



Annual Report 2002-2003

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INTRODUCTION

The Office of Water Programs (OWP) is a nonprofit, self-supporting unit of the California State University, Sacramento Foundation. The OWP includes a Training Group and a Research Group. Since 1972, the Training Group has provided high-quality, low-cost training programs for drinking water treatment plant and distribution system operators and for wastewater collection, treatment, and disposal system operators. The revenue generated by these training programs supports our students, keeps our training materials current, promotes our program, and funds development of new training materials and methods. During the 2002-2003 fiscal year, 57,373 manuals, 13,834 enrollments, and 363 sets of videos were purchased. Over 8,884 students successfully completed their courses.

Several new courses were offered for Continuing Education Units (CEUs) this year, including an on-line course, **Small Water System Operation- Wells**, for 1.5 CEUs. Three sets of training videos are also being offered for CEUs. The Training Group will continue to develop its popular manuals into CD-ROM and on-line courses.



The Research Group began work on three new contracts this year in addition to its long-standing contract with Caltrans. The group will test drain inlet inserts for the California Integrated Waste Management Board at a new testing facility to be constructed on the CSUS campus. For the State Water Resources Control Board, researchers will survey six communities to estimate the costs to municipalities of complying with their Stormwater permits. And for the California Stormwater Quality Association (CASQA), the group will develop tests and on-line testing for



four Stormwater Best Management Practices handbooks. The handbooks and tests will be offered for CEUs beginning next spring.

The OWP expanded its on-line certification program this year with the addition of a **Water Treatment Plant Operation Specialist Certificate**. Students can earn the certificate by completing three courses in operation and maintenance of water treatment facilities. Two students have already earned their certificates, and 27 more have completed one or more of the courses.

The Office of Water Programs looks forward to moving into Modoc Hall in 2004 where both groups will be under one roof, making it easier to share resources and continue to work together to provide state-of-the-art training and research.

TRAINING GROUP

NEW COURSES

Collection Systems: Methods for Evaluating and Improving Performance

This new course is based on the training manual of the same name. The purpose of the course is to provide collection system personnel with techniques for evaluating the adequacy and effectiveness of the wastewater collection system operation and maintenance program and to identify areas where improvements could be made.

Small Water System Operation – Wells

This course is being offered for the first time this year. Students who enroll receive a CD containing some of the training materials. To complete the course, students use both the CD and additional training materials available over the internet. Upon completion of their studies, students take an on-line final exam. Operators should be able to protect a well from contamination, identify the parts of a well and pump system, maintain and rehabilitate a well, operate and maintain a well pump and hydropneumatic pressure tank, inspect a well and pumping system,

disinfect wells and pumps, keep accurate records of a well and pumping system, remove sand from water and mains, troubleshoot a well and pumping system, select a well site, describe the types of wells and drilling methods, test and evaluate a well and pump, and abandon and plug a well no longer productive or needed.

WATER TREATMENT PLANT OPERATION SPECIALIST CERTIFICATE

The Office of Water Programs offers a **Water Treatment Plant Operation Specialist Certificate** program, which is designed to prepare students for beginning successful careers in the drinking water industry. Classes are offered as correspondence courses using the highly popular training manuals published by the Office of Water Programs. The correspondence format enables students to work at their own pace and to schedule studies around their other commitments. The certificate program consists of three courses in operation and maintenance of water treatment facilities:

- **Water Treatment Plant Operation I (CE 28A)**
- **Water Treatment Plant Operation II (CE 28B), and**
- **Small Water System Operation and Maintenance (CE 29)**

Students can earn the **Water Treatment Plant Operation Specialist Certificate** from the university by completing these three correspondence courses and passing a comprehensive final exam for each course (the final exam must be taken on line).



NEW TRAINING VIDEOS

Collection System Operation and Maintenance

These training videos complement Volumes I and II, **Operation and Maintenance of Wastewater Collection Systems**. The video series is suitable for potential, new, and experienced collection system operators and will help prepare them to safely operate and maintain both sanitary and combined sewer systems. Each video is approximately 30 minutes long. These videos demonstrate the equipment and procedures collection system crews use to safely and effectively operate and maintain their collection systems. Students enrolled in the video training program will learn how to properly identify, solve, and record solutions to existing and potential collection system problems. The titles and main topics of the six videos are:

- **Guardians of Health:** Emphasizes the importance of operators, inspectors, and testing
- **TV Stars:** Closed-circuit television inspection
- **Pipe Detectives:** Pipeline cleaning and maintenance methods
- **Way Makers:** Pipeline cleaning and chemical control
- **Flow Movers:** Operation of wastewater lift stations
- **Motor Specialists:** Maintenance of wastewater lift stations

Pretreatment Facility Inspection

This set of five training videos provides an excellent introduction to the knowledge, skills, and abilities needed by new pretreatment facility inspectors. Experienced inspectors also will find helpful ideas on how to improve their performance. Each 30-minute video portrays real-world experiences and features inspectors of industrial pretreatment facilities performing actual tasks. The videos can be used alone or to enhance the training provided in the **Pretreatment Facility Inspection** training manual. This training program includes the following videos:

- **Meeting the Goal Together:** The pretreatment facility, the inspection program, responsibilities of inspectors and administrators, protection of the environment, and the importance of ethical performance.

- **Taking a Closer Look:** How to conduct an inspection, scheduling, entering an industry for an inspection, level of inspection, after the walk-through, and report writing.
- **Starting at the Source:** How to inspect a metal finishing industry, on-site industrial inspections, pollution prevention, and data management.
- **Taking up a Collection:** Reasons for sampling, preparation for sampling, proper sample collection and handling, transporting samples, and chain of custody.
- **Going With the Flow:** Sampling and flow monitoring, instrumentation, and automatic samplers.

CD-ROMS AND ON-LINE TESTING

This year the Office of Water Programs embarked on a program to offer our students alternative modes of training. We will continue to produce our printed training manuals, but will also be producing CD-ROM versions of all of our courses. Material in the CDs is the same as the material in the respective printed manuals, although the CDs contain some useful enhancements such as search functions. Students who enroll to earn CEUs may use either version or both together. The CD version of the **Small Water Systems Video Information Series** (3 CDs) and the CD version of **Operation of Wastewater Treatment Plants, Volume I**, have been completed. Both courses are available for purchase.

COMPUTER-BASED TRAINING DEVELOPMENT

The rapid expansion of computer availability has fostered a demand for computer-based and internet-based training. In response to that demand, the Office of Water Programs is developing computer-based training that integrates the internet and CDs with our training manuals. These new and exciting formats offer enhancements to our manual-based correspondence courses. Students follow web-based lessons and links to animations, video clips, websites, and on-line exams. The first courses

developed using these new formats are in small water system operation and maintenance. Each course provides 15 contact hours of training, which can be applied toward CEUs or specialized training requirements for drinking water operator certification.

TRANSLATIONS

The Office of Water Programs and the National Environmental Training Association (NETA) have partnered with operators from Comisión Estatal de Servicios Públicos de Mexicali (CESPM) and de Tijuana (CESPT) to translate portions of two of our manuals into Spanish:

- **Operación y Mantenimiento de Sistemas de Recolección de Aguas Residuales** (from **Operation and Maintenance of Wastewater Collection Systems, Vols I and II**), and
- **Operación de Plantas de Tratamiento de Aguas Residuales** (from **Operation of Wastewater Treatment Plants, Vols I and II**).

At the request of the U.S. Agency for International Development (USAID), the Office of Water Programs presented a proposal to translate **Operation of Wastewater Treatment Plants, Volume I**, into Arabic. We anticipate that there will be a substantial demand for this translation.

WEBSITE

The website (www.owp.csus.edu) for the Office of Water Programs has been redesigned and now provides access to information about both the Training and Research groups. Users can find and download our research papers, use specialized software developed for stormwater applications, order manuals, and enroll in courses. Links to other websites provide up-to-date information on current regulations, emerging technologies, and management of utility agencies.

NEW CONTRACTS

California Department of Health (CDH)

The CDH has contracted with the Office of Water Programs, through CSUS Foundation, to develop and produce training videos and an on-line operator training course for operators of both water treatment plants and water distribution systems. These training opportunities will allow operators to earn contact hours needed to renew operator certificates.

Sacramento County Regional Sanitation District

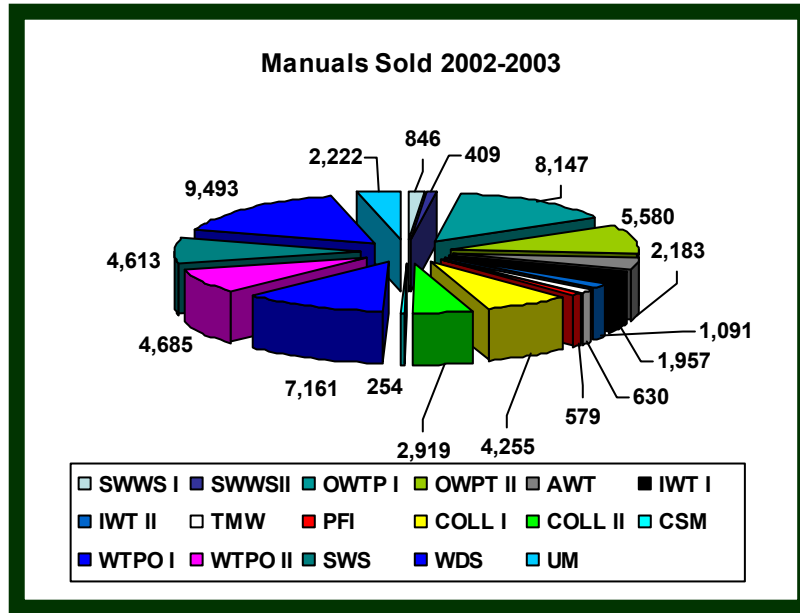
The OWP has been awarded a contract to produce three technical reports evaluating engineering sustainability, energy costs and use, and environmental implications of vitrified clay and polyvinyl chloride sewer pipe materials.

California Stormwater Quality Association (CASQA)

The Office of Water Programs has contracted with CASQA to print, store, inventory, and distribute four Stormwater Best Management Practice handbooks. In addition, OWP researchers are developing tests and study guides for these handbooks. OWP will offer Continuing Education Units for completion of the tests beginning next spring.

UPDATES

The Office of Water Programs continues to update and promote its manuals. This year we added **Small Wastewater System Operation and Maintenance, Volume II**. We have also updated several manuals, including **Industrial Waste Treatment, Volume II**, **Water Distribution System Operation and Maintenance**, and **Small Water System Operation and Maintenance**.



Key to Abbreviations

SWWS I:	Small Wastewater System Operation and Maintenance , Vol. I
SWWS II:	Small Wastewater System Operation and Maintenance, Vol. II
OWTP I:	Operation of Wastewater Treatment Plants, Vol. I
OWTP II:	Operation of Wastewater Treatment Plants, Vol. II
AWT:	Advanced Waste Treatment
IWT I	Industrial Waste Treatment, Vol. I
IWT II:	Industrial Waste Treatment, Vol. II
TMW:	Treatment of Metal Wastestreams
PFI:	Pretreatment Facility Inspection
COLL I:	Operation and Maintenance of Wastewater Collection Systems, Vol. I
COLL II:	Operation and Maintenance of Wastewater Collection Systems, Vol. II
CSM:	Collection Systems: Methods for Evaluating and Improving Performance
WTPO I:	Water Treatment Plant Operation, Vol. I
WTPO II:	Water Treatment Plant Operation, Vol. II
SWS:	Small Water System Operation and Maintenance
WDS:	Water Distribution System Operation and Maintenance
UM:	Utility Management

RESEARCH GROUP

For the past five years, OWP engineers and scientists have assisted Caltrans in planning and managing its stormwater research program. The major elements of this program are characterization monitoring and field testing of best management practices (BMPs). The OWP is an affiliate member of the California Stormwater Quality Association (CASQA).

During the past year, the Research Group continued to assist Caltrans in monitoring stormwater runoff from 120 sites throughout the state. As part of the effort, various data validation, management, and evaluation tools were developed or enhanced. Additional special projects are also ongoing to study litter, highway congestion, the effectiveness of drain inlet cleaning, pathogens, herbicides, toxicity, California Toxics Rule (CTR) constituents, and first flush characteristics. All of these efforts are in compliance with the existing National Pollutant Discharge Elimination System (NPDES) permit or court order requirements, or in anticipation of



expected future regulations. Results of these studies have been and will continue to be applied in the design and development of stormwater treatment technologies.

The Applied Studies Team is currently conducting various stages of 91 full-scale pilot studies and 16 small-scale studies. Sixty-one full-scale studies are currently in the operation or final reporting phase and include the following technologies: alternative media filters, constructed wetlands, drain inlet inserts, extended detention basins, gross solids removal devices (GSRDs), infiltration, oil/water separators, sand filters, sand traps, and roadside vegetated treatment systems. Thirty full-scale pilot studies are in the scoping/design/construction phase and include the following technologies: alternative media filters, bioretention, constructed wetlands, sand traps, extended detention basins, and GSRDs. In addition, pilot studies on 11 GSRDs were completed. The small-scale laboratory in the

Tahoe Basin tests various combinations of sedimentation, filtration, and chemical addition. Thirty studies were completed during the past year and 15 more studies are in the design phase.

This year's erosion research projects focused on improving vegetation establishment and water quality for roadside slopes. The Soil Erosion



Control New Technology Report was completed this year. The Report summarizes two years' research and testing results on over 250 potential new products for Caltrans pilot testing. The Roadside Vegetated Treatment Sites Study, which assess vegetated biofilters and stormwater pollutant removal, was completed after two years.

NEW CONTRACTS

California Stormwater Quality Association (CASQA)

In addition to printing and distribution services provided by the OWP Training Group, the Research Group is developing tests and study guides for four Stormwater Best Management Practice handbooks. OWP will offer CEUs for completion of the tests beginning next spring.

California Integrated Waste Management Board

OWP researchers are evaluating the effectiveness of several drain inlet inserts for removing oil and grease from stormwater. A small testing facility will be constructed on the CSUS campus and the project will run through April of 2004.

State Water Resources Control Board

The State Water Resources Control Board has contracted with the Office of Water Programs to survey six communities to estimate the costs to municipalities of complying with their stormwater permits. This project will be completed in March 2005.

SHARING OUR RESEARCH

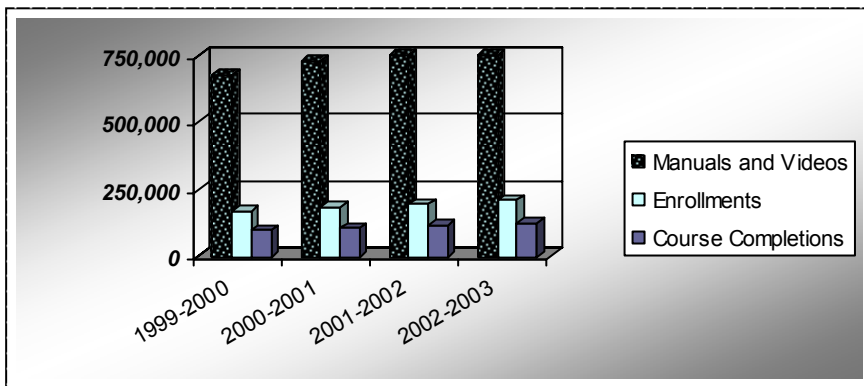
The Research Group shares its expertise with transportation and storm-water professionals by publishing and presenting research results at meetings and conferences. This past year, interim results of the Road-side Vegetated Treatment Sites Pilot Program were presented at the International Erosion Control Association (IECA) conference, and OWP authors were honored with the **Most Distinguished Technical Paper Award**.

The Tahoe Basin Small-Scale Pilot Project research facility earned Caltrans a Certificate of Appreciation for the **2002 Best of the Basin Awards Program** by the Tahoe Regional Planning Agency (TRPA). This project is investigating methods of removing pollutants from storm water and increasing the clarity of the water in Lake Tahoe. OWP also produced a brochure highlighting the Storm Water Treatment Pilot Studies at Lake Tahoe.

The Research Group's professional papers are available on our website (www.stormwater.water-programs.com).

SUMMARIES

During Fiscal Year 2002-2003, 57,373 manuals, 13,834 enrollments, and 363 sets of videos were purchased. Over 8,884 operators and students successfully completed a program.



WASTEWATER**Small Wastewater System Operation and Maintenance, Volume I**

(First Edition, 1997)

4,821 manuals purchased

1,972 enrollments purchased

1,196 students have completed this training program.

More than 35 colleges and universities use this manual as a textbook.

The manual and course enrollments have been purchased in the U.S., Canada, and 23 other countries.

Small Wastewater System Operation and Maintenance, Volume II

(First Edition, 2002)

409 manuals purchased

112 enrollments purchased

34 students have completed this training program.

Volume II is a continuation of Volume I and focuses on the knowledge and skills needed to operate and maintain several types of package wastewater treatment processes. The course also describes various effluent disposal options, how to perform basic lab procedures, and how to administer a small wastewater system.

Operation of Wastewater Treatment Plants, Volume I

(First Edition, 1980; Fifth Edition, 2002)

180,872 manuals purchased

55,252 enrollments purchased

32,556 students have completed this training program.

More than 429 colleges and universities use this manual as a textbook.

The manual and course enrollments have been purchased in the U.S., Canada, and 51 other countries.

Operation of Wastewater Treatment Plants, Volume II

(First Edition, 1980; Fifth Edition, 2001)

130,746 manuals purchased

28,434 enrollments purchased

16,566 students have completed this training program.

More than 385 colleges and universities use this manual as a textbook.

The manual and course enrollments have been purchased in the U.S., Canada and 55 other countries.

Advanced Waste Treatment

(First Edition, 1987; Fourth Edition, 2002)

50,792 manuals purchased

11,880 enrollments purchased

7,719 students have completed this training program.

More than 251 colleges and universities use this manual as a textbook.

Companies and individuals in the U.S., Canada, and 47 other countries have purchased manuals and enrollments.

Industrial Waste Treatment, Volume I

(First Edition, 1987; Second Edition, 1994)

25,903 manuals purchased

4,715 enrollments purchased

2,710 students have completed this training program.

More than 157 colleges and universities use this manual as a textbook.

The manuals and course enrollments have been purchased in the U.S., Canada, and 47 other countries.

Industrial Waste Treatment, Volume II

(First Edition, 1987; Second Edition, 1995)

13,826 manuals purchased

1,883 enrollments purchased

1,169 students have completed this training program.

More than 121 colleges and universities use this manual as a textbook.

Individuals and companies in the U.S., Canada, and 43 other countries have purchased manuals and enrollments.

Treatment of Metal Wastestreams

(First Edition, 1986; Second Edition, 1993)

27,359 manuals purchased

7,343 enrollments purchased

5,926 students have completed this training program.

More than 132 colleges and universities use this manual as a textbook.

The manuals and course enrollments have been purchased in the U.S., Canada, and 42 other countries.

Pretreatment Facility Inspection

(First Edition, 1988; Third Edition, 1996)

15,272 manuals purchased

5,790 enrollments purchased

3,736 students have completed this training program.

More than 105 colleges and universities use this manual as a textbook.

Individuals and companies in the U.S., Canada, and 37 other countries have purchased manuals and enrollments.

**Operation and Maintenance of Wastewater Collection Systems,
Volume I**

(First Edition, 1976; Fifth Edition, 1996)

55,775 manuals purchased

11,484 enrollments purchased

7,908 students have completed this training program.

More than 163 colleges and universities use this manual as a textbook.

Individuals and companies in the U.S., Canada, and 45 other countries have purchased manuals and enrollments.

**Operation and Maintenance of Wastewater Collection Systems,
Volume II**

(First Edition, 1976; Fifth Edition, 1995)

40,706 manuals purchased

5,797 enrollments purchased

4,099 students have completed this training program.

More than 155 colleges and universities use this manual as a textbook.

Individuals and companies in the U.S., Canada, and 45 other countries have purchased manuals and enrollments.

Collection Systems: Methods for Evaluating and Improving Performance

(First Edition, 1998)

1,835 copies purchased

This unique resource for operators and managers of wastewater collection systems has been sold throughout the United States and Canada, in 13 other countries, and to 22 colleges and universities. The Office of Water Programs is now offering a course based on this manual and CEUs can be earned for completing the course.

DRINKING WATER



Water Treatment Plant Operation, Volume I

(First Edition, 1983; Fourth Edition, 1999)

115,695 manuals purchased

36,834 enrollments purchased

19,483 students have completed this training program.

More than 275 colleges and universities use this manual as a textbook. Individuals and companies in the U.S., Canada, and 49 other countries have purchased manuals and enrollments.

Water Treatment Plant Operation, Volume II

(First Edition, 1983; Third Edition, 1998)

73,131 manuals purchased

17,027 enrollments purchased

10,102 students have completed this training program.

More than 155 colleges and universities use this manual as a textbook. Individuals and companies in the U.S., Canada, and 45 other countries have purchased manuals and enrollments.

Small Water System Operation and Maintenance

(First Edition, 1983; Fourth Edition, 1999)

58,452 manuals purchased

11,923 enrollments purchased

6,414 students have completed this training program.

More than 195 colleges and universities use this manual as a textbook.

Individuals and companies in the U.S., Canada, and 52 other countries have purchased manuals and enrollments.

Water Distribution System Operation and Maintenance

(First Edition, 1983; Fourth Edition, 2000)

91,029 manuals have been purchased

19,363 enrollments have been purchased

11,236 students have completed this training program.

More than 205 colleges and universities use this manual as a textbook.

The manuals and course enrollments have been purchased in the U.S., Canada, and 25 other countries.

Utility Management

(First Edition, 1998)

9,345 manuals purchased

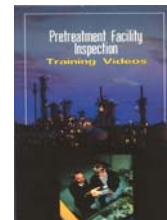
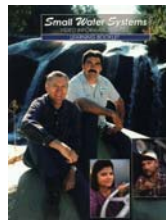
4,371 enrollments purchased

3,545 students have completed this training program.

More than 29 colleges and universities use this manual as a textbook.

Individuals and companies in the U.S., Canada, and 26 other countries have purchased manuals and enrollments.

VIDEOS



Pretreatment Facility Inspection Training Videos

(First Edition, 1998)

1,125 sets purchased

This set of five videos is designed to train inspectors to use safe and efficient procedures when inspecting industrial pretreatment facilities. The videos can be used in conjunction with the manual.

Collection System Operation and Maintenance Training Videos

(First Edition, 1997)

1,230 sets purchased

Created for operators of wastewater collection systems, these videos are suitable for training new and experienced collection system operators to safely operate and maintain their systems. They can be used with Volumes I and II of **Operation and Maintenance of Wastewater Collection Systems**. These training videos are being used throughout the United States, Canada, and several foreign countries.

Small Water Systems Video Information Series

(First Edition, 2001)

337 sets purchased

122 enrollments purchased

75 students have completed this training program.

This ten-video course provides training for a wide variety of operators, managers, owners, and governing bodies of small public systems.

Video Sales

