

Chapter 1

Introduction

CWNS

The Clean Watersheds Needs Survey. In this report, CWNS refers to the 2000 survey.

What is the purpose of the Clean Watersheds Needs Survey 2000 Report to Congress?

The United States Environmental Protection Agency (EPA), Office of Water, conducted the Clean Watersheds Needs Survey (CWNS) 2000 and prepared the *Clean Watersheds Needs Survey 2000 Report to Congress*, hereinafter referred to as “this report,” to meet the requirements set forth in the Clean Water Act (CWA). Section 516 of the CWA requires reports to Congress detailing State and national estimates and comprehensive studies on costs for compliance with the CWA.¹ This report includes a presentation and analysis of the capital investment necessary to meet the Nation’s wastewater treatment and collection system needs and, to a limited extent, its municipal storm water management program needs. EPA has also elected to include nonpoint source pollution control needs.

Why did EPA change the name of the survey to the Clean Watersheds Needs Survey?

Recognizing the importance of making the data in the CWNS 2000 consistent with EPA’s and the States’ initiatives to manage data on a watershed level, EPA modernized the CWNS database to require more detail on the geographic location of each facility. In addition, EPA changed the name of the survey from the Clean Water Needs Survey to the Clean Watersheds Needs Survey in keeping with the move to manage data at the watershed level. Although the name has changed, the acronym “CWNS” is still used, and this and future CWNS reports to Congress will be sufficiently similar to the 12 previous surveys to allow for valid comparisons of most categories.

What is the scope of the Clean Watersheds Needs Survey 2000?

EPA conducted the CWNS 2000 in partnership with the States in an attempt to identify and document the cost of projects needed to address water quality and public health problems. Those projects include both State Nonpoint Source Management Plans as defined in section 319 of the CWA and Comprehensive Conservation and Management Plans (CCMPs) as defined in section 320 of the CWA. Before the survey began, the CWNS National Workgroup, which was composed of representatives from EPA headquarters and regional offices and 15 States, developed a set of guidelines and criteria for gathering, documenting, and entering data. The needs data included in this report have met the criteria specified and are eligible for funding under the Clean Water State Revolving Fund (CWSRF) program established under Title VI of the CWA.

Because of limitations in the availability of needed data, the documented needs developed as described in the preceding paragraph do not fully account for all needs with respect to diffuse sources of pollution, including nonpoint source (NPS) pollution, sanitary sewer overflows (SSOs), and municipal storm water management programs. Therefore, for those categories of pollution, EPA has developed a second set of needs estimates based on the use of models, as described in Chapter 4 and in Appendices D and E.

The CWNS 2000, however, does not include all needs related to water quality and public health problems. The amount of data entered into the CWNS 2000 was limited by the resources available to the participating States.² As in past surveys, information about privately

¹ Section 516, paragraphs (2) and (4), specifically requires the following: “The Administrator, in cooperation with the States...shall make a detailed estimate, biennially revised, of the cost of construction of all needed publicly owned treatment works; in each of the States...and shall submit such detailed estimate and such comprehensive study of such cost to the Congress ...”.

² American Samoa, Guam, Nevada, Northern Mariana Islands, Puerto Rico, Virgin Islands, and Wyoming did not participate in CWNS 2000.

owned wastewater facilities or wastewater treatment facilities that serve industrial facilities, military installations, and national parks was not gathered for this survey because those facilities are not eligible for funding under CWSRF programs.

The CWNS 2000 did not request data for needs and facilities that serve American Indians, hereinafter referred to as Tribal needs. Some States, however, reported such data in the CWNS 2000.³ EPA does not include or report Tribal needs because the Indian Health Service (IHS) conducts a separate survey and provides a report to Congress annually under Public Law 86-121. The IHS reports on wastewater treatment systems, improvement of community drinking water supplies, and solid waste disposal facilities. A special set-aside of the CWSRF appropriation uses a priority list of projects, updated annually by the IHS, to provide funding for Tribal needs.

Need

A water quality or public health problem and an associated abatement cost that is eligible for funding under the CWSRF.

The CWNS 2000 defined a *need* as a water quality or public health problem and an associated abatement cost that is eligible for funding under the CWSRF. The needs data reported in the CWNS 2000 had to exist as of January 1, 2000. The information gathered by the States belonged to three broad categories: data on wastewater treatment and collection systems, data on storm water management programs, and data on NPS pollution control projects. Table 1-1 lists the data elements that could be entered for each facility in the CWNS 2000 database. Descriptions of the data gathered for each category follow.

Wastewater Treatment and Collection Systems. The CWNS 2000 includes data on the documented capital

costs required to meet the needs of the Nation's publicly owned wastewater collection and treatment infrastructure in accordance with section 516 of the CWA. Eligible costs include the replacement, rehabilitation, or expansion of collection systems and treatment plants; construction of new treatment plants; correction or elimination of combined sewer overflows (CSOs); and replacement or rehabilitation of individual on-site systems and construction of decentralized treatment systems. In addition to the needs, technical data such as flow and treatment levels for treatment plants, population, unit process, discharge location, and geographic data were collected on each wastewater treatment plant, collection system, individual on-site system, or decentralized system included in the CWNS 2000.

To complement the wastewater treatment and collection system data entered in the CWNS 2000, EPA used data from the survey to model the cost of correcting wet weather sanitary sewer overflows (SSOs) in response to the Wet Weather Water Quality Act of 2000. This act authorized a grant program to address SSO and CSO problems. The act states that the allocation of funds to the States is to be based on needs identified in the most recent CWNS. EPA developed this model because SSOs are not a specific need category in the CWNS 2000. Although funding for the new grant program was not appropriated, this report includes State-level modeled cost estimates for the control of SSOs, as well as documented cost estimates for the correction and elimination of CSOs.

Storm Water Management Programs. The documented eligible needs for this category include the capital costs for meeting the municipal requirements of the Storm Water Phase I and II National Pollutant Discharge Elimination System (NPDES) regulations. Only those storm water management programs with municipal separate storm sewer systems (MS4) that are covered by an NPDES permit can submit their needs under this category. The portion of an MS4 Phase I or II storm water management program that is eligible as a documented need in the CWNS 2000 consists of

³ The CWNS 2000 data for Tribal facilities are summarized in Appendix I.

Table 1-1. Data Elements in the CWNS 2000

Facility Summary ^a	Needs ^a	Technical
<ul style="list-style-type: none"> • Authority/Facility (A/F) Number • Facility Name • Natures (Present and/or Projected) and Changes • System Name^b • “Privately Owned” Flag • “Interim Treatment Plant” Flag^b 	<ul style="list-style-type: none"> • Needs Category • CWSRF-Eligible Needs • Documentation Information • Separate State Estimates^b • Operation and Maintenance Costs^b • Funding Information <p>Geographic^a</p> <ul style="list-style-type: none"> • Latitude and Longitude “Point of Record” (POR) • POR County • Watershed • Congressional District • Boundaries 	<ul style="list-style-type: none"> • Population (and “Small Community Exception” Flag)^c • Flow Capacities of Treatment Plants^c • Discharge Method(s) and Location(s)^c • Effluent Data^c • Concentration Details^b • Unit Process or BMP Descriptions^b • Combined Sewer Details • Responsible Entity Information (and “Tribal Flag”) • Permit Numbers and Types^d • Biosolids Handling Data^b • Pollution Problem Descriptions^{b,e} • Miscellaneous Comments^b

^a Unless otherwise indicated, data elements under these categories were required for every facility in the CWNS 2000.

^b Data elements that were not mandatory for the CWNS 2000. The States entered data for these fields voluntarily.

^c These data elements were required for wastewater treatment and collection systems.

^d This data element was required for facilities with storm water management program needs.

^e States identified SSOs under this data element.

needs for developing and implementing the program. Because the storm water regulations for Phase II were finalized in December 1999 (64 *Federal Register* 68722 *et seq.*, December 8, 1999), municipalities with Phase II needs identified as of January 1, 2000, were allowed to have their projected needs entered into the CWNS 2000 database even though the regulations did not go into effect until March 2003. Needs for Phase II MS4s must include evidence that the municipality was identified in the regulation or could be designated based on being in an urbanized area. In the CWNS 2000, few Phase II MS4 municipalities had their needs identified; it is anticipated, however, that in the next CWNS many more Phase II municipalities will identify their needs. Storm water facilities were required to enter geographic location and permit data in addition to needs information.

Nonpoint Source Control Projects. The CWNS 2000 includes documented needs for implementing

NPS management programs under section 319 and implementing CCMPs for estuaries under section 320 of the CWA. NPS pollution control projects included in the CWNS 2000 must have been included under a State’s approved Nonpoint Source Management Plan (section 319) or must have been included in an approved CCMP (section 320). CWSRF financing is available for a broad range of traditional NPS pollution control activities, such as implementing agricultural best management practices (BMPs), replacing leaking underground storage tanks, or replacing privately owned failed septic systems with new on-site systems. In addition, section 320 allows financing of a broader range of activities found in CCMPs, such as habitat restoration. For each NPS pollution control facility in the CWNS 2000, EPA required a geographic location along with the needs data. In addition, EPA conducted an alternative NPS modeled needs analysis, which is described in Appendix D.

CWNS database

The database by which States enter and update their needs data. The newly modernized CWNS database allows States to enter detailed information about each facility, including geographic coordinates, population, flow discharge locations, watershed boundaries, and funding origins.

How was the Clean Watersheds Needs Survey 2000 conducted?

Forty-eight States and the District of Columbia⁴ participated in the CWNS 2000. Guidance developed by EPA and the CWNS National Workgroup was presented to the States at a national start-up meeting in March 2000 and at several training workshops given by EPA throughout the data collection period. Although EPA and the CWNS National Workgroup set guidelines for the survey, they also frequently received input from the States participating in the survey. To maintain consistency and ensure the quality of information gathered during the survey, EPA and the National Workgroup held monthly conference calls to clarify issues and develop necessary responses. EPA also provided information to the States through the Internet, e-mail, and written correspondence. It was through these discussions that EPA and the States determined, for example, that SSOs were difficult to document and that modeling of wet weather SSO costs would be needed. During the course of the survey, EPA concluded that costs for correcting SSOs were included in only some of the needs documented by the States and that the results from the SSO model would show a more complete picture of the costs to control wet weather SSOs. The CWNS National Workgroup and EPA also evaluated the possible use of cost models for storm water management program needs and NPS pollution control needs. These needs categories tend to be difficult to document using the established documentation criteria; therefore, this report also includes alternative model-based analyses in Appendices D and E.

In coordination with a subcommittee of the CWNS National Workgroup, EPA modernized the CWNS database to be used by States in updating their needs data. The new CWNS database allows States to enter detailed information about each facility, specifically discharge locations (by latitude and longitude), watershed boundaries, and funding awards. The States are able to link directly into the database, continually update their data, generate reports, and download the data into a geographic information system (GIS) to create maps. These capabilities enable States to use the CWNS as a management tool rather than simply a reporting vehicle. The criteria for submitting and updating information described earlier, as well as the level of State participation in the CWNS 2000, have continued to improve the quality of the data in the CWNS database.

The CWNS 2000 data collection period (April 1, 2000, to January 4, 2002) was an extensive 21-month effort by EPA and the States. The States were primarily responsible for gathering and updating the data included in the CWNS 2000. In March 2000 EPA provided an inventory of data from the 1996 Clean Water Needs Survey to each State to begin the CWNS 2000 data-collection effort. One of the most frequently used data-collection methods was distribution of an “in-State” survey form to the communities in the State. In addition, State coordinators worked with the various program offices in their States to ensure that the most accurate data were compiled. Data in the CWNS 2000 were organized by facility for all types of water pollution control, including storm water management programs and NPS pollution control projects. For each facility in the database, a State entered the needs and technical data specific to that facility. Although the term *facility* typically refers to a wastewater treatment facility or some other structure, for NPS pollution control it refers to a place. The types of NPS pollution control projects vary considerably, ranging from installing a pumpout system at a single marina to implementing county-wide conservation tillage programs on numerous farms. The CWNS database contains information on 30,142 facilities. Of these, 27,702 are wastewater treatment

⁴ American Samoa, Guam, Nevada, Northern Mariana Islands, Puerto Rico, Virgin Islands, and Wyoming did not participate in CWNS 2000.

and collection facilities (including CSOs), 2,088 are NPS pollution control projects, and 352 are storm water management program facilities.

Once the States had gathered all the required documentation and entered the data into the CWNS database, they submitted selected documentation to EPA for review and acceptance. EPA evaluated the technical and needs data entered for each facility. The review process adhered to the policy and procedures established at the beginning of the CWNS 2000 to evaluate and accept needs estimates and enhance national consistency and data integrity. Participation was another key factor that affected the quality of CWNS 2000 data. The level of effort that States put forth in reporting their CWNS 2000 data varied considerably. Thus, availability of resources (e.g., staff, time, information) to each State further affected the data quality and the total needs reported nationally in the CWNS 2000. EPA used monthly conference calls, the Internet, *News Alerts*, and e-mail to promote participation in the survey, as well as to assist the States with technical difficulties encountered when entering data.

What are the specific objectives of the Clean Watersheds Needs Survey 2000?

The primary objective of every CWNS is to improve on the information from previous surveys, thereby capturing a more accurate representation of the national needs. The following are the key objectives of the CWNS 2000:

- Update and improve the validity, accuracy, and quality of all needs information by redocumenting outdated information from the 1996 survey.
- Improve the documentation of needs for NPS pollution control, storm water management programs, and the correction of SSOs and CSOs.
- Provide geographic data for all facilities, including latitude, longitude, Congressional district, and watershed boundaries used to support a watershed-based needs analysis.

Documented needs

Needs that have met the CWNS 2000 documentation requirement and were accepted by EPA. Only documented needs are used to report the total needs in this report.

- Update and improve the quality of technical data such as population, flow, treatment level, and discharge method and location.
- Raise awareness of the CWNS among State commissioners and program managers, and emphasize its importance as a management tool for priority planning, funding, and watershed-based management.

What data are presented in this report to Congress?

The needs data from each EPA-accepted facility are presented in this report. All needs included in the survey had to exist on January 1, 2000. As mentioned earlier, EPA and the States made a concerted effort to improve data quality by evaluating the needs carried over from previous Clean Water Needs Surveys. States followed a strict redocumentation protocol that required documentation for every need up to \$20 million in the CWNS 2000 to be dated no later than January 1, 1990. An additional requirement was placed on facilities with total needs greater than \$20 million: documentation for these needs could not be dated prior to January 1, 1994. (A more detailed discussion of the documentation criteria is included in Chapter 2.) Only needs eligible for CWSRF funding are included in the CWNS 2000; however, not all water quality improvement projects were included in the CWNS 2000. Furthermore, data on projects entered into the CWNS 2000 database that did not meet documentation criteria were included separately in this report as Separate State Estimates (SSEs). This report also summarizes the technical data (e.g., population, flow, effluent) for every facility included in the CWNS 2000.

Modeled needs

Estimate or need developed using a model to compensate for needs categories where limited information was available.

Key results and analyses of the needs and technical data are included in Chapter 3. Chapter 4 presents the wet weather SSO model. Summaries of the CWNS 2000 data, 1996 Clean Water Needs Survey data, and CWNS 2000 technical data (population, flow, and so forth) are presented in Appendices A, B, and C, respectively.

Does EPA report documented and modeled needs in the Clean Watersheds Needs Survey 2000?

Unlike previous Clean Water Needs Surveys reports to Congress, this report does not combine documented needs with modeled needs. This is the first report, since the beginning of the Clean Water Needs Survey, in which the needs estimates included in the report rely exclusively on documented needs. For the CWNS 2000, EPA believes that the data entered into the CWNS database adequately represented the Nation's needs for wastewater collection and treatment. For other sources of pollution, such as NPS pollution, SSOs, and municipal storm water management programs, documentation was scarce or simply did not exist. Therefore, this report includes modeled national estimates for these needs categories for comparison purposes only. A discussion of the models follow.

Chapter 4 provides a more detailed description of the wet weather SSO model and the results from the modeling exercise. The CWNS 2000 has no needs category for wet weather SSOs. SSO needs are typically included in needs for secondary wastewater treatment (Category I), sewer replacement/rehabilitation and infiltration/inflow (I/I) correction (Category III), and new sewers and appurtenances (Category IV). EPA modeled SSO needs using CWNS data to better

represent the SSO needs of the country. The SSO model provides State-level estimates and includes capital costs for a combination of increasing treatment capacity, decreasing I/I, and increasing storage.

The NPS model in Appendix D modeled NPS pollution control needs at the national level. This model provides a broader view of the country's NPS needs, and the estimates from the model come closer to capturing actual total NPS needs in all States than does the documented approach. Nevertheless, it provides only a national estimate and does not disaggregate the needs by States. The national estimates of needs included in the NPS model provide a broader spectrum of NPS pollution control categories, including urban runoff, resource extraction, marinas, and hydromodification, which were not provided in the NPS modeled needs reported in the 1996 Clean Water Needs Survey.

The storm water model built on the modeling methodology used in the 1996 Clean Water Needs Survey. The model includes the costs for Phase I and Phase II municipal storm water management programs after deducting Phase I needs that should have been met. A more detailed description of the model and the results from the modeling exercise are included in Appendix E.

How does the Clean Watersheds Needs Survey 2000 facilitate a watershed approach to needs accounting?

EPA and the States have made a concerted effort to gather information on a watershed basis consistent with the watershed management concept. Unlike political boundaries, the watershed provides a comprehensive basis for both analysis and efficient use of resources. One of the objectives for the CWNS 2000 was to gather more geographic information about facilities, including latitude and longitude, as well as upstream and downstream relationships between facilities. Chapter 5 describes national watershed analyses and provides a case study from the Long Island Sound in the northeastern United States to illustrate the potential of

the CWNS to manage need information by watershed. A summary of the CWNS 2000 data by watershed is presented in Appendix F, Table F-1.

What is the history of the Clean Watersheds Needs Survey and what is its relationship to the Clean Water State Revolving Fund?

In 1972 EPA began collecting information about needs to meet the requirements of section 205(a) of the CWA in support of the Construction Grants Program. EPA conducted 11 biennial surveys between 1972 and 1992. For the duration of the Title II Construction Grants Program, the survey of needs focused on providing an estimate of additional publicly owned treatment works (POTWs) needed, as well as an inventory of existing wastewater conveyance and treatment facilities in the United States. Between 1972 and 1996, \$61.1 billion was awarded to municipalities through EPA's Construction Grants Program. In 1987 Congress extended Federal aid for wastewater treatment construction under Title VI of the CWA and provided grants to capitalize the CWSRF. The amendments resulted in a transition toward State and local government responsibility for financing clean water projects. As of January 1, 2000, capitalization

grants under the CWSRF Program totaling \$16.2 billion had been awarded to States. States in turn provided assistance of \$28.2 billion, mostly in the form of loans, to municipalities. By June 20, 2002, capitalization grants awarded to the States totaled \$19.5 billion, and States in turn provided assistance of \$38.7 billion.

Following the 1987 CWA Amendments and the establishment of Title VI and the CWSRF Program, the scope of the 1992 Needs Survey was broadened by adding new needs categories for municipal storm water management programs and NPS pollution control projects to reflect those new funding opportunities. With the inception of the Drinking Water Infrastructure Needs Survey in 1995, EPA changed the frequency of CWNS updates from every 2 years to every 4 years. EPA continued to expand the scope of the survey as water quality problems were nationally recognized. The CWNS 2000 also continued the effort begun by the 1996 Clean Water Needs Survey to improve on the needs data reported for storm water management programs and NPS pollution control facilities, in addition to the needs for the Nation's wastewater treatment and collection system infrastructure.

