

MARYLAND DEPARTMENT OF THE ENVIRONMENT
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
MUNICIPAL SEPARATE STORM SEWER SYSTEM DISCHARGE PERMIT

PART I. IDENTIFICATION

A. **Permit Number:** MS-BA-94-005

B. **Permit Area**

This permit covers stormwater discharges from the municipal separate storm sewer system in Baltimore County, Maryland.

C. **Effective Date:** November 17, 1994

D. **Expiration Date:** November 17, 1999

PART II. STANDARD PERMIT CONDITIONS

A. **Legal Authority**

1. By 5/17/95, Baltimore County shall develop and incorporate into Baltimore County Code an ordinance which satisfies the legal requirements stipulated in 40 Code of Federal Regulations (CFR) 122.26(d)(2)(i) for municipal separate storm sewer system discharges. The above referenced ordinance shall remain in effect for the duration of this National Pollutant Discharge Elimination System (NPDES) permit.
2. By 5/17/95, Baltimore County shall provide legal certification that the ordinance referenced in A.1. above is in accordance with 40 CFR 122.26(d)(2)(i) for municipal separate storm sewer system discharges.

B. **Source Identification**

1. By 5/17/95, Baltimore County shall establish procedures for recording any new source identification information and submitting this information to Maryland Department of the Environment (MDE) in accordance with Part IV "ANNUAL PROGRESS REPORTS" of this permit.
2. By 5/17/96, Baltimore County shall compile on GIS all source identification information requested in 40 CFR 122.26(d)(1)(iii) and 122.26(d)(2)(ii), which includes the identification and mapping of storm sewer system outfalls, land use activities, population estimates, runoff coefficients, major structural controls, landfills and controls, publicly owned lands, NPDES dischargers, and industries organized by watershed and Standard Industrial Classification (SIC) codes. (Alternate condition -- for pilot watershed, then expand)

C. Discharge Characterization

CONSENT ORDER REQUIRES THIS INFORMATION TO BE SUBMITTED BY MAY 2, 1994.

1. By 5/17/95, Baltimore County shall submit any outstanding storm event monitoring data and analysis to MDE. This shall include three storm events at each of the five approved Part 2 monitoring sites.
2. By 5/17/95, Baltimore County shall propose sampling sites for its long-term monitoring program. These sites shall include at least one residential site, one commercial site, and one industrial site. An in-stream ambient station shall be proposed downstream of each site.
3. Within 6 months of MDE's approval of Baltimore County's proposed long-term monitoring sites, the county shall commence sampling at an approved outfall and its appropriate in-stream monitoring station.
4. Sampling at the remaining outfalls and in-stream stations shall begin on a schedule of one outfall and its associated in-stream station every six months until sampling is being performed at all approved sites.
5. Baltimore County shall complete the following minimum requirements:
 - a) A total of 12 storm events shall be monitored at each site per year with at least 3 storm events occurring per quarter. Quarters shall be based on calendar year. If extended dry weather periods occur, baseflow samples shall be taken at least once per month. If no flow is observed at the outfall during periods of dry weather, samples shall be taken at the in-stream monitoring stations only.
 - b) Three discrete samples shall be taken for stormwater flow at both outfall and in-stream monitoring stations. Samples submitted for analysis shall be representative of the approximate flow at the following three intervals along the hydrograph: the midpoint of the rising limb, the peak, and the midpoint of the falling limb.
 - c) Flow rates shall be recorded at points when discrete samples are taken.
 - d) Collected samples shall be submitted to an Environmental Protection Agency (EPA) certified laboratory for analysis according to methods listed under 40 CFR Part 136 and analyzed for the following parameters:

BOD ₅	Fecal Coliform	TSS
TKN	Nitrate plus Nitrite	
Total Phosphorus	Cadmium	
Copper	Lead	
Zinc	Oil and Grease	
pH	Water Temperature	
6. For each storm event, a description of any equipment problems and weather conditions such as duration and intensity shall be recorded.

7. Reporting Frequency and Requirements
 - a) Laboratory results shall be recorded on MDE's long-term monitoring database (Appendix 3) and submitted with annual reports.
 - b) Annual and seasonal pollutant load estimates, using data collected as a result of long-term monitoring, shall be submitted with annual reports.
 - c) Pollutant loads shall be estimated for all identified municipal storm sewer outfalls.
 - d) By 11/17/98, Baltimore County shall use monitoring data from existing in-stream monitoring stations to further refine pollutant load estimates.
 - e) By 11/17/98, Baltimore County shall assess its monitoring program and outline potential alternative sampling sites and procedures.

D. Management Programs

1. Baltimore County shall maintain an acceptable stormwater management program in accordance with the Environment Article, Title 4, Subtitle 2, Annotated Code of Maryland.
2. Baltimore County shall conduct maintenance inspections of all stormwater management facilities at least once every three years. Inspections, necessary corrective action, and enforcement actions shall be documented and summarized in annual reports.
3. Baltimore County shall submit information regarding stormwater management on the latest version of MDE's stormwater management spreadsheet (Appendix 4) in annual reports.
4. (?)By 11/17/94, Baltimore County shall develop and implement stormwater management procedures for significant redevelopment in areas other than the Critical Area.
5. (?)By 5/17/94, Baltimore County shall implement its proposed Watershed Survey Program for the identification of stormwater pollutants. By 5/17/96, Baltimore County shall complete watershed surveys for all storm sewer outfall drainage areas in the county.
6. (?)By 5/17/94, Baltimore County shall submit an implementation schedule for its proposed pilot stormwater management studies for residential, commercial, and industrial land uses. These pilot studies shall be coordinated with Baltimore County's long-term monitoring program. Beginning in 1995, Baltimore County shall include analyses of pilot studies in its annual reports including proposals for the expansion of successful pilot studies.
7. (?)By 5/17/94, Baltimore County shall implement its Brick Cleaning and Waste Water Program including procedures for inspection and enforcement.

8. (?)By 5/17/95, Baltimore County shall implement its proposed programs for the control of pesticide, herbicide, and fertilizer use. These programs shall include the inspection of storage areas, the assessment of monitoring and GIS data, the development of a pesticide task force, the assessment of Integrated Pest Management (IPM) techniques, and working with MDE on its "Residential Pesticide Usage and Levels in Urban Surface Waters" study.
9. (?)By 5/17/95, Baltimore County shall perform an assessment regarding the effects of road maintenance activities including street sweeping, litter control, deicing procedures, and the application of herbicides for vegetation control on stormwater discharges. This assessment shall include an analysis of alternative practices for reducing pollutants associated with road maintenance activities. By 11/17/95, Baltimore County shall incorporate effective alternative practices in its road maintenance procedures for reducing pollutants.
10. (?)Baltimore County shall perform cost/benefit analyses of potential retrofit sites and alternative source control measures and develop a priority list for implementation. These analyses and an implementation schedule shall be included in its 1996 annual report.
11. (?)By 11/17/94, Baltimore County shall implement its proposed educational program for reducing stormwater pollutants. Educational materials shall include information on illicit discharges and reporting, reducing fertilizer and pesticide use, and the proper disposal of household wastes. Additionally, the county shall integrate educational efforts with local volunteer groups.
12. By 11/17/94, Baltimore County shall begin implementing its illicit connection program as a pilot study and screen at a minimum 50 outfalls within the year. By 11/17/95, Baltimore County shall complete its *Manual of Practice for Detection and Removal of Illicit Connections* which shall include a detailed description of procedures for the investigation of illicit connections and enforcement protocol. Additionally, by 11/17/95, Baltimore County shall expand its pilot study and screen at least 200 outfalls per year. Field screening results shall be submitted on MDE's Part 1 field screening database as part of its annual report submittal. Any industrial dischargers that are discovered as a result of the county's program shall be required to obtain an NPDES permit from MDE.
13. Baltimore County shall maintain an acceptable erosion and sediment control program in accordance with the Environment Article, Title 4, Subtitle 1, Annotated Code of Maryland.
14. (?)Baltimore County shall continue its "responsible personnel" certification classes to educate construction site operators regarding erosion and sediment control requirements for the term of this permit.
15. (?)By 11/17/95, Baltimore County shall conduct a pilot study for assessing the effects of sanitary sewer system leaks on stormwater discharges and provide a schedule for expanding its assessment program system-wide. As maintenance problems are discovered, they will be forwarded to the county's sewer maintenance section for correction. As sanitary sewer system leaks are diagnosed, Baltimore County shall propose a schedule for correcting them in the

following year's capital improvement program.

E. Program Funding

1. By 5/17/95, Baltimore County shall submit a fiscal analysis of the capital, operation, and maintenance expenditures necessary to comply with all conditions of this permit.
2. Baltimore County shall maintain adequate program funding to comply with all conditions of this permit.

F. Assessment of Controls

1. Annually, Baltimore County shall submit estimates of expected pollutant load reductions as a result of its proposed management programs.

PART III. SPECIAL PROGRAMMATIC CONDITIONS

Since the signing of the Chesapeake Bay Agreement in 1983, Maryland has been working toward meeting the goal of reducing by 40% the discharge of nutrients to the Chesapeake Bay by the year 2000. To achieve this nutrient goal, MDE has developed strategies to improve the water quality in the tributaries that drain to the Bay. MDE has subdivided the Bay watershed into ten major tributaries which have each been assigned a 40% nutrient reduction goal. Characterizations of specific tributaries have been made in terms of land use, nutrient loads, and water quality. Additionally, strategy options have been developed based on identified problems in order to guide the restoration effort in each individual tributary.

Baltimore County lies within two of the Chesapeake Bay's ten major tributaries that being the Upper Western Shore and Patapsco/Back. This NPDES permit requires Baltimore County to assist with the implementation of the strategy designed to meet the nutrient reduction goals in the Upper Western Shore and Patapsco/Back tributary. The specific permit conditions presented below will promote a watershed based approach to controlling the contribution of pollutants from stormwater runoff. Coordination between and among other jurisdictions is a major requirement and the identification of those appropriate jurisdictions will occur jointly with MDE. Additionally, deadlines, priorities, and scheduling to satisfy specific conditions will be determined in conjunction with MDE. In any case, progress toward meeting these conditions shall be reported to MDE.

A. Programmatic Coordination

1. Baltimore County shall coordinate water quality restoration and protection efforts in watersheds shared with other jurisdictions. These efforts shall include:
 - a) the exchange of information on restoration/protection program effectiveness;
 - b) the definition of watershed management measures to support restoration/protection efforts;
 - c) the identification of appropriate watershed boundaries for planning and program development efforts; and

d) the coordination of planning and zoning activities to support the goals of watershed management.

B. Data Management

1. Baltimore County shall develop standards for record keeping and databases to meet the standard permit conditions in Part II of this permit. These standards shall be developed in concert with other appropriate jurisdictions and include:

- a) management practice databases and GIS compatibility among jurisdictions for base maps, pollutant source area locations, stormwater management facility location and description, and land use and zoning designations;
- b) comparable population estimates and growth projections; and
- c) consistent land use and runoff coefficients.

C. Discharge Characterization

1. Baltimore County shall develop standards for discharge characterization. These standards shall be developed in concert with other appropriate jurisdictions and include:

- a) coordination of long term monitoring site selection among other appropriate jurisdictions;
- b) standards for field and laboratory methods;
- c) standards for monitoring databases; and
- d) standards for annual and seasonal pollutant load estimates.

D. Management Programs

1. Baltimore County shall develop management program standards. These standards shall be developed in concert with other appropriate jurisdictions and include:

- a) acceptable preventative maintenance procedures;
- b) watershed management plans and retrofit assessments;
- c) development and implementation of public information and educational programs; and
- d) watershed inventories, illicit discharge inspection programs, and water quality enforcement.

E. Assessment of Controls and Annual Progress Reporting

1. Baltimore County shall develop standards for loading reduction estimates, annual progress reports, and stormwater management program effectiveness.
2. Along with other jurisdictions, Baltimore County shall evaluate the cumulative impact of its stormwater management waiver policy with regard to receiving water quality.

PART IV. ANNUAL PROGRESS REPORTS

Annual progress reports required under 40 CFR 122.42(c) will facilitate the long-term assessment of Baltimore County's NPDES stormwater program. According to EPA guidance, these reports shall be based on assessment techniques proposed by jurisdictions in Part 2 NPDES applications. These reports shall include:

§122.42(c) "(1) The status of implementing the components of the storm water management program that are established as permit conditions;"

§122.42(c) "(2) Proposed changes to the storm water management programs that are established as permit conditions...;"

§122.42(c) "(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application...;"

§122.42(c) "(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year;"

§122.42(c) "(5) Annual expenditures and budget for year following each annual report;"

§122.42(c) "(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs;"

§122.42(c) "(7) Identification of water quality improvements or degradation;"

MDE has developed a spreadsheet (Appendix 4) for the reporting and tracking of NPDES data. This spreadsheet lists components of Baltimore County's NPDES stormwater program along with appropriate reporting parameters. Annual progress reports, including MDE's spreadsheet, shall be submitted to MDE by the anniversary date of permit issuance for each year of the permit term.

PART V. ENFORCEMENT AND PENALTIES

A. Program Review and Evaluation

In order to assess the effectiveness of the permittee's NPDES program for eliminating non-stormwater discharges and reducing the discharge of pollutants to the maximum extent possible, MDE will review and evaluate program implementation, annual reports, and periodic data submittals on an annual basis. Procedures for the review of local erosion and sediment control and stormwater management programs exist in Maryland's Sediment Control and Stormwater Management Laws. Additional periodic reviews and evaluations will be conducted to determine compliance with the permit conditions. Continuation or reissuance of this permit beyond November 17, 1998 will be subject to

MDE's review and evaluation of Baltimore County's compliance and implementation of the conditions of this permit.

B. Discharge Prohibitions and Receiving Water Limitations

The permittee shall effectively prohibit non-stormwater discharges through its municipal separate storm sewer system. NPDES permitted non-stormwater discharges are exempt from this prohibition. Discharges from the following will not be considered a source of pollutants when properly managed: water line flushing; landscape irrigation; diverted stream flows; rising ground waters; uncontaminated ground water infiltration to separate storm sewers; uncontaminated pumped ground water; discharges from potable water sources; foundation drains; air conditioning condensation; irrigation waters; springs; footing drains; lawn watering; individual residential car washing; flows from riparian habitats and wetlands; dechlorinated swimming pool discharges; street wash water; and fire fighting activities. The discharge of stormwater containing pollutants which have not been reduced to the maximum extent practicable is prohibited.

The permittee shall not cause the contamination or other alteration of the physical, chemical, or biological properties of any waters of the State, including a change in temperature, taste, color, turbidity, or odor of the waters or the discharge or deposit of any organic matter, harmful organism, or liquid, gaseous, solid, radioactive, or other substance into any waters of the State, that will render the waters harmful to:

- (1) Public health, safety, or welfare;
- (2) Domestic, commercial, industrial, agricultural, recreational, or other legitimate beneficial use;
- (3) Livestock, wild animals, or birds; or
- (4) Fish or other aquatic life.

C. Duty to Mitigate

The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

D. Duty to Comply

The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; permit termination, revocation and reissuance, or modification; or denial of a permit renewal application. The permittee shall comply at all times with the provisions of the Environment Article, Title 4, Subtitles 1, 2, and 4; Title 7, Subtitle 2; and Title 9, Subtitle 3 of the Annotated Code of Maryland.

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the

permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by the permittee only when the operation is necessary to achieve compliance with the conditions of the permit.

E. Sanctions

1. Penalties Under the CWA - Civil and Criminal

The CWA provides that any person who violates any permit condition is subject to a civil penalty not to exceed \$25,000 per day for each violation. Any person who negligently violates any permit condition is subject to criminal penalties of \$2,500 to \$25,000 per day of violation, or imprisonment of not more than 1 year, or both. Any person who knowingly violates any permit condition is subject to criminal penalties of \$5,000 to \$50,000 per day of violation, or imprisonment for not more than 3 years, or both.

2. Penalties Under the State's Environment Article - Civil and Criminal

Nothing in this permit shall be construed to preclude the institution of any legal action nor relieve the permittee from civil or criminal responsibilities and/or penalties for noncompliance with Title 4, Title 7, and Title 9 of the Environment Article, Annotated Code of Maryland, or any federal, local, or other State law or regulation.

The Environment Article, §9-342, Annotated Code of Maryland, provides that any person who violates a permit condition is subject to a civil penalty up to \$1,000 for each violation, but not exceeding \$50,000 total. The Environment Article, §9-343, Annotated Code of Maryland, provides that any person who willfully or negligently violates a permit condition is subject to a criminal penalty not exceeding \$25,000 or imprisonment not exceeding 1 year, or both.

The Environment Article, §9-343, Annotated Code of Maryland, provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than six months per violation, or both.

The Environment Article, §9-343, Annotated Code of Maryland, provides that any person who knowingly makes any false statement, representation, or certification in any records or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction, be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than six months per violation, or both.

F. Permit Revocation and Modification

1. Permit Actions

This permit may be modified, revoked, or terminated for cause. The filing of a request by the permittee for a permit modification, or a notification of planned changes or

anticipated noncompliance does not stay any permit condition. A permit may be modified by the Department upon written request by the permittee and after notice and opportunity for a public hearing in accordance with and for the reasons set forth in the Code of Maryland Regulations (COMAR) 26.08.04.10 C.

After notice and opportunity for a hearing and in accordance with COMAR 26.08.04.10., the Department may modify, suspend, or revoke and reissue this permit in whole or in part during its term for causes including, but not limited, to the following:

- a) Violation of any terms or conditions of this permit;
- b) Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts;
- c) A change in any condition that requires either a temporary reduction or elimination of the authorized discharge; or
- d) A determination that the permitted discharge poses a threat to human health or welfare or to the environment and can only be regulated to acceptable levels by permit modification or termination.

2. Duty to Provide Information

The permittee shall furnish to the Department, within a reasonable time, any information which the Department may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit; or to determine compliance with this permit. The permittee shall also furnish to the Department, upon request, copies of records required to be kept by this permit.

G. Property Rights

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, State, or local law or regulations.

H. Severability

The provisions of this permit are severable. If any provision of this permit shall be held invalid for any reason, the remaining provisions shall remain in full force and effect. If the application of any provision of this permit to any circumstance is held invalid, its application to other circumstances shall not be affected.

I. Signature of Authorized Administrator and Jurisdiction

All applications, reports, or information submitted to the Department shall be signed as required by COMAR 26.08.04.01 D. As in the case of municipal or other public facilities, signatories shall be either a principal executive officer, ranking elected official, or other duly authorized employee.

J.L. Hearn, Director
Water Management Administration

Date

APPENDIX 1

DISCHARGE PERMIT APPLICATION SUMMARY

APPENDIX 1

MARYLAND DEPARTMENT OF THE ENVIRONMENT

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM MUNICIPAL SEPARATE STORM SEWER SYSTEM DISCHARGE PERMIT APPLICATION SUMMARY

BALTIMORE COUNTY

PART I. STATEMENT OF AUTHORITY

A. United States Environmental Protection Agency

Section 402 of the Clean Water Act (CWA) prohibits the discharge of any pollutant to waters of the United States from a point source, unless that discharge is authorized by a National Pollutant Discharge Elimination System (NPDES) permit. Under the provisions of the NPDES regulations, stormwater discharges from municipal separate storm sewer systems are considered point sources that require an NPDES permit.

B. State of Maryland

The Maryland Department of the Environment (MDE) has been granted authority by the United States Environmental Protection Agency (EPA) to issue NPDES permits in accordance with statutory requirements promulgated by the CWA. The Environment Article, Title 9, Subtitle 3, Part IV, Annotated Code of Maryland requires a discharge permit for any activity that could cause or increase the discharge of pollutants into waters of the State. Additionally, Code of Maryland Regulations (COMAR) 26.08.04 requires MDE to administer the NPDES program as part of the State's own discharge permit system. These regulations also define municipal separate storm sewer systems as point sources of pollution subject to NPDES permit requirements.

C. Permittee Responsibilities

Section 402(p) of the CWA, as amended by the Water Quality Act of 1987, requires NPDES permits for stormwater discharges from large municipal separate storm sewer systems. A large municipal separate storm sewer system is defined in the CWA as serving a population of 250,000 or more. Baltimore County, according to the United States Department of Commerce's 1990 Census, has a total population of 697,900 and is therefore considered a large municipality. As a result, the county was required to submit a two-part NPDES permit application. Baltimore County has submitted an NPDES stormwater application that was prepared to satisfy the EPA's regulations for permitting stormwater discharges from municipal separate storm sewer systems. Appendix 1 summarizes the county's NPDES stormwater application. NPDES regulations require permit conditions that effectively prohibit non-stormwater discharges and reduce the discharge of pollutants to the "maximum extent practicable." Specific permit conditions are outlined in Permit # MS-BA-94-005 and Appendix 2. Appendix 3 outlines MDE's long-term monitoring database and a spreadsheet for the reporting and

tracking of NPDES data is included as Appendix 4. Additionally, NPDES regulatory requirements can be found in Appendix 5.

PART II. BACKGROUND

A. Problems Associated with Stormwater Pollutants

Pollutants in stormwater discharges from many sources are largely uncontrolled. The *National Water Quality Inventory, 1990 Report* to Congress provides a general assessment of water quality based on biennial reports submitted by the States under Section 305(b) of the CWA. This report indicates that roughly 30% of identified cases of water quality impairment are attributable to stormwater discharges. During rain events that produce runoff, numerous pollutants including sediment, nutrients, bacteria, oil, metals, and pesticides are washed into storm sewer systems from diffuse sources such as construction sites, residential neighborhoods, commercial areas, parking lots, roads, and industrial facilities. Additionally, illegal dumping, sanitary sewer system leaks, and illicit connections to storm sewer systems can be significant sources of pollutants. Some of the more serious effects to receiving waters are the contamination of drinking water supplies, restrictions on water contact recreation, loss of wildlife habitat, decreases in the number and variety of aquatic organisms, and fish kills.

B. History of NPDES Stormwater Program

Efforts to improve water quality under the NPDES program have traditionally focused on reducing pollutants in point source discharges from industrial facilities and municipal sewage treatment plants. In response to the need for controlling stormwater discharges, Congress amended the CWA in 1987 requiring the EPA to establish NPDES requirements for stormwater discharges. In November 1990, EPA issued final stormwater regulations for eleven categories of industry and certain municipal separate storm sewer systems. As part of the municipal stormwater program, jurisdictions in Maryland operating large municipal storm sewer systems must submit a two-part application to MDE outlining programs for monitoring and controlling stormwater discharges. Required information includes Legal Authority, Source Identification, Discharge Characterization, Management Programs, Assessment of Controls, and Fiscal Resources.

C. Maryland's Perspective

Maryland's efforts to reduce stormwater pollution have focused on protecting and restoring the water quality of Chesapeake Bay. The Maryland General Assembly passed the Erosion and Sediment Control Law in 1970 to control runoff from construction sites and in 1982 passed the Stormwater Management Act which requires that appropriate Best Management Practices (BMP) be used for new development in order to maintain, as nearly as possible, the pre-development runoff conditions. Additionally, the Chesapeake Bay Program, a cooperative effort among the major Bay states and the federal government, has elevated the importance of stormwater management programs in Maryland by establishing a 40% nutrient reduction goal to the Chesapeake Bay and, more recently, by focusing cleanup efforts on the Bay's tributaries. Although Maryland's existing programs will aid local jurisdictions in satisfying NPDES stormwater requirements, additional stormwater control measures will be needed for full compliance with the federal program.

PART III. APPLICATION SUMMARY

A. Jurisdiction Description

1. Physical Data

Baltimore County is located in central Maryland and surrounds the State's largest City, Baltimore. The County is bounded on the north by Pennsylvania's York County, on the east by Harford County, on the South by Anne Arundel County and on the West by Howard and Carroll counties. According to the *Soil Survey, Baltimore County, Maryland (1976)*, 173 miles of the county's southern extremity borders the Chesapeake Bay. Baltimore County has a total land area of 390,400 acres or, 610 square miles. The northern portion of the County is predominately agricultural land with small villages, while central and southern Baltimore County are urbanized or rapidly developing due to their proximity to Baltimore City. All areas immediately adjacent to Baltimore City have extensive residential communities. In addition to these residential areas, land adjacent to the Patapsco River south and east of Baltimore are heavily industrialized while development to the west and north is more commercial. According to projections made by Maryland Office of Planning (MdOP) Baltimore County's population is expected to grow by 4% between 1990 and the year 2,000, increasing its 1990 population of 697,900 to 726,400 by the turn of the century.

2. Hydrologic Information

Baltimore County lies within two physiographic provinces, the Atlantic Coastal Plain and the Piedmont Plateau. Drainage patterns are generally from the Northwestern part of the county where elevations are over 900 feet to the Southeastern corner where county marshes meet Chesapeake Bay at sea level. The northern areas of the county are drained by Little Gunpowder and Gunpowder Falls. Western and southern portions of the county drain via the Patapsco River and the county's southeastern quadrant drains into Chesapeake Bay via Middle and Back Rivers.

According to the *Soil Survey, Baltimore County, Maryland (1976)*, the county's climate is moderate with four well defined seasons. The warmest temperatures occur in late July and early August when average daily highs reach 83° farenheight and the coldest temperatures occur in the last part of January and the beginning of February when average daily lows dip to 20° farenheight. Baltimore County's annual precipitation averages between 40 and 45 inches and is distributed fairly evenly throughout the year. During the winter months, the County averages between 20 and 25 inches of snow. Events with the greatest intensity of precipitation are usually associated with thunderstorms and occur in the summer months.

(Note: working on getting better information from the county, hopefully, we can improve this section with more factual information)(According to Baltimore County's *Flood Insurance Study*, floods in Baltimore County are usually caused by spring thaws or by rainfall associated with hurricanes. In recent years, development in the County has increased the imperviousness of the land and has influenced the amount of runoff during

storms. Additionally, in some areas, floodplain development has been extensive. Consequently, floodwaters that would have been harmless in predevelopment times now endanger lives and damage buildings, roads, and utilities.

One of the largest measured floods in Baltimore County was the result of rainfall associated with Tropical Storm Agnes, which occurred in June 1972. The Agnes flood caused massive damage and destruction in the county. In July 1968, extremely damaging floods occurred across the county. Flooding from streams throughout the county caused an estimated \$2,000,000 worth of damage and killed approximately 50 people. Other recent major floods in Baltimore County occurred on August 23, 1933; March 11, 1936; October 15, 1954; August 1, 1971; June 22, 1972; and September 26, 1975.)

Baltimore County has conducted numerous studies in smaller watersheds in order to assess the impact of urban stormwater runoff. These studies have been conducted in the following watersheds; Chink Creek, Jones Creek, Lynch Point Cove, Tabasco Cove, Charlesmont Cove, North Point Cove, Muddy Gut, Greenhill Cove, Sue Creek, and Oakleigh Cove, better known as Schoolhouse Cove. Monitoring in these watersheds show elevated levels of sediment, nutrients, oil and grease, and heavy metals. From watershed observations, the major potential sources of these pollutants include runoff and deterioration of impervious surfaces, lawn and garden care, atmospheric deposition, domestic pet waste, and vehicle maintenance/traffic. Additionally, numerous State-wide reports have documented the impact of urban runoff to Baltimore County streams. Pursuant to sections 305(b) and 319 of the Clean Water Act, MDE produced two reports, the *Maryland Water Quality Inventory, 1989-1991* and the *State of Maryland, Nonpoint Source Assessment Report (1989)*. These documents implicate urban runoff in Baltimore County as a significant source of sediment, bacteria, pesticides, nutrients, and thermal pollution to surface waters impacting aquatic life and limiting water contact recreation. Stream systems affected include the Patapsco, Gynns Falls, Jones Falls, Bush River, Middle River, Gunpowder River, and the Bird River.

B. Programmatic Components

The NPDES stormwater permit application process for municipal separate storm sewer systems is specified in 40 CFR 122.26(d). The two-part application process was devised to provide a basis for reducing and eliminating pollutants in stormwater discharges from large municipal separate storm sewer systems. Part 1 of the application process requires applicants to submit information regarding existing programs and legal authority, identify sources of pollutants, field screen major outfalls to detect illicit connections, and propose strategies to characterize discharges. The Part 2 application process requires the demonstration of adequate legal authority, additional information on pollutant source identification, characterization of discharges, a proposed stormwater management program, an estimate of the effectiveness of stormwater controls, and a fiscal analysis. The following sections (1 through 6) provide a summary of Baltimore County's application.

1. Legal Authority

CONSENT ORDER SUBMITTAL FOR LEGAL AUTHORITY ON JULY 1, 1994.

A summary of Baltimore County's NPDES stormwater application submittal, specific to the regulatory requirements for adequate legal authority, is as follows:

The Baltimore County Code, Building Code, and Plumbing Code contain many provisions which directly or indirectly regulate discharges to the county's storm sewer system. Baltimore County has proposed to develop a new ordinance which will define specific and general prohibitions of discharges to the Baltimore County storm drain system, enforcement procedures, right of entry and penalties. This ordinance is to be completed in Fiscal Year 1995.

§122.26(d)(2)(i)"(A) Control...the contribution of pollutants...associated with industrial activity...;"

§122.26(d)(2)(i)"(B) Prohibit...illicit discharges..."

§122.26(d)(2)(i)"(C) Control...spills, dumping or disposal of materials other than storm water;"

§122.26(d)(2)(i)"(D) Control...pollutants from one portion of the municipal system to another portion of the municipal system;"

Anne Arundel, Howard, Carroll, and Harford counties and Baltimore City will be issued individual NPDES municipal separate storm sewer discharge permits for their respective storm sewer systems. These permits will be used to address interjurisdictional issues among these jurisdictions. Additionally, MDE will issue general permits for State and federal properties which will address issues between these entities and the county.

§122.26(d)(2)(i)"(E) Require compliance..."

§122.26(d)(2)(i)"(F) Carry out all inspection, surveillance, and monitoring procedures..."

Summary

2. Source Identification

A summary of Baltimore County's NPDES stormwater application submittal, specific to the regulatory requirements for source identification, is as follows:

§122.26(d)(1)(iii)"(A) A description of the historic use of ordinances..."

Prior to 1978, Baltimore County used sections 2,9,13, and 14 of the Plumbing Code to regulate discharges to its sanitary sewer system. These sections prohibited certain substances, regulated the temperature of effluent, and required county approval for all connections. In 1978, new Waste Water regulations were promulgated in response to the federal Clean Water Act. Section 35 of the Baltimore County Code requires permits,

establishes user fees, prohibits specific substances, requires pretreatment, authorizes monitoring, and establishes enforcement procedures and the ability to levy fines.

§122.26(d)(1)(iii)(B) A USGS 7.5 minute topographic map..."

Baltimore County used 2,000 scale topographic maps created in 1954 to record source identification data. County personnel used markers to map all required information.

§122.26(d)(1)(iii)(B)(1) The location of known municipal storm sewer system outfalls..."

Black markers were used to map all major storm sewer outfalls on 2,000 scale maps.

§122.26(d)(1)(iii)(B)(2) A description of the land use activities...population densities...average runoff coefficient..."

Land use activities were derived from 1990 satellite photographs and based on a 5.5 acre scale. Land uses such as residential, commercial, industrial, agricultural, forested, and barren are broken down into 15 separate watersheds. Population data and projections were derived from the Baltimore Regional Council of Government's *Notes on Forecasting, Assumptions and Methodologies, Round IV, The Composite Scenario*. Runoff coefficients were gathered from *Urban Hydrology for Small Watersheds* (US Department of Agriculture, TR-55, June 1981).

§122.26(d)(1)(iii)(B)(3) The location...of each currently operating or closed municipal landfill..."

Solid waste facilities are mapped on the county's 2,000 scale topographic maps. Descriptions of operations are included in Baltimore County's Solid Waste Management Plan.

§122.26(d)(1)(iii)(B)(4) The location and permit number of any known discharge...that has been issued a NPDES permit;"

NPDES permit holders were gathered from MDE's Hazardous and Solid Waste Management Administration. Ninety-two active permits were identified. All facilities are mapped on the county's 2,000 scale topographic maps.

§122.26(d)(1)(iii)(B)(5) The location of major structural controls..."

Stormwater management facilities have been mapped on the county's 2,400 scale topographic maps.

§122.26(d)(1)(iii)(B)(6) The identification of publicly owned parks..."

Publicly owned lands have been mapped on the county's 2,400 scale topographic maps.

§122.26(d)(2)(ii)...an inventory, organized by watershed... of each facility associated with industrial activity..."

Data on 4,207 industries was gathered from the Department of Public Works pretreatment program. They are identified by Standard Industrial Classification (SIC) codes and organized by watershed.

Summary

Baltimore County has satisfied the NPDES stormwater requirements for source identification. The county's permit will encourage the transference of these data onto GIS for better stormwater modelling and program development.

3. Discharge Characterization

§122.26(d)(1)(iv)"(A) Monthly mean rain and snow fall estimates..."

§122.26(d)(1)(iv)"(B) Existing quantitative data..."

§122.26(d)(1)(iv)"(C) A list of water bodies that receive discharges..."

§122.26(d)(1)(iv)"(D) Results of a field screening analysis for illicit connections..."

§122.26(d)(1)(iv)"(E) ...the location of outfalls or field screening points appropriate for representative data collection..."

§122.26(d)(2)(iii)"(A) Quantitative data from...between five and ten outfalls representative of commercial, industrial, and residential..."

§122.26(d)(2)(iii)"(B) Estimates of annual pollutant loads...and the event mean concentration..."

§122.26(d)(2)(iii)"(C) A proposed schedule to provide estimates...of the seasonal pollutant load..."

§122.26(d)(2)(iii)"(D) A proposed monitoring program...for the term of the permit..."

Summary

4. Management Programs

§122.26(d)(2)(iv) "(A) A description of structural and source control measures ..."

§122.26(d)(2)(iv)(A) "(1) A description of maintenance activities...for structural controls...;"

§122.26(d)(2)(iv)(A) "(2) A description of planning procedures...to reduce...pollutants...from areas of new development and significant redevelopment...;"

§122.26(d)(2)(iv)(A) "(3) A description of practices for operating and maintaining public streets...;"

§122.26(d)(2)(iv)(A) "(4) A description of procedures to assure that flood management projects assess the impacts on the water quality...;"

§122.26(d)(2)(iv)(A) "(5) A description of a program to monitor pollutants from operating or closed municipal landfills...;"

§122.26(d)(2)(iv)(A) "(6) A description of a program to reduce...pollutants... associated with the application of pesticides...;"

§122.26(d)(2)(iv) "(B) A description of a program...to detect and remove...illicit discharges...The program shall include:"

Baltimore County's Illicit Connection Program incorporates a number of existing programs, expands some programs and creates new program elements in an effort to meet the objectives of illicit connection removal and source reduction.

§122.26(d)(2)(iv)(B) "(1) A description of a program...to prevent illicit discharges...;"

Several sections of the Baltimore County Code will be used to prevent illicit connections. Section 14-337 prohibits water pollution. Sections 14-345 through 14-350 details enforcement and penalties for violations. Section 31-10 specifically prohibits the depositing of materials in county streets or drains. Section 35-74 addresses the overflow of sewage onto ground surfaces. Section 35-180 through 35-186 require the connection of toilets and drains to the sanitary system and provisions for enforcement. Additionally, Baltimore County proposes to obtain explicit legal authority to prohibit illicit discharges to the municipal storm drain system in Fiscal Year 1995. This ordinance will supplement the above referenced County Code and will define specific prohibitions of discharges to the Baltimore County storm drain system, enforcement procedures, right of entry and penalties.

§122.26(d)(2)(iv)(B) "(2) A description of...on-going field screening activities...;"

The selection of outfalls for field screening shall be based on the data generated as a result of the art 1 field screening effort, the balance of major outfalls not inspected, and outfalls in commercial and industrial land use areas. Storm drain outfalls shall only be sampled after 72 hours of dry weather. All storm drain outfalls will be assessed for the qualitative parameters of odor, algal growth, floatables, deposits/stains, sediment depositions, vegetative condition, erosion and structural condition of the outfall. Outfalls with flow or with a pool below the outfall, shall be sampled for the additional qualitative parameters of color and clarity of water. Lamotte test kits will be used for sampling temperature, pH, phenols, chlorine, detergents and copper. If flow is observed, then the flow rate shall be estimated using the simple float-timing method.

During Fiscal Year 1995, 50 outfalls will be screened for illicit connections in a pilot study. Also, during FY 1995, a complete *Manual of Practice for Detection and Removal of Illicit Connections* will be developed based on the experience gained in the field study. Baltimore County proposes to screen two hundred outfalls per year during the term of the permit. Some of these field screenings shall be revisits of sites suspected of intermittent discharges. the timing of the revisit shall be based on such criteria as shift changes in industrial areas or end of the work week, when intermittent cleaning activities may take place.

§122.26(d)(2)(iv)(B) "(3) A description of procedures...to investigate portions of the separate storm sewer system...;"

If the field screening indicates the possibility of an illicit connection, the field crew will conduct an initial investigation of the watershed to determine possible sources. The field crew shall attempt to trace the flow by removing manhole covers working from the storm drain outfall backwards. Inlets will be observed for surface flows into them or subsurface water flowing through them. If the source is located, it will be indicated on an illicit connection report form for routing to appropriate departments and for response. Additional field screening of the outfall may be conducted in order to ascertain the source.

If the source can not be readily identified by field crew, information on the illicit discharge will be routed to the following -- DPW Bureau of Utilities, DEPRM Ground Water Management, DPW Bureau of Highways, Maryland Department of the Environment, Save Our Streams, and Baltimore Metropolitan Water District. Detailed investigation methodology will be determined in conjunction with each affected agency during the course of the pilot study and the results shall be incorporated into the *Manual of Procedures for Illicit Connection Detection and Removal*.

§122.26(d)(2)(iv)(B) "(4) A description of procedures to prevent, contain, and respond to spills...;"

The Department of Environmental Protection and Resource Management -- Bureau of Air Quality and Waste Management has the responsibility of inspection of sites for spill prevention, and responding to reports of spills and containment of small spills. The containment of major spills is done by the Baltimore County Fire Department. The lead agency in the response to large spills is Maryland Department of the Environment, however in some cases, the U.S. Coast Guard may assume responsibility. Maryland Department of the Environment regulates private properties on which chemicals are stored based on authority delegated to them by the federal government.

A Management Committee shall be instituted in FY 1995 to address the requirements of the NPDES program and assess the effectiveness of various portions of the program. One of its responsibilities will be to assure that Pollution Prevention and Spill Response Plans are prepared for all county agencies. Additionally, this committee will review its maintenance procedures in relation to pollution reduction.

§122.26(d)(2)(iv)(B) "(5) A description of a program to promote...public reporting of...illicit discharges...;"

Educational materials will contain information on how to report an illicit discharge and encourage citizens to participate. These materials will also contain information on potential sources of illicit connections and reasons for reducing controllable pollutant discharges. These programs will complement the county's existing program to encourage citizens to adopt local streams and their watersheds as part of its response to non-point source initiatives, including the Maryland Chesapeake Bay Tributary Strategies.

§122.26(d)(2)(iv)(B) "(6) A description of educational activities...;"

Baltimore County has a contractual relationship with Maryland Save Our Streams for

educational activities associated with stream and shoreline restoration, dredging programs, stream monitoring and water quality activities.

The county proposes to expand the program components with additional funds from the Capital budget. In Fiscal Year 1995, educational brochures will be developed specifically addressing the proper management and disposal of used oil and toxic materials. Starting in FY 1996, outfalls and inlets which show evidence of improper disposal of materials shall be flagged and a priority list shall be developed for targeting communities. Specific material regarding the community such as the name of streams affected, number of outfalls in a watershed, percent of impervious area, and location of recycling centers will be developed for these targeted communities to make the educational materials more meaningful.

Additionally, half-hour presentation packages that target elementary, middle school and high school students will be assembled. The presentation will cover management and disposal of used oil and toxic materials and the application of pesticides, herbicides, and fertilizer to urban areas. These materials will be developed in FY 1995 and offered to teachers for presentation to their classes. Teacher training sessions shall be implemented in FY 1996. Storm drain stenciling programs "Chesapeake Bay Drainage - Do Not Dump" will continue.

Methods of assessing the effectiveness of the educational programs will be refined in FY95 and may include mailed surveys, door to door surveys and testing in the school environment.

§122.26(d)(2)(iv)(B) "(7) A description of controls to limit infiltration of seepage..."

The Department of Public Works, Capital Projects Bureau, Design Division has the responsibility of enforcing standards for sanitary sewer lines and storm drain systems. These standards include a separation of seven feet between the two systems. This distance will suffice to prevent infiltration from the sanitary sewer system to the storm drain system.

Additionally, DPW, Bureau of Utilities, conducts inspections and maintenance of the sanitary sewer system, correcting any leaks found. This Bureau also responds to any citizen complaints of overflow. If leaks are discovered via the Illicit connection screening process, information will be forwarded to the Bureau of Utilities as well.

§122.26(d)(2)(iv) "(C) A description of a program to monitor and control pollutants...from municipal landfills...The program shall:"

§122.26(d)(2)(iv)(C) "(1) Identify priorities and procedures for inspections..."

§122.26(d)(2)(iv)(C) "(2) Describe a monitoring program..."

All facilities will be required to follow MDE's industrial monitoring requirements as set forth in the State's general permit for industrial stormwater discharges.

§122.26(d)(2)(iv) "(D) A description of a program to implement and maintain structural

and non-structural best management practices to reduce pollutants in storm water runoff from construction sites...which shall include:"

§122.26(d)(2)(iv)(D) "(1) A description of procedures for site planning...;"

§122.26(d)(2)(iv)(D) "(2) A description of requirements for non-structural and structural best management practices;"

§122.26(d)(2)(iv)(D) "(3) A description of procedures for inspecting sites...;"

§122.26(d)(2)(iv)(D) "(4) A description of appropriate educational and training measures for construction site operators."

Summary

5. Program Funding

A summary of Baltimore County's NPDES application submittal, specific to the regulatory requirements for program funding, is as follows:

§122.26(d)(2) "(vi) For each fiscal year to be covered by the permit, a fiscal analysis... shall include a description of the source of funds...to meet the necessary expenditures..."

Summary

6. Assessment of Controls

A summary of Baltimore County's NPDES application submittal, specific to the regulatory requirements for assessment of controls, is as follows:

§122.26(d)(2) "(v) Estimated reductions in loadings...expected as a result of the... management program..."

Summary

APPENDIX 2

PERMIT CONDITIONS

APPENDIX 2

NPDES Permit Conditions and Compliance Schedule -- Baltimore County			
Standard Permit Conditions	Permit Condition		Due Date
A. Legal Authority	1	Baltimore County shall develop and incorporate into Baltimore County Code an ordinance which satisfies the legal requirements stipulated in 40 Code of Federal Regulations (CFR) 122.26(d)(2)(i) for municipal separate storm sewer system discharges. The above referenced ordinance shall remain in effect for the duration of this National Pollutant Discharge Elimination System (NPDES) permit.	5/17/95
	2	Baltimore County shall provide legal certification that the ordinance referenced in A.1. above is in accordance with 40 CFR 122.26(d)(2)(i) for municipal separate storm sewer system discharges.	5/17/95
B. Source Identification	1	Baltimore County shall establish procedures for recording any new source identification information and submitting this information to Maryland Department of the Environment (MDE) in accordance with Part IV "ANNUAL PROGRESS REPORTS" of this permit.	5/17/95
	2	Baltimore County shall compile on GIS all source identification information requested in 40 CFR 122.26(d)(1)(iii) and 122.26(d)(2)(ii), which includes the identification and mapping of storm sewer system outfalls, land use activities, population estimates, runoff coefficients, major structural controls, landfills and controls, publicly owned lands, NPDES dischargers, and industries organized by watershed and Standard Industrial Classification (SIC) codes. (Alternate condition -- for pilot watershed, then expand)	5/17/96
C. Discharge Characterization	1	Baltimore County shall submit any outstanding storm event monitoring data and analysis to MDE. This shall include three storm events at each of the five approved Part 2 monitoring sites.	5/17/95
	2	Baltimore County shall propose sampling sites for its long-term monitoring program. These sites shall include at least one residential site, one commercial site, and one industrial site. An in-stream ambient station shall be proposed downstream of each site.	5/17/95
	3	Within 6 months of MDE's approval of Baltimore County's long-term monitoring sites, the county shall commence sampling at outfall x and its appropriate in-stream monitoring station.	Contingent on MDE Approval
	4	Sampling at the remaining outfalls and in-stream stations shall begin on a schedule of one outfall and its associated in-stream station every six months until all monitoring sites and in-stream stations are being monitored.	Contingent on MDE Approval
	5	Baltimore County shall complete the following minimum requirements:	Ongoing
	a)	A total of 12 storm events shall be monitored per year with at least 3 occurring per quarter. Quarters shall be based on calendar year. If extended dry weather periods occur, baseflow samples shall be taken at least once per month. If no flow is observed at the outfall during periods of dry weather, samples shall be taken at the in-stream monitoring stations only.	Monthly
	b)	Three discrete samples shall be taken for stormwater flow at both outfall and in-stream monitoring stations. Samples submitted for analysis shall be representative of the approximate flow at the following three intervals along the hydrograph: the midpoint of the rising limb, the peak, and the midpoint of the falling limb.	Monthly

NPDES Permit Conditions and Compliance Schedule -- Baltimore County			
	c)	Flow rates shall be recorded at points when discrete samples are taken.	Each Sample
Standard Permit Conditions	Permit Condition		Due Date
(Discharge Char. - cont.)	d)	Collected samples shall be submitted to an EPA certified laboratory for analysis according to methods listed under 40 CFR Part 136 and analyzed for the following parameters: BOD5, Fecal Coliform, TKN, Nitrate plus Nitrite, Total Phosphorus, Cadmium, Copper, Lead, Zinc, Oil and Grease, pH, and Water Temperature and TSS.	Each Sample
	6.	For each storm event, a description of equipment problems and weather conditions such as duration and intensity shall be recorded.	Each Sample
	7	Reporting Frequency and Requirements:	
	a)	Laboratory results shall be recorded on MDE's long-term monitoring database and submitted along with annual reports.	Annually
	b)	Annual and seasonal pollutant load estimates along with an analysis of pollutant load trends shall be submitted with annual reports.	Annually
	c)	Pollutant loads shall be estimated for all storm sewer outfalls.	Annually
	d)	Baltimore County shall utilize monitoring data from existing in-stream monitoring stations to further refine pollutant load estimates.	11/17/97
	e)	Baltimore County shall assess its monitoring program and outline potential alternative sampling sites and procedures.	11/17/94
D. Management Programs	1	Baltimore County shall maintain an acceptable stormwater management program in accordance with the Environment Article, Title 4, Subtitle 2, Annotated Code of Maryland.	Ongoing
	2	Baltimore County shall conduct preventive maintenance inspections of all stormwater management facilities at least on a triennial basis. Inspections, necessary corrective action, and enforcement actions shall be documented and summarized in annual reports.	Annually
	3	Baltimore County shall submit the 1992 stormwater management data form distributed by MDE.	5/17/94
		For each year of the permit, Baltimore County shall submit information regarding stormwater management on MDE's stormwater management spreadsheet (Appendix 3) along with annual reports.	Annually
	4	Baltimore County shall develop and implement stormwater management procedures for significant redevelopment in areas other than the Critical Area.	11/17/94
5	Baltimore County shall implement its proposed Watershed Survey Program for the identification of stormwater		

NPDES Permit Conditions and Compliance Schedule -- Baltimore County			
		pollutants.	5/17/94
		Baltimore County shall complete watershed surveys for all storm sewer outfall drainage areas in the county.	5/17/96
	6	Baltimore County shall submit an implementation schedule for its proposed pilot stormwater management studies for residential, commercial, and industrial land uses.	11/17/94
Standard Permit Condition	Permit Condition		Due Date
(Management Prog. - cont.)		Baltimore County shall include analyses of pilot studies in annual reports, including proposals for the expansion of successful pilot studies.	11/17/95 Annually
	7.	Baltimore County shall implement its Brick Cleaning and Waste Water Program including procedures for inspection and enforcement.	5/17/94
	8	Baltimore County shall implement its proposed programs for the control of pesticide, herbicide, and fertilizer use. These programs shall include the use of GIS and monitoring data for assessment purposes, the development of a pesticide task force for assessing IPM techniques and developing strategies for limiting pesticide use, and working with MDE on its "Residential Pesticide Usage and Levels of Urban Surface Waters" study.	
	9	Baltimore County shall perform an assessment regarding the effects of road maintenance activities including street sweeping, litter control, deicing procedures, and herbicide use for vegetation control, on stormwater discharges. This assessment shall include an analysis of alternative practices for reducing pollutants associated with road maintenance activities.	5/17/95
		Baltimore County shall incorporate effective alternative practices for reducing pollutants in its road maintenance procedures.	11/17/95
	10	Baltimore County shall perform cost/benefit analyses of potential retrofit sites and alternative source control measures and develop a priority list for implementation.	11/17/96
		These analyses and an implementation schedule shall be included in its 1996 annual report.	11/17/96
	11	Baltimore County shall implement its proposed educational program for reducing stormwater pollutants. Educational materials shall include information on illicit discharges and reporting, and the reduction of fertilizer and pesticide use, the proper disposal of household wastes. Additionally, the county shall integrate educational initiatives with local volunteer groups.	11/17/94
	12	Baltimore County shall begin implementing its illicit connection program as a pilot study and screen at a minimum 50 outfalls within the year.	11/17/94
		Baltimore County shall complete its <i>Manual of Practice for Detection and Removal of Illicit Connections</i> which shall include a detailed description of procedures for the investigation of illicit connections and enforcement protocol.	11/17/95
		Baltimore County shall expand its pilot study and screen at least 200 outfalls per year. Field screening results shall be submitted on MDE's Part 1 field screening database as part of its annual report submittal. Any	11/17/95

NPDES Permit Conditions and Compliance Schedule -- Baltimore County			
		industrial dischargers that are discovered as a result of the county's program shall be required to obtain an NPDES permit from MDE.	
	13	Baltimore County shall maintain an acceptable erosion and sediment control program in accordance with the Environment Article, Title 4, Subtitle 1, Annotated Code of Maryland.	Ongoing
	14	Baltimore County shall develop and implement "responsible personnel" certification classes to educate construction site operators regarding erosion and sediment control.	11/17/94
Standard Permit Condition		Permit Condition	Due Date
(Management Prog. - Cont.)	15	Baltimore County shall conduct a pilot study for assessing the effects of sanitary sewer system leaks on stormwater discharges and provide a schedule for expanding its assessment program system-wide. As maintenance problems are discovered, they will be forwarded to the county's sewer maintenance section for correction. As sanitary sewer system leaks are diagnosed, Baltimore County shall propose a schedule for correcting them in the following year's capital improvement program.	5/17/95
E. Program Funding	1	Baltimore County shall submit a fiscal analysis of the capital, operation, and maintenance expenditures necessary to comply with all conditions of this permit.	11/17/94
	2	Baltimore County shall maintain adequate program funding to comply with all conditions of this permit.	Ongoing
Special Conditions		Permit Condition	Due Date
Assessment of Controls	1	Baltimore County shall submit estimates of expected pollutant load reductions as a result of its proposed management programs.	
A. Programmatic Coordination	1	Baltimore County shall coordinate water quality restoration and protection efforts in watersheds shared with other jurisdictions. These efforts shall include:	
	a)	the exchange of information on restoration/protection program effectiveness;	
	d)	the definition of watershed management measures to support restoration/protection efforts;	
	c)	the identification of appropriate watershed boundaries for planning and program development efforts; and	
	d)	the coordination of planning and zoning activities to support the goals of watershed management.	
B. Data Management	1	Baltimore County shall develop standards for record keeping and databases to meet the standard permit conditions in Part II of this permit. These standards shall be developed in concert with other appropriate jurisdictions and include:	
	a)	management practice databases and GIS compatibility among jurisdictions for base maps, pollutant source area locations, stormwater management facility location and description, and land use and zoning designations;	
	b)	comparable population estimates and growth projections; and	

NPDES Permit Conditions and Compliance Schedule -- Baltimore County			
	c)	consistent land use and runoff coefficients.	
C. Discharge Characterization	1	Baltimore County shall develop standards for discharge characterization. These standards shall be developed in concert with other appropriate jurisdictions and include:	
	a)	coordination of long term monitoring site selection among other jurisdictions;	
	b)	standards for field and laboratory methods;	
Special Conditions	Permit Condition		Due Date
	c)	standards for monitoring databases; and	
	d)	standards for annual and seasonal pollutant load estimates.	
D. Management Programs	1	Baltimore County shall develop management program standards. These standards shall be developed in concert with other appropriate jurisdictions and include:	
	a)	acceptable preventative maintenance procedures;	
(Management Prog. - cont.)	b)	watershed management plans and retrofit assessments;	
	c)	development and implementation of public information and educational programs; and	
	d)	watershed inventories, illicit discharge inspection programs, and water quality enforcement.	
E. Assessment of Controls and Annual Progress Reporting	1	Baltimore County shall develop standards for loading reduction estimates, annual progress reports, and stormwater management program effectiveness.	
	2	Along with other jurisdictions, Baltimore County shall evaluate the cumulative impact of its stormwater management waiver policy with regard to receiving water quality.	

APPENDIX 3

LONG-TERM MONITORING DATABASE

APPENDIX 3

The following is information regarding the long-term monitoring database. The database has been modified from the Part 2 monitoring database to include more site information for each storm event sampled.

FIELD NAME DESCRIPTION

JURIS	Jurisdiction name
WATSHED	Watershed name
DATE	Date
TIME	Time of Day
INST	Instream or Outfall Station Sample?
LAT	Latitude of monitoring location
LONG	Longitude of monitoring location
STAT	Storm flow or base flow sampled?
DEPTH	Rainfall amount during sampled period
DURAT	Duration of Storm Event
INTENS	Intensity of Storm Event
BOD	Biological Oxygen Demand
TKN	Total Kjeldahl Nitrogen
PHOSPH	Total Phosphorus
COPPER	Copper
ZINC	Zinc
PH	pH
COLIF	Fecal Coliform
NITRATE	Nitrate plus Nitrite
CADMIUM	Cadmium
LEAD	Lead
O&G	Oil and Grease
WATEMP	Water Temperature in Celsius
TSS	Total Suspended Solids

APPENDIX 4

**STORMWATER MANAGEMENT SPREADSHEET
for
ANNUAL REPORTING**

APPENDIX 4

The following are hard copies of IMPROV spreadsheets that have been constructed to store annual reporting data. The IMPROV software is an advanced version of Lotus 1-2-3 and is compatible with older Lotus software. The following data will be recorded by watershed.

Baltimore County, Maryland
Permit Number: MS-BC-93-002
Effective Date: November 17, 1993
Permit Duration: 5 years

B. Source Identification				
Criteria/Watershed	Jones Falls	Patapsco	Gwynns Falls	Herring Run
major outfalls				
minor outfalls				
commercial landuse %				
industrial landuse %				
residential landuse %				
population				
watershed acreage				
NPDES permitted facilities				

D. Management Programs - Illicit Connection Detection				
Criteria/Watershed	Jones Falls	Patapsco	Gwynns Falls	Herring Run
1Visual screening				
Chemical screening				
Permits granted				
Permits denied				
Complaints				
Dry weather flow - yes				
Sources identified				
Sources removed				
Enforcement actions				
Fines issued				
Money collected				

Program funding				
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D. Management Programs - Stormwater Management				
Criteria/Watershed	Jones Falls	Patapsc o	Gwynns Falls	Herring Run
Building permits issued				
Grading permits issued				
SWM exempt projects				
SWM project plans reviewed				
Plans reviewed				
SWM waivers requested				
Waivers denied				
Waivers granted (Qn)				
Waivers granted (Ql)				
Total (Qn+Ql)				
Fees-in-lieu approved				
Total \$ collected				
Plan approvals				
SWM facil. required on plans				
Infiltration facilities				
Retention ponds				
Detention ponds				
Extended detention ponds				
Vegetated swales				
Wetlands/shallow marshes				
Oil/grit separators				
Other				
Total facilities				
Total # facilities completed				
Acres land developed				
Acres land served by SWM				
Facilities under construction				
Retrofits				
Const. inspections completed				
NOVs/SWOs issued				

Private facilities inspected				
Maint. agreements enforced				
Public facilities inspected				
Complaints				

D. Management Programs - Miscellaneous				
CriteriaWatershed	Jones Falls	Patapsc o	Gwynns Falls	Herring Run
Gallons oil recycled				
Gallons antifreeze recycled				
Tons recycled material				
Recycling pamphlets distrib.				
Pest./herb. pamphlets distrib.				
Miles street sweeping				
Total street miles				
Feet storm drains cleaned				
Total length of storm drain system				
Tons sand/salt applied				
Spill responses				

Reporting on a watershed basis does not apply to the following information. Rather, this information will be recorded for each year of the permit term.

C. Discharge Characterization						
Criteria/Permit Year	Permit Year 1	Permit Year 2	Permit Year 3	Permit Year 4	Permit Year 5	Total
Is database completed?						
Added pollutant monitored #1						
Added pollutant monitored #2						
Added pollutant monitored #3						
Added pollutant monitored #4						
Added pollutant monitored #5						
Monitoring program costs						

F. Fiscal Analyses						
Criteria/Permit Year	Permit Year 1	Permit Year 2	Permit Year 3	Permit Year 4	Permit Year 5	TOTAL
NPDES budget						
NPDES staff #						
GIS budget						
GIS staff #						
Is a stormwater utility being proposed?						
Anticipated utility revenue						
Actual utility revenue generated						

APPENDIX 5

NPDES REGULATORY REQUIREMENTS

APPENDIX 5 SPECIFIC CWA REGULATORY REQUIREMENTS

1. Legal Authority

The specific regulatory requirements contained in 40 CFR 122.26(d) for adequate legal authority are as follows:

§122.26(d)(2)(i) "(A) Control through ordinance, permit, contract, order or similar means, the contribution of pollutants to the municipal storm sewer by storm water discharges associated with industrial activity and the quality of storm water discharged from sites of industrial activity;"

§122.26(d)(2)(i) "(B) Prohibit through ordinance, order or similar means, illicit discharges to the municipal separate storm sewer;"

§122.26(d)(2)(i) "(C) Control through ordinance, order or similar means the discharge to a municipal separate storm sewer of spills, dumping or disposal of materials other than storm water;"

§122.26(d)(2)(i) "(D) Control through interagency agreements among coapplicants the contribution of pollutants from one portion of the municipal system to another portion of the municipal system;"

§122.26(d)(2)(i) "(E) Require compliance with conditions in ordinances, permits, contracts or orders; and"

§122.26(d)(2)(i) "(F) Carry out all inspection, surveillance and monitoring procedures necessary to determine compliance and noncompliance with permit conditions including the prohibition on illicit discharges to the municipal separate storm sewer."

2. Source Identification

The specific regulatory requirements contained in 40 CFR 122.26(d) for source identification are as follows:

§122.26(d)(1)(iii) "(A) A description of the historic use of ordinances, guidance or other controls which limited the discharge of non-storm water discharges to any Publicly Owned Treatment Works serving the same area as the municipal separate storm sewer system..."

§122.26(d)(1)(iii) "(B) A USGS [United States Geological Survey] 7.5 minute topographic map (or equivalent topographic map with a scale between 1:10,000 and 1:24,000 if cost effective) extending one mile beyond the service boundaries of the municipal storm sewer system ..."

§122.26(d)(1)(iii)(B) "(1) The location of known municipal storm sewer system outfalls discharging to waters of the United States;"

§122.26(d)(1)(iii)(B) "(2) A description of the land use activities...accompanied with estimates of population densities and projected growth for a ten year period within the drainage area served by the separate storm sewer. For each land use type, an estimate of an average runoff coefficient..."

§122.26(d)(1)(iii)(B) "(3) The location and description of the activities of the facility of each currently operating or closed municipal landfill or other treatment, storage or disposal facility for municipal waste;"

§122.26(d)(1)(iii)(B) "(4) The location and permit number of any known discharge to the municipal separate storm sewer that has been issued a NPDES permit;"

§122.26(d)(1)(iii)(B) "(5) The location of major structural controls for storm water discharge..."

§122.26(d)(1)(iii)(B) "(6) The identification of publicly owned parks, recreational areas, and other open lands."

§122.26(d)(2) "(ii) [A]n inventory, organized by watershed of the name and address, and a description (such as SIC [Standard Industrial Codes] codes) which best reflects the principal products or services provided by each facility which may discharge, to the municipal separate storm sewer, storm water associated with industrial activity..."

3. Discharge Characterization

NPDES stormwater regulations divide discharge characterization into two parts. The specific regulatory requirements contained in Part 1, described in 40 CFR §122.26(d)(1)(iv), include providing the following information in an effort to characterize storm sewer discharges:

§122.26(d)(1)(iv) "(A) Monthly mean rain and snow fall estimates...and the monthly average number of storm events."

§122.26(d)(1)(iv) "(B) Existing quantitative data describing the volume and quality of discharges from the municipal storm sewer, including a description of the outfalls sampled, sampling procedures and analytical methods used."

§122.26(d)(1)(iv) "(C) A list of water bodies that receive discharges from the municipal separate storm sewer system...and a brief description of known water quality impacts...the description of impacts shall include a description of whether the water bodies receiving such discharges have been: [(1)] Assessed and reported in section 305(b) reports...[(2)] listed under section 304(l)...[(3)] listed in State Nonpoint Source Assessments required by section 319(a)...[(4)] identified and classified according to eutrophic condition of publicly owned lakes listed in State reports required under Section 314(a)..."

§122.26(d)(1)(iv) "(D) Results of a field screening analysis for illicit connections and illegal dumping for...major outfalls...A screening analysis shall include a narrative description...of visual observations made during dry weather periods. If any flow is observed, two grab samples shall be collected during a 24 hour period...For all such samples, a narrative description of the color, odor, turbidity, the presence of an oil sheen shall be provided...In addition, a narrative description of the results of a field analysis using suitable methods to estimate pH, total chlorine, total copper, total phenol, and detergents...shall be provided..."

§122.26(d)(1)(iv) "(E)...the location of outfalls or field screening points appropriate for representative data collection..." required in Part 2.

Part 2 of the NPDES regulations, described in 40 CFR §122.26(d)(2)(iii), requires that applicants sample stormwater discharges from the municipal separate storm sewer system. Applicants must propose between five and ten outfalls representative of commercial, residential, and industrial land uses for stormwater monitoring. This will include a description of why the outfall or field screening point is representative, the seasons during which sampling is intended, and a description of the sampling equipment. The specific regulatory requirements for Part 2 NPDES permit applications include the following:

§122.26(d)(2)(iii) "(A)...Quantitative data from...between five and ten outfalls or field screening points as representative of the commercial, residential, and industrial land use...[(1)] For each outfall...samples shall be collected of storm water discharges from three storm events occurring at least one month apart...[(3)] quantitative data shall be provided for: the organic pollutants listed in Table II; the pollutants listed in Table III (toxic metals, cyanide, and total phenols) of appendix D of 40 CFR part 122, and for the following pollutants: Total suspended solids (TSS), Total dissolved solids (TDS), COD, BOD₅, Oil and grease, Fecal coliform, Fecal streptococcus, pH, Total Kjeldahl nitrogen, Nitrate plus nitrite, Dissolved phosphorus, Total ammonia plus organic nitrogen, Total phosphorus..."

§122.26(d)(2)(iii) "(B) Estimates of the annual pollutant load...and the event mean concentration of the cumulative discharges to waters of the United States from all identified municipal outfalls during a storm event..."

§122.26(d)(2)(iii) "(C) A proposed schedule to provide estimates for each major outfall...of the seasonal pollutant load and of the event mean concentration of a representative storm for any constituent detected in any sample..."

§122.26(d)(2)(iii) "(D) A proposed monitoring program for representative data collection for the term of the permit that describes the locations of outfalls or field screening points to be sampled...why the location is representative, the frequency of sampling, parameters to be sampled, and a description of sampling equipment."

4. Management Programs

The specific regulatory requirements contained in 40 CFR §122.26(d) for management programs are as follows:

§122.26(d)(2)(iv) "(A) A description of structural and source control measures to reduce pollutants...from commercial and residential areas...accompanied with an estimate of the expected reduction of pollutant loads and a proposed schedule for implementing such controls. At a minimum, the description shall include:"

§122.26(d)(2)(iv)(A) "(1) A description of maintenance activities and a maintenance schedule for structural controls..."

§122.26(d)(2)(iv)(A) "(2) A description of planning procedures...to develop, implement, and enforce controls to reduce the discharge of pollutants...from areas of new

development and significant redevelopment...;"

§122.26(d)(2)(iv)(A) "(3) A description of practices for operating and maintaining public streets, roads and highways...including deicing activities;"

§122.26(d)(2)(iv)(A) "(4) A description of procedures to assure that flood management projects assess the impacts on the water quality...and that existing structural flood control devices have been evaluated to determine if retrofitting...is feasible;"

§122.26(d)(2)(iv)(A) "(5) A description of a program to monitor pollutants from operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste...;"

§122.26(d)(2)(iv)(A) "(6) A description of a program to reduce...pollutants... associated with the application of pesticides, herbicides, and fertilizer..."

§122.26(d)(2)(iv) "(B) A description of a program...to detect and remove...illicit discharges and improper disposal...The proposed program shall include:"

§122.26(d)(2)(iv)(B) "(1) A description of a program...to prevent illicit discharges...the description shall address all types of illicit discharges..."

§122.26(d)(2)(iv)(B) "(2) A description of procedures to conduct on-going field screening activities..."

§122.26(d)(2)(iv)(B) "(3) A description of procedures...to investigate portions of the separate storm sewer system that...indicate illicit discharges or other sources of non-stormwater..."

§122.26(d)(2)(iv)(B) "(4) A description of procedures to prevent, contain, and respond to spills..."

§122.26(d)(2)(iv)(B) "(5) A description of a program to promote...public reporting of...illicit discharges..."

§122.26(d)(2)(iv)(B) "(6) A description of educational activities, public information activities...to facilitate the proper management and disposal of used oil and toxic materials; and"

§122.26(d)(2)(iv)(B) "(7) A description of controls to limit infiltration of seepage from municipal sanitary sewers..."

§122.26(d)(2)(iv) "(C) A description of a program to monitor and control pollutants...from municipal landfills, hazardous waste treatment, disposal and recovery facilities, industrial facilities that are subject to section 313 of title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA), and industrial facilities...The program shall:"

§122.26(d)(2)(iv)(C) "(1) Identify priorities and procedures for inspections and establishing...control measures for such discharges;"

§122.26(d)(2)(iv)(C) "(2) Describe a monitoring program...including the submission of quantitative data on...oil and grease, COD, pH, BOD5, TSS, total phosphorus, total Kjeldahl nitrogen, nitrate plus nitrite nitrogen, and any discharges required under 40 CFR 122.21(g)(7)(iii) and (iv)."

§122.26(d)(2)(iv) "(D) A description of a program to implement and maintain structural and non-structural best management practices to reduce pollutants in storm water runoff from construction sites...which shall include:"

§122.26(d)(2)(iv)(D) "(1) A description of procedures for site planning which incorporate consideration of potential water quality impacts;"

§122.26(d)(2)(iv)(D) "(2) A description of requirements for non-structural and structural best management practices;"

§122.26(d)(2)(iv)(D) "(3) A description of procedures for inspecting sites and enforcing control measures...;"

§122.26(d)(2)(iv)(D) "(4) A description of appropriate educational and training measures for construction site operators."

5. Program Funding

The specific regulatory requirement contained in 40 CFR 122.26(d) for program funding is as follows:

§122.26(d)(2) "(vi) For each fiscal year to be covered by the permit, a fiscal analysis of the necessary capital and operation and maintenance expenditures necessary to accomplish the activities of the programs under paragraphs (d)(2)(iii) and (iv) of this section. Such analysis shall include a description of the source of funds that are proposed to meet the necessary expenditures, including legal restrictions on the use of such funds."

APPENDIX 1

MARYLAND DEPARTMENT OF THE ENVIRONMENT

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM MUNICIPAL SEPARATE STORM SEWER SYSTEM DISCHARGE PERMIT APPLICATION SUMMARY

BALTIMORE COUNTY

PART I. STATEMENT OF AUTHORITY

A. United States Environmental Protection Agency

Section 402 of the Clean Water Act (CWA) prohibits the discharge of any pollutant to waters of the United States from a point source, unless that discharge is authorized by a National Pollutant Discharge Elimination System (NPDES) permit. Under the provisions of the NPDES regulations, stormwater discharges from municipal separate storm sewer systems are considered point sources that require an NPDES permit.

B. State of Maryland

The Maryland Department of the Environment (MDE) has been granted authority by the United States Environmental Protection Agency (EPA) to issue NPDES permits in accordance with statutory requirements promulgated by the CWA. The Environment Article, Title 9, Subtitle 3, Part IV, Annotated Code of Maryland requires a discharge permit for any activity that could cause or increase the discharge of pollutants into waters of the State. Additionally, Code of Maryland Regulations (COMAR) 26.08.04 requires MDE to administer the NPDES program as part of the State's own discharge permit system. These regulations also define municipal separate storm sewer systems as point sources of pollution subject to NPDES permit requirements.

C. Permittee Responsibilities

Section 402(p) of the CWA, as amended by the Water Quality Act of 1987, requires NPDES permits for stormwater discharges from large municipal separate storm sewer systems. A large municipal separate storm sewer system is defined in the CWA as serving a population of 250,000 or more. Baltimore County, according to the United States Department of Commerce's 1990 Census, has a total population of 697,900 and is therefore considered a large municipality. As a result, the County was required to submit a two-part NPDES permit application. Baltimore County has submitted an NPDES stormwater application that was prepared to satisfy the EPA's regulations for permitting stormwater discharges from municipal separate storm sewer systems. Appendix 1 summarizes the County's NPDES stormwater application. NPDES regulations require permit conditions that effectively prohibit non-stormwater discharges and reduce the discharge of pollutants to the "maximum extent practicable." Specific permit conditions

are outlined in Permit # MS-BA-95-005 and Appendix 2. Appendix 3 outlines MDE's long-term monitoring database and a spreadsheet for the reporting and tracking of NPDES data is included as Appendix 4. Additionally, NPDES regulatory requirements can be found in Appendix 5.

PART II. BACKGROUND

A. Problems Associated with Stormwater Pollutants

Pollutants in stormwater discharges from many sources are largely uncontrolled. The *National Water Quality Inventory, 1990 Report* to Congress provides a general assessment of water quality based on biennial reports submitted by the States under Section 305(b) of the CWA. This report indicates that roughly 30% of identified cases of water quality impairment are attributable to stormwater discharges. During rain events that produce runoff, numerous pollutants including sediment, nutrients, bacteria, oil, metals, and pesticides are washed into storm sewer systems from diffuse sources such as construction sites, residential neighborhoods, commercial areas, parking lots, roads, and industrial facilities. Additionally, illegal dumping, sanitary sewer system leaks, and illicit connections to storm sewer systems can be significant sources of pollutants. Some of the more serious effects to receiving waters are the contamination of drinking water supplies, restrictions on water contact recreation, loss of wildlife habitat, decreases in the number and variety of aquatic organisms, and fish kills.

B. History of NPDES Stormwater Program

Efforts to improve water quality under the NPDES program have traditionally focused on reducing pollutants in point source discharges from industrial facilities and municipal sewage treatment plants. In response to the need for controlling stormwater discharges, Congress amended the CWA in 1987 requiring the EPA to establish NPDES requirements for stormwater discharges. In November 1990, EPA issued final stormwater regulations for eleven categories of industry and certain municipal separate storm sewer systems. As part of the municipal stormwater program, jurisdictions in Maryland operating large municipal storm sewer systems must submit a two-part application to MDE outlining programs for monitoring and controlling stormwater discharges. Required information includes Legal Authority, Source Identification, Discharge Characterization, Management Programs, Assessment of Controls, and Fiscal Resources.

C. Maryland's Perspective

Maryland's efforts to reduce stormwater pollution have focused on protecting and restoring the water quality of Chesapeake Bay. The Maryland General Assembly passed the Erosion and Sediment Control Law in 1970 to control runoff from construction sites and in 1982 passed the Stormwater Management Act which requires that appropriate Best Management Practices (BMP) be used for new development in order to maintain, as nearly as possible, the pre-development runoff conditions. Additionally, the Chesapeake

Bay Program, a cooperative effort among the major Bay states and the federal government, has elevated the importance of stormwater management programs in Maryland by establishing a 40% nutrient reduction goal to the Chesapeake Bay and, more recently, by focusing cleanup efforts on the Bay's tributaries. Although Maryland's existing programs will aid local jurisdictions in satisfying NPDES stormwater requirements, additional stormwater control measures will be needed for full compliance with the federal program.

PART III. APPLICATION SUMMARY

A. Jurisdiction Description

1. Physical Data

Baltimore County is located in central Maryland and surrounds the State's largest City, Baltimore. The County is bounded on the north by Pennsylvania's York County, on the east by Harford County, on the South by Anne Arundel County and on the West by Howard and Carroll counties. According to the *Soil Survey, Baltimore County, Maryland (1976)*, 173 miles of the County's southern extremity borders the Chesapeake Bay. Baltimore County has a total land area of 390,400 acres or, 610 square miles. The northern portion of the County is predominately agricultural land with small villages, while central and southern Baltimore County are urbanized or rapidly developing due to their proximity to Baltimore City. All areas immediately adjacent to Baltimore City have extensive residential communities and commercial areas. Additionally, land adjacent to the Patapsco River south and east of Baltimore are heavily industrialized. According to projections made by the Maryland Office of Planning (MdOP), Baltimore County's population is expected to grow by 4% between 1990 and the year 2000, increasing its 1990 population of 697,900 to 726,400 by the turn of the century.

2. Hydrologic Information

Baltimore County lies within two physiographic provinces, the Atlantic Coastal Plain and the Piedmont Plateau. Drainage patterns are generally from the northwestern part of the County where elevations are over 900 feet to the southeastern corner where County marshes meet Chesapeake Bay. The northern areas of the County are drained by the Little Gunpowder Falls and the Gunpowder River. Western and southern portions of the County drain via the Patapsco River and the County's southeastern quadrant drains into Chesapeake Bay via Middle and Back Rivers.

Climate conditions are summarized in the *Soil Survey, Baltimore County, Maryland (1976)*, and are based on data gathered at a National Weather Service Cooperative station 2 miles southwest of Parkton. The County's climate is moderate with four well defined seasons. The warmest temperatures occur in late July and early August when average daily highs reach 89° farenheight (F) and the coldest temperatures occur in the last part of January and the beginning of February when average daily lows dip to 21° F. Baltimore County's annual precipitation averages between 40 and 44 inches and is

distributed fairly evenly throughout the year. During the winter months, the County averages between 20 and 25 inches of snow. Events with the greatest intensity of precipitation are usually associated with thunderstorms that occur in the summer months.

According to Baltimore County's NPDES municipal stormwater permit application, flooding prior to the twentieth century has been documented, however, damages were generally limited to agricultural or mill activities. With the advent of suburban development and growth in flood plain areas, damages increased as the population inhabited those high risk areas. Flooding in Baltimore County usually occurs as a result of heavy rains associated with tropical storms and summer thunderstorms. In the County's low lying coastal areas, flooding can also occur as a result of tidal surges. In 1933, an unnamed hurricane produced record high tides and storm surges which were measured at 8.33 feet in Baltimore City. Since the 1933 storm, Baltimore County has been impacted by tropical storms on 6 occasions, 1955 (Connie & Diane), 1972 (Agnes), 1975 (Elloise), and 1979 (David & Frederick). Each of these storms produced flood impacts of great magnitude. The greatest impact was from tropical storm Agnes which caused millions of dollars in damages. Since 1979, Baltimore County has been spared the impact of tropical storms on numerous occasions. However, portions of Baltimore County experience flooding nearly annually from summer thunderstorms. In localized areas, these storms can often exceed the impact of tropical storms. For example, a series of thunderstorms developed over the eastern portion of the County in 1971 and a major cell stalled creating conditions which produced more than 12 inches of rain in 6 hours. This storm surpassed the intensity of tropical storm Agnes in 1972.

Numerous reports have documented the impact of stormwater runoff to streams in Baltimore County. Two reports produced by MDE, the *Maryland Water Quality Inventory, 1989-1991* and the *State of Maryland, Non-Point Source Assessment Report* (1989), implicate urban runoff in Baltimore County as a significant source of sediment, bacteria, pesticides, nutrients, and thermal pollution to surface waters. These pollutants have impacted aquatic life and limited water contact recreation in the Gwynns and Jones Falls, and the Patapsco, Bush, Gunpowder, Bird, and Middle rivers. Additionally, Baltimore County has conducted numerous studies in smaller watersheds in order to assess the impact of urban stormwater runoff. These studies have been conducted in the Chink Creek, Jones Creek, Lynch Point Cove, Tabasco Cove, Charlesmont Cove, North Point Cove, Muddy Gut, Greenhill Cove, Sue Creek, and Oakleigh Cove watersheds. Monitoring in these watersheds show elevated levels of sediment, nutrients, oil and grease, and heavy metals. Sources of these pollutants include runoff from impervious surfaces, lawn and garden care, atmospheric deposition, domestic pet waste, and vehicle maintenance/traffic.

B. Programmatic Components

The NPDES stormwater permit application process for municipal separate storm sewer systems is specified in 40 CFR 122.26(d). The two-part application process was devised to provide a basis for reducing and eliminating pollutants in stormwater discharges from large municipal separate storm sewer systems. Part 1

of the application process requires applicants to submit information regarding existing programs and legal authority, identify sources of pollutants, field screen major outfalls to detect illicit connections, and propose strategies to characterize discharges. The Part 2 application process requires the demonstration of adequate legal authority, additional information on pollutant source identification, characterization of discharges, a proposed stormwater management program, an estimate of the effectiveness of stormwater controls, and a fiscal analysis. The following sections (1 through 6) provide a summary of Baltimore County's application.

1. Legal Authority

A summary of Baltimore County's NPDES stormwater application submittal, specific to the regulatory requirements for adequate legal authority, is as follows:

§122.26(d)(2)(i)"(A) Control...the contribution of pollutants...associated with industrial activity...;"

Baltimore County provided all relevant sections of its County Code which can be used to control discharges associated with industrial activity. Baltimore County controls both the quantity and quality of runoff from new development, significant redevelopment, and construction activities through Code 14 (Section 151-161) Stormwater Management, and Code 14 (Section 191-225), Excavations, Grading, Sediment Control and Forest Management. Additionally, stormwater discharges from industrial activity are controlled through Baltimore County Code 26 (Section 166-305), Development Regulations; Code 26 (Section 436-461), Chesapeake Bay Critical Area Regulations; Code 14 (Section 331-350), Protection of Water Quality, Streams, Wetlands and Floodplains; Code 14 (Section 401-422), Forest Conservation; and Code 32 (Section 1-81), Solid Waste.

§122.26(d)(2)(i)"(B) Prohibit...illicit discharges..."

Baltimore County Code 35 (Section 74) Water and Sewers, prohibits "overflow of sewage, wash water or other liquids or solids...onto any ground surface, streets or roads or into any waters of the county, except as authorized by a valid permit from the State..." Also, the director of the Department of Environmental Protection and Resource Management (DEPRM) has the authority to order corrections for violations.

§122.26(d)(2)(i)"(C) Control...spills, dumping or disposal of materials other than storm water;"

Baltimore County Code 31 (Section 10-12) restricts the deposition of "metal, wood, glass, nails, grass clippings, leaves, and other objects or article, or any dead animal, offal, garbage, ashes, fruit, dirt, filth, rubbish, noxious fluid or substance, or refuse of any kind whatever upon or into...any drain within the limits of the county." Additionally, County Code 14 (Section 296-301) provides for the control and cleanup of spills of petroleum products and hazardous substances.

§122.26(d)(2)(i)"(D) Control...pollutants from one portion of the municipal system to another portion of the municipal system;"

Anne Arundel, Howard, Carroll, and Harford counties and Baltimore City will be issued individual NPDES municipal separate storm sewer discharge permits for their respective storm sewer systems. These permits will be used to address interjurisdictional issues among these jurisdictions. Additionally, MDE will issue general permits for State and federal properties which will address issues between these entities and Baltimore County.

§122.26(d)(2)(i)"(E) Require compliance..."

Most authority for obtaining compliance with storm sewer system regulations in Baltimore County comes from the County's erosion and sediment control and stormwater management programs. Additional enforcement activities are a result of close-out inspections, citizen complaints, and violations discovered by DEPRM personnel. Enforcement actions include stop work orders, violation notices, revocation of permits, civil citations, criminal citations, and injunctive relief.

§122.26(d)(2)(i)"(F) Carry out all inspection, surveillance, and monitoring procedures..."

The authority provided by Baltimore County's Stormwater Management, Erosion and Sediment Control, and Chesapeake Bay Critical Area programs is adequate for the review of private and public development projects. Also, Baltimore County Code 17 (Section 31-33) authorizes DEPRM to perform duties in the interest of public health, and the Annotated Code

of Maryland, section 3-307 provides authorization for a health officer to enter private homes and places of business to perform official duties. DEPRM believes these last two provisions give authorization for County personnel to enter facilities for surveillance and monitoring when illicit connections are suspected.

Summary

In aggregate, the programs described above should provide Baltimore County with the necessary legal authority to control stormwater discharges in accordance with 40 CFR 122.26(d)(2)(i). The County's attorney provided a certified note stating that Baltimore County has the necessary authority to control stormwater discharges pursuant to 40 CFR 122.26(d).

2. Source Identification

A summary of Baltimore County's NPDES stormwater application submittal, specific to the regulatory requirements for source identification, is as follows:

§122.26(d)(1)(iii)"(A) A description of the historic use of ordinances..."

Prior to 1978, Baltimore County used Sections 2,9,13, and 14 of the Plumbing Code to regulate discharges to its sanitary sewer system. These sections prohibited the discharge of certain substances, regulated the temperature of effluent, and required County approval for all system connections. In 1978, new Waste Water regulations were promulgated in response to the CWA. Section 35 of the Baltimore County Code requires permits, establishes user fees, prohibits the discharge of specific substances from being discharged into the system, requires pretreatment, authorizes monitoring, and establishes enforcement procedures and the ability to levy fines.

§122.26(d)(1)(iii)(B) "A USGS 7.5 minute topographic map..."

Baltimore County recorded source identification information on 2,400 scale topographic maps showing County land use. Over top these maps, color coded markers were used to show the location of major storm sewer system outfalls, drainage areas, stormwater management facilities, municipal landfills, existing NPDES dischargers, and the location of sampling stations.

§122.26(d)(1)(iii)(B) "(1) The location of known municipal storm sewer system outfalls..."

Baltimore County located 674 major outfalls and 2,752 minor outfalls. All outfalls have been organized by watershed. Additionally, the major outfalls and their associated drainage areas have been mapped on the County's 2,400 scale topographic base maps.

§122.26(d)(1)(iii)(B) "(2) A description of the land use activities...population densities...average runoff coefficient..."

Land use activities were derived from 1990 satellite photographs and based on a 5.5 acre scale. Land use categories include residential, commercial, industrial, agricultural, forested, and barren. These land uses have been grouped by the County's 15 major watersheds for further analysis. Population data and projections were derived from the Baltimore Regional Council of Government's *Notes on Forecasting, Assumptions and Methodologies, Round IV, The Composite Scenario*. Runoff coefficients were gathered from *Urban Hydrology for Small Watersheds* (US Department of Agriculture, TR-55, June 1981).

§122.26(d)(1)(iii)(B) "(3) The location...of each currently operating or closed municipal landfill..."

Baltimore County has 6 sanitary landfills, two transfer stations, one resource recovery facility, three industrial waste disposal sites, and two composting sites. All of these facilities have been mapped on the County's 2,400 scale topographic maps.

§122.26(d)(1)(iii)(B) "(4) The location and permit number of any known discharge...that has been issued a NPDES permit;"

NPDES permit holders were gathered from MDE's Hazardous and Solid Waste Management Administration. Ninety-two active permits were identified. All facilities are mapped on the County's 2,400 scale topographic maps.

§122.26(d)(1)(iii)(B)"(5) The location of major structural controls..."

Baltimore County has compiled a database of 1130 stormwater management facilities. As part of this database, information is included for facility type, location, storm design, ownership, drainage area, land use, and watershed. Baltimore County mapped these stormwater management facilities on its 2,400 scale topographic base maps.

§122.26(d)(1)(iii)(B)"(6) The identification of publicly owned parks..."

Baltimore County has provided a comprehensive database which includes the location of all County, State, and federally owned lands. This database will be used in conjunction with watershed analysis for the selection of potential retrofit sites.

§122.26(d)(2)"(ii)...an inventory, organized by watershed... of each facility associated with industrial activity..."

Data for 4,207 industries were gathered from the Department of Public Works (DPW) pretreatment program. These industrial facilities are identified by Standard Industrial Classification (SIC) codes and organized by watershed.

Summary

Baltimore County has satisfied the NPDES stormwater requirements for source identification. The County's permit will encourage the transfer of these data into Geographical Information System (GIS) format for better stormwater modelling and management program development.

3. Discharge Characterization

A summary of Baltimore County's NPDES stormwater application submittal, specific to the regulatory requirements for discharge characterization, is as follows:

§122.26(d)(1)(iv)"(A) Monthly mean rain and snow fall estimates..."

Monthly mean rain and snowfall estimates in Baltimore County were obtained from *Weather Almanac of U.S. Cities* (1985). Means were calculated from data gathered between 1951 and 1984.

§122.26(d)(1)(iv)"(B) Existing quantitative data..."

As part of Baltimore County's Waterway Improvement Program, storm event monitoring data has been collected at nine sites throughout the County. These studies have been conducted in the Chink Creek, Jones Creek, Lynch Point Cove, Tabasco Cove, Charlesmont Cove, North Point Cove, Muddy Gut, Greenhill Cove, Sue Creek, and Oakleigh Cove watersheds. Monitoring in these watersheds show elevated levels of

sediment, nutrients, oil and grease, and heavy metals. Sources of these pollutants include runoff from impervious surfaces, lawn and garden care, atmospheric deposition, domestic pet waste, and vehicle maintenance/traffic.

§122.26(d)(1)(iv)(C) A list of water bodies that receive discharges..."

Baltimore County provided excerpts from two reports, *Maryland Water Quality Inventory, 1987-1989*, and *State of Maryland Non-point Source Pollution Assessment Report 1989*, which list receiving water bodies and an assessment of their water quality. Water bodies listed for Baltimore County in these reports include Chesapeake Bay, Gunpowder River, Lower Gunpowder Falls, Little Gunpowder Falls, Loch Raven Reservoir, Prettyboy Reservoir, Middle River, Back River, Baltimore Harbor, Jones Falls, Gwynns Falls, Patapsco River, and Liberty Reservoir.

§122.26(d)(1)(iv)(D) Results of a field screening analysis for illicit connections..."

Baltimore County field screened 500 outfalls for dry weather flow to detect potential illicit connections. The results of this screening show that over 50% of the outfalls tested showed dry weather flow. According to Baltimore County's analysis, 69% of the wet outfalls showed at least one pollutant indicator, however, only 25% were considered severely polluted. The investigation revealed that the highly urban areas of Baltimore Harbor, Back River, and Middle River had the highest number of dry weather flows and commercial land use showed the greatest number of pollutants.

§122.26(d)(1)(iv)(E) ...the location of outfalls or field screening points appropriate for representative data collection..."

Baltimore County selected five outfalls for representative data collection. Criteria used to select the monitoring sites included land use, drainage area, current and future capital projects, hydraulic factors, accessibility, and safety. Five different land uses were selected for characterization purposes including commercial (Long Quarter Branch), agricultural (Whitemarsh Run), light industrial (Brien Run), heavy industrial (Tobasco Creek), and single family residential (Spring Branch). Upon field visits by Baltimore County and MDE officials, evaluations were made regarding representability of land use and amenability to wet weather sampling. As a result of the field assessment, the County's characterization plan was approved by MDE.

§122.26(d)(2)(iii)(A) Quantitative data from...between five and ten outfalls representative of commercial, industrial, and residential..."

Baltimore County selected five representative outfalls for monitoring as outlined above. Three storms were monitored at each sampling location and the results were entered on MDE's formatted database. These results will be used to develop a list of appropriate sampling parameters for long-term monitoring. Baltimore County included an assessment of the pollutants detected and a discussion of potential sources of these pollutants to help guide cleanup efforts.

§122.26(d)(2)(iii)(B) Estimates of annual pollutant loads...and the event mean concentration..."

Annual pollutant load estimates for Baltimore County's municipal separate storm sewer system were characterized using both default value event mean concentration (EMC) levels and those derived from the County's Part 2 monitoring. Comparison of these pollutant load estimates show that when Part 2 monitoring EMC's are used, pollutant loads for most parameters tended to be less than default value estimates.

§122.26(d)(2)(iii)"(C) A proposed schedule to provide estimates...of the seasonal pollutant load..."

Baltimore County used its Part 2 monitoring data to provide estimates of seasonal variations in stormwater pollutant loads. Because none of the storms monitored for Part 2 of the County's application occurred during the summer, these results are preliminary. The County's application states that as more data are gathered as a result of long term monitoring, these analyses can be improved.

§122.26(d)(2)(iii)"(D) A proposed monitoring program...for the term of the permit..."

Baltimore County has proposed three outfall monitoring sites with associated in-stream monitoring stations for the term of the permit. Two of these sites are in the Loch Raven watershed and are representative of residential (Spring Branch) and commercial (Long Quarter Branch) land use. The third site is heavy industrial land use and is located in the Patapsco River watershed. The County has proposed these sites because restoration efforts have been planned in these watersheds and an opportunity exists for evaluating pre and post restoration stormwater pollutant loads.

Summary

Baltimore County has provided all necessary information for the discharge characterization part of the NPDES municipal permit application. Data supplied will be used by MDE to develop a list of relevant parameters for long-term monitoring. Subsequently, long-term monitoring data can be used to further refine pollutant load estimates and guide stormwater management plans.

4. Management Programs

A summary of Baltimore County's NPDES stormwater application submittal, specific to the regulatory requirements for management programs, is as follows:

§122.26(d)(2)(iv) "(A) A description of structural and source control measures ..."

Baltimore County's structural and source control program is intended to address non-point source pollutants from commercial and residential land uses. Source controls are those best management practices that prevent pollutants from being introduced into the environment. Structural controls treat the pollutant once it has been introduced into the waterway. The County's proposed structural and source control program includes

existing programs, the expansion of existing programs, and the creation of new programs as described below.

§122.26(d)(2)(iv)(A) "(1) A description of maintenance activities...for structural controls...;"

Maintenance of the Baltimore County storm drain system and County owned stormwater management facilities is the responsibility of the DPW, Highways and Traffic Operations Bureau, Highway Construction and Maintenance Division. Storm drain pipes, inlets, and outfalls are cleaned by three Vac-Con crews which can cover the entire County every year and a half. All stormwater management facilities are inspected after construction completion (As-Built), one year after As-Built approval, and every three years thereafter. Public facilities in need of maintenance are repaired by the Bureau of Highways and Traffic Operations. Maintenance of privately owned stormwater management facilities is assured by the execution and recordation of Maintenance Agreements in the Baltimore County Land Records. The County has proposed to create a database for tracking and ensuring maintenance of stormwater management facilities.

§122.26(d)(2)(iv)(A) "(2) A description of planning procedures...to reduce...pollutants...from areas of new development and significant redevelopment...;"

Site planning and requirements for nonstructural and structural best management practices in Baltimore County are performed by DEPRM. The Bureau of Engineering - Design and Review Section provides comments on proposed development in Baltimore County. These reviews include grading, erosion and sediment control, and stormwater management. Additionally, the Environmental Impact Review Section provides comments on the protection of streams, wetlands, flood plains, forest, and rare and endangered species as well as the protection and maintenance of water quality.

§122.26(d)(2)(iv)(A) "(3) A description of practices for operating and maintaining public streets...;"

Baltimore County's Bureau of Highways and Traffic provides a broad range of services related to the control of stormwater from the County road system. The Bureau maintains and repairs 1,300 stormwater management facilities. These activities include the conversion of "dry" ponds to "wet" ponds, and the cleaning and repair of stormwater management facilities. Additionally, the Bureau maintains 664 miles of storm drain system. These activities include the cleaning of storm drain inlets and pipes with a VAC-CON storm drain truck which cleared 1,070 cubic yards of debris from 13,743 inlets in fiscal year 1994. The County has proposed getting the Division of Highways Maintenance to aid in the location and removal of illicit connections to the storm drain system with the use of a pipe inspection camera. The Bureau of Solid Waste Management is responsible for cleaning more than 4,000 miles of curb and gutter. Currently it takes the Bureau's seven mechanical sweepers and twelve employees nine months to clean all roads in the County. This program collects 10,000 cubic yards of solid waste which would otherwise enter into the County stormwater system.

§122.26(d)(2)(iv)(A) "(4) A description of procedures to assure that flood management projects assess the impacts on the water quality...;"

The requirements of this provision are currently being met for new development and significant redevelopment by the application of water quality design requirements for stormwater management as described above. For existing developed areas, Baltimore County has proposed conducting watershed management plans. To facilitate the development of these plans, Baltimore County has ranked its fourteen major watersheds based on factors such as the amount of developed land, watershed impervious percentage, number of industries, and potential for stormwater retrofits. Beginning with the most impacted watersheds, the County will conduct comprehensive assessments from which action plans for cleanup and restoration will be developed. For fiscal years 1996-1997, Baltimore County has proposed to develop watershed management plans for the Loch Raven, Gwynns Falls, and Back River watersheds. For fiscal years 1998-1999, the Jones Falls, Patapsco River, and Lower Gunpowder are slated for watershed management plans. Finally, the County will develop these plans for Baltimore Harbor, Middle River, and the Little Gunpowder River in fiscal years 2000-2001. The Bird River watershed is currently undergoing assessment and action plan development. Experience from this project will aid in the development of future watershed management plans. The remaining four watersheds, Prettyboy Reservoir, Deer Creek, Liberty Reservoir, and Gunpowder River are the least impacted and are not considered priorities for watershed management plans during the course of this five year permit.

The watershed management plans will be developed in three phases. In phase one, the County will use its GIS and stormwater management model (SWMM) for watershed characterization. Phase two will include analyses of sub-watersheds along with prioritization for restoration. The final phase will involve feasibility assessments of various management techniques including stormwater management pond conversions and retrofits; stream, flood plain, and wetland restoration; afforestation and restoration of riparian buffer habitat; educational efforts; illicit connection removal efforts; and recommendations for zoning changes. Completed feasibility assessments will provide an action plan for each priority sub-watershed including project list, restoration budget, and implementation schedule.

§122.26(d)(2)(iv)(A) "(5) A description of a program to monitor pollutants from operating or closed municipal landfills...;"

Baltimore County intends to rely upon MDE's Industrial Discharge Program for the establishment of monitoring requirements for industrial sites including municipal landfills and other treatment, storage, and disposal facilities. The County's Eastern Sanitary Landfill has already applied for and received coverage under an NPDES General Permit and as part of that process has prepared a pollution prevention plan. Baltimore County's NPDES Management Committee will identify any additional facilities that may

require NPDES General Permit coverage and advise those facilities of their responsibilities.

§122.26(d)(2)(iv)(A) "(6) A description of a program to reduce...pollutants... associated with the application of pesticides...;"

The requirement to reduce the application of pesticides, herbicides, and fertilizers will be met by two program elements. First, educational programs will be developed for homeowners, businesses, and school children. The educational materials will be developed in 1995 and pilot presentations and surveys will be conducted to test their effectiveness. Based on these results, successful educational materials will be expanded in 1996. Second, for publicly owned lands, Baltimore County's NPDES stormwater management committee will advise the County on pesticide control and use reduction. As part of this process, information on the types of chemicals used by the County, application sites, rates, and storage areas will be gathered. Additionally, grounds maintenance documents will be reviewed to see if there are opportunities for improvement.

§122.26(d)(2)(iv) "(B) A description of a program...to detect and remove...illicit discharges...The program shall include:"

Baltimore County's Illicit Connection Program incorporates a number of existing programs, expands some programs, and creates new program elements in an effort to meet the objectives of illicit connection removal and source reduction. Some of these components are described below.

§122.26(d)(2)(iv)(B) "(1) A description of a program...to prevent illicit discharges...;"

Several sections of the Baltimore County Code will be used to prevent illicit connections. Section 14-337 prohibits water pollution. Sections 14-345 through 14-350 details enforcement procedures and penalties for violations. Section 31-10 specifically prohibits the depositing of materials in County streets or drains. Section 35-74 addresses the overflow of sewage onto ground surfaces. Sections 35-180 through 35-186 require the connection of toilets and drains to the sanitary system and includes provisions for enforcement. From these ordinances, Baltimore County has determined that it has the necessary legal authority to address the requirements of the illicit connection program.

§122.26(d)(2)(iv)(B) "(2) A description of...on-going field screening activities...;"

The selection of outfalls for field screening shall be based on the data generated as a result of the Part 1 field screening effort, the balance of major outfalls not inspected, and outfalls in commercial and industrial land use areas. Storm drain outfalls shall only be sampled after 72 hours of dry weather. All storm drain outfalls will be assessed for the qualitative parameters of odor, algal growth, floatables, deposits/stains, sediment depositions, vegetative condition, erosion, and structural condition of the outfall. Outfalls with flow or with a pool below the outfall, shall be sampled for the additional

qualitative parameters of color and clarity of water. Lamotte test kits will be used for sampling temperature, pH, phenols, chlorine, detergents and copper. If flow is observed, then the flow rate shall be estimated using the simple float-timing method.

During 1995, 50 outfalls will be screened for illicit connections in a pilot study. Also, during 1995, a complete *Manual of Practice for Detection and Removal of Illicit Connections* will be developed based on the experience gained in the field study. Baltimore County proposes to screen two hundred outfalls per year during the term of the permit. Some of these field screenings shall be revisits of sites suspected of intermittent discharges. The timing of revisits shall be based on criteria such as shift changes in industrial areas or end of the work week when intermittent cleaning activities may take place.

§122.26(d)(2)(iv)(B) "(3) A description of procedures...to investigate portions of the separate storm sewer system...;"

If field screening indicates the possibility of an illicit connection, the field crew will conduct an initial investigation of the watershed to determine possible sources. The field crew shall attempt to trace the flow by removing manhole covers working from the storm drain outfall backwards. Inlets will be observed for surface or subsurface flows. If the source is located, it will be indicated on an illicit connection report form for routing to appropriate departments for response. Additional field screening of the outfall may be conducted in order to ascertain the source.

If the source can not be readily identified, information on the illicit discharge will be routed to the following -- DPW Bureau of Utilities, DEPRM Ground Water Management, DPW Bureau of Highways, Maryland Department of the Environment, Save Our Streams, and Baltimore Metropolitan Water District. Detailed investigation methodology will be determined in conjunction with each affected agency during the course of the pilot study and the results shall be incorporated into the *Manual of Procedures for Illicit Connection Detection and Removal*.

§122.26(d)(2)(iv)(B) "(4) A description of procedures to prevent, contain, and respond to spills...;"

The DEPRM -- Bureau of Air Quality and Waste Management has the responsibility for inspecting sites for spill prevention, responding to reports of spills, and containment of small spills. The containment of major spills is done by the Baltimore County Fire Department. The lead agency in the response to large spills is MDE. However in some cases, the U.S. Coast Guard may assume responsibility. MDE regulates private properties on which chemicals are stored based on authority delegated by the federal government.

A Management Committee shall be instituted in 1995 to address the requirements of the NPDES program and assess the effectiveness of various portions of the program. One of its responsibilities will be to assure that Pollution Prevention and Spill Response Plans

are prepared for all County agencies. Additionally, this committee will review its maintenance procedures in relation to pollution reduction.

§122.26(d)(2)(iv)(B) "(5) A description of a program to promote...public reporting of...illicit discharges...;"

Educational materials will contain information on how to report an illicit discharge and encourage citizens to participate. These materials will also contain information on potential sources of illicit connections and reasons for reducing controllable pollutant discharges. These programs will complement the County's existing program to encourage citizens to adopt local streams and their watersheds as part of its response to non-point source initiatives, including the Maryland Chesapeake Bay Tributary Strategies.

§122.26(d)(2)(iv)(B) "(6) A description of educational activities...;"

Baltimore County has a contractual relationship with Maryland Save Our Streams for educational activities associated with stream and shoreline restoration, dredging programs, stream monitoring, and water quality activities. The County proposes to expand this program with additional funds from the Capital budget. In 1995, educational brochures will be developed specifically addressing the proper management and disposal of used oil and toxic materials. Starting in 1996, outfalls and inlets which show evidence of improper disposal of materials shall be flagged and a priority list developed for targeting communities. Specific material regarding the community such as the name of streams affected, number of outfalls in the watershed, percent of impervious area, and location of recycling centers will be developed for these targeted communities to make the educational materials more meaningful.

Additionally, half-hour presentation packages that target elementary, middle, and high school students will be assembled. The presentation will cover management and disposal of used oil and toxic materials and the application of pesticides, herbicides, and fertilizer to urban areas. These materials will be developed in 1995 and offered to teachers for presentation to their classes. Teacher training sessions shall be implemented in 1996. Existing storm drain stenciling programs "Chesapeake Bay Drainage -- Do Not Dump" will continue. Methods of assessing the effectiveness of the educational programs will be refined in 1995 and may include mailed surveys, door to door surveys, and testing in the school environment.

§122.26(d)(2)(iv)(B) "(7) A description of controls to limit infiltration of seepage...;"

The DPW, Capital Projects Bureau, Design Division has the responsibility of enforcing standards for sanitary sewer lines and storm drain systems. These standards include a separation of seven feet between the two systems. Additionally, DPW, Bureau of Utilities, conducts inspections and maintenance of the sanitary sewer system, correcting any leaks found. This Bureau also responds to citizen complaints of overflow. If leaks are

discovered via the illicit connection screening process, information will be forwarded to the Bureau of Utilities for response as well.

§122.26(d)(2)(iv) "(C) A description of a program to monitor and control pollutants...from municipal landfills...The program shall:"

§122.26(d)(2)(iv)(C) "(1) Identify priorities and procedures for inspections...;"

The objectives of inspecting, controlling, and monitoring stormwater from industrial sites will be achieved by the continuance of existing Baltimore County programs that address industrial site stormwater runoff, the creation of the Baltimore County Illicit Connection Program, and the reliance on permit conditions established by the MDE's NPDES Industrial Discharge Permit Program.

§122.26(d)(2)(iv)(C) "(2) Describe a monitoring program...."

All facilities will be required to follow MDE's industrial monitoring requirements as set forth in the State's general permit for industrial stormwater discharges.

§122.26(d)(2)(iv) "(D) A description of a program to implement and maintain structural and non-structural best management practices to reduce pollutants in storm water runoff from construction sites...which shall include:"

§122.26(d)(2)(iv)(D) "(1) A description of procedures for site planning...;"

Site planning and requirements for nonstructural and structural best management practices in Baltimore County are performed by DEPRM. The Bureau of Engineering - Design and Review Section provides comments on proposed development in Baltimore County. These reviews include grading, erosion and sediment control, and stormwater management. Additionally, the Environmental Impact Review Section provides comments on the protection of streams, wetlands, flood plains, forest, and rare and endangered species as well as the protection and maintenance of water quality.

§122.26(d)(2)(iv)(D) "(2) A description of requirements for non-structural and structural best management practices;"

The Baltimore County Soil Conservation District is responsible for the technical review of erosion and sediment control plans for proposed development projects. This review ensures that all erosion and sediment control plans are in compliance with the 1991 Maryland Standards and Specifications for Soil Erosion and Sediment Control.

§122.26(d)(2)(iv)(D) "(3) A description of procedures for inspecting sites...;"

Inspection of construction sites and enforcement of the regulations fall under the purview of DEPRM, Bureau of Engineering Services - Inspection and Enforcement. Inspections are performed at construction sites once every two weeks as required by State law to ensure that sites are in compliance with approved erosion and sediment control plans.

§122.26(d)(2)(iv)(D) "(4) A description of appropriate educational and training measures for construction site operators."

Baltimore County has in the past conducted State approved certification classes to educate construction site operators regarding erosion and sediment control practices. This education program will be re-implemented during the term of the County's NPDES municipal stormwater permit. Classes will be conducted on an as needed basis. Currently, all construction site operators are required to produce their certification prior to the release of a grading permit.

Summary

Baltimore County has numerous existing programs which address the requirements of the NPDES municipal stormwater program. In areas where programs are lacking, Baltimore County has proposed new programs such as educational activities, illicit connection detection, and watershed assessment plans. Baltimore County has yet to describe an existing program or propose a new program for addressing pollutants associated with road maintenance activities. Baltimore County's permit will require the implementation of programs which address all NPDES municipal stormwater permit requirements.

5. Program Funding

A summary of Baltimore County's NPDES application submittal, specific to the regulatory requirements for program funding, is as follows:

§122.26(d)(2) "(vi) For each fiscal year to be covered by the permit, a fiscal analysis... shall include a description of the source of funds...to meet the necessary expenditures..."

All NPDES municipal stormwater program requirements will be performed by Baltimore County DEPRM and DPW. Because many of these programs already exist or are expansions of existing programs, the County had difficulty separating specific NPDES requirements and their associated costs. Operating costs for all DEPRM and DPW programs participating in the NPDES municipal stormwater program in fiscal year 1995 is \$14,313,229. The projected operating budgets for 1996-2001 are based on incremental increases for each year and the addition of three positions in 1996, three positions in 1998, and three positions in 2000. All nine positions are in DEPRM and will work on watershed management plans. By 2000, the County's anticipated operating budget for all participating DEPRM and DPW programs is \$16,975,187. Additionally, capital funds are allocated for stormwater management retrofits through DEPRM's Capital Improvement Program. In fiscal year 1995, the approved budget for these projects is \$11,130,067 (\$4,981,419 County funds, \$6,148,648 matching funds and grants). The projected capital budget for 1995-2000 is \$24,890,000. Another major capital program is for the building and maintenance of the storm drain system. The projected capital budget for Baltimore County's storm drain system for years 1995-2000 is \$138,000,000

Summary

Baltimore County believes that the approved funding and staffing for fiscal year 1995 is adequate to meet the requirements of the NPDES municipal stormwater discharge permit. The proposed funding and staffing for fiscal years 1996-2000 should be adequate to meet all NPDES requirements.

6. Assessment of Controls

A summary of Baltimore County's NPDES application submittal, specific to the regulatory requirements for assessment of controls, is as follows:

§122.26(d)(2) "(v) Estimated reductions in loadings...expected as a result of the... management program..."

For assessing the effectiveness of structural BMPs, Baltimore County used established BMP pollutant load reduction rates supplied in *A Current Assessment of Urban Best Management Practices* (Shuler, et al. 1992). Pollutant load reductions were calculated by multiplying the drainage acreage for a facility type by the pounds per acre of pollutant by the removal efficiency for that facility type.

For assessing pollutant reduction as a result of educational programs, Baltimore County has proposed the use of surveys. These surveys will be designed in 1995 and used for a pilot study. Experience gained from this pilot study will be used to modify the survey for full distribution by 1996. In order to gauge effectiveness, surveys will be distributed before and after stormwater education to see if there is any change in behavior. In an effort to assure participation, the County is proposing to distribute the surveys as homework for school students. An additional surrogate for gauging the effectiveness of educational programs will be to use Tributary Strategy figures on nutrient removal as a result of education. These values are 1 pound per acre for nitrogen and 0.1 pound for phosphorus.

Summary

Baltimore County has provided the necessary pollutant removal information for complying with the NPDES municipal stormwater requirements. During the course of the County's permit, stormwater monitoring data can be used to improve these estimates and help guide the future development and implementation of effective stormwater management programs.