.A. 13:9B-1 et seq.) must first obtain a Freshwater Wetlands Permit. The purpose of the permit is to prohibit the unnecessary or undesirable alteration or disturbance of freshwater wetlands in the State.

Currently, the Freshwater Wetlands Permit is being issued in conjunction with the U.S. Army Corps of Engineers which still maintains jurisdiction over wetlands in the State through its 404 Permit Program. Eventually, the Department intends to assume the Corps' 404 Permit Program for all eligible freshwater wetlands within the State, thereby eliminating the need for a Corps permit in these areas. Details for merging the two programs are presently being negotiated between the Corps and the Department.

Under the current regulations certain activities are exempted from obtaining a Freshwater Wetlands Permit including: activities that are part of an established ongoing farming, ranching, or silviculture operation which are eligible for or receive farmland assessment; activities and projects in areas under the jurisdiction of the New Jersey Pinelands Commission or the Hackensack Meadowlands Development Commission and areas regulated as a coastal wetland pursuant to N.J.S.A 13:9A-1 et seq. Even though these activities are exempted from the Freshwater Wetlands Permit requirements, at the present time approval from the Corps is still required.

OUTSIDE? No SW. mgmt. Required.

Rather than strict prohibition of all activities within freshwater wetlands, there are certain activities that will be allowed and are approved through the issuance of "Statewide General Permits". Presently, several such permits exist under the regulations with more being proposed. In addition, provisions also exist in the regulations to allow other activities in freshwater wetlands requiring the issuance of individual permits when no other practicable alternative exists such as when the activity is water dependent or represents a compelling public need.

The BMPs that will be employed during all of these activities will vary greatly depending on the details of each project and will be specified during the permitting process. However, at a minimum, and as required by USEPA for assumption of the Corp's 404 program, BMPs that have been established in USEPA's 404(b)1 Guidelines have been adopted into the regulations and will be utilized.

3. Coastal Area Facilities Review (CAFRA) Program, Coastal Wetlands Permit Program, and Waterfront Development Permit Program:

These programs together regulate activities occurring within the State's designated coastal zone. Each of these programs is administered in accordance with the Rules on Coastal Resources and Development (N.J.A.C. 7:7E-1.1 et seq.) which establishes the Department's coastal policies by which permit decisions are made. The decision making process is a three step process that takes into consideration location, use and resource policies. Under these policies many activities are prohibited. Where development is approved based on location and use criteria the resources of the coastal zone must still be protected. Water resource protection in the coastal zone is evaluated according to the policies established for Surface Water Use (N.J.A.C. 7:7E-8.5), Groundwater Use (N.J.A.C. 7:7E-8.6), Marine Fish and Fisheries (N.J.A.C. 7:7E-8.2), Shellfisheries (N.J.A.C. 7:7E-8.3), Water Quality (N.J.A.C. 7:7E-8.4), Stormwater Runoff (N.J.A.C. 7:7E-8.7), Vegetation (N.J.A.C. 7:7E-8.8), Important Wildlife Habitat (N.J.A.C. 7:7E-8.9), Buffers and Compatibility of Uses (N.J.A.C. 7:7E-8.13) and Flood Prone Areas (N.J.A.C.7:7E-8.19). The BMPs that are used in the coastal zone for controlling NPS pollution are described in these policies. In addition, all applicable activities

must also comply with the standards adopted by local Soil Conservation Districts or municipalities pursuant to the Soil and Sediment Control Act (N.J.S.A. 4:24-39 et seq.).

4. Land Disposal Programs:

Land disposal-related nonpoint pollution sources may be divided into three categories: sanitary landfills, hazardous wastes (including those facilities and activities subject to the jurisdiction of the Environmental Cleanup Responsibility Act and/or the Resource Conservation and Recovery Act), and individual subsurface sewage disposal systems. Each of these sources is discussed below, including the manner by which they are managed and the agencies providing that management. The specific BMP's employed to control the nonpoint sources are determined as part of the applicable regulatory process.

i. Sanitary Landfills: A sanitary landfill is defined in the N.J. Administrative Code as a "solid waste facility, at which solid waste is deposited on or into the land as fill for the purpose of permanent disposal or storage for a period of time exceeding six months, except that it shall not include any waste facility approved for disposal of hazardous waste . . ." (N.J.A.C. 7:26-1.4). Landfills are managed primarily through two mechanisms: a program of State-issued permits and associated requirements as contained in the New Jersey Administrative Code, and solid waste management plans.

The New Jersey Administrative Code (N.J.A.C. 7:26-1.1 et seq.) includes several provisions which regulate landfills. Among the regulation's requirements are:

- No new sanitary landfill shall be constructed or any existing landfill continue to operate where solid waste is or would be in contact with the surface or ground waters.
- Leachate from any sanitary landfill shall not be allowed to drain or discharge into the surface water or ground water except as permitted pursuant to the NJPDES regulations.
- No new sanitary landfill shall begin construction or operation without first obtaining a NJPDES permit pursuant to N.J.A.C. 7:14A and approval of its Soil Erosion and Sediment Control Plan pursuant to N.J.A.C. 2:90.
- The owner or operator of an existing sanitary landfill shall be required to design and after Department approval of the design, construct, operate and maintain a leachate control collection and treatment system when leachate is determined to be impacting the quality of the surface and ground waters of the area.
- The owner or operator of any existing sanitary landfill shall be required to design and after Department approval of the design, construct, operate and maintain a surface drainage system when it is determined that soil erosion and sedimentation will result in substantial soil losses and negative impacts upon the quality of the surface and ground water of the area.

The regulations also discuss, in detail, the NJDEP's requirements pertaining to permits to construct and operate a sanitary landfill, the proper siting and configuration of a sanitary landfill, the placement of an impervious liner, leachate collection etc.

Solid Waste Management Plans constitute the other major mechanism by which sanitary landfills are regulated. The Solid Waste Management Act (N.J.S.A. 13:1E-1 et seq.) requires that the county boards of chosen freeholders (in the case of counties) and the Hackensack Meadowlands Development Commission (in the case of the Hackensack Meadowlands District) develop solid waste management plans. The required plans were developed, and received NJDEP approval, in the time period of 1980-1982 (Sondermeyer, March 1988). The solid waste management plans are in effect for a period of 10 years. Upon expiration of a plan, a new plan must be developed.

A solid waste management plan contains certain required information, among which are:

- An inventory of the sources, composition, and quantity of solid waste generated within the solid waste management district in the year in which the report is prepared,
- Projections of the amounts and composition of solid waste to be generated within the district in each of the 10 years following the year in which the report is prepared,
- An inventory and appraisal, including the identity, location, and life expectancy, of all solid waste facilities within the solid waste management district,
- The designation of a body to supervise the implementation of the solid waste management plan,
- A statement of the solid waste disposal strategy to be applied in the solid waste management district, and
- A site plan, which includes all existing solid waste facilities located within the solid waste management district.

The solid waste management plan is enforceable through the permit process, since a permit for a new facility or a renewal permit may not be issued unless the proposed permit is in compliance with the applicable approved solid waste management plan.

ii. Hazardous Wastes: The two major mechanisms for controlling pollution from hazardous waste sources are the Environmental Cleanup Responsibility Act (ECRA) and the Resource Conservation and Recovery Act (RCRA). The NJDEP's programs for the implementation of these laws are discussed below.

The Environmental Cleanup Responsibility Act (ECRA) is a New Jersey law which imposes preconditions on the sale, transfer, or closure of industrial establishments involved in the generation, manufacture, refining, transportation, treatment, storage, handling, or disposal of hazardous substances or wastes. The goal of the NJDEP in implementing this Act, is to ensure that industrial establishments are environmentally acceptable upon sale, transfer, or closure.

In ensuring that the facilities are environmentally sound, "preconditions" are imposed. Preconditions include such possibilities as

the execution of an approved cleanup plan detailing the measures necessary to detoxify and restore contaminated property, the NJDEP's approval of a negative declaration that there have been no discharges of hazardous waste on the property (or that such discharges were cleaned up to the satisfaction of the NJDEP), and the execution of an Administrative Consent Order between the owner/operator and the NJDEP allowing the sale to be consummated prior to full ECRA compliance.

In the period of January 1984 to September 1987, approximately 300 sites were remediated with private funds, 12,500 negative declarations and 122 cleanup plans were approved, and $11.5 million of private party funds were spent on cleanup operations (NJDEP, October 1987a).

The Resource Conservation and Recovery Act (RCRA) is a federal act, passed by Congress in 1976, which was designed to regulate hazardous wastes from their point of generation to their final disposal location. This concept is often referred to as "cradle-to-grave," due to the comprehensive nature of the program. In 1984, the Act was amended by the Hazardous and Solid Waste Amendments to expand the authority of RCRA. Those amendments include provisions that require remediation of any latent contamination emanating from a RCRA-regulated facility before it may receive NJDEP approval of a proposed closure.

In order to relieve the State's industries from the burden of both federal and state hazardous waste requirements, the NJDEP petitioned the USEPA to consolidate the federal program into the state program. In February, 1985 New Jersey received final authorization from the USEPA to achieve this consolidation.

The heart of the program is the manifest system for tracking of the waste, and other requirements applicable to both the generators and

transporters of hazardous waste. All handlers of the hazardous waste complete the manifest forms (generators, transporters, and disposal facilities) and send them to the State. The manifests specify the amounts and types of waste and the route of movement. Discrepancies in the manifest forms are evaluated and considered for enforcement action. New Jersey processes over 100,000 manifests annually (NJDEP, October 1987a).

iii. Individual Subsurface Sewage Disposal Systems: Individual subsurface sewage disposal systems are regulated through the Standards for the Construction of Individual Subsurface Sewage Disposal Systems (N.J.A.C. 7:9-2.1 et seq.). Those rules discuss technical aspects related to the design and siting of individual septic tanks and specify the responsibilities of the administrative authority having jurisdiction over them. These regulations have been proposed for amendment. The public comment period for the proposed new rules concluded October 14, 1988. (Individual Sewage Disposal System Alternate Designs are regulated by the Division of Water Resources.)

Among the subjects addressed by the proposed rules are: administration, site evaluation and system location requirements, determination of soil suitability, permeability testing, general design and construction requirements, pretreatment units, effluent distribution networks, disposal fields, seepage pits, and operation and maintenance.

The Standards contains many requirements regarding the siting of individual sewage disposal systems. For example, there are restrictions pertaining to locating a system in the vicinity of the following features:

- bedrock outcrops or areas with excessive stones,
- sinkholes,

- steep slopes showing signs of unstable soil such as landslide scars, slump blocks, fence posts or lower trunks of trees bending downslope,
- bare eroded ground, denuded of vegetation, or with deep wheel ruts,
- highly disturbed ground indicated by such features as remnants of foundations or pavements, buried building debris or buried plant remains,
- sand dunes,
- mine spoils, borrow pits, dumps, or landfills,
- low-lying coastal areas exhibiting signs of tidal inundation or tidal marsh vegetation such as cordgrass, salt-meadow grass or spike grass,
- low-lying inland areas showing signs of ponding or wetland vegetation such as skunk cabbage, tussock sedge, cat-tails, alders, or white cedar, and
- flat low-lying areas adjoining streams (N.J.A.C. 7:9A, proposed).

The proposed regulations also include several other restrictions and requirements, such as the minimum distances which components of individual subsurface sewage disposal systems must be from reservoirs, wells, suction lines, water service lines, watercourses, occupied buildings, property lines, disposal fields, existing seepage pits or cesspools, and in-ground swimming pools.

C. Federal Financial Assistance and Development Program Review

Pursuant to Executive Order No. 12372, as in effect on September 17, 1983, Table 2 lists those Federal Assistance and Federal development projects that the State has determined need to be reviewed for consistency with the NPS management program. This list was developed utilizing the most recent catalog of Federal Domestic Assistance.

Table 2. AGENCY PROGRAM INDEX

DEPARTMENT OF AGRICULTURE

AGRICULTURE RESEARCH SERVICE

Agricultural Research - Basic and Applied Research

ANIMAL AND PLANT HEALTH INSPECTION SERVICE

Plant and Animal Disease and Pest Control

AGRICULTURAL STABILIZATION AND CONSERVATION SERVICE

Community Loans and Purchases
Dairy Indemnity Program
Emergency Conservation Program
Storage Facilities and Equipment Loans
Water Bank Program
Agricultural Conservation Program
Forestry Incentives Program
Rural Clean Water Program
Conservation Reserve Program

COOPERATIVE STATE RESEARCH ADMINISTRATION

Farm Operating Loans
Resource Conservation and Development Loans
Soil and Water Loans
Water and Waste Disposal Systems for Rural Communities
Waterhed Protection and Flood Prevention Loans

EXTENSION SERVICE

Cooperative Extension Service

FOREST SERVICE

Forestry Research
Cooperative Forestry Assistance

SOIL CONSERVATION SERVICE

Resource Conservation and Development
Soil and Water Conservation
Watershed Protection and Flood Prevention
River Basin Surveys and Investigations
Rural Abandoned Mine Program

National Water Resources Research Program
Geological Survey - Research and Data Acquistion

NATIONAL PARK SERVICE

Outdoor Recreation - Acquisition, Development and Planning
Urban Park and Recreation Recovery Program

DEPARTMENT OF TRANSPORTATION

FEDERAL HIGHWAY ADMINISTRATION

Highway Planning and Construction
Highway Beautification - Control of Outdoor Advertising, and Control of Junkyards

ENVIRONMENTAL PROTECTION AGENCY

OFFICE OF WATER

Construction Grants for Wastewater Treatment Works
Water Pollution Control - State and Interstate Program Support
State Public Water System Supervision
State Underground Water Source Protection
Construction Management Assistance
Water Quality Managment Planning
Comprehensive Estuarine Management

OFFICE OF RESEARCH AND DEVELOPMENT

Environmental Protection - Consolidated Research
Pesticides Control Research
Solid Waste Disposal Research
Water Pollution Control - Research, Development, and Demonstration
Safe Drinking Water Research and Demonstration
Toxic Substances Research

OFFICE OF PESTICIDES AND TOXIC SUBSTANCES

Pesticides Enforcement Program
Toxic Substances Compliance Monitoring Cooperative Agreements

OFFICE OF SOLID WASTE AND EMERGENCY RESPONSE

Hazardous Waste Management State Program Support
State Underground Storage Tanks Program

Chapter VI. Local Agency and Public Involvement in the NPS Program

The public has been involved in the NJDEP's NPS protection initiatives prior to the development of this document. In November 1985, for example, the New Jersey Clean Water Council, an advisory body to the Commissioner of the NJDEP, held a hearing to obtain public comment on the issue of NPS pollution. As a result of that hearing, recommendations related to NPS pollution were made and subsequently presented to the Commissioner. These included recommendations pertaining to NPS-related water quality monitoring, completion of the Chapter 199 septic system regulations, and NPS-related public education.

Initial local agency input during the development of this draft Nonpoint Source Assessment and Management Program was gathered from an NPS questionnaire which was sent to the State Soil Conservation Committee, county and regional planning departments, and field offices of the Division of Fish, Game and Wildlife. These bodies served as "coordination and distribution" agencies for obtaining local nonpoint source information from local governments and other public and private agencies. The State Soil Conservation Committee distributed the questionnaire to all of the soil conservation districts in the State for completion. All of the soil conservation districts responded with completed questionnaires. The county planning boards were requested to complete their questionnaires based on their knowledge of the waters in their geographic areas in consultation with other local agencies (e.g., health departments, county engineering departments etc.). Most of the county planning departments submitted completed questionnaires.

The questionnaires requested information regarding categories of nonpoint source(s) believed to be impacting waterbodies in 150 watersheds; the severity of the problem, trends etc. This information was compiled and discussed in the draft 1988 State Water Quality Inventory Report, and the NPS assessment in this report. In addition, these same agencies involved with completing the questionnaires are also being given the opportunity to comment on the draft document.

Presently, the availability of the draft State Nonpoint Source Assessment and Management Program for review is being announced in three regional newspapers within the State (Newark Star Ledger, Cherry Hill Courier Post, and Trenton Times). Through those advertisements, the public is being invited to comment on the document, copies of which are available for inspection at State depositories as well as at Division of Water Resources offices and the Department library. The list of State depositories is included in Appendix F. The Division will hold three public meetings, which are being held in northern, central, and southern New Jersey at which the public can present comments on the document.

To ensure further involvement with local agencies and the public, the NJDEP will form a "Nonpoint Source Advisory Council." This body will meet periodically to discuss issues related to NPS management. The specific functions of this council will be to advise the Department on a broad range of issues related to the control of NPS. The group will consist of appropriate representation of environmental, economic and public interests.

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APPENDICES

Appendix A. Nonpoint Source Education Program Plan

Nonpoint source pollution contributes significantly to the existing water quality problems of the State's surface and ground waters. Unlike point source pollution, which is limited to specific discharges, NPS pollution is more widespread, resulting from the full range of human and naturally occurring activities.

NPS pollution originates from agriculture, urban and suburban areas, construction sites during development, and in many areas, large populations of wildlife. The types of pollutants generated by each of these activities varies from sediments to fecal bacteria, nutrients, toxic substances and oil and grease. The effects of these pollutants on water quality are often chemical and biological in nature and not readily apparent to the average person. All of us, often innocently, contribute pollution to the environment everyday. As average citizens. we use a variety of household chemicals for cleaning; we fertilize our lawns and gardens; we operate machinery that either releases vapors or liquids which contain a variety of hazardous chemicals; we disturb the soil in development; and we frequently release other pollutants in other everyday activities.

The NJDEP has recently estimated that 69% of the freshwater streams and rivers it has monitored in the State of New Jersey do not meet the swimmable and fishable goals established in the Clean Water Act. Much of the pollution loads in streams are due to NPS pollution. Further, it is recognized that NPS pollution is the major reason for restrictions being imposed in New Jersey's shellfish growing areas and for bathing beach closures in backbays and estuaries. Current investigations into nitrate

contamination of ground water resources in various areas of the State are pointing towards NPS pollution as the cause of this contamination; possibly from agricultural activities and/or extensive septic system use for home wastewater disposal. In other areas of the State, NPS are the primary contributor of organic chemicals to ground water which have rendered numerous public and private wells unusable as drinking water supplies.

Public awareness of these water quality impacts caused by NPS pollution and the contributions each individual makes to NPS is seriously lacking. The average person usually associates water pollution with the more visible and noticeable types of pollution such as floating garbage, oil slicks, hazardous waste sites or effluent discharged from pipes from industrial sources and sewage treatment plants (point sources). This perception is probably due to the considerable attention that has been given to these issues over the past two decades by the media, environmental groups and government. Until recently little or no consideration has been given to pollution which originates from human activities.

In an effort to heighten public awareness of NPS pollution, the Division has recently organized a NPS Education Working Group to develop a statewide NPS education program to expand and coordinate existing NPS educational activities. The group is comprised of individuals from various offices within the Department and representatives from the Mercer County Planning Department and the Rutgers University Cooperative Extension Service. In addition, the New Jersey Alliance for Action, representing the business community has recently expressed an interest in becoming involved in the education effort by initiating a NPS awareness

campaign; working with an advertising firm to create a central theme for NPS control throughout the State.

As its mission, the NPS Education Working Group collectively decided that any education program it would develop must be designed to educate individuals on their role in creating and preventing NPS of pollution. The goals that have been established by the group include developing and implementing a statewide NPS education program that strives to educate all sectors of society on the importance and benefits of reducing pollution and to encourage citizen involvement in activities that promote voluntary and regulatory NPS prevention and control. The Group recognized the importance of tailoring educational efforts to the different audiences that together would represent the full community. After numerous discussions and meetings held by the group to determine which audiences should be targeted in the education program, the following list was developed:

Selected Audiences for NPS Education

- Adult (Informal) Education
- Media
- Elected Officials
- Business Community
- Formal Education (Grades K-12)

The following sections outline the strategies that have been developed by the NPS Education Working Group for educating each of these audiences. In conjunction with existing Department activities, the problem of household hazardous wastes and their disposal will be folded into all strategies.

It must be kept in mind that these strategies collectively comprise the first phase of a Statewide NPS Education Program Plan. This plan has been devised to create an education and awareness program for the general public with an emphasis on how each individual contributes to water pollution problems through their current lifestyles and activities. More importantly, not only will this plan serve to point out the causes and the problems associated with NPS, it will also attempt to provide some solutions by emphasizing simple methods that can be used by the average individual to minimize the impacts we all have on the quality of our water resources.

A key emphasis of the overall program will be active involvement of citizens and organizations. A standard maxim in education is that learning by doing is the best approach for meaningful education. The Division of Water Resources' Office of Public Participation has already initiated New Jersey Water Watch, a program of local involvement in water resource protection. As of July 30, 1988, fifty Water Watch groups have "adopted" local water resources. The Water Watch program will be a key tool for integrating volunteers into local educational and monitoring activities relating to NPS and for actually investigating and seeking resolution of NPS problems.

In addition, active efforts will be made to involve watershed associations, health departments, environmental commissions, soil conservation districts and other organizations concerned with water quality issues. Given the extensive nature of this educational effort, it will be important to utilize and coordinate the institutional and human resources that are aligned with the goals of NPS education.

Elected Officials

Goals - To educate local public officials and employees concerning the importance and benefits of implementing nonpoint source control activities. In New Jersey local government, primarily municipalities, exercise significant control over land development activities, zoning and other planning functions and enforcement of building or health codes. In the long-term local government is also expected to play an important role in nonpoint source/stormwater management. Because of this role, educating local officials and employees in the benefits of nonpoint source controls should be a important component of a total nonpoint source education effort.

Objectives

1) Promote the water quality, recreation, water use and aesthetic benefits of nonpoint source (NPS) controls.

2) Establish a coordinated effort of NPS control at all levels of government.

3) Encourage counties to expand their environmental management responsibilities that have been empowered to them through the County Environmental Health Act to included NPS control.

4) Create a NPS network within the NJDEP that will be responsive to the needs of local governments.

Activities -

- Prepare an educational brochure for widespread distribution to local officials. A generalized awareness educational brochure specifically for local elected officials describing what nonpoint sources are, how they impact water quality, which programs the State is using for NPS management, the State's overall strategy for NPS control, the benefits of NPS management, interfacing with Water Watch programs, possible funding sources for necessary work, and how to get additional information and special presentations (both general and technical). Such brochures could also be tailored to specific areas/waterways in the State (coastal waters). (First-year activity)

- Develop presentation packages for local council meetings, special meetings for elected officials, etc. These presentations will stress the importance of local initiatives in controlling NPS/stormwater. Presentations would encourage local officials to support Water Watch activities. (First-year activity)

- Conduct education seminars on details of developing NPS/stormwater management programs/activities. Seminars could be developed for local administrators, township/county engineers, planners, code enforcement officers, and health officers that would show how to manage NPS/stormwater, their identification, what activities the State/federal government are performing, and what assistance

programs are available. Such seminars would be held in conjunction with government interest groups (Authorities Association, League of Municipalities, engineers society, planners association, etc.). (First and second-year activity)

- Preparation or gathering of technical resource documents for distribution to interested officials. Would include documents such as the Guide to Stormwater Management Practices, Urban BMPs Guide, or new documents could be prepared as necessary. The NJDEP could purchase a large number of these documents for free distribution to local offices. (On-going activity)

- Develop a model NPS ordinance which municipalities/counties could incorporate into planning ordinances. Ordinance may include stormwater management, stream corridor/buffers, additional soil erosion control over Chapter 251, maintenance and inspection of control structures, dog litter laws, local education of residents, etc. (Second-year activity in conjunction with State planning program)

- As needed, special education seminars would be held for local governments adjacent to waterways identified by the Department as a statewide priority for the control of NPS to protect important water uses or resources. On-going as needed. 7. Provide technical assistance as requested. Make it be known that the State/county would be willing to have engineers, planners available to assist local governments in addressing problems related to NPS pollution/stormwater management. (second-year and beyond activity)

Adult (Informal) Education

Goal - To raise awareness among the general public as to the nature of nonpoint source pollution and what must be done to reduce it, by both individuals and government, and to create avenues for citizen involvement in investigation and addressing nonpoint source pollution problems in local communities.

Objectives

1) Produce a set of educational materials and programs for general adult education about NPS problems and solutions.

2) Coordinate the distribution of such materials and programs involving existing groups and networks whenever possible.

3) Create mechanisms within New Jersey Water Watch for citizen participation in investigating and addressing NPS problems locally.

Activities

- Develop a NPS presentation to take "on the road." Participate in existing seminar series, attend county fairs, etc. Amend presentation to focus on how individuals in their area contribute

to NPS and can reduce it. For example, emphasis for agricultural communities may be on soil erosion while in urban communities, street runoff may be highlighted. (First-year activity)

- Produce a calendar listing when and where the NPS presentations will be given for general distribution and media ads. (First-year activity)

- Continue distribution on a large scale of the Clean Water Book. This 24-page booklet provides a comprehensive overview of what individuals can do to reduce NPS generated in their homes and neighborhoods. A total of more than 30,000 copies have been printed and distributed; an additional 60,000 are being printed for distribution over the next two years. (On-going activity)

- Distribute videotapes of the 30-minute documentary now being prepared by New Jersey Network TV on NPS. These will be loaned to all interested organizations for viewing and will be made available to schools through existing distribution channels. (On-going activity)

- Continue distribution of the "Water Watcher" brochure inviting individuals to pledge to reduce NPS generated in their households. Enlisting Watcher Watchers will be a major focus of New Jersey Water Watch. (On-going activity)

- Develop an NPS Education Network with other interested agencies and organizations. Contacts would be mailed to the full range of interest groups and other agencies such as the Soil Conservation Service. Listings of all materials and programs through the network would be sent to all members. (First-year activity)

- Prepare both as part of the New Jersey Water Watch and for general distribution to interested groups, a handbook on investigating and identifying NPS problems and actions that can be undertaken at the local level to address these problems. For example, in cooperation with the County Health Departments the handbook would describe how to work with the county in locating and describing stormwater discharge pipes along a particular resource (this will be a necessary step for counties in developing NPS control programs). Where there are serious stormwater runoff problems, groups can press for stricter stormwater management ordinances or raise awareness of practices that can increase the level of contaminants carried by runoff into waterways. (First-year and beyond activity)

- Escalate the visibility of the Water Watcher effort through media ads, press releases, appearances of DEP officials on radio and TV shows, posters, etc. This effort will involve close cooperation with the Office of Communications and Public Education. It should be timed so that we can follow up this media campaign with large numbers of materials and programs. (Second-year activity)

- Prepare and distribute a set of mailers and colorful fact sheets describing various types of NPS pollution and what can be done to

reduce them. These will be designed so that they can easily be incorporated by other organizations in their mailings. The fact sheets will also be designed so that they can be run by newspapers as a series of articles; a packet of fact sheets will be sent to all daily and weekly newspapers in the State. (Second-year activity)

- Prepare and "clean water" survey form with which individuals can rate their households as to the degree to which it may contribute to NPS. This will be a way to bring home in a vivid way to individuals the range and types of activities that can pollute water. May be incorporated in seminars. (Second-year activity)

Formal Education (Grades K-12)

Goals- To educate school children (K-12) as to the nature of nonpoint source (NPS) pollution and promote environmental awareness and behavior that can prevent NPS.

Objectives

1) To produce a set of materials aimed at school age children.

2) To produce materials for use by school teachers in their classrooms.

Activities

- The following materials will be developed:

  A comic or coloring book introducing nonpoint source pollution to be handed out at fairs or by local groups.
  Posters and small stickers oriented to young audiences. (First-year activities)
  Bulletin board kit - include posters and activity materials. (Second-year activity)

- Continue distribution of "My World, My Water, and Me," an activity book for teachers which covers general water issues with the addition of specific sections addressing NPS. (On-going activity)

- Develop a videotape on how Water Watch activities can be incorporated into high school classes and distribute to schools. (First-year activity)

- Development of "Water Watch" workshops for high school teachers, demonstrating how their classes can study and monitor lake or stream segments as a way of learning about water issues. Encourage participation in specific action projects to reduce NPS as well as other problems. (First-year activity)

- Presentation of awards and certificates to teachers who initiate creative NPS-related programs. Teachers would be invited to send descriptions of their programs and samples of materials to receive

certificates of appreciation and possible awards. This information would then be summarized and disseminated at educational conferences and other events. (Second-year activity)

Media

Goals- To inform representatives of the media - newspaper, trade journals, magazines, radio and television - of the existence of nonpoint source pollution and its acute and chronic public health and environmental impacts as well as its short- and long-term economic consequences. In addition, this plan will seek to encourage direct personal involvement by publicizing cooperating communities and creative citizen initiatives that have been successful in control of NPS pollution.

Objectives

1) Encourage media coverage of NPS and activities focusing on the reduction and control of NPS.

2) Produce camera-ready programs and visuals about various aspects of NPS.

Activities

- Issue press releases when appropriate on newsworthy nonpoint source pollution developments and activities. Send schedules of clean-up efforts, seminars, etc. to encourage media coverage. Encourage local interest groups (Environmental Commissions, Water Watch groups) to contact media directly. (First-year activity)

- Acquaint the media with NPS by preparing a one page summary briefly defining nonpoint source pollution and explaining its environmental context and legislative evolution. Include a nonpoint source glossary and bibliography for further reading. Present interrelationships of agencies that handle parts of the nonpoint source pollution program statewide and nationally in a flow chart format. Make available to reporters who have demonstrated an interest in NPS. (First-year activity)

- Develop graphic, colorful advertisements for newspapers and magazines. (First-year activity)

- Maintain an "open line" of communication with reporters by acknowledging accurate articles with letters to the editor and follow-up phone calls. (First-year activity)

- Develop a nonpoint source pollution "experts list" to talk about stormwater, agriculture, laws, demonstration projects, "cutting edge" developments and the full spectrum of nonpoint source research and control. (Second-year activity)

- Develop radio series for distribution as public service announcements to interested stations. Duration can be as short as 30 or 60 second "commercials." Scripts can be sent to newspapers to use as column filler. (Second-year activity)

- Write letters to the editor or Op-Ed commentaries to keep public attention focused on the individual's role in reducing nonpoint source pollution. Increase credibility by having the Commissioner sign letters. (Second-year activity)

Business Community

Goals - To educate business owners, managers and employees about nonpoint source pollution and how their operations contribute to and can potentially reduce the problem. A number of industries and businesses have already begun to recognize the importance of reducing NPS and have independently organized efforts to address the issue (Shore Foundation, for example). Many businesses, on the other hand, may not understand the the nature and extent of nonpoint source pollution. Even if aware, most lack the financial resources and time to investigate and initiate NPS programs and general pollution control. In addition, businesses through chambers of commerce and trade associations represent a powerful, untapped network for promoting efforts to reduce NPS. Persuading businesses that NPS is an issue involving them will be a challenge. Therefore, an underlying message in all educational efforts will be how reducing nonpoint source pollution not only benefits the environment but also means good business.

Objectives

1) Promote good housekeeping practices that can reduce nonpoint source pollution generated by their business.

2) Encourage businesses to voluntarily control or recycle hazardous and other waste discharges not currently addressed in existing regulations.

3) Encourage and coordinate business support, either monetary or material, for community and citizen group efforts to reduce nonpoint source pollution.

Activities

- Prepare nonpoint source pollution educational brochures tailored to various business types. Distribution of brochures can be through chambers of commerce and trade associations, perhaps in conjunction with already existing newsletters. (First-year activity)

- Conduct presentations about nonpoint source pollution at chambers of commerce and trade association meetings. The scope of these presentations can range from providing a general overview to conducting technical seminars on low-cost strategies for reducing nonpoint source wastes. Presentations can stress improvement within their own facility and/or illustrate examples of support for community and citizen group efforts (Water Watch). Encourage business leaders to eventually speak for us. (General overview, first-year activity; technical presentations, second-year activities)

- Establish a network of communication and support between businesses, citizen groups and local officials. This could be accomplished by compiling mailing lists of those who have expressed interest and making this master list available to the various groups. (First-year activity)

- Produce materials for display, such as stickers and posters, commending the efforts of business to reduce nonpoint source pollution. (First or second-year activity)

- Positively promote businesses who support nonpoint source pollution through media coverage (for example, feature stories in newspapers). (Second-year activity or as needed)

- Establish hotline numbers which businesses may call for direction on technical questions, taking care to convey that DEP wishes to work with businesses--not against them. Include a network within DEP for quick response. (Second or third-year activity)

- Purchase advertisements in trade magazines, newsletters, and other media that presently reach business groups informing them of available educational materials and sources of technical advice (hotline numbers). (Second-year activity)

- Prepare package of materials explaining new developments in NPS control in laymen's language, listing various agencies businesses may contact for assistance. (Second-year or beyond activity as regulations develop)

NPS is diverse in form and spans so many disciplines and regulatory programs. Because of this diversity, numerous agencies and offices will be contacted to assist in the process of developing educational materials and to participate in this NPS education program. The following list represents key agencies with potential resources that will be initially contacted.

<u>Rutgers Cooperative Extension of New Jersey, New Brunswick</u>

Resources: 1) County Agents
2) Home Economists
3) 4-H Agents
4) USDA staff research
5) Extension Review magazine

<u>USDA Soil Conservation Service, Somerset</u>

Resources: 1) State Conservationist
2) Local District Conservationist
3) State Public Affairs Specialists
4) Soil and Water Conservation News

<u>Soil Conservation Districts</u>

Resources: 1) 16 local districts in New Jersey handling Chapter 251

2) District education coordinators

New Jersey Department of Agriculture, Trenton

Resources: 1) newsletters
2) Division of Rural Resources
3) State Soil Conservation Committee

New Jersey Department of Environmental Protection, Trenton

Resources: 1) Department newsletters, bi-monthly magazine and press conferences
2) Division of Science and Research
3) Office of Public Education and Communications
4) Office of Public Participation
5) Office of Intergovernmental Relations

U.S. Environmental Protection Agency

Resources: 1) Office of Water Criteria and Standards Division, Nonpoint Sources Branch
2) Publications Office
3) Press Office

Association of New Jersey Environmental Commissions

Resources: 1) newsletter
2) courses
3) conferences
4) mailing list of 3,000 members

New Jersey Environmental Federation

Resources: 1) 23 environmental groups
2) quarterly newsletter

New Jersey Public Interest Research Group

Resources: 1) 70,000 members
2) outreach on all New Jersey colleges
3) "Citizen Alert" newsletter

National Water Quality Evaluation Project
North Carolina State University

Resources: 1) Nonpoint source evaluation project
2) literature reviews
3) conferences and workshops
4) monthly newsletter

Environmental Communication Research Program
New Jersey Experiment Station

Resources: 1) Publications
2) conferences workshops

3) research on environment risk - media coverage, public perceptions and source interactions

Watershed Associations

Resources: various associations throughout the State

Stonybrook-Millstone Watershed Association
Resources: 1) quarterly newsletter
2) K-12 environmental education programs
3) conferences
4) mailing list of 3,000 members

South Branch Watershed Association
Passaic River Coalition
Upper Raritan Watershed Association
Rockaway River Watershed Association

Alliance for Environmental Education

Use available resources

Department of Education

Use available resources

NJEA

Use available resources

NMEA and NJMEA

Resources: Newsletters and K-12 educational materials

Nature Education Centers

Resources: centers located in Essex, Camden, Morris, Ocean, Bergen, Sussex, Monmouth, Middlesex, Mercer, Somerset, Union and Passaic counties

Appendix B. PRELIMINARY LIST OF WATERWAYS SUSPECTED OF BEING IMPACTED BY NONPOINT SOURCE POLLUTION

Rivers and streams that without additional action to control nonpoint sources of pollution, cannot be expected to attain or maintain standards. Categories of nonpoint sources which add significant pollution to the listed waterbodies are provided. Pollution sources are limited to those reported to us as having a moderate to severe impact upon the receiving waterway. Pollution categories listed are most often suspected and preliminary and are not based upon monitored data.

Rivers underlined denote names of major watersheds (listed alphabetically). Rivers not underlined are tributaries within the major watershed listed immediately above.

STREAM/RIVER	POLLUTION CAUSE CATEGORIES (POLLUTANTS)	POLLUTION SOURCE
Assicunk Creek	Sedimentation, Nutrients	Agricultural Runoff, Construction, Urban Runoff
Assunpink Creek	Sedimentation, Nutrients	Construction, Urban Runoff
Big Timber Creek Woodbury Creek	Sedimentation, Nutrients, Pathogens, Toxics(?), Oils and Grease	Agriculture, Construction, Urban Runoff, Surface Mining, Landfills, Septic Systems, Waste Storage Tanks, Road Runoff
Cooper River	Sedimentation, Nutrients, Pathogens, Oils and Grease	Agricultural Runoff, Construction, Urban Runoff, Mining Activities, Landfills
Crosswicks Creek	Nutrients, Sedimentation, Anonia, Pathogens, Pesticides, Herbicides, Chlorides	Agricultural Runoff, Construction, Septic Systems, Urban Runoff
North Run	Nutrients, Oil and Grease	Agricultural Runoff, Road Runoff

Appendix B. (cont'd) PRELIMINARY LIST OF WATERWAYS SUSPECTED OF BEING IMPACTED BY NONPOINT SOURCE POLLUTION

STREAM/RIVER	POLLUTION CAUSE CATEGORIES (POLLUTANTS)	POLLUTION SOURCE
Crosswicks Creek (Continued)		
Doctors Creek	Nutrients, Herbicides, Pesticides, Siltation	Agricultural Runoff, Construction, Urban Runoff
Elizabeth River	Nutrients, Pathogens, Oils and Grease, Flooding, Loss of Habitat, Organics, Chlorides	Urban Runoff, Channelization
Great Egg Harbor River (Lower)	Pathogens, Nutrients,	Storm Sewers, Septic Systems
Maple Run	Siltation, Habitat Loss	Surface Runoff, Construction, Channelization
Hackensack River	Siltation, Nutrients, Toxics (?), Flooding, Habitat Destruction, Pathogens	Construction, Urban Runoff, Landfills, Spills, Inplace Contaminants, Flow Regulation
Manasquan River	Nutrients, Pathogens, Siltation, Volatile Organics, Chlorides	Agriculture (pastureland, animal holdings), Hazardous Waste Site, Road Runoff
	Erosion, Siltation, Loss of Habitat	Dam Construction, Flow Regulation, Streambank Modification
Marsh Bog Brook	Siltation, Nutrients, Pathogens (?)	Agricultural Runoff, Landfills

Appendix B. PRELIMINARY LIST OF WATERWAYS SUSPECTED OF BEING
(cont'd) IMPACTED BY NONPOINT SOURCE POLLUTION

STREAM/RIVER	POLLUTION CAUSE CATEGORIES (POLLUTANTS)	POLLUTION SOURCE
Mantua Creek	Sedimentation, Nutrients, Pathogens, Oils and Grease	Road Runoff, Agricultural Runoff, Septic Systems, Urban Storm Sewers, Surface Mining
Maurice River	Sedimentation, Nutrients, Pathogens, Oils and Grease	Agricultural Runoff, Construction, Road Runoff, Landfills, Urban Runoff via storm sewers,
Nacote Creek Matrix Run	Sedimentation, Oils and Grease	Road Runoff, Construction
Metedeconk River	Pathogens, Turbidity	Septic Systems, Urban Surface Runoff
Muddy Ford Brook	Volatile Organics, Oils/Grease	Landfill
Millstone River	Nutrients, Sedimentation, Pesticides, Pathogens, Toxics	Agricultural Runoff, Urban Runoff, Septic Systems, Landfills, Spills, Construction
Mullica River	Sedimentation, Nutrients	Agricultural Runoff, Landfills, Construction, Surface Mining
Wading River		Hazardous Waste Site
Musconetcong River	Siltation, Nutrients, Pathogens, Oils and Grease	Construction, Agriculture, Road Runoff, Urban Runoff, Septic Systems
Mine Brook	Sedimentation, Chlorides, Habitate Destruction	Construction, Road Runoff, Channelization

Appendix B. PRELIMINARY LIST OF WATERWAYS SUSPECTED OF BEING
(cont'd) IMPACTED BY NONPOINT SOURCE POLLUTION

STREAM/RIVER	POLLUTION CAUSE CATEGORIES (POLLUTANTS)	POLLUTION SOURCE
Navesink River	Nutrients, Pathogens, Pesticides, Sedimentation	Agricultural Runoff, Urban Runoff, Septic Systems
Swimming River	Siltation, Nutrients, Pathogens, Oils and Grease	Agriculture, Construction, Urban Runoff
North Branch Raritan River	Sediment, Nutrients, Pathogens	Agricultural Runoff, Construction, Urban Runoff
Lamington River	Sediment, Nutrients, Pathogens	Agricultural Runoff, Construction, Urban Runoff, Septic Systems
Rockaway Creek	Sedimentation	Surface Mining
Oldmans Creek	Sedimentation, Nutrients, Pathogens, Oils and Grease	Agricultural Runoff, Construction, Urban Surface Runoff, Septic Systems
Oyster Creek	Pathogens, Oils/Grease	Urban Surface Runoff
Passaic River	Siltation, Nutrients, Habitat Destruction, Elevated Stream Temperatures, Toxics, Pathogens	Construction, Urban Runoff, Flow Regulation, Spills, Inplace Contaminants, Waste Storage Leaks, Septic Systems
Green Brook Toney's Brook	Siltation, Habitat Destruction, Stream Bank Modification	Silviculture, Channelization

Appendix B. PRELIMINARY LIST OF WATERWAYS SUSPECTED OF BEING
(cont'd) IMPACTED BY NONPOINT SOURCE POLLUTION

STREAM/RIVER	POLLUTION CAUSE CATEGORIES (POLLUTANTS)	POLLUTION SOURCE
Passaic River (Continued)		
Second River	Nutrients, Toxics, Oils/Grease, Pathogens	Urban Runoff
Mill Creek	Oils and Grease	Urban Runoff
Notch Brook	Siltation, Pathogens, Nutrients, Chlorides, Oils and Grease	Construction, Urban Runoff
Peckman River	Siltation, Nutrients, Pathogens, Oils/Grease, Chlorides, Habitat Destruction, Pathogens	Construction, Urban Runoff, Silviculture, Road Runoff, Stream Bank Modification
Foulertons Brook Canoe Brook	Siltation, Nutrients, Pathogens, Oils/Grease, Chloride	Urban Runoff, Channelization
Primrose Brook	Siltation, Habitat Destruction	Construction, Road Runoff, Flow Regulation
Paulins Kill	Chlorides	Landfill, Road Runoff

Appendix B. PRELIMINARY LIST OF WATERWAYS SUSPECTED OF BEING
(cont'd) IMPACTED BY NONPOINT SOURCE POLLUTION

STREAM/RIVER	POLLUTION CAUSE CATEGORIES (POLLUTANTS)	POLLUTION SOURCE
Pequannock River	Siltation, Nutrients, Organics, Habitat Destruction, Oils/Grease, Pathogens	Construction, Urban Runoff, Surface Mining, Road Runoff, Channelization, Stream Bank Modification
Kikeout Brook	Habitat Destruction, Siltation	Construction
Pequest River	Chlorides, Flooding, Habitat Destruction (within Channelized reach)	Road Runoff, Construction, Channelization
Pohatcong Creek	Oils and Grease	Urban Runoff
Pompton River	Siltation, Nutrients, Warming of Stream Temperatures, Flooding	Construction, Urban Runoff, Surface Mining, Flow Regulation, Dredging
Sheffield Brook	Erosion, Turbidity, Destabilization of Stream Channel	Hazardous Waste Site, Channelization
Masonicus Brook	Siltation, Toxics (?)	Urban Runoff, Construction
Raccoon Creek	Sedimentation, Nutrients, Pathogens, Oils and Grease	Road Runoff, Agricultural Runoff, Septic Systems

Appendix B. PRELIMINARY LIST OF WATERWAYS SUSPECTED OF BEING
(cont'd) IMPACTED BY NONPOINT SOURCE POLLUTION

STREAM/RIVER	POLLUTION CAUSE CATEGORIES (POLLUTANTS)	POLLUTION SOURCE
Rahway River	Sediment, Nutrients, Pathogens, Oil and Grease, Elevated Stream Temperature, Flooding, Loss of Habitat, Chlorides	Construction, Urban Runoff, Landfills, Channelization
Ramapo River	Siltation, Warming of Stream Temperatures	Construction, Urban Storm Sewers
	Loss of Habitat for Biota	Channelization, Dredging
Rancocas Creek	Sedimentation, Nutrients, Pathogens, Habitat Destruction	Landfill, Construction, Agricultural Runoff, Urban Runoff, Septic Systems
Raritan River	Sedimentation, Nutrients	Urban Runoff, Construction, Landfills
Rockaway River	Siltation, Nutrients, Pathogens, Warming of Stream Temperature, Habitat Destruction	Construction, Urban Runoff, Flow Regulation, Streambank Modification
Jackson Brook Beaver Brook	Siltation, Pathogens, Nutrients	Construction, Urban Runoff, Spills
Den Brook	Siltation, Nutrients, Habitat Destruction	Construction

Appendix B. PRELIMINARY LIST OF WATERWAYS SUSPECTED OF BEING
(cont'd) IMPACTED BY NONPOINT SOURCE POLLUTION

STREAM/RIVER	POLLUTION CAUSE CATEGORIES (POLLUTANTS)	POLLUTION SOURCE
Salem River	Sedimentation, Nutrients, Pathogens, Oils and Grease	Agricultural Runoff, Construction, Road Runoff, Septic Systems
Swedes Run	Oils and Grease	Road Runoff
Shark River	Siltation, Nutrients, pH Depression, Chlorides	Urban Runoff, Landfill, Construction, Waste Storage leaks
Shrewsbury River	Pathogens, Sedimentation, Nutrients, Oils and Grease, Elevated Stream Temperatures	Horse Race Track (agricultural), Construction, Urban Runoff, Agricultural Runoff, Septic Systems, Hazardous Waste Site
South Branch Raritan	Sedimentation, Nutrients, Pathogens	Spills, Agriculture, Septic Systems
Mulhockaway Creek	Siltation	Construction
Neshanic River	Pathogens, Nutrients, Siltation	Pasturelands Feedlots, Septic Systems, Construction, Storm Sewers, Sludge disposal
South River	Nutrients, Sedimentation	Construction, Urban Runoff, Streambank, Destabilization
Manalapan Brook Matchaponix Brook	Siltation, pH Depression, Nutrients, Pathogens	Agricultural, Runoff, Construction, Urban Runoff, Septic Systems

Appendix B. PRELIMINARY LIST OF WATERWAYS SUSPECTED OF BEING
(cont'd) IMPACTED BY NONPOINT SOURCE POLLUTION

STREAM/RIVER	POLLUTION CAUSE CATEGORIES (POLLUTANTS)	POLLUTION SOURCE
Tons River	Siltation, Pathogens, Nutrients, Siltation, pH Depression	Agriculture (crop production), Septic Systems, Urban Surface Runoff, Construction
Manapaqua Brook	High Ammonia, Nutrients, Turbidity, Pathogens	Urban Surface Runoff, Septic Systems
Wallkill River	Sedimentation, Nutrients, Pathogens	Construction, Urban Runoff, Agricultural Runoff
Clove Brook Papakating Creek	Nutrients, Pathogens	Agricultural Runoff
Wanaque River	Siltation, Warming of Stream Temperatures	Urban Runoff, Road Runoff
Belcher Creek	Siltation, Oils and Grease	Construction, Urban Runoff
Mulpany River	Siltation, Nutrients, Pathogens, Oils and Grease	Construction, Urban Runoff, Spills, Inplace Contaminants

Appendix C. PRELIMINARY LIST OF LAKES SUSPECTED OF BEING IMPACTED BY NONPOINT SOURCE POLLUTION

Lakes, listed by watershed, which are evaluated as being significantly impacted by nonpoint and point source pollution. Specific pollution problems, categories, and their sources are listed. Question marks following pollution categories denote suspected categories based upon pollution sources supplied to us. Lake evaluations are based upon the best professional judgement of the agencies reporting and are not based upon monitoring data. Watersheds are listed alphabetically.

WATERSHED	LAKE	POLLUTION CAUSE (POLLUTANT) CATEGORIES (Suspected)	POLLUTION SOURCES
Assunpink	Lake Assunpink Stone Tavern Lake Rising Sun Lake Mercer Lake	Nutrients	Agriculture, Suburban Runoff
Doctors Creek	Imlaystown Lake Allentown Lake	Siltation (severe)	Agriculture (crop production)
Flatbrook	Kittantinny Lake	Eutrophication	Construction, Suburban Surface Runoff, Septic System (Summer homes being converted to year-round homes)
Great Egg Harbor River	Collings Lake	Eutrophication (?)	Septic Sys., Road Runoff
	Lake Lenape	Eutrophication (?) Siltation (?)	Agriculture (crop production), Road Runoff
	Patcong Lake	Siltation	Construction, Suburban Runoff
	Atlantic City Reservoir	Possible Contamination of Drinking Supply	Hazardous Waste

Appendix C. (cont'd)

WATERSHED	LAKE	POLLUTION CAUSE (POLLUTANT) CATEGORIES (Suspected)	POLLUTION SOURCES
Manasquan River	Nac's Pond	Eutrophication, Elevated Bacterial Levels	Natural (birds), Road Runoff, Inplace Contaminants
	Stockton Pond	Eutrophication	Urban Runoff, Inplace Contaminants, Natural (birds)
Maurice River	Palatine Lake Union Lake	Eutrophication (?)	Septic Sys.
	Clartis Mill Pond Mill Pond	Siltation (?)	Point Sources: Industrial and Municipal STP. Nonpoint Sources: Urban Runoff, Landfills, Hazardous Waste Sites, Dam Construction
Mid-Atlantic Coastal Region	Tuckerton Lake	Beach Closings	Urban Runoff, Natural (birds, severe)
Millstone River	Etra Lake Peddie Lake	Siltation	Agriculture (severe crop production runoff)
Mullica River	Hammington Lake	Eutrophication	Urban/Suburban Runoff, Severe STP Input.

Appendix C. (cont'd)

WATERSHED	LAKE	POLLUTION CAUSE (POLLUTANT) CATEGORIES (Suspected)	POLLUTION SOURCES
Musconetcong	Lake Shawnee	Siltation, Eutrophication (?)	Construction
	Lake Hopatcong	Eutrophication	Construction, Storm Sewers, Septic Sys., Fuel Spills and Leaks
Navesink River	Swimming River Reservoir Shadow Lake Poricy Pond	Siltation, Elevated Bacteria, Organics	Construction, Urban Storm Sewers
Passaic River	Verona Lake	Sediment Bars, Fishery Impairment	Construction, Urban Runoff, Dredging, Flow Regulation, Removal of Riparian Vegetation
Paulins Kill	Paulinskill Lake Culvers Lake Lake Owassa	Some Eutrophication Eutrophication	Construction, Suburban Surface Runoff, Septic System (Summer homes being converted to year-round homes)
Pennsauken River	Strawbridge Lake	Fish and Duck Kills	Urban Runoff (Waterway passes through highly developed residential office complexes and regions of light industry)
	Memorial Lake	Siltation	Urban Runoff
Rockaway River	Dixons Pond Kohlers Pond	Fishery Impairment	Urban Runoff (storm sewers)

Appendix C. (cont'd).

WATERSHED	LAKE	POLLUTION CAUSE (POLLUTANT) CATEGORIES (Suspected)	POLLUTION SOURCES
Toms River	Bennets Pond	Oil and Grease, Siltation	Urban Runoff, Construction
	Twilight Lake	Siltation, Beach Closings	Urban Runoff, Natural (birds)
	Pine Lake	Beach Closings	Point Sources: Municipal STP Nonpoint Sources: Urban Runoff (severe)
	Manahawkin Lake Ocean Acres Lake	Beach Closings	Urban Runoff, Natural (severe problem with birds)
Whippany River	Speedwell Lake Black Meadows Troy Meadows	Siltation (?)	Construction (severe), Urban Runoff (storm sewers)

APPENDIX D. PRELIMINARY LIST OF WATERWAYS SUSPECTED OF BEING IMPACTED BY NONPOINT SOURCE POLLUTION: Estuaries, Bays, Coastal Waters.

Bays, estuaries, and coastal waters suspected of being degraded or threatened by nonpoint source pollution. Pollution source categories and cause categories are as described in Table III-12a.

WATER BODY (Bay, Estuary, Coast)	POLLUTION CAUSE (POLLUTANT) CATEGORIES (Suspected)	POLLUTION SOURCE
Hudson River	Sediment CSO's?	Hydrologic/Habitat Modification-Dredging
Lower NY Bay	Sediment, Landfill Leachate, Heavy Metals Pathogens, Oils and Grease	Urban runoff, Hydrologic/Habitat Modification Construction, Land Disposal
Raritan Bay	Pathogens, Eutrophication, pH Depression, Landfill Leachate, Petroleum Contamination, Benzene and Other Volatiles, PCB's	Suburban Runoff, Natural: Acid Runoff, Landfill Leachate, Inplace Contaminants, Hazardous Waste Site Leachate.
Sandy Hook Bay	Pathogens, Siltation, Oil and Grease, Nutrients, Toxic Leachate	Construction, Suburban Runoff, Septic Tanks, Landfills.
Navesink River Shrewsbury River	Pathogens, Nutrients, Siltation, Oils and Grease	Agricultural Runoff: Crop and Animal (stored horse manure), Construction, Suburban Runoff, Septic Tanks, Natural (Waterfowl).
Shark River	Pathogens, Siltation, Nutrients	Agricultural (crop and animal holding), Construction, Suburban Runoff, Landfill, Natural (Waterfowl).
Manasquan River Metedeconk River	Pathogens, Siltation, Nutrients	Agricultural Runoff (cropland and animal holding), Suburban Runoff, Natural (Waterfowl).

APPENDIX D
(cont'd)

PRELIMINARY LIST OF WATERWAYS SUSPECTED OF BEING IMPACTED BY NONPOINT SOURCE POLLUTION: Estuaries, Bays, Coastal Waters.

WATER BODY (Bay, Estuary, Coast)	POLLUTION CAUSE (POLLUTANT) CATEGORIES (Suspected)	POLLUTION SOURCE
Barnegat Bay: including Kettle Creek Toms River, South to Tuckerton Creek	Pathogens, Siltation, Nutrients, Oils and Grease	Construction, Septic Systems, Suburban Runoff, Landfill Leachate, Natural (Waterfowl). (Forked River and Oyster Creek: Channelization, Spills, Inplace Contaminants).
Great Bay	Pathogens, Oil and Grease, Nutrients, Siltation	Construction, Suburban Runoff, Natural (Waterfowl).
Brigantine Reeds Bay Absecon Bay	Pathogens, Oils and Grease, Nutrients	Suburban Surface Runoff, Septic Systems, Boat Docking Facilities, Natural (Waterfowl).
Lakes Bay	Pathogens, Nutrients	Suburban Runoff, Marinas
Great Egg Harbor	Pathogens, Nutrients	Septic Systems, Natural (Waterfowl)
Cape May: Atlantic Estuaries	Pathogens	Suburban Surface Runoff, Marinas
Cape May: Delaware Bay Estuaries	Pathogens, Nutrients	Septic Systems, Natural (Waterfowl)
Delaware Bay Estuaries: (West Creek, Maurice River, Dividing Creek to Cohansey River)	Pathogens	Septic Systems, Natural (Waterfowl)

Appendix D
(cont'd)

PRELIMINARY LIST OF WATERWAYS SUSPECTED OF BEING IMPACTED BY NONPOINT SOURCE POLLUTION: Estuaries, Bays, Coastal Waters. (Continued)

WATER BODY (Bay, Estuary, Coast)	POLLUTION CAUSE (POLLUTANT) CATEGORIES (Suspected)	POLLUTION SOURCE
Atlantic Ocean: Chelsea Beach (near Shark River)	Pathogens	Natural (Birds on Pier).
Atlantic Ocean: All other beaches	Pathogens	Storm Sewers fed by Suburban Runoff.

A.C. Seaside Long Beach.

Appendix E. Summary of Existing State and Local Programs for Nonpoint Source Management

1. State

a. Regulatory Programs

Department of Environmental Protection

- Stormwater Management Program (N.J.S.A. 55D-93 et seq.; N.J.A.C. 7:8)

  Regulates management of storm water from new development and provides grants to local governments for development of local storm water management ordinances and plans.

- Water Quality Management Planning Program (N.J.S.A. 58:11A-1 et seq.; N.J.A.C. 7:15)

  Provides regulatory authority for consistent statewide and regional approaches for maintaining, improving, and protecting water quality.

- Water Pollution Control Act (N.J.S.A. 58:10A-1 et seq.; N.J.A.C. 7)

  Establishes the New Jersey Pollutant Discharge Elimination System (NJPDES) Permit Program to restrict and control the discharge of pollutants, including toxic and hazardous pollutants, and municipal and industrial waste, to both surface and groundwater. Authorizes the Department of Environmental Protection to adopt and enforce rules to prevent, control, or abate water pollution.

- County Environmental Health Program (N.J.S.A. 26:3A2-21 et seq.; N.J.A.C. 7:1H)

  Requires provision of water pollution and other environmental health services by county health departments or certified municipal or regional health agencies.

- Department of Environmental Protection Act of 1970 (N.J.S.A. 13:1D-1 et seq.)

  Directs the Department of Environmental Protection to formulate comprehensive policies for conservation, environmental protection, and pollution prevention. Authorizes the Department to perform registration, inspection, and enforcement activities, and to prepare, administer, supervise, and direct Statewide,

regional, and local programs of conservation and environmental protection.

- Sewage Infrastructure Improvement Act (L. 1988, c. 90)

  Provides for Department of Environmental Protection supervision of municipal storm sewer and NPS pollution abatement programs in four coastal counties, and of abatement of combined sewer overflows Statewide. Requires that stormwater collection systems built by State agencies be designed to abate adverse surface water quality impacts to the greatest extent feasible.

- Pesticide Control Program (N.J.S.A. 13:1F-1 et seq.; N.J.A.C. 7:30)

  Regulates the use, transportation, storage, sale, and disposal of pesticides.

- Stream Encroachment Program (N.J.S.A. 58:16A-50 et seq.; N.J.A.C. 7:13)

  Regulates structures and activities in the channels and flood plains of streams.

- Freshwater Wetlands Permit Program (N.J.S.A. 13:9B-1 et seq.; N.J.A.C. 7:7A)

  Regulates activities in freshwater wetlands.

- State Open Water Fill Permit Program (N.J.S.A. 58:10A-1 et seq.; N.J.A.C. 7:7A)

  Regulates discharge of dredged or fill material into most nontidal surface waters other than freshwater wetlands.

- Dam Program (N.J.S.A. 58:4-1 et seq.; N.J.A.C. 7:20)

  Regulates construction, modification, and maintenance of dams.

- Water Supply Management Program (N.J.S.A. 58:1A-1 et seq.; N.J.A.C. 7:19)

  Regulates diversion of surface and ground waters. Requires the New Jersey Statewide Water Supply Plan to include recommendations for protecting watershed areas.

- Individual Subsurface Sewage Disposal Program (N.J.S.A. 58:11-23 et seq.; N.J.A.C. 7:9-2)

  Controls design and installation of individual subsurface sewage disposal systems.

- Solid Waste Management Program (N.J.S.A. 13:1E-1 et seq.; N.J.A.C. 7:26)

  Regulates storage and transport of "solid waste" (including sludge and liquid waste), and construction, operation, and closure of solid waste facilities.

- Hazardous Waste Management Program (N.J.S.A. 13:1E-1 et seq., N.J.S.A. 13:1K-6 et seq., N.J.S.A. 58:10-23.11 et seq., N.J.S.A. 58:10A-1 et seq., N.J.S.A. 58:10A-21 et seq.; N.J.A.C. 7:1E, N.J.A.C. 7:14A, N.J.A.C. 7:14B, N.J.A.C. 7:26, N.J.A.C. 7:26B)

  Establishes requirements to prevent, contain, cleanup, and remove discharges of hazardous substances; regulates storage and transport of hazardous waste and construction, operation, and closure of hazardous waste facilities.

- Coastal Area Facilities Review (CAFRA) Program (N.J.S.A. 13:19-1 et seq.; N.J.A.C. 7:7, N.J.A.C. 7:7E)

  Involved in coastal area planning as well reviewing the siting of certain facilities in the State's designated "coastal area".

- Coastal Wetlands Permit Program (N.J.S.A. 13:9A-1 et seq.; N.J.A.C. 7:7, N.J.A.C. 7:7E)

  Regulates activities in designated "coastal wetlands".

- Waterfront Development Permit Program (N.J.S.A. 12:5-3; N.J.A.C. 7:7, N.J.A.C. 7:7E)

  Regulates construction activities in and adjacent to tidal water bodies of the State.

- Wild and Scenic Rivers Program (N.J.S.A. 13:8-45 et seq.; N.J.A.C. 7:38)

  Provides for designation of wild, scenic, or recreational rivers, and regulation of adjacent areas of land.

Departments of Agriculture, Environmental Protection, and Transportation

- Soil Erosion and Sediment Control Act (N.J.S.A. 4:24-39 et seq.; N.J.A.C. 2:90-1, N.J.A.C. 16:25A)

  Requires installation of "best management practices" to control soil erosion and sedimentation during construction, mining or quarrying, and other land disturbing activities (other than agriculture or horticulture).

Other Regulatory Programs

- Pinelands Protection Act (N.J.S.A. 13:18A-1 et seq.; N.J.A.C. 7:50)

  Protects, preserves and enhances the significant values of the resources of the Pinelands area of New Jersey.

- Hackensack Meadowlands Development Commission (N.J.S.A. 13:17-1 et seq.; N.J.A.C. 19-3 et seq.)

  Provides for reclamation, planning, development and redevelopment of the Hackensack Meadowlands.

- Delaware and Raritan Canal Commission (N.J.S.A. 13:13A-1 et seq.; N.J.A.C. 7:45)

  Provides for review of State and local actions that impact on the Delaware and Raritan Canal State Park.

- Beach Erosion Commission (N.J.S.A. 52:9J-1 et seq.)

  Protects and preserves the State's beaches and shorefront.

- Tidelands Resource Council (N.J.S.A. 13:1B-10, 13; N.J.S.A. 13:1D-18.2)

  Issues riparian leases and grants.

- Delaware River Basin Commission (N.J.S.A. 32:11D-1 et seq.)

  Develops and effectuates plans, policies and projects relating to the water resources of the Basin.

- Interstate Sanitation Commission (N.J.S.A. 32:18-1 et seq., N.J.S.A. 32:19-1 et seq.)

  Formed to abate existing and control future pollution in the harbor of New York.

- State Planning Commission (N.J.S.A. 52:18A-196 et seq.; N.J.A.C. 17:32)

  Requires a "State Development and Redevelopment Plan" which shall, among other things, protect the natural resources of the State, including wetlands, stream corridors, aquifer recharge areas, and steep slopes.

b. Voluntary Programs

Department of Environmental Protection

- Department of Environmental Protection Act of 1970 (N.J.S.A. 13:1D-1 et seq.)

  Authorizes the Department of Environmental Protection to conduct and supervise Statewide programs of environmental education, and to prepare educational bulletins in cooperation with the Department of Health.

- Water Pollution Control Act (N.J.S.A. 58:10A-1 et seq.)

  Empowers the Department of Environmental Protection to cooperate with other State, interstate, and Federal agencies, political subdivisions, and affected groups in furthering the purposes of the Water Pollution Control Act.

- Navesink River Shellfish Pollution Control Project

  An inter-governmental cooperative effort aimed at restoring water quality and the shellfish resources in the Navesink River through the implementation of best management practices designed to control bacteria caused by NPS pollution.

- Sewage Infrastructure Improvement Act (L. 1988, c. 90)

  Provides grants to municipalities in four coastal counties for inventory and mapping of storm sewer systems, water quality monitoring at storm sewer outfalls, and planning and design necessary to eliminate unpermitted interconnections of storm sewers and sanitary sewers. Provides grants to public entities Statewide for planning and design of measures to abate combined sewer overflows.

- N.J. Wastewater Treatment Financing Program (N.J.S.A. 58:11B-1 et seq.; P.L. 1985, c. 329; N.J.A.C. 7:22)

  Provides low interest loans for constructing and upgrading municipal wastewater treatment systems.

- State Flood Control Facilities (N.J.S.A. 58:16A-1 et seq.)

  Authorizes the Department of Environmental Protection to acquire, construct, and operate specific flood control facilities approved by acts of the Legislature.

- State Water Systems (N.J.S.A. 58:1B-1 et seq.)

  Authorizes the New Jersey Water Supply Authority to acquire, construct, and operate water systems.

- Green Acres (N.J.S.A. 13:8A-1 et seq.; N.J.A.C. 7:36)

  Authorizes the Department of Environmental Protection to acquire lands for conservation and recreation purposes, and to make grants for such purposes to municipal, county, or other political subdivisions.

Department of Agriculture

- Statewide Soil and Water Conservation Program (N.J.S.A. 4:24-1 et seq.)

  Provides technical and financial assistance to landowners for nonpoint source control.

- Agricultural Retention and Development Program (N.J.S.A. 4:1C-11 et seq.; N.J.A.C. 2:76, N.J.A.C. 2:90-2,3)

  Cost sharing program developed for farmers to implement "best management practices" to reduce nonpoint source pollution in farmland preservation areas.

- Right to Farm Program (N.J.S.A. 4:1C-1 et seq., N.J.S.A. 4:1C-26; N.J.A.C. 2:76-2)

  Provides for development of a program of recommended agricultural management practices for water quality control, for consideration of such practices by State regulatory agencies, and for immunity of agricultural operations in legal actions.

Department of Education

- Environmental Education Act (N.J.S.A. 18A:6-80 et seq.)

  Authorizes the Department of Education to promote elementary and secondary school environmental education programs.

Department of Transportation

- Highway Programs (N.J.S.A. 27; N.J.A.C. 16)

  Authorizes the Department of Transportation to construct and maintain State highways (including highway drainage systems), and to establish standards for construction and maintenance of State-assisted county and municipal roads.

c. Technical Assistance/Advisory Agencies

- Commission on Intergovernmental Relations (N.J.S.A. 52:9B-4)

  Formulates proposals for cooperation between New Jersey, other states and the federal government.

- Clean Water Council (N.J.S.A. 58:25-11, 12)

  Advises the Department of Environmental Protection on water pollution control matters.

- Pesticide Control Council (N.J.S.A. 13:1F-6 et seq.)

  Advises the Department of Environmental Protection on regulation and use of pesticides.

- Water Supply Advisory Council (N.J.S.A 13:1B-49.2 et seq.)

  Advises the Department of Environmental Protection and the New Jersey Water Supply Authority on water supply matters.

- Advisory Council on Solid Waste Management (N.J.S.A. 13:1E-7, 8)

  Advises the Department of Environmental Protection on solid waste management.

- Hazardous Waste Advisory Council (N.J.S.A. 13:1E-54 et seq.)

  Advises the Hazardous Waste Facilities Siting Commission and the Department of Environmental Protection on major hazardous waste facilities.

- New Jersey Sea Grant Extension

  Provides educational and technical advice on coastal resource issues.

- Rutgers Cooperative Extension

  Provides educational and technical support for various environmental concerns.

- Soil Conservation Act (N.J.S.A. 4:24-1 et seq.)

  Provides technical assistance for Best Management Practices that control soil erosion and sedimentation.

2. Local

a. Regulatory Programs (County/Municipal)

- Statewide Stormwater Management Program (where in existence under N.J.S.A. 40:55D-93 et seq. and N.J.A.C. 7:8)

  Requires municipalities (if grants are made available by the Department of Environmental Protection) to prepare stormwater management plans and ordinances that conform to Federal and State requirements and that are subject to approval by county planning boards or county water resources associations.

- Water Quality Management Planning Program (where designated under N.J.S.A. 58:11A-1 et seq.)

  Requires designated county or regional planning agencies to develop comprehensive areawide Water Quality Management Plans which describe long term needs and strategies for protecting and improving water quality within their planning areas.

- County Environmental Health Act (N.J.S.A. 26:3A2-21 et seq.; N.J.A.C. 7:1H)

  Requires county health departments, or certified municipal or regional health agencies, to provide environmental health services (including control of water pollution) which meet Department of Environmental Protection standards.

- Sewage Infrastructure Improvement Act (L. 1988, c. 90)

  Requires all municipalities with stormwater systems discharging into saline waters of Monmouth, Ocean, Atlantic, and Cape May counties to adopt a storm sewer/sanitary sewer map, eliminate unpermitted interconnections between storm and sanitary sewers, monitor water quality at storm sewer outfalls, and abate storm water contamination disclosed by such monitoring. Requires all public entities operating combined sewer systems in New Jersey to provide abatement measures at combined sewer overflow points.

- Soil Erosion and Sediment Control Act (N.J.S.A. 4:24-39 et seq.; N.J.A.C. 2:90-1)

  Requires soil conservation districts to control soil erosion and sedimentation from land disturbing activities (other than agriculture or horticulture), except where such control is provided by qualifying municipalities.

- Stream Encroachment Program (N.J.S.A. 58:16A-50 et seq.; N.J.A.C. 7:13)

  Requires municipalities or other responsible entities to adopt rules and regulations concerning the development and use of land in delineated flood fringe areas.

- Individual Subsurface Sewage Disposal Program (N.J.S.A. 58:11-23 et seq.; N.J.A.C. 7:9-2)

  Requires county, regional, or municipal boards of health (or bodies or officers exercising their powers) to certify that proposed individual subsurface sewage disposal systems comply with Department of Environmental Protection standards and local ordinances .

- Solid Waste Management Program (N.J.S.A. 13:1E-1 et seq.; N.J.A.C. 7:26)

  Requires county boards of chosen freeholders to adopt solid waste management plans, including recycling plans and provisions for sludge management. Requires municipalities to establish and implement municipal recycling programs.

- Hazardous Waste Management Program (N.J.S.A. 13:1E-64)

  Requires county health departments or local boards of health to conduct weekly inspections of major hazardous waste facilities.

- Pinelands Protection Act (N.J.S.A. 13:18A-1 et seq.; N.J.A.C. 7:50)

  Requires counties and municipalities to revise and enforce county and municipal master plans and local land use ordinances in order to implement the Pinelands Commission's comprehensive management plan.

b. Voluntary Programs (County/Municipal)

- County Environmental Health Act (N.J.S.A. 26:3A2-21 et seq.; N.J.A.C. 7:1H)

  Authorizes the Department of Environmental Protection to delegate administration of one or more aspects of the environmental health laws to county health departments. Authorizes county boards of health to adopt and enforce environmental health ordinances. Directs county health departments and certified health agencies to provide public information and citizen education services in environmental health matters.

- Water Quality Management Planning Program (N.J.S.A. 58:11A-1 et seq.; N.J.A.C. 7:15)

  Authorizes county planning boards to prepare county water quality management plans.

- Municipal Land Use Law (N.J.S.A. 40:55D-1 et seq.)

  Authorizes adoption of master plans, capital improvement programs, official maps, subdivision ordinances, site plan ordinances, and zoning ordinances which may address (and are sometimes required to address) such NPS-related matters as drainage, erosion and flood control, sewage disposal, natural resources conservation, and land use.

- County Master Plans (N.J.S.A. 40:27-2)

  Authorizes county master plans to recommend locations for conservation, water supply, sanitary and drainage facilities.

- Home Rule Act (N.J.S.A. 40:48-1 et seq.)

  Authorizes municipalities to adopt and enforce ordinances, not contrary to state or federal law, for the protection of persons and property, and for the preservation of the public health, safety and welfare of the municipality.

- Public Health Statutes (N.J.S.A. 26:1A-1 et seq., N.J.S.A. 26:3-1 et seq., N.J.S.A. 26:3A2-1 et seq.)

  Authorizes local boards of health (or other municipal bodies or officers exercising their powers), regional health commissions, and county boards of health to abate public health nuisances, and to adopt and enforce ordinances to protect public health.

- Statewide Soil and Water Conservation Program (N.J.S.A. 4:24-1 et seq.)

  Provides funding through a cost share mechanism to implement soil and water best management practices.

- Agricultural Retention and Development Program (N.J.S.A. 4:1C-1 et seq.; N.J.A.C. 7:26)

  Authorizes counties and municipalities to establish farmland preservation programs; requires implementation of best management practices in such programs to reduce erosion and sedimentation and improve water quality.

- Conservation Operations Program (N.J.S.A. 4:24-1 et seq.)

  Provides technical assistance to landowners through local soil conservation districts.

- County Subdivision/Site Plan Review (N.J.S.A. 40:27-6.1 et seq.)

  Authorizes counties to approve subdivisions and site plans affecting county road or drainage facilities.

- Municipal Sewerage and Drainage Statutes (N.J.S.A. 40:63-1 et seq.)

  Authorizes municipalities to construct, acquire, operate, and maintain municipal sewerage and drainage systems, to prescribe charges and restrictions as to connection with and use of such systems, and to regulate construction of sewers and drains.

- Local Sewerage and Drainage Improvements (N.J.S.A. 40:56-1 et seq.)

  Authorizes municipalities to construct sewerage and drainage systems as "local improvements" (with costs or portions thereof assessed upon nearby lands benefited thereby).

- Municipal Street Cleaning (N.J.S.A. 40:66-1)

  Authorizes municipalities to provide for street cleaning.

- County Drainage Works (N.J.S.A. 40:30-18 et seq.)

  Authorizes counties to construct, operate, and maintain drainage works and control the flow of surplus and surface waters.

- County and Local Roads (N.J.S.A. 27:13 et seq.)

  Authorizes counties and municipalities to construct and maintain roads, including road drainage systems.

- Animal Control Programs (N.J.S.A. 26:3-31, N.J.S.A. 40:48-1)

  Authorizes local boards of health and municipal governing bodies to regulate or prohibit the keeping of animals.

- Litter Control Programs (N.J.S.A. 13:1E-92 et seq.)

  Authorizes grants to eligible counties and municipalities for litter pickup and removal programs.

- Stream Encroachment Program (N.J.S.A. 58:16A-50 et seq.; N.J.A.C. 7:13)

  Authorizes the Department of Environmental Protection to delegate administration of the stream encroachment program to consenting counties. Authorizes counties and municipalities to review stream encroachments in small drainage areas.

- County Stormwater Control and Drainage Planning (N.J.S.A. 58:16A-55.4)

  Authorizes county governing bodies to prepare stormwater control and drainage plans for use in the stream encroachment program.

- County Flood Control Facilities (N.J.S.A. 40:23-34 et seq.)

  Authorizes counties to purchase, construct, and operate facilities for flood control and management of surface water.

- Joint Flood Control Commissions (N.J.S.A. 40:14-16 et seq.)

  Authorizes municipalities and counties to establish joint flood control commissions to alleviate and prevent floods.

- Water Supply Facilities (N.J.S.A. 40:14B-1 et seq., N.J.S.A. 40:14C-1 et seq., N.J.S.A. 40:62-47 et seq.)

  Authorizes municipalities, counties, municipal utilities authorities, and county utilities authorities to acquire, construct, and operate water supply facilities.

- Parks and Public Lands (N.J.S.A. 40:37-1 et seq., N.J.S.A. 40:56A-1 et seq., N.J.S.A. 40:61-1 et seq., N.J.S.A. 40A:12-1 et seq.)

  Authorizes municipalities and counties to acquire real property or interests therein for park or conservation purposes.

- On-Site Wastewater Systems (N.J.S.A. 40:14A-7, N.J.S.A. 40:14B-20)

  Authorizes sewerage authorities, municipal utilities authorities, and county utilities authorities to inspect on-site wastewater systems and abate nuisances created by such systems. (Also see "Public Health Statutes" above.)

- Solid Waste Management (N.J.S.A. 40:14B-1 et seq., N.J.S.A. 40:37A-44 et seq., N.J.S.A. 40:66-1 et seq., N.J.S.A. 40:66A-1 et seq.)

  Authorizes municipalities, counties, municipal utilities authorities, county utilities authorities, county improvement authorities, incinerator authorities, and solid waste management authorities to provide solid waste services and facilities.

Appendix F

DEPOSITORY LIBRARIES FOR NEW JERSEY DOCUMENTS
As of July 1988

College Libraries

Camden County College. Blackwood, NJ
Drew University. Madison, NJ
Fairleigh Dickinson University. Rutherford, NJ
Glassboro State College. Glassboro, NJ
Jersey City State College. Jersey City, NJ
Montclair State College. Upper Montclair, NJ
Monmouth College. West Long Branch, NJ
Kean College of New Jersey. Union, NJ
Ocean County College. Toms River, NJ
Princeton University. Princeton, NJ
Ramapo College of New Jersey. Mahwah, NJ
Richard Stockton State College. Pomona, NJ
Rider College. Lawrence Township, NJ
Rutgers, the State University:
- Alexander/Sci Med. New Brunswick, NJ
- Kilmer Area. Piscataway, NJ
- Douglass College. New Brunswick, NJ
- College of Arts and Sciences, Newark. Newark, NJ
- Law School, Newark. Newark, NJ.
- College of Arts and Sciences, Camden. Camden, NJ

Seton Hall University. South Orange, NJ
Seton Hall University, Law School. Newark, NJ
Trenton State College. Ewing, NJ
William Paterson College of New Jersey. Wayne, NJ
Salem Community College. Penns Grove, NJ

County Libraries

Atlantic County Library. Mays Landing, NJ
Burlington County Library. Mount Holly, NJ
Camden County Library. Echelon Urban Complex, Voorhees, NJ
Cape May County Free Library. Cape May Court House, NJ
Cumberland County Library. Bridgeton, NJ
Monmouth County Library. Freehold, NJ
Morris County Free Library. Whippany, NJ
Ocean County Library. Toms River, NJ
Somerset County Library. Somerville, NJ
Sussex County Library. Newton, NJ

Public Libraries

Bloomfield, NJ, Public Library
Cherry Hill, NJ, Free Public Library
East Brunswick, NJ, Public Library
East Orange, NJ, Free Public Library
Elizabeth, NJ, Free Public Library
Hackensack, NJ, Johnson Free Public Library
Jersey City, NJ, Free Public Library
Linden, NJ, Public Library
New Brunswick, NJ, Free Public Library
Newark, NJ, Public Library
Paterson, NJ, Public Library
Phillipsburg, NJ, Public Library
Plainfield, NJ, Public Library
Ridgewood, NJ, The Library
Trenton, NJ, Public Library
Wayne, NJ, Public Library
Woodbridge, NJ, Free Public Library
Woodbury, NJ, Public Library

Out-Of-State Libraries

Albany, New York. New York State Library
Chicago, Illinois. Center for Research Libraries
Lexington, Kentucky. Council of State Governments
New York, New York. PAIS/New York Public Library (5th Avenue)
Philadelphia, Pennsylvania. Free Public Library of Philadelphia
Sacramento, California. California State Library
Washington, DC. Library of Congress

DEPARTMENT OF COMMERCE

ECONOMIC DEVELOPMENT ADMINISTRATION

Economic Development - Grants for Public Works and Development Facilities
Economic Development - Business Development Assistance
Economic Development - Public Works Impact Projects
Economic Development - State and Local Economic Development Planning

DEPARTMENT OF DEFENSE

DEPARTMENT OF THE ARMY, OFFICE OF THE CHIEF OF ENGINEERS

Flood Plain Management Services
Protection of Essential Highways, Highway Bridge Approaches, and Public Works
Flood Control Projects
Navigation Projects
Snagging and Clearing for Flood Control
Protection, Clearing and Straightening Channels

DEPARTMENT OF THE ARMY, NATIONAL GUARD BUREAU

Military Construction, Army National Guard

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

COMMUNITY PLANNING AND DEVELOPMENT

Community Development Block Grants/Entitlement Grants
Community Development Block Grants/Small Cities Program
Urban Development Action Grants
Community Development Block Grants/State's Program

DEPARTMENT OF THE INTERIOR

BUREAU OF LAND MANAGEMENT

Non-Sale Disposals of Mineral Material

U.S. FISH AND WILDLIFE SERVICE

Anadromous Fish Conservation
Resource Containment Assessment
Fish and Wildlife Management Assistance
Wildlife Restoration

GEOLOGICAL SURVEY

Assistance to State Water Resources Research Institutes

Describe CA&RA Permit Process V-5 of Green
Describe Drainage Basin 2-21 of Green
Describe BMTs - Get from CA&RA reqs
Maw Then describe new ones Chpt 5 Green

open forums

(1) Who are stormwater reqs binding on?

- Mandatory [illegible] ending - do there?
- V-2 says [illegible] ?
- How mar [illegible] steel sw man plan
  to dar [illegible]
  Cooks c [illegible]
- Stormwa [illegible] 'y apply
  90 [illegible]
  35% of drainage [illegible] 848 sq miles
  [illegible] 1,211 outside
  6 15,000 of pop inside
  520,000 outside

Although most municipals have A&S [illegible]