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Report to Congress

Implementation and Enforcement of the Combined Sewer Overflow Control Policy

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List of Acronyms

6MM—Six Minimum Measures

AMSA—Association of Metropolitan Sewerage Authorities

AO—Administrative Order

APWA—American Public Works Association

BAT—Best Available Technology Economically Achievable

BCT—Best Conventional Pollutant Control Technology

BEACH Program—Beaches Environmental Assessment, Closure and Health Program

BMP—Best Management Practice

BPJ—Best Professional Judgement

CAPD—Compliance Assistance Planning Database

CIP—Capital Improvement Plan

CMC—Center for Marine Conservation

CSO—Combined Sewer Overflow

CSS—Combined Sewer Systems

CWA—Clean Water Act

CWNS—Clean Water Needs Survey

DEM—Department of Environmental Management

DEP—Department of Environmental Protection

EBPS—Environmental Benefit Permit Strategy

EPA—Environmental Protection Agency

ERPs—Regional Enforcement Response Plans

FOIA—Freedom of Information Act

GPRA—Government Performance and Results Act

IEPA—Illinois Environmental Protection Agency

LGEAN—Local Government Environmental Assistance Network

LTCP—Long-Term Control Plan

MAG—Office of Water Management Advisory Group

mgd—Million Gallons per Day

MHI—Median Household Income

MOA—Memorandum of Agreement

MS4s—Municipal Separate Storm Sewer Systems

MSD—Metropolitan Sewer District

MWRA—Massachusetts Water Resources Authority

MWRD—Metropolitan Water Reclamation District

NEORSD—Northeast Ohio Regional Sewer District

NEPPS—National Environmental Performance Partnership System

NMC—Nine Minimum Controls

NMP—National Municipal Policy

NOAA—National Oceanic and Atmospheric Administration

NOV—Notices of Violation

NPDES—National Pollutant Discharge Elimination System

NRDC—Natural Resources Defense Council

NYCDEP—New York City's Department of Environmental Protection

O & M—Operation and Maintenance

OECA—Office of Enforcement and Compliance Assurance

OGWDW—Office of Ground Water and Drinking Water

ORD—Office of Research and Development

OW—Office of Water

OWM—Office of Wastewater Management

OWOW—Office of Wetlands, Oceans and Watersheds

PCS—Permit Compliance System

POTW—Publicly Owned Treatment Works

PPA—Performance Partnership Agreement

RCATS—Reporting Compliance Assistance System

SCSs—Satellite Collection Systems

SEA—Senate Enrolled Act

SRF—State Revolving Fund

SSES—Sewer System Evaluation Study

SSO—Sanitary Sewer Overflow

SWAP—Source Water Assessment Program

TARP—Tunnel and Reservoir Plan

TMDL—Total Maximum Daily Loads

TOGS—Technical and Operational Guidance Series

UAA—Use Attainability Analysis

USDA—United States Department of Agriculture

WEF—Water Environment Federation

WPD—Water Permits Division

WWTP—Wastewater Treatment Plants

Glossary

This glossary includes a collection of the terms used in this manual and an explanation of each term. To the extent that definitions and explanations provided in this glossary differ from those in EPA regulations or other official documents, they are intended for use in understanding this manual only.

A

Anti-backsliding—A provision in the Federal Regulations [CWA §303(d)(4); CWA §402(c); CFR §122.44(l)] that requires a reissued permit to be as stringent as the previous permit with some exceptions.

Antidegradation—Policies which ensure protection of water quality for a particular water body where the water quality exceeds levels necessary to protect fish and wildlife propagation and recreation on and in the water. This also includes special protection of waters designated as outstanding natural resource waters. Antidegradation plans are adopted by each state to minimize adverse effects on water.

Authorized Program or Authorized State—A state, territorial, tribal, or interstate NPDES program which has been approved or authorized by EPA under 40 CFR Part 123.

Average Number of Overflow Events Per Year—The total number of combined sewer overflow events that occurred during the term of the permit divided by the permit term in years.

B

Best Available Technology Economically Achievable (BAT)—Technology-based standard established by the Clean Water Act (CWA) as the most appropriate means available on a national basis for controlling the direct discharge of toxic and nonconventional pollutants to navigable waters. BAT effluent limitations guidelines, in general, represent the best existing performance of treatment technologies that are economically achievable within an industrial point source category or subcategory.

Best Conventional Pollutant Control Technology (BCT)—Technology-based standard for the discharge from existing industrial point sources of conventional pollutants including BOD, TSS, fecal coliform, pH, oil and grease. The BCT is established in light of a two-part "cost reasonableness" test which compares the cost for an industry to reduce its pollutant discharge with the cost to a POTW for similar levels of reduction of a pollutant loading. The second test examines the cost-effectiveness of additional industrial treatment beyond BPT. EPA must find limits which are reasonable under both tests before establishing them as BCT.

Best Management Practice (BMP)—Permit condition used in place of or in conjunction with effluent limitations to prevent or control the discharge of pollutants. May include schedule of activities, prohibition of practices, maintenance procedure, or other management practice. BMPs may include, but are not limited to, treatment requirements, operating procedures, or practices to control plant site runoff, spillage, leaks, sludge or waste disposal, or drainage from raw material storage.

Best Professional Judgment (BPJ)—The method used by permit writers to develop

technology-based NPDES permit conditions on a case-by-case basis using all reasonably available and relevant data.

BOD5—Five-day biochemical oxygen demand; a standard measure of the organic content of wastewater, expressed in mg/l.

Biochemical Oxygen Demand (BOD)—A measurement of the amount of oxygen utilized by the decomposition of organic material, over a specified time period (usually 5 days) in a wastewater sample; it is used as a measurement of the readily decomposable organic content of a wastewater.

Bypass—The intentional diversion of wastestreams from any portion of a treatment (or pretreatment) facility.

C

Catch Basin—A chamber usually built at the curbline of a street, which admits surface water for discharge into a storm drain.

Clean Water Act (CWA)—The Clean Water Act is an act passed by the U.S. Congress to control water pollution. It was formerly referred to as the Federal Water Pollution Control Act of 1972 or Federal Water Pollution Control Act Amendments of 1972 (Public Law 92-500), 33 U.S.C. 1251 et. seq., as amended by: Public Law 96-483; Public Law 97-117; Public Laws 95-217, 97-117, 97-440, and 100-04.

Code of Federal Regulations (CFR)—A codification of the final rules published daily in the Federal Register. Title 40 of the CFR contains the environmental regulations.

Collector Sewer—The first element of a wastewater collection system used to collect and carry wastewater from one or more building sewers to a main sewer. Also called a lateral sewer.

Combined Sewage—Wastewater and storm drainage carried in the same pipe.

Combined Sewer Overflow (CSO)—A discharge of untreated wastewater from a combined sewer system at a point prior to the headworks of a publicly owned treatment works. CSOs generally occur during wet weather (rainfall or snowmelt). During periods of wet weather, these systems become overloaded, bypass treatment works, and discharge directly to receiving waters.

Combined Sewer System (CSS)—A wastewater collection system which conveys sanitary wastewaters (domestic, commercial and industrial wastewaters) and storm water through a single pipe to a publicly owned treatment works for treatment prior to discharge to surface waters.

Compliance Schedule—A schedule of remedial measures included in a permit or an enforcement order, including a sequence of interim requirements (for example, actions, operations, or milestone events) that lead to compliance with the CWA and regulations.

Criteria—The numeric values and the narrative standards that represent contaminant concentrations that are not to be exceeded in the receiving environmental media (surface water, ground water, sediment) to protect beneficial uses.

D

Designated use—Use specified in WQS for each water body or segment whether or not it is being attained.

Director—The Regional Administrator or State Director, as the context requires, or an authorized representative. When there is no approved state program, and there is an EPA administered program, Director means the Regional Administrator. When there is an approved state program, "Director" normally means the State Director.

Discharge Monitoring Report (DMR)—The form used (including any subsequent additions, revisions, or modifications) to report self-monitoring results by NPDES permittees. DMRs must be used by approved states as well as by EPA.

Draft Permit—A document prepared under 40 CFR §124.6 indicating the Director's tentative decision to issue, deny, modify, revoke and reissue, terminate, or reissue a permit. A notice of intent to terminate a permit, and a notice of intent to deny a permit application, as discussed in 40 CFR §124.5, are considered draft permits. A denial of a request for modification, revocation and reissuance, or termination, as discussed in 40 CFR §124.5, is not a draft permit.

Dry Weather Flow Conditions—Hydraulic flow conditions within the combined sewer system resulting from one or more of the following: flows of domestic sewage, ground water infiltration, commercial and industrial wastewaters, and any other non-precipitation event related flows (e.g., tidal infiltration under certain circumstances). Other non-precipitation event related flows that are included in dry weather flow conditions will be decided by the permit writer based on site-specific conditions.

Dry Weather Flow Overflow—A combined sewer overflow that occurs during dry weather flow conditions.

E

Effluent Limitation—Any restriction imposed by the Director on quantities, discharge rates, and concentrations of pollutants which are discharged from point sources into waters of the United states, the waters of the contiguous zone, or the ocean.

G

General Permit—An NPDES permit issued under 40 CFR §122.28 that authorizes a category of discharges under the CWA within a geographical area. A general permit is not specifically tailored for an individual discharger.

I

Indirect Discharge—The introduction of pollutants into a municipal sewage treatment system from any nondomestic source (i.e., any industrial or commercial facility) regulated under Section 307(b), (c), or (d) of the CWA.

Infiltration—Water other that wastewater that enters a wastewater system and building sewers from the ground through such means as defective pipes, pipe joints, connections, or manholes. (Infiltration does not include inflow).

Infiltration/Inflow (I/I) —The total quantity of water from both infiltration and inflow.

Inflow—Water other than wastewater that enters a wastewater system and building sewer from sources such as roof leaders, cellar drains, yard drains, area drains,

foundation drains, drains from springs and swampy areas, manhole covers, cross connections between storm drains and sanitary sewers, catch basins, cooling towers, stormwaters, surface runoff, street wash waters, or drainage. (Inflow does not include infiltration).

Interceptor Sewer—A sewer without building sewer connections which is used to collect and carry flows from main and trunk sewers to a central point for treatment and discharge.

L

Load Allocation (LA) —The portion of a receiving water's loading capacity that is attributed to one of its existing or future nonpoint sources of pollution, or to natural background sources.

M

Major Facility—Any NPDES facility or activity classified as such by the Regional Administrator, or in the case of approved state programs, the Regional Administrator in conjunction with the State Director. Major municipal dischargers include all facilities with design flows of greater than one million gallons per day and facilities with EPA/state approved industrial pretreatment programs. Major industrial facilities are determined based on specific ratings criteria developed by EPA/state.

Million Gallons per Day (mgd)—A unit of flow commonly used for wastewater discharges. One mgd is equivalent to 1.547 cubic feet per second.

Mixing Zone—An area where an effluent discharge undergoes initial dilution and is extended to cover the secondary mixing in the ambient water body. A mixing zone is an allocated impact zone where water quality criteria can be exceeded as long as acutely toxic conditions are prevented.

N

National Pollutant Discharge Elimination System (NPDES)—The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of CWA.

National Pretreatment Standard or Pretreatment Standard—Any regulation promulgated by the EPA in accordance with Sections 307(b) and (c) of the CWA that applies to a specific category of industrial users and provides limitations on the introduction of pollutants into publicly owned treatment works. This term includes the prohibited discharge standards under 40 CFR §403.5,

including local limits [40 CFR §403.3(j)].

O

Overflow Rate—Detention basin release rate divided by the surface area of the basin. It can be thought of as an average flow rate through the basin. Generally expressed as gallons per day per sq. ft. (gpd/sq.ft.).

P

Peak Flow—The maximum flow that occurs over a specific length of time (e.g., daily, hourly, instantaneous).

Point Source—Any discernible, confined, and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fixture, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel, or other floating craft from which pollutants are or may be discharged.

Pollutant—Dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials (except those regulated under the Atomic Energy Act of 1954, as amended (42 U.S.C. 2011 et seq.)), heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water.

Precipitation Event—An occurrence of rain, snow, sleet, hail, or other form of precipitation. Precipitation events are generally characterized by parameters of duration and intensity (inches or millimeters per unit of time). This definition will be highly site-specific. For example, a precipitation event could be defined as 0.25 inches or more of precipitation in the form of rain or 3 inches or more of precipitation in the form of sleet or snow, reported during the preceding 24-hour period at a specific gaging station. A precipitation event could also be defined by a minimum time interval between measurable amounts of precipitation (e.g., 6 hours between the end of rainfall and the beginning of the next rainfall).

Pretreatment—The reduction of the amount of pollutants, the elimination of pollutants, or the alteration of the nature of pollutant properties in wastewater prior to or in lieu of discharging or otherwise introducing such pollutants into a publicly owned treatment works [40 CFR §403.3(q)].

Primary Clarification or Equivalent—The level of treatment that would typically be provided by one or more treatment technologies under peak wet weather flow

conditions. Options for defining primary clarification include a design standard (e.g., side wall depth and maximum overflow rate), a performance standard (e.g., percent removal), or an effluent standard (e.g., concentration of pollutants). "Equivalent to primary clarification" is site-specific and includes any single technology or combination of technologies shown by the permittee to achieve primary clarification under the presumption approach. The permittee is responsible for showing equivalency to primary treatment as part of the evaluation of CSO control alternatives during LTCP development. Primary clarification is discussed in more detail in the Combined Sewer Overflows-Guidance for Long-Term Control Plan (EPA, 1995a).

Primary Treatment—The practice of removing some portion of the suspended solids and organic matter in a wastewater through sedimentation. Common usage of this term also includes preliminary treatment to remove wastewater constituents that may cause maintenance or operational problems in the system (i.e., grit removal, screening for rags and debris, oil and grease removal, etc.).

Publicly Owned Treatment Works (POTW)—A treatment works, as defined by Section 212 of the CWA, that is owned by the state or municipality. This definition includes any devices and systems used in the storage, treatment, recycling, and reclamation of municipal sewage or industrial wastes of a liquid nature. It also includes sewers, pipes, and other conveyances only if they convey wastewater to a POTW treatment plant [40 CFR §403.3].

R

Rainfall Duration—The length of time of a rainfall event.

Rainfall Intensity—The amount of rainfall occurring in a unit of time, usually expressed in inches per hour.

Regulator—A device in combined sewer systems for diverting wet weather flows which exceed downstream capacity to an overflow.

S

Sanitary Sewer—A pipe or conduit (sewer) intended to carry wastewater or water-borne wastes from homes, businesses, and industries to the POTW.

Sanitary Sewer Overflows (SSO)—Untreated or partially treated sewage overflows from a sanitary sewer collection system.

Secondary Treatment—Technology-based requirements for direct discharging municipal sewage treatment facilities. Standard is based on a combination of physical and

biological processes typical for the treatment of pollutants in municipal sewage. Standards are expressed as a minimum level of effluent quality in terms of:BOD5, suspended solids (SS), and pH (except as provided for special considerations and treatment equivalent to secondary treatment).

Sensitive Areas—Areas of particular environmental significance or sensitivity that could be adversely affected by a combined sewer overflow, including Outstanding National Resource Waters, National Marine Sanctuaries, water with threatened or endangered species, waters with primary contact recreation, public drinking water intakes, shellfish beds, and other areas identified by the permittee or National Pollutant Discharge Elimination System permitting authority, in coordination with the appropriate state or federal agencies.

Solid and Floatable Materials—Solid or semi-solid materials should be defined on a case-by-case basis determined by the control technologies proposed by the permittee to control these materials. The term generally includes materials that might impair the aesthetics of the receiving water body.

State Revolving Fund Program—A federal program created by the Clean Water Act Amendments in 1987 that offers low interest loans for wastewater treatment projects.

STORET—EPA's computerized STOrage and RETrieval water quality database that includes physical, chemical, and biological data measured in waterbodies throughout the United States.

Storm Water—Storm water runoff, snow melt runoff, and surface runoff and drainage [40 CFR §122.26(b)(13)].

T

Total Maximum Daily Load (TMDL)—The amount of pollutant, or property of a pollutant, from point, nonpoint, and natural background sources, that may be discharged to a water quality-limited receiving water. Any pollutant loading above the TMDL results in violation of applicable water quality standards.

Total Suspended Solids (TSS)—A measure of the filterable solids present in a sample, as determined by the method specified in 40 CFR Part 136.

V

Variance—Any mechanism or provision under Sections 301 or 316 of the CWA or under 40 CWR Part 125, or in the applicable "effluent limitations guidelines" which allows modification to or waiver of the generally applicable effluent limitations requirements or time

deadlines of the CWA. This includes provisions, which allow the establishment of alternative limitations based on fundamentally different factors.

W

Wasteload Allocation (WLA)—The proportion of a receiving water's total maximum daily load that is allocated to one of its existing or future point sources of pollution.

Water Quality Criteria—Comprised of numeric and narrative criteria. Numeric criteria are scientifically derived ambient concentrations developed by EPA or states for various pollutants of concern to protect human health and aquatic life. Narrative criteria are statements that describe the desired water quality goal.

Water Quality Standard (WQS)—A law or regulation that consists of the beneficial use or uses of a waterbody, the numeric and narrative water quality criteria that are necessary to protect the use or uses of that particular waterbody, and an antidegradation statement.

Waters of the United States-All waters that are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters subject to the ebb and flow of the tide. Waters of the United States include but are not limited to all interstate waters and intrastate lakes, rivers, streams (including intermittent streams), mudflats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, play lakes, or natural ponds. [See 40 CFR §122.2 for the complete definition.]

Wet Weather Flow—Dry weather flow combined with stormwater introduced into a combined sewer, and dry weather flow combined with inflow in a separate sewer.

Wet Weather Flow Conditions—Hydraulic flow conditions within the combined sewer system resulting from a precipitation event. Since the definition of precipitation event is site-specific, the permit writer should evaluate and define certain site-specific weather conditions that typically contribute to wet weather flow. EPA encourages permit writers to include snowmelt as a condition that typically contributes to wet weather flow.

Executive Summary

Report to Congress on Implementation and Enforcement of the Combined Sewer Overflow Control Policy

The U.S. Environmental Protection Agency (EPA or "the Agency") is transmitting this Report to Congress on the progress made by EPA, states, and municipalities in implementing and enforcing the Combined Sewer Overflow (CSO) Control Policy signed by the Administrator on April 11, 1994. This report is required by Section 402(q)(3) of the Clean Water Act (CWA).

Overview and Background

Why is EPA preparing this report?

In the Consolidated Appropriations Act for Fiscal Year 2001, P.L. 106-554 (or "2000 amendments to the CWA") Congress made several changes to the CWA regarding CSOs, including:

> *Section 402(q) Combined Sewer Overflows*
>
> *(3) Report.–Not later than September 1, 2001, the Administrator shall transmit to Congress a report on the progress made by EPA, states and municipalities in implementing and enforcing the CSO Control Policy.*

This Executive Summary provides an overview of this report and highlights report findings, key program challenges, and EPA actions and next steps to ensure effective implementation and enforcement of the CSO Control Policy.

What are CSOs, and why are they a problem?

As defined in the CSO Control Policy, a combined sewer system (CSS) is:

> *A wastewater collection system owned by a state or municipality (as defined by Section 502(4) of the CWA) which conveys sanitary wastewaters (domestic, commercial and industrial wastewaters) and storm water through a single-pipe system to a publicly owned treatment works (POTW)...*

Further, a CSO is defined as:

In this chapter:

The discharge from a CSS at a point prior to the POTW...

CSSs were among the earliest sewers built in the United States and continued to be built until the middle of the twentieth century. During precipitation events (e.g.,rainfall or snowmelt), the volume of sanitary wastewater and storm water runoff entering CSSs often exceeds conveyance capacity. Combined sewer systems are designed to overflow directly to surface waters when their design capacity is exceeded. Some CSOs occur infrequently; others, with every precipitation event. Because CSOs contain raw sewage and contribute pathogens, solids, debris, and toxic pollutants to receiving waters, CSOs can create serious public health and water quality concerns. CSOs have caused or contributed to beach closures, shellfish bed closures, contamination of drinking water supplies, and other environmental and public health problems.

What statutory and regulatory framework applies to CSOs?

The CWA establishes national goals and requirements for maintaining and restoring the nation's waters. As point sources, CSOs are subject to the technology- and water quality-based requirements of the CWA. They are not, however, subject to the secondary treatment standards that apply to POTWs.

In 1989, EPA initiated action to clarify requirements for CSOs through the publication of the National CSO Control Strategy (54 FR 37370, September 8, 1989). As a result, states developed—and EPA approved—state CSO strategies. In 1992, a management advisory group to EPA recommended that the Agency begin a dialogue with key stakeholders to better define the CWA expectations for controlling CSOs. A workgroup of CSO stakeholders was assembled during the summer of 1992. The workgroup achieved a negotiated dialogue that led to agreement on many technical issues, but no consensus on a policy framework. Individuals from the workgroup representing stakeholder groups met in October 1992 and developed a framework document for CSO control that served as the basis for portions of the draft CSO Control Policy issued for public comment in January 1993. With extensive and documented stakeholder support, EPA issued the final CSO Control Policy on April 19, 1994 (59 FR 18688). When the CSO Control Policy was released, many stakeholders, key members of Congress, and EPA advocated that it be endorsed in the CWA to ensure its full implementation.

In the Consolidated Appropriations Act for Fiscal Year 2001, P.L. 106-554, Congress also stated that:

...each permit, order or decree issued pursuant to this Act after the date of enactment of this subsection for a discharge from a municipal combined storm and sanitary sewer shall conform to the CSO Control Policy signed by the Administrator on April 11, 1994.

In addition, Congress required preparation of a second report to Congress by December 2003. The second report will summarize the

extent of human health and environmental impacts from CSOs and sanitary sewer overflows (SSOs), quantify and characterize resources spent by municipalities to address these impacts, and evaluate the technologies used by municipalities to control overflows. EPA collected data during the preparation of this first report in anticipation of preparing the second report.

What is the CSO Control Policy?

The CSO Control Policy "represents a comprehensive national strategy to ensure that municipalities, permitting authorities, water quality standards authorities and the public engage in a comprehensive and coordinated effort to achieve cost effective CSO controls that ultimately meet appropriate health and environmental objectives." In 1994, EPA estimated that the cost of CSO control, consistent with the CSO Control Policy, would be $40 billion. In the *1996 Clean Water Needs Survey Report to Congress* (EPA, 1997b), EPA estimated the cost to be $44.7 billion (1996 dollars).

The CSO Control Policy established four key principles to guide CSO planning decisions by municipalities, NPDES authorities, and water quality standards authorities:

1. Providing clear levels of control that would be presumed to meet appropriate health and environmental objectives.

2. Providing sufficient flexibility to municipalities, especially financially disadvantaged communities, to consider the site-specific nature of CSOs and to determine the most cost-effective means of reducing pollutants and meeting CWA objectives and requirements.

3. Allowing a phased approach to implementation of CSO controls considering a community's financial capability.

4. Reviewing and revising, as appropriate, water quality standards and their implementation procedures when developing CSO control plans to reflect the site-specific wet weather impacts of CSOs.

The CSO Control Policy expected that NPDES permits or other enforceable mechanisms would require CSO communities to implement nine minimum technology-based controls (the "nine minimum controls" or NMC) by January 1, 1997, and to develop CSO long-term control plans (LTCPs). The LTCP must assess a range of control options, including costs and benefits, and lead to selection of an alternative that would achieve appropriate water quality objectives and compliance with the CWA. Once the NPDES authority and CSO community reached agreement on an LTCP, the CSO community would design and construct the CSO controls as soon as practicable.

What methodology did EPA use for this Report to Congress?

The basic study approach for this report was to collect data and report on implementation and enforcement activities across EPA headquarters and the nine EPA regions and 32 states

known to have CSO communities within their jurisdictions. This entailed:

- Reviewing existing information in state and EPA permit and enforcement files, and federal data bases.
- Performing a literature search on policy, technology, and environmental data.
- Using modeling projections in certain cases.
- Conducting site visits to five EPA Regions and 16 states in which more than 90 percent of the nation's CSSs are located.
- Developing 15 CSO community case studies.
- Reviewing data from surveys conducted by the Association of Metropolitan Sewerage Agencies (AMSA) and the CSO Partnership.
- Organizing a stakeholder discussion of the preliminary issues and findings from the report at a meeting in Chicago, Illinois on July 12 and 13, 2001.

These efforts have allowed the Agency to compile a data base of all CSO permits, prepare profiles of all state CSO programs, and identify and document data gaps. The methodology for this Report to Congress recognizes that the Report to Congress required in 2003 will focus on the extent of environmental and human health impacts, resources spent, and an evaluation of technologies for CSO control.

Report Findings

What are the overall findings of this Report to Congress?

Progress has been made in implementing and enforcing CSO controls prior to, and as a result of, the 1994 CSO Control Policy. Cities that have made substantial progress and investments in CSO control are realizing public health and water quality benefits. The CSO Control Policy provides a sound approach to assess and implement cost effective CSO controls that meet appropriate environmental goals and objectives and achieve CWA compliance. It fosters and expects significant involvement of the public and the NPDES and water quality standards authorities.

Although federal, state, and municipal officials are involved in a broad range of activities to regulate and control CSOs, CSOs continue to pose a serious environmental and public health threat. Much remains to be done to fully realize the objectives of the CSO Control Policy and the CWA. The CSO Control Policy provides an appropriate framework for communities to control CSOs. EPA believes the codification of the CSO Control Policy through the 2000 amendments to the CWA will focus greater attention on implementation of the CSO Control Policy.

EPA believes a number of factors have affected the degree of implementation of the CSO Control Policy, including the lack of any statutory or regulatory endorsement of the CSO Control

Policy from 1994 until December 2000, and competing priorities at the federal, state and local level.

Below, EPA presents a summary of the key findings of this report, organized along four central themes. These themes are:

- A description of the status of CSOs in the United States.
- An overview of progress in implementing and enforcing the CSO Control Policy, examining key programmatic accomplishments at the federal and state levels, as well as municipal actions to implement the technology- and water quality-based controls.
- Early feedback on the nature and extent of environmental results stemming from CSO control.
- A review of remaining challenges in implementing and enforcing the CSO Control Policy.

What is the status of CSOs in the United States?

Today, there are 772 CSO communities with a total of 9,471 CSOs that are identified and regulated by 859 NPDES permits. Key attributes of the CSO universe include:

- CSSs are found in 32 states (including the District of Columbia) and nine EPA Regions. They are regionally concentrated in older communities in the Northeast and Great Lakes regions as shown in Figure ES.1.
- CSSs are diverse, varying in configuration, size, age, number and location of outfalls. For example:
  - Prior to CSO control, San Francisco estimated that CSO discharges from 43 combined sewer outfalls occurred approximately 58 times per year, with a total annual overflow volume of 7.5 billion gallons, discharging into Islais Creek, San Francisco Bay, and the Pacific Ocean. As a result of its CSO control program, San Francisco has eliminated seven outfalls and reduced total annual overflow volume by more than 80 percent.
  - In Bremerton, WA, prior to initiation of CSO control, the average annual CSO volume was more than 120 million gallons from 16 CSOs discharging into Puget Sound. As part of its CSO control program, Bremerton has eliminated three outfalls and reduced total annual overflow volume by nearly 70 percent.
- Of the 772 CSO communities, approximately 30 percent have populations greater than 75,000, and approximately 30 percent are very small with total service populations of less than 10,000.
- EPA estimated in 1978 that there were as many as 1,300 CSO communities. Differences with today's 772 CSO communities are primarily attributable to the improved inventory of CSO

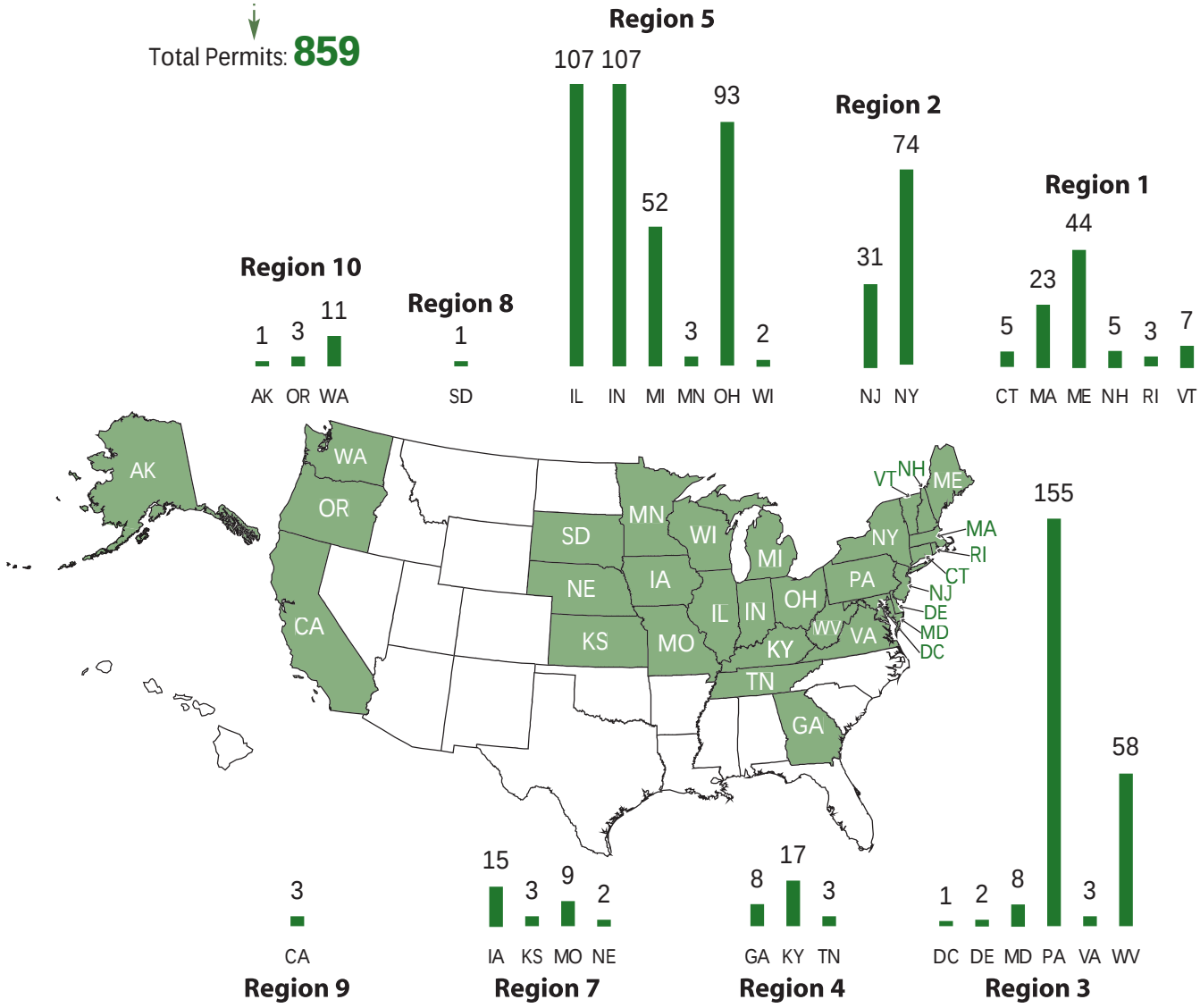
Since implementing CSO controls, San Francisco has reduced the number of CSO events and pollutant loads by an average of 88%.

Photo: Photodisc

Figure ES.1

Distribution of CSO Permits by Region and State

CSOs are found throughout the U.S., but are most heavily concentrated in the Northeast and Great Lakes regions.



permits developed for this report, completed sewer separation projects, and better differentiation between CSSs and separate sewer systems.

- National projections of annual CSO discharges are estimated at 1,260 billion gallons per year.
- Available data indicate the following distribution in receiving waters for CSOs: 43 percent to rivers, 38 percent to streams, five percent to oceans, estuaries and bays, two percent to ponds/lakes, and 12 percent to other waters (ditches, canals, unclassified waters).
- Uncontrolled CSOs continue to impair water quality in areas served by CSSs:
  - According to EPA's 1998 *National Water Quality Inventory*, CSOs are a source of impairment for 12 percent of assessed estuaries (in square miles) and two percent of assessed lakes (in shore miles) (EPA, 2000a).
  - According to a state-by-state report of impaired waters listed under CWA Section 303(d), less than one percent of the nearly 15,600 impaired water bodies in states with CSOs are impaired by CSOs. Further, approximately eight percent of the assessed water bodies are impaired by urban runoff (which may include CSOs). Appendix N provides a summary of the 303(d) listed waters.
  - The Natural Resources Defense Council (NRDC) reported in its 2000 *Testing the Waters* report that sewage spills and overflows accounted for 2,230 beach closings and advisories in 2000. Sewage spills in the NRDC report include combined sewer overflows, sanitary sewer overflows, and breaks in sewer lines or septic systems (NRDC, 2001).
- Localized impacts of uncontrolled CSO discharges have been well documented by some communities. For example:
  - New York City reported that prior to CSO control, CSOs caused or contributed to shellfishing restrictions for more than 30,000 acres of shellfish beds. In 1998, New York City reported that improvements to sewage treatment infrastructure and operations, including CSO control, led to the lifting of shell-fishing restrictions.
  - The State of New Jersey reported that prior to CSO floatables control, CSOs caused or contributed to hundreds of days of ocean beach closings each year. The control of floatables in CSOs and storm water discharges has reduced the average annual days of ocean beach closings by more than 95 percent.

Fecal coliform concentrations in New York Harbor have declined dramatically from the early 1970s to the present. This improvement is largely attributable to abatement of raw sewage discharges through the construction and expansion of POTWs, elimination of illegal discharges, and reduction of CSOs.

Photo: Photodisc

What is the status of implementation and enforcement of the 1994 CSO Control Policy?

There has been definitive progress implementing and enforcing CSO controls prior to, and as a result of, the CSO Control Policy, resulting in demonstrable environmental progress in some communities where CSO controls have been instituted. EPA, states, and municipalities all have played important roles in advancing the CSO Control Policy.

EPA Progress

- EPA issued guidance, supported communication and outreach, and provided compliance assistance and some financial support for CSO control.
- EPA issued guidance on coordinating CSO LTCPs with water quality standards in 2001.
- EPA issued extensive technical and policy guidance documents to foster implementation of CSO controls dealing with the NMC, monitoring and modeling, financial capability, LTCPs, and permit writing and water quality standards reviews. EPA has sponsored and conducted more than 15 workshops and seminars on various aspects of implementation of the CSO Control Policy as well as other compliance assistance activities.
- Administrative and civil judicial actions have been used successfully together with permitting and compliance assistance activities to foster development and implementation of CSO controls. Many of the CSO communities that have made the most progress to date, including several of the largest municipalities in the United States, have done so as the result of enforcement actions.
- EPA issued the *Compliance and Enforcement Strategy for Combined Sewer Overflows and Sanitary Sewer Overflows* in 2000.

State Progress

- Most states have made efforts to regulate and control CSOs. NPDES authorities have done extensive work placing conditions for CSO control in permits. In total, 94 percent of CSO communities are required to control CSOs, either through a permit or an enforceable order.
- All 32 states with CSSs developed CSO strategies in response to the National CSO Control Strategy. Most states have adopted the key provisions of the CSO Control Policy:
  - 27 require implementation of the NMC or a suite of best management practices (BMPs) that include or are analogous to the NMC.
  - 25 require development and implementation of LTCPs.
- Most CSO communities are required to implement BMP measures to mitigate CSO-related impacts:

- 94 percent of CSO permits require implementation of one or more BMPs.
- 86 percent of CSO permits have requirements to implement the NMC or a set of BMPs that includes or is analogous to the NMC.
- 6 percent of CSO permits do not require any BMPs.

- Imposition of permit or other enforceable requirements for more capital intensive CSO facility planning (e.g., sewer separation or underground storage) is less extensive:
  - 82 percent of CSO permits include enforceable requirements to develop and implement CSO facilities plan.
  - 65 percent of CSO permits contain requirements to develop and implement an LTCP.
  - 18 percent of CSO permits do not require CSO facilities planning.
- Several states have addressed the full range of programmatic components (e.g., guidance, compliance assistance, communications and information management, among others). Other states, principally those with fewer CSO communities, have dealt with CSOs on a site-specific basis.
- Many states have provided compliance assistance and most include compliance monitoring of CSOs in their NPDES inspections programs. Many state strategies have been updated since issuance of the CSO Control Policy in 1994. Yet, state programs vary widely in the approaches used to implement the CSO Control Policy.
- Most states have not developed separate, specific procedures for coordinating the review of water quality standards with LTCP development. Some states have approaches for considering water quality standards for CSO receiving waters. For example:
  - Indiana passed legislation providing a mechanism whereby CSO communities may apply for a temporary suspension of state water quality standards when certain criteria are met.
  - Maine passed legislation codifying standard procedures for providing variances for CSO receiving waters during the implementation of an approved LTCP.
  - Massachusetts added a series of refined uses to its state water quality standards use classification system to address CSO-impacted waters.
  - Illinois' water quality standards program framework presumes compliance with water quality standards upon the completed implementation of a CSO facility plan that meets the

criteria for the state-derived presumption approach.

- Michigan rules allow the use of alternate design flows (i.e., alternate to 7Q10 low flows or 95-percent exceedance flows) when determining water quality based requirements for intermittent wet weather discharges such as treated CSOs.
- New Hampshire has developed a surface water partial-use designation. A partial-use designation is made only if the community planning process and watershed planning efforts demonstrate that the allowance of minor CSO discharges is the most environmentally protective and cost-effective option available.

- At least 16 states have brought enforcement actions that have included CSO violations. The enforcement actions have primarily been administrative actions, such as administrative compliance orders.

Municipal Progress

- Most CSO communities have documented CSO control through some combination of the NMC and other best management practices.
  - 77 percent of CSO communities have submitted documentation of implementation of one or more of the NMC to their NPDES authority.
  - 32 percent have submitted documentation of implementation of all NMC.
- A smaller number of CSO communities have developed LTCPs.
  - 34 percent of CSO communities have submitted draft LTCPs to their NPDES authority.
  - 19 percent have had their LTCPs approved.
  - 17 percent have initiated implementation of LTCPs or other CSO facility plans.
  - 87 CSO communities have substantially completed implementation of their LTCPs or other CSO control programs.
- CSO communities with LTCPs developed or approved are pursuing attainment of water quality standards in roughly equal measure under three approaches – demonstration, presumption, and a combination of the demonstration and presumption approaches.
- LTCPs indicate that CSO communities are relying on a wide range of technologies to address CSOs including storage (e.g.,tunnels), expanded treatment capacity, sewer separation, and improved conveyance. EPA will be examining the environmental

benefits of various CSO control technologies, including sewer separation, in the second Report to Congress in 2003.

What is the nature and extent of environmental accomplishments from CSO control?

EPA has seen some examples of demonstrable public health and environmental improvements in communities that have made substantial progress in controlling CSOs. The second Report to Congress, due in 2003, will focus on the environmental and human health impacts of CSOs and SSOs, the resources spent by CSO communities in controlling them, and an evaluation of CSO technologies. However, some early insights into the environmental gains from CSO controls are provided so that Congress has some sense of the return on federal, state and municipal investments. The following preliminary observations have been made:

- According to EPA's initial modeling estimates, CSO controls have resulted in an estimated 12 percent reduction of untreated CSO volume and pollutant loadings since 1994. EPA developed a preliminary model, GPRACSO, which estimates that since 1994, annual CSO volumes have decreased by 170 billion gallons per year. It also estimates that loadings of biochemical oxygen demand (BOD) have decreased by 125 million pounds per year.
- The number of CSO communities documenting environmental results from CSO control is growing. EPA has identified a number of notable CSO efforts in which significant infrastructure has been completed and environmental improvements noted. For example:
  - Prior to CSO control South Portland, Maine's 35 CSOs discharged approximately 100 million gallons of combined sewer overflows each year to the Fore River and Casco Bay. As of 2001, South Portland has spent nearly $9 million on capital improvements in the CSS and invests another $350,000 annually on CSO-related operations and maintenance activities. These expenditures have resulted in the elimination of 25 of their 35 CSOs, and an 80-percent reduction in the amount of untreated combined sewer overflows discharged from the CSS each year. The City of South Portland has been recognized by the Friends of Casco Bay for its efforts to control CSOs and the resulting positive impact on the Bay.
  - Prior to CSO control, Saginaw, Michigan's 36 CSOs discharged nearly 3 billion gallons of combined sewage each year to the Saginaw River. As of 2001, Saginaw has spent nearly $100 million on capital improvements in the CSS. These expenditures have resulted in the elimination of 20 of 36 CSOs, and a

The City of South Portland has been recognized by the Friends of Casco Bay (shown here) for its positive impact on the Bay.

Photo: Photodisc

75-percent reduction in the amount of combined sewage discharged from the CSS each year. The Saginaw River is now characterized by fishing periodicals as one of the top walleye fisheries in the country.

Key Program Challenges

In developing this Report to Congress, EPA identified several noteworthy challenges to CSO control in the United States. Each of these challenges, based on an overall synthesis of the report findings, is briefly described below.

Financial Challenges

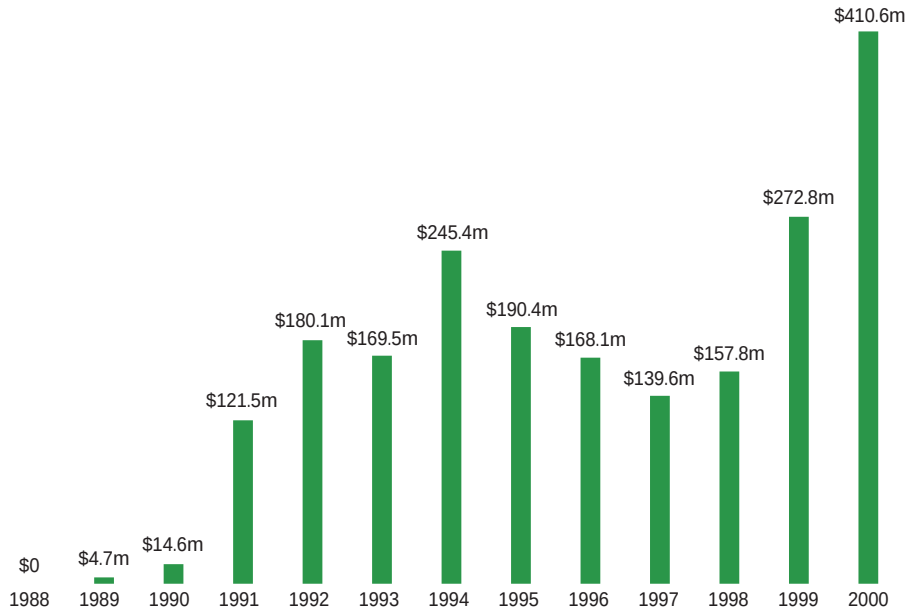
When the CSO Control Policy was issued, EPA estimated the nationwide financial need to control CSOs, consistent with the CSO Control Policy, at $40 billion (in 1992 dollars). More recently, data from EPA's 1996 Needs Survey sets national CSO needs at $44.7 billion (in 1996 dollars). CSO control costs will continue to be considerable, and EPA has received numerous requests from CSO communities for financial assistance, given mounting water and wastewater infrastructure costs and the resource-intensive nature of CSO controls. CSO LTCPs typically involve major infrastructure investments that must compete with other infrastructure needs. Respondents to the AMSA and CSO Partnership surveys reported that funding is the primary challenge in implementing LTCPs.

CSO communities are using a combination of local funding sources, Clean Water State Revolving Fund (SRF) loans, state grants and loans, and, in special cases, line item congressional appropriations to fund CSO controls. EPA does not have data on the total extent of CSO spending.

Figure ES.2

SRF Loans for CSO Projects,1988—2000

SRF loans for CSO projects reached more than $245 million in 1994 and began to rise again in 1998, reaching more than $400 million in 2000. This suggests that funding for the implementation of CSO controls lagged several years behind the issuances of the 1989 Strategy and the 1994 Policy.



Use of SRF Loans for CSO Infrastructure Continues to Climb

- State use of the SRF to fund CSO control projects has increased steadily since 1990. As shown in Figure ES.2, CSO loans in 2000 were the highest ever, accounting for $411 million, or about 12 percent, of total SRF assistance. SRF loans for CSO control totaled $2.08 billion from 1989 to 2000 (about 5 percent of the total CSO need). States with the highest SRF spending levels for CSO control (typically driven by a few large projects) were Illinois, Michigan, New York, and California.

- Congress has appropriated specific CSO infrastructure grants totaling over $600 million for 32 CSO communities since FY 1992.

Congress has shown some support for additional funding for CSO control. The 2000 amendments to the CWA authorize EPA to provide grants to CSO communities, either directly or through states, for planning, design, and construction of CSO and sanitary sewer overflow (SSO) treatment. The amendments also require EPA to provide technical assistance and grants to POTWs for watershed-based management of CSOs, SSOs, and storm water discharges. The EPA Administration requested $450 million for this program in its FY 2002 budget. To date, however, Congress has not appropriated funds for these grant programs.

Water Quality Standards Review

The CSO Control Policy anticipated that development of LTCPs would be coordinated with the review and revision, as appropriate, of water quality standards. Many reasons, including institutional barriers, exist for the lack of coordination in the LTCP development and water quality standards review processes. States cite public pressure to maintain their water quality standards, EPA requirements for development of a "use attainability analysis" (UAA) prior to revising a state water quality standard, and the lack of water quality monitoring data that could be used to justify water quality standards revisions. During EPA-sponsored listening sessions held in the spring of 1999, designed to support development of guidance for coordinating CSO LTCPs and water quality standards reviews, many participants expressed concern about the complexity of the process for revising water quality standards.

Among the changes in the 2000 amendments to the CWA, Congress added Section 402(q) to require issuance of guidance to facilitate the conduct of water quality and designated use reviews for CSO receiving waters by July 31, 2001. EPA prepared a draft guidance for public review and comment (66 FR 364, January 3, 2001) and issued the final guidance on August 2, 2001.

Information Management and Performance Measurement

This Report to Congress relied extensively on an assessment of CSO information that resides in EPA and

state files. EPA believes that this additional information on progress in implementing CSO controls and derived water quality benefits exists at the community level. EPA was hindered by the lack of a national data system for comprehensively evaluating the implementation and effectiveness of the CSO program, and by the lack of clear, national performance measures in place to assess the effectiveness of CSO control efforts on a national basis.

EPA Actions and Next Steps

What actions will EPA take to improve implementation and enforcement of the CSO Control Policy?

Despite significant efforts and progress by EPA, states, and CSO communities to implement CSO controls, more work remains to ensure that human health and the environment are adequately protected from CSOs. The 1994 CSO Control Policy provides a sound and appropriate framework for developing and implementing cost-effective CSO controls. With the codification of the CSO Control Policy in the 2000 amendments to the CWA, EPA will continue to work in partnership with the states to address remaining CSO issues. EPA will work aggressively with NPDES authorities, water quality standards authorities, and CSO communities to implement and enforce the CSO Control Policy. Based on the findings of this Report to Congress, EPA will pursue a number of activities to ensure the continued effective implementation and enforcement of the CSO Control Policy.

Ensure That All CSOs are Appropriately Controlled

- Implement the "shall conform" statutory mandate.
  - Begin efforts to implement new CWA Section 402(q)(1), which requires that future permits or other enforceable mechanisms for CSOs conform to the CSO Control Policy.
- Ensure all CSOs are covered by an NPDES permit or other enforceable mechanism.
  - Follow up with NPDES authorities to ensure that NPDES permits or other enforceable mechanisms are issued as soon as possible for those CSO communities that have not yet been required to control CSOs. EPA will also work with the states to ensure that permits and enforcement actions (e.g.,orders, decrees) conform with the CSO Control Policy, as required by the 2000 amendments to the CWA.

Improve Implementation of the CSO Control Policy

- Advocate CSO control on a watershed basis.
  - Continue efforts to focus protection of water quality on a watershed scale, and support development of LTCPs on a

watershed basis. EPA will continue efforts to encourage integration of wet weather programs, including support to facilitate wet weather pilot projects as designated in the 2000 CWA amendments.

- Work with states to speed the water quality standards review and revision process.
  - Continue to work with states, communities, and constituency groups on coordinating the review and revision of water quality standards with development of LTCPs. EPA will establish a tracking system for water quality standards reviews on CSO receiving waters. EPA will also assess the need for additional guidance and tools to facilitate the water quality standards review process for all sources, including CSOs.
- Strengthen CSO information management.
  - Ensure that the Office of Water and the Office of Enforcement and Compliance Assurance coordinate information management and performance measurement activities to demonstrate the environmental outcomes and benefits of CSO control.
- Improve compliance assistance and enforcement.
  - CSOs will continue to be a national compliance and enforcement priority in fiscal years 2002 and 2003. EPA will work closely with NPDES authorities to target enforcement actions, where appropriate, to ensure compliance with the CSO requirements in NPDES permits or other enforceable mechanisms. In addition, EPA will develop and promote compliance assistance tools.

Initiate Efforts for 2003 Report to Congress

- Initiate efforts to define the scope and methodology for the second Report to Congress on efforts related to CSO controls. By December 2003, EPA is required to summarize the extent of human health and environmental impacts caused by CSOs and SSOs, report on the resources spent by municipalities to address these impacts, and evaluate the technologies used, including whether sewer separation is environmentally preferred for all situations. EPA will build on CSO data collected for this report and develop a methodology for addressing the challenges of collecting and analyzing SSO data.