United States Environmental Protection Agency

ECOS

Environmental Pollutant Reporting Data in EPA's National Systems

Data Collection by State Agencies

U.S. Environmental Protection Agency One Stop Reporting Program

Environmental Council of States

September 30, 1999

State Environmental Data in EPA's National Systems

This report was made possible with the support of the U.S. Environmental Protection Agency through Cooperative Agreement CX-824461-01. Although this report was produced with the involvement and review of ECOS membership and senior EPA staff, the opinions expressed herein are not necessarily theirs. Prepared under contract to EPA by Barbara F. Bass, Ph.D.
Project Director: R. Steven Brown, ECOS.

Jointly Published by

Environmental Council of States (ECOS)
U.S. Environmental Protection Agency (EPA)

September 30, 1999

TABLE OF CONTENTS

EXECUTIVE SUMMARY . . . . . .

INTRODUCTION . . . . . .

AEROMETRIC INFORMATION RETRIEVAL SYSTEM (AIRS)/
AIRS FACILITY SUBSYSTEM (AFS) . . . . . .

AEROMETRIC INFORMATION RETRIEVAL SYSTEM (AIRS)/
AIR QUALITY SUBSYSTEM (AQS) . . . . . .

BIENNIAL REPORTING SYSTEM (BRS) . . . . . .

PERMIT COMPLIANCE SYSTEM (PCS) . . . . . .

SAFE DRINKING WATER INFORMATION SYSTEM (SDWIS/FED) . . . .

WATER QUALITY INFORMATION SYSTEM (STORET - STOrage and
RETrieval of U.S. Waterways Parametric Data) . . . . . .

TOXIC CHEMICAL RELEASE INVENTORY SYSTEM (TRIS) . . . . . .

CONCLUSION . . . . . .

ACKNOWLEDGEMENTS . . . . . .

EXECUTIVE SUMMARY

The States and the U.S. Environmental Protection Agency (EPA) are committed to building a strong partnership on environmental information management. In this evolving relationship, the States and EPA are addressing a variety of significant information management and exchange issues that support the respective program needs of EPA and State environmental agencies and move their partnership toward a more performance-based environmental management system.

Performance-based environmental protection demands sound data reporting on releases from sources of potential pollution and on the quality of the air, water and land that surrounds us. Increased public and political needs for timely, reliable environmental information also drive the demand for sound reporting data. In early 1999, ECOS and the EPA's One Stop Reporting Program undertook a research effort to paint a clearer picture of State agencies' role in collecting and managing environmental information with an eye towards pinpointing opportunities for improving data flows of critical data streams between states and EPA. For purposes of the analysis, environmental pollutant data were defined as information on pollutant releases to the environment (e.g., air emissions, water discharges), hazardous waste management, and ambient levels of pollutants.

The study finds that States are responsible for the collection and submission of 83 to 99 percent of the environmental pollutant data contained in six key EPA data systems. The mean of the percentages is 94 percent.

Percentage of Data Collected by States in 6 EPA National Systems

System[1]	Type of Data in System	% Data Collected by States
AIRS/AFS	air pollution – stationary sources	99
AIRS/AQS	air pollution – ambient sources	99
SDWIS	drinking water	99
PCS	wastewater discharges	83[2]
STORET	waterway quality	90
BRS	hazardous waste	92

The results of the study make it clear that the States have the primary responsibility for the collection of environmental pollutant data. These findings are supported by the trend, within the last decade, of States assuming more delegations for carrying out major environmental programs. The study further support the need for continued work through partnership to create efficient, timely ways of sharing critical high quality environmental data.

[1] Aerometric Information Retrieval System/AIRS Facility Subsystem (AIRS/AFS), Aerometric Information Retrieval System/Air Quality Subsystem (AIRS/AQS); Biennial Reporting System (BRS), Permit Compliance System (PCS), Safe Drinking Water Information System (SDWIS); Water Quality Information System (STORET), Toxic Chemical Release Inventory System (TRIS) also contains environmental pollutant data but was not included in the study because reports are submitted simultaneously to the States and EPA

[2] This figure is for reports from major facilities, the figure for reports from minor facilities (which States are not required to report to EPA) is 94 percent

"...the One Stop strategy is unique. Recognizing the importance of States as primary collectors and stewards of environmental data, One Stop is partnering with the states to jointly implement full-scale reporting and data management reforms."

From the "One Stop Reporting Program Strategy", One Stop Reporting Program, EPA, *http://www.epa.gov/reinvent/onestop/about/strategy.htm.*

INTRODUCTION

The States and the U.S. Environmental Protection Agency (EPA) are committed to building a strong partnership on environmental information management. In this mature yet evolving relationship, the States and EPA are addressing a variety of significant information management and exchange issues that include activities which:

- define what information is needed to set priorities, track progress, manage and oversee environmental programs and inform the public;
- ensure that information is collected and exchanged as accurately and efficiently as possible; and
- promote and encourage the respectful use and release of information across varied information exchanges, interests and audiences.

These types of activities support the respective program needs of EPA and State environmental agencies and move their partnership toward a more performance-based environmental management system.

Performance-based environmental protection demands sound data reporting on releases from sources of potential pollution and on the quality of the air, water and land that surrounds us. Increased public and political needs for timely, reliable environmental information also drive the demand for sound reporting data. To support the States and EPA in their commitment to innovative approaches to environmental management and reporting, the ECOS and the One Stop Reporting Program undertook a study to quantify the extent to which States collect environmental pollutant reporting data in the 13 national data systems targeted in EPA's *Reinventing Environmental Information (REI) Action Plan*[3] (Table 1). It is hoped that the findings will be useful for targeting opportunities to improve data exchange practices based on compatible data standards.

[3] *Reinventing Environmental Information (REI) Action Plan*, U.S. Environmental Protection Agency, Draft version 11/25/97.

TABLE 1. EPA'S National Systems targeted in EPA's *Reinventing Environmental Information (REI) Action Plan*			
AIRS - AFS	Aerometric Information Retrieval System/AIRS Facility Subsystem	Emissions estimates, compliance data, and administrative information on Title V permits of stationary sources	CAA
AIRS - AQS	Aerometric Information Retrieval System/Air Quality Subsystem	Monitoring data of ambient air levels of criteria pollutants	CAA
BRS	Biennial Reporting System	Hazardous waste generation and management information from large quantity generators and treatment, storage and disposal facilities	RCRA
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System	Tracking system on hazardous waste site assessments, remediations, and enforcement actions	CERCLA
EF	Envirofacts Data Warehouse	A warehouse that allows single point access to eight environmental databases, integrating database tools, and spatial data information	
NCDB	National Compliance Database	Tracking system for the Pesticides and Toxic Substances Compliance and Enforcement Program	FIFRA, TSCA, EPCRA, AHERA
DOCKET	Enforcement Docket	Tracking system for civil judicial and administrative enforcement cases under all environmental statutes	All environmental laws
PCS	Permit Compliance System	Discharge monitoring, inspection, compliance, enforcement, and permit information on National Pollution Discharge Elimination System (NPDES) permitted facilities	CWA
RCRIS	Resource Conservation and Recovery Information System	Tracking system for permits, closure status, compliance, and cleanup activities of hazardous waste handlers	RCRA
RMP*Info	CAA 112(r) Risk Management Plan Information System	System under development for tracking and making available information from Risk Management Plans submitted under the Clean Air Act	CAA
SDWIS	Safe Drinking Water Information System	Type of system, population served, water source, violations of drinking water standards, enforcement actions, and sampling results of public water systems	SDWA
STORET	Water Quality Information System (Storage and Retrieval of U.S. Waterways Parametric Data)	Information on aquatic organisms, stream flow, and water quality of U.S. waterways	Various, esp. CWA
TRIS	Toxic Chemical Release Inventory System	Information on the releases of pollutants to the environment and other waste management activities for facilities required to report to the Toxics Release Inventory	EPCRA

This report specifically focuses on the environmental pollutant reporting data contained in the 13 national systems, and whether State agencies, EPA Regional offices, or EPA Headquarters are the primary collecting organizations for these data. **For purposes of this environmental analysis, pollutant reporting data are defined as information on pollutant releases to the environment (e.g., air emissions, water discharges), hazardous waste management, and ambient levels of pollutants.** Where possible, the analysis has included the quantification of data collection, e.g., the number of 1998 discharge monitoring reports in the Permit Compliance System initially collected by State agencies versus EPA Regional offices. Given the differences in the purposes and contents of the national systems, the type of quantitative analysis varied from one system to the other.

Although other types of information, e.g., permit tracking, compliance data, and enforcement actions, are contained in many of the national systems; the scope of the study was limited, for a number of reasons, to environmental data. First, as stated in the *Preliminary Report on EPA's Data Gaps Strategy*, sound environmental information about pollutant emissions and their contribution to ambient pollutant levels is "at the heart of performance-based environmental protection".[4] The second reason is that the task of analyzing and quantifying other types of information contained in some of the national systems databases, as well as identifying the primary agency responsible for the information (e.g., State versus EPA enforcement actions), is quite complex and would have extended the time frame for this study significantly. Based upon the above considerations, the initial focus of the study targeted environmental reporting data contained in REI's 13 national data systems.

Examination of the 13 national systems revealed that a number of them were not appropriate for inclusion in this particular study because they contain little or no environmental pollutant emission, discharge, release, or ambient level monitoring data (Table 1). For this reason, CERCLIS, NCDB, DOCKET, and RCRIS were not included in the analysis. In addition, Envirofacts was excluded given that it is a data warehouse that allows users to have a single point of access to eight data systems, seven of which are on REI's list of 13 national systems: AIRS/AFS, BRS, CERCLIS, GICS (Grants Information and Control System, which is not on REI's list), PCS, RCRIS, SDWIS, and TRIS.[5] The environmental pollutant data that is accessed via Envirofacts is duplicative of the data in the seven national systems. The last system excluded from the study was RMP*Info which is still under development. Based upon the above considerations, the following seven national systems were included in the analysis:

---

[4] *Preliminary Report on EPA's Data Gaps Strategy*, Center for Environmental Information and Statistics, U.S. Environmental Protection Agency, December 14, 1998, p.3.

[5] It should be noted that the public does not have access via Envirofacts to the complete set of information contained in some of the databases, but rather to a subset of information in each. For example, confidential enforcement information is not available. In other cases, the full set of raw data may not be available, but the summary data are.

- Aerometric Information Retrieval System/AIRS Facility Subsystem (AIRS/AFS)
- Aerometric Information Retrieval System/Air Quality Subsystem (AIRS/AQS)
- Biennial Reporting System (BRS);
- Permit Compliance System (PCS);
- Safe Drinking Water Information System (SDWIS);
- Water Quality Information System (STORET);
- Toxic Chemical Release Inventory System (TRIS).

As mentioned previously, other types of information, e.g., permit tracking, compliance data, and enforcement actions, are contained in many of the 13 national systems, and this is true for several of the systems included in this report. However, **only environmental pollutant reporting data,** e.g., pollutant releases, hazardous waste, and ambient pollutant levels, contained in the seven systems were examined for purposes of this preliminary study. The information in each of the 13 national systems is described in Table 1, and, in the case of the seven systems included in this analysis, the types of information they contain are further characterized in the relevant sections of this report.

AEROMETRIC INFORMATION RETRIEVAL SYSTEM (AIRS)/ AIRS FACILITY SUBSYSTEM (AFS)[6]

The AIRS Facility Subsystem (AFS) stores three types of information on air pollution point sources, also known as stationary sources (i.e., plants/facilities):

- emissions data on criteria air pollutants;
- compliance data; and
- tracking of administrative information for Title V permits.

The data in AFS have been submitted by the State and local air agencies. Information from other groups can be stored in AFS, but this has not occurred to any significant degree. Basically, AFS is considered a "State" database. Given the focus of this report on the collection of environmental pollutant reporting data, the following analysis addresses the air emissions data in AFS.

Under State Implementation Plans (SIPs), facilities are required to report air emissions to their appropriate State or local air agency. State and local air agencies are required under Clean Air Act regulations to report annually to EPA the emissions estimates primarily for large stationary sources, i.e., those facilities emitting criteria pollutants above a specified threshold. In addition, States are also required to submit emissions data for facilities in nonattainment areas. These emissions data are entered into the AFS database. Although not required to do so, State and local air agencies often enter into AFS emission estimates for small stationary sources as well. The criteria pollutant emission thresholds (tons/year) used for designating whether a facility is a large source are the following: 100 tons per year for nitrogen dioxide (NO_2), sulfur dioxide (SO_2), volatile organic compounds (VOCs)[7], total particulate matter (PT), particulate matter $<10\mu m$ (PM_{10}); 1,000 tons per year for carbon monoxide (CO); and five tons per year for lead (Pb).[8,9]

Emissions data in AFS cover not only plants/facilities, but their components as well: "stacks, the points at which emissions are introduced into the atmosphere; points, the emission point or process within a plant that produces the pollutant emissions; and segments, which are components of the processes that produce emissions."[10] Emission estimates are usually

---

[6]Information in this section is based upon several U.S. EPA web sites, as noted throughout the text, and on various communications (voice, fax, email) from Ed Lillis, Office of Air Quality Planning and Standards, Information Transfer and Program Integration Division, February and March, 1999.

[7]VOCs are not criteria pollutants, but are precursors of the criteria pollutant ozone (O_3).

[8]*http://www.epa.gov/airs/afs.html*

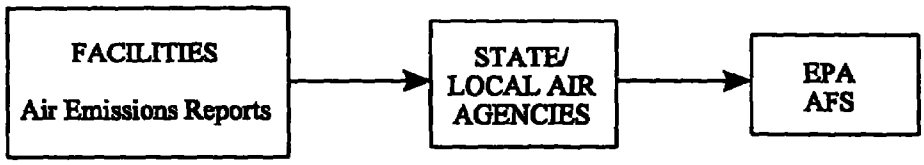
[9]In certain areas, e.g., nonattainment, the emissions thresholds for designating large sources may vary from those listed.

[10]*http://www.epa.gov/enviro/html/airs/airsover.html*

calculated for each segment of a point process and then totaled at the point and plant level.[11] Therefore, an emission estimate for a particular criteria pollutant for a plant is potentially based upon the summation of numerous other emissions estimates, all of which are contained in AFS.

The air emission reports that State and local air agencies receive from facilities can vary in format as well as content. For example, some States may require for their own purposes a facility to submit additional information, over and above what the State is required to submit to EPA. States must process their data into a format specific for AFS. They enter emissions data electronically into AFS either by submitting batch files to the EPA mainframe computer or by submitting the information online via formatted screens for data entry. In both cases there is a data validation process before the data are added to the AFS database.[12] Approximately 15-20 agencies are currently using AFS as their only emissions data system. (Figure 1)

Figure 1. Data Flow into AFS



AFS contains records dating from the mid 1980's[13] and includes approximately 175,000 different sources over the lifetime of the database, with emissions data on approximately 90,000 sources and compliance data on 156,000. State and local air agencies, as noted previously, submit emissions data on an annual basis; compliance data is submitted by States on a quarterly basis. The size of the AFS database, which is a mainframe (ADABASE), is estimated to be 10 gigabytes.

Between 1990 and 1996, State and local air agencies collected and electronically entered into AFS emissions estimates for approximately 21,000 to 39,000 facilities annually.[14,15] Of these, the number of facilities with emissions >100 tons per year (tpy) of any criteria pollutant ranged from approximately 4,500 to 8,200.[16] The number of facilities for which data are submitted differs

[11] *http://www.epa.gov/airs/afs.html*

[12] *http://www.epa.gov/airs/afs.html*

[13] There is a small number of records dating back to the 1970's.

[14] As noted, other groups may store relatively small amounts of data in AFS and, therefore, the number of sources cited here is for all sources. However, the number of sources from which States received data as well as the amount of data they received far outweighs anything stored by other groups.

[15] Currently, 1996 is the last year with completed data.

[16] The search performed on AFS was done in an attempt to get an approximation of the number of large sources in the database. As indicated previously, the definition of "large" is somewhat more complicated.

from annually for a number of reasons. For example, there are some years when, for programmatic reasons, there is an increased emphasis on the need for submittal of a comprehensive emissions inventory, e.g., to implement the Clean Air Act Amendments of 1990. (Table 2 and Figure 2)

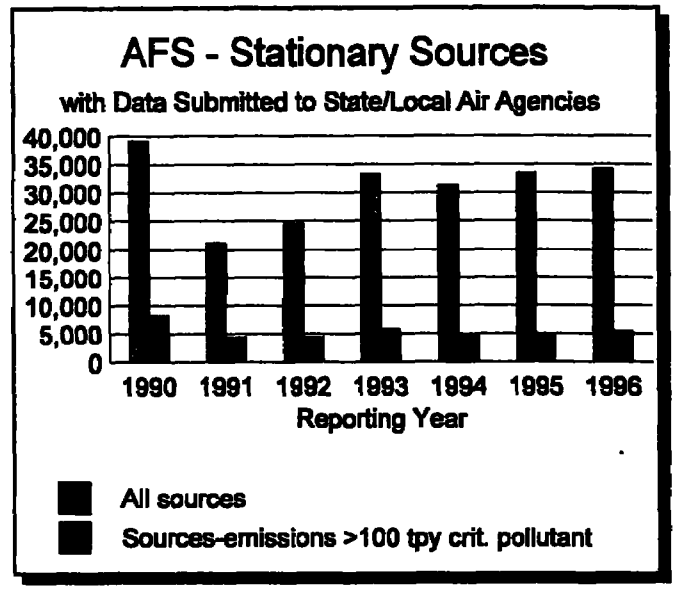
Table 2. Aerometric Information Retrieval System - AIRS Facility Subsystem (AFS) Number of Sources with Emissions Data Submitted to State/Local Air Agencies[17]

	Reporting Year						
	1990	1991	1992	1993	1994	1995	1996
All sources	39,151	21,290	24,660	33,272	31,450	33,507	34,204
Sources with emissions > 100 tons per year of criteria pollutant	8,194	4,527	4,505	5,876	4,856	4,702	5,477
Total Number of Historical Sources (Plants/Facilities) in AFS: ~ 90,000							

Source: Data query information provided by Ed Lillis, Office of Air Quality Planning and Standards, Information Transfer and Program Integration Division, 2 March 1999.

[17]As noted, other groups may store relatively small amounts of data in AFS and, therefore, the number of sources cited here is for all sources. However, the number of sources from which States received data as well as the amount of data they received far outweighs anything stored by other groups.

Figure 2. AFS - Number of Stationary Sources with Emissions Data Submitted to State/Local Air Agencies[13]

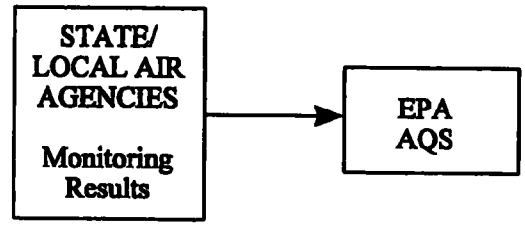


AEROMETRIC INFORMATION RETRIEVAL SYSTEM (AIRS)/ AIR QUALITY SUBSYSTEM (AQS)[18]

AQS contains ambient monitoring data for criteria pollutants that all State and local air agencies are required to collect under the Clean Air Act regulations. The criteria pollutants are carbon monoxide, lead, nitrogen dioxide, ozone, sulfur dioxide, particulate matter <10μm, and particulate matter <2.5μm. State and local air agencies submit the ambient monitoring data to EPA on a quarterly basis. Most of the monitors have been established since the late 1970's, but some monitoring data in AQS dates back to the 1950's. States sometimes submit ambient toxics data to AQS although they are not required to do so. AQS also contains a very minimal amount of monitoring data collected by others (probably less than one percent), but for all intents and purposes it is considered a "State" database.

The ambient monitoring units used by State and local air agencies collect samples in different ways. Some operate continuously, others intermittently. The States electronically send to EPA the individual measurements for 1-hour and 24-hour average air pollutant concentrations which are stored in AQS. The data must then pass through edit checks before they are uploaded to AQS. From these individual measurements, AQS software creates other statistics such as monthly and annual summaries for each piece of monitoring equipment, including highest and average values reported as well as values above the national ambient air quality standards for criteria pollutants.[19] (Figure 3)

Figure 3. Data Flow into AQS



All AQS data are currently active; no information is archived. The database is currently being redesigned as an ORACLE relational database with an estimated size of 300 gigabytes.

[18]Information in this section is based upon several U.S. EPA web sites, as noted throughout the text, and on various communications (voice, fax, email) from Ed Lillis, Office of Air Quality Planning and Standards, Information Transfer and Program Integration Division, February and March, 1999.

[19]*http://www.epa.gov/airsdata/monitors.htm*

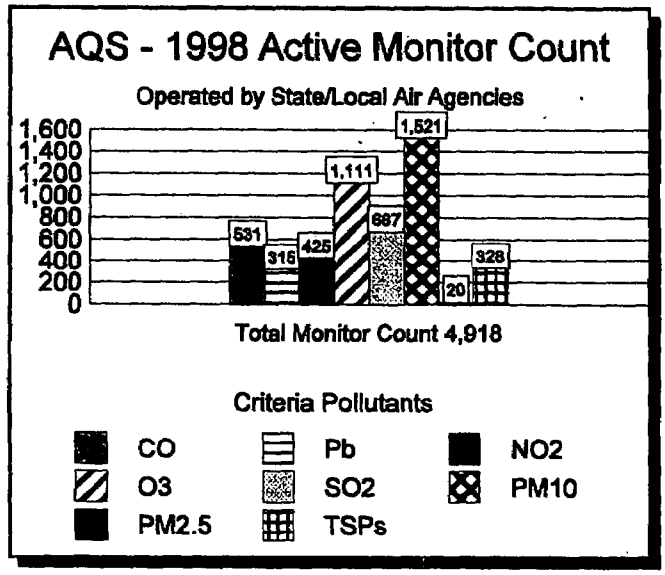
Approximately 10,000 monitors with sampling results for criteria pollutants have been stored in AQS over its lifetime, some of them dating back to the 1950's. In 1998 State and local air agencies collected data from 4,918 active monitors, including 531 for carbon monoxide, 315 for lead, 425 for nitrogen dioxide, 1,111 for ozone, 667 for sulfur dioxide, 1,521 for particulate matter <10μm, 20 for particulate matter <2.5μm, and 328 for total suspended particulates.[20,21] (Table 3 and Figure 4)

Table 3. Aerometric Information Retrieval System - Air Quality Subsystem (AQS)

Number of Monitors Operated by State/ Local Air Agencies[20]	
Total Number of Monitors (Since the 1950's)	~ 10,000
Active Monitor Count - 1998	
Total	4,918
Carbon Monoxide (CO)	531
Lead (Pb)	315
Nitrogen Dioxide (NO_2)	425
Ozone (O_3)	1,111
Sulfur Dioxide (SO_2)	667
Particulate Matter 10 (PM_{10})	1,521
Particulate Matter 2.5 ($PM_{2.5}$)	20
Total Suspended Particulates (TSPs)	328

Source: Data query information provided by Ed Lillis, Office of Air Quality Planning and Standards, Information Transfer and Program Integration Division, 24 February 1999.

Figure 4. AQS - Number of Monitors Operated by State/Local Air Agencies in 1998[20]



[20]Total suspended particulates (TSPs) are no longer a criteria pollutant, but some States still measure TSPs.

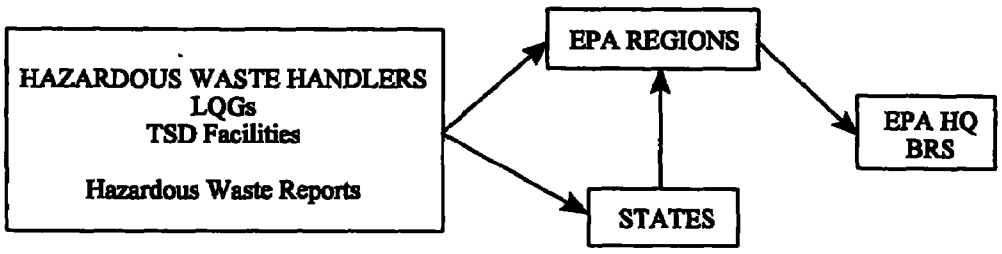
[21]As noted, AQS also contains a very minimal amount of monitoring data collected by others (probably less than one percent) and, therefore, these numbers include those monitors as well.

BIENNIAL REPORTING SYSTEM (BRS)

Hazardous waste handlers who generate waste above a certain threshold or who treat, store or dispose of such waste are required to submit biennial hazardous waste reports on their activities in accordance with Sections 3002 and 3004 of the Resource Conservation and Recovery Act (RCRA). These large quantity generators (LQGs) and treatment, storage and disposal (TSD) facilities submit their biennial reports either to their State agency, if it is so authorized, or to the EPA Regional Office by March 1st of every even numbered year for the previous reporting year, e.g., March 1, 1998, for the reporting year 1997. There is a specific federal hazardous waste report, but some States have their own versions, require additional information, or require reporting on an annual basis (e.g., Texas). If so, these States must still collect and submit the relevant federally required information to EPA.

Most States that collect the hazardous waste reports enter the data into an electronic database and then send the biennial report information in electronic form to their EPA Regional office.[22] A few (Guam, Hawaii, and Navajo Nations)[23], however, collect the reports, passing them on in hard copy to the EPA Regional office, which then enters the information into an electronic database. Also, there are some States which do not collect the hazardous waste reports at all (Alaska, Iowa, Michigan[24], Trust Territories, and Virgin Islands)[25], in which case, the facilities in those States send their reports directly to the appropriate EPA Regional office, which then enters the data into the electronic database. The Regional offices, in turn, send the electronic reporting information to EPA HQ for entry into the Biennial Reporting System database. (Figure 5)

Figure 5. Data Flow into BRS



[22]Personal Communication from Michael Hillard, Office of Solid Waste, Communications, Information, and Resources Management Division, 12 February 1999.

[23]Personal Communication from Dina Villari, Office of Solid Waste, Communications, Information, and Resources Management Division, 19 and 22 February 1999.

[24]Beginning in 1999, Michigan will collect the Hazardous Waste Reports.

[25]Personal Communication from Dina Villari, Office of Solid Waste, Communications, Information, and Resources Management Division, 19 and 22 February 1999.

A hazardous waste handler may be both a LQG and a TSD facility and, as such, files only one hazardous waste report. The Biennial Report consists of several forms, the submittal of each being dependent on the activities of the waste handler. EPA's *The National Biennial RCRA Hazardous Waste Report (Based on 1995 Data)*[26] reports separately the number of the LQGs and the TSD facilities that submitted hazardous waste reports, not the total number of waste handlers. However, from a brief analysis of the BRS ASCII flat files[27], it appears that the total number of waste handlers reporting was 21,028 with 1,828 of those reporting as both LQGs and TSD facilities. Based on the 1995 data, 95.4% (19,917) of the biennial reports from LQGs and 92.3% (1,831) from TSD facilities were submitted to State agencies, accounting for over 200 million pounds of hazardous waste generated and approximately 194 million pounds managed. EPA Regional offices received 4.6% of the reports submitted by LQGs and 7.7% from TSD facilities.[28] (Table 4 and Figure 6)

Table 4. BRS - 1995 National Biennial RCRA Hazardous Waste Report

Collecting Agency	Large Quantity Generators		Hazardous Waste Generated		TSD Facilities		Hazardous Waste Managed	
	Number	Percent	Tons	Percent	Number	Percent	Tons	Percent
States	19,917	95.4	200,584,892	93.7	1,831	92.3	193,732,444	93.0
EPA	956	4.6	13,507,613	6.3	152	7.7	14,539,588	7.0
Total	20,873	100.0	214,092,505	100.0	1,983	100.0	208,272,032	100.0

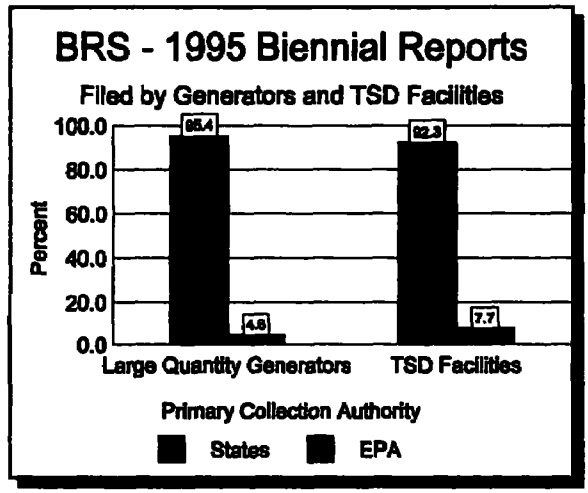
Source: U.S. Environmental Protection Agency. *The National Biennial RCRA Hazardous Waste Report (Based on 1995 Data)*, 1997.

[26]U.S. Environmental Protection Agency. *The National Biennial RCRA Hazardous Waste Report (Based on 1995 Data)*, 1997.

[27]*http://www.epa.gov/epaoswer/hazwaste/data/brs95.htm*

[28]U.S. Environmental Protection Agency. *The National Biennial RCRA Hazardous Waste Report (Based on 1995 Data)*, 1997.

Figure 6. BRS - 1995 Biennial Reports Submitted by Large Quantity Generators and TSD Facilities



This Page Intentionally Left Blank.

PERMIT COMPLIANCE SYSTEM (PCS)

Under the Clean Water Act, facilities that have been granted permits to discharge wastewater under the National Pollution Discharge Elimination System (NPDES) submit monitoring reports to EPA or the authorized States. Specifically, it contains data in the following areas:

- facility characteristics;
- permit conditions;
- discharge monitoring information;
- inspections;
- compliance schedules; and
- enforcement actions.[29]

Both major and minor facilities are tracked in PCS, a facility's classification being based on a number of parameters, including amount of discharge per day, wastewater sources, and population affected by discharge.[30] Given the focus of this report on the collection of environmental pollutant reporting data, the following analysis addresses the discharge monitoring data in PCS.

As required in a facility's permit, monitoring results of a facility's discharges are submitted in Discharge Monitoring Reports (DMRs), either to the relevant State agency, if it has been authorized/delegated by EPA, or to the appropriate EPA Regional office if the State is not authorized.[31,32,33] The DMRs from major facilities are required to be entered into PCS, but those

---

[29] *http://www.epa.gov/ow/compendium/permit.htm*

[30] *http://www.epa.gov/ow/compendium/permit.htm*

[31] States without NPDES permit authority: Alaska, Arizona, Idaho, Maine, Massachusetts, New Hampshire, New Mexico, District of Columbia, Puerto Rico, Pacific Territories (including American Samoa and Guam), and Federal Indian Reservations. *http://www.epa/gov/owm/faq.htm*

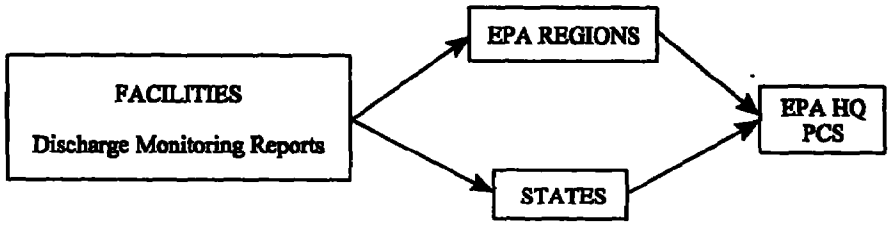
[32] A few States are authorized for NPDES permits for all facilities except federal facilities (Colorado, Delaware, Florida, Vermont, Virgin Islands, and Washington). In these States, all facilities except federal ones, send their DMRs to the State agency, while federal facilities send their DMRs to the EPA Regional office. Personal communication from Jan Pickrel and Howard Rubin, Office of Wastewater Management, Permits Division, 18 February 1999.

[33] Oklahoma and Texas have partial NPDES permitting authority. In these States, separate agencies oversee different categories of facilities and not all of theses agencies applied for NPDES permitting authority. For example, in Texas the Texas Natural Resource Conservation Commission (TNRCC) received authorization September 1998 to issue NPDES permits. However, the Texas Railroad Commission, which oversees oil, gas, and mineral exploration and production facilities, did not apply for NPDES approval. Therefore, the facilities under TNRCC jurisdiction send their DMRs to TNRCC, but the oil, gas, and mineral exploration and production facilities in Texas send theirs to EPA Region VI. Personal communication from Paulette Johnsey, Water Quality Protection Division, NPDES Permit Branch, EPA Region VI, 19 March 1999.

from minor facilities are not, although some States and Regional offices enter them anyway.[34,35] A DMR is filed for every pipe/outfall that is required to be monitored at a facility and the frequency of monitoring, as well as the parameters to be monitored at each outfall, are specified in the permit. It is common for monthly monitoring to be required. For example, a facility with one outfall that is required to file a monthly discharge monitoring report, files 12 reports over the course of a year. If the facility has eight outfalls, all of which require monthly monitoring, then the facility would file 96 DMRs per year.

Facilities submit DMRs in hard copy to the appropriate authority, i.e., a delegated State agency or an EPA Regional office. State agencies and the EPA Regional offices enter the data either online directly into PCS or send batch files for processing into PCS.[36] (Figure 7.)

Figure 7. Data Flow into PCS



Currently (March 1999), there are 59,190 NPDES permitted facilities, 6,702 of which are defined as major, 52,488 as minor. State agencies are responsible for collecting DMRs for approximately 91% (6,071) of the major facilities, 97% (51,023) of the minors, and 96% (57,094) of all NPDES permitted facilities. EPA Regional offices collect the DMRs for approximately 9% (631) of the major facilities, 3% (1,465) of the minors, and 4% (2096) of all permitted facilities.[37,38] (Table 5 and Figure 8)

---

[34]Personal communication from Lucy Reed, Office of Compliance, Enforcement Planning, Targeting, and Data Division, 9 February 1999.

[35]Personal communication from Jan Pickrel and Howard Rubin, Office of Wastewater Management, Permits Division, 18 February 1999.

[36]Personal communication from Lucy Reed, Office of Compliance, Enforcement Planning, Targeting, and Data Division, 19 March 1999.

[37]Data used to derive these numbers were supplied by Jim Corpuz, Office of Compliance, Enforcement Planning, Targeting, and Data Division, March 1999. General Permits are not included in these numbers.

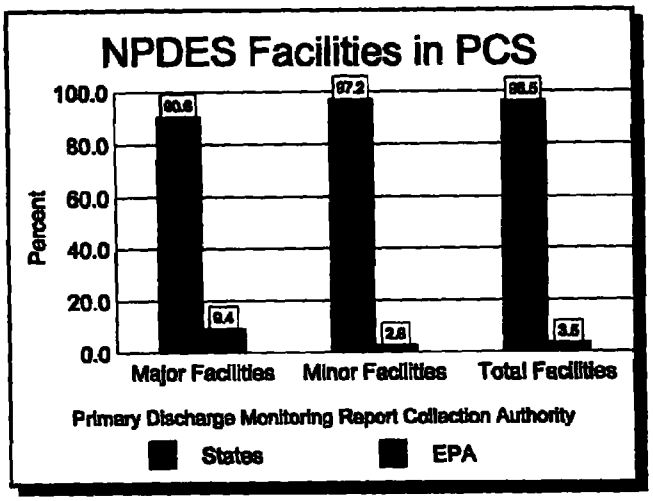
[38]The number of facilities that send their DMRs to a State agency is actually smaller than that stated here (and the number of those that send DMRs to an EPA Regional office is somewhat larger). Federal Indian Reservation facilities, which send their DMRs to EPA Regional offices, could not be easily identified by a simple search of PCS and, therefore, are included in the numbers of facilities in those States that collect DMRs from NPDES permitted facilities. Also, the facilities in Oklahoma and Texas that send DMRs to State agencies versus EPA Region VI have not been separated and all facilities are included in the count for States.

Table 5. NPDES Permitted Facilities in PCS and Discharge Monitoring Report Collection

DMR Collecting Agency	Major Facilities		Minor Facilities		Total Facilities	
	Number	Percent	Number	Percent	Number	Percent
States	6,071	90.6	51,023	97.2	57,094	96.5
EPA	631	9.4	1,465	2.8	2,096	3.5
Total	6,702	100.0	52,488	100.0	59,190	100.0

Source: Data used to derive the numbers in this table were supplied by Jim Corpuz, Office of Compliance, Enforcement Planning, Targeting, and Data Division, March 1999.

Figure 8. NPDES Permitted Facilities in PCS and Primary DMR Collection Authorities



Of the 419,739 DMRs reported in 1998 and subsequently entered in PCS, approximately 48% (202,632) were from major facilities. As noted previously, these are required to be entered into PCS. Approximately 83% (169,040) of the DMRs from major facilities had been collected and entered by State agencies, 17% (33,592) by EPA Regional offices. DMRs from minor facilities are not required to be entered in PCS, but States and EPA Regions often do include them in the database. In fact, 52% (217,107) of all 1998 DMRs in PCS were from minor facilities.[39] Of the DMRs from minor facilities, approximately 94% (204,729) were collected and entered by State agencies, 6% (12,378) by EPA Regional offices.

[39]The number of minor facilities that had submitted these DMRs could not be easily determined by a simple query of the PCS database.

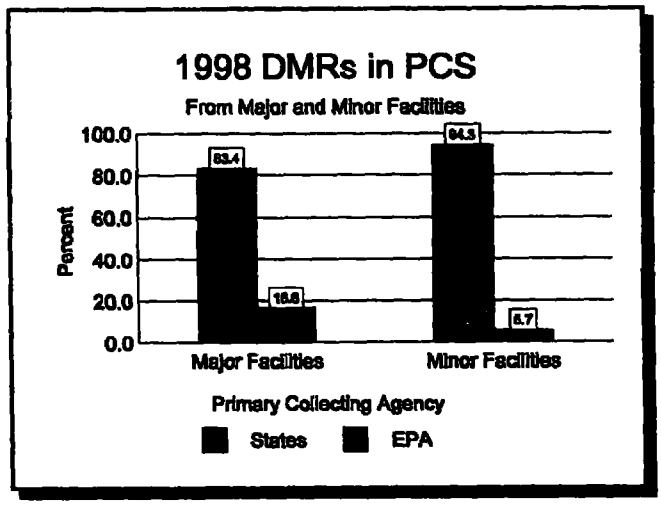
Of the **total** number of 1998 DMRs entered into PCS, State agencies accounted for 89% and EPA Regional offices for 11%.[40] (Table 6 and Figure 9)

Table 6. 1998 DMRs in PCS from NPDES Facilities

DMR Collecting Agency	DMRs from Major Facilities in 1998		DMRs from Minor Facilities in 1998		Total DMRs in PCS 1998	
	Number	Percent	Number	Percent	Number	Percent
States	169,040	83.4	204,729	94.3	373,769	89.0
EPA	33,592	16.6	12,378	5.7	45,970	11.0
Total	202,632	100.0	217,107	100.0	419,739	100.0

Source: Data used to derive the numbers in this table were supplied by Jim Corpuz, Office of Compliance, Enforcement Planning, Targeting, and Data Division, March 1999.

Figure 9. Collection of 1998 DMRs in PCS from NPDES Facilities



[40]The number of DMRs sent to State agencies is probably smaller than that stated (and the number sent to EPA Regional offices somewhat larger). Federal Indian Reservation facilities send their DMRs to EPA Regional offices, but these could not be easily identified by a simple search of PCS and, therefore, DMRs from such facilities in authorized States are included in the number of DMRs sent to State agencies. Also, the DMRs from facilities in Oklahoma that are sent to the State agency versus EPA Region VI have not been separated and are included in the count for States. Because Texas did not receive partial NPDES permitting authority until September 1998, all DMRs from Texas facilities are included in the number sent to EPA Regions.

SAFE DRINKING WATER INFORMATION SYSTEM (SDWIS/FED)

The Safe Drinking Water Information System at the federal level (SDWIS/FED) contains information on public water systems (PWSs), including type of water system; size of population served; sources of water; monitoring and reporting violations; monitoring and sampling results indicating violations of Maximum Contaminant Level (MCL) standards and mandated treatment techniques; enforcement actions; and sampling results.[41] The sampling results that are included in SDWIS are of two types: 1) currently, only those sampling results that exceed the MCL standards or indicate violations of mandated treatment techniques, and 2) the sampling results for unregulated contaminants that some PWSs are required to monitor.[42] Given the focus of this report on the collection of environmental pollutant reporting data, the following analysis addresses only the monitoring data in SDWIS.

PWSs are required to collect samples under the Safe Drinking Water Act (SDWA) and send them to a certified laboratory for analysis. The analytical results are sent by the PWS or the certified lab to either the appropriate State agency, if the State has primacy or a cooperative agreement with EPA, or, if the PWS is not located in such a State, to the EPA Regional office. All States, except Wyoming and Tribal water systems, have primacy and collect monitoring information from PWSs.[43]

The State agencies, and EPA Regions (in the case of Wyoming and Tribal water systems), are required to send quarterly reports on new violations, new enforcement actions, and new variances or exemptions involving PWSs.[44] These reports are sent in an electronic file format to EPA Headquarters where they are processed and entered into SDWIS on a quarterly basis; however, EPA Regional offices may review the reports before they are entered into the database.[45] It should be noted that the reports sent by the State agencies or EPA Regions do not include all the sampling/monitoring data collected by PWSs, but only those mentioned above (i.e., sampling results indicating violations of MCL standards and mandated treatment techniques, and results for unregulated contaminants). (Figure 10)

---

[41]http://www.epa.gov/ogwdw000/datab/sfed.html

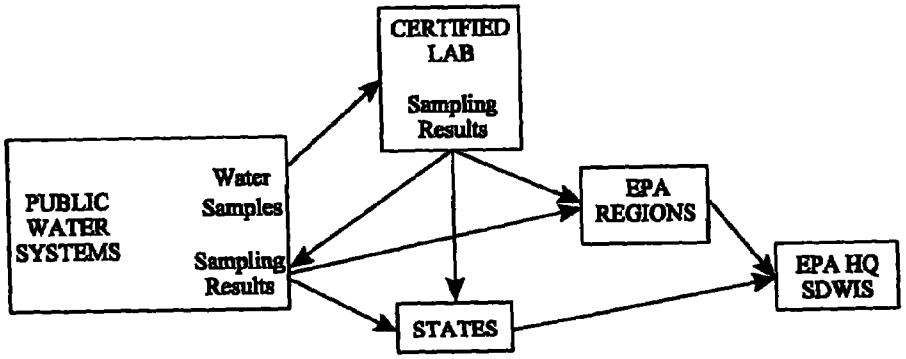
[42]Personal communication from Jeff Sexton, Office of Ground Water and Drinking Water, Implementation and Assistance Division, 25 February 1999.

[43]*Ibid.*, 10 February and 23 March 1999.

[44]40 CFR 142.15

[45]Personal communication from Jeff Sexton, Office of Ground Water and Drinking Water, Implementation and Assistance Division, 10 February 1999.

Figure 10. Data Flow into SDWIS/FED



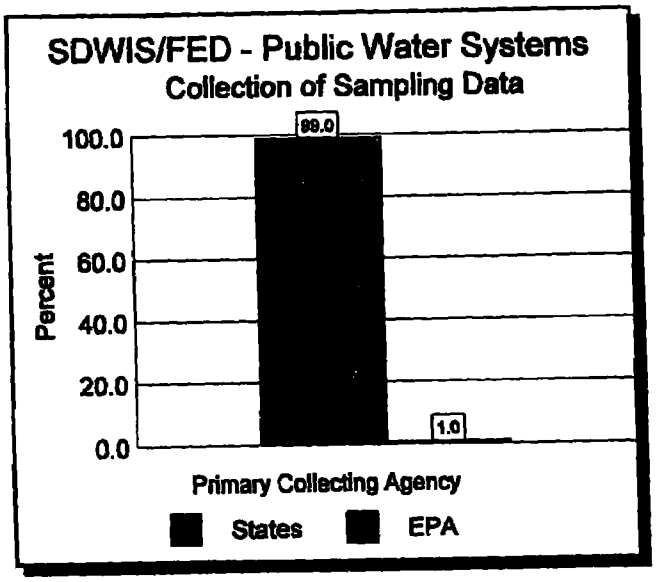
SDWIS contains 19 years of data and has acquired approximately five million records over a 10 year period.[46] As of January 1999, there were 170,429 public water systems being tracked in SDWIS. Of these, 99% (168,727) report their monitoring results to State agencies, 1.0% (1,702) to the EPA Regional offices.[47] (Table 7 and Figure 11)

Table 7. Number of Public Water Systems in SDWIS/FED, January 1999

Collecting Agency for Sampling Data	Number of Systems	Percent
States	168,727	99.0
EPA	1,702	1.0
Total	170,429	100.0

Source: Data supplied by Jeff Sexton, Office of Ground Water and Drinking Water, Implementation and Assistance Division, 10 and 25 February 1999.

Figure 11. Public Water Systems in SDWIS/FED and Primary Collecting Agencies



[46]Personal communication from Jeff Sexton, Office of Ground Water and Drinking Water, Implementation and Assistance Division, 10 and 25 February 1999.

[47]*Ibid.*, 23 March 1999.

WATER QUALITY INFORMATION SYSTEM (STORET - STOrage and RETrieval of U.S. Waterways Parametric Data)

The Water Quality Information System (STORET - STOrage and RETrieval of U.S. Waterways Parametric Data) was first developed by the U.S. Public Health Service in 1964 for the purpose of collecting and making available information on the water quality of U.S. waterways. Two years later, STORET moved to the Department of the Interior where it remained until 1970, when EPA became responsible for the system. It is currently maintained by EPA's Office of Wetlands, Oceans, and Watersheds (in the Office of Water).[48]

Most STORET information has been collected since 1975, however, some records date back to 1899. There are three components of STORET:

- Biological System (BIOS) - information on aquatic organisms in U.S. waterways;[49]
- Daily Flow System (DFS) - stream flow information from gaging stations belonging to the U.S. Geological Survey (USGS);[50] and
- Water Quality System (WQS) - chemical and physical information obtained during monitoring of U.S. waterways.[51]

About 800 organizations have stored information in STORET over the years.[52] Some of the data stored in STORET are required to be entered in the system (e.g., monitoring data collected under Section 106 of the Clean Water Act), while in other cases, the system has been used voluntarily by organizations as a utility system.[53]

With the exception of the USGS-owned DFS component of STORET which is not being included in the newer version of STORET, State organizations own approximately 90% of the information in the database, and collect and submit about 63% of the data that they are responsible for.[54,55] USGS, under contract to various States, collects and submits the remaining

---

[48]Personal communication from Bob King, Office of Wetlands, Oceans, and Watersheds, Assessment and Watershed Protection Division, 23 March 1999.

[49]*http://www.epa.gov/ow/compendium/bios.htm*

[50]*http://www.epa.gov/ow/compendium/dfs.htm*

[51]*http://www.epa.gov/ow/compendium/wqs.htm*

[52]*http://www.epa.gov/ow/compendium/legacy.htm*

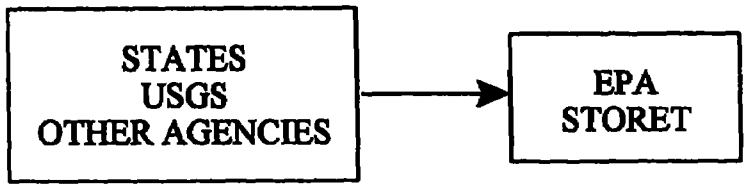
[53]Personal communication from Bob King, Office of Wetlands, Oceans, and Watersheds, Assessment and Watershed Protection Division, 1 March 1999.

[54]*Ibid.*

[55]Personal communication from Joyce Boyd, Office of Wetlands, Oceans, and Watersheds, Assessment and Watershed Protection Division, 14 April 1999.

State-owned data.[56] Organizations submit their data electronically to EPA in batch files, which are then processed and entered into STORET. (Figure 12)

Figure 12. Data Flow into STORET



Currently, STORET is approximately 20 gigabytes in a compressed format size; it is being converted to ORACLE, a relational database, and is expected to become seven to 10 fold larger when uncompressed.[57]

STORET's Water Quality System, which is the component used most by organizations, States and tribes, is tracked statistically by EPA. The following analysis, therefore, only pertains to WQS. The total number of sampling stations (or sites) historically stored in STORET/WQS has been increasing over the years and as of 27 December 1998, there were 843,739 stations.[58] Many of these stations are no longer active for numerous reasons, but their data are still available. (Table 8 and Figure 13)

Table 8. STORET/WQS - Stations Stored over Lifetime of System

As of:	Total Number of Stations
December 28, 1996	818,211
December 26, 1997	837,560December 27, 1998843,739

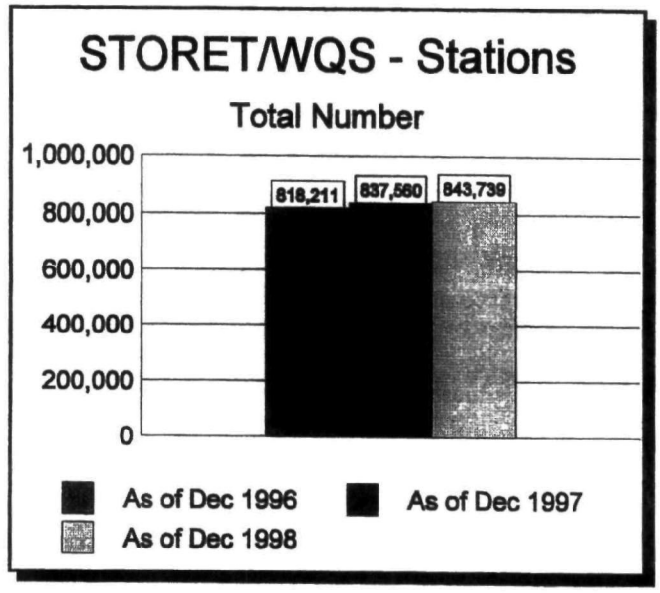
Source: Data supplied by Joyce Boyd, Office of Wetlands, Oceans, and Watersheds, Assessment and Watershed Protection Division, 19 March 1999.

[56]Personal communication from Bob King, Office of Wetlands, Oceans, and Watersheds, Assessment and Watershed Protection Division, 1 March 1999.

[57]*Ibid.*

[58]Personal communication from Joyce Boyd, Office of Wetlands, Oceans, and Watersheds, Assessment and Watershed Protection Division, 19 March 1999.

Figure 13. Total Number of Sampling Stations Stored over Lifetime of STORET/WQS



In 1997, there were 174,200 active sampling stations which were associated with approximately 6.8 million sampling transactions; in 1998, there were fewer active stations (119,340), but a greater number of parametric transactions, 7.3 million in total.[59] (Parametric transactions may include new sampling results, corrections of older data, or occasionally a complete overwrite of a group of existing data with only some changes to the existing data.) (Table 9 and Figures 14 and 15)

Table 9. STORET/WQS - Annual Activity

Year	Number of Active Stations	Parametric Transactions
1997	174,200	6,819,710
1998	119,340	7,324,120

Source: Data supplied by Joyce Boyd, Office of Wetlands, Oceans, and Watersheds, Assessment and Watershed Protection Division, 2 and 18 March 1999.

[59]Personal communication from Joyce Boyd, Office of Wetlands, Oceans, and Watersheds, Assessment and Watershed Protection Division, 2 and 18 March 1999.

Figure 14. Number of Annually Active Stations in STORET/WQS

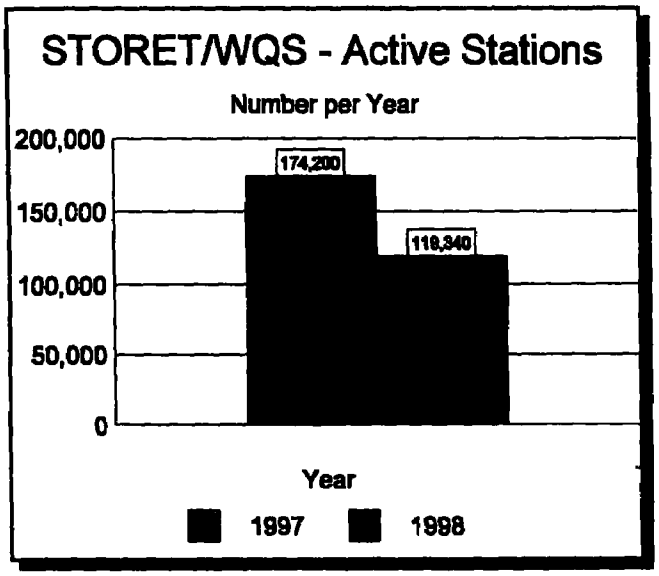
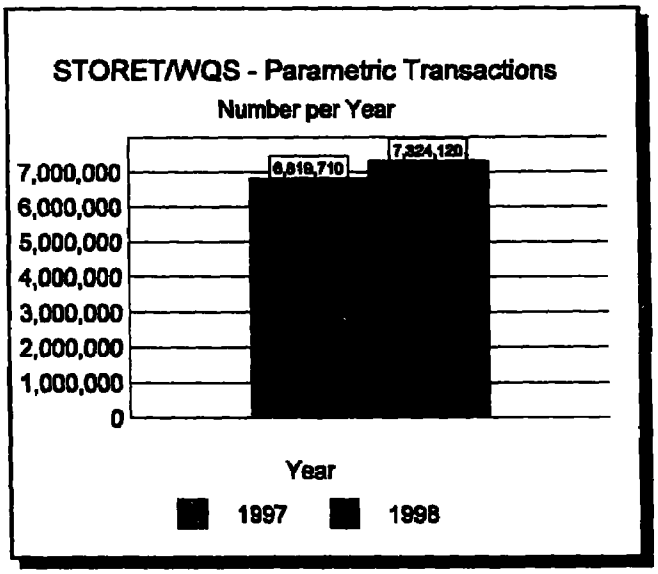


Figure 15. Number of Annual Parametric Transactions in STORET/WQS



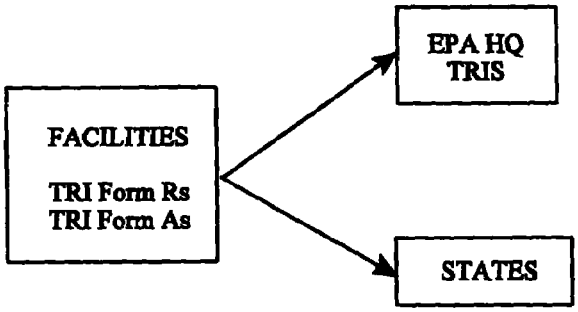
TOXIC CHEMICAL RELEASE INVENTORY SYSTEM (TRIS)

The Toxic Chemical Release Inventory System (TRIS) is a database which contains the information submitted by facilities under Section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA). A facility that is required to report must submit either a Toxic Chemical Release Inventory (TRI) Form R or, if the facility did not exceed certain threshold requirements, a Form A for each TRI listed chemical. For 1996, the last year for which TRI data from EPA are currently available[60], the list included over 600 chemicals and 28 chemical categories.

TRI Form R contains detailed information on a facility's chemical releases to the environment, as well as its waste management activities, for those chemicals on the TRI list. TRI Form A was implemented beginning in 1995 for purposes of reducing reporting burdens for those facilities with relatively low quantities of reportable amounts of TRI chemicals. The form is basically a certification statement from the facility stating that the facility has met the necessary requirements for reporting the particular TRI chemical on Form A.

Facilities are required under federal regulations[61] to submit copies (either in paper copy or in magnetic media) of their TRI Forms both to the appropriate State Agency and to EPA Headquarters by July 1 of each year for the previous reporting year.[62] Information from the reporting forms is entered into the TRIS database only by EPA Headquarters, not by State agencies.[63] (Figure 16)

Figure 16. Data Flow into TRIS



[60]TRI data for 1997 is expected to be available from U.S. EPA in May 1999.

[61]40 CFR 372.27(d) and 372.30(a)

[62]U.S. Environmental Protection Agency. *Toxic Chemical Release Inventory Reporting Forms and Instructions. Revised 1997 Version.* EPA 745-K-98-001, 1998.

[63]Personal communication from Chi Tran, Office of Pollution Prevention and Toxics, Information Management Division, 2 February 1999.

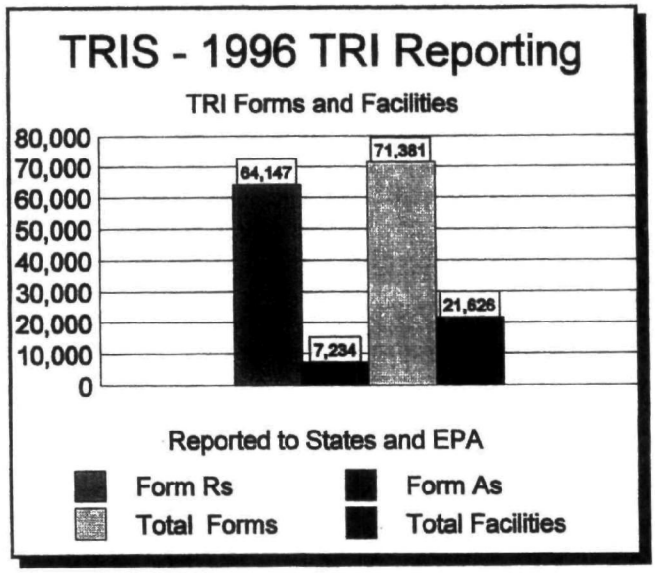
In 1996 State Agencies and EPA both collected a total of 71,381 TRI Form Rs and Form As from 21,626 facilities. The information reported on these forms included details on the releases of 2.4 billion pounds of TRI chemicals as well as other types of waste management (recycling, energy recovery, or treatment) of 20.9 billion pounds of such chemicals.[64] (Table 10 and Figure 17)

Table 10. 1996 TRI Reporting in TRIS

Form Rs	64,147
Form As	7,234
Total Forms	71,381
Total Facilities	21,626
Total On- and Off-site Releases (lbs)	2,433,506,582
Other On- and Off-site Waste Management (lbs)	20,901,063,788

Source: U.S. Environmental Protection Agency. *1996 Toxics Release Inventory: Public Data Release - Ten Years of Public Right-to-Know.* Office of Pollution Prevention and Toxics, EPA 745-R-98-005, 1998.

Figure 17. 1996 TRI Reporting in TRIS



[64]U.S. Environmental Protection Agency. *1996 Toxics Release Inventory: Public Data Release - Ten Years of Public Right-to-Know.* Office of Pollution Prevention and Toxics, EPA 745-R-98-005, 1998.

CONCLUSION

The analysis presented in this report indicates that State environmental agencies are responsible for the initial collection and subsequent submission to EPA of approximately 83% or more of the environmental pollutant reporting data contained in five of the seven national data systems analyzed in this study: AFS, AQS, BRS, PCS, and SDWIS. In the case of STORET (with the exception of the U.S. Geological Survey's (USGS) Daily Flow System component, which is not being included in the newer version of the database), States own approximately 90% of the information in the database, and collect and submit about 63% of the data themselves. USGS, under contract to various States, collects and submits the remaining State-owned data. Regarding TRIS, States are collecting 100% of the same information that is contained in this database, but they do not subsequently submit it to EPA or enter it into the system. This is due to the fact that facilities are required by regulation to report their TRI emissions to both EPA Headquarters (where it is entered into the national database) as well as the relevant State agency.

These findings make it clear that the States currently play a primary role in the collection of environmental pollutant reporting data in the REI national databases. They further support the need for continued building of a strong partnership between the States and EPA, especially as the partnership moves toward a more performance-based environmental management system.

This Page Intentionally Left Blank.

ACKNOWLEDGEMENTS

The following individuals were key in contributing basic information about the national data systems reviewed in this report as well as providing data on which the quantitative analyses were based. In addition, all the individuals cited in this report participated in the review of the section relevant to the information they provided. Their cooperation and efforts are greatly appreciated.

AEROMETRIC INFORMATION RETRIEVAL SYSTEM (AIRS): AIRS FACILITY SUBSYSTEM (AFS) AND AIR QUALITY SUBSYSTEM (AQS)

Ed Lillis	Office of Air Quality Planning and Standards; Information Transfer and Program Integration Division

BIENNIAL REPORTING SYSTEM (BRS)

Michael Hillard	Office of Solid Waste; Communications, Information, and Resources Management Division
Mary Villarreal	Waste, Pesticides, and Toxics Division; Program Management Branch; EPA Region V
Dina Villari	Office of Solid Waste; Communications, Information, and Resources Management Division

CAA 112(R) RISK MANAGEMENT PLAN INFORMATION SYSTEM (RMP*Info)

Lisa Jenkins	Office of Solid Waste and Emergency Response; Chemical Emergency Preparedness and Prevention Office

COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY INFORMATION SYSTEM (CERCLIS)

Patricia Gowland	Office of Emergency and Remedial Response; Information Management Center

NATIONAL COMPLIANCE DATA BASE (NCDB)

James Johnson	Office of Compliance; Enforcement Planning, Targeting, and Data Division

OFFICE OF ENFORCEMENT AND COMPLIANCE ASSURANCE DOCKET (DOCKET)

Debra Villari	Office of Compliance; Enforcement Planning, Targeting, and Data Division

PERMIT COMPLIANCE SYSTEM (PCS)

Jim Corpuz	Office of Compliance; Enforcement Planning, Targeting, and Data Division
Paulette Johnsey	Water Quality Protection Division; NPDES Permit Branch, EPA Region VI

Jan Pickrel	Office of Wastewater Management; Permits Division
Lucy Reed	Office of Compliance; Enforcement Planning, Targeting, and Data Division
Howard Rubin	Office of Wastewater Management; Permits Division

REI NATIONAL SYSTEMS BOARD

Ruby Boyd	Office of Information Resources Management; Information Resources Management Planning Division

RESOURCE CONSERVATION AND RECOVERY INFORMATION SYSTEM (RCRIS)

Michael Hillard	Office of Solid Waste; Communications, Information, and Resources Management Division

SAFE DRINKING WATER INFORMATION SYSTEM (SDWIS/FED)

Jeff Sexton	Office of Ground Water and Drinking Water; Implementation and Assistance Division

WATER QUALITY INFORMATION SYSTEM (STORET - STOrage and RETrieval of U.S. Waterways Parametric Data)

Joyce Boyd	Office of Wetlands, Oceans, and Watersheds, Assessment and Watershed Protection Division
Robert King	Office of Wetlands, Oceans, and Watersheds, Assessment and Watershed Protection Division

TOXIC CHEMICAL RELEASE INVENTORY SYSTEM (TRIS)

Chi Tran	Office of Pollution Prevention and Toxics; Information Management Division

State/EPA Vision and Operating Principles For Environmental Information Management

"The States and EPA are committed to a partnership to build locally and nationally accessible, cohesive and coherent environmental information systems that will ensure that both the public and regulators have access to the information needed to document environmental performance, understand environmental conditions, and make sound decisions that ensure environmental protection."

For details and more information, contact ECOS at 202-624-3660 or see http.//www state-epa-info-group.org/Vision/vision.html.