Source Control Report

MULTI-AGENCY

Benchmarking Study

December 1999

MULTI-AGENCY BENCHMARKING STUDY

Source Control Report

Participating Agencies

City of Los Angeles Bureau of Sanitation

City of Portland Bureau of Environmental Services

East Bay Municipal Utility District

King County Department of Natural Resources

Orange County Sanitation District

Sacramento Regional County Sanitation District

December 1999

Data and information used to develop this report are from Fiscal Year 1997 (FY1997).

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Introduction

The primary purpose of a source control program is to control discharges of wastewater from non-domestic sources into a public sewer system. An effective source control program should prevent discharges that could be harmful to people, the treatment works or the environment. Any Publicly Owned Treatment Works (POTW) with a design flow of 5 million gallons per day (mgd) or more is required by Federal regulations to develop and implement a Pretreatment Program (source control program). The minimum requirements for a source control program are detailed in the Code of Federal Regulations (40 CFR 403) and are an enforceable condition of a POTW's discharge permit. For a variety of practical and legal reasons, most source control programs go beyond these minimum requirements. Because of their knowledge of industrial facilities and access to discharge data, most source control programs play an essential role in revenue collection. Many POTWs have also developed and implemented Pollution Prevention programs to reduce pollutant loads beyond the scope of the Federal program.

Most agencies recognized the need for source control before it became a requirement in the late 1970s. Uncontrolled industrial discharges can upset biological treatment processes, and pollutants can pass through the treatment plant to the receiving waters. Industrial and commercial discharges can also damage facilities and interfere with collection system operations. Collection system and treatment plant workers may also be exposed to hazardous chemicals discharged by industrial or commercial users of the system. More recently, exfiltration of industrial and commercial chemicals from collection systems has been associated with soil and groundwater contamination resulting in significant liability for some POTWs.

Source Control represents a relatively small percent of most agencies' budgets. Of that cost, the majority is for labor. Many source control programs are at least partially funded by user fees assessed on the industrial dischargers. The cost of source control may be offset by avoided costs for repair of damaged sewer lines, sewer maintenance, additional treatment equipment, increased use of treatment chemicals, biosolids reuse, biosolids disposal, air pollution control equipment, increased monitoring, increased reporting, fines, and lost revenues. For example, effective enforcement of pH limits can prevent corrosion of concrete sewer lines and manholes and avoid the cost of premature replacement or repairs. Control of heavy metals concentrations may increase the efficiency of activated sludge processes, improve anaerobic digestion, and may be necessary to meeting NPDES permit effluent limits. An effective grease control program can reduce the number of sewer line blockages and the cost of maintenance. Accurate flow and load measurements of discharges from industrial users are essential to equitable application of sewer rates.

A POTW must develop and implement an approved Pretreatment Program that meets the basic requirements in the Federal Regulations. NPDES permits may contain additional requirements such as program reporting, special studies, or development of a pollution prevention program. The POTW must have the legal authority, resources, and procedures in place to:

- Control new or increased contributions of pollutants;
- Require compliance with discharge standards;
- Issue permits;
- Enforce all pretreatment standards and requirements;
- Carry out inspections, surveillance, and monitoring;
- Identify and locate industrial users; and
- Receive and analyze industry self monitoring reports.

Other significant program requirements are development of Local Limits, development of an Enforcement Response Plan, and submittal of periodic program reports.

Once the POTWs program is approved, it must be fully and effectively implemented at all times. It cannot be modified without notification of the Approval Authority (this is usually the state agency with NPDES permitting authority). Significant modifications of the program require prior approval. There is some latitude as to how each of the program requirements is achieved, but the basic elements must be in place. Most state agencies conduct annual Pretreatment Compliance Inspections and the United States Environmental Protection Agency (US EPA) typically audits major programs about once every five years. The bottom line is being able to demonstrate consistent compliance with applicable standards for each of the industrial users in the POTW's service area and elimination of NPDES permit violations caused by industrial users.

Benchmarking Source Control Programs

The purpose of benchmarking is to identify best practices, innovative ideas, and operating procedures that lead to superior performance and adapting those practices, ideas, and procedures to improve the performance of one's own organization. Pursuant to these objectives, the primary goals of this benchmarking effort were to identify, define, and collect comparable program cost and practices information, and to use this information to improve the performance of the respective source control programs.

Source Control is fundamentally different from most other POTW functions. It is a Federally mandated local regulatory program that may be unfamiliar, uncomfortable, and unpopular with staff and management. There is considerable variability in the factors that drive the level of effort required for an effective source control program. Discharge limits, program requirements, number of industrial users, types of industrial users, and percentage of industrial user flow may differ dramatically between different agencies. These uncontrollable differences present unique challenges to comparison of programs.

There was lengthy discussion about what activities should be included under the umbrella of "source control." All of the source control programs represented in this study include the traditional elements of a pretreatment program required by Federal pretreatment regulations. However, the represented programs have widely varying responsibilities related to non-domestic user service charges and implementation of non-traditional source reduction programs (pollution prevention programs) targeting the commercial or residential sectors. These differences in source control program scope led to separate evaluation of a subset of the program tasks, the traditional or "core" pretreatment program. Actual differences in program performance were more easily discernable from the core pretreatment program data. Identification of top performers and best practices are based primarily on "core" pretreatment program performance.

Agency Overviews

City of Los Angeles

Description

The City of Los Angeles is an incorporated city with an estimated population of 4 million. Within this city government, the Department of Public Works' five-member board of commissioners oversees the Bureaus of Engineering, Sanitation, Street Lighting, and Street Maintenance, along with other support Bureaus. The Bureau of Sanitation is responsible for sewer service and wastewater treatment, including industrial source control, as well as solids resource handling.

Wastewater services cover approximately 700 square miles, including 28 contractual jurisdictions. There are 48 pumping plants and approximately 6,600 miles of sewer line within the city boundaries. This collection system feeds four treatment plants covering two service areas—an average of 456 mgd (average for 1996/97). One service area includes two upstream water reclamation plants (Tillman Water Reclamation Plant and Los Angeles-Glendale Water Reclamation Plant) that provide hydraulic relief to the city's major wastewater treatment plant (Hyperion Treatment Plant). A separate, smaller service area within the city contains one wastewater treatment plant (Terminal Island Treatment Plant). Primary and secondary waste-activated sludge from Tillman and Los Angeles-Glendale Water Reclamation Plants is discharged back to the sewer and removed at Hyperion Treatment Plant. The treatment process at both Hyperion and Terminal Island includes solids handling and generation of biosolids for land application.

There are no combined sewers. A separate storm drain system is in place to handle storm water flow that is discharged to the Los Angeles River, Los Angeles Harbor, and Santa Monica Bay.

Primary wastewater aspects within the Bureau include sewer maintenance, treatment plant operations, industrial waste control, and storm water management. Primary solids aspects include refuse collection, recycling, and landfill operations. The Bureau of Sanitation also has a laboratory that services the needs of both wastewater and solid resources.

The Industrial Waste Management Division (IWMD) within the Bureau of Sanitation is responsible for administering the Source Control Program. IWMD is organized in three sections: inspection, engineering, and administrative support. These sections work together to perform major functional elements of the core pretreatment program.

Approval Authority

The California State Regional Water Quality Control Board—Los Angeles Region (Regional Board) regulates the City of Los Angeles' Source Control Program. The Regional Board performs pretreatment compliance inspections on a periodic basis, approximately every three years. However, staff resources at the Regional Board are limited, and pretreatment programs have taken a lower priority to NPDES permitting and new storm water control programs.

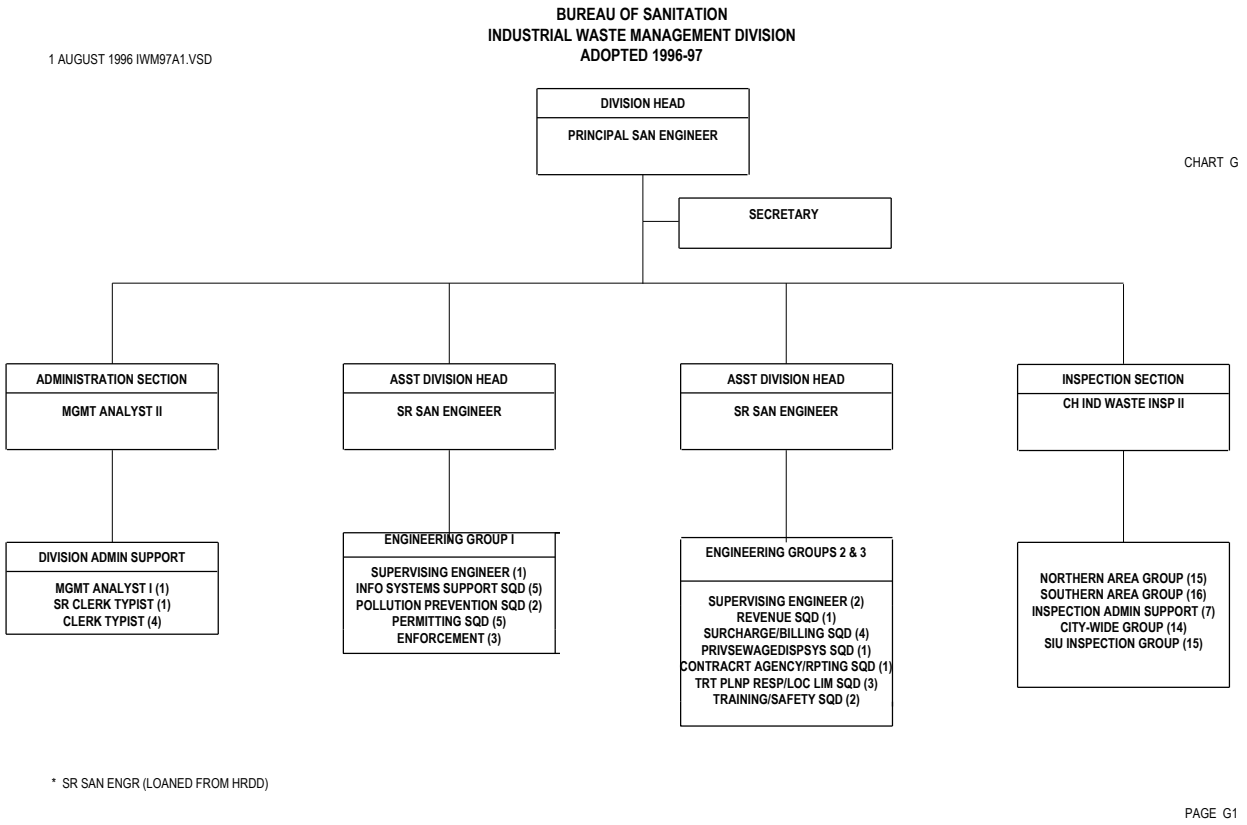
Although not the direct approval authority since California is a designated state, US EPA Region IX is very active, and in 1990 performed a pretreatment program evaluation on the City's program. City staff primarily contacts US EPA Region IX for technical assistance pertaining to interpretation of regulations.

All four of the City's NPDES permits issued by the State Regional Board require administration of a pretreatment program in accordance with 40 CFR 403 regulations. The NPDES permits also require that quarterly noncompliance report be prepared, in addition to annual pretreatment pro-

gram reports. These reports are submitted to both the State Regional Board and US EPA, Region IX.

Source Control Staffing

In 1996-97, IWMD staffing consisted of 109 positions of which 67 were inspectors, 29 were engineers, (including the division manager), and 13 were administrative (see IWMD organization chart). Staff is primarily located at the main headquarters location with some inspection staff located at five outlying offices.



Core Pretreatment Program Activities

Industrial User Inventory

The inventory for 1996/97 consisted of 6,343 industrial users. One hundred eighty three (183) were categorical IUs in 13 different categories, most of which were metal finishers and electroplaters. There were also 97 local SIUs (noncategorical SIUs). Local SIUs are defined as IUs with flow greater than 25,000 gpd or those that have a potential to adversely impact the POTW. The remaining 6,063 IUs were non-SIUs that include industry types such as auto repair shops, service stations, restaurants, food processing operations, dental labs, laundries, textiles, printing, and truck and auto washing.

IWMD has a dedicated and ongoing inventory effort that includes annual purchase of a database of businesses in Los Angeles. A list of potential IUs is developed and distributed to inspection staff for scheduling of canvassing inspections to determine if permits are needed. Applications are distributed and permits are issued for those businesses determined to be subject to the Industrial Waste Control Ordinance.

Permitting

In general, permits are required for the discharge of industrial wastewater to the City sewer in excess of 200 gpd (where pretreatment is also required). SIU permits are issued for a maximum duration of three years. Non-SIU permits hold no requirements for renewal.

SIU permits are comprehensive documents whose major sections include federal and local limits, self-monitoring requirements, and special conditions. Fact sheets are also attached and include an in-depth description of the business and manufacturing process, identification of process unit operations and pretreatment unit operations, rationale for categorization, combined waste stream formula calculations, and mass or production-based limit calculations.

Non-SIU permits utilize a simpler format. The main sections include local limits and special conditions (special conditions may include self-monitoring requirements).

IWMD's non-SIU inventory of 6,603 also includes approximately 300 permits for discharge to the storm drain system or waters of the state. These permits include limits established by the Regional Board for various receiving waters. In the near future, responsibility for these permits will be transferred to the Storm Water Management Division.

Monitoring (Inspection and Sampling)

SIU inspection staff is responsible for inspection and sampling of all SIUs. A team of two inspectors inspects a facility and performs sampling during the same visit. The next day, the team will return to retrieve the composite sampler. SIU inspections and sampling are performed on a quarterly basis, at a minimum. One of the quarterly inspections includes a more comprehensive annual inspection. Once every three years, inspection and engineering staff perform a joint audit as part of the permit renewal process for SIUs.

LIU inspection staff is responsible for inspection of all LIUs. Individuals, not teams, perform LIU inspections. Depending on the industry type, inspections are performed from one to four times per year at a minimum. Sampling of LIUs is performed only on an as-needed basis.

Split sampling for surcharge purposes is also performed on non-SIUs whenever they sample to meet surcharge self-monitoring requirements.

Aside from regularly scheduled inspections, other inspections include activities such as follow-up inspections for violations, delinquent account fee collection, and responding to complaints.

System Sampling

System sampling includes sampling for ongoing data collection as well as special projects. Border monitoring if performed routinely to collect data on the quality of sewage entering the City's system from contractual jurisdictions. A night crew of inspectors is also on duty five days per week to perform upstream/downstream street sampling as part of surveillance monitoring.

Sampling is performed when called for as part of treatment plant response activities to identify where specific pollutants upsetting or passing through the treatment plant are being discharged. Sampling is also done as needed to gather data used for local limits development. This involves collecting samples from residential, commercial, and industrial areas.

Special projects either within the division or outside the division sometimes require sampling support. Such projects have included sampling of auto repair facilities spent cleaning baths, sampling certain areas of the sewer system to address odor problems, and monitoring the sewer system during sodium hydroxide dosing.

Local Limits

Currently the City of Los Angeles enforces local limits that were established in the 1970s. These limits, as shown in Table 1, are not technically based and are instantaneous maximum concentration values that apply to all IUs throughout the entire city.

Table 1
City of Los Angeles Local Limits

Pollutant	Instantaneous Maximum Limit (mg/l)
Arsenic	3.00
Cadmium	15.00
Copper	15.00
Cyanide (Total)	10.00
Cyanide (Free)	2.00
Dissolved Sulfides	0.10
Lead	5.00
Nickel	12.00
pH Range	5.50-11.00
Silver	5.00
Total Chromium	10.00
Zinc	25.00
Oil and Grease (Total)	600.00

Technically based local limits were developed and submitted to the Los Angeles Regional Water Quality Control Board and US EPA in 1995 and have not yet been approved. There are two sets of proposed technically based local limits that apply to two service areas in the city. These limits include both concentration-based instantaneous maximum limits and daily average limits.

Enforcement Response Plan

IWMD has developed an Enforcement Response Plan (ERP) and utilized progressive administrative enforcement for over 10 years. Over 300 administrative enforcement cases have been handled during this time. The ERP includes actions such as issuance of notices of violation (NOVs); issuance of administrative orders including consent orders, cease-and-desist orders and compliance orders; permit suspension; permit revocation; and civil and criminal prosecution. An administrative penalties program has been drafted but has not yet been implemented.

IWMD also participates on two Strike Force Teams. One team is coordinated by the Los Angeles County District Attorneys Office, and another by the US EPA Criminal Investigations Division. These efforts sometimes result in criminal prosecution against industrial users and assessment of monetary penalties. IWMD often receives cost restitution for staff time and lab analysis as part of these penalties.

Data Management

Data management systems development staff within IWMD is involved in tracking and reviewing self-monitoring reports in addition to coordinating with the outside systems division on improvements and modifications to the permittee information tracking system (PITS). The system is currently on a mainframe platform and is in the process of being converted to a wide area network Oracle database. An extensive database has been developed over the years to capture information on all IUs. Inspection, engineering, and clerical staff are responsible for data input of designated components of the system. For example, inspection staff enters inspection reports and

NOV data, engineering staff enters permit discharge limits and self-monitoring requirements, and clerical staff enters permit application information.

POTW sampling data provided by the lab is accessible. Self-monitoring data is entered by IWMD clerical staff and made available on the mainframe.

Reporting

Reporting staff is responsible for coordinating efforts in preparation of the annual report and quarterly noncompliance reports as required by our NPDES permits. Staff also handles other status reports required by the Bureau or Department.

Additional Source Control Activities

Pollution Prevention

Pollution Prevention activities are handled primarily by one engineer. The dry cleaning program was developed as part of pollution prevention efforts and requires that all dry cleaning businesses in the city (approximately 1,000) submit zero discharge certificates or obtain noncategorical SIU permits and meet a nondetect limit for perchloroethylene if they choose to discharge. Other pollution prevention efforts focus on issues such as control of copper, lead, and zinc discharge from radiator repair shops; auto repair shops converting from solvent cleaners to water-based cleaners, and controlling lindane discharge from chemicals used for lice control. Other efforts include organizing pollution prevention workshops for both industry representatives and regulatory personnel as well as developing various brochures.

IWMD has also implemented an IU Award program to recognize those IUs with exemplary compliance rates. Criteria has been established where IUs must have a three-, four- or five-year 100% compliance rate in order to be recognized. For 1996, 24 IUS were presented with awards.

Many projects involve working with various agencies on multi-media pollution concerns. Staff also participate in several organizations including the Southern California Pollution Prevention Committee and the California Water Environment Federation's Pollution Prevention Subcommittee.

Another major pollution prevention effort is handled through enforcement cases. As part of administrative orders, IUs under enforcement are required to submit pollution prevention plans. These plans identify pollution prevention practices or installation of pollution prevention equipment that will help the IU achieve compliance. Pollution prevention is also addressed in a general sense during normal inspection activities. The time spent on pollution prevention by enforcement staff and inspection staff was allocated to enforcement and inspection work orders and was thus not captured as pollution prevention work activity.

In addition, the Hazardous and Toxic Materials (HTM) Office of the Environmental Affairs Department also addresses pollution prevention issues for all businesses in the city. A small part of the activities handled by HTM involve industrial wastewater permittees. These activities are coordinated with IWMD's pollution prevention staff.

Household Hazardous Waste

Household hazardous waste activities are handled by the solids resources side of the Bureau and are not considered part of the wastewater program.

Rate Development and Fees

This staff handles inspection and control fee issues and surcharge billing issues. The Bureau of Accounting mails all bills. However, IWMD staff responds to questions and inquiries and handles flow updates for surcharge purposes. IWMD staff also handles billing for special surcharge accounts. In addition, billing staff and inspection staff are responsible for tracking and collecting delinquent payments.

The industrial waste fees and rates are developed by IWMD staff as a portion of the entire wastewater revenue program. Another division handles the main portion of the wastewater revenue program.

Biosolids and Influent/Effluent Quality

The Source Control Program has been effective in regulating industrial wastewater discharge, which has resulted in reducing heavy metals influent to the treatment plants by 88% over the last 20 years. The award-winning biosolids program consists of 95% land application and 5% composting. A graph of the reduction in heavy metals influent to Hyperion Treatment Plant is shown in Figure 1.

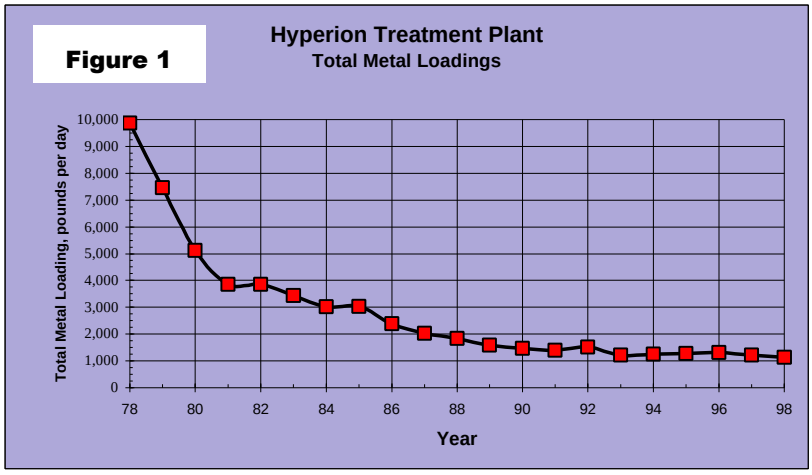
Special Studies

Special studies include local limits development and other projects, such as specific pollutant studies. The City's NPDES permits require preparation of reports on source identification of specific pollutants and methods for control. Interim, more lenient limits are established in the NPDES permits in order to allow the city time to develop and implement a plan that will reduce discharge concentrations from the treatment plants. Ultimately, however, the interim limits will be replaced with final limits that the City will be responsible for meeting.

Septage Disposal Control Program

In 1996/97, the City's septage disposal control program consisted of five designated sites where septage haulers were allowed to discharge septage to the sewer. Some of these sites were open 24 hrs a day and staffed by an inspector only on occasion. Haulers were required to permit each truck on an annual basis and pay and fee of $1,700 per year.

A new program was implemented in September 1998 with four designated discharge sites open at designated hours and staffed during these hours by inspectors. New fees commensurate with the city's cost to treat the waste have also been established on a per-gallon basis.



City of Portland Bureau of Environmental Services

Description

The City of Portland's Bureau of Environmental Services (Bureau) provides a number of environmental services to the citizens of Portland including: sanitary sewage and stormwater collection; wastewater treatment; solid waste services; and stormwater and watershed protection programs. In terms of wastewater treatment services, Portland services 500,000 residential and 25,000 commercial users. The sanitary service area covers 106 square miles, 91 within Portland and 15 in neighboring communities. The collection system consists of 2,300 miles of sewer pipe ranging in diameter from 4" to 144". The collection system is served by 98 pump stations, and approximately 40% of the sewer service area is combined sewers.

Portland is serviced by two treatment plants, which have a combined secondary treatment capacity of 110 mgd. The Columbia Boulevard Wastewater Treatment Plant is Portland's main plant (100 mgd) and it discharges to the Columbia River. The Tryon Creek Wastewater Treatment Plant (10 mgd) receives primarily domestic wastewater and discharges to the Willamette River. Both plants are activated sludge secondary treatment plants.

The Bureau's Industrial Source Control Division (ISCD) implements various source control programs to protect the local environment from harmful substances discharged by industrial and commercial users.

The industrial permitting section administers the core pretreatment program for industrial users issued industrial wastewater discharge permits. The industrial projects section implements the pollution prevention and surcharge programs, maintains the industrial user survey and building plan review process, and handles batch discharge requests. The industrial stormwater section administers the industrial stormwater program through an agreement with DEQ for industries issued industrial stormwater NPDES permits that discharge stormwater runoff to the City's separate storm sewer system.

The ISCD also receives support services from the Environmental Compliance (ECD) and Environmental Monitoring and Investigations (EMID) Divisions. The ECD provides legal assistance for major enforcement actions, responds to pollution complaints and spill episodes, traces slug loads discovered entering the treatment plants, and handles the septage sewage hauling program. The EMID provides all sampling and testing services required by the ISCD on a "work order" basis.

The industrial permitting section is responsible for implementing the core pretreatment program. The section supervisor assigns, reviews, and approves the work performed by permit managers. The section supervisor ensures that the technical quality of work, employee performance, and procedural issues for the industrial permitting section are maintained.

Permit managers maintain the daily activities for their assigned industrial users including: issuing wastewater discharge permits, conducting facility inspections, reviewing compliance reports, maintaining industrial files and electronic information, and taking appropriate enforcement actions in response to industrial user non-compliance. Permit managers are also routinely involved in work process improvement activities and managing special projects.

Approval Authority

Portland's pretreatment program was approved by the Oregon Department of Environmental Quality (DEQ) in 1983. Portland completed a major revision to its program in December 1992. Several substantial program modifications were approved by DEQ in 1998.

Schedule E of Portland's NPDES permit contains detailed pretreatment program implementation requirements for permitting, inspecting and sampling IUs, as well as enforcement response plan requirements, program reporting and modification requirements, and local limits, IU survey and plant monitoring requirements. These detailed requirements provide the legal framework for DEQ to enforce proper program implementation.

DEQ conducts yearly pretreatment compliance inspections and performs comprehensive program audits every 5 years. Portland's last audit occurred in May 1998, for calendar year 1997. DEQs comprehensive oversight creates a no-error work atmosphere within the ISCD.

Source Control Staffing

The ISCD has three operating sections (see Figure 2) and is staffed by a division manager, three section supervisors, 16 environmental technicians, and one secretary.

Distinctive Features

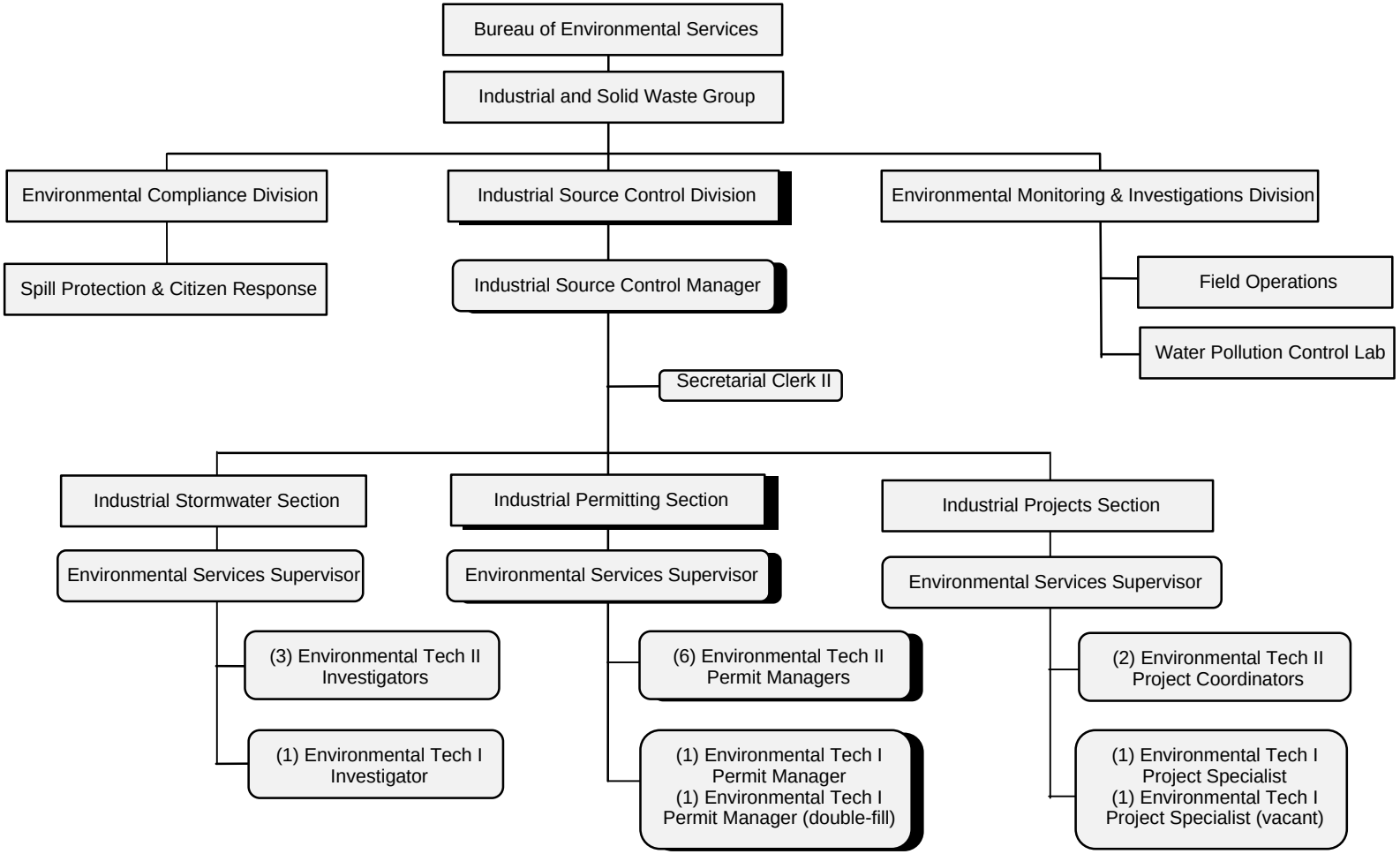
1. City limits. Portland adopted new City discharge standards in 1998 that are outside the scope of the pretreatment program. The City limits only apply to non-permitted industrial users. This approach provides broad flexibility in applying the standards such as using alternative discharge control mechanisms (BMPs) in lieu of meeting the numeric standard.
2. IU partnerships in compliance assurance. Portland has enacted ordinances that provide the automotive repair industry the ability to self-implement a voluntary certification program to comply with City limits. Portland is also working the Oregon Dental Association on a similar self-implemented compliance assurance program.
3. Portland adopted new local limits in 1998 that apply only to permitted industries. The new limits provide for an individual organics limitation strategy and the use of industrial-user-permit-specific limits. The limits also provide for using a percent rule to limit pollutant discharges.
4. Portland has implemented an industrial stormwater program to control stormwater runoff from regulated industrial facilities. The program is implemented through a Memorandum of Understanding with the Oregon Department of Environmental Quality. The program includes permit administration, sampling, inspection, and enforcement activities, as well as survey efforts to identify and locate IUs that are subject to NPDES stormwater permitting requirements.

Core Pretreatment Program Activities

Industrial User Inventory

The ISCD continuously updates its IU inventory through field inspections, citizen complaint investigations, building plan reviews, and periodic reviews of water account records, the telephone directory, the Portland Fire Bureau's Sara Title III list, and the Portland Metropolitan Business Directory. Portland also purchases a "Metro" database, which is a comprehensive listing of businesses in the Portland metropolitan area. About 200 facilities were surveyed in 1997, and included in Portland's annual pretreatment report.

Figure 2
City of Portland Bureau of Environmental Services
Industrial Source Control Division
Organizational Chart



Portland's industrial base is diverse and includes light and heavy industrial manufacturing, automotive manufacturing, high-tech industry, metal finishing/electroplating facilities, dairies, breweries (large and microbrewery), beverage and food preparation industries, foundries and metal casting industries, and ship yards. Portland's major permitted industries discharge approximately 7 mgd of process wastewater, which comprises about 7% of the average daily wastewater treatment plant flow. Appendix 1 provides additional technical information on Portland's permitted industries.

Permitting

The ISCD classifies industries into two categories: permitted or non-permitted IUs.

The permitted class contains 170 permitted IUs: 34 categorical SIUs, 43 local SIUs, and 93 non-SIUs. All permitted IUs undergo the same permitting procedure and are issued the same permit. Permits are issued for a maximum period of five years. The permits are comprehensive documents that contain all applicable limits, self-monitoring requirements, special and general conditions, definitions, and an appendix. A comprehensive fact sheet is used to document all decisions associated with preparing permits.

Monitoring (Inspection and Sampling)

Permit managers use a discharge risk analysis (DRA) procedure to determine IU inspection, compliance monitoring and self-monitoring frequencies. At a minimum, permit managers conduct an annual major facility inspection for each assigned permitted IU. Some IUs receive additional minor inspections based on the DRA. Inspections are normally conducted by the permit manager, but for some facilities a two-person inspection team is used depending on the nature the facility.

Sample collection is performed by the field operations (FO) section of the Bureau's EMID. The FO section uses compliance monitoring schedules prepared by permit managers to develop sample collection schedules. SIUs are sampled twice per year, at a minimum, and more often where identified by the DRA. For the extra-strength surcharge program, samples are collected separately from compliance samples and the sampling frequency is based on revenue collection. The FO section uses a two-person team to collect samples.

System Sampling

Portland does not perform system sampling on a routine basis. The source control program does investigations if a problem occurs and the source is not known, but this rarely occurs.

Local Limits

Portland implemented discharge standards in 1974 prior to federally required local limits. The City implemented pretreatment local limits in 1982. The local limits were updated in 1990 and in 1998. Table 2 shows the local limits in effect during the 1996/97, study period for this report.

Table 2 City of Portland Local Limits FY1996/1997	
Pollutant	**Limit (mg/L)**
Ammonia	50.0
Arsenic	0.3
Cadmium	0.7
Chlorinated Hydrocarbons	0.5
Chromium	3.8
Copper	2.3
Cyanide	1.2
Lead	0.7
Mercury	0.014
Nickel	3.0
Phenolics	1.0
Silver	0.4
Sulfate	500.0
Sulfide	50.0
Zinc	4.0
Fats, Oils and Grease Non-Polar Polar	 100.0 500.0
pH	5.5 – 11.5 S.U.

Enforcement Response Plan

Portland implemented its enforcement response plan (ERP) in 1991. It includes five escalating enforcement steps: Compliance Telephone Memorandums (no civil penalty), Letter of Violation ($50 to $100 civil penalty), Warning Notice ($250 to $1,000 civil penalty), Notice of Violation/Compliance Order ($1000 to $2,500 civil penalty), and Violation of Compliance Order ($4000 civil penalty). The ERP outlines the appropriate initial and escalating enforcement steps and IU response time frames.

Data Management

The ISCD implemented a new custom data management system in 1997 called AQUARIUS, which is a Sybase relational database system. This program maintains IU general and technical information, city and self-monitoring data, discharge and stormwater permit data, and violation and enforcement actions. The system can be used to track various reports, applications, surveys and response due dates. An automatic daily report is being designed to track outstanding reports and violations. Tracking is currently accomplished through add-hoc reports. For word processing work, an electronic filing system was established in 1992 to standardize filing all text documents.

Reporting

Portland is required to submit to DEQ an annual pretreatment report that covers the City's implementation efforts for the previous calendar year. The report is comprehensive in nature and requires substantial documentation on industrial users. DEQ uses the report as one tool to evaluate compliance with program implementation requirements.

Additional Source Control Activities

Pollution Prevention

ISCD staff participates in a regional Pollution Prevention Outreach (P^2O) team that is comprised off several municipalities and area county governments, a regional governmental entity, and a regional wastewater treatment authority. Staff also work with the DEQ on an Environmental Assistance Program directed at providing pollution prevention services and technical assistance to large businesses that are in compliance with applicable regulations. ISCD staff also provide technical assistance during routine inspections, or when resolving compliance issues with permitted IUs. The ISCD is also implementing an Alternative Discharge Control Mechanism (ADCM) program that allows non-permitted industrial users (e.g., automotive shops, dental, photo shops) to use BMPs in lieu of meeting City limits.

Household Hazardous Waste

The City of Portland has several recycling centers that handle household hazardous waste. The Bureau encourages residents to use these facilities through media advertisements and information included with water and sewer bills.

Rate Development and Fees

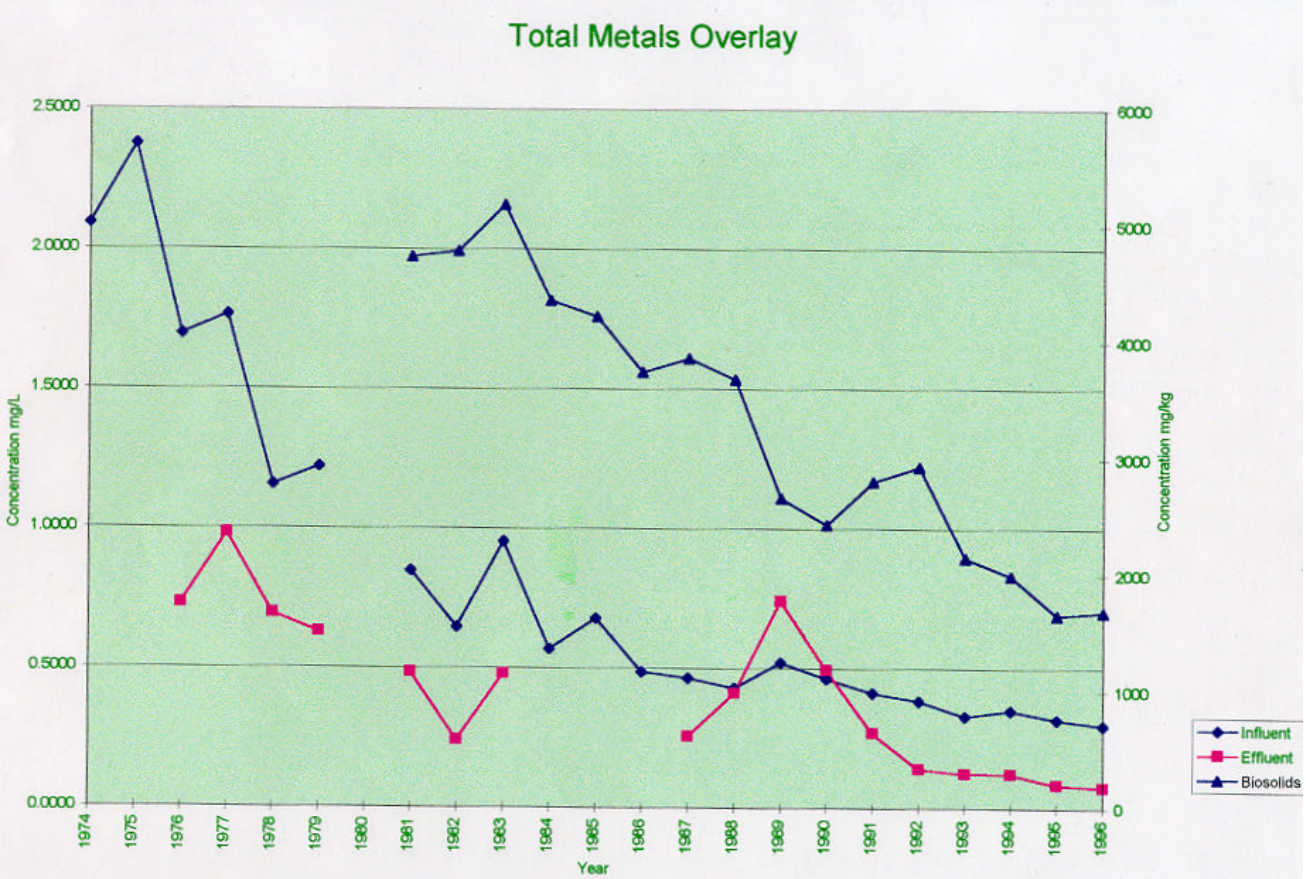
The Bureau's Business Services Group handles rate development. The ISCD is involved in the extra-strength surcharge program for industries that discharge excess BOD and TSS. The ISCD also processes permit fees and assists in collecting civil penalties. Portland is currently evaluating increasing permit fees to more fully fund the pretreatment program by industrial users.

Biosolids and Influent/Effluent Quality

Portland has actively worked with many industrial users since 1974 to reduce process waste discharges that contain toxic pollutants. Significant pollutant reductions have been achieved through source control efforts.

Figure 3 indicates that the average metals concentrations have significantly decreased in the plant influent (91%), effluent (87%), and biosolids (68%). Portland's biosolids quality exceeds pollutant concentration limits (Table 3). The majority of biosolids (85%) are land applied at a dedicated farm site and the balance of the biosolids (15%) are composted and distributed to the public.

Figure 3
City of Portland Metals Reductions



East Bay Municipal Utility District

Description

East Bay Municipal Utility District (EBMUD) is a publicly owned utility formed under the Municipal Utility District (MUD) Act, which was passed by the state legislature in 1921. The EBMUD supplies water and provides wastewater treatment for part of the California counties of Alameda and Contra Costa. The District's water system serves approximately 1.1 million people in a 317-square-mile area. The wastewater system serves approximately 611,000 people in a 83-square-mile area along the east shore of San Francisco Bay. EBMUD is governed by a seven-member publicly elected Board of Directors.

The Special District No. 1 (District) is responsible for treating domestic, commercial and industrial wastewater of the cities of Alameda, Albany, Berkeley, Emeryville, Oakland, Piedmont, and for the Stege Sanitary District, which includes El Cerrito, Kensington and part of Richmond. The interceptors are 27.1 miles of reinforced concrete pipes. They collect wastewater from approximately 1,800 miles of community sewers. Fourteen pumping stations, ranging in capacity from 1.5 to 60 mgd, lift wastewater through the interceptors as it travels to the main Wastewater Treatment Plant. Special District No. 1 is administered by the District's Wastewater Department. The Wastewater Department is organized into four functional Divisions: Wastewater Treatment, Support Services (engineering), Laboratory Services and Source Control.

The Source Control Division is responsible for monitoring and controlling wastewater discharges from over 170,000 residential, commercial, and industrial customers within its wastewater service area. The Division is implementing federal categorical pretreatment program and pollution prevention program, and administering the rates and charges system.

The Division is organized into two sections: Industrial Discharger Section and Field Services Section. The Industrial Discharger Section regulates the quality and quantity of wastewater discharged to the treatment plant, issuing wastewater discharge permits, enforcing Ordinance requirements and setting rates and charges. Field Services Section is the division's investigative and monitoring arm.

Approval Authority

The US EPA approved the EBMUD pretreatment program on June 17, 1983. The EBMUD Source Control program is regulated by the California Environmental Protection Agency's California Regional Water Quality Control Board, San Francisco Bay Region. The Regional Board performs pretreatment compliance inspections annually at the District. EPA Region IX also regulates the EBMUD program and conducted a Pretreatment Program audit in 1993.

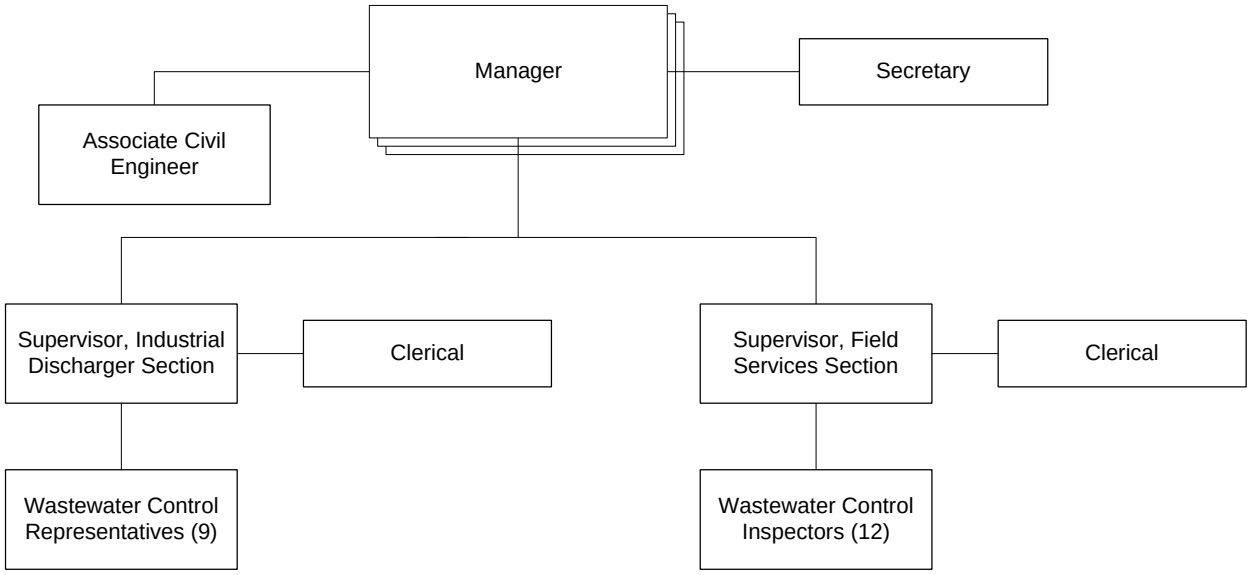
The NPDES permit for the wastewater discharge plant requires administration of a pretreatment program in accordance with 40 CFR 403. The pretreatment program permit from the Regional Board requires semi-annual pretreatment compliance reports and an annual report. The Board also requires two semi-annual reports on the District's pollution prevention permit program, which applies to the 14,000 commercial businesses in the service area.

Source Control Staffing

The Source Control Division currently has 25 people, including one division manager, two section supervisors, one engineer, eight wastewater control representatives, and 13 wastewater control inspectors.

Source Control Division
East Bay Municipal Utility District

Organizational Chart



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Distinctive Features

During 1997, the District's Pretreatment Program was awarded the United States Environmental Protection Agency's (US EPA) National First Place Award for Outstanding Pretreatment Program. This national award recognizes pretreatment programs that have shown exemplary efforts in reducing the discharge of toxic pollutants and the prevention of upset, pass-through and interference of wastewater treatment plant processes. The District also received the First Place Award during 1993 and 1989 making it the only program of its size to receive the First Place Award three times. The District's program expanded beyond conventional pretreatment control methods to include increased enforcement and a multimedia approach to pollution prevention to reduce or eliminate the generation of air, land, surface water and groundwater pollutants. Some of the program innovations and accomplishments include:

- **Expanded the District's permit program by issuing permits containing best management practices to commercial facilities.** Through the commercial permitting program, the District has been able to achieve more than a 90% reduction in heavy metals discharged to the WWTP since 1974 and a significant reduction in the discharge of organic pollutants since 1988 (97% reduction in tetrachloroethylene).
- **Increased public awareness and participation** through informational meetings, technical workshops, direct mail customer bill inserts, a District staffed information hotline,

meetings with citizen environmental advocate groups, multi-lingual publication and special community events such as festivals and Earth Day celebrations.

- **Established an annual "Pollution Prevention Excellence Award"** to recognize businesses that have demonstrated exemplary pollution prevention and source reduction measures.
- **Provided economic incentives** in the form of reduced permit application fees and monitoring and testing fees for facilities that eliminate process wastewater discharges.
- **Adopted of a special Waste Minimization Fee** to recover the District's costs for implementing its pollution prevention program.

Core Pretreatment Program Activities

Industry User Inventory

New customers are classified by Business Classification Code (BCC) at the time service is established through the EBMUD New Business Office. The District monitors changes in responsible party, BCC, and meter size. Inspections are performed to verify that the BCC assigned to a business is consistent with the quantity and quality of the wastewater discharge.

Potable water consumption is measured and recorded by Customer Services Division personnel in EBMUD's Water Department. Any facility with more than 1,500 units of water use during a two-month period (1 unit = 748 gallons) is inspected to determine whether a mandatory Wastewater Discharge Permit (WWDP) is required.

The IU inventory is continually updated from process surveys, field inspections, city business licenses, phone book lists, other agency lists and industrial association lists. In addition, the District has developed an inter-agency referral form which is used to notify various city, county, state and federal agencies when issues brought to the District's attention fall outside of its regulatory jurisdiction or service area. The form provides a means of increasing communication and facilitating the flow of information between different agencies while also serving to supplement the District's industrial user inventory activities.

The District's industrial flow consists of approximately 7.1 % of total user flow.

Permitting

Discharge minimization and estimation permits have been issued to 116 dischargers as follows:

- 16 Significant Industrial Users–Federal Categorical;
- 42 Significant Industrial Users–Local Non-categorical;
- 23 Groundwater Remediation Dischargers; and
- 35 Flow Estimation Dischargers.

Significant Industrial User (SIU) is defined as follows:

1. All dischargers subject to Categorical Pretreatment Standards; or
2. All non-categorical dischargers that contribute a process waste stream which makes up 5% or more of the average dry weather capacity of the POTW treatment plant; or
3. All non-categorical dischargers that discharge an average of 25,000 gallons per day or more of process wastewater to the POTW; or

4. All non-categorical dischargers that, in the opinion of the Manager, require special regulation or source control.

All District users are subject to the wastewater discharge regulations of Ordinance No. 311. Specific users must additionally obtain a permit to discharge to the sanitary sewer. Permits may contain wastewater discharge limits in addition to those found in Ordinance No. 311, depending upon the processes in operation and the type of pollutants discharged.

The District issues three types of permits: Minimization Permits, Estimation Permits and Pollution Prevention Permits.

Discharge Minimization Permits (DMP). DMPs establish compliance reporting requirements, site-specific discharge limitations, industry self-monitoring requirements and billing conditions for unique wastewater strengths and flow. This permit is very detailed and includes specific information on production rates, process diagrams, and water use on other provisions. The annual permit fee is $2,490, plus monitoring and testing fees. A DMP is mandatory for the following types of users:

1. Dischargers who are subject to Federal Categorical Pretreatment Standards, with the exception of zero dischargers (zero discharge categorical industries are issued Pollution Prevention Permits).
2. Dischargers designated by Ordinance No. 311 as critical industries with a two-month water use exceeding 1,500 hundred cubic feet per month.
3. Dischargers with average wastewater strengths exceeding the normal business classification range or varying seasonally.
4. Dischargers using an unmetered source of water.
5. Dischargers requiring special regulation, including groundwater remediation dischargers.

Discharge Estimation Permits (DEP). This optional permit estimates wastewater discharge volume and billing conditions. The annual permit fee is $1,100. This permit is issued to dischargers that request an estimation of wastewater flow due to unmetered diversion of more than 20% of water consumption.

Pollution Prevention Permits (PPP). A total of 1,578 permits establish pollution prevention discharge requirements for specific processes. These permits may include discharge prohibitions and/or process-specific Best Management Practices (BMPs). Each facility is periodically inspected to ensure adherence to permit requirements. A Waste Minimization Fee ($3.25 per month) is applied to all non-residential accounts, and this money funds the pollution prevention program. There is no additional permit fee. This type of permit has been issued to:

1. Industrial and/or commercial users whose processes include auto repair, boat repair, dry cleaning, furniture stripping, photo processing, printing, radiator repair, and multi-tenant commercial property.
2. Facilities operating categorical processes that do not discharge regulated process wastewater to the sanitary sewer.

Table 3 shows the summary of the different types of permits issued in 1997.

Monitoring (Inspection and Sampling)

Table 3 provides a summary of Pretreatment and Pollution Prevention Program monitoring and enforcement activities.

TABLE 3
EBMUD Pretreatment and Pollution Prevention Programs
Monitoring and Enforcement Summary as of December 31, 1997

Permit Type	No. of Permits	Inspections/ Sampling		Violation Fees		Settlements		
		District	SMR	No.	$	$	IC	SNC
SIU-F (Minimization)	16	61	64	6	$4,408	$0	1	0
SIU-L (Minimization)	42	317	530	36	$16,740	$694,718 *	4	1
Groundwater	23	32	67	4	$931	$0	0	0
Estimation	35	NA	NA	0	$0	$0	NA	NA
Pollution Prevention	1,578	364	6	0	$0	$0	0	0
Totals	1,694	774	667	46	$22,079	$694,718	5	1

* $374,464 from Fleischmann's Yeast and $320,254 from Granny Goose for settlement of exceedences of permit average wastewater strength limits. (NOTE: $181,363 of the $320,254 from Granny Goose was for past permit exceedences.

All industrial facilities (including SIUs and IUs) are inspected several times per year. An EBMUD inspection consists of a walk-through to ensure that the permit conditions are unchanged, a review of the pretreatment facility, and the collection of grab and 24-hour composite samples. EBMUD also requires self-monitoring by each facility, usually at a frequency similar to EBMUD inspection frequency. EBMUD also conducts an annual joint inspection with the inspector and the representative prior to the re-issuance of the permit.

EBMUD conducts violation follow-up inspections to ensure that compliance has been achieved following an EBMUD or self-monitoring permit violation. If compliance is not achieved, EBMUD has an escalating Violation Response Plan. EBMUD actions may include additional sampling, Cease-and-Desist Orders, and the issuance of an Administrative Civil Liability penalty. The frequency of EBMUD monitoring and industry self-monitoring is determined by a case-by-case analysis of the following criteria: mass of pollutant loading, toxicity of pollutants discharged, volume of the discharge, type and number of processes, compliance history of the discharger, and relative consistency of pollutant concentrations in the discharge.

Many of the non-categorical industries do not discharge toxic pollutants due to the nature of their business activity. These facilities are sampled for CODF and TSS for billing purposes. The sampling frequency at these facilities is set so as to obtain a representative characterization of the average discharge strength. The average strengths are used to establish unique billing conditions at these facilities. Generally, the minimum number of inspections and sampling events for many of the non-categorical industries is twice per year to determine compliance with local discharge limits, as well as to establish billable strengths.

Monitoring frequencies at federal categorical industries are determined by their federal categorical classification, compliance history, and reliability of the control technology used to achieve compliance. These industries are evaluated on a case-by-case basis and are sampled at a fre-

quency that provides a high degree of confidence that compliance is consistently achieved. The minimum required number of inspections and sampling events performed by EBMUD at categorical industries is one per year. The minimum required number of self-monitoring events for federal categorical facilities is two per year, unless EBMUD samples in lieu of the facility. The Zero Discharge federal categorical facilities are inspected once per year to verify that there is no discharge of regulated process wastewater to the sanitary sewer.

System Sampling

EBMUD has installed seven strategically placed Quality Monitoring Stations on the interceptor system leading to the treatment plant. At these stations, sampling can be carried out that can help isolate areas where a discharge may have originated. EBMUD has developed a Geographic Information System that allows the identification (with overlays) of streets, sewer lines, basin collection systems, industrial locations, and the pollutants used at a facility. The system is capable of tracing backward from a given location to all the possible sites using a particular pollutant. Inspectors can then visit each identified site to determine the responsible discharge party. EBMUD's inspection unit responds immediately to unusual conditions in the plant influent. EBMUD also maintains a 24-hour standby spill response team. EBMUD is sampling particular wastewater basins to identify sources for newly or more strictly regulated pollutants, such as mercury, copper, dioxin, and tributyltin.

Local Limits

Additional Wastewater Strength Limits. Wastewater strength limits for constituents not listed in Section 3a may be established in a wastewater discharge permit based on available treatment technology, existing wastewater conditions in the District's facilities or other factors as determined by the Manager. The Manager may also establish wastewater strength limits on the wastewater discharge permits at locations within a premise whenever non-process water may dilute the wastewater discharging from side sewers.

Quantity and Rate of Flow Limits. No person shall discharge wastewater into a community sewer in quantities or at rates of flow which may have an adverse or harmful effect on or overload District facilities or cause excessive or additional District treatment costs. The Manager may establish mass discharge limits in wastewater discharge permits to control the quantity and rate of flow of wastewater discharges.

Radioactive Limits. No person shall discharge or cause to be discharged any radioactive wastewater into a community sewer except when the person is authorized to use radioactive material by the Nuclear Regulatory Commission or other governmental agency empowered to regulate the use of radioactive materials and when the wastewater is discharged in strict conformity with current Nuclear Regulatory Commission regulations and recommendations for safe, disposal and in compliance with all rules and regulations of State and local regulatory agencies.

Enforcement Response Plan

The District conducts enforcement actions against violators in accordance with the Enforcement Response Plan Procedures based on the Wastewater Control Ordinance No. 311. A complete Procedure is included in the EBMUD's 1997 Annual Pretreatment Program report.

Data Management

Since 1984, Source Control Division has managed most of its Pretreatment information using dBASE III+ database software. In 1987, the database was moved from a PC to the VAX on the

Wastewater Department Management System (WDMS). WDMS operates the dBASE III+ software using Virtual Microsystems Bridge Software for PC emulation.

In 1990 and 1995, the SCD developed two more databases for the Pollution Prevention program. One is to track P2 permit issuance for commercial facilities, and the other is to track Business Classification Code activities for all customers. Additional information used by the Pretreatment Program is collected and maintained by other District groups. Laboratory data is located in a separate database system, called LIMS. Water consumption data and water and wastewater billing information are located on a separate IBM mainframe connected to VAX computer via a dedicated high-speed modem connection.

Beginning in 1997, the District is in the process of developing a new data management system in two phases. The first phase is a "rescue" system, which will temporarily replace the existing dBASE III+ that will soon be decommissioned. The second phase is to develop an ultimate and future Pretreatment Information Management System for the Source Control Division. The scopes of each of the phases are being developed.

Reporting

EBMUD submits two semiannual reports and one annual pretreatment report to control authorities. The annual report consists of a program overview, a record of public participation, definitions, NPDES compliance record, examples of types of permits, record of industrial monitoring and compliance, copies of semiannual reports, budget, inspection procedures, enforcement response plan, laboratory procedures, EBMUD ordinance, copy of the pollution prevention annual report, and treatment plant operating data. EBMUD also submits two semiannual Pollution Prevention reports. These reports include EBMUD's unique program elements, record of program accomplishments, a record of public participation, an evaluation of effectiveness, and a discussion of activities. Pollution prevention permits are issued to furniture refinishing, radiator repair, dry cleaning, commercial photo processing, auto repair, auto body, printing, boat repair, warehouse, multi-tenant, and zero discharge businesses.

Additional Source Control Activities

Pollution Prevention

The District implements the Pollution Prevention Program utilizing a comprehensive broad-based approach to reduce the discharge of pollutants to the sanitary sewers. The program focuses on waste minimization and pollution prevention at sources. As of December 31, 1997, EBMUD's Pollution Prevention Program totaled 1,578 Pollution Prevention Permits, including 33 zero discharge category industries (these numbers reflect active permits, excluding permits closed or rescinded during 1997).

Household Hazardous Waste

The SCD is actively involved in reducing household hazardous waste discharges by implementing proactive public outreach efforts. The program produces and distributes multi-lingual brochures on household hazardous waste reduction. This material is distributed through direct mailing, booths at public events, and homeowners association meetings.

Rate Development and Fees

The SCD develops the basis and updates for the Wastewater Revenue Program. The SCD updates new dry weather wastewater treatment rates, wet weather facility charges, and special fees (including permit fee, monitoring and testing fees, waste minimization fees, and wastewater ca-

pacity fees). A key element to the success of the EBMUD program has been the fact that special fees have made the pretreatment program permitting, monitoring, testing, and violation follow-up self-supporting. In addition, EBMUD's innovative pollution prevention program is funded by a special monthly fee to all commercial and industrial users so that the efforts to permit, develop BMPs, provide public outreach, and operate a hot-line are self-supporting as well. The industrial special fees are as follows:

- **Wastewater Discharge Permit Fees.** There are two types of Wastewater Discharge Permits: a Discharge Minimization Permit and a Discharge Estimation Permit. A Discharge Minimization Permit establishes compliance reporting requirements, site-specific discharge limitations, industry self-monitoring requirements, and billing conditions for unique wastewater strengths and flow. The Discharge Estimation Permit establishes billing conditions when wastewater volumes cannot be determined by District water meters due to significant non-sewer use.
- **Monitoring and Testing Fees.** This fee recovers the cost of labor and equipment to perform field inspections, review reports and mail notices of District findings to industry. The testing fee recovers the cost of labor and equipment used to perform the laboratory testing and analysis.
- **Violation Followup Fees.** A Stage 1 Violation Followup Fee covers costs for followup actions to regulate commercial users issued permits that contain no sampling requirements. This reflects the cost to conduct the followup activity. A Stage 2 Fee is applied to violators of Discharge Minimization Permits exceeding wastewater discharge limitations or any violation followup requiring sampling. The Stage 3 fee is applied to violators when enforcement orders are issued.
- **Waste Minimization Fees**. A Waste Minimization Fee funds the Pollution Prevention program. This fee applies to all non-residential accounts subject to the District's Wastewater Control Ordinance No. 311 to cover costs for implementation.

Biosolids and Influent/Effluent Quality

The District's biosolids meet the 40 CFR 503 standards and all the biosolids are land-applied in the Central Valley. Figures 4 and 5 show reductions in metals and organics.

Figure 4

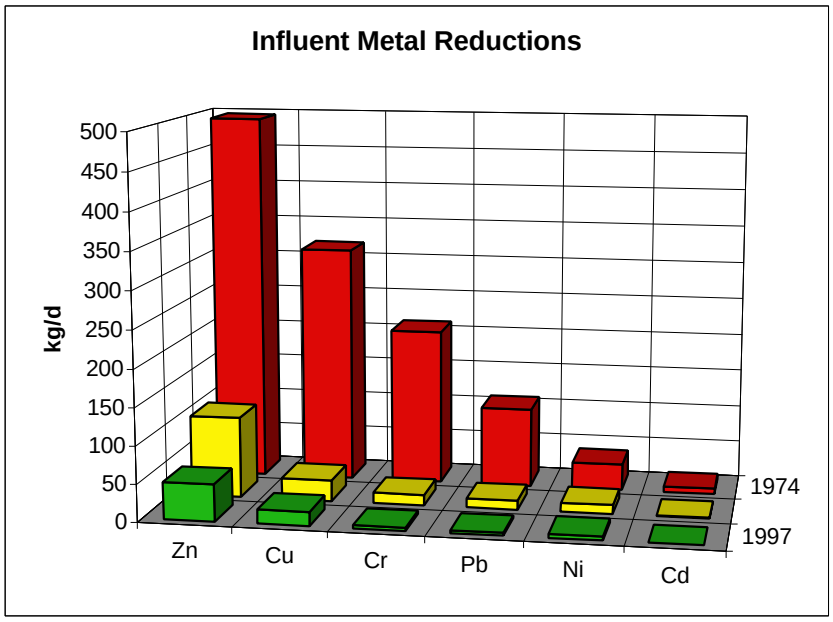
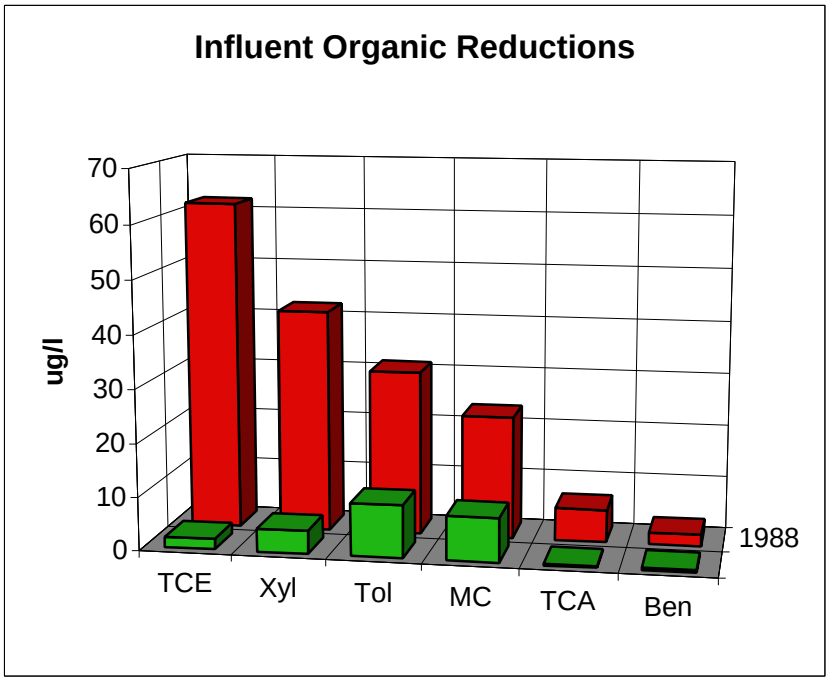


Figure 5



King County Department of Natural Resources

Description

King County provides wholesale wastewater treatment and disposal service to 17 cities and 18 local sewer/water districts. The major sewer interceptors and pump stations that carry wastewater from the local systems to the treatment plants are owned, operated and maintained by King County. The pipelines and other conveyance facilities that carry wastewater to King County's interceptors are owned, operated, and maintained by the respective cities and districts.

King County's wastewater system consists of more than 255 miles of pipeline, 38 pump stations, 22 regulator stations, two wastewater treatment plants, two combined sewer overflow (CSO) treatment plants, and 34 CSO locations.

King County's service area covers about 420 square miles and includes most of the urbanized areas within King County and part of southwestern Snohomish County. The population within the service area, including commercial and industrial employment, is approximately 2 million people (as of 1990).

The total service area is divided into east and west service areas. The conveyance system in the west service area transports wastewater to the West Point Treatment Plant (West Treatment Plant). The conveyance system in the east service area transports wastewater to the East Section Reclamation Plant at Renton (East Treatment Plant).

The majority of KCDNR's source control efforts are in the Business Services Section of the Water and Land Resources Division, a separate division from wastewater treatment operations. The Business Services Section consists of two units that operate fairly independently from each other. The Industrial Waste Unit performs traditional industrial pretreatment functions. The Hazardous Waste Unit is an arm of King County's Local Hazardous Waste Management Program (LHWMP). LHWMP consists of four-agencies and 36 suburban cities, and is coordinated by a technical planning committee. KCDNR's source control functions also include a septage program managed by the East Section Reclamation Plant at Renton.

KCDNR's wastewater fees fund 17% of the LHWMP, the greater part of the program is funded by solid waste tipping fees. Neither the Wastewater Treatment Division nor the Industrial Waste Unit has responsibility for management of work done by the HW unit. For this reason, the focus of this analysis will be on the Industrial Waste Program, although the fees spent by WTD on the LHWMP will be accounted for.

Approval Authority

The Washington State Department of Ecology regulates King County's pretreatment program. The Northwest Regional Office of the Department of Ecology performs a Pretreatment Compliance Inspection annually and a full audit every five years. The last audit was done in 1996. In addition, in past years the Region X office of the US EPA was more active in assisting the Department of Ecology in its oversight of KCDNR, reviewing and requesting modifications to its ordinance, its local limits, and its enforcement response plan.

Pretreatment requirements for all King County's wastewater treatment plants are included in the NPDES permit for the West Point Treatment Plant. In addition to the requirements set forth in 40 CFR 403 the permit requires the development and maintenance of a data management system and the maintenance of adequate staff, funds, and equipment to implement KCDNR's pretreatment program.

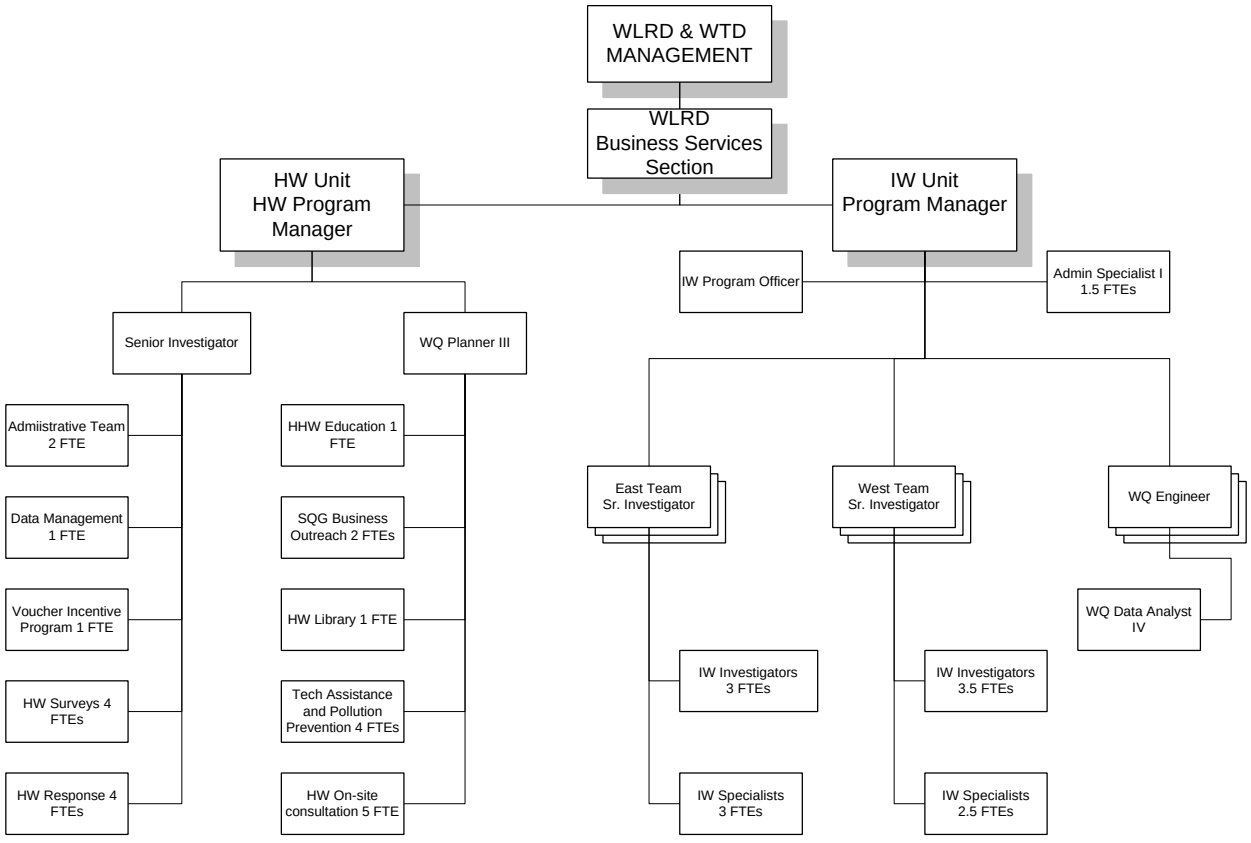
A unique feature of Washington State's pretreatment program is the requirement in state law that all wastewater treatment facilities, including industrial pretreatment facilities, be reviewed and approved by a registered engineer of the Department of Ecology. This function has been delegated to KCDNR separately from the federal pretreatment program but has been integrated into KCDNR's pretreatment program.

Source Control Staffing

The organization of the Business Services Section is shown in the Figure 6. FTEs shown for the Hazardous Waste Program are those for the entire Hazardous Waste Unit and include FTEs paid for by solid waste tipping fees as well as Wastewater fees and thus exceed the number of FTEs shown in the template for KCDNR. The Hazardous Waste unit is organized into functional teams, while the Industrial Waste Unit is organized into two geographically based teams. IW's East Team serves those companies that discharge to the East Section Reclamation Plant at Renton, and the West Team serves companies that discharge to the West Point Treatment Plant. Engineering, data management, and administrative staff of the IW unit serve both east and west teams.

The East and West Teams staff include both IW Investigators (who issue permits, do inspections, and take enforcement actions), and IW Specialists (who do compliance, surcharge, and system sampling).

Figure 6
KCNDR Source Control Organizational Chart



Core Pretreatment Activities

Industrial User Inventory

King County has 143 Significant Industrial Users (SIUs), of which 74 are Categorical and 69 are local SIUs. The category with the largest number of users is metal finishing, with a total of 55 "new" and existing sources. Electroplaters are the second-largest category with 15 SIUs. The remaining are organic chemicals, iron and steel, pharmaceutical, and can making. The largest group of local SIUs are found in the food processing and beverage businesses (25 companies). Other groups with multiple companies are landfills, solid waste transfer stations, metal recycling, tank farms, barrel cleaning and tank cleaning, industrial laundries, TSDs, photo processing, groundwater remediation, and construction dewatering.

This mix of company types (particularly the large proportion of metal platers) reflects the major regional industries of airplane manufacturing and computer technologies. The Boeing Corporation is KCDNR's largest customer, with a total of six permits and seven discharge authorizations. Many of Boeing's permitted facilities are multiple buildings, each with multiple discharge sites. Many of the plating shops and other manufacturing facilities are Boeing contractors. Other major industrial activities include biotechnology, ship and boat building, transportation facilities, and machinery manufacturing (e.g., scissor lifts and trucks).

KCDNR's industrial flow comprises about 2% of the total flow to both treatment plants.

Permitting

The decision to designate a discharger as a local SIU and require a permit is made on the following criteria:

- Discharges greater than 25,000 gpd;
- Apparent risk to POTW (e.g., complicated treatment, risk of danger to POTW or worker safety, or potential to contaminate biosolids);
- Significant unknown risk;
- Self-monitoring of once per month is warranted;
- Regulating company will involve significant staff time;
- Discharger has history of noncompliance; and
- Discharge warrants KCDNR monitoring.

In addition to the SIUs that all receive industrial waste discharge permits, KCDNR also regulates a number of non-SIUs by issuing "mini-permits" called Discharge Authorizations (DAs). NSIUs discharging between 5,000 gpd and 25,000 gpd of processing water may be issued major or minor discharge authorizations, depending on the risk potential to the sewerage system and whether or not self-monitoring is called for. Major DAs are issued to facilities deemed significant enough to warrant a self-monitoring requirement.

A common application form is used for SIUs and NSIUs, but the control documents differ. A discharge authorization is a much simpler document than a permit, normally only two or three pages long. However, a permit can be 20 to 30 pages long and take at least 60 days to issue, including mailing a draft permit to the company and local sewer district for comments. DAs are normally issued within 30 days, and draft DAs are not issued.

Monitoring (Inspection and Sampling)

Normally, all SIUs are inspected at least once annually. Additional inspections are done prior to issuing a new or renewed permit, following a discharge and/or permit violation or if a public complaint has been filed regarding the company. The extent of any inspection is at the discretion of the investigator, and is based on the size, complexity and compliance history of the company.

All SIUs are sampled a minimum of twice per year. As with inspections, additional sampling events at a company are conducted following any violation of discharge limits or other permit conditions. The number of post-violation samples will depend upon the severity of the violation, the volume of the company's discharge, and the history of previous violations.

KCDNR requires companies to do self-monitoring once per month to once per day, depending on volume and compliance history, nature of wastestream, level of pretreatment, possible impact on worker safety downstream from the discharge, the chemical constituents or variability of the discharge, and the need for setting organic limits. As a general guideline, sampling frequency may be based on the following:

- >100,000 gpd continuous discharge (daily composites), batch discharge (each batch);
- 50,000-99,999 gpd continuous discharge (two composites per week), batch discharge (two per week);
- 10,000-49,999 gpd continuous discharge (one daily composite per week), batch discharge (one batch per week); and
- <10,000 gpd continuous (one daily composite per month), batch discharge (one batch per month).

System Sampling

KCDNR's system sampling is referred to as the Key Manhole Program. It is both reactive (responding to spills at the treatment plant or elevated levels of contaminants in the biosolids) as well as routine (to develop a baseline level of contaminants).

Routine sampling sites are chosen that depict sewer drainage basins to help KCDNR understand the long-term performance of critical areas within the collection system. This in turn helps spotlight deviations and assists in tracking uncontrolled user activity. Routine monitoring events are conducted twice a year. Each site is sampled for one week during both wet weather flow conditions (November through April) and dry weather flow conditions (May through October). Each site is sampled for approximately seven to eight days during each event. Heavy metals (arsenic, cadmium, chromium, copper, lead, nickel, silver, zinc) and pH are analyzed. Flow data to calculate approximate loadings is available via computer database access. Fifty percent (50%) of the Key Manhole Program is recovered from SIUs through the heavy metals monitoring fees.

Key Manhole staff initiate source tracing and upstream/downstream investigations if unusual pollutants or unusual amounts of pollutants of concern are detected at the treatment facilities. Investigations can also be initiated if process upsets occur at the treatment plants, or if tips are received from other agencies or employees of the company concerned.

Local Limits

KCDNR has adopted local limits developed using US EPA's PRELIM computer program. Specific numerical limits exist for pH, heavy metals and cyanide, hydrogen sulfide, and petroleum-based fats, oils, and grease. Narrative limits have also been adopted prohibiting the discharge of nonpolar (animal-vegetable) fats, oils, and grease and organic compounds. The IW program also

has authority to impose case-by-case limits on companies for compounds not covered by published local limits, or in cases where the local limits would not protect the treatment plant.

Although King County has two major treatment plants, it has only one set of local limits for all dischargers, derived by selecting the lowest limit for the two plants for each parameter. Local limits apply to all industrial and commercial discharges whether under permit or not.

The numerical limits are shown in Table 4.

Table 4
KCDNR Local Limits CY1997

Parameter	Daily Average mg/L (ppm)	Instantaneous Maximum mg/L (ppm)
Arsenic	1.0	4.0
Cadmium	0.5	0.6
Chromium	2.75	5.0
Copper	3.0	8.0
Lead	2.0	4.0
Mercury	0.1	0.2
Nickel	2.5	5.0
Silver	1.0	3.0
Zinc	5.0	10.0
Cyanide	2.0	3.0
‘pH (lower)	5.5 (media	5.0 (single sample)
‘pH (upper)		12.0 (may be exceeded w/authorization)
Petroleum-based FOG		100
Atmospheric H_2S		10 ppm

Enforcement Response Plan

KC DNR has had an enforcement response plan since the mid 1980s, before one was required by the Federal pretreatment program. The plan was significantly revised and improved following the promulgation of federal requirements. KCDNR’s ERP outlines the philosophy and objectives of enforcement, which is to achieve compliance—not be punitive. The detailed procedures are contained in the IW Procedures Manual.

Escalating enforcement steps are outlined in KCDNR’s ERP and include:

- Notices of violation (NOV);
- Compliance orders;
- Requirements for additional self-monitoring;
- Assessment of Post-Violation Inspection Monitoring Program (PVIMP) charges;
- Final notices;

- Monetary penalties (fines);
- Assessments for damage;
- Suspension of permit or authorization;
- Revocation of permit or authorization;
- Termination of discharge; and
- Emergency suspension of discharge.

Penalties will be escalated if a discharge violation continues or becomes worse, if the discharger is not making a good faith effort to correct the problem, or the discharger knowingly violates KCDNR regulations.

The type of action taken is determined by filling out an enforcement worksheet, which assigns points for such items as severity and duration of the violation, compliance history of company, potential or actual harm caused by the violation. The worksheet's aim is to give a systematic method of assigning an appropriate penalty or other action. KCDNR has civil authority to issue penalties up to $10,000 per day per violation. Assessments for damages and economic gain due to noncompliance are in addition.

In 1997, KCDNR issued 70 NOVs. The majority of these resulted in compliance orders; six resulted in fines. Twenty-five post-violation assessments (fees for additional inspections and sampling) were made.

Data Management

All Industrial Waste and Hazardous Waste staff have PCs on their desks with access to the Internet and email. IW staff also have access to KCDNR Environmental Laboratory's Laboratory Information Management System (LIMS) through their desktop PCs and to the County's GIS system. KC IW does not currently have a Pretreatment Information Management System (PIMS) accessible to all staff. Instead, they compile information from different sources (LIMS for sampling data, Company Database for company information, Violation List with company information from an Excel Spreadsheet maintained by the Program Officer maintains, and other lists that IW Investigators keep as their own source of information). This disconnected system was being replaced by a fully integrated PIMS through a contract with EcoAnalysis of California. EcoAnalysis recently informed KC that they were going out of business and KC staff are researching alternatives for completing the project.

The current LIMS database generates data letters and data reports which IW staff print out and mail to the companies. In addition, through the office network, IW staff use standard letters and forms for permits, enforcement worksheets, and inspection forms.

Reporting

The West Point NPDES permit requires the submittal of an annual pretreatment report to the Department of Ecology by March 31 of each year. The NPDES permit lists in detail the items to be submitted in the report which include results of sampling at the treatment plants, an update of the non-domestic user inventory, information on the status of pretreatment program implementation, and information on status of compliance activities.

Additional Source Control Activities

Pollution Prevention

Most of KCDNR's pollution prevention activities take place in the Hazardous Waste unit as part of King County's Local Hazardous Waste Management Program (LHWMP). The LHWMP's

Mission is to protect public health and the environment from the adverse effects of improper handling and disposal of household hazardous waste and small quantity generator hazardous waste, thus minimizing hazardous chemicals in municipal wastestreams (wastewater, solidwaste, and stormwater).

Hazardous Waste Unit activities include on-site assistance, an interagency regulatory analysis committee, a voucher incentive program, an EnviroStar incentive program (for public recognition and business marketing), a business communication and outreach program, a hazardous waste reference and research library, a Waste Information Network which has sponsored an annual hazardous waste trade fair, and a technical assistance team to characterize waste and recommend BMPs and regulatory changes.

KCDNR's Hazardous waste unit has performed outreach to specific sectors (e.g., auto body and auto repair, the dental community, dry cleaning, metal finishing, painters, printers) in conjunction with its LHWMP partners and other agencies, such as the Washington State Department of Ecology.

The IW unit also performs activities that fit the definition of pollution prevention in the source control template. Its activities tend to be focused on larger companies who are either Significant Industrial Users or have enough discharge volume to be of direct concern. Activities include a quarterly newsletter, pamphlets and other written information, and workshops and treatment plant tours especially for industrial users.

Household Hazardous Waste

Household hazardous waste information lines and collection sites are offered as part of the LHWMP, but operated by other agencies in the County and cities.

Rate Development and Fees

KCDNR's source control staff are not involved in anyway in the setting of the sewer rates that apply to nonindustrial dischargers. The Industrial Waste Program does administer a number of fees and charges applicable to industrial discharges only.

1. Waste Discharge permit and discharge authorization fees to recover the costs of drafting permits and discharge authorizations.
2. High-strength surcharge fees.
3. "Monitoring" charges for heavy metals and fats, oils, and grease (FOG) to cover King County's administrative, monitoring, and laboratory costs (based on volume).
4. Post-violation inspection and monitoring fees to recover the cost of additional sampling and inspection of companies with violations.

All fees are revised annually to accommodate budget changes. Surcharge, heavy metals, and FOG monitoring fees are billed by the local sewer districts. Permit and post-violation fees are billed directly by King County.

Biosolids and Influent/Effluent Quality

Biosolids at both of KCDNR's treatment plants consistently meet the 503 standards for exceptional quality biosolids. Since the program was approved by the US EPA in 1981, KCDNR (then Metro) has achieved steadily improving biosolids and effluent quality. Its biosolids reached agricultural quality in 1988, and application on food chain crops began in 1991. A graph of biosolids quality since 1981 are shown in Figure 7. Prior to 1987, all biosolids were processed at West Point.

Total metals also decreased at KCDNR's two treatment plants after 1981, when the agency's pretreatment program was approved by the US EPA (Figures 8 and 9). The greater decrease at the West Point Treatment Plant than the Renton Treatment Plant may reflect the greater population and industrial growth in the Renton service area.

Figure 7

West Point/Renton Biosolids Quality Total Metals

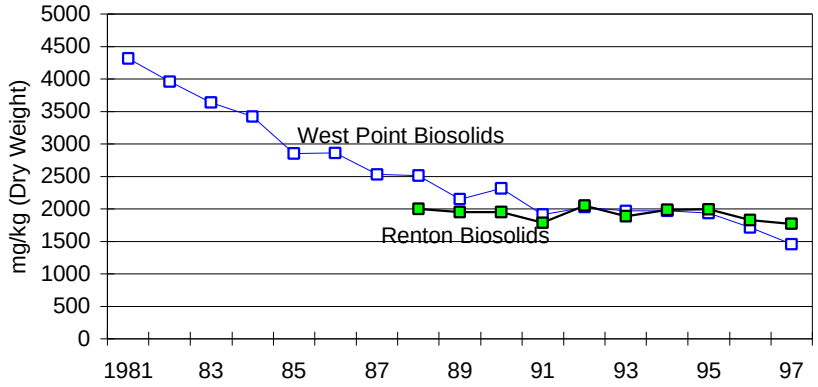


Figure 8

West Point
Influent Total Metals lbs/Day

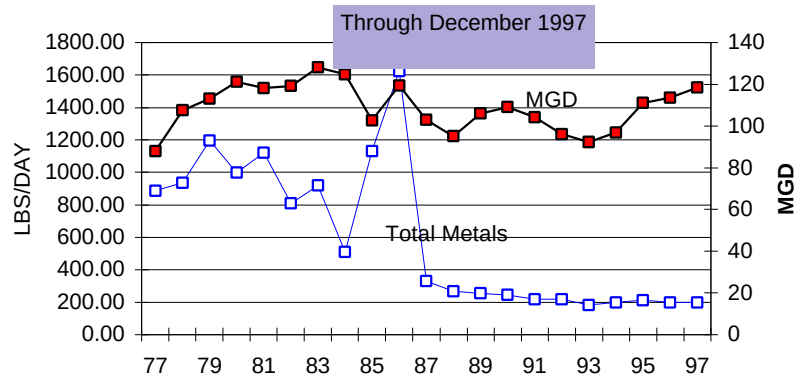
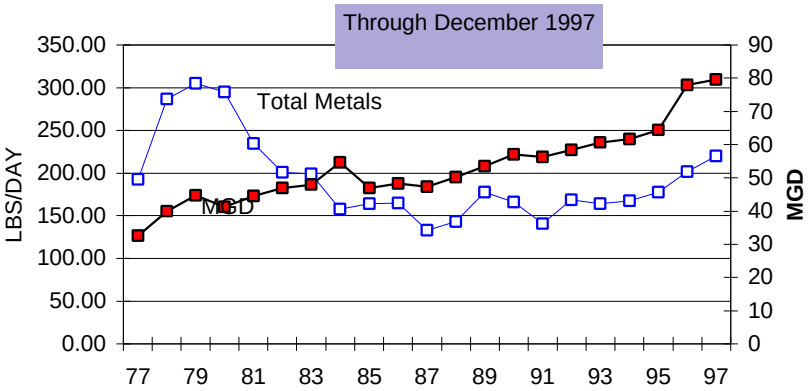


Figure 9

East Division Reclamation Plant at Renton
Influent Total Metals lbs/Day



Orange County Sanitation District

Description

The Orange County Sanitation District (OCSD) presently serves 23 of the 31 cities in Orange County, California, and a population of approximately 2.1 million. The service area consists of 470 square miles encompassing northern and central Orange County. OCSD currently treats approximately 245 mgd.

The service area is divided into nine separate revenue areas, each governed by a Board of Directors consisting of elected officials from each city or sanitary district within the District and a member of the Orange County Board of Supervisors. Each revenue area has its own budget. Seven of the nine areas (except Areas 13 and 14) have their own tax rate and trunk sewer systems. Area 13 buys capacity in the other OCSD' facilities, while Area 14 owns part of the transmission facilities with the other areas. As of June 30, 1997, the day-to-day operation of the organization is under the direction of a general manager, two assistant general managers, seven department heads, and a staff of 533.

The District operates and maintains more than 650 miles of subtrunk and trunk sewers ranging in size from 6" to 96" in diameter, 22 sewage pumping stations, two wastewater treatment plants, and ocean discharge facilities. Only domestic and industrial wastewater is allowed into the system. Surface waters and runoff are conveyed through separate local storm drain systems that in turn flow into storm drain facilities operated by the local cities. The major storm drain facilities are owned and operated by the Orange County Public Facilities and Resources Department. There are no combined storm sewers or bypass facilities in the District's sewer system.

The OCSD has oversight for three outside agencies that discharge to the District's facilities: the Santa Ana Watershed Project Authority (SAWPA), the Irvine Ranch Water District (IRWD), and the Los Angeles County Sanitation District (LACSD).

SAWPA. SAWPA is an agency in Riverside County that was formed to develop a long-range plan for managing, preserving and protecting the quality of water supplies in the Santa Ana Basin. It consists of five agencies: Chino Basin Municipal Water District, Eastern Municipal Water District, Orange County Water District, San Bernardino Valley Municipal Water District, and Western Municipal Water District. SAWPA has 19 direct connections and one truck disposal station. A Memorandum of Understanding (MOU) has been developed to delineate enforcement responsibilities between SAWPA and the OCSD.

SAWPA's program in water quality management is integrated with those of other local, state and federal agencies. Two examples are the Santa Ana Regional Interceptor (SARI) sewer and the Stringfellow Treatment Plant. The SARI line is a pipeline designed to carry saline wastewater from the Upper Basin and dispose of it after treatment into the Pacific Ocean. This water consists of highly saline rinsing water, desalted brine, agricultural return water, and saline wastewater from domestic and industrial use. The water is treated by the OCSD to comply with environmental standards before discharge to the ocean outfall. The capacity of the SARI line is approximately 30 mgd. SAWPA uses approximately 9 to10 mgd of the trunkline capacity.

At the Stringfellow Treatment Plant, heavy metals are removed from the contaminated groundwater by lime precipitation, and organic pollutants are removed by activated carbon absorption. Treated water is then trucked and disposed in the SARI line, sludge is trucked to a Class I landfill, and the supplier regenerates spent carbon. The flow meter at the Orange County line is sampled by SAWPA weekly and all direct connections are sampled a minimum of once per quarter using both grab and composite techniques.

IRWD. IRWD is a California Water District located in central Orange County, California, which is served by several sewerage districts and water agencies. IRWD joined the District in January 1986 to dispose of treated wastewater generated within IRWD's service area not needed for reclamation. In February 1987, IRWD and the OCSD entered into an MOU governing the administration of the IRWD industrial waste program. The MOU brought industries considered as Class I industries by the District's *Wastewater Discharge Regulations* (Ordinance) under a joint IRWD/District's Class I permit, which is administered by the District under the District's Ordinance. The MOU also preserves the independent authority and responsibilities of both agencies, thereby allowing IRWD to operate its pretreatment program for MWRP in compliance with Federal and state pretreatment regulations.

The District serves as the primary agency for sampling, inspecting and permitting industries in those portions of the IRWD service area served by the District. To consolidate reporting requirements, IRWD submits its industrial waste program activities through the District, including those for Area 14, which in turn are reported in the District's quarterly and annual Source Control Reports.

LACSD. LACSD has a minor discharge to Orange County from its easterly boundary. There is an agreement between the two agencies to account for flow generated outside the District. There are no categorical companies in the area that discharge to Orange County.

The OCSD is governed by a 29-member Board of Directors, and is responsible for the operation of two treatment plants, NPDES compliance, and collection system maintenance. The Board is made up of elected city officials plus representatives from unincorporated areas of the County. Reporting directly to the Board are a General Manager and an assistant General Manager. There are eight operational departments: Operations and Maintenance, Technical Services, Engineering, Communications, Human Resources, Finance, Information Technology, and General Services Administration.

The Technical Services Department contains three divisions: Source Control, Laboratory and Environmental Compliance, and Monitoring. The Source Control Division is responsible for administering the District's pretreatment program in accordance with the Clean Water Act and their NPDES permit.

Authority Approval

The Orange County Pretreatment Program was approved by the US EPA in January 1984.

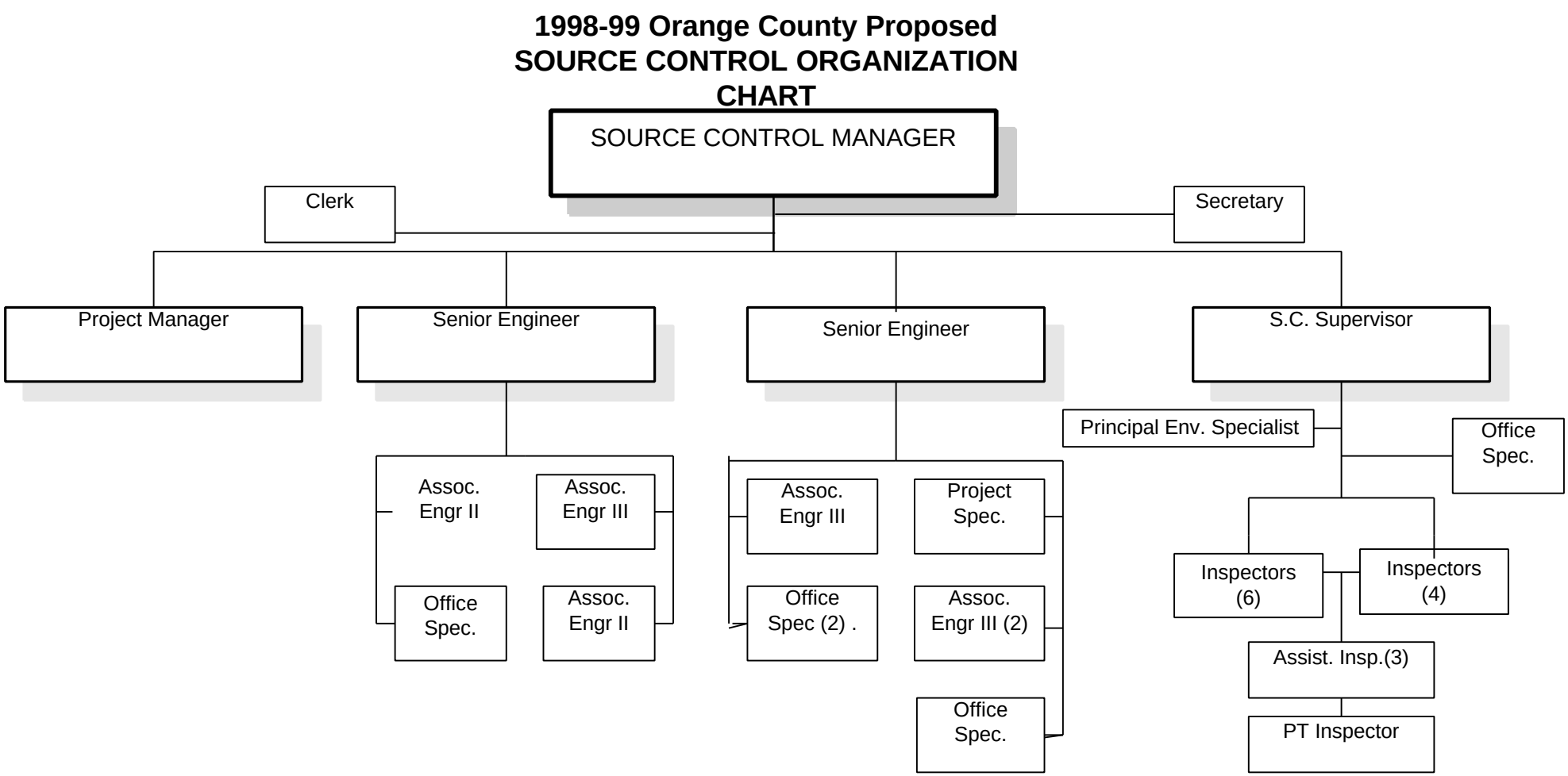
Source Control Staffing

Source Control staff are responsible for industrial permitting, enforcement, inspection, sampling, pollution prevention, and septage haulers. During FY1996/1997, the Source Control Division consisted of 37 positions. The positions were staffed by 15 supervisory and professional personnel, 12 field inspectors, 4 technicians (one of which was a temporary placement), and 6 administrative support personnel. Figure 10 shows the 1998-99 proposed Source Control org chart (the 1997 chart ws not available).

The Source Control Manager oversees the work of two engineering supervisors, one field supervisor, and one project manager and reports to the Director of Technical Services. The two engineering supervisors oversee the work of eight engineers. The engineers are responsible for issuance and renewal of permits, and all formal enforcement actions and they also conduct field inspections as necessary to support these functions. The field supervisor oversees the field monitoring and inspection activities. Twelve field inspectors conduct sampling and inspection of

all assigned industries, including those with categorical, non-categorical, and local permits. The inspectors also conduct area-search activities and inspections of non-permitted facilities such as dry cleaning and radiator shops. Four technicians are responsible for sampling equipment maintenance, equipment inventory, and sampling at the District's wastehauler station. The project manager oversees interagency activities, regulatory mandates, ordinance revisions, local limits development, reporting activities, computer programming, and special projects. The administrative support staff is specialized to handle permits/enforcement, self-monitoring, or inspection/lab reports.

Figure 10
1998-99 Orange County Proposed Source Control Organization Chart



Distinctive Features

OCSD's federally approved source control program consists of:

1. **Mass emission rates.** The District uses a dual approach to regulating wastewater constituents in order to:
   - Encourage water conservation waste minimization, and recycling;
   - Limit the total pounds of pollutants that enter the treatment facilities; and
   - Deter the achievement of compliance through dilution.

   Permits are issued with both concentration-based limits and mass emission limits. For concentration limits, the District applies either the Federal Categorical Standards or the District's local discharge limits (whichever are the more stringent). Allowable mass emission rates are calculated using the applicable concentration limits in combination with an industry's three-year average wastewater flow (or base flow rate). The base flow rate is determined at the time a permit is initially issued or reissued.
2. **An automated industrial wastewater discharge permit system** to set industrial discharge limits and requirements, and create permits. For permit renewal, the field inspectors complete annual permit evaluation forms after performing a thorough inspection. The forms are entered into a database, and the permit templates are completed automatically. Permit engineers review all submitted information for accuracy, and write any special conditions into the permit.
3. **A strong field-oriented sampling and inspection effort that samples industries at least four times per year.** Enforcement inspections are performed in response to compliance problems, and typically involve close cooperation with the permittee to identify and correct deficiencies. Source Control inspectors resample non-compliant industries within 30 days from the date of analysis verification, and submit compliance inspection reports to document corrective measures taken and to support enforcement action.
4. **The OCSD joined with state, county, city and other local agencies to form the Orange County Hazardous Materials Strike Force,** which identifies, investigates, and prosecutes dischargers of hazardous materials to the environment. The District's Source Control inspectors assisted the Strike Force in FY1996-97 by conducting covert industry sampling, spill response, and co-inspections of companies suspected of environmental crimes. Data obtained from these projects have been supplied to the Orange County District Attorney's office for evaluation and use in possible prosecution or remediation.
5. **Effective enforcement procedures to deter violations and bring dischargers back into compliance with requirements.** If a permittee exceeds the Mass Emission Rate or concentration discharge limits, the violation is subject to a noncompliance sampling fee as specified in the *Ordinance Establishing Source Control Fees, Administrative Fees, Non-Compliance Sampling Fees, and Miscellaneous Charges*, and may be subject to administrative penalties as provided in the WDR Ordinance. These fees are calculated automatically through a computer program when producing a Wastewater Analysis Report that shows the analytical values of a sample.
6. **An effective and award-winning pollution prevention program is part of the core pretreatment program**. The program uses enforcement, permitting and outreach elements to improve industrial pollution prevention.
7. **An office automation system creates self-monitoring forms with constituents to be sampled, sample dates and submission dates.** For self-monitoring, these forms are

automatically computer generated for daily, weekly, monthly, and quarterly monitoring. The computer assigns a tracking number and the constituent(s) to be sampled in addition to the sampling and submission dates. The forms are sent out and are returned completed by the company. A clerk calls up the tracking number and enters the data. A report is run every two weeks that shows those tracking numbers that are still open because self-monitoring data was not submitted as required.

8. **Compliance tracking.** The Source Control Program has many sophisticated methods to track dischargers that are in compliance or out of compliance at any given time. The database used is Oracle for Windows. Programming has been developed that generates various noncompliance reports.

9. **The Source Control Division is a partner with the District's O&M divisions on a community outreach team**, which holds annual meetings with the managers of every city and water district in the service area. The topics include the control of inflow/infiltration, sewer rehabilitation, non-sewerable waste disposal, and cost sharing for large infrastructure projects.

10. **Four Source Control staff members have received certification in confined-space entry, hazardous materials spill response, and search/rescue.** This training is used for emergency response and for equipment installation in manhole structures.

Core Pretreatment Program Activities

Pollution Prevention

The District's Pollution Prevention Program is integrated into the core duties and everyday tasks of most Source Control staff. Both inspectors and permit engineers discuss P2 issues with industrial contacts as part of routine inspections, permit renewal, and enforcement activities. It should be mentioned that, as a result of P2 integration into the core pretreatment program activities, it is impractical to separate a substantial amount of the cost of P2 from the core pretreatment program budget.

The purpose of the OCSD Pollution Prevention Program is to promote and carry out the application of waste management strategies and practices that will reduce or eliminate the generation of waste at the source, thereby reducing the volume and toxicity of waste-streams entering the OCSD system. In 1984, the OCSD implemented a waste minimization policy to control and reduce the quantity of pollutants discharged by industrial users to the sewerage system. To achieve these objectives, mass emission rates (rather than concentration limits) were promulgated for each permitted discharger. Compliance was based on the results of samples collected at each discharger's facility, along with a corresponding discharge flow. As part of this initial effort and the enforcement of mass emission limits, permittees were required to install flow restrictors or control valves to assure wastewater reduction and to prevent the company from achieving compliance by dilution.

Additionally, through permitting and enforcement activities, OCSD promoted and implemented good housekeeping practices and installation of waste minimization equipment. This included the implementation of waste segregation and the installation of dragout tanks, spray rinses, and flow restrictors. As a result, industries discovered that these practices reduce the volume of waste generated and create economic incentives in the form of lower pretreatment and sewer use charges.

In September 1989, as part of the revisions to the OCSD Wastewater Discharge Regulations, provisions were incorporated which established waste minimization requirements. In essence,

these provisions required all users to provide waste minimization plans to conserve water, investigate products substitution, provide inventory control, implement educational activities, and other steps required to minimize waste.

The program is implemented by two entities within the division. An engineering supervisor directs the public outreach activities (e.g., workshops and mass mailings), as well as Technical Assistance Center activities. Pollution prevention elements are integrated into the permitting and enforcement activities of the engineering group. The permitting engineers visit each industry to review the industry's manufacturing processes and assess waste minimization opportunities. The field inspectors conduct pollution prevention activities directly with permittees during the course of on-site inspections. Pollution prevention recommendations are integrated with on-site monitoring activities and process/pretreatment evaluations. Inspectors recommend practices such as product substitution, material substitution, process modification, and housekeeping.

Industrial User Inventory

As of June 30, 1997, OCSD was administering 892 permits, of which 434 were Class I permits, 199 were Class II permits, 200 were Class III permits, 44 were Wastehauler permits, and 15 were Special Purpose permits. This permit inventory represents a decrease of 5% from the 935 permits administered during the previous fiscal year. Of the 434 Class I users, 271 were subject to federal Categorical Pretreatment Standards (Table 5).

It is estimated that industrial flow is approximately 12%.

Table 5 OCSD Permits Issued (By Type)		
Industrial Category	**Permitted Industries Subject to US EPA Standards**	**40 CFR Part**
Aluminum Forming	8	467
Battery Manufacturing	2	461
Coil Coating	1	465
Copper Forming	0	468
Electrical/Electronic Components	8	469
Electroplating	51	413
Inorganic Chemicals Manufacturing	0	415
Iron and Steel Manufacturing	0	420
Leather Tanning/Finishing	0	425
Metal Finishing	181	433
Metal Molding and Casting	2	464
Nonferrous Metals Forming/Powders	0	471
Nonferrous Metals Manufacturing	4	421
Organic Chemicals	2	414
Pesticide Chemicals	0	455
Petroleum Refining	0	419
Pharmaceutical Manufacturing	6	439
Porcelain Enameling	0	466
Pulp, Paper, and Paperboard	1	430
Soap and Detergent Manufacturing	5	417
Steam Electric Power Generating	0	423
Timber Products Processing	0	429
Total	271	9,724

Permitting/Certification

In general, Class I permits are issued to industrial dischargers, the Class II are issued to commercial dischargers, and Class III are issued to commercial dischargers that discharge only domestic waste (e.g., banks, public buildings). A Special Purpose Discharge permit are issued for the purpose of discharging unpolluted water, stormrunoff, or groundwater to the District's sewerage facilities. Wastehauler permits are issued to septage haulers for the purpose of disposing sanitary waste at the District's wastehauler facility. Table 6 shows OCSD permitted and non-permitted users.

Table 6 OCSD Permitted and Nonpermitted Users	
Permitted Users	
Class I Permits – 271 of which are categorical	434
Class II Permits	199
Class III permits – Domestic Only Discharge	200
Wastehaulers	44
Special Purpose Permits – Ground Water Remediation Projects	15
TOTAL:	892
Non-Permitted IUs	
Dry Cleaning	550
Radiator Shops	100
TOTAL:	650

Significant industrial users are defined as those holding a Class I permit. The conditions for a Class I permit are:

- Subject to Federal Categorical Pretreatment Standards; or
- Discharging wastewater which averages 25,000 gallons per day or more of regulated process water; or
- Discharging wastewater determined by the OCSD to have a reasonable potential for adversely affecting the OCSD operation or for violating any pretreatment standard, local limits, or discharge requirement; or
- Discharging wastewater, which may cause, as determined by the General Manager, pass through or interference with the District's system.

Conditions for a Class II permit are:

- Whose charge for use is greater than the ad valorem ("imposed at a rate percent of value") tax basic levy allocated to the District; and
- Discharging waste other than sanitary; and
- Not otherwise required to obtain a Class I permit.

Conditions for a Class III permit are:

- Discharging only sanitary waste; and
- Not required to obtain a Class I or Class II permit; and
- Whose charge for use is greater than the ad valorem basic levy tax paid to the District.

Certification Programs. Several categories of dischargers fall outside the main permitting program and each category has a unique set of requirements.

- The District includes nine major hospitals that are each required to maintain a current Waste Management Plan for silver, radioactive materials, and infectious waste. In return,

the hospitals are given Class II permits instead of Class I, reducing the regulatory burden on both the hospitals and the District.

- The District includes approximately 50 radiator shops that have the option to certify yearly that they operate with zero discharge, or to discharge under the conditions of a Class I permit. All radiator shops in the service area currently operate under certified zero discharge, and are subject to inspection once per year.
- The District includes approximately 550 dry cleaning businesses that are required to maintain a certification of zero discharge for perchloroethylene (PERC), and are subject to inspection once per year. A Notice of Violation and an Order to Correct are issued when PERC discharges are discovered.
- The District includes a very large population of auto repair facilities. Estimates range from one to five thousand. The program is in development and will likely include BMPs and certification that spent solutions are properly disposed.

Monitoring (Inspection and Sampling)

Source Control inspectors conduct all sampling on the District's SIUs. Samples are collected during quarterly inspections, and as needed for enforcement. Composite samples of a permittee's discharge are collected using automatic samplers and are time-composited over a 24-hour period. In conjunction with each inspector's on-site observations, the results of laboratory analyses are used to verify compliance status, help disclose potential operational and housekeeping problems, evaluate the adequacy of pretreatment systems, and detect new sources of regulated substances. Grab samples are collected for the determination of compliance with total toxic organics (TTO), cyanides, and pH.

Class I permittees have the following sampling requirements:

- OCSD samples at least four times per year for TSS, BOD, and Heavy Metals.
- Sampling of TTOs for categorical is two times per year.
- Self-Monitoring for TSS, BOD, and metals is four times per year.
- TTO is two times per year for OCSD and self-monitoring.
- If discharge violations are noted after the analysis is returned, OCSD will resample in 30 days or the company must resample if it is a self-monitoring violation.

Class II permittees have the following requirements:

- OCSD samples four times per year for BOD and TSS.
- Self-Monitoring is four times per year for BOD and TSS.

Class III permits are not sampled. Waste discharge is considered 250 mg/L for both BOD and TSS.

System Sampling

In addition to the regular industrial sampling, inspectors conduct special project sampling such as upstream\downstream sampling for enforcement, local limit sampling, and system sampling to determine mass balance, as well as sampling for industrial spills.

Local Limits

The District has adopted local limits for all dischargers tributary to the OCSD system, whether under permit or not. The District has two treatment plants, but one set of limits applies to all dischargers. When a company is an US EPA categorical company, OCSD applies either the categorical limit or its local limit for each regulated constituent, whichever is more stringent. The local limits are shown in Table 7. Table 8 shows limits for wastehaulers discharging domestic waste.

Table 7
OCSD Local Limits[a]

Constituent	Milligrams Per Liter
Arsenic	2.00
Cadmium	1.00
Chromium (Total)	2.00
Copper	3.00
Lead	2.00
Mercury	0.03
Nickel	10.00
Silver	5.00
Zinc	10.00
Cyanide(Total)	5.00
Cyanide (Amenable)	1.00
Polychlorinated Biphenyls	0.01
Pesticides	0.01
Total Toxic Organics	0.58
Sulfide(Total)	5.00
Sulfide (Dissolved)	0.50
Oil and Grease of Petroleum Origin	100.00

a Users subject to Federal Categorical Pretreatment Standards may be required to meet more stringent limits.

Table 8 OCSD Limits for Wastehaulers Discharging Domestic Waste	
Constituent	**Milligrams Per Liter**
Cadmium	1.00
Chromium	2.00
Copper	25.00
Lead	10.00
Nickel	10.00
Zinc	50.00

Enforcement Response Plan

The OCSD enforcement program is designed to bring noncompliant industries back into conformance with Federal pretreatment standards and OCSD local discharge limits. If permittees violate a discharge limit, enforcement action is initiated. This includes the assessment of noncompliance sampling fees and additional sampling. Subsequent noncompliance may result in the issuance of an order detailing corrective measures, mandatory installation of additional pretreatment equipment, mandatory implementation of pollution prevention measures, the issuance of Emergency Suspension Orders, or suspension or revocation of the discharge permit.

The following are informal actions:

- Non-compliance fees are charged for time spent collecting additional samples. Compliance fees are not applicable to self-monitoring violations.
- A Probation Order is issued if a permittee violates any provision of the Ordinance or discharge permit, or has not paid all fees and charges. In accordance with the OCSD Ordinance, the term of the Probation Order may not exceed 90 days, and the permittee is required to comply with all directives, conditions, or requirements within the time specified (including the submittal of information pertaining to waste source characterizations, pretreatment modifications, and waste minimization alternatives), and the performance of accelerated self-monitoring.
- An ECSA is an agreement between the permittee and the OCSD specifying that permit revocation will be temporarily held in abeyance, provided that pretreatment equipment is installed or pollution prevention measures are implemented by the permittee within a scheduled time period, and that the permittee remains in consistent compliance during the term of the ECSA. The ECSA contains terms and conditions by which the permittee must operate and specifies dates for construction or acquiring and installing the pretreatment equipment and/or implementing waste minimization to achieve compliance. For the duration of the ECSA, inspection and sampling of the facilities are conducted monthly by the OCSD inspectors to verify that all terms and conditions of the ECSA are met. In addition, the permittee is required to perform accelerated and extended self-monitoring.

Following are formal actions:

- **Administrative Civil Penalties.** Pursuant to the authority of California Government Code Sections 54740.5 and 54740.6, the District may issue administrative complaints and penalties.
- **Injunction.** Whenever a discharger is in violation of any provision of the ordinance, or standard, or requirement, or refuses to allow the District entry to inspect or monitor, the District may petition the Superior Court for the issuance of an injunction.
- **Emergency Suspension Order.** Pursuant to Section 613 of the OCSD' *Wastewater Discharge Regulations,* an Emergency Suspension Order may be ordered to stop an actual or impending discharge which presents or may present an imminent or substantial endangerment to the health and welfare of persons, or to the environment, or may cause interference to the OCSD sewerage facilities, or may cause the OCSD to violate any state or federal law or regulation.
- **Published Notices for SNC.** In accordance with Federal Regulations, the District annually publishes (in the newspaper having the largest circulation in the District's service area) the names of all industrial users in significant noncompliance.
- **Permit Revocation.** The last recourse in the chain of administrative enforcement provisions is permit revocation. A permittee with a critical noncompliance record or that has failed to pay fees and charges is notified in writing of the reasons for permit revocation and the date of the permit revocation hearing. At the hearing, OCSD staff and the permittee are provided the opportunity to present evidence to a designated hearing officer. After the conclusion of the hearing, the hearing officer makes a determination if permit revocation is warranted, and provides a written report to the General Manager for final determination. Should the General Manager determine that the non-compliance record is substantial, revocation of the industrial waste discharge permit and loss of sewer discharge privileges may ensue.
- **Permit Suspension.** When OCSD believes that grounds exist for permit suspension, the permittee is notified in writing of the reasons for permit suspension and the date of the permit suspension hearing. At the hearing, OCSD staff and the permittee are provided the opportunity to present evidence to a designated hearing officer. After the conclusion of the hearing, the hearing officer makes a written determination. Upon issuance of an order of suspension, the permittee must cease and desist all discharges to the sewer for the duration of the suspension.

Data Management

The Source Control Program has an extensive data management system. Refer to Distinctive Features item seven (above).

Reporting

The OC Sanitation District is required to submit quarterly reports and an annual report that covers the district's pretreatment implementation efforts for the pervious fiscal year. The report is comprehensive and shows all aspects of the source control division. The US EPA and regional water quality control board use the report in addition to periodic audits to verify program implementation requirements.

Additional Source Control Activities

Household Hazardous Waste

Over the years, OCSD has supplied funding and staff time to facilitate household hazardous waste round-ups. Homeowners bring their household hazardous waste to a designated location where the waste is categorized and then hauled by a licensed hazardous waste disposal company.

Rate Development and Fees

These activities are carried out under the direction of the finance department. The source control division is involved to the extent that it provides user charge, connection charge, and other pertinent financial data to the permitted industrial community.

Biosolids and Influent/Effluent Quality

From 1971 through 1979, OCSD beneficially recycled 100% of their biosolids through a local fertilizer company and other composting operations. During the late 1970s and early 1980s, the Coyote Canyon Landfill (which was operated by the Orange County), was used to air dry, compost, and co-dispose (with municipal solid waste) of OCSD's biosolids. Beginning in 1984, the BKK Landfill in West Covina was used to dispose of 100% of OCSD biosolids. Recycling options began to be used by OCSD in 1988, reducing the quantity being landfilled to about 50%.

In November 1991, OCSD achieved one of its longtime goals: 100% beneficial recycling of their biosolids in an environmentally safe and cost-effective manner. Beneficial recycling allows the OCSD to lower its management costs and eliminates the need to take up valuable landfill space. The present program consists of direct land application of the OCSD biosolids. Direct land application of the OCSD biosolids was used to enhance agricultural solids, reduce the amount of irrigation water needed, and provide a much-needed source of organic humus. Beneficially recycling biosolids through direct land application provides an environmentally safe recycling option that costs significantly less than landfilling, and should become even more cost-effective in the future as competition grows and new biosolids management technologies develop. By March 1997, the OCSD Biosolids Management Team included four beneficial recycling contractors. This mix of contractors provides considerable diversity, security and competitive prices.

Biosolids quality plays an important role in determining the feasibility of reuse versus disposal options. Two important factors affecting biosolids qualities are the trace metal and toxic organic chemical content. The OCSD Source Control Program has been very effective in reducing levels of pollutants in the biosolids as shown in the following tables and figures. The ceiling concentrations and EQ concentrations promulgated by the US EPA's sludge regulations (40 CFR 503), which went into effect July 20, 1993 are presented in the figures as a reference. For FY1996-97, OCSD biosolids complied with the exceptional quality limits for the regulated parameters. Table 9 shows reductions in biosolids metals over a period of time as compared to US EPA's Exceptional Quality Limits for Biosolids.

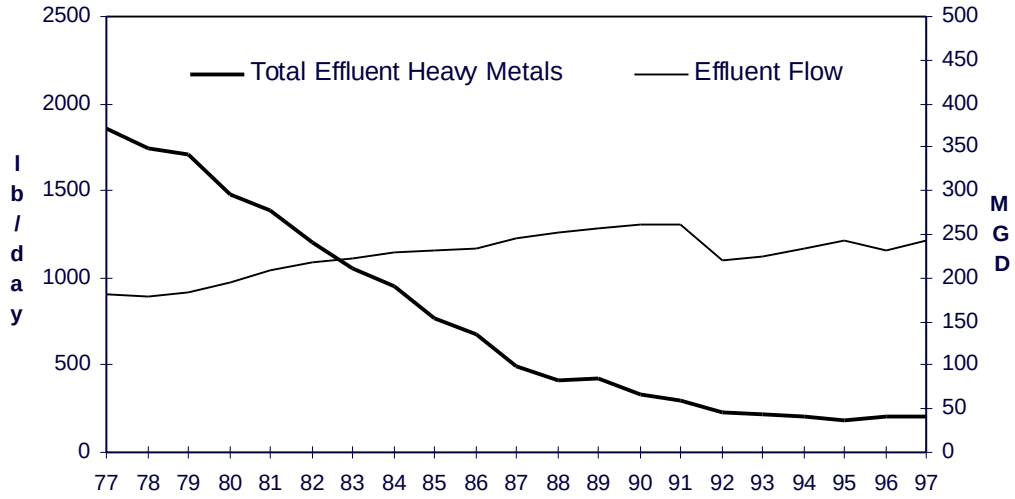
Table 9
OCSD Trends in Trace Metal Content of Biosolids, FY1988-1997
(Concentration in mg/kg, Dry Weight)

Metal	Exceptional Quality Limits	Plant No. 1			Plant No. 2		
		Min.	Max.	Avg.	Min.	Max.	Avg.
Arsenic	41						
1987-88		3.4	4.0	3.7	9.5	10.0	9.7
1996-97		2.5	8.9	4.6	3.0	8.9	5.5
Cadmium	39						
1987-88		30.0	52.0	38.0	52.0	84.0	69.0
1996-97		17.0	29.0	22.0	8.0	23.0	14.0
Chromium	**						
1987-88		260.0	470.0	390.0	240.0	330.0	280.0
1996-97		104.0	158.0	127.0	78.0	103.0	91;0
Copper	1,500						
1987-88		1,470.0	1,890.0	1,690.0	1,260.0	1,600.0	1,390.0
1996-97		875.0	1,355.0	1,107.0	730.0	911.0	827.0
Lead	300						
1987-88		180.0	380.0	250.0	84.0	160.0	200.0
1996-97		71.0	96.0	83.0	54.0	76.0	63.0
Mercury	17						
1987-88		3.5	4.7	4.1	ND	3.2	2.1
1996-97		1.3	3.2	2.5	1.6	3.5	2.3
Nickel	420						
1987-88		120.0	240.0	180.0	89.0	160.0	120.0
1996-97		142.0	248.0	184.0	97.0	138.0	115.0
Selenium	100						
1987-88		ND	5.3	3.3	2.2	4.5	3.2
1996-97		4.9	9.4	6.8	2.9	6.9	5.1
Silver	**						
1989-90		20.0	160.0	93.0	19.0	100.0	67.0
1996-97		33.0	76.0	55.0	28.0	68.0	42.0
Zinc	2,800						
1987-88		1,050.0	1,530.0	1,210.0	1,000.0	1,930.0	1,320.0
1996-97		770.0	1,101.0	993.0	819.0	965.0	892.0

** No 40 CFR Part 503 Exceptional Quality Criteria
ND = Non-detectable

Since FY1976-77, the source control program has been successful in reducing the total mass of metals entering the OCSD system by 81%, and reducing the metals discharged to the marine environment by 89%. Over this period, influent cadmium has been reduced by 97%, chromium by 94%, copper by 72%, lead by 95%, nickel by 75%, and zinc by 80%. There were no incidents of pass-through or interference during FY1996-97. Figure 11 depicts the mass of total metals discharged in comparison to the effluent flows.

Figure 11



The reduction in toxics by the source control program has been so effective that, for the last five years, the influent heavy metals to the OCSD treatment plants have met NPDES effluent standards even without benefit of treatment. During the past five years, there has been a general downward trend in the discharge of toxic organics. For FY1996-97, the monthly mean concentrations of effluent toxic organic pollutants met all of the 36 Marine Water Chronic Criteria established by the US EPA.

The source control program has has also been effective in protecting the collection, treatment, and disposal facilities from incidents of pass-through or interference, and in enabling OCSD to meet their NPDES ocean discharge limits. The quality of OCSD influent, effluent, and biosolids are testimony to how well the program has progressed. Its future challenges will be to continue improving and meeting the program goals through the promotion of pollution prevention, education, communication, and industrial and regulatory joint understanding of sustainable growth, and the consistent enforcement of OCSD's *Wastewater Discharge Regulations* (Ordinance).

Sacramento Regional County Sanitation District

Description

SRCSD is a regional sewerage agency that serves most of the urbanized part of Sacramento County. The District operates one pure oxygen secondary treatment plant with a design hydraulic capacity of 181 mgd. Current dry weather flows average 155 mgd. The service area is approximately 250 square miles, and has a population of a little over 1 million. The County of Sacramento Water Quality Division encompasses both SRCSD and County Sanitation District No.1 (CSD-1) which owns and operates the County's part of the collection system. The cities of Folsom and Sacramento operate their own collection systems, but SRCSD implements the Pretreatment Program in the entire service area.

Approval Authority

SRCSD's Industrial Waste Pretreatment Program was officially approved by the State of California and the US EPA in January of 1983. The Industrial Waste Section had a staff of four until 1990, when the District received an administrative order from US EPA citing deficiencies in the program. After several years of intensive program development, there is currently a staff of 15. A US EPA performance audit in 1997 made a few recommendations for improvements but found that the approved program is being implemented and current resources are adequate.

Source Control Staffing

The Industrial Waste Section staff consists of a program manager, one industrial waste specialist, two supervisors, six inspectors, a computer operations specialist, and one clerk. The remainder of the staffing consists of student trainees or other temporary employees.

Figures 12 and 13 show the organization of SRCSD and the Industrial Waste Section.

Distinctive Features

One distinctive feature of SRCSD Industrial Waste Section workload organization is the broad range of program functions performed at the inspector level. Inspectors have primary responsibility for inspections, monitoring, billing information, enforcement, and permitting for their assigned industries. Management, supervisory, and technical staff support, assist, and advise the inspectors, but the bulk of the core pretreatment program work is done at the inspector level. Most of the data entry, bills, billing reports, pollutant loading reports, and other management information functions are performed by clerical and computer support staff. Another characteristic of workload organization is that management and supervisors spend a significant part of their time with "hands-on" work. The program manager frequently reviews new industrial user permit applications and may even write permits on occasion. The Supervising Inspector often assists with sampling, inspections, and special studies.

Core Pretreatment Program Activities

Industrial User Inventory

Another characteristic feature of the SRCSD source control program is the shift in industrial user base that has occurred over the past several years. Prior to 1997, summertime flows and loads at the treatment plant were dominated by fruit and vegetable cannery wastes. Every summer, two canneries would double the SRCSD influent BOD loads, sometimes within a few days. The Industrial Waste Section formerly played a critical role in coordinating treatment plant and cannery operations. After the 1996 season, both of these seasonal canning operations were shut down.

The District still has a sizeable food processing load, but no longer experiences the seasonal variations from fruit and vegetable processing. In general, the industrial user base has been shifting towards the light industrial and high-tech sectors.

Permitting

About 9% of SRWTP influent flow is industrial. SRCSD permits about 232 industrial and commercial dischargers. There are 39 permitted industries that are subject to categorical pretreatment standards, and 33 significant industrial users not subject to categorical standards. Most of the local SIUs have process wastewater flows in excess of 25,000 gpd. However, there are a few (2 or 3) with lower flows but exceed local loading criteria. To address facilities with low-volume, high-strength flows, any industry which discharges more than 37.5 pounds of BOD or TSS per day is classified as an SIU (37.5 pounds of BOD and TSS per day is equivalent to 25,000 gpd at domestic strength). All SIUs are issued Wastewater Discharge Permits. A table showing the numbers in each classification for industrial users is included in Appendix I.

Monitoring (Inspection and Sampling)

During FY1996-97, SRCSD performed two compliance inspections and one sample point inspection per year. Each compliance inspection was comprehensive and included a full report. Sample point inspections are limited to review of the flow metering, sampling equipment, pH monitoring and industry self-monitoring procedures. Follow-up visits and brief "demand" inspections are documented but are not included in SRCSD's inspection count.

System Sampling

System sampling is limited to periodic influent sampling at the treatment plant, special projects, and investigations of suspected illegal discharges. Three times a year, SRCSD samples the treatment plant influent and effluent for seven consecutive days. Special project sampling is highly variable. Examples of special sampling projects are: commercial category loading studies, residential wastewater studies, and dissolved gas studies. The section occasionally conducts surveillance sampling of specific industries in response to complaints or other indications of discharge violations.

Local Limits

SRCSD is unique among the agencies in this benchmarking effort in its lack of traditional local limits. The only "local limits" are mass and concentration copper limits placed on one industrial discharger and limits for organic pollutants applied to groundwater discharges. SRCSD also applies a zero process wastewater policy to discharges from dry cleaning businesses. The District has done extensive evaluation of the need for local limits and has determined that local limits beyond those previously mentioned are not necessary. The regulatory environment of SRCSD has been a contributing factor. The District has no toxic pollutant limits in its NPDES permit and, until recently, biosolids disposal was done on-site in dedicated land disposal units. While the absence of local limits may give the impression that control of industrial discharges is inadequate, treatment plant effluent and biosolids quality indicate otherwise. SRWTP effluent is of very high quality, meeting or exceeding the effluent quality of many POTWs that have stringent local limits. Plant biosolids meet 40 CFR Part 503 exceptional quality biosolids criteria and are currently land applied for forage crops.

Enforcement Response Plan

SRCSD has a comprehensive approved Enforcement Response Plan with the full range of enforcement mechanisms. The ERP incorporates an escalating enforcement scheme that is designed

to bring IUs into compliance promptly. An enforcement action is taken for any and all violations of permit conditions. Available enforcement actions range from warning notices for first-time minor violations to pursuit of criminal penalties. Low-level enforcement actions are taken directly by Industrial Waste Section staff, but higher level enforcement such as Administrative Penalties or Show Cause Hearings must be signed by the District Engineer and are normally done with the concurrence of the SRCSD Board of Directors.

Figure 12
Sacramento's IWS Organization Chart

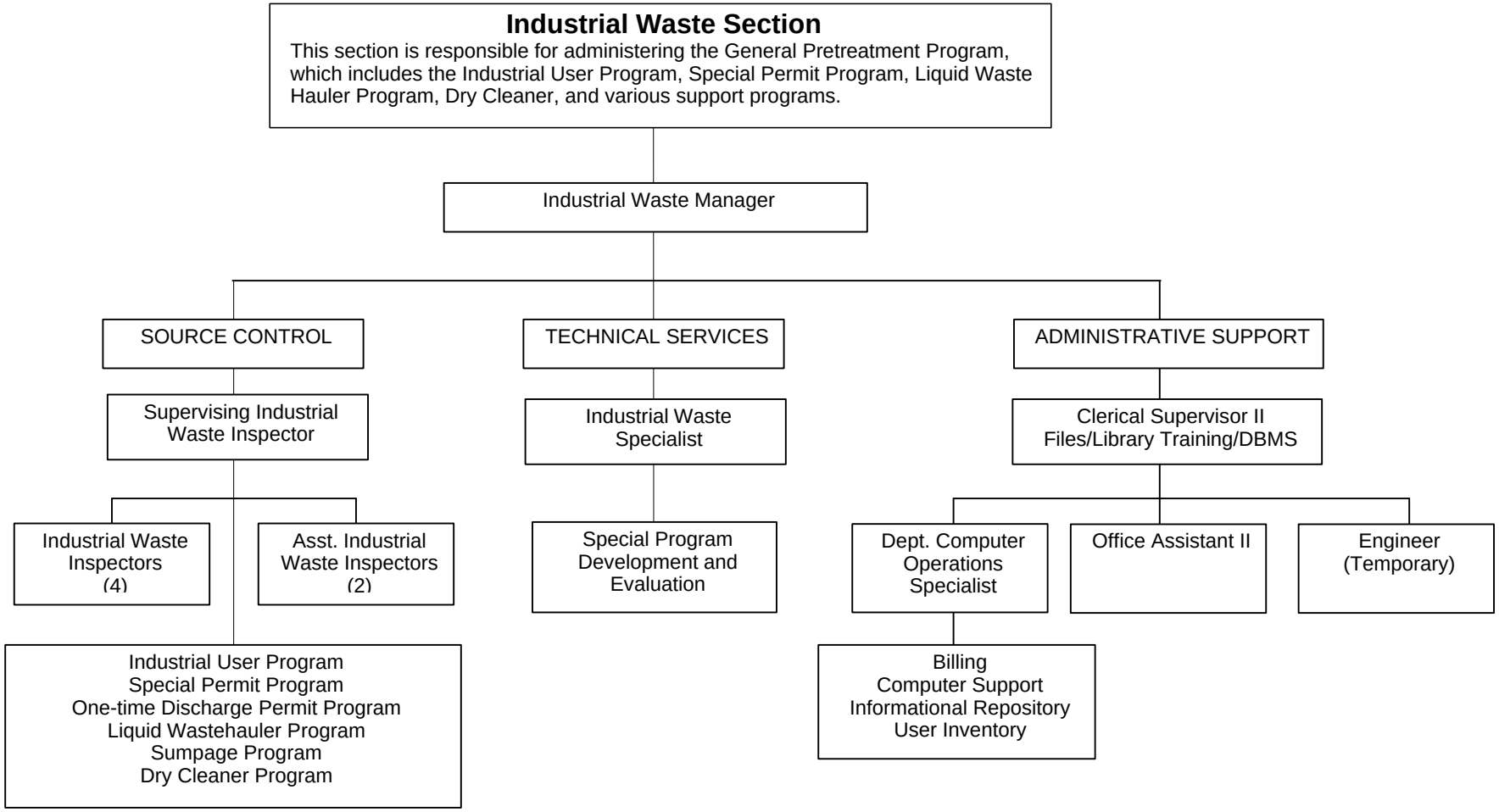
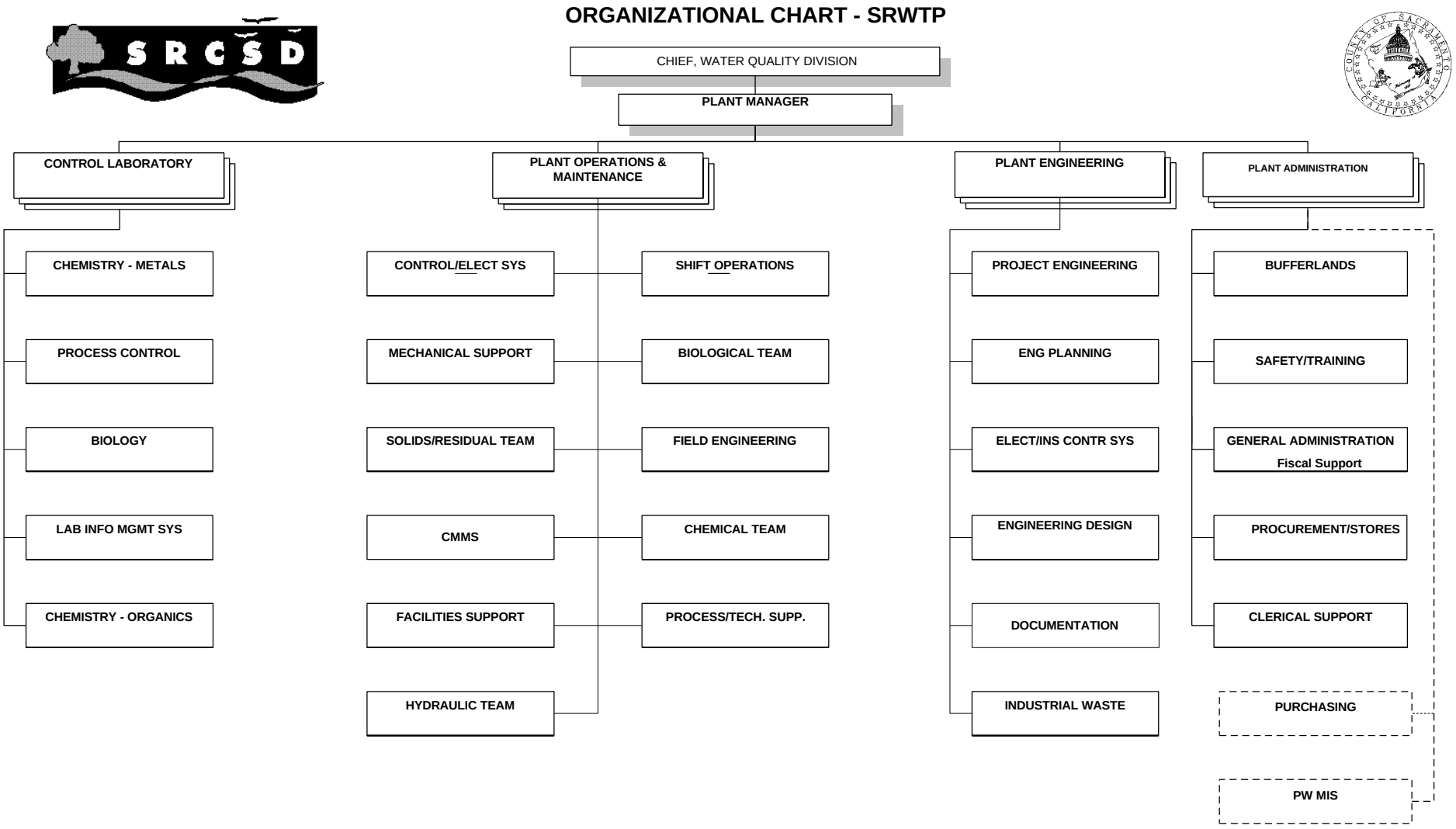


Figure 13


ORGANIZATIONAL CHART - SRWTP
SRCSD
CHIEF, WATER QUALITY DIVISION
PLANT MANAGER
CONTROL LABORATORY
PLANT OPERATIONS & MAINTENANCE
PLANT ENGINEERING
PLANT ADMINISTRATION
CHEMISTRY - METALS
PROCESS CONTROL
BIOLOGY
LAB INFO MGMT SYS
CHEMISTRY - ORGANICS
CONTROL/ELECT SYS
MECHANICAL SUPPORT
SOLIDS/RESIDUAL TEAM
CMMS
FACILITIES SUPPORT
HYDRAULIC TEAM
SHIFT OPERATIONS
BIOLOGICAL TEAM
FIELD ENGINEERING
CHEMICAL TEAM
PROCESS/TECH. SUPP.
PROJECT ENGINEERING
ENG PLANNING
ELECT/INS CONTR SYS
ENGINEERING DESIGN
DOCUMENTATION
INDUSTRIAL WASTE
BUFFERLANDS
SAFETY/TRAINING
GENERAL ADMINISTRATION
Fiscal Support
PROCUREMENT/STORES
CLERICAL SUPPORT
PURCHASING
PW MIS

Data Management

The Industrial Waste Section has two full-time staff devoted primarily to data management. Most monitoring and inspection data must be entered. Inspectors collect monthly IU billing information, and data management staff enter the data and generate the bills. During FY1996-97, most program data was processed and tracked using "off-the-shelf" spreadsheet and database programs. A few simple applications were developed in-house to perform various data-tracking and processing functions. SRCSD was in the process of selecting and purchasing a comprehensive Pretreatment Program information management software package in FY1996-97.

Reporting

Quarterly and annual pretreatment program report preparation is a coordinated effort of Industrial Waste Section clerical, inspection, supervisory, and management staff. Reports are generated using a combination of commercially available word processing, spreadsheet and database software.

Additional Source Control Activities

Pollution Prevention

Pollution prevention activities have taken place in campaigns targeted to specific pollutants of concern along with continuing incentive programs to reduce flows and loadings of conventional pollutants. Past efforts have addressed discharges from dry cleaning businesses, radiator repair shops, metal finishers, and photo processors. IUs participating in the incentive program for minimization of flow, BOD, and TSS loadings are required to implement an approved waste minimization program. For the time period of this report, the level of effort for pollution prevention activities was low compared to previous years. SRCSD anticipates future increases in pollution prevention activities aimed at reducing loadings of pollutants of concern.

Household Hazardous Waste

Household hazardous waste collection and outreach are handled by Sacramento County's Waste Management and Recycling Division.

Rate Development and Fees

The Industrial Waste Section is responsible for generating monthly invoices for sewer service charges for 118 industrial users. The invoice is a detailed accounting that includes flow, BOD, TSS, inspection, monitoring, and permit fee charges. The Industrial Waste Section plays a minor role in determining sewer rates and rate implementation for commercial users.

Biosolids and Influent/Effluent Quality

Pollutant amounts in SRWTP influent have declined dramatically since the Pretreatment Program was established in the early 1980s. As Figure 14 shows, total heavy metals concentrations have been reduced about 60% over the past 14 years. Biosolids metals concentrations have likewise been reduced from 1,860 mg/kg in 1983 to 890 mg/kg in 1997 as shown in Figure 15

Figure 14

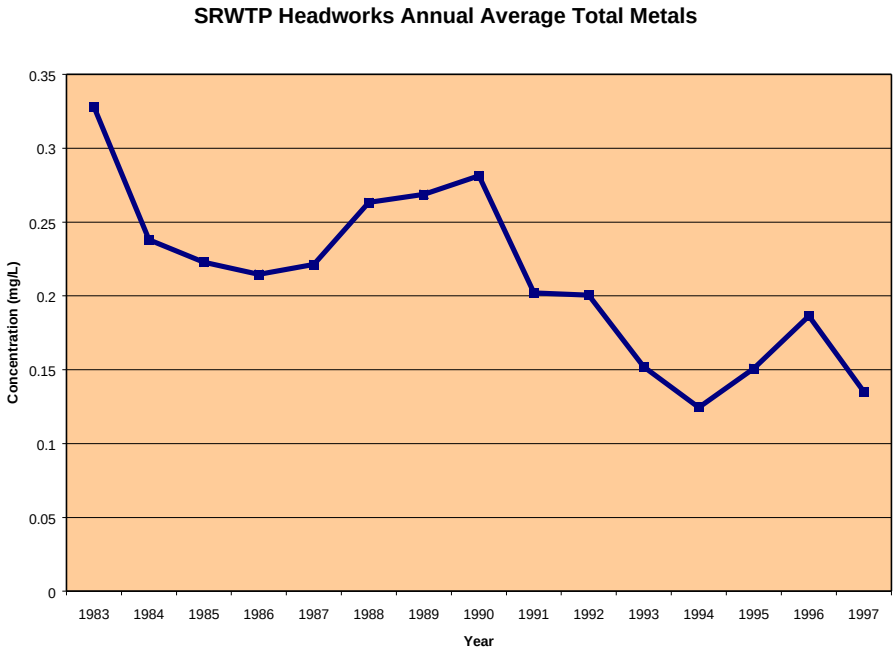
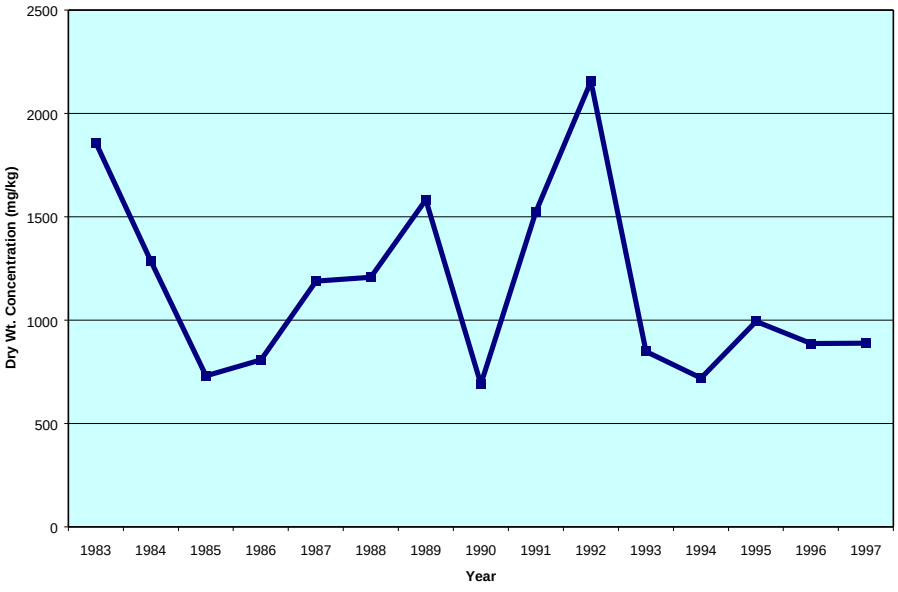


Figure 15



Source Control Benchmarking Approach

The overall approach used by the source control group was to identify key activities to compare and then to strictly define those activities to ensure comparisons were "apples-to-apples." This task was more difficult than the group first envisioned, and the resultant definitions and numbers are best viewed as a first draft to be fine-tuned in future years.

From the beginning, the agencies agreed on a number of principles for the benchmarking efforts:

- Staffing levels expressed as FTEs (full time equivalent—1,840 hours), not dollars, are the critical measure of resources for comparison in source control.
- There are many ways to design a source control program which result in different distributions of effort between the particular tasks. No one task should be looked at in isolation.
- Mgd of sewage treated is not an effective normalization factor for performance benchmarking of specific source control activities, although it provides an indicator of level of effort for comparing entire source control programs. Variations in domestic flow contribution and industrial bases create differing resource needs. Even industrial flow is not a true normalization factor because all industrial flow is not equal in risk to the POTW.

The iterative process that was used for performance benchmarking involved brainstorming, refining, applying the results of the brainstorming, then refining again. It was done roughly in the following order:

1. Brainstorming of a list of tasks to be included in performance benchmarking. Presentations by each agency on their program to understand the differences and similarities between the programs.
2. Defining the key elements (template boxes) for comparison. The group started by using definitions used by the earlier tri-state benchmarking group, adding to and modifying the list and definitions.
3. Brainstorming a list of template boxes for performance and process benchmarking.
4. Writing process benchmarking questions, answering them, and compiling the answers into one document for comparison.
5. Brainstorming a list of normalizing factors. The purpose of the normalizing factors was to facilitate performance benchmarking comparisons by removing differences caused by the size of the programs.
6. Developing a spreadsheet of the template boxes. Each agency filled in the numbers for their source control program.
7. Reviewing the spreadsheets, discussing the obvious differences, and identifying definitions and normalization factors that were confusing or that were being applied differently.
8. Revising the definitions and producing new spreadsheets, this time with graphs, based on the new definitions.
9. Reviewing the graphs and identifying additional definition changes or inconsistencies in application of definitions. Two results emerged with this step. First, a number of normalizing factors were dropped because the committee felt they did not show any meaningful differences in the programs. Second, the committee revised the template to separate the pollution prevention and rate development and implementation boxes. This separation provided for benchmarking total source control and core pretreatment programs individually.

10. Final analysis of graphs, drafting and review of report. Each agency was assigned several graphs to analyze by reviewing agency descriptions, the process survey answers, and interviewing the other members by phone.

During the process of developing the template and definitions, several concerns and findings emerged that made benchmarking source control a challenge. These were:

- Each agency representative brought with them assumptions based on their own program. The group repeatedly would think they had agreed on a definition only to discover that there were six interpretations of that definition. The final numbers still reflect those assumptions. For example, it was not until the final numbers had been developed that we discovered there were two very different ways to define a "permit" that led to different numbers.
- Not all agencies had good timekeeping records to develop their numbers. For those that did, none did it the same way. Therefore, the final numbers in all cases involve some estimates and "best guesses."
- Policy differences between agencies in some areas were so significant as to make reasonable comparisons in those areas almost impossible. The most troublesome differences concerned use of the source control program for sewer rate development/implementation and involvement in pollution prevention activities. The amounts of resources spent on these two tasks were so different that they made comparison of percent efforts on other tasks difficult. To allow meaningful comparisons, the group developed the concept of a "core pretreatment program," defined as those tasks required by 40 CFR 403 and others commonly associated with pretreatment programs. By excluding Pollution Prevention and rate development/rate implementation, more meaningful comparisons resulted among total source control programs, core pretreatment programs, and for individual tasks within the core pretreatment programs.

The final template used in the comparisons and analyses is shown in Figure 16.

Analysis of Program Differences

Program Characteristics

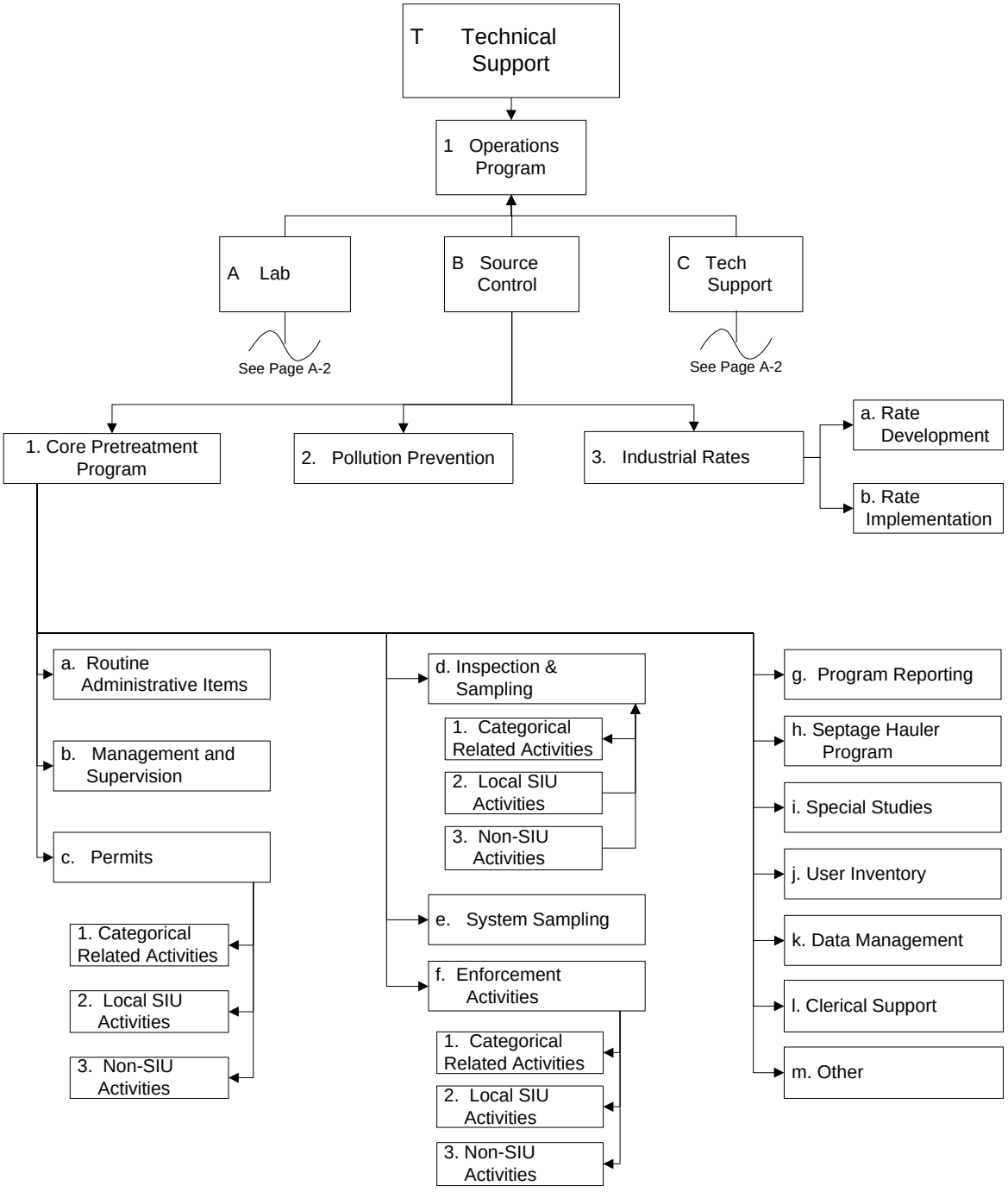
In analyzing differences between programs and in searching for best practices that each agency can adopt to improve efficiency, the source control group found it useful to compare a number of program and regional characteristics, including number and types of industries, local limits, and NPDES limits.

The summary tables below compare local limits and the industrial base of the different agencies. A program with more categories of industrial users is assumed to require more effort. Similarly, more stringent local limits or limits on more parameters are assumed to require more effort as the potential for violations increases.

Figure 16

Multi-Agency Template
Technical Support Section
Breakdown of Functional Areas

DRAFT



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Rev. 7.4 8/21/98

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Table 10 shows the local limits for all six agencies.

Table 10
Local Limits for All Six Agencies (mg/L)

	CPBES	SRCSD[1]	CSDOC	EBMUD	KCDNR		CLABS
Parameter	**Daily Avg**	**Daily Avg**	**Daily Avg**	**Daily Avg**	**Daily Avg**	**Inst. Max**	**Inst. Max**
Ammonia	**50.0**						
Arsenic	**0.3**		2.0	2.0	1.0	4.0	**3.0**
Cadmium	0.7		1.0	1.0	**0.5**	**0.6**	15.0
Chlorinated hydrocarbons	**0.5**			**0.5**			
Chromium	3.8		**2.0**	**2.0**	2.75	**5.0**	10.0
Copper	**2.3**		3.0	5.0	3.0	**8.0**	15.0
Cyanide-T	**1.20**		5.0	5.0	2.0	**3.0**	10.0
Cyanide-A			**1.0**				2.0
Iron				**100.0**			
Lead	**0.7**		2.0	2.0	2.0	**4.0**	5.0
Mercury	**0.014**		0.03	0.05	0.1	**0.2**	
Nickel	3.0		10.0	5.0	**2.5**	**5.0**	12.0
Pesticides			0.01				
Phenolics	**1.0**			100.0			
Polychlorinated biphenyls			0.01				
Silver	**0.4**		**5.0**	1.0	1.0	**3.0**	5.0
Sulfate	**500.0**						
Sulfide-T	50.0		5.0				
Sulfide-D			0.6				**0.1**
Sulfide – atmospheric						10.0	
TTO			**0.58**				
Zinc	**4.0**		10.0	5.0	5.0	**10.0**	25.0
FOG NP	**100.0**		**100.0**			**100.0**	
FOG P	**500.0**				no floatable FOG		
FOG Total				**100.0**			600.0
pH, SIU	5.5-11.5	5-12.5		5.5	5.5	**5.0**-12.0	5.5 –**11.0**
Total Parameters	19.0	1.0	17.0	15.0	11.0	13.0	14.0

Bold = Most stringent daily max

Blue = Most stringent instantaneous max (grab)

[1] SRCSD develops limits for some individual industrial users and industrial user groups on a case-by-case basis.

Table 11 shows a summary of each agency's industrial flow as compared to its overall POTW flow.

Table 11
Summary of Agency Industrial User Information

	CPBES	SRCSD	CSDOC	EBMUD	KCDNR	CLABS
# Categorical SIUs	34	39	271	16	74	175
# Categorical permits	34	39	271	16	74	183
# CIU Categories	9	6	12	3	7	13
Total Categorical Flow (gpd)	1,208,000	1,217,000	12,200,000	339,868	1,306,391	9,377,396
GPD/CIU	35,529	31,205	45,018	21,242	17,654	53,585
# LSIUs	43	33	362	59	69	79
# LSIU Permits	43	33	362	100	69	97
Total LSIU Flow (gpd)	4,793,000	7,453,000	15,767,000	2,359,596	2,579,530	15,892,846
GPD/LSIU	111,465	225,848	43,555	39,993	37,384	201,175
TOTAL SIU flow	6,001,000	8,670,000	27,967,000	2,699,464	3,885,921	25,270,242
% SIU flow	6.00%	4.79%	11.42%	3.18%	1.78%	5.54%
POTW Flow (mgd)	100,000,000	181,000,000	245,000,000	85,000,000	218,000,000	456,000,000

In viewing Tables 11 and 12, it is evident that there is a great deal of variability in both percent of industrial flow and in whether that industrial flow comes from categorical or local significant industrial users. Table 12 shows that even within the broad categories of federal categorical and local, there are significant differences in the types of companies found at each agency. There are also two sources of variability that are not obvious in either Table 11 or Table 12: the interpretation and the implementation of the definition of significant industrial user, and in how permits are issued to SIUs, especially to Local SIUs. If the same non-categorical company with the same characteristics were located in all six agencies, depending on its nature and size, it might not receive a permit at all six agencies (and in some it might receive multiple permits). This is explained further in some of the individual graph analyses.

Tables 12 and 13 show more details of the agency SIUs. The first shows categorical industrial users, the second local industrial users.

Table 12
Agency SIUs—categorical industrial users.

Category	CPBES			SRCSD			CSDOC			EBMUD			KCDNR			CLABS		
40 CFR	**#IU**	**Total GPD**	**GPD/IU**	**#IU**	**Total GPD**	**GPD/IU**	**#IU**	**Total GPD**	**GPD/IU**	**#IU**	**Total GPD**	**GPD/IU**	**#IU**	**Total GPD**	**GPD/IU**	**#IU**	**Total GPD**	**GPD/IU**
413	11	224,000	20,364	3	60,000	20,000	51	2,315,000	45,392	6	69,156	11,526	15	62,726	4,182	64	354,636	5,541
413/433																5	77,627	15,525
414	1	-	-	2	34,000	17,000	2	15,000	7,500				1	16,499	16,499	2	7,153	3,577
417							5	38,000	7,600									
419	1	87,000	87,000													2	7,031,984	3,515,992
420													1	19,583	19,583			
420/471																1	36,320	36,320
421							4	44,000	11,000				1	-	-			
423																1	-	-
430				1	442,000	442,000	1	1,612,000	1,612,000									
433	11	464,000	42,182	32	627,000	19,594	181	7,187,000	39,707	8	20,663	2,583	54	1,190,196	22,041	85	614,641	7,231
433/464																2	77,883	38,942
433/464,7,8																1	443,604	443,604
433/465																1	447	447
433/469																1	87,130	87,130
433/471																1	3,195	3,195
439	3	4,000	1,333				6	144,000	24,000	2	250,049	125,025	2	17,387	8,694	14	534,887	38,206
446	1	-	-															
461							2	66,000	33,000									
464	3	-	-				2	32,000	16,000							1	150	150
465				1	40,000	40,000	1	12,000	12,000				2	152,481	76,241	1	87,472	87,472
467	2	114,000	57,000				8	100,000	12,500							1	20,267	20,267
469	1	315,000	315,000	1	14,000	14,000	8	635,000	79,375									
Total:	34	1,208,000		40	1,217,000		271	12,200,000		16	339,868		76	1,458,872		183	9,377,396	
		Average	35,529		Average	30,425		Average	45,018		Average	21,242		Average	19,196		Average	51,243

Table 13
Detailed Local SIU Summary

SIU	CPBES			SRCSD			CSDOC			EBMUD			KCDNR			CLABS		
Category	# IU	Total GPD	GPD/IU	# IU	Total GPD	GPD/IU	# IU	Total GPD	GPD/IU	# IU	Total GPD	GPD/IU	# IU	Total GPD	GPD/IU	# IU	Total GPD	GPD/IU
1000							34	3,317,000	97,559							1	85,927	85,927
2000	20	2,520,000	126,000	17	5,871,000	345,353	92	6,220,000	67,609	32	1,283,933	40,123	32	1,369,384	42,793	59	11,398,152	193,189
3000	2	612,000	306,000	1	14,000	14,000	55	1,310,000	23,818	8	329,003	41,125	3	21,515	7,172			
4000	2	87,000	43,500	1	1,000	1,000	13	135,000	10,385	13	332,448	25,573	15	916,914	61,128	5	331,885	66,377
5000	8	554,000	69,250	1	1,000	1,000	10	175,000	17,500				4	23,453	5,863	5	167,056	33,411
6000				0			3	5,000	1,667									
7000	9	623,000	69,222	9	608,000	67,556	105	1,455,000	13,857	6	414,212	69,035	5	67,028	13,406	22	2,058,038	93,547
8000	2	397,000	198,500	1	73,000	73,000	28	1,818,000	64,929							4	1,196,010	299,003
9000				1	1,339,000	1,339,000	4	1,332,000	333,000				8	181,256	22,657		655,768	
Total:	43	4,793,000		31	7,907,000		344	15,767,000		59	2,359,596		67	2,579,530		96	15,892,836	
		Average:	111,465		Average:	255,065		Average:	45,834		Average:	39,993		Average:	38,500		Average:	165,550

Benchmarking Graphs

The following pages present a series of graphs generated from normalized benchmarking data. For each graph presented, an analysis was performed to identify reasons for the relative rankings.

Normalizing factors were developed to screen out differences caused by the size of the programs and to ensure comparisons were of "apples-to-apples" (Table 14). Template boxes for which no specific normalizing factors were identified were normalized by percent of program FTEs.

Table 14
Normalizing Factors

Template Box Name	Normalized Units
Total Source Control	FTEs and $ /mgd of POTW flow
Core Pretreatment Program	FTEs and $/ mgd of POTW flow
Permits, Categorical Permits, Local SIU	# Permits/FTE
Inspection and Sampling, Categorical SIUs	Total # of inspections and sampling events or # of combined inspections and sampling events/permit
Inspection and Sampling, Local SIUs	Total # of inspections and sampling events or # of combined inspections and sampling events/FTE
Enforcement, Categorical SIUSs	# Enforcement actions/FTE
Enforcement, Local SIUs	# Enforcement actions/Permit
Septage Hauler Program	Millions of gallons of septage per year/FTE

Total Source Control Program $ &FTEs and Core Pretreatment $ & FTEs per Average Influent mgd

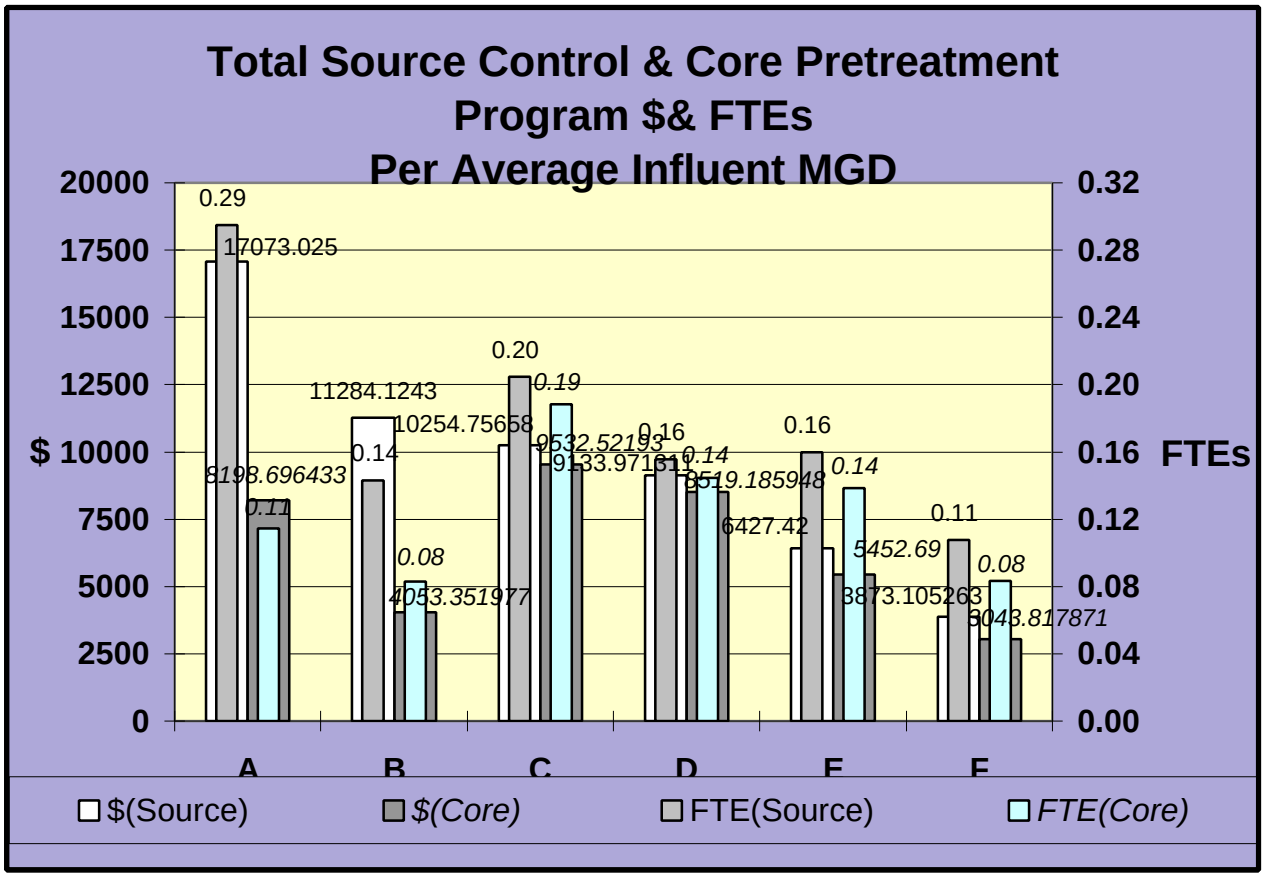
Figure 17 shows an overall comparison of the six source control programs. Costs for total source control programs ranged from $3,873 to $17,073/mgd and 0.07 to 0.29 FTEs/mgd respectively. Costs for core pretreatment programs ranged from $3,044/mgd to $9,533 and from 0.08 FTEs/mgd to 0.19 FTEs/mgd.

There is a greater variability between agencies for the total source control program than for the core pretreatment programs. The SCC group believes that the differences in costs and FTEs between the agencies is due less to differences in efficiencies of operations and more to differences in user demographics, the industrial base, biosolids management choices, the nature of the receiving water body, and the number and stringency of pollutants limited in the effluent. For example, Agency F (with the lowest cost) has a totally enclosed plant (which negates concerns regarding pollutants impacting air quality), has no effluent water toxic limits, and is not required to implement a formal pollution prevention program. Agency A (with the highest cost) has extensive effluent limitations, and integrates system-wide rate development and implementation and is required by its NPDES permit to have a formal pollution prevention program. Several agencies (C, D, and E) receive flows from other contributing areas over which full source control services are not provided. The relative difference between total cost and total FTEs of Agency B appear to be due to the amount of outside services used for providing pollution prevention outreach education.

Because of the variety of these external factors affecting cost, the SCC found it difficult to pinpoint the exact effect any of these factors caused. To assist in the analysis, correlation analyses were performed on some of the factors in Table 14. Because of the small number of data points, a level of 0.1 was chosen as significant. The correlation analyses showed that the FTEs that an agency devotes to its total source control program is correlated to the average POTW flow, but not to its significant industrial user flow. However, the FTEs the agencies devote to their core pretreatment programs are correlated to both the POTW average flow and the total SIU flow. Core pretreatment FTEs are also correlated to the flow from categorical industrial users and to the average gpd of those industrial users. This last effect was the opposite of what the SCC group expected. The SCC believed that smaller categorical users were more difficult to regulate than the larger ones.

The agency with the highest costs for the core pretreatment program (C) is not the same as for the total source control program (A). Some of the change in ranking between total source control program and core pretreatment program can be accounted for by policy decisions on whether to regulate small dischargers (non-SIUs) through the core pretreatment program or through a pollution prevention program. Agency C permits, inspects and samples non-SIUs through their core pretreatment program while other agencies control small dischargers through their pollution prevention programs. Agency B (which is the second highest in terms of dollars spent on its total source control program but drops to fifth in terms of dollars spent on its core pretreatment program) has a large pollution prevention program which is part of its local hazardous waste management program rather than part of its pretreatment program. Agency F, with the lowest dollars spent on core pretreatment, has a program that focuses on large dischargers, has few local limits, and does limited permitting and inspection of non-SIUs.

Figure 17


Total Source Control & Core Pretreatment Program $& FTEs Per Average Influent MGD
$
FTEs
20000
17500
15000
12500
10000
7500
5000
2500
0
0.32
0.28
0.24
0.20
0.16
0.12
0.08
0.04
0.00
0.29
17073.025
8198.696433
0.11
11284.1243
0.14
10254.75658
0.08
4053.351977
0.20
0.19
9532.52193
9133.971611
0.16
0.14
8519.185948
6427.42
0.16
0.14
5452.69
3873.105263
0.11
0.08
3043.817871
A
B
C
D
E
F
$(Source)
$(Core)
FTE(Source)
FTE(Core)

Source Control Program % FTES for Pollution Prevention, Rate Development and Implementation, Core Pretreatment Program

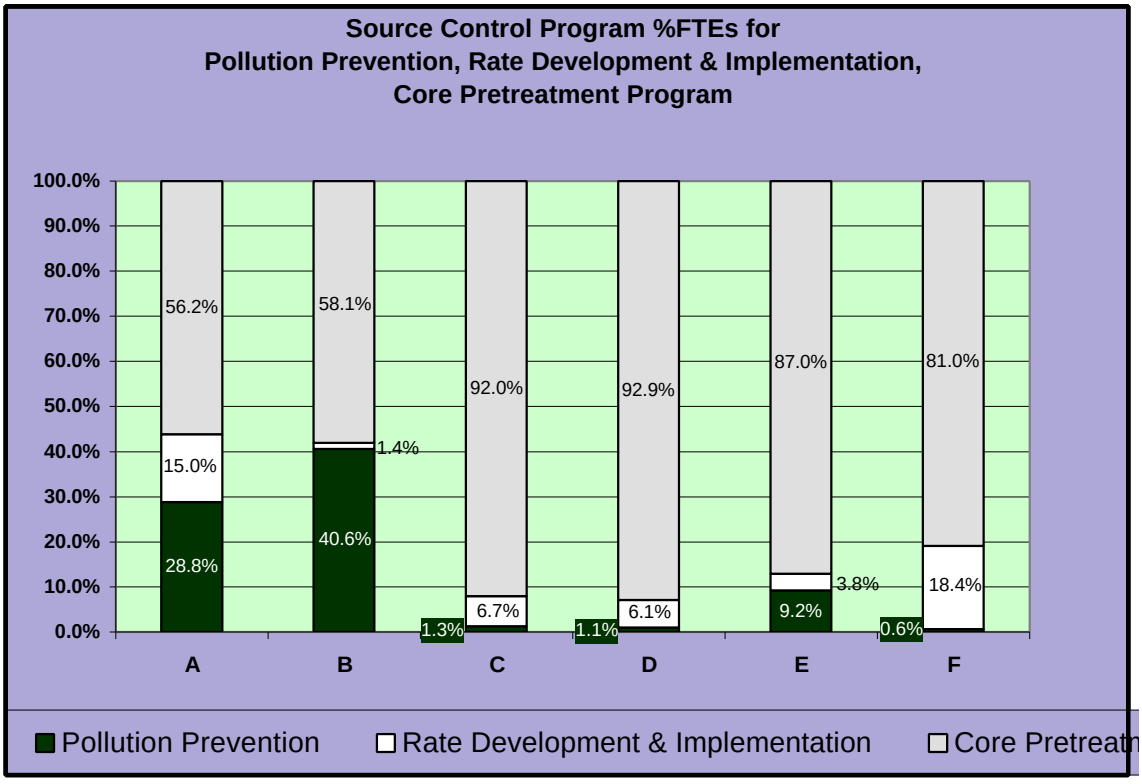
Figure 18 presents a comparison of the relative efforts by each of the agencies performing core pretreatment, pollution prevention, and rate making/implementations activities. The POTWs have considerable discretion over the program elements. However, regulatory and agency policies generally drive the extent to which resources are applied. This graph explains some of the differences between the two graphs above (total source control $ and FTEs/Avg influent mgd and core pretreatment $ and FTEs/Avg influent mgd).

The Source Control Program of Agency A has been required to develop and implement a formal Pollution Prevention Plan as a condition of its NPDES permit, and Agency B is responsible for implementing hazardous material regulations. As shown In Figure 18, all agency programs include varying efforts toward pollution prevention.

The significant effort devoted to pollution prevention by Agencies A and B compared to some of the others would ordinarily suggest that this would be an area for possible cost savings. However, both agencies have had these requirements imposed on them by outside agencies or forces, so that the actual cost-saving potential may be very small.

Agency A (which devotes 15% of its FTES to rate development and implementation) has a significant responsibility toward determining and implementing all wastewater rates and charges (residential, commercial, and industrial). The other agencies focus on developing industrial fees and collecting waste discharge information on industrial users. Agency F (which devotes 18% of its FTE resources to rate development and implementation) believes the reason for its high percentage is because the overall small size of its program makes the percentage higher.

Figure 18



Number of Local SIU Permits/Categorical Permits/FTE

The number of local SIU permits and the number of categorical permits per FTE are shown in Figure 19 Both types of permits show a considerable range among the agencies, from 32 to 172 local permits per FTE and 28 to 160 categorical permits/FTE. However, relative ratings for the two types of permits are different.

A significant portion of the differences in permits/FTE may be due to the definition of permit. Agencies C and D issue a permit to each sample site, while agencies B, E, and F issue one permit per facility. Agency A appears to have a philosophy somewhere in between the two approaches. Agency F (with only 72 SIUs) has one SIU with eight sampling sites, another with six, and others with two to three. Agency B estimates that its permit count would increase from 143 to about 240 if it issued one permit per sample site instead of one per facility. A large facility with many sampling sites requires more effort to permit than a single sample site, although with automated permitting it takes no more effort to issue multiple permits to a large facility than one permit for the same facility. The reason for this is that the work in issuing a permit is in reviewing files and regulations, visiting the site, consulting with the company representatives, and making decisions on permit limits. The actual work of producing the paper permit is relatively small, especially with an automated process.

Agency F (with 39 local SIU permits per FTE and 33 categorical permits per FTE) attributes its low numbers of permits per FTE to its philosophy of focusing on the large dischargers. Agency F does not have local limits, while the other agencies all have local limits that impose additional requirements on local SIUs and would tend to increase the time spent on them. Agency D (with 172 Local SIU permits per FTE) has a number of companies under permit for rate implementation purposes only, which require less time per permit. In general, all agencies feel they spend more time on the larger companies, so that having proportionally more large companies (or fewer small companies) results in more time spent per permit.

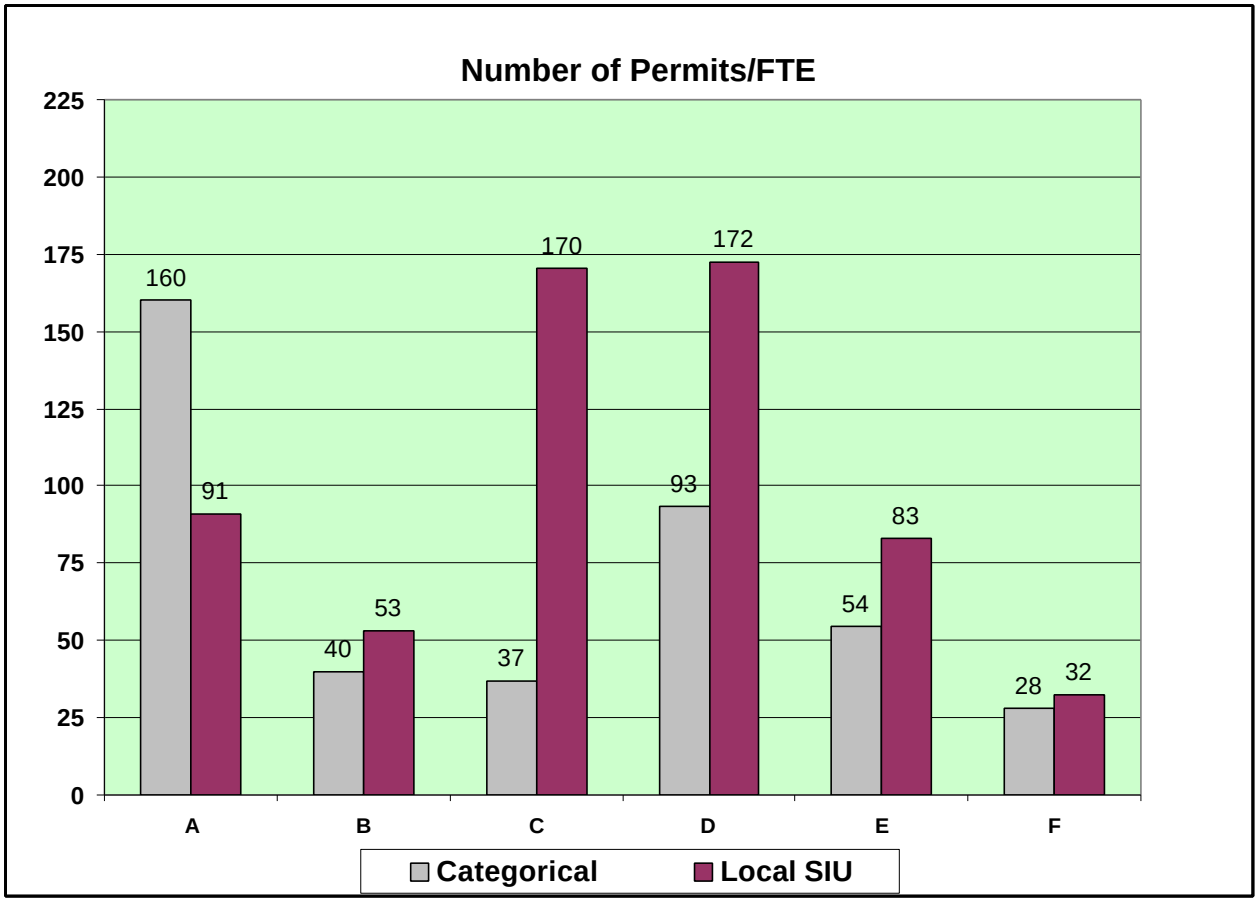
Agency A attributes its higher number of categorical permits per FTE (160/FTE) compared to local permits per FTE (91/FTE) to the fact that all of its categorical permits are electroplaters, discharge less than 10,000 gpd, occupy only one building with one sample site, and are stable companies. Difference in timekeeping also accounts for some of the differences in Agency A's numbers for both local SIU and categorical permits. Agency A has extensive pollution prevention requirements in all its permits, and uses its permits for rate implementation. Agency A recorded the time spent on the pollution prevention and rate implementation under those template boxes rather than under the permit boxes. Since time spent on pollution prevention and rate implementation helps bring a company into compliance, this appears to reduce the time spent on permit processing. Agency B (which also has an extensive pollution prevention program) focuses that program on the smaller companies which do not have permits and therefore the pollution prevention effort does not reduce the permit processing time. Agency C and D have some pollution prevention efforts in the permits and charge that time to permit processing rather than pollution prevention.

Several differences in the way permits are processed were identified. Unfortunately, it was not possible to isolate those differences to see if they created true efficiencies. Agency D is the only agency with a fully automated permit system; permits are generated automatically when clerks enter company data into the database. Agency D also generates flow diagrams for each company instead of relying on diagrams submitted by the company, which might increase processing time. Two agencies, B and F, issue draft permits and allow companies and sewer districts to comment on the permits before a final is issued, resulting in more contact with the companies and with lo-

cal sewer agencies. Agency B also puts notice in local papers of application for permit as required by state law.

A number of additional hypotheses to explain the differences were examined and found to be inconclusive. These included the average volume of discharge per permit, the number and types of different categories, and frequency of renewal. If any of these are affecting the number of permits/FTE, the affect is masked by other factors.

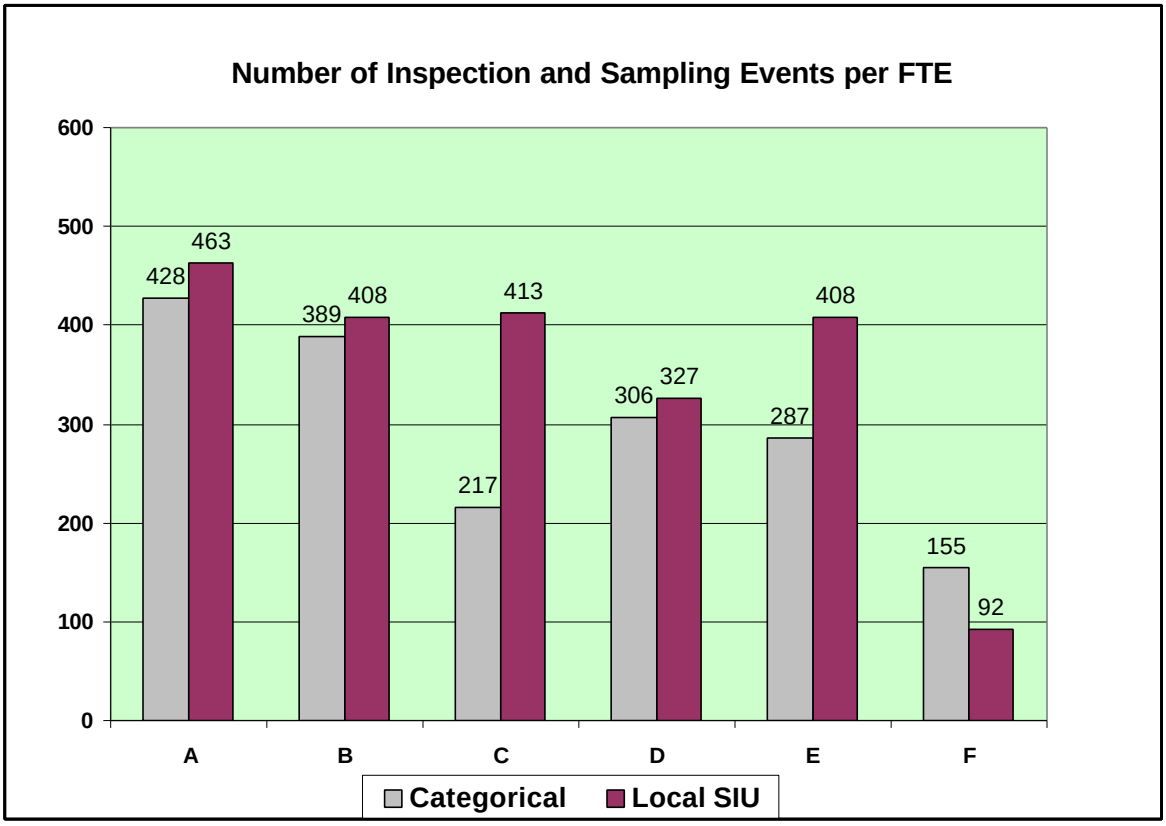
Figure 19



Number of Inspections and Sampling Events Per FTE

Figure 20 shows the normalized data for the Number of Inspection and Sampling Events per FTE. Two factors were calculated: one for categorical IUs and one for local SIUs. The high value for categorical IUs was 428 Inspection and Sampling Events per FTE, and the low was 155. For local SIUs, the high was 463 Inspection and Sampling Events per FTE and the low was 92. Both high values were from Agency A, and both low values were from Agency F.

Figure 20



The Inspection and Sampling per FTE normalizing factor was the subject of extensive discussion during the benchmarking efforts regarding not only the definitions of an "inspection" and a "sampling event" but also whether the two functions should be combined in one normalizing factor or separated. Because of difficulties of some agencies in separating the two activities, it was decided to combine the two.

In conducting a process analysis of this function, rather than reveal the efficiencies of the agencies with high numbers of inspections and sampling/FTE, it was discovered that the variance in results seems to be due more to an inconsistency in the way inspections and sampling events were counted. Although there was extensive discussion of this issue during the entire benchmarking process, factors such as lack of detailed time charge records and a difference in the way of doing business made it difficult to have an accurate "apples-to-apples" comparison.

As a result, most of the analysis of these two normalizing factors is centered on explaining the differences in each agency's process which resulted in either high or low normalized data. The findings are described below.

1. **Definition of Inspection.** One possible explanation for the higher values of Agencies A and B is that all types of field visits for these two agencies were counted as an inspection. This included post-violation inspections on discharge violations, verification of installation of pretreatment equipment, and followup inspections to verify corrective actions for IUs under enforcement. The other four agencies counted inspections only as those field visits that were full and complete inspections (some refer to these as regularly scheduled inspections). There was also inconsistency in counting inspections on IUs with zero flow. It was agreed that these inconsistencies would be further addressed in the next benchmarking effort for 1997/98.
2. **Sites/Facilities with Multiple Discharge Points.** For Agency C and D, if one facility has multiple regulated discharge points, multiple permits are issued and thus multiple inspections are counted when the facility is inspected. For Agencies B, E, and F, one inspection is counted per facility even if there are multiple discharge points. This results in a lower count for the number of inspections. Agency A utilizes a combination of both approaches.
3. **Inspection Teams**. Agency C utilizes teams of two inspectors to perform inspection and sampling. Agency E utilizes teams for sampling, although inspections are primarily performed by individuals. All other agencies, for the most part, utilize individuals, not teams, to conduct inspections or take samples. This results in a lower factor of Inspections and Sampling per FTE for Agencies C and E, since the FTEs in the denominator are higher.
4. **Surcharge Sampling** Agencies A, B, and D perform surcharge sampling at the same time as sampling for local and federally regulated pollutants. Since all the sampling is done at the same time, it was counted as one sampling event. Agencies C and E perform surcharge sampling as separate events apart from compliance sampling This inconsistency in the counting results in a lower normalized factor for those agencies that conduct surcharge and compliance sampling at the same time. Agency F relies on surcharge self-monitoring and does not perform surcharge sampling.
5. **CN, TTO, O & G Sampling.** Agencies B, D, and F collect four grab samples each for CN and total toxic organics. Results are then mathematically averaged to determine compliance. Agencies A, C and E collect only one grab sample each for CN and TTO to determine compliance. More FTEs are required to collect multiple samples.
6. **Duration of Inspection.** Agencies D and F conduct inspections that may sometimes require continuation into an additional day or days. Even so, this results in only one inspection report; therefore, it is counted as only one inspection. This fact is reflected in the lower normalized factors for these agencies.
7. **Inspection and Sampling.** Agencies A and C perform inspections and IU sampling during the same site visit. Agencies B, D, E, and F perform inspections and sampling separately, at different times. Agencies D and F utilize the same staff to perform inspection and sampling; however, inspection and sampling are done at different times. In Agency B, inspections and sampling are performed by different job classes. In Agency E, sampling and inspection activities are performed by different job classes assigned to different

divisions. Sampling in this agency is actually contracted out by the Source Control division to another division that also performs sample analysis.

After further discussion with each agency regarding the specifics of their inspection and sampling programs, the following efficiencies and program improvements were identified as possible areas for each agency to further investigate.

1. Surcharge sampling performed concurrently with compliance sampling may improve efficiency in that only one trip would be required to meet two needs. Also, as with one agency that relies solely on self-monitoring data for surcharge fee determination, the other agencies may want to consider whether surcharge sampling is even necessary.
2. Inspections and/or sampling performed by individuals rather than teams may reduce the FTEs needed to perform the job function.
3. The need for collecting four grabs each for CN, total toxic organics, and oil and grease should be evaluated by those programs that collect only one grab sample each. Although four grab samples taken to determine compliance is more time consuming, it may be necessary in order to ensure that violations will be upheld in court situations.
4. 4. Because of the numerous factors affecting the inspection and sampling normalizing results, it was difficult to isolate whether inspections and sampling performed at different times, by different job classes, or by contracting with another division, create efficiencies/inefficiencies or cost savings/increases. These areas will be further evaluated in upcoming benchmarking efforts as part of a more detailed process analysis.

Number of Inspections and Sampling (Categorical)/Permit

With the exception of Agency C, whose number is about 70% higher than the others, the numbers were consistent with each other, in spite of several differences in programs. Agency C counts each occurrence of inspection and sampling as two events, and counts extra trips taken to collect duplicates of all self-monitoring samples. Some agencies issue one permit to large facilities with multiple discharges, while others issue a permit to each discharge point. In some cases, this could be a significant variation so that it is difficult to tell from the data whether the differences are real._Most of the agencies only count “full inspections.” Agency C conducts a large number of followup enforcement inspections in response to non-compliance, and counts them as full inspections. Agency F, which had the lowest number, has a relatively small number of categorical industries with minimal non-compliance problems, conducts inspections three times per year, and samples twice.

The agencies other than C were generally in the same range, but has some significant differences in their programs. Agency B normally conducts full inspections of compliant dischargers only once per year, increasing the number per permit when a company has a violation. Agency E includes a small number of surcharge sampling events, which occur at separate times from compliance sampling. The result is a slight increase in the number. Some agencies conduct routine or scheduled inspections and sampling on separate dates. This is true for agencies that employ separate inspection and sampling crews. Agency D conducts a minimum of four inspections per year, employs one crew to conduct all sampling and inspection, and counts each visit as one event. Thirty-seven percent (37%) of the categorical users in Agency D were in non-compliance during the year, resulting in additional sampling and inspection. Most other agencies reported similar effects from non-compliance.

Number of Inspections and Sampling (Local)/Permit

The number of inspections and sampling events per permit varied significantly for every agency (Figure 21). One factor involved the number of local permits versus the number sampled. Agency D only sampled local permits that were also SIUs. Another factor was the variation in the number of samples collected and inspections conducted per year. Agency B varies the frequency depending partly on compliance records. Agency E includes a large number of surcharge samples, which may account for as much as half of their number. Surcharge samples are collected at separate times from compliance samples. Agency C also includes separate surcharge sampling. Agency C utilizes two inspectors for composite sampling, and each inspector counts time separately. Agency C also conducts separate visits to collect duplicates of all self-monitoring samples. Most of the agencies count only full inspections and composite samples, and count all work done at a facility during one day as one event. Agency C counts a sample/inspection visit as two events.

Categorical and Local SIU Enforcement Actions Per Permit

Figure 22 shows the number of enforcement actions per permit for both Categorical and Local SIUs. With the exception of Agency D, the resources applied to enforcement, normalized for the number of permits, were nearly identical for Categorical and Local SIUs. This indicates that the differences can be explained by factors other than industrial classification. Agency D indicated that there is relatively little enforcement effort directed toward Local SIUs because they are included in the program primarily because of rate issues.

Several factors were identified that could explain the differences. Policies and procedures for pH enforcement, reporting violation policies and procedures, the types of enforcement actions used, and overall program effectiveness were identified as possible explanatory factors. Several agencies indicated that violation rates have decreased over time. Firm and consistent enforcement was identified as the primary reason for the reduced number of violations. A significant percentage of violations for two of the high agencies were for pH violations. Differences in pH monitoring and enforcement procedures, rather than actual differences in compliance, are probably the cause. Agencies have received differing interpretations of the rules related to pH enforcement from their state and US EPA contacts. Allowance for pH “excursions” or reduced frequency of pH monitoring (where grab samples are used) could reduce the staff time spent on enforcement, provided the collection system is adequately protected. The highest agency indicated that majority of the reported enforcement actions were for low-level warning notices. The data do not reflect the resources spent per enforcement action. Another agency indicated that reporting violations are reduced when IUs are given telephone reminders of upcoming due dates.

One possible source of error in the data is a fundamental difference in agencies’ definition of what constitutes a separate facility for permitting purposes. At large and complex industrial sites, some agencies issue separate permits for different buildings, whereas other agencies issue a single permit with all discharges covered under a single permit. This amounts to a fundamental difference in the definition of permit. Another agency indicated that violations other than excedence of limits were not reflected in their data because it was not available in their information management system.

Figure21

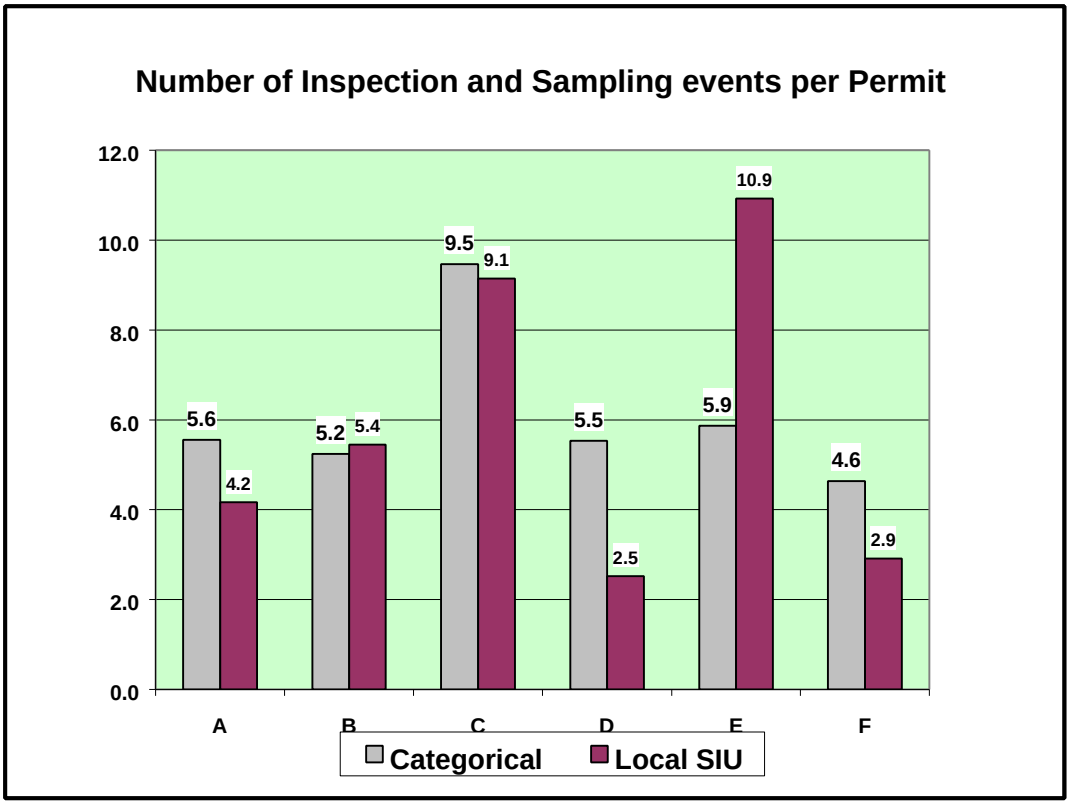
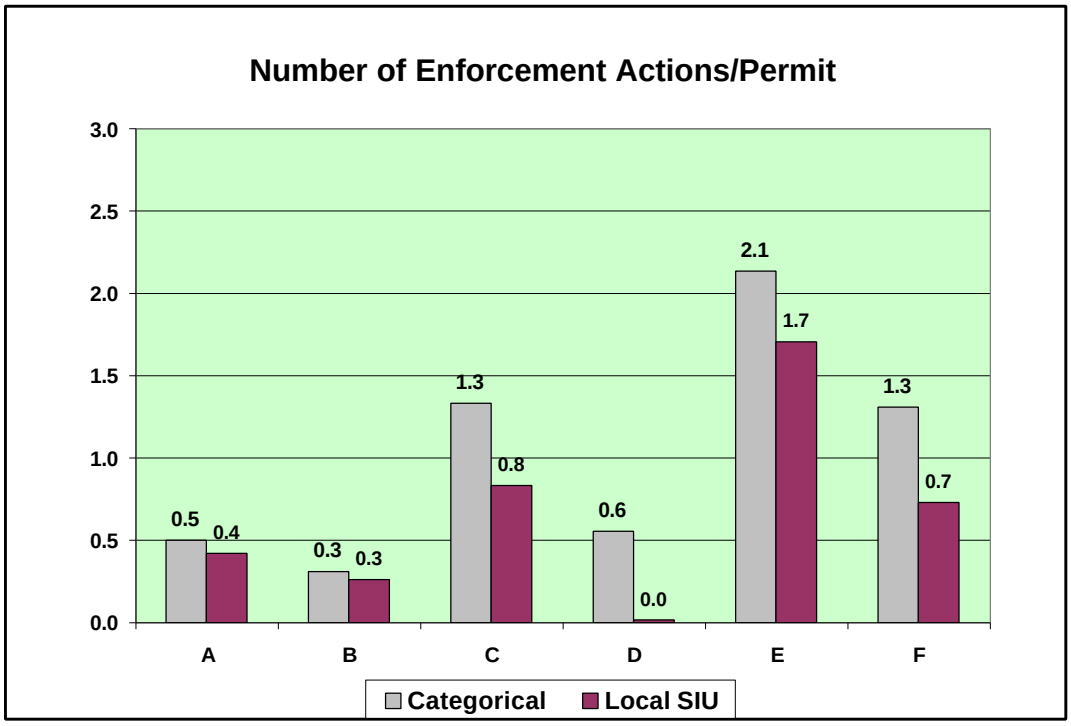


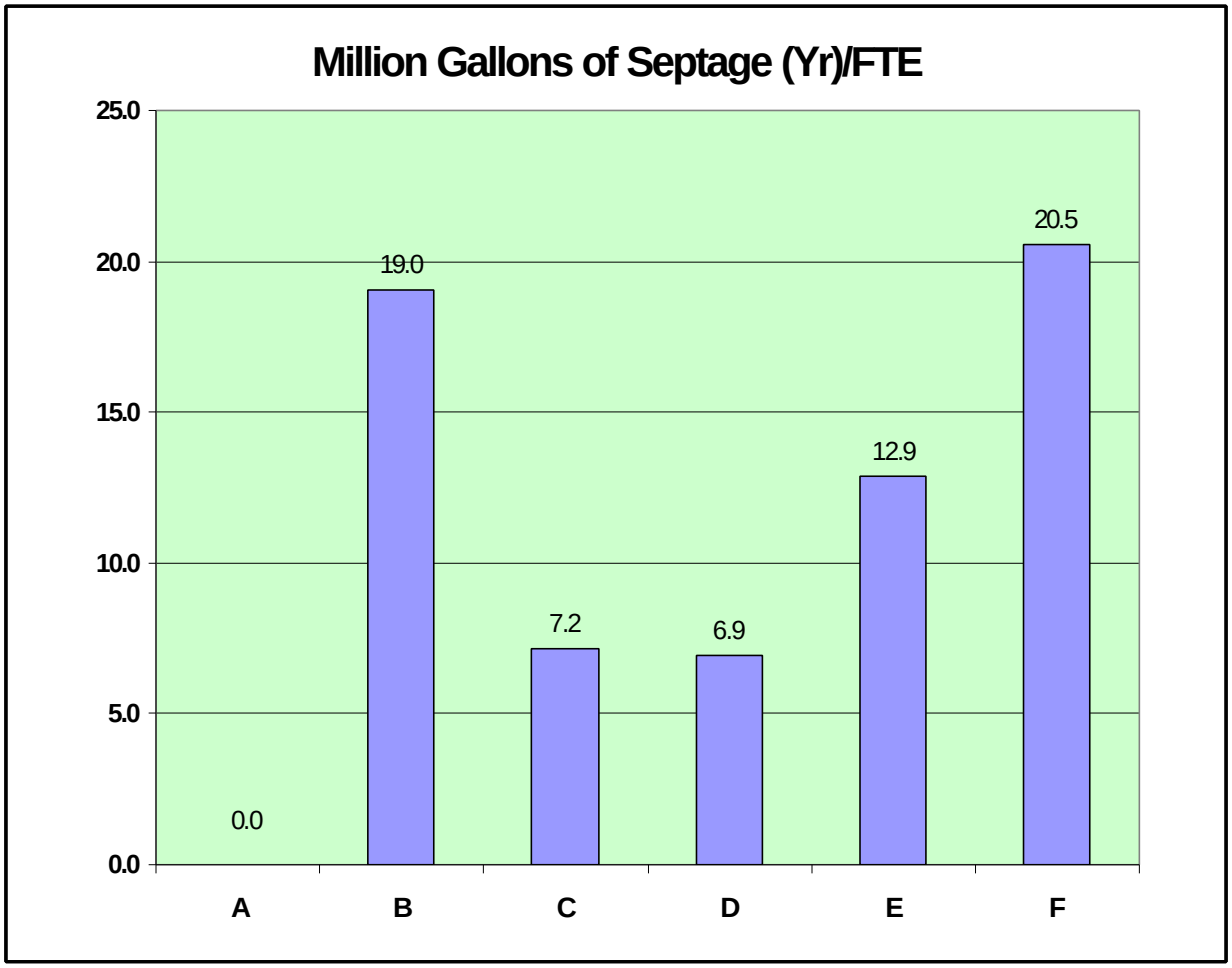
Figure 22



Million Gallons of Septage (Yr)/FTE

Agency B and F both have unmanned stations with card-key access. Both agencies have nearby large rural, unsewered areas, with no alternate disposal sites. Agency F does not routinely collect samples. Agency B collects samples from every truck once per month. Agency A has no waste-hauler disposal facilities. Agency E serves a mixed rural and urban area, and shares some of the characteristics of both. Agencies C and D are in urban areas, and spend more time on enforcement issues and sampling, which is evident in the numbers on the chart Million Gallons of Septage (Yr)/FTE.

Figure 23

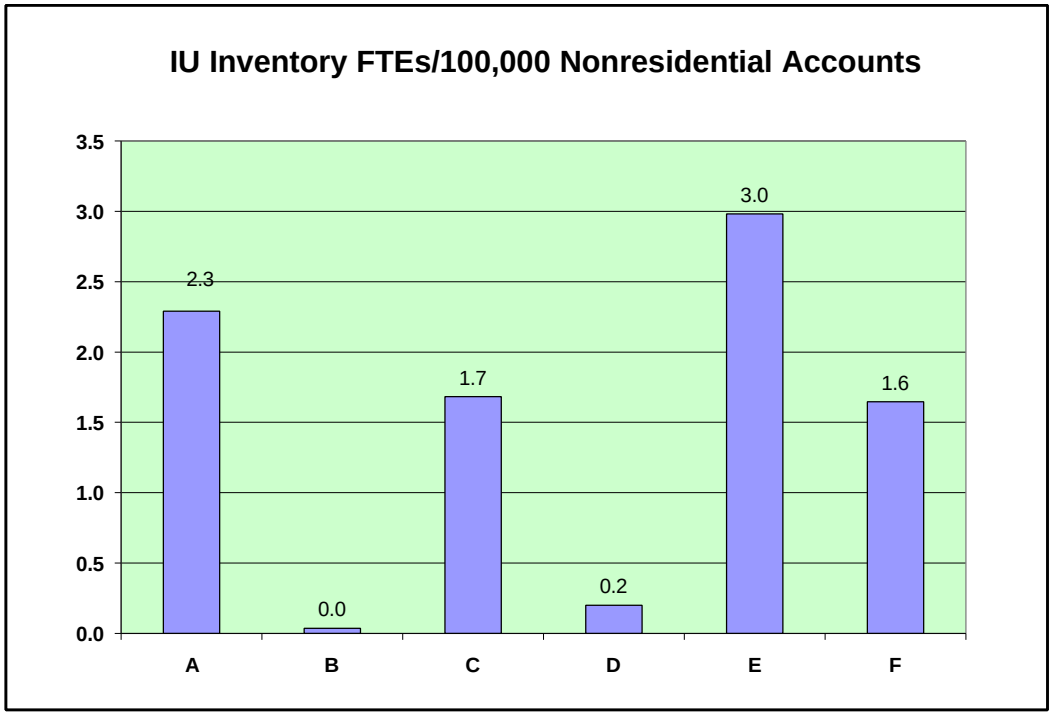


Industrial User Inventory

There was a wide range of effort reported for Industrial User Inventory (Figure 24). Full-time equivalents normalized based on the number of nonresidential accounts ranged from nearly 0 to 3.0. The two agencies that reported the lowest allocation of resources to this task reported that they expend very little effort on Industrial User Inventory. These agencies rely on survey methods such as review of the yellow pages, word of mouth, drive-by surveys, and business periodicals to identify new industrial users. Agencies reporting higher allocations of resources generally have mechanisms for identifying new industries which are linked to utility billing, business license information, or commercial business data services. Some agencies use a survey form (questionnaire) to gather information on potential IUs and most track business information using a database program.

Sources of error include possible differences in the type of activities included in the "Industrial Survey" bucket, the availability of accurate time data, and differences in the way in which the number of nonresidential accounts was determined. There may also be significant year-to-year variation in levels of effort. Some agencies conduct intensive surveys spaced several years apart rather than taking a continuos maintenance approach. The requirement for an industrial user survey in the General Pretreatment Regulations, 40 CFR 403.8 (f) (2), does not give any detailed guidance on procedures. Although procedures enabling the POTW to "identify and locate all possible Industrial Users" is subject to interpretation, all of the participating agencies have approved programs, and have passed their US EPA/state audits and inspections with respect to this program requirement. Agencies with higher resource allocations may be able to achieve reductions by adopting a less formal approach to the industrial user survey. However, agencies may use survey information to support other functions such as pollution prevention, rate implementation, system sampling, incident response and local limits development. The choice of approach to this element of the program is largely a policy decision. A rigorous and highly structured survey process may be cost effective, particularly if there are multiple uses for the information.

Figure 24



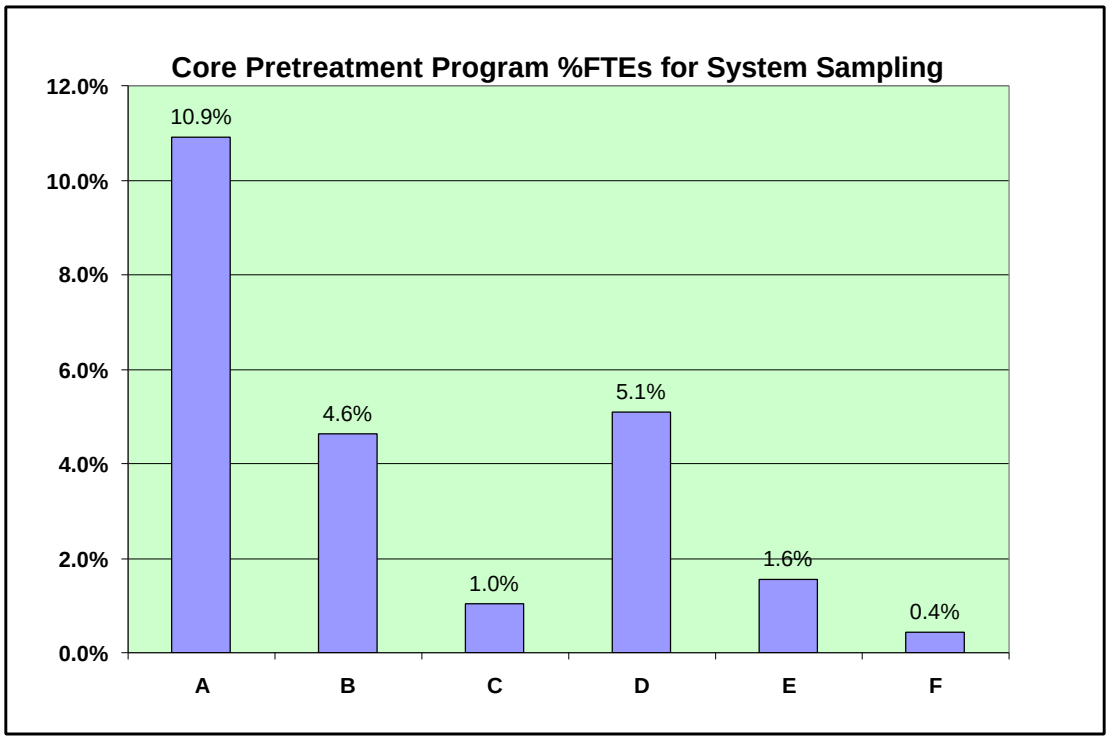
Core Pretreatment Program Percent FTES for System Sampling

The relative percent effort of system sampling varies significantly between agencies (Figure 25). Factors impacting the percentages include agency policy choices due to the relative size of the program, the diversity and complexity of the sewer collection systems, and the extent of which sewer source identification and tracking of new pollutants of concern is necessary.

Agency A (with the highest effort on system sampling: 10.9% of its FTEs) has constructed seven strategically located permanent monitoring stations to monitor changes in conditions and track new pollutants of concern occurring from all sources within contributing basins. Agency B and D both spend about 5% of their FTE resources on system sampling, about half of Agency A. The other three agencies all put less than 2% of their pretreatment FTEs on system sampling. Both B and D have programs of routine monitoring in the system but do not have permanent systems. Agency B does routine system sampling twice a year at eight locations for seven days, supplementing it with ongoing review of the daily influent followed by special investigations when influent analyses show unusually high levels of any contaminant. Agency D does monthly trunkline influent monitoring on eleven trunklines for two days. Both Agencies B and D also conduct downstream sampling investigations and surveillance in response to anonymous tips, histories of noncompliance, or requests from other agencies. Agency D also does trunkline monitoring on an irregular basis, in concentrated industrial areas to determine batch dumping of spent solutions. All agencies do system sampling as needed to gather data for local limits determination.

Other agencies have found limited value of system sampling in identifying potential sources of pollutants, preferring to spend resources getting more information directly from non-residential users and focusing on thorough industrial user surveys and detailed inspections. While the percentages indicate wide differences (0.4%-10.9%), these efforts reflect a relatively small portion of total source control program efforts.

Figure 25



Core Pretreatment Program Percent FTES for Administration, Supervision, Data Management, Clerical, and Reporting

Table 15 presents an analysis of the overall administrative effort expended in the administration, management /supervision, data management, clerical, and program reporting areas of the core pretreatment program. The overall combined percent FTEs ranged from 30.4 to 44.8% of the core pretreatment program resources.

Table 15
Core Pretreatment Program Percent FTES for Administration, Supervision, Data Management, Clerical, and Reporting

AGENCY	ADMIN	MANAGE/ SUPERVISION	DATA MNGT	CLERICAL	REPORTING	TOTAL
A	8.8	7.7	14.7	11.4	2.2	44.8
B	6.5	10.9	11.4	8.6	1.0	38.4
C	7.1	7.7	7.5	7.1	1.0	30.4
D	9.2	8.5	7.1	7.9	1.7	34.4
E	14.7	3.3	11.9	4.9	4.3	39.1
F	2.8	5.4	12.5	11.9	1.7	34.3
LOW	2.8	3.3	7.1	4.9	1.0	19.4
HIGH	14.7	10.9	14.7	11.9	4.3	56.5
AVERAGE	7.7	6.4	8.8	6.5	1.7	36.8

As shown in figure 26, for each area, the ranges vary quite widely among agencie: Administration (2.8 to 14.7%); Management /Supervision (3.4 to 10.9%); Data Management (7.1 to 14.7%); Clerical (4.9 to 11.96%); and Reporting: 1 to 4.3%. No one agency had the lowest or highest FTE use for all five areas.

In general, differences in the administration, management/supervision and clerical areas are governed by the following:

- Organizational structures;
- Operational policies;
- Employee involvement;
- Oversight of outside jurisdictional service areas; and
- Accuracy of time allocation estimates among the template boxes

Agency E recorded the lowest FTEs for the management /supervision and clerical areas but the highest for the administration area. Agency E has a high degree of employee self-directed team work that increases administration work but reduces management /supervision and clerical needs. Agency E also has oversight responsibility for seven outside service areas, which adds to administrative work. Agency F had the lowest FTEs in the administrative area and highest in the clerical area. Agency F accounted for this by having a lean staff and inconsistencies in time allocation estimates (clerical staff doing IU survey work that was allocated to clerical FTEs). Agency B had the highest management /supervision FTE allocation. Agency B believes this is

due to inconsistent time allocation between the management /supervision and administration template boxes.

For the data management area, differences appear to be related to the following:

- Inconsistent time allocations to the data management functional area;
- Extent of having a functionally integrated data management system;
- Emphasis on designing or re-engineering of a system; and
- Degree of automation for processing information and providing outputs (permits, reports, and tracking functions).

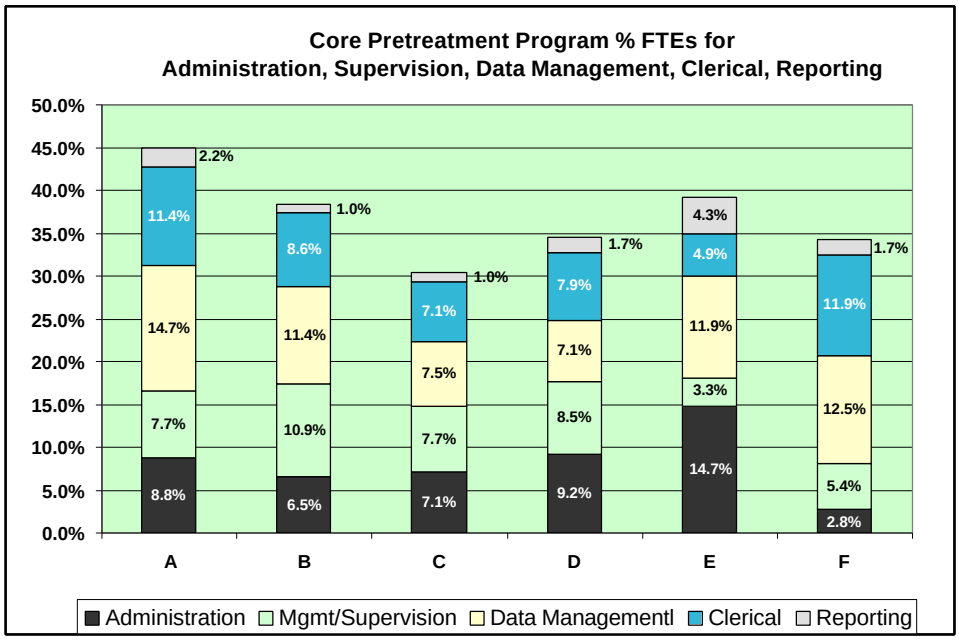
Two agencies (C and D) averaged 7.3 % of core FTEs on data management, while agencies A, B, E and F average 12.7%. Agency D's data management system appears to be the most automated and integrated. Other agencies expressed a need to upgrade their systems to improve efficiency in the data management area.

Differences in the reporting area are related to the following issues:

- Number of reports required by the Approval Authority each year;
- Extent and detail of technical information contained in reports; and
- How time was allocated for preparing reports.

Some agencies have quarterly reports that are required by their approval authority, while others have semi-annual or a single annual report. Some agencies use one person to prepare reports, while others have a shared effort among staff members. Due to the different levels of staff involved in preparing reports, time accounting may be inconsistent. The core FTEs (1 to 4.3%) used for the reporting area is not significant; however, most agencies indicated that improvements to their data management systems will decrease resources needed to prepare reports.

Figure 26



Summary and Conclusions

The source control committee (SCC) believes that the benchmarking project has been a worthwhile investment and learning experience. Through the course of the benchmark project, each agency was challenged to think about their program and work activities. Each agency came to the project with a clear notion of what a source control program was and how it should operate. It became clear early on, however, that there were significant differences in programs and for very valid reasons. Consequently, the SCC directed a substantial effort to identify the tenets of a source control program and determine whether the agencies could make meaningful comparisons. The outcome of the SCCs work did result in an initial successful benchmarking effort. The work of the SCC resulted in developing the following:

- A template that identified agreed-upon areas to benchmark;
- A set of template definitions for performance and process benchmarking;
- A set of normalization factors that facilitated performing a performance benchmarking analysis;
- A set of graphs that were used for an initial performance benchmarking analysis; and
- A completed process benchmarking survey that can be consulted for improving areas of low performance.

In general, the source control benchmarking study succeeded in providing an initial comparison among the agencies and a foundation for which future SCC work can build upon.

The SCC identified a number of conclusions based on analysis of the graphs provided in the Analysis of Program Differences section and from information discussed and exchanged during the course of the benchmarking study itself. The conclusions that were identified had repetitive themes and are discussed below:

1. **Source control programs are influenced by a number of external factors which restrict quantitative "apples-to-apples" performance benchmarking.** The core pretreatment program is implemented under the 40 CFR 403 general pretreatment regulations. While the regulations are prescriptive in nature and require specific programmatic functions and minimum required activities, other factors dictate the scope and process of how a program is implemented at the local level. Such things as policies of the agency's regional US EPA office, policies of the state or US EPA approval authority, amount of oversight by the approval authority, and philosophies of the umbrella agency in which the pretreatment program resides can all influence the scope of the pretreatment program. Other issues such as local citizen involvement, NPDES requirements, local water quality issues, and industrial user base impact program operations. All of these circumstances fashion an "unwritten standard" under which a program operates to "fit" local needs. The outcome of all of these factors results in programs that differ substantially in scope and emphasis. Consequently, these external factors made the performance benchmarking effort difficult in terms of identifying "best practices" and the SCC views the benchmarking information as primarily a qualitative assessment.
2. **The information collected by the agencies for the performance benchmarking effort contains inconsistencies and further refinement is needed to improve comparisons before making any final conclusions.** The major effort for the first phase of the study was to identify areas to benchmark, strictly define those areas to facilitate direct comparisons, and then collect the appropriate information to make comparisons. The SCC real-

ized late in the process that a number of definitions including those for inspections, permits, enforcement, sample types (grab versus composite), and SIU needed further discussion to complete the analysis and make refinements. In addition, other inconsistencies exist due to time allocation of FTEs and normalization information. This resulted from differing interpretations of definitions, lack of time-keeping information, and inconsistent tabulating of specific activities (e.g., number of inspections, samples). For example, some agencies do not keep detailed time records to accurately allocate FTE information for the template areas and rough estimates were used. Other agencies kept detailed time records that provided more accurate time allocations. These problems were repetitively mentioned in the analysis of the graphs and were recognized as problem areas during the course of the benchmarking study. Other areas that need additional consideration include sampling (agency versus self-monitoring) and inspection frequencies and agency policies regarding P2 programs, system sampling, septage programs, special projects and IU inventory updating efforts. These issues should be addressed in the next phase of the study to provide for more consistent comparisons.

3. **The process benchmarking study resulted in separating source control activities into core pretreatment and total program areas to facilitate making meaningful comparisons.** The SCC determined that to make meaningful comparisons, it was necessary to divide the source control template into a "core" pretreatment program template and a total source control program template. The difference between the core and total program templates is that the core template does not contain the pollution prevention and rate development and implementation template boxes. This was necessary because of the differences in resources spent by the agencies in these template boxes. Only two agencies (A and B) spend significant resources on pollution prevention. Agency A has a mandatory NPDES requirement to implement a pollution prevention program, while agency B has an intergovernmental regional emphasis on pollution prevention. The other agencies spend considerably less, if any, resources on pollution prevention. In the rate development and implementation areas, only one agency (A) spends considerable resources in these template areas. Consequently, both the pollution prevention and rates development and implementation boxes were removed to provide a core pretreatment program to provide better comparisons.
4. **The SCC completed a process benchmarking survey, which needs further analysis and refining to identify best practices.** The SCC develop a comprehensive process benchmarking survey which included questions for all template boxes. The survey resulted in collecting a substantial amount of information on each agency's practices. The SCC did not evaluate the survey to identify best practices because the majority of time was directed to completing the performance benchmarking effort. The SCC agrees that in Phase 2 of the study, the process survey needs to be analyzed to identify any refinements and possible best practices.
5. **The SCC identified one agency (D) as having a data management system that provides for efficiencies in the data management, permitting and violation tracking areas that can be examined by other agencies for making program improvements.** Agency D has a highly integrated data management system that provides for automatically generating permits, identifying violations, and for preparing reports, notices, violation letters, and other information. Agency D believes this leads to more efficient use of permitting, data management and reporting resources. The system, however, does need improvements in tracking outstanding, non-returned IU reports.

6. **Some agencies may improve performance in the inspection and sampling per FTE area.** Some agencies collect samples for surcharge and compliance sampling separately and may improve efficiency by concurrent sampling so that only one trip would be used to meet two needs. Some agencies use teams rather than individuals to perform inspections and/or sampling. Use of individuals rather than teams may reduce FTEs and provide for more efficient use of resources. One agency has sampling performed by a different division and may want to evaluate the efficiency and effectiveness this practice.
7. **The benchmarking study did not identify a set of "best management practices" that describe a model program from which agencies can make comparisons to make improvements.** Each agency was able, however, to identify an area(s) to evaluate for program efficiency improvements. One encouraging outcome of the benchmarking effort is that each agency was able to identify an area(s) where program improvements can be evaluated. During the next year, each agency will review the following areas to make program improvements:
    a. Upgrade data management systems to include a higher degree of integration and automation.
    b. Update IU inventory through a comprehensive survey and finalize a data management system.
    c. Evaluate IU sampling and inspection frequencies to improve efficiency, revamp data management system, and improve permit management efficiency.
    d. Evaluate time-keeping records to determine if under-reporting occurred in enforcement, permitting, batch discharge inspection, and certification areas.
    e. Finalize a new data management system, evaluate sampling policies and efficiencies, evaluate the influence new local limits on violation frequency, and implement a time-keeping system.
    f. Evaluate inspection process and data management system to improve efficiency.

At the completion of the second year of the study, each agency will be able to compare its results and determine improvements in program performance.

Based on this year's experience, the SCC Team predicts that performance or metric benchmarking of Source Control programs would be more effective at a detailed, task-oriented level. This is because, aside from having a budget smaller than other plant cost-centers, the typical Source Control program's budget is also more heavily dominated by salaries/FTEs. Yet, in the interest of examining and accurately proportioning plant-wide expenses, the MABS FY97 seven-level Template structure, and even the agency FIS structures upon which it is based, are deliberately designed to capture large cost-centers. Indiscernible within these larger dollar categories is the cost detail necessary for evaluating labor practice efficiencies such as: team versus single sampling and inspection, or use of a single person versus use of separate staff to handle sampling and inspection. Attention to these work practices—a task focus—would be the key to finding cost reductions.

Appendix A:
Template Definitions(Revised 8/28/98)

1. **(1A) ADMINISTRATION**

   Resources and/or labor associated with:
   Staff meetings
   Nonplanning related budgeting (pulling budget together)
   Timekeeping
   Internal reports (monthly reports, status reports)
   Participating in planning (work planning)
   Safety committee work
   Continuous improvement processes
   Coordination and contractual agreements with other agencies/jurisdictions
   Policy development and ordinance revisions unlesss specifically tied to one of the other template activities.
   Public information including public disclosure activities.
   Administration. associated with pollution prevention, rate development, and rate implementation is not included.

2. **(1B) MANAGEMENT/SUPERVISION**
   Resources and labor associated with management and supervision. Any FTE that is responsible for writing performance appraisals is a manager or supervisor. This category includes the time of any manager who is directly responsible for management of the Source Control Program whether classified as manager or supervisor. The actual amount of FTE attributed to supervision will be determined by actual time on the following supervisory responsibilities:
   Management of staff
   Direction of staff
   Staffing schedules
   Reviewing and signing time sheets
   Planning/program development
   Budgeting for programs (not pulling budget together)
   Supervisor/Manager time spent on workman's comp, etc. re: specific employees
   Supervisor/Manager time spent on hiring, discipline, etc. for specific employees
   Management/supervision associated with pollution prevention, rate development, and rate implementation is not included.

3. **(1C1) PERMITS, CATEGORICAL**
   Resources and/or labor associated with:
   IU Discussions/Negotiations
   Permit Processing
   Plan Review
   Application Processing
   Permit administration/compliance review
   SDPC TTO Plan Review/Approval
   Application of site specific user charges if included in permits

4. **(1C2)PERMITS, LOCAL SIU**
   Resources and/or labor associated with:
   IU Discussions/Negotiations
   Permit Processing
   Plan Review
   Application Processing
   Permit administration/compliance review
   SDPC TTO Plan Review/Approval
   Application of site specific user charges if included in permits

5. **(1C3) PERMITS, NON-SIU**
   Resources and/or labor associated with:
   IU Discussions/Negotiations
   Permit Processing
   Plan Review
   Application Processing
   Permit administration/compliance review
   Batch discharge or special discharge approval
   SDPC TTO Plan Review/Approval (if applicable)
   Application of site specific user charges if included in permits

6. **(1D1) INSPECTION AND SAMPLING, CATEGORICAL**
   Resources and/or labor associated with:
   Combined sampling and inspection events
   Discrete sampling or inspection events
   Investigations at facility location
   Preparation of field inspection notes
   Field IU Surveys
   Surcharge or user charge sampling
   Annual major facility inspections and permit reviews

7. **(1D2) INSPECTION AND SAMPLING, LOCAL SIUs**
   Resources and/or labor associated with:
   Combined sampling and inspection events
   Discrete sampling or inspection events
   Investigations at facility location
   Preparation of field inspection notes
   Field IU Surveys
   Surcharge or user charge sampling
   Annual major facility inspections and permit reviews

8. **(1D3) INSPECTION AND SAMPLING, NON-SIU**
   Resources and/or labor associated with inspection and sampling of non-SIUs with permits or other control mechanisms:
   Combined sampling and inspection events
   Discrete sampling or inspection events
   Investigations at facility location

Preparation of field inspection notes
Field IU Surveys
Surcharge or user charge sampling
Annual major facility inspections and permit reviews

9. **(1E) SYSTEM SAMPLING**
   Resources and/or labor associated with:
   Periodic Collection System Sampling Programs
   Headworks Sampling
   Investigations/Incident Response in Collection System
   Upstream/downstream monitoring (investigations)

10. (1f1) ENFORCEMENT, CATEGORICAL SIU
    Resources and/or labor associated with written enforcements including:
    Progressive Enforcement Action in Response to Violations
    NOVs, Cease & Desist Orders, Administrative Actions, Injunctions, Fines, Enforcement Fees, Penalties, etc.
    SNC Determination

11. **(1f2) ENFORCEMENT, LOCAL SIU**
    Resources and/or labor associated with written enforcements including:
    Progressive Enforcement Action in Response to Violations
    NOVs, Cease & Desist Orders, Administrative Actions, Injunctions, Fines, Enforcement Fees, Penalties, etc.
    SNC Determination

12. **(1f3) ENFORCEMENT, NON-SIU**
    Resources and/or labor associated with permitted written enforcments of non_SIUs with permits or other control mechanisms, including:
    Progressive Enforcement Action in Response to Violations
    NOVs, Cease & Desist Orders, Administrative Actions, Injunctions, Fines, Enforcement Fees, Penalties, etc.
    SNC Determination

13. **(2) POLLUTION PREVENTION AND UNPERMITTED DISCHARGERS PROGRAMS**
    Resources and/or labor associated with:
    Source identification for new pollutants
    Waste minimization audits
    Public outreach to commercial dischargers
    Public outreach to households not including hazardous waste collection events or facilities
    Public outreach to schools and other organizations
    Coordination of P2 activities with other agencies
    Commercial program certification
    Incentive programs
    Technical assistance
    Sampling for pollution prevention activities
    Dry cleaner/auto shop/other similar group programs including inspections and enforcement

of nonpermitted dischargers
Administration, supervision, and program reporting associated with pollution prevention activities.

14. **(3A) RATE DEVELOPMENT**
Resources and/or labor associated with:
Development of user charges as relate to industrial users.
Permit fee calculations
Noncompliance fees
Administration, supervision, and program reporting associated with rate development.

15. **(3B) RATE IMPLEMENTATION**
Resources and/or labor associated with:
IU Discussions/Negotiations with specific companies related to rates if not included in permit process
Calculations of company or site specific billings using agency developed rates, if not included in permit process
Permit Processing
Plan Review
Application Processing
Initial billing and fee collection, collection of past due fees, and activities on past due accounts.
Administration, supervision, and program reporting associated with rate implementation.

16. **(1g) PROGRAM REPORTING**
Resources and/or labor associated with:
Pretreatment Reports to Oversight Agency
Pollution Prevention Reports to Oversight Agency
SNC Publication
Response/Follow-Up to PCI or Audits
Program reporting associated with pollution prevention is not included.

17. **(1H) SEPTAGE HAULER PROGRAM**
Resources and/or labor associated with:
Permitting for septage
monitoring
anything else re: septage haulers

18. **(1I) SPECIAL STUDIES**
Resources and/or labor associated with:
Local limits development
Studies of new pollutants of concern in WTP not necessarily leading to pollution prevention activities
Targeting particular groups
Tracking sources of particular pollutants
Evaluating different pretreatment technologies

19. **(1J) USER INVENTORY**
    Resources and/or labor associated with:
    Identification and Verification of Dischargers
    -Office support

20. **(1K) DATA MANAGEMENT**
    Resources and/or labor associated with:
    Computerized programs and programming
    Data base administration
    Data entry, including entry of self-monitoring data

21. **(1m) OTHER**
    Resources and/or labor associated with activities in the domain of source control but not specifically defined in the other template boxes:
    Union negotiations and activities by both staff and supervisors/managers

22. **(1l) CLERICAL**
    Resources and/or labor associated with:
    Secretarial and other clerical services specifically in support of the Source Control Program.

23. **TRAINING (IN ADMIN TEMPLATE)**
    Resources and/or labor associated with:
    Registration, class tuition, staff time spent in training classes, both technical and "soft training" such as communication skills, team-building, supervisory training.

24. **LABORATORY SERVICES (in laboratory template)**
    Cost of laboratory analyses of all samples collected for source control program including compliance samples, rate development and implementation, system sampling, pollution prevention, and special studies.