

## 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.