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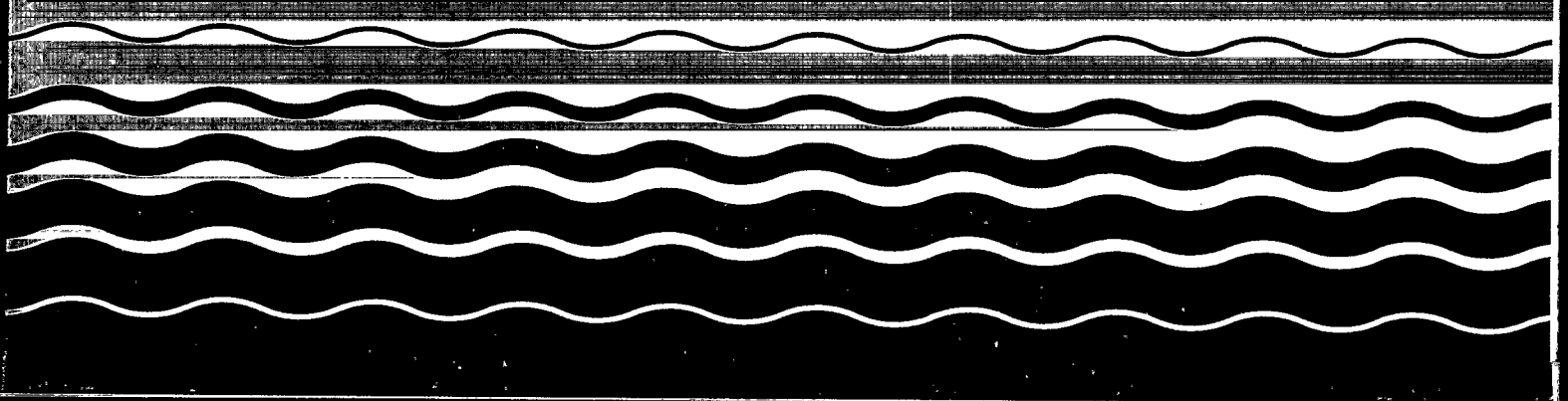
Improving Industrial Pretreatment Success Factors, Challenges, And Project Ideas

Findings From EPA Sites Visits To California, Indiana, And Virginia



Improving Industrial Pretreatment: Success Factors, Challenges, and Project Ideas

Findings from EPA Site Visits to California, Indiana and Virginia

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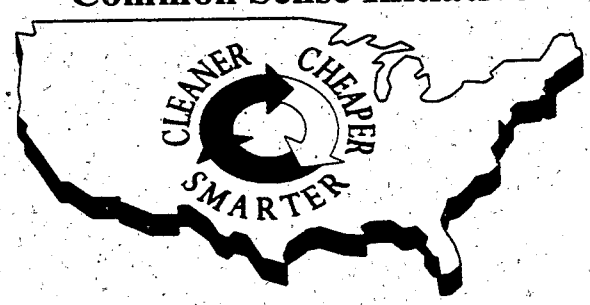
Common Sense Initiative



Metal Finishing Sector

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Without the enthusiastic participation of the many pretreatment professionals from around the country, this document would not have been possible. We extend our thanks to the many staff at the following programs who took the time and interest to share their thoughts with us: California - City of Escondido's Hale Avenue Resource Recovery Facility, City of West Sacramento POTW, County Sanitation Districts of Orange County, East Bay Municipal Utility District, and Union Sanitation District; Indiana - Muncie Sanitary District, City of Elkhart Wastewater Treatment Utility, City of Fort Wayne Wastewater Treatment Plant, Connersville Utilities, and Richmond Sanitary District; Virginia - Alexandria Sanitation Authority, City of Richmond Wastewater Treatment Plant, Hampton Roads Sanitation District, and Hopewell Regional Wastewater Treatment Facility.

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EXECUTIVE SUMMARY

Early in 1996, an interview team from EPA headquarters visited fourteen industrial pretreatment programs throughout California, Indiana, and Virginia. The trips were undertaken as part of EPA's Common Sense Initiative (CSI) for the Metal Finishing industry in recognition that the quality of a POTW's pretreatment program can have an important impact on metal finisher compliance with the Clean Water Act.

The goals of this project were twofold: to improve the capabilities of the lowest tier POTWs and to provide the most effective POTWs with increased flexibility to achieve higher environmental quality at a lower cost. Programs visited represented a wide range of capabilities, from top-tier winners of pretreatment awards to small programs under EPA or state enforcement action for inadequate performance. Strong programs tended to have technically-skilled staff, adequate resources, good information on their industrial users, and proactive and positive relationships with the regulated universe of dischargers. Weaker programs were not only lacking in these areas but also often faced political interference in carrying out their mission.

The many perspectives heard on this trip suggested a few common areas where pretreatment staff felt EPA involvement could be of great benefit to leveraging their performance and improving environmental quality:

- **Upgrades to PIPES on-line information system.** Addressing the common need for faster access to a wider range of information on pretreatment and the industrial users, a high-priority effort to upgrade PIPES would give the programs real-time access to a host of core program resources not easily available now.

- **Increased transfer of pretreatment information systems.** EPA could facilitate improved information management within the programs by identifying and promoting mechanisms that allow pretreatment programs to share information system development costs with other POTWs and with other branches of their own POTW.

- **Training Videos.** Focusing on program basics, sampling, and conducting an inspection, the videos would bring expertise to small, struggling programs that do not have the budget or staff to travel to more traditional training activities.

- **Cost accounting and budgeting.** By providing examples of good budgeting and cost accounting practices, this EPA project would provide pretreatment programs with useful tools to demonstrate the cost-effectiveness of their programs and to better understand the financial impact of certain types of

discharges on their sewage treatment system.

- **"Guidance to the Guidance."** A need expressed especially by the smaller programs, this guidance would serve as a "roadmap" to help new coordinators prioritize their learning and filter the massive amounts of guidance now available. The goal of the project is to quickly bring programs to a functional level, and to help structure incremental learning.

- **Choosing a contract laboratory**. Many programs were not confident in their ability to evaluate the quality of the contract laboratories they relied on for at least some of their analytical requirements, despite the importance of this choice in ensuring an effective pretreatment program. This guidance would provide them with the tools to evaluate laboratory performance and make better choices regarding contract laboratory services.

- **Increased regulatory flexibility for top performers.** A number of programs complained that certain regulations required substantial staff time with little or no environmental benefit. A possible pilot study would give a top-performing POTW the flexibility to redeploy the resources now used to meet these regulations towards areas of higher environmental benefit.

INTRODUCTION

Early in 1996, an interview team from EPA headquarters visited fourteen industrial pretreatment programs throughout California, Indiana, and Virginia. The trips were part of EPA's Common Sense Initiative (CSI) for the Metal Finishing industry, initiated in 1993 by EPA Administrator Carol Browner. CSI's purpose is to use a less-adversarial regulatory approach, working with industry, government, the public, and environmental groups to achieve more efficient environmental protection.

Through working with the metal finishing industry, EPA determined that pretreatment programs, managed by the local wastewater treatment authorities throughout the country, are an extremely important regulatory factor in metal finishing operations. This reflects the large discharges of water associated with metal finishing processes. The metal finishing industry has shown great interest in seeing improved pretreatment programs, since effective programs help finishers achieve and maintain environmental compliance while also forcing negligent firms to upgrade or cease production, thereby preventing them from undercutting the environmentally-responsible firms. Environmental participants on the Metal Finishing subcommittee were equally supportive of the effort because of the large potential to improve water quality through more effective pretreatment programs.

Programs visited represented a wide range of capabilities, from top-tier winners of pretreatment awards to small programs under EPA or state enforcement action for inadequate performance. Despite the diversity of the programs, there were many areas of agreement. Some of the practices that the best programs felt contributed to their success were areas where struggling programs knew they needed to improve. The day-long interviews at each facility included a range of people, including the pretreatment program coordinators, lab personnel, inspectors, samplers, and utility-managers. In a number of cases, the team also interviewed local industrial users (most often metal finishers) to get their perspectives on the programs. The results of these interviews have been summarized in this document. As was agreed prior to the site visits, the names of specific individuals or programs have been excluded from this report.

Goals of the Site Visits

The goals of this project were twofold: to improve the capabilities of the lowest tier POTWs so that they can manage their industrial users in such a way as to reduce mass pollutant loadings without unnecessarily limiting or curtailing industrial activity; and to provide the most effective POTWs with increased flexibility to achieve higher environmental quality at a lower cost.

The interviews were successful in both of these areas. Top-tier programs shared many aspects of what they feel make them effective; struggling programs were equally candid discussing their limitations and how to address them. In addition, every program visited had numerous

suggestions to both EPA and the Common Sense Initiative about where regulatory flexibility would reduce workloads and costs while improving or maintaining environmental quality.

The results of the visits, summarized in this report, outline some clear needs of the pretreatment programs and highlight effective directions for EPA involvement in the pretreatment arena. The interview team hopes that the insights we have collected from the many dedicated pretreatment staff across the country will help EPA to reallocate priorities and budgets to better reflect the expressed needs of the field staff.

Site Visit Logistics

As mentioned above, the interview team visited fourteen pretreatment programs in three states:

- California: East Bay Municipal Utility District, Union Sanitation District, City of Escondido, City of West Sacramento, and County Sanitation Districts of Orange County.
- Indiana: Elkhart, Fort Wayne, Richmond, Connersville, Muncie.
- Virginia: Hampton Roads, Hopewell, Richmond, Alexandria

The interview team varied somewhat in the three states, but contained representatives from the Office of Policy, Planning, and Evaluation; the Office of Water; and the Office of Enforcement and Compliance Assurance. EPA staff from the Region 5 and 9 offices also participated on a number of the site visits. Additional support was provided by Industrial Economics, an EPA contractor. The multi-office approach gave the interview team a range of perspectives and skills that made the visits more successful.

Overview of Report Structure

This report contains a brief summary of the major findings of the interviews, followed by a number of attachments containing more detailed summaries of the site visits:

- Attachment 1: Interview Guidelines
- Attachment 2: Summary of Issues and Recommendations by Program Area
- Attachment 3: Summary of Top-Ranked Projects Identified Through Site Visits

- Attachment 4: Trip Report from California Site Visits
- Attachment 5: Trip Report from Indiana Site Visits
- Attachment 6: Trip Report from Virginia Site Visits
- Attachment 7: Summary List of All Potential Projects Suggested During Site Visits

MAJOR FINDINGS OF THE INTERVIEWS

Major findings of the interviews are described in three sections. The first section discusses common themes raised by the various programs; there was a rather remarkable consistency in information reported across POTWs of different sizes and performance levels regarding the challenges they face and the factors that make a program successful. The second section identifies some of the unmet needs of struggling pretreatment programs. The third section identifies common challenges or needs of both the top-tier and the struggling programs.

General Issues

Common elements repeatedly brought up by pretreatment staff included:

- **Enforcement is extremely important**. Where local politics prevented the pretreatment program from enforcing the law against IUs or where insufficient or poorly trained staff precluded running an effective pretreatment program, enforcement was critical. All of the programs visited that were under current or past EPA enforcement actions said they were grateful the action had been taken. The pressure from outside enabled them to get rid of incompetent staff, obtain additional resources, and get the program back on track.

- **Cooperation works better than confrontation**. Once there is respect for the necessity of pretreatment (i.e., IUs aren't flouting the law), a cooperative relationship for solving discharge problems has been most effective in ensuring compliance.

- **Establishing "control" over an IU production process is a critical goal.** Successful programs worked hard with IUs so that the industrial process was well understood, and the impact on water quality from changes in production parameters could be predicted ahead of time. The technical expertise of pretreatment personnel was an important factor in achieving this level of control.

- **POTWs felt that some EPA regulations made little environmental or economic sense.** Some EPA regulation of POTWs requires them to do things that they don't feel have any particular environmental benefit, but these activities use up staff time and resources.

- **Access to timely information is critical but often missing.** Information management within pretreatment programs, as well as access to important information of a more general type (e.g., pollution prevention), exists in very few programs.

- **Self-reported IU test data generally viewed with skepticism.** The POTWs consistently said that industry self-reported tests found substantially lower constituents of concern than did the POTW's own sampling. Self-reported data was heavily discounted by the pretreatment staff. This has important implications for CSI-related efforts to provide flexibility to industry through reduced testing.

- **Staff retention is important in building a good program.** Pretreatment staff must have knowledge across a wide range of topics, skills that can take years to develop. Upgrading staff skills and retaining core staff were extremely important in assuring quality programs, though sometimes difficult for the smaller programs.

- **Pretreatment staff need direct oversight of dischargers in order to run an effective program.** Many programs receive wastes from industries in surrounding municipalities, where an interjurisdictional agreement governs pretreatment access to discharging industries. These agreements often fail to give program staff the oversight required to ensure proper environmental performance.

Unmet Needs of Struggling Programs

Struggling programs sometimes faced an uphill battle in improving their performance. There were a number of common needs expressed by these programs.

- **Special needs of small programs.** Given the diversity of required knowledge for pretreatment staff, as well as the role that local politics sometimes plays in the programs, it is not surprising that staff in some of the small programs sometimes struggled to meet the heavy program demands. Common needs of these programs include prioritizing training activities for new coordinators and key staff, overcoming political pressures, and demonstrating the value of pretreatment to the local economy.

- **Information filtering**. Struggling programs often need help managing and processing large amounts of regulatory, industry, and program information. In addition to simply writing regulations more clearly, solutions such as common language summaries of new regulations would help reduce this burden.

- **More training options**. Training staff was a critical need in all of the struggling programs. New training alternatives that did not require expensive registration fees or travel were a high priority for these programs.

Common Challenges Across Most Pretreatment Programs

Even successful programs face challenges in trying to make their programs more effective. The interviews identified several areas where most programs face challenges:

- **Cost accounting and budgeting**. This was a major weakness across almost every program. Without good information, program coordinators had a difficult time making efficient decisions, demonstrating the value of pretreatment to the locality, or sending the proper economic signals to industries about priority areas in which to invest resources for pollution prevention or improved pollution controls.

- **More rapid access to better information**. Both large and small programs thought access to better information would help them do their jobs better. The areas suggested for improvement included a comprehensive on-line repository of all EPA guidances, an on-line database on pollution prevention opportunities for core discharging industries, and improved data management systems within programs.

- **Demonstrating program efficiency and effectiveness**. Pretreatment coordinators described their programs on a number of occasions as the "poor stepchild" to other water programs. While strongly convinced that pretreatment was an extremely effective and efficient mechanism by which to protect the quality of the receiving waters, program coordinators were seeking better ways to demonstrate their convictions tangibly to the broader utility and the broader community. The impending threat of privatization, mentioned by most programs visited, added a certain urgency to this need.

POSSIBLE METHODS TO ADDRESS PROGRAM NEEDS

Using the interview comments, EPA staff developed a list of possible actions to address the central issues identified through the site visits (Attachment 7). This list was then ranked to narrow the actions to those felt most likely to have a positive impacts (Attachment 3). These top-ranked projects are described briefly below:

- **Upgrades to PIPES on-line information system.** Addressing the common need for faster access to a wider range of information on pretreatment and the industrial users, a high-priority effort to upgrade PIPES would accelerate the transition from paper to on-line distribution of information with many peripheral benefits. Specific components of this upgrade include:

  -- Putting old EPA guidance on-line.
  -- Converting all system documents to a standard portable digital format.
  -- Converting the site to a full World Wide Web capabilities to improve access, and make using the site easier for users.
  -- Uploading "plain English" updates and summaries of regulations of concern.
  -- Creating a regional calendar, to which regions and states could add activities.
  -- Creating additional content for the system, including information on P2, changes facing pretreatment programs as their NPDES permits are renewed, and compiling national SNC/NOV summaries to increase leverage of POTWs over recalcitrant industries.

- **Increased transfer of pretreatment information systems.** This project would help identify and promote mechanisms that allow pretreatment programs to share information system development costs with other POTWs and with other branches of their own POTW, thereby reducing the costs of improved internal information management.

- **Training Videos.** Focusing on program basics, sampling, and conducting an inspection, the videos would bring expertise to small, struggling programs that do not have the budget or staff to travel to more traditional training activities.

- **Cost accounting and budgeting.** By providing examples of good budgeting and cost accounting practices, this project would provide pretreatment programs with useful tools to demonstrate the cost-effectiveness of their programs and to better understand the financial impact of certain types of discharges on their sewage treatment system.

- **"Guidance to the Guidance."** This guidance would help new coordinators prioritize their learning and filter the massive amounts of guidance now available. The goal of the project is to quickly bring programs to a functional level, and to help structure incremental learning.

- **Choosing a contract laboratory.** Solid analytical results are a critical input to a successful pretreatment program, yet many programs were not confident in their ability to evaluate the quality of the contract laboratories they relied on for at least some of their analytical requirements. This guidance would provide them with the tools to evaluate laboratory performance and make better choices regarding contract laboratory services.

- **Increased regulatory flexibility for top performers.** A number of programs complained that certain regulations required substantial staff time with little or no environmental benefit. A possible pilot study would give a top-performing POTW the flexibility to redeploy the resources now used to meet these regulations towards areas of higher environmental benefit.

Attachment 1:

Interview Guidance for POTW Site Visits

CSI INTRODUCTION

- Overview of CSI and importance of pretreatment issues to metal finishing sector.
- Goal of project to learn from pretreatment program staff: what works, what doesn't; and to hear their suggestions for making the program work better.

GENERAL INTRODUCTION

Purpose: To set the scene, prior to biasing interviewee with certain types of questions that could make them defensive.

1) **Program Background.** How many employees are working on pretreatment? Where is the pretreatment program located in the local government structure? What is the authorizing/funding authority for the POTW -- municipality or regional authority? Describe your Industrial Users, their products, and their discharges. How many are metal finishers?

2) **Successes.** What have been your biggest successes (individual or overall POTW) in the pretreatment program during the past three years?

3) **Challenges.** What are the biggest problems/challenges you face in making your pretreatment program work more effectively? What would help you most in being able to better address these problems?

4) **Identifying IUs.** How do you locate/identify IUs? What process do you use to categorize them? Do you experience any problems locating and categorizing metal finishers?

5) **Permitting IUs.** What are some particularly effective or efficient aspects of your program to permit or otherwise apply pretreatment requirements to the nondomestic users addressed in your program?

6) **Pollution Prevention.** Does your operation (both within the POTW and working with IUs) emphasize pollution prevention? What pollution prevention initiatives have you found successful? What have not worked as you had expected? What were the main barriers in implementing pollution prevention?

7) **Preventing Media-Shifting.** *(Explain this what is meant here -- overall waste management as opposed to moving pollution from one media to another).* Do you operate on a multimedia basis? How do you factor multimedia considerations into your operations?

8) **Suggestions to EPA Regarding Oversight.** What would you change about the existing NPDES program/pretreatment programs?

9) **Suggestions to EPA Regarding Focus.** Where should EPA/State devote compliance assistance/enforcement resources in the next few years? Would you change the roles of the states and EPA regarding the pretreatment program? How?

EVALUATING THE PRETREATMENT PROGRAM

10) **Measuring Results.** How do you assess the environmental results of the pretreatment program?

- Have you established local limits and how are these implemented?
- Do you track trends in influent, effluent, and sludge loadings over time?
- What is the quality of the POTW's sludge?

11) **Controlling Discharges.** What approach do you use to control pollutant discharges from industrial or commercial customers? How does the POTW prevent upsets? How do you respond to strange influent at the plant? Do focus exclusively on IUs or do you look at commercial and domestic contributions also?

12) **Sampling Strategy.** Please describe your strategy for sampling IUs. Specifically, what frequency is sufficient? What balance do you strike between self-reported data and POTW inspections? How do you ensure sampling accuracy?

13) **Inspection Strategy.** Please describe the strategy and objectives for your inspection program.

14) **Enforcement Strategy.** Please describe the strategy and objectives of your enforcement program. What is the level of management support for enforcement activities?

15) **Assuring Consistent Implementation.** How do you assure that the pretreatment program is implemented consistently in all political jurisdictions served by the POTW? How is the communication between the inspectors, the plant operators, the sampling personnel, the lab personnel coordinated between themselves and with the program coordinator? *(May be simple for small POTWs).*

16) **Benchmarking.** Do you study other treatment plants for new ideas?

17) **Future Goals.** Please describe your goals for the pretreatment program over the next three to five years.

EMPLOYEE ISSUES

18) **Overview.** Please describe the number and organization of pretreatment employees. How many years has the program coordinator worked at the POTW? How long has the coordinator been working in the environmental field? Provide similar information for the staff. *(May have been partly covered during the introductory program background discussion).*

19) **Staff Turnover.** Is staff turnover a problem? If so, what steps have been taken to retain staff?

EDUCATION/TRAINING ACTIVITIES AND INITIATIVES

Purpose: To learn which areas the POTW thinks are most important; to identify current gaps; to identify why past efforts may not have worked.

20) **Internal Training.** Describe your training program for staff and the resources you have available for training activities. How important is training in running a successful pretreatment program? How many state or EPA training events have you and your staff attended over the past year? Did you find them useful?

21) **External Training.** Describe any training programs started (or used) by your office to educate IUs.

22) **Additional Training.** Do you think additional POTW pretreatment training/outreach is needed? Of what type and by whom?

23) **Useful Guidance Documents.** Do you use any pretreatment program guidance documents or manuals regularly? Would you recommend any particular guidance documents to other pretreatment professionals?

PRETREATMENT RESOURCES AND COST ACCOUNTING

24) **Budget.** How is your program funded? What trends do you foresee?

25) **Demonstrating Value-added.** What approach do you use to illustrate to IUs and taxpayers that your pretreatment services are valuable and efficiently provided?

26) **Cost Accounting.** Do you calculate the cost of handling particular IUs and/or particular types of pollutants on the overall system? Are these costs charged back to specific dischargers? To industrial dischargers overall, or paid for by all dischargers?

27) **Impact of IU Fees on Economic Activity.** Please describe what impact full cost recovery from IUs has had (or would have) on the industrial base located in your service area.

28) **Investment Decisions.** What information do you review to make decisions regarding investments in equipment, training, outreach, or consulting services?

29) **Contracting Services.** Do you, or have you, considered using consultants or contractors for parts of your program? How did you make this decision? If not, do you ever evaluate whether outsourcing would be attractive for certain portions of your program?

INFORMATION SYSTEMS

30) **Overview of Information Systems.** Please describe any information systems that are being used to support the pretreatment program. Are these systems linked to the rest of the POTW? Have there been any past attempts to build information systems that did not provide the expected benefits to the program?

Areas of Interest Include:

- Enforcement, compliance, permitting systems.
- Tracking trends and variances.
- Cost accounting.
- Targeting enforcement and/or outreach.
- Expert systems on pollution prevention opportunities for particular sectors.

31) **Ensuring Compliance.** How do you gather and maintain data to determine pretreatment program compliance? Describe how sampling, testing, chain of custody, and pretreatment program compliance determinations are handled. What steps do you take to get noncomplying IUs into compliance?

OUTREACH

32) **Industrial Users.** Do you meet regularly with your industrial users? How would you characterize your relationship?

33) **Local and State Government.** Describe the relationship between the program coordinator and his/her management. What dialog occurs between the program and the mayor/city council/regional authority? What effect does the Chamber of Commerce have on the program functioning properly? What is the level of local government support for the pretreatment program?

34) **General Public.** What outreach activities for the general public do you undertake? Have there been any issues over the past three years that have generated substantial interest from citizens or public interest groups?

ISSUES FOR CLASS 1 AND CLASS 2 POTWS

Class 1

35) **Reasons for Non-compliance.** What are the key contributing factors to your past pretreatment program noncompliance? What steps have you taken to overcome the barriers to compliance?

36) **IU Non-compliance.** What steps have taken to achieve an improved level of IU complaince? What methods have you found effective in changing a noncompliant IU into a compliant one?

Class 2

37) **Reasons for Success.** What are the key contributing factors to your successful program?

38) **IU Non-compliance.** What steps have taken to achieve an improved level of IU complaince? What methods have you found effective in changing a noncompliant IU into a compliant one?

39) **Suggestions for Non-compliers.** What are the first steps a POTW program should take to improve its noncompliance status? What are the first steps a POTW program should take to improve its IUs' noncompliance status?

Attachment 2:

SUMMARY OF ISSUES AND RECOMMENDATIONS BY PROGRAM AREA

Following the format of the interview guidance (Attachment 1), this section provides a summary overview of the major issues brought out by pretreatment staff during the course of our site-visits and interviews. Each issue is followed by a summary of the recommendations made by program staff and EPA personnel as possible solutions. These recommendations represent a listing of suggestions; they have not been analyzed for effectiveness. With this caveat in mind, it is also important to note that many of the suggestions are in current use by one or more of the programs visited, and that the programs often felt the approaches were working.

Identifying IUs

1. **Identification of unpermitted dischargers has been a challenge for some POTWs.**

   - Use multiple sources of information to identify these firms. Some of the sources that programs relied upon included: telephone yellow pages, changes in water consumption, site visits, construction permits, applications for water or sewer hookups, inquiries to the local Chamber of Commerce, and hazardous materials filings with fire departments.

   - Rely on regulated competitors to act as a powerful source of information. Firms do not want to be unfairly disadvantaged by businesses that evade water treatment regulations.

   - Employ unannounced inspections and "drive bys" of industrial areas to identify new dischargers.

Permitting IUs

1. **Inspection of minor industrial users (MIUs) increases workload with small or insignificant environmental benefits.**

   - Relax regulations of smaller categorical users who discharge such low levels of regulated constituents that they have no effect on the POTW meeting local limits.

   - Reduce frequency of MIU inspection.

- Coordinate with local industries and trade associations to implement best management practices on industries with relatively small discharges instead of permits.

- Require zero discharge from certain types of industries (e.g. dry cleaners).

2. **Setting local limits has been difficult for smaller POTWs to do.**

   - Hire consultants to aid in this challenge.

   - Work with other POTWs to share successful strategies for establishing technically-based local limits.

Pollution Prevention (P2)

1. **Economic benefits of installing P2 equipment and processes were often not known.**

   - Demonstrate the economic benefits of pollution prevention through pilot projects.

   - Prepare information on costs of service and influent constituents (i.e., better cost accounting) in order to adjust fees accordingly. This will give dischargers price signals that help them identify where to invest in waste minimization or pretreatment equipment.

2. **Inspectors are not always trained to identify promising pollution prevention opportunities.**

   - Have inspectors shadow an experienced staff person to learn how to identify P2 opportunities.

   - Create a handbook that highlights P2 prospects.

   - Provide inspectors with pollution prevention materials to distribute.

3. **There are not enough industry-specific inspector training guides available for those interested in expanding their P2 efforts.**

   - Implement better sharing of existing P2 documents, including materials developed in other languages (to target industries with large immigrant populations) and at conferences.

- Develop industry-specific information on P2 options obtainable via PIPES.
- Establish a phone list of specialty contacts who are willing to field questions about particular P2 issues.
- Work through local trade associations to demonstrate the value of P2.
- Provide educational courses on waste minimization opportunities.

4. **There is an existing level of concern among POTWs that P2 or pollution control equipment (PCE) will not perform as required or as advertised.**

- Provide facilities with actual examples of industries that have successfully benefitted from installing the equipment.
- Compile performance data on equipment and technologies.

EVALUATING THE PRETREATMENT PROGRAM

Controlling Discharges/Sample Strategy

1. **Chemical discharges are not always detected in advance, leaving treatment process vulnerable to potential upsets.**

- Understand IU processes to ensure that processes are "under control." If violations occur they can be quickly detected and corrected.
- Install sensors on inflow pipes or conduct regular trunkline/lift station sampling to alert a facility in advance if they should divert flow to protect the treatment plant from upsets.
- Use dedicated samplers to make testing SIUs easier to do and to reduce the ability of the IU to manipulate flows when an inspector arrives.
- Increase use of unannounced sampling to confirm IUs are not altering production parameters to hide non-compliance.
- Distribute test kits to public works personnel to facilitate rapid sampling of unknown discharge seen or smelled in the sewer.

- Create an Interjurisdictional Agreement (IJA) that gives POTWs direct enforcement or monitoring control over remote industries. This would work to ensure that pretreatment programs have adequate control over their dischargers.

2. **Regulation of indirect dischargers only does not necessarily allow the POTW to protect quality of their overall receiving water.**

   - Give pretreatment program responsibility for the entire receiving water rather than just the plant outfall.
   - Target direct dischargers as well as indirect, and work with them to implement pretreatment programs.

3. **IUs do not always feel comfortable talking to POTWs about a problem that they are experiencing.**

   - Initiate an industry advisory council approach to act as a forum to educate industry about regulations and to build trust over the long-term.
   - Establish a close working inspector/IU relationship to promote open lines of communication.
   - Treat IUs fairly in regards to self-reporting and insignificant violations.
   - Maintain frequent contact with IUs even when there is not a pending problem.

4. **Many POTWs use contract laboratories that provide poor quality analysis and inadequate service.**

   - Develop guidance to assist pretreatment programs and IUs in choosing a qualified lab.
   - Require a copy of the lab's Standard Operating Procedures (SOP) manual, and visit the lab. If the lab will not send an SOP, or the pretreatment manager is not allowed to observe the operations unannounced, disqualify the lab from consideration.
   - Require that the lab meet a pre-determined turn around time. Upon failure to meet this time frame, disqualify them.

- Develop laboratory certification, or increase the frequency of EPA quality control audits, to increase lab quality.

- Substitute biological indicators for some chemical lab tests, where possible, such as by testing whole effluent toxicity. This will help identify any synergistic impacts of discharges.

5. **Several top performing pretreatment programs express frustration at some of the federal requirements.**

   - Allow top-performing pretreatment programs greater flexibility in deploying available resources to areas of the program that the facility feels will have the greatest environmental benefits.

Inspection and Enforcement Strategy

1. **Difficult to balance enforcement and education; good working relationship is needed between pretreatment program and IU to identify and solve discharge problems.**

   - Maintain the education and enforcement balance. Incorporate education into the strategy while preserving the enforcement component of the inspection.

     -- Provide general information on how to address compliance issues by way of education, rather than making specific recommendations that could cause problems later on if they don't work.
     -- In addition to the typical inspection, add a new educational component each visit, by choosing a different target area to discuss in detail with the IU.
     -- Invite a third party to take over from pretreatment staff (e.g., POTW's legal staff) as soon as there is a problem, so as not to contaminate the relationship between IUs and pretreatment personnel.

   - Communicate program goals to the IUs.

   - Focus attention on why an IU was out of compliance and not on determining whether they were or not.

   - Send the same inspector for a number of years to provide continuity and specialized knowledge.

   - Rotate inspectors every few years to avoid cooption and to allow fresh eyes to spot trouble areas.

- Streamline inspections by multiple oversight agencies to reduce the regulatory burden on industries.

2. **Inspections tend to capture facilities when they are on their "best behavior".**

   - Conduct unscheduled inspections to allow inspectors to see how the facility is run on an average day.

3. **Political pressures and the threat that industry might move out of town sometimes make it difficult for POTWs to enforce against IUs.**

   - Demonstrate how a strong pretreatment program is not a threat to business.
   - Build a solid working relationship with the political entity to allow for continued progress over a period of many years.
   - Bring in help from the state or region.
   - Use publicity to leverage recalcitrant national companies.
   - Levy fines that are refundable upon IUs implementing specified improvements in the appointed time frame.
   - Provide POTW some leeway by creating a hierarchy of enforcement strategies of gradually increasing severity.

EMPLOYEE ISSUES, EDUCATION/TRAINING ACTIVITIES AND INITIATIVES

Staff Issues

1. **POTWs are faced with a high rate of staff turnover.**

   - Expand jobs to keep them both challenging and interesting, by providing opportunities for cross-training development to learn other's roles.
   - Implement a formal tier job classification system to eliminate dead-end jobs, move employees to the highest level over time, and increase expertise.
   - Develop an awards system to maintain motivation.
   - Distribute "grunt" tasks equally among all tiers of employees.

Training

1. **New coordinators often do not know "where to begin" in running a pretreatment program.**

   - Provide a simple "ramp up" course that helps them prioritize training and navigate the many available guidance documents.
   - Develop a new employee pretreatment program orientation package that would include the history of the pretreatment program, job responsibilities, and the required reports and plans.
   - Develop strategies to assist small pretreatment programs.

2. **It is difficult for POTWs to stay up-to-date with current regulations.**

   - Create a non-legalistic guide of the regulations in a timely manner, to aid in compliance.
   - Create working relationship with surrounding universities and use students to leverage limited staff and update routine information.
   - Obtain regulatory changes from WEF and on-line sources.
   - Work with surrounding POTWs to leverage useful problem solving resources.
   - Seek out topical seminars that travel to the plants.

3. **Time and budget constraints do not allow POTWs to take advantage of training opportunities and tools that would make their jobs easier and their programs more effective.**

   - Provide tools that can be distributed locally.
     - -- Initiate regional pretreatment meetings.
     - -- Develop exchange programs for pretreatment managers and staff that allow them to visit various sites.
     - -- Obtain or develop training videos that use expert inspectors to help train staff at smaller programs both in general techniques and how to evaluate with new industries.
     - -- Hold in-house training seminars produced by larger POTWs.

- Use state and federal water personnel as informational resources.
- Videotape WEF conferences.
- Create certification programs for samplers and inspectors.
- View inspectors notes to see what they are thinking as they go through the plant.

4. **Poorly-trained pretreatment operators within IUs make POTW's job more difficult and harm water quality.**

- Require periodic training to ensure on-site equipment is being operated properly.
- Create certification programs for pretreatment operators.

<u>Information Systems</u>

1. **Program staff is unable to obtain or analyze pretreatment information in a timely manner.**

- Invest in a new information system or improve existing one.
  - -- Seek out a Laboratory Information System (LIM) in order to improve laboratory and sampling operations and to save time and money for pretreatment personnel.
  - -- Update and seek out a commercial vender for a general pretreatment management software package (e.g., PCME).
- Standardize and share common programming elements where possible to eliminate redundant spending on software development by POTWs.
- Increase transfer of effective software modules among POTWs; develop industry standards to streamline data collection and dissemination.
  - -- Collaborate with other POTWs to share material from pollution prevention programs in order to reduce costs.
  - -- Develop electronic reporting protocols to allow electronic data interchange.
  - -- Create inspection reports electronically to reduce the amount of paperwork.

2. **Geographic Information Systems offer much to pretreatment but are slow to evolve.**

- Learn how GIS could help pretreatment programs.
- Establish links with existing GIS groups in municipality or other parts of the WWTP to collaborate and coordinate information gathering and system design.

PRETREATMENT RESOURCES AND COST ACCOUNTING

Budget

1. **Some programs lack an independent budget for pretreatment staff and are not made aware of the resources that they have at their disposal.**

- Work closely with the utility manager to create a budget system that communicates available funds to pretreatment staff and provides incentives for improving program efficiency.
- Create a model budgeting system (EPA).

2. **Without capital budgeting, POTWs do not develop a normalized estimate of their cost of providing service.**

- Establish a capital budget using debt issues or sinking funds to finance a capital investment.
- All capital, including computer systems development, should be financed this way.

3. **Programs do not have any indicators to measure their program efficiency against others.**

- Develop and use defined measurements (e.g., operating ratios) to enable the program to compare its facility to others around the country.

Cost Accounting

1. **POTWs are seldom aware of the financial impact that particular discharges, or particular discharging industries, have on their system. For example, contamination of sludge and treated effluent, such as with metals or salt, can preclude its reuse as a soil amendment or as irrigation water.**

   - Work with city officials or outside consultants to set up a strong cost accounting and cost recovery program to ensure that IUs are not being undercharged.
   - Evaluate how particular industries or dischargers affect plant costs. Use this information to set charges or to identify areas for POTW investment in pretreatment.
   - Charge IUs the actual amount the POTW incurs to provide service, in order to eliminate any cross subsidy and to encourage P2.

2. **The billing of inspections and associated lab tests is often difficult to track.**

   - Integrate these components into a broader cost accounting system.
   - Hire a firm to take over billing processes.

3. **Expansion of sewer lines is subsidized by the POTW or by the county, understating cost of service and reducing the incentive to find alternative treatment.**

   - Be sure line expansions are included in a cost accounting system.

Innovative User Fees

1. **Facilities face the need to expand capacity without the financial means to do so.**

   - Require developers to purchase access to sewers before beginning their projects.
   - Use cost accounting system to help identify ways to use existing capacity more efficiently.

Attachment 3:

SUMMARY OF TOP-RANKED POTW PROJECTS

1) "Guidance to the Guidance" for pretreatment program coordinators

Purpose: To provide a simple "roadmap" for a new pretreatment coordinator about what they are responsible for, where they can get a quick overview of each area of responsibility, and resources they can use for upgrading their knowledge base. The project would produce:

- A general overview of the components of a pretreatment program and the responsibilities of the coordinator.
- Background on the requirements for each aspect of the program.
- Suggested references for increased understanding of any one part of the program. This would refer staff to specific chapters within a broader guidance when possible, to reduce the need to review peripheral information.

Need: Pretreatment coordinators must have an extremely wide range of knowledge, from state and federal regulations to laboratory and sampling issues to a variety of industrial processes. Many coordinators, especially at smaller programs, faced a difficult situation when starting their job. They lacked trained colleagues to transfer knowledge on how the program should be run, yet faced many requirements as soon as they took the job.

Progress to Date:

- Developed outline of guidance components.
- Identified some programs with expertise in the area of staff training, and others with an interest in using such a document.

Next Steps: EPA has prepared an outline of what this document would look like (attached). Moving the project forward requires:

- Work group approval of preparing the guidance.
- Subcommittee endorsement.

- Identification of partners: OW; OC; AMSA (to work with programs that have already developed similar products, such as Orange County, CA); and one or two regions (to work with regional staff and local programs that would be using the document).

- Timeline: The workgroup expects this project to take approximately 6 months to complete.

2) Training Videos

Purpose: To bring targeted expertise to remote programs without travel budgets and to help IUs improve their pretreatment systems by giving them insights into what a pretreatment inspector is looking for during a site visit.

Need: Many of the programs visited expressed a strong interest in visual training materials. They felt that a video would educate personnel with different learning styles better than written material, and that many of the subtleties associated with an inspection (e.g., professional appearance, tone of questioning, eye contact, etc.) could be demonstrated. Since a video could be shipped to small, remote programs, this medium would provide a low-cost but useful learning mechanism.

Progress to Date:

- The workgroup has identified its preferences for the first three videos: (1) program basics, including how a strong pretreatment program helps business; (2) sampling; (3) conducting an inspection.

- A couple of potential longer-term sources of funding have been identified (primarily the CWA grant program).

- Based on the near universal support for his written guidance materials, Ken Kerri (of California State University at Sacramento) has been identified as the first choice to produce the videos.

Next Steps:

- Workgroup approval for moving forward; Subcommittee endorsement
- Additional research on funding mechanism:
  - -- CWA grants.
  - -- Ken Kerri interest & experience with videos.
  - -- Check existing projects of National Enforcement Training Institute.
  - -- Work out funding mechanism for first video.
- Identify partners:
  - -- OW, OC, AMSA, NETI

3) Upgrades to PIPES on-line information system

Purpose: Develop PIPES into the primary conduit for general information on pretreatment for the nation. Provide user-friendly repository for past guidances, and a point for communication and sharing of solutions among pretreatment staff across the country.

Need:

- Most pretreatment programs faced a handful of similar problems:
  - -- Couldn't find the information they needed to solve particular problems.
  - -- Had difficulty obtaining copies of EPA's past guidances.
  - -- Often couldn't afford to travel to attend conferences or visit other programs.
- PIPES, as an existing bulletin board system for water issues, is the natural solution to disseminate knowledge across the nation and to develop into an active community of informed users.

Progress to Date:

- Have identified major areas of PIPES upgrades from site visits:
  - -- Put old EPA guidance on the system.
  - -- Convert all system documents to universal PDF format.
  - -- Expand access to PIPES, make full WWW site, and make more user friendly.
  - -- Upload "plain English" updates and summaries of regulations of concern.
  - -- Create a PIPES regional calendar, to which regions and states could add activities.
  - -- Create additional content for the system, including information on P2, changes facing pretreatment programs as their NPDES permits are renewed, and compiling national SNC/NOV summaries to increase leverage of POTWs over recalcitrant industries.

Next Steps:

- Identify budget and plans of current PIPES staff.
- Get workgroup and subcommittee approval to make PIPES a priority, and get endorsement of various subtasks.
- Identify partners and develop timeline for each subtask.

4) **Pretreatment information systems transfer**

Purpose: To identify and promote mechanisms that allow pretreatment programs to share information system development costs with other POTWs and with other branches of their own POTW; to demonstrate the financial and environmental benefits of good pretreatment information systems.

Need: Pretreatment programs face very similar challenges and regulatory requirements across the country. Information management and pretreatment data systems play a critical role in organizing the information the programs need to meet regulatory requirements and ensure their POTWs meet their NPDES permits. Large programs have tended to develop unique data systems, at a cost of hundreds of thousands of dollars each. Small programs have either written their own simple (but limited) applications or used less-than-satisfactory commercial or EPA-developed software packages. In both areas, programs expressed interest in ways to improve their systems at a lower cost.

Progress to Date:

- Have begun background research on pretreatment information systems.
- Have identified programs that might be interested in participating in this project.

Next Steps:

- Initiate discussion of strengths and weaknesses of existing systems and unmet needs.
- Work with one or two large programs on issues associated with selling or giving away software to other POTWs, and on documenting the environmental and financial benefits of good information systems.
- Identify innovative mechanisms to encourage private sector provision of pretreatment software.

5) Cost Accounting and Budgeting

Purpose: To demonstrate how improved cost accounting and budgeting for pretreatment can make the job of pretreatment coordinators easier, demonstrate the cost-effectiveness of pretreatment programs, and provide important information to IUs about the most effective areas to invest in pretreatment equipment or pollution prevention.

Need: POTWs with approved pretreatment programs are required to have adequate resources to implement the pretreatment program. There is a very strong link between resources and funding of the program. Both dischargers and POTWs make decisions, in part, based on costs. If the cost information they use in these decisions is wrong, they may underinvest in pretreatment equipment, or in the pretreatment program overall. Most of the programs visited had incomplete or inadequate cost accounting and budgeting systems. In some cases, program staff had no access to information on the pretreatment budget. In other cases, the pretreatment staff had little information on how particular dischargers affected the overall cost of operating the POTW. In both cases, staff did not have the information necessary to inform their management about the various operational tradeoffs they faced in running the program.

Progress to Date:

- Have identified major categories of weakness in existing cost accounting and budgeting systems.
- Have identified a couple of promising case studies, although these programs have not been approached yet to see if they are interested in participating.

Next Steps:

- Identify target case studies to gauge their willingness to participate.
- Identify additional data that would be needed to conduct one in-depth study of cost accounting problems and one of budgeting problems.
- Develop format for case studies that would be useful both to EPA HQ/CSI and to the case study participant in improving their existing systems.

6) Choosing a Contract Laboratory

Purpose: To help pretreatment staff understand how to evaluate contract labs. Areas to be covered include: the types of questions to ask, how to structure an RFP for lab services, evaluating a laboratory Standard Operating Procedures manual, and evaluating the decision of when to use a contract laboratory rather than conduct testing in-house. The focus would be on lab consumers (i.e., pretreatment programs), rather than on laboratory staff as has been done in past EPA guidance.

Need: Much of the effectiveness of a pretreatment program relies on sound analytical data. Thus, choosing a laboratory capable of producing such results is critical. Since many of these labs may also be used by IUs, and for sampling as well as analysis, many programs felt that the choice of a lab was one of the most important in their program. POTWs with relatively sophisticated lab assessment practices felt that many programs had little undersanding of how to ensure they were getting good analytical services.

Progress to Date:

- Have identified POTWs that might be interested in serving as partners on this project.

Next Steps:

- Discussion of why this is important at the July FACA meeting.
- Workgroup and subcommittee approval of project going forward.
- Identification of additional partners (considering OC, Elkhart, HRSD, and OW OM & OST).
- Coordination with related EPA work:
  - -- OC work on good lab practices.
  - -- OST Engineering and Analysis work.
- Decision on whether to integrate with a lab certification program or to consider separately.
- Evaluation of issues associated with POTWs preparing a list of acceptable contract labs.

7) **Increased regulatory flexibility for top performers**

Purpose: To allow top-performing pretreatment programs greater flexibility in deploying available resources to areas of their program that they think will have the greatest environmental benefits.

Need: Many of the top performing pretreatment programs expressed frustration at some of the federal requirements they had to follow. An example is the requirement that they monitor and inspect all categorical users, no matter how small. In some areas, program coordinators pointed out that these small CIUs had very little impact on their systems (i.e., POTW performance, effluent and sludge quality), yet took up a disproportionate amount of staff time to oversee. A number of other examples were also mentioned.

Progress to Date:

EPA Office of Water, Permits Division has started work on a plan for streamlining the National Pretreatment Regulations. Issue papers have been distributed to approximately 80 identified stakeholders.

Next Steps:

- Develop a plan to educate POTWs about where flexibility exists in the current regulations that they have not taken advantage of.

- Provide more detailed information on the progress of regulatory revisions now in process, including which specific areas it is addressing, who is involved, and the expected timeline for completion. Possibly bring in other parties (e.g., AMSA) so they are aware of the progress being made.

- Develop consensus on results-based performance measures that would allow EPA to grant flexibility to POTWs without a risk of this flexibility contributing to reduced environmental quality.

Abbreviated Summary of Other Projects Considered

Each of the projects described below were brought out during site visits with pretreatment programs. Based on the priority rankings expressed by EPA staff or ongoing EPA initiatives, they have been put on hold.

A) Inspection Streamlining

To reduce the regulatory burden on industries, this project would have worked to consolidate some of the many different inspections that a facility faces each year. Since inspections occur across all media and at the federal, state, and local levels, this project would have involved substantial cooperation with a range of government agencies.

B) Model Interjurisdictional Agreement

Many POTWs accept industrial discharge from IUs in surrounding areas, but have no direct enforcement or monitoring controls over these remote industries. This project would create a model IJA that, if implemented, would ensure pretreatment programs had adequate control over their dischargers.

EPA staff pointed out that EPA recently developed a model IJA, and felt that this adequately addressed the concerns mentioned by the programs.

C) Evaluating impact of new discharges on POTW

New materials are constantly entering the marketplace; residuals often then enter the POTW system. This project would develop an organized way of testing these materials to be sure they didn't inhibit POTW functioning.

D) Place-based regulation of water quality

POTWs regulate only indirect dischargers, though direct dischargers can have a substantial impact on the quality of receiving waters into which the POTW discharges. This project would compare the quality of receiving waters between regions that have locally-based regulatory control over the entire water-body with those that don't (i.e., most POTWs).

E) Information provision

A number of additional areas of information provision were suggested, including guidance on sludge and sampling, and PR materials for pretreatment overall. These were viewed as lower priority than other projects.

Attachment 4:

SUMMARY OF CALIFORNIA POTW SITE VISITS, FEBRUARY 26 - MARCH 1, 1996

SITES VISITED

East Bay Municipal Utility District
Union Sanitary District
City of Escondido's Hale Avenue Resource Recovery Facility
City of West Sacramento POTW
County Sanitation Districts of Orange County

Interview Team: Jim Casey, OPPE; Mamie Miller, OECA; Doug Koplow, IEc; Greg Arthur, EPA Region 9 (for East Bay Municipal Utility District and Union Sanitary District only).

MOST CRITICAL FACTORS IN RUNNING A SUCCESSFUL PROGRAM

Every program evaluated during the CA trip has reduced metals loadings substantially during the past 10 to 15 years. These reductions seem to have come both from pretreatment programs and from changes in the industrial dischargers.[1] Despite this commonality, however, there are important distinctions between highly effective and less effective programs. Below are the pretreatment staff's views on the critical factors in making a program successful.

- **Staff Expertise.** Programs with substantial in-house expertise regarding pretreatment systems were much more successful:
  - -- Better able to write permits and evaluate the adequacy of pretreatment systems proposed by the Industrial User (IU). One inspector noted that "rejecting applications is an important power, but utility districts must have the technical expertise to evaluate a permit application. Many POTWs simply can't do this."
  - -- Better able to provide useful feedback to IUs during inspections about technological options and management methods. With the same inspectors coming over a couple of years, they know what is going on at the facility and can provide more effective oversight.

[1] For example, one of the POTWs had 62-63 platers in the 1980s; it now has less than 40.

- **Balancing enforcement and education during inspections**. At effective POTWs, inspectors have a great deal of knowledge about pretreatment systems and act as professional resources for IUs. They are viewed by IUs as a useful resource as well as an enforcement mechanism.

- **Understanding IU processes**. The effective programs focused on understanding the treatment process at IUs and ensuring that their processes are "under control."[2] In this respect, violations, even if they occur, can be quickly detected and corrected.

- **Proper local limits**. Proper local limits helped to focus program resources in the areas most critical in protecting environmental health and meeting the plant's NPDES permit requirements.

- **Good information on costs of service and influent constituents.** This information is used to set fees that send the proper signals to dischargers regarding where to invest in waste minimization or pretreatment equipment.

OPPORTUNITIES FOR TRANSFERRING SUCCESSES

- **Staff Training and Retention**

  -- In-house training seminars produced by the larger POTWs could be opened to inspectors from surrounding regions.
  -- Some of the combining of staff functions initiated by programs we visited can help smaller programs to retain staff despite a small diversity of IUs (often associated with limited opportunity for on-the-job professional development).
  -- Training videos using expert inspectors could help train staff at smaller programs in general techniques and how to deal with new industries.

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[2] According to Greg Arthur, an EPA Region 9 study compared IU compliance rates to installation of BAT. It was found that only 60 to 70 percent of the categorical IUs with BAT installed were able to achieve compliance rates better than 92 percent and 97 percent of them could only achieve compliance rates of better than 67 percent. However, these rates far exceed the abilities of the industries without BAT in place. The reason this does not show up clearly is that most CIUs with standards based on BAT in good programs in CA have the BAT installed already which means the violations that show up now are usually due to the inability to operate the treatment equipment.

- **Information Sharing**

  -- Information systems and programming solutions to common problems could benefit many pretreatment programs.
  -- Improved on-line access to training manuals and regulations of concern could improve dissemination of existing materials.
  -- Pollution prevention programs often develop similar materials. A joint effort among POTWs could reduce the cost.
  -- Generic permits could be developed and shared among POTWs.
  -- Multiple POTWs have repeatedly used outside consultants to produce information systems.

- **Cost Accounting and Charge Structures**

  -- Establishing a better understanding of how costs vary in response to particular types of discharges can help the POTWs set better fees and encourage investment in pretreatment equipment.
  -- Understanding cross-subsidies and potentially eliminating them could help to encourage new controls in the most appropriate sectors.

MEETING DISCHARGE LIMITS

The purpose of pretreatment programs is to help the POTW meet the discharge requirements under their NPDES permits. These limits drive the local limits set by the POTWs for IUs. Stringent NPDES limits for particular constituents generally translate to stringent local limits. For example, copper discharges into the SF bay are such an issue of concern that the POTWs have had to expand outreach into the residential sector in order to achieve the required control levels. Some interesting NPDES-related issues:

- Multiple POTWs may share a single NPDES permit and discharge point. For example, several facilities are part of the East Bay Dischargers Authority.

  -- Allocation of allowable limits among these POTWs has many of the same opportunities for market-based mechanisms as are applicable to IU discharges and POTW limits.
  -- In the case of East Bay Dischargers Authority, there is no effluent trading now, although trading has been discussed.[3]

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[3] There are a number of factors that can make trading complicated. First, trading may be applied to both point sources (PS) and nonpoint sources (NPS). NPS are complex to model, and the allocation of reductions between PS and NPS is currently done at the state rather than the federal level. In addition, trading must be based on mass-loadings rather than concentration-based loadings, complicating measurement somewhat.

- POTWs discharging to the ocean tended to have less difficulty meeting the terms of their permits than those discharging into SF bay, because limits tended to be less stringent.

- Setting local limits has been difficult for the smaller POTWs.

  -- One of the treatment works hired a consultant who originally set the local limits without scaling up from their industrial flow to account for dilution. As a result, the limits were originally set far too low.[4]
  -- Another program did not have local limits until forced to develop them under court order.

- Mass limits encourage increased water recycling, though they are somewhat more difficult to set and monitor than are concentration-based limits. (Two California POTWs use some form of mass-based limits).

Allocation of Allowable Discharges Among IUs

- **New Versus Old Sources.** Newer sources within a discharge area sometimes have more stringent discharge restrictions than do older sources. This tends to occur because CIUs must meet both Federal and local limits. The difference in standards for existing versus new sources varies, and is due to the ability of the Federal government to impose a more rigorous level of BAT on new industry. For certain industries, such as platers, some of the industrial users we visited argued that these differences had substantial competitive impacts, with allowable concentrations up to an order of magnitude different between similar plants.

- **No Use of Marketable Permits.** Allowable discharges were allocated among IUs by fiat. Although the flows are centralized within a single POTW, none had used market-based mechanisms to allocate allowable discharges based on the marginal costs of control at the plant.[5]

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[4] However, once these new limits were set, their program manager calculated mass-based limits on his own. Despite their ability to encourage water conservation, mass-based limits are more difficult to set and enforce than concentration-based limits. As a result, there are relatively few POTWs that use them.

[5] EPA came out with some emissions trading guidance in January 1996 that may make trading more common.

IDENTIFYING INDUSTRIAL USERS

An important aspect of every pretreatment program is the ability to identify new IUs. All of the POTWs we visited felt that there were very few IUs of which they were not aware. They described a fairly complex process to identify new dischargers. This process was similar across POTWs.

- **Literature Reviews.** Yellow pages and business licenses were reviewed, as well as any new construction permits or sewer modification permits.

- **Information from Other Municipal Departments**. Pretreatment staff networked with other municipal functions, such as local fire departments and hazardous materials regulators for leads on industries to target. Similar links were often maintained with surrounding communities, for advance information of firms seeking to move in.

- **Site Visits**. Unannounced inspections of industrial areas were employed by many pretreatment programs to identify new dischargers. This approach is especially important in warehouses, where subtenants may share a general water meter and discharge pipe.

- **Competitor Reporting.** A couple of POTWs mentioned that regulated competitors have been a powerful source of information, as firms do not want to be unfairly disadvantaged by businesses that do not incur the proper waste water treatment costs.

- **Analysis of Water Data**. Where POTWs have access to water consumption data, this has proven to be a valuable targeting tool for identifying IUs. High water consumption or sudden changes in consumption patterns are an important indicator. Most of the POTWs require a periodic water mass balance, where an industrial user must reconcile water inflows and discharges. This exercise provides the pretreatment program with important baseline data on IU production processes, as well as evaporative losses and non-production uses such as landscaping.

According to one of the larger POTWs, field-checking remains extremely important because their IU turnover can be as high as 10 to 20 percent per year. Despite the feeling that most IUs had been identified, some of the POTWs did experience fairly high levels of discharges that were unaccounted for. While not large enough to send the POTW out of compliance with their NPDES permits, the discharges do suggest that there may be pockets of illegal dischargers.

SAMPLING AND INSPECTION STRATEGY

Inspection Strategy

A number of goals associated with the pretreatment inspection programs were mentioned by multiple interviewees:

- The best programs used inspections as a way to communicate program goals to their IUs and to educate them regarding pretreatment options.
  - -- To provide continuity and specialized knowledge, the same inspector will generally visit the same sites for a number of years. This helps them to understand the site and quickly identify changes, although POTWs must rotate staff eventually to minimize the risk of cooption.
  - -- One of the smaller POTWs said that their inspectors pick a target area ahead of time to discuss in detail with the IU. In this respect, the inspections convey new information at each visit.
- Balancing education and enforcement objectives of the inspection was not easy:
  - -- Universally, while inspectors would provide general information about available technology or waste water treatment operations management, they would not make any specific recommendations. Specific recommendations, if they didn't end up working, could be very problematic for the POTW.
  - -- Larger POTWs rotated staff every 1 1/2 to 3 years, to minimize the likelihood of inspectors being coopted. The rotation represents a balance between site-specific knowledge and inspector independence. Inspectors liked staying on the same cases for a few years because they were able to see improvements in plant operations attributable to their work.
  - -- Many of the inspectors tried to have some interactions with IUs that were not enforcement-related, such as sharing information. This helped them to be seen as a conduit of possible solutions rather than simply an enforcement agent.

Inspection and Sampling Frequency

While the exact number of inspections per year varied somewhat across POTWs, the minimum for IUs tended to be two per year, with one being announced and one unannounced. The announced inspection helped the inspectors identify how well the systems could perform, and

provided data used to set local limits.[6] Larger IUs tend to have a greater required sampling frequency. For example, one of the larger POTWs requires sampling at SIUs of 8 to 12 times per year and four times per year at IUs. Self-monitoring (which does not always need to be sent to a certified lab) is done even more frequently.

Within these frequency targets, many of the programs give the inspectors wide latitude in scheduling specific inspections. One POTW, for example, feels that inspectors need to be free to spend as long as necessary at a particular site to get the information they need. Flexibility in scheduling gives them this freedom.

Due to the high workload and relatively low reductions in loads from minor industrial users (MIUs), most of the programs have tried an alternative to the inspection and sampling routine followed for larger industries. Among the options utilized:

- **Reduced inspection frequency.** MIUs are frequently inspected only once per year, if at all.

- **Prohibit discharges.** For industries where zero discharge is technically feasible, some of the POTWs have pressured these firms to stop discharging entirely. The approach often employed is dual track permitting: simple for firms agreeing to zero discharge, more complicated and expensive for firms opting for traditional oversight.

- **Best management practices and standardized permits.** Industries with relatively small discharges and similar characteristics across a large number of small shops have been dealt with in some cases using a best management practice approach rather than through individualized permits with chemical-specific limits. One POTW has applied such an approach to radiator shops and automotive repair shops with machine shops. Another has used the approach for restaurants and dentist offices.[7]

Many of the MIU strategies require careful coordination with local industries and trade associations.

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[6] One POTW noted that if the IU ran operations in order to minimize pollutant loadings during the announced inspection, this would hurt them in the long-run because their local limits would be set at a lower overall discharge level.

[7] Prior to shifting to this approach, one of the sites had nearly 200 permitted facilities, and not enough inspectors to go around. Once local limits were developed, the POTW could identify problem areas and eliminate unnecessary permittees.

One POTW was hoping to extend prohibitions on oil and grease discharges from restaurants, rather than having specific limits. Under 40 CFR 403.5b, petroleum oil and nonbiodegradable cutting oil are prohibited from being introduced into a POTW. Testing for these constituents is expensive and requires the use of Freon and hexane, posing both environmental and worker safety issues. Furthermore, the oil and grease is a problem for the collection system rather than for the treatment plant. A blanket prohibition would simplify inspections and avoid the need for sampling and testing.

Slug Protection and IU Process Controls

To protect their treatment process from upsets caused by chemical discharges, pretreatment staff have worked to improve advance detection of incoming chemicals, accelerate their ability to trace such discharges back to their source, and work with industrial users to reduce the likelihood of surprise discharges.

Advance Detection of Incoming Chemicals and Tracing Discharges Back to their Source

- **Remote Sensors.** In one of the plants a series of sensors were installed on their inflow pipes. These automatically relay information back to the central offices, providing advance warning of impending slugs. The POTW can then divert flow if necessary to protect the treatment plant from upsets.

- **Unannounced Sampling.** Most of the plants we visited supplement self-monitoring and site-sampling with unannounced trunkline sampling. Thus, illegal discharge levels can be detected. These tests have been useful on many occasions. For example, one of the POTWs discovered that one of its "model" industrial users, nominated for a pretreatment award, was illegally discharging wastes on a regular basis.

Ensuring a Process is "In Control"

An industrial process that is "in control" is well understood and behaves predictably. In the same way that a plant works to ensure its products have no defects, process controls from a pretreatment perspective involve ensuring that discharges are predictable and within compliance. If exceedances do occur, the IU should have a process to quickly detect the problem and correct it. Pretreatment staff use inspections to ensure that adequate equipment is in place, and use monitoring and self-monitoring requirements to force the IU to gather information on how well its pretreatment process is working.

The views expressed by staff on self-monitoring are particularly interesting. All of the POTWs require IUs to self-monitor and supplement less-frequent POTW site-visits with self-monitored data. Across-the-board, POTWs viewed self-reported data as less accurate than POTW sampling events.

- IUs would generally choose a time to take samples that would be most beneficial to their meeting effluent limits. In addition, contract labs would do what was possible to help their clients.

- The sampling accuracy of these tests varies by constituents. One of the POTWs has found oil and grease results to have the largest discrepancies between POTW tests and self-reporting. In addition, contract labs often conduct metals tests without using low enough detection limits.

- POTWs viewed self-reported data as information for the IU to use to understand their production process and waste water treatment system, rather than as useful for enforcement. It is a very useful tool for process control, but a relatively poor tool for enforcement. The implication of this viewpoint for CSI is that a shift to total reliance on self-reported data, even for top tier performers, may not provide an adequate oversight mechanism.

Substituting Biological Indicators for Some Laboratory Tests

Many of the programs we visited used indicator species to test for effluent purity. These organisms are sensitive to a wide variety of water quality disruptions, and therefore provide a useful general indicator of treatment efficacy. One of the smaller POTWs does not conduct metals analyses in-house. As a result, they seldom test influent for metals, but rely instead on disruptions to plant microbes to signal influent problems. While these approaches may provide a cost-effective way to detect problems, strong analytical capabilities are also needed so that problem constituents can be quickly identified if a biological indicator should die.

ENFORCEMENT STRATEGY

Successful programs echoed a theme already identified in the inspection strategy section above: focus on the industrial process rather than a specific incident. The enforcement components presented below support this view of compliance assurance.

- **Information Flow to POTW**. At one POTW, the program manager wanted to create an atmosphere of cooperation with the IUs to solve discharge problems; to have IUs focus on solving the problem rather than being fearful of going to jail. This was echoed by another POTW, again focusing on being contacted when there was a problem so the pretreatment staff could help the IU solve it.

  -- Minor violations, especially if they don't cause any problems for the POTW meeting local limits or plant upsets, are met with relatively low economic penalties, but fraud and lying to the POTW are met with criminal action.

  -- The biggest problem they have faced with IU noncompliance is the use of unqualified people to operate the treatment equipment. At most POTWs visited, staff felt that the IUs did have pretreatment equipment installed.

- **Focus on Why Out of Compliance**. The effective programs were not interested in the simple question of whether an IU was out of compliance, but rather on determining why such non-compliance had occurred. One of the larger POTWs tries to tailor its requirements on IUs to help them better characterize their waste streams.

- **Severity and Frequency of Violation**. One of the smaller programs felt that the severity and frequency of violations were important components of determining an appropriate enforcement response.

Most of the programs had a hierarchy of enforcement strategies of gradually increasing severity. These hierarchies could be quite complicated, although all of them spanned a range from a simple letter to criminal prosecution. Smaller programs seemed less willing to take significant enforcement actions, especially if the non-compliance was not causing NPDES violations. One of the programs used program engineers, rather than inspectors, to pursue enforcement activities as a way to somewhat protect the inspector's role as a source of solutions for the IU. Where enforcement actions forced the POTW to incur additional sampling and analysis costs, these costs were generally charged back to the IU if a violation was found. Whether the additional charges were passed on to the IU if violations were not found varied by POTW.

POLLUTION PREVENTION

Pollution prevention programs were one area where activities varied significantly between large and small POTWs. Most of the large POTWs had well-developed pollution prevention programs, consisting primarily of information sharing, case studies, outreach, and training. Only

one program had financial incentives in place to encourage IU investment in pollution prevention equipment, although several references were made to state-level programs that ostensibly encouraged such investments.[8] This program is financed through budget savings that the pretreatment program is allowed to retain. The loan subsidy is open to any industry, even large sophisticated ones that have regular access to capital markets. Nonetheless, there have not been many applicants. Staff believe this is due to the fact that so many of the IUs are already in compliance.

POTWs have been innovative in linking pollution prevention to their efforts to remove minor industrial users from the standard permitting process. Efforts have included developing education materials in foreign languages and working through local trade associations. Some have even developed educational courses. For example, one of the programs has taught a course on waste minimization opportunities for metal platers. This course was financed through a settlement with an IU for discharge violations. Other important findings:

- Smaller programs discuss pollution prevention as an area they would like to expand into, but feel their largest benefits in the short-term lie in improving their control over wastewater treatment operations both at the POTW and at IUs.

- It is our observation that even the larger programs have done little rigorous analysis to evaluate the cost-effectiveness of their pollution prevention activities.

- In addition, there appears to be substantial overlap between the pollution prevention materials developed by different POTWs. Combined efforts may be able to improve the efficiency of some of these operations.

EMPLOYEE ISSUES

In-house expertise to write and review permits and conduct inspections was identified as an extremely important component of a successful pretreatment program. To maintain and develop in-house expertise, staff retention and training are important. Staff retention and training are continual challenges even for the larger programs. It is especially difficult for the smaller, municipally-run programs where pay scales can be low.

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[8] In California, this is primarily the CALCAP program that subsidizes loans to certain industries. In practice, the program has not had much success in targeting pollution prevention investments over pollution control equipment or even general capital.

Nonetheless, the best programs tend to have high staff retention, excited and motivated people, and many more job candidates from outside the system than there are new openings. The struggling programs have had a more difficult time attracting and retaining staff. Some useful themes came out across all facilities:

- **Cross-Training.** Training staff in multiple disciplines was viewed as important by many of the POTWs, both to improve the decisions that field staff make and to help with staff retention by keeping jobs challenging and interesting. A major goal of one training program, for example, is to get the staff to see the cross-media and cross-program impacts of their activities.

  -- **Plant Operations and Pretreatment.** For many of the programs we visited, pretreatment staff was fairly distinct from treatment plant staff. However, pretreatment staff that did have plant operations experience felt that this experience was extremely beneficial because it allowed them to see the "big picture" regarding IU practices and overall plant operations.

  -- **Alternate Staffing.** One of the programs has developed an innovative program to upgrade the skills of its staff and has established a formal three-tier job classification system (entry, journey, and expert) to accomplish this end. The goal was to eliminate dead-end jobs and to move everybody to the highest level over time. The system has improved staff retention and expertise. Although staff will become more expensive over time (as more and more people reach the upper levels), program managers were confident that the improved expertise would be well worth it. Joint training between pretreatment and stormwater staff has greatly increased cooperation between the two divisions.

  -- **Permitting and Enforcement.** One program had problems in the past because permits were written with a different perspective than enforcement. This caused friction because poorly written permits caused problems for enforcement staff. To address this issue, they combined the functions. The inspectors have a long-term relationship with the firm's they inspect, conducting routine site visits and inspections. Engineers, who also write the permits, get involved as soon as there is any hint of enforcement action against an IU. This division is helpful because the inspectors sometimes have a difficult time taking significant actions against the firms.

- **Sharing "Grunt" Work Evenly.** Sampling is a task that most inspectors don't like. Concentrating sampling tasks on entry-level employees has created a "dead-end" job with high turnover. To address this problem, one of the programs has required that sampling tasks be shared evenly by all

levels of their pretreatment staff. Such a distribution keeps all staff current in sampling techniques as well as reducing the turnover at the entry level positions.

- **Expanding Jobs to Keep them Challenging.** The greater the diversity of the challenges facing a pretreatment employee, the more likely staff is to stay. Larger POTWs, serving IUs in complex industries and a larger number of users, have better staff retention than those with a required skill set that is not challenging to master. For many inspectors, especially at small programs, there is little opportunity for upward movement within the plant.[9] Thus, lateral movement, or movement to a larger POTW is quite common.

  -- POTWs may combine functions, such as wastewater and stormwater inspections. This reduces the inspector burden on private industry, provides the inspectors with a broader exposure to the dischargers, and improves the efficiency of government oversight.

  -- For small POTWs, combining roles is a necessity; there simply isn't a budget to have highly specialized staff positions. For example, the same staff at one POTW manage water, wastewater, and stormwater functions. This variety does help to make the job more challenging to inspectors.

EDUCATION/TRAINING ACTIVITIES AND INITIATIVES

Pretreatment personnel stated that they found EPA manuals to be generally (although not always) useful.[10] However, they were often difficult to obtain, especially after they were no longer printed. Program managers thought that putting the manuals on the Internet would be a valuable tool and eliminate many of the problems associated with an inability to obtain the documents.[11] Short of this, some of the older ones should be reprinted. Nearly every POTW was using at least one EPA manual that was over ten years old, stating that it continued to be of value.

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[9] Even large programs may face similar problems. One of the large programs had a difficult time retaining its engineering staff after it had collected basic data on its IUs.

[10] When asked for specific titles that were valuable, few were able to list them on the spot.

[11] Some manuals are available on the Point Source Information Provisions and Exchange System (PIPES) bulletin board system. However, EPA could convert manuals into a PDF format fairly easily. This format allows graphics and text to be combined in a visual image of the original. The documents are accessible to all platforms (DOS, Apple, and UNIX) using a freely available reader (Acrobat reader), and can be searched on-line or printed.

Smaller POTWs also felt that training assistance related to federal regulations would be extremely useful. At the very least, EPA could provide continuously-updated regulations on the Internet for local program managers to reference. Changes could be highlighted so that managers could easily identify how changes were likely to affect their workload and responsibilities.

The larger POTWs had formalized training programs. One such facility has developed an internal training manual that all new inspectors learn during their first two years on the job. Another program has developed formal skill categories for employees and runs internal training sessions on various topics throughout the year. Partnering on inspections is another approach often used in the larger districts to train employees in new areas.

Some anecdotal information on favored approaches follows:

- One POTW mentioned Kenneth Kerri's series of guidance manuals (put out by California State University, Sacramento) as an industry standard.

- Some POTWs felt that videos would be more helpful than written materials for a number of reasons:

  -- They could be lent to IUs as well as used by inspectors.
  -- They are useful to both visual and aural learners.
  -- They can contain many subtleties of a site visit, such as how to introduce yourself.
  -- They provide an important resource to small programs where there is a limited diversity of IU industries.

- Written materials remain important as reference tools, however.

- One POTW felt that inspector certification would be useful as well. While already required in California, broader application of minimal standards might help to bolster the professionalism of the business.

- Industry conferences offer a good opportunity for continued learning. One POTW wanted EPA support for the Association of Metropolitan Sewerage Agencies (AMSA) pretreatment conference to continue.

- One POTW has developed its own training manual for inspectors that inspectors learn over their first couple of years on the job. EPA development documents were helpful in developing this manual.

Smaller POTWs faced unique training challenges because they did not have the internal resources to cross-train through rotation. Certain industries or issues simply do not exist within their districts. For these POTWs, developing networks with the surrounding POTWs was deemed one solution. Inspectors could travel to attend training sessions or inspections; at the very least, they could have a telephone network with other inspectors to help them address new challenges. Use of EPA's PIPES bulletin board could also serve as a networking device for pretreatment coordinators.

OUTREACH

Outreach generally focused on industrial users both large and small. Where classes of users needed to be educated regarding new requirements or best management practices, the larger POTWs would work through trade associations and community groups, as well as through local newspapers. Two of the programs had initiatives targeting immigrant subgroups, and produced materials in Korean and Spanish to reach them. One of these sponsored workshops for the Korean Drycleaners Association as another way to educate small IUs.

The industrial advisory council approach was also used by at least three of the POTWs we visited. The Councils provided pretreatment program managers with sounding boards regarding rate structure, outreach, and new regulations. Working through the Councils, program coordinators were able to disseminate information and reduce fears in the IU community. For POTWs that historically had strained relationships with their IUs, the Councils provided a forum for rebuilding trust and cooperation between industry and the POTW.

The Councils, by design, have tended not to include environmental groups. This decision is based on their purpose of informing the industrial community about compliance issues rather than serving as a forum for policy discussion. Some program managers thought that including non-governmental organizations (e.g., environmental groups) on these councils would be divisive and prevent industry from stating its concerns.

PRETREATMENT RESOURCES AND COST ACCOUNTING

Even the best performing POTWs had limited information on their cost of providing services to specific classes of customer or managing certain types of constituents. In addition, budgets appeared to be developed on a cash-flow basis, with little or no use of multi-year capital accounting. As a result, there are multiple levels of cross-subsidization within the pretreatment program, and between pretreatment and other municipal activities. These cross-subsidies make it difficult to prioritize areas in which to focus pretreatment activity, and can reduce the incentives of IUs to install pretreatment equipment or minimize the use and discharge of constituents of particular concern.

Budgeting

Budgeting issues centered on three main areas: use of capital budgeting; incentives for improving program efficiency; and comparing program efficiency.

- **Capital budgeting.** Capital budgeting is not always used; rather, the full costs are financed out of a single year's budget. For example, setting local limits in one facility cost $200,000, nearly doubling the pretreatment program's "normal" budget. However, the cost was not allocated over the number of years that the local limits would be in effect in order to estimate the cost of service.

  -- As a result, budget demands can be volatile, and the POTW does not develop a normalized estimate of their cost of providing service.

  -- The POTW noted however, that it would be difficult to retain surplus funds within the pretreatment program to finance a capital investment, given the many other revenue needs within the department and city. Therefore, a debt approach would be needed instead.

- **Incentives for improving program efficiency**. One of the programs is allowed to retain surplus funds for use in subsequent years. This has provided them with an incentive to spend their budgeted funds more efficiently (i.e., providing the same services for less money). The POTW operates on a two-year budget cycle, and is allowed flexible line-item budgeting so that spending can be shifted as needed to meet the critical demands of the program. This differs from other programs, where fines and penalties are returned to the general fund. The pretreatment budget in these other programs, if not spent within a fiscal year, also reverts back to the general fund.

- **Evaluating program efficiency**. All of the programs have experienced declining budgets and, in some cases, pressure to privatize all or a part of their operations. One of the larger POTWs, in grappling with these pressures, was interested in what measures one might use to evaluate the efficiency of a pretreatment program, and to enable it to be compared to other programs around the country.

Cost Accounting

Accounting for the costs of providing wastewater treatment services is an important exercise for every POTW to undertake. Only when costs are allocated to particular classes of users or types of dischargers can both the community and the industries make rational decisions regarding which wastes to treat at the factory and which to treat at the POTW; how much water to conserve; and which constituents are most important to remove from the discharge.

The cost accounting and cost recovery programs varied widely among the POTWs visited. Many POTWs did not know how much they spent to provide service to particular types of dischargers, and did not know how much problem discharges such as metals or salt cost their systems in higher maintenance, testing, or residual management expenses. Cross-subsidies between water and sewer services and between different classes of dischargers were the norm rather than the exception. This has generally resulted in underpricing services to IUs and, therefore, an underinvestment in source reduction and pretreatment by these users.

Cross-Subsidies

Cross-subsidies refer to situations where the fees on particular types of dischargers are set too low to recover the costs of the services provided to those dischargers. This shortfall is made up through increased charges on other users. A wide variety of cross-subsidies can exist within a pretreatment program; each will cause different types of distortions. Examples of cross-subsidies existing at the CA sites we visited are presented below; this is not intended to be a comprehensive listing.

- **Between Municipalities.** One of the POTWs receives sewage from IUs located in an adjacent large city. While this city does pay a fee for sending this sewage to the plant, it is likely that these charges do not reflect the program's full costs of treating this discharge.[12]

- **Between the General Taxpayer and/or Water Consumer and the Wastewater Treatment Program.** A number of the communities we visited have some fund transfers into the program from general tax revenues. The size of these transfers varies by locality. In one POTW, for example, the development of local limits was entirely financed from outside the wastewater treatment program.

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[12] For example, an SIU in this city is a major discharger of some of the constituents of concern that prevent this POTWs from selling its treated effluent to the agricultural sector. This discharger should bear a substantial portion of lost revenues to the POTW that result from this discharge.

- **Between Industrial Dischargers.** Most programs seemed to undercharge dischargers of constituents of concern, such as metals or salt.

  -- One of the POTWs wants to sell its treated effluent for agricultural use, but can't due to salt content, primarily from water softening operations (both industrial and residential). Currently, the plant can't charge more for salt discharge, but wants to move in this direction -- including much higher charges on home water softeners. Longer term, the plant hopes to divert brine wastes directly into the ocean, thereby not contaminating its secondary effluent.

- **Between Industrial and Non-Industrial Dischargers**. One of the POTWs evaluated a cost recovery plan to charge customers based on their cost of service in the pretreatment program.

  -- The cost for IUs skyrocketed, to a level this facility thought might lead industries to relocate. Especially hard-hit were the small categorical users, regulated based on statute even though their discharges were quite small. Under the prospective system, their fees would have gone from $100 per year to about $18,000.

  -- In contrast, when these costs are allocated across all users, they were very low. As a result, they decided that the pretreatment program benefitted all dischargers, and that fees should not be based on cost of service.

- **Between Agricultural Consumption of Fresh Water and the Wastewater Treatment Program.** Heavily subsidized access to fresh water for agriculture in California reduces the demand for treated effluent from POTWs in the southern part of the state because the fresh water is too inexpensive for farmers to seek out substitutes. Were POTW effluent able to be sold for irrigation, the additional revenues would likely allow sewer rates for all wastewater dischargers to decline.

Cost-Recovery for Pretreatment Program

One form of cross subsidy mentioned above involved transfers from water consumers or local taxpayers to wastewater dischargers -- primarily industry. In fact, many pre-treatment programs are paid for by general sewer or water users, rather than by the industries themselves. Where costs are not recovered, industries may be benefitting from subsidized sewage treatment. Often, large industries pay less, while residential or small commercial customers pay more. Aside from equity

concerns, such an arrangement may also reduce the incentive for industries to invest in pretreatment equipment. There was a wide variation across the POTWs regarding the portion of pretreatment costs paid for by industry and how these charges were structured.[13]

Interestingly, while a couple of people did mention that they were under pressure to keep sewer fees low to retain industry, nobody felt that increasing discharge fees had been the primary factor causing IUs to shut down. They did feel that rising fees encouraged the industries to minimize discharges, however, through process changes or improved pretreatment.

- One facility does not charge its IUs a fee. In addition, laboratory costs associated with particular IUs are absorbed by the city rather than charged to the industry unless they are associated with an enforcement action. In the view of the POTW,
  - -- The industries bring valuable jobs to the region.
  - -- The POTW does not want to penalize local business. Nearby businesses, in a different governmental jurisdiction, discharge into the plant but are not charged a permit fee. Therefore, the pretreatment personnel did not wish to disadvantage their local industry.
- The service area for some of the POTWs continues to grow. Therefore, there is political pressure to keep sewer fees low in order to help attract new industry.
- One program charges the same permit fees to all sized firms.
- Another POTW originally recovered very little of its program costs from IUs. Is has begun to charge IUs for lab costs and sampling. Sewer fees make up the rest of the annual budget. When the higher charges were explained to industry, the firms did not threaten to leave; they actually felt that the charges made sense.
  - -- Commercial firms also pay for pretreatment because the city must monitor discharge from this sector and include it as part of their headworks analysis. The charge is $2.25 per month.

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[13] Since commercial and residential users also contribute discharges that use of capacity for particular constituents, these classes should also pay a portion of pretreatment costs. However, the current allocation of charges is often distortionary.

Innovative User Fees

- **Capacity Charges.** Faced with the need to expand plant capacity but without the financial means to do so, one of the POTWs financed new construction by selling access to its system. Developers were not allowed to begin their projects without purchasing access to the sewers in advance.

  -- The system charged a fixed amount per EDU (equivalent discharge unit, equal to approximately 250 gallons per day). The purchase of one EDU gave a discharger the perpetual right to discharge that amount per day, but these rights can not be bought and sold. Thus, once purchased, capacity fees provide little incentive for source reduction -- despite the fact that the market price for new discharge rights has risen steeply (to about $5,780 per EDU), thereby offering existing industries large potential gains for reducing their demands on the municipal system.[14]

Shadow-Pricing

In industrial processes, capacity constraints on a single machine can limit production from the rest of the plant. The machine in this example, known as a "bottleneck," can greatly reduce plant throughput, with important implications on factory profitability. Assigning costs to these bottlenecks, equal to the value of foregone production, can help plant managers identify critical changes needed in their plant in order to make it more efficient.

Waste water treatment is an industrial process, and can also be subject to bottlenecks. One of the facilities provides an interesting example of how shadow pricing can help to improve plant efficiency. The POTW has an average flow of about 15 mgd, and a capacity of 16 to 17.5 mgd. While operating at close to capacity, there is between 1 and 3 mgd (between 7 and 20 percent of current flow) remaining. However, because the plant shares an outfall with another treatment plant, and this plant currently needs most of the outfall capacity, managers at the site do not think they will be able to use the full capacity of their treatment plant. Thus, the outfall is a bottleneck.

Were the limited outfall capacity to carry a shadow price (where the plants would actually pay a charge to use the outfall) reflecting the cost of being unable to use up to 20 percent of the plant's treatment capacity, managers in both plants would have a strong incentive to innovate. These innovations could reduce the effluent discharged, or perhaps expand the capacity in the outfall. In either case, costs to the utility system and its customers would be minimized.

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[14] The IUs also pay a charge every month based on the gallons of water consumed, providing some incentive to conserve water.

Cost-Accounting and Beneficial Reuse of Effluent and Biosolids

The contamination of sludge and treated effluent with metals and salt can preclude its reuse as soil amendments and irrigation water. Proper cost accounting would help to solve this problem. For example, a POTW that must landfill its sludge due to high levels of metals would charge all metals dischargers the incremental cost of sludge disposal in a landfill versus disposal on a farm.

The California sites actually visited all met land application standards for their sludge.[15] As a result, improper cost accounting does not appear to be affecting this aspect of operations. The situation with secondary effluent varies. Many facilities reuse their wastewater for agricultural and urban end uses. In other programs, very little of the treated water is being reused prior to discharge. This appears partly to be due to contamination levels and partly due to the heavily subsidized agricultural water available throughout southern California, eliminating much of the economic incentive to use reclaimed water. In such cases, the lost revenues increase the costs of wastewater treatment to dischargers.

- **Constituents of Concern in Sludge.** Primarily heavy metals.
- **Constituents of Concern in Treated Effluent.**
  - -- Fluoride can precipitate out calcium.
  - -- Boron levels can hurt lemon trees.
  - -- Salt levels harm many crops. Especially salt-sensitive crops, such as avocado trees, can be used to test the ability to use effluent in agriculture.
  - -- Selenium, molybdenum, and zinc are also constituents of concern in effluent.

INFORMATION SYSTEMS

Improved Systems Would be Extremely Valuable

The pretreatment staff universally felt that improved information systems would benefit their programs. The systems would allow them to provide their services more efficiently, as well as to identify trends in discharges much more readily. Rapid access to basic data on IUs has proven to be a powerful aid to enforcement. The systems have also reduced staffing needs. For example, a

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[15] Reuse of biosolids seems to have as much to do with shopping around for an interested farm as with metals levels in the sludge. For example, sludge was landfilled at one of the programs until November 1995, when they identified somebody willing to take their sludge for land application. The metals loadings had not changed.

combination of self-monitoring requirements and automation allowed one of the POTWs visited to reduce its inspection force by three positions. Staff are able to spend more time on evaluation and inspection and less on administration.

While some of the larger facilities are investing heavily in information systems, there are many opportunities for standardization, information sharing, and dissemination of successful systems to the smaller POTWs. The benefits would be substantial. One pretreatment staffperson (at a small POTW) estimated that he spends about a half-day each time he gets lab results looking for data trends. Formatting data for the various required reports and standardizing data forms would also be helpful.

Information Systems Available to POTWs

Below is a compilation of information systems that were used by the sites we visited, or mentioned by them.

- **Oracle-Based systems.** The larger POTWs tended to have a Laboratory Information Management System (LIMs) to track laboratory samples. The LIMs would be linked to an Oracle-based database containing information on permits, required sampling dates, etc. One information specialist thought that a Paradox database could be used rather than Oracle to build such a system for a smaller POTW.

  -- Many of the POTWs have spent tens of thousands of dollars developing specialized programming to track trends, meet state and local reporting requirements, and generate correspondence to IUs automatically. There exists tremendous opportunities for them to sell these programs to other POTWs.

- **Pretreatment Program Manager.** An integrated, DOS-based, pretreatment management program, this software was used regularly by one of the smaller plants we visited, and had been analyzed by the other small plant. Staff felt the software was useful, albeit somewhat rigid and difficult to work with. The software retails for $4,500. It appears to be too limited for the larger POTWs.

  -- Contact: ARCCA Incorporated, 215/322-8396.
  -- ARCCA was very interested in this CSI project and our findings. They are willing to work with EPA to improve their program, and may be open to innovative ways of extending the use of the software among smaller POTWs.

- **Prelim 4.0**. This program helps pretreatment programs to set local limits. The interview team did not get feedback from pretreatment staff on its usefulness.

- **PCME**. This software package, developed by EPA, was universally disliked by every pretreatment staffperson we asked. The program was inflexible, difficult to learn, and not very powerful. Many had stories of frustration related to their past attempts to use the software.

- **PIPES (Point Source Information Provision and Exchange System)**. This is EPA's on-line bulletin board for many water-related areas, including pretreatment. It was mentioned as a potentially valuable resource; however, many of the smaller programs did not currently have easy access to the Internet.

Use of Geographic Information Systems (GIS)

Most of the programs we visited have begun to develop GIS. The norm seems to have these efforts start with the treatment plant, to improve operations and maintenance of sewage treatment capital and sewer networks. The links between treatment-driven GIS operations and the pretreatment program is mostly hypothetical at this point, and there does not appear to be much input from the pretreatment programs to help shape GIS development. A number of systems are linking into a municipality-level GIS that includes basic data on industry such as location and business licenses. Program staff did discuss numerous potential benefits of linking GIS to pretreatment:

- Linking business licenses to SIC data to help identify IUs and inform the inspectors.

- Locating IUs on the sewer grid and linking to sampling data to identify contributions of particular pollutants to system trunk lines. For some POTWs, this sampling data could be fed by automatic sensors located at critical points along the grid.

- Integrating many water and sewer-related functions such as water networks, sewage treatment, pretreatment, stormwater programs, brine lines, well fields, and even hazardous material response, with resultant improvements in accuracy and efficiency.

- Informing the development of local limits.

Challenges Facing Information System Expansion

- Some POTWs have developed segregated databases to meet specialized uses. While they acknowledge that an integrated system would be far more powerful, the process of integration can be a difficult task.

- Tailoring specialized analyses and reports can be time-consuming and expensive for POTWs.

- Links between external labs and the POTW data systems are not very advanced.

- Need systems that are user-friendly, and that the staff can modify.

OWNERSHIP PATTERNS

The POTWs we visited in CA had a wide range of ownership patterns regarding infrastructure, management units, and degree of outsourcing. In a number of cases, fragmented ownership of assets or overlapping jurisdictions created problems for efficient management and cost accounting. In other cases, pressure to improve efficiency had led to outsourcing of certain functions, or developing additional capabilities in-house. The various patterns we encountered are described below. It is too early in the POTW site visits to draw significant conclusions from the patterns seen.

- One of the facilities owns the treatment system. However, the sewer systems that feed the plant are owned and operated by the local cities. Several POTWs discharge to the East Bay Dischargers Authority. Coordinating among the many different owners can be complicated.

- One of the POTWs receives effluent from industries in a nearby large city. Industrial users, frustrated at falling into two management jurisdictions, petitioned to be shifted into the city district. The city now runs the pretreatment program; however, since the effluent from this area still flows into the POTW in another community, the city inspectors do not have a good understanding of issues confronting the plant. To address this issue, inspectors from the POTW will often conduct joint inspections with the city. In addition, they do have some input into the discharge permits that the city writes.

- One of the sanitation regions is divided into a number of districts. Each district has a different sewerage surcharge, based roughly on the differing costs of service. These have proven to be administratively complex, and may

be eliminated. The POTW has already outsourced a number of activities including biosolids hauling, design work, plant security, and legal counsel (including enforcement).[16]

Laboratory Operations

Sampling and analysis of samples provide a core component of the pretreatment program. Whether laboratory operations are run in-house or outsourced, the pretreatment program must coordinate closely with lab personnel. The degree to which lab operations are outsourced represents a trade-off between economics and convenience.

- **Enforcement cases require a great deal of staff time.** One of the POTWs contracts for most of their lab work even though they are certified to do it in-house. The pretreatment manager prefers not to have his staff tied up with QA/QC issues related to pending enforcement actions.

- **Specialized analyses are generally outsourced.** Where the needs for a particular analysis are infrequent, even POTWs with extensive internal labs tend to rely more heavily on external laboratories.

- **Internal analyses may be faster.** Quick turnaround, greater control over testing conditions, and the ability to link results easily into POTW data systems all favor internal testing.

Comparing the economics of internal versus external testing is not straightforward. For example, because IUs must do self-monitoring and send the samples to contract laboratories for analysis, they can easily compare charges to fees for POTW in-house sampling. This keeps pressure on the POTW labs to be cost-competitive. In fact, one facility says their lab costs are so low that the private sector has asked them to run their samples. However, meeting external lab prices does not necessarily mean the internal lab is as efficient. The internal lab does not earn a profit (allowing it to underprice private labs, all else being equal), and may be subsidized by other aspects of the POTW operations.

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[16] The enforcement portion of this function may soon be brought back in-house.

"In-Sourcing"

Outsourcing refers to shifting a function previously performed by internal staff to an outside firm. "In-sourcing" refers to the opposite: internal staff taking on a responsibility previously performed by an outside entity. Both forces are occurring simultaneously within the POTW arena, though in different areas. One POTW we visited was especially interested in expanding its experience with site inspections and waste water treatment systems into the stormwater program, previously run locally. "In-sourcing" can offer important benefits to the POTW:

- Skills of its inspectors can be utilized, rather than having to train an additional set of inspectors for a much narrower job.
- Inspection efficiency can be enhanced.
- The skills of pretreatment inspectors, in conjunction with their presence in the field already, can provide significant cost savings to the taxpayer over the current dual-inspector system.
- The additional responsibility can bring in additional revenues to the POTW, as well as expose the inspectors to new potential dischargers.

Another of the programs has brought equipment repair in-house in order to save money. Previously, equipment had to be shipped to the manufacturer in another state, at great expense both in terms of cost and time out of service. POTW staff have recently been trained by the manufacturer to do the repairs themselves, with substantial benefits to the POTW.

KEY FACTORS IN IMPROVING PERFORMANCE AT UNDERPERFORMING POTWS

Operations of Treatment Process a Larger Factor than Pretreatment

Two of the POTWs in California had faced compliance actions in the past five years. Both felt that their programs were now in control, a conclusion that regulatory officials seemed to concur with. Interestingly, in both cases, pretreatment program managers felt that improvements in plant operations rather than the pretreatment program were the largest factors in bringing the programs back into compliance. In both cases, as well, the enforcement actions had created an atmosphere in which new managers were able to take over the program in a turnaround-type situation. Funds were made available to improve the treatment program, and the past failures made staff changes and new operating procedures possible to implement. New staff and resources were brought in, and, in some situations, old staff were forced to meet employment expectations that they had not previously been meeting.

- One of the sites visited felt that although the IUs had often been blamed for plant failures, the operations of the sewage treatment plant itself was more to blame for plant upsets. In addition, new local limits that scaled from IUs to the entire user base to incorporate the dilution from the other sources (and were therefore easier to meet) brought the POTW out of technical violation.

  -- Within the pretreatment program, two changes were implemented to improve plant operations. First, major industries were targeted for additional scrutiny. Second, IU performance was tracked more carefully.
  -- The action also gave them the power to enforce fines that it had previously lacked due to jurisdictional issues.

- In one case, the program manager felt that local limits were very important in helping him set priorities.[17] Their major technical problems, however, were associated with poor process controls in the sewage treatment process, rather than with industrial discharges. In their estimation, 95 percent of the improvement in their program was due to operational controls, only 5 percent was due to pretreatment.

Challenges for Smaller POTWs

- **Expertise.** Training and retaining inspectors and engineers capable of reviewing permits and providing useful feedback to IUs.

- **Classifying IUs.** The federal regulations can be difficult to understand and continually change. Proficiency in the regulations is a substantial task, and poses a large fixed cost for smaller programs. One small POTW had misclassified some IUs, an oversight the EPA's regional inspector brought to their attention. As a result, some IUs made investments to comply with particular standards and later had to reinvest in new equipment once the misclassification came to light.

[17] However, they were forced to set local limits for over 70 pollutants. Most other POTWs had limits for only 15. The large number has imposed a burden on them for monitoring and testing, and the pretreatment program manager feels that many of the limits are unnecessary.

SUMMARY OF SUGGESTIONS TO EPA

- **Put guidance manuals on the Internet.** Older documents are hard to find once they are out of print; having them on-line would solve this problem. (EPA's PIPES bulletin board does have a number of guidance manuals on-line. These appear to be text files, suggesting that useful graphics are not included. Expanding the menu to include all of the documents pretreatment staff find useful, as well as putting them in PDF rather than TXT formats, would add value to the existing offerings.)

- **Provide updated regulations of relevant to pretreatment on the Internet.** Any layman's guide to these regulations would also be useful to a number of the program staff with whom we spoke.

- **Higher Presence of EPA Regional Inspectors.** Pretreatment program staff had mixed reviews of state regulators. However, they all felt that they had benefitted tremendously from the knowledge and suggestions of Region 9 inspectors. Those facilities farther away from San Francisco wanted a much stronger presence of the inspectors than was currently occurring. For example, some of the smaller programs said they could go years in between inspector visits.

- **Mention the Positive In Audit Reports.** Where programs have improved, pretreatment managers wanted EPA audit reports to acknowledge these improvements in the audit report, rather than only listing the program shortcomings. Pretreatment managers must compete for attention and resources with many other municipal needs, and positive feedback is a powerful motivator for their staff and for their superiors.

- **More EPA Interaction with Utility and Public Works Managers.** EPA contact with utility and public works managers could help boost the status of the pretreatment program in the eyes of these managers.

- **Encourage Use of Mass-Based Limits.** According to one of the POTWs visited, EPA has backed away from mass-based limits in recent years. This has led some IUs in the service area to increase water use in order to meet concentration based limits.[18]

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[18] In some cases, high concentrations of toxins could cause plant upsets, arguing for a balance between mass-based and concentration-based limits. Staff say this is not a problem in large plants because slugs pose very little risk of causing an upset.

- **Set De Minimis Limits for Categorical Users**. Small categorical users often discharge such low levels of regulated constituents that they have no effect on the POTW meeting local limits. Eliminating these users from regulation could result in substantial cost savings with no discernable environmental impact. An alternative to a de minimis exemption would be to allow the POTW to exempt small dischargers if they were not affecting compliance with the NPDES permit.

- **Relaxed Restrictions on the Use of Reclaimed Water**. Mostly a state issue.

- **Greater State or Federal Involvement in Setting Local Limits or Writing Permits**. According the one of EPA's regional inspectors, local limits and permit writing can be extremely difficult for the smaller POTWs to do well. Greater involvement at the state or federal level might improve the results in these areas. [19]

- **Re-examine the Concept of Significant Non-Compliance (SNC)**. One POTW felt that the current definition of SNC did not target the facilities that had the biggest problems. This conclusion is based on two factors:

  -- As non-compliance levels rise, the frequency of testing required rises as well, allowing extremely poor test results to be averaged across a much larger sample of readings. In contrast, a plant with no history of violations that has one test come back out of compliance will have a small number of tests over which to average the poor result.

  -- A 20 percent variation between the standard and the test result can, for certain tests, be statistically-insignificant.

- **Increased Attention to Bioaugmentation**. One POTW felt that many bioaugmentation options were underutilized because many plant operators did not know about them. Existing products could provide odor control, corrosion control, and achieve rapid drops in required BOD. They can also help a plant to recover more quickly from an upset.

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[19] The larger POTWs have established fairly automated permit-writing using boilerplate text. Some of these approaches may be transferable as well.

SUGGESTIONS FOR THE CSI PROJECT

- **Evaluating Impact of Privatization.** How do POTWs compare to privately-owned plants in terms of their structure and their efficiency? How might privatization affect pretreatment and environmental performance?

- **Benchmarking**. How do you compare across POTWs to evaluate program efficiency? How does one document productivity: focusing on results rather than on actions?

- **Barriers to Energy Recovery with No Environmental Benefits**. One of the plants generates methane from its sludge digester that it wanted to use to fuel plant operations. The city requires such energy recovery operations to be permitted, but the POTW's methane contained too much NOx to be permittable. As a result, the methane is flared off (the city has no regulations on flaring), and the exact same NOx is released to the atmosphere without energy recovery.

- **Reducing the Burden of Inspections on IUs.** EPA and pretreatment inspectors both mentioned that they are often met with resistance by the IUs. Much of this, they believe, has to do with the large number of government officials these industries must deal with. According to an EPA regional inspector, there are 26 agencies that do environmental oversight in California, creating a burden especially for small businesses. Multiple inspectors (local, state, and federal) for the same media are especially duplicative.

  -- There has been some talk of a "super-inspector" that would visit a site and inspect for all programs at once.
  -- The general feeling was that such an inspector would not have the specialized knowledge to do a good job in any of the media areas, and would not be viewed as an informational resource by the industry. However, people did feel that a single inspector for each media, covering all levels of government, might be possible.
  -- A number of the pretreatment staff felt that greater coordination between inspectors on when they visit a site might be possible.
  -- Another possible solution is "equivalency" for permits and reporting. This would reduce the number of modified documents that a firm would need to generate for the various regulatory authorities.

Attachment 5:

SUMMARY OF INDIANA POTW SITE VISITS, MARCH 25 - 29, 1996

SITES VISITED

The City of Elkhart Wastewater Treatment Utility
The City of Fort Wayne Wastewater Treatment Plant
Richmond Sanitary District
Connersville Utilities
The Bureau of Water Quality, Muncie Sanitary District

Interview Team: Jim Casey, OPPE; Greg Waldrip, OECA; Patrick Bradley, OW (for Richmond, Connersville, and Muncie); Matt Gluckman, EPA Region 5 (for Elkhart and Fort Wayne); Doug Koplow, IEc.

NEW INSIGHTS FROM THE INDIANA VISITS

- **Political support for pretreatment is important.** Requiring industries to invest in pretreatment equipment can be expensive. In a number of the cities we visited in Indiana, high unemployment made the city councils and utility boards reluctant to require anything of industry that might induce them to leave. This historic lack of support for pretreatment made it difficult for program staff to pursue even cooperative solutions. In some cases, the lack of pretreatment led to problems at the POTW and reduced sludge quality -- forcing the city to incur substantial financial costs.

- **Internal "PR" is as important as external PR.** Small pretreatment staff within a much larger utility were sometimes lost. They did not get information from other parts of the organization quickly (such as unreported discharges), and the other parts did not understand how pretreatment could help them protect their sewer infrastructure. Staffing resources were sometimes disproportional to the requirements of the POTW, and were not always utilized across departments when things were slow in one area.

- **Programs operating under expired NPDES permits not always aware of the large changes they will face as permits are renewed.** Although in compliance with their old permit, a number of programs will face substantial challenges as they must meet newer discharge limits, install dechlorination, and incorporate whole effluent toxicity testing. Many of these programs have not adequately begun planning for this transition.

- **Focusing on a river or watershed, rather than a discharge point, has important benefits for environmental quality**. NPDES permits focus on allowable discharges to a receiving body rather than on the health of the receiving body overall. Consideration of the mass loadings entering a watershed and its effects must be better integrated. One POTW has adopted this type of approach, giving a local regulatory agency control over both indirect and direct dischargers to the local river. This has given them much wider latitude to implement cost effective controls on all types of dischargers.

- **New staff in small programs need immediate guidance**. Despite the plethora of pretreatment guidance materials available, new program coordinators need a "road map" of what running a pretreatment program entails and how to use the existing literature effectively. They also require some assistance determining the priorities of the program. This guidance would help them "ramp up" quickly to being an effective manager even if (as is often the case) there is no other staff on-site to train them.

- **Many POTWs and IUs do not know how to choose a good contract lab.** Despite the importance of accurate lab results, some Indiana staff were concerned that both POTWs and IUs had trouble evaluating laboratory options to be sure their samples were being accurately and promptly tested.

- **Small programs can leverage substantial nearby resources.** Some programs in Indiana have made effective use of nearby universities and pretreatment programs as resources to help them do their job better. They have also linked with wastewater and water personnel to improve sampling coverage and coordinate joint problem solving. Though not always easy, these approaches have made small pretreatment programs much more effective.

- **Age of pretreatment program affects resource requirements.** Older, established programs are operating in "steady-state." IUs are under control, systems have been established and refined, and working relationships have been established to deal with problems that do arise. Newer programs (or programs under administrative orders) face large tasks in all these areas, as well as in learning all aspects of the program.[1] As a result, they will often require more resources for a given size program.

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[1] A well-established pretreatment coordinator pointed out that material he's learned over 25 years is now required of new pretreatment coordinators in 3 or 4 months.

- **Smaller programs have less resources to promote pollution prevention.** "We'd like to do more," or "It's one of our goals over the next couple of years," are common statements at the smaller programs. With very little staff and often large programmatic challenges, these programs simply do not have the information or the time to conduct P2 outreach and education. Ways to reduce the difficulty of providing P2 information to IUs would be helpful.

- **Geographic Information Systems (GIS) are being implemented nearly everywhere, but benefits to pretreatment are still a few years off.** GIS, which computerizes core geographic data (such as sewer infrastructure, roads, buildings) and allows rapid access for updating or analyzing, is being developed in nearly every city we visited. However, the effort is in its early phases, and focuses on sewer infrastructure. Parameters of concern for pretreatment will be added, but not for a few more years. EPA could help shape this implementation by illustrating the value of GIS to pretreatment.

MOST CRITICAL FACTORS IN RUNNING A SUCCESSFUL PROGRAM

There were many similarities between California and Indiana in terms of critical factors in running a successful pretreatment program. The Indiana perspective is summarized below.

Staff Expertise

Coordinators in small programs mentioned how important it was for them to understand their responsibilities and the various approaches at their disposal for enforcing the law. There was less discussion about understanding the industrial process at IUs in Indiana than in California. The focus here was more on expertise on the requirements of a pretreatment program and innovative ways to meet them.

Balancing enforcement and education during inspections

This issue came out in most of the site visits.

- POTW A found that it was very important to explain why certain things were being required of IUs. Once firms understand why something is needed they will generally do it.

  -- More than 50% of jobs in community are in manufacturing. Therefore, the pretreatment program has always emphasized establishing a working relationship with industry.

-- As soon as there's a problem, legal staff take over from pretreatment staff, so as not to contaminate the relationship between IUs and pretreatment personnel.

- **POTW B** found that once they moved from catching people to educating them, IU attitudes towards the POTW changed and progress was more attainable. They are careful to provide general information on how to address compliance issues rather than making specific recommendations that could cause them problems later on if they didn't work.

- At **POTW C** the pretreatment coordinator will recommend consultants when IUs have questions, but will not tell them what they need to do directly. The coordinator will also help them if they are having trouble with their paperwork.

- **At POTW D**, the coordinator stressed the theme of working with industry on joint solutions again and again. By assuming that industry wants to do the right thing, and by helping them to find out what it is and implement the solution, this program has made tremendous strides in improving water quality. Pretreatment staff are careful not to make specific recommendations to firms, though they will provide general guidance to small firms on how to solve a particular problem.

  -- This approach has had equally positive results with both small local companies and with large firms headquartered in the city.
  -- Where there are violations, POTW D generally negotiates a compliance schedule with the industry. This keeps Indiana Department of Environmental Management (IDEM) and EPA out, and protects the company from third-party lawsuits. In addition, it formalizes a time line for new investment and reduced discharges of concern.
  -- Their approach is not to fine IUs if there has been no environmental damage, but to make them invest capital to correct the problem.

Political support is important

The Indiana site visits brought out the importance of the political environment in running a good pretreatment program much more than was apparent during our California trip. A number of the communities we visited in Indiana were small with few industries, and had only a handful of large industries. Facing already high levels of unemployment, the pretreatment staff faced difficult

challenges in protecting water quality. In other communities, staff noted that a stable, supportive relationship with the political entity had made their jobs much easier, allowing continued progress over a period of many years.

- **Supportive relationships help ensure continued progress.** One particular POTW has had the same, environmentally-supportive, mayor for twelve years. This consistency has allowed the pretreatment program to continue to progress. In contrast, a different Indiana facility for a long time had a mayor who was also the head of a major IU that had strongly opposed EPA regulation. Since this mayor was replaced, the pretreatment program has had a much more friendly environment in which to operate.

- **Enforcement actions help overcome local resistance.** In a number of programs, federal and state program audits and enforcement actions gave the pretreatment coordinator the power to make needed changes in the program. However, as in California, some of the Indiana programs complained that state inspectors were sometimes ill-informed and did a poor job.

- **Politics within the utility also hampered progress.** A couple of programs we visited felt that there were problems with their reporting relationships. In some cases, the POTW superintendents paid little attention to pretreatment coordinators (short of plant upsets). In others, utility managers (overseeing water, wastewater, solid waste, storm water, etc.), viewed pretreatment as an afterthought.

  -- **Poor relationships with utility managers can lead to under staffing.** Under staffing at some programs made inspections and enforcement difficult to do. Most of the available staff time was spent on administrative tasks such as permits, and written correspondence with industry.

  -- **Under staffing is not necessarily equal across all utility programs.** Within a utility district, there is sometimes surplus staff in one area (such as sewer maintenance) at the same time there are staff shortages in pretreatment. This is especially true during the winter season where little sewer maintenance can be conducted. However, without intervention by the utility manager, these resources are not more evenly shared. In some of the districts we visited, utility managers felt that sewer staff were fully utilized; pretreatment staff (including some who had worked with sewer crews) felt there was substantial slack labor.

- **Close relationships between IUs and the utility board or city mayor created problems.** Other programs had difficulty enforcing against non-compilers because the utility boards, overseeing their activities, were comprised of many people from the regulated industries. For example, 4 of the 7 members of a Utility Board in one of the cities visited were also employees or owners of SIUs. This process undermines the pretreatment staff because IUs will often complain about the "fairness" of inspections to the board, with the expectation of undermining the inspector.[2]

Understanding of short- and long-term program requirements is critical

The NPDES permits are generally the basis by which pretreatment staff evaluate the effectiveness of their program. At three sites visited in Indiana, however, NPDES permits had been expired for close to five years.[3] Thus, the parameters they contained were developed over ten years ago, and are likely to change dramatically when the permit is renewed. While these programs are generally in compliance with their existing permit, EPA staff felt there would be serious shortcomings were a "modern" NPDES permit used as a basis of comparison instead. Pretreatment staff, as well as utility-level managers, did not have the information necessary to identify areas for required improvement over the next five years. Some of the changes could require substantial new capital investment.

Focus on Watershed rather than Discharge Point

Most pretreatment programs focus on meeting discharge requirements at the POTW outfall. In contrast, one POTW is organized around a river. As a result, it regulates both direct and indirect dischargers, whereas most pretreatment programs regulates only indirect dischargers. Control of the direct dischargers has been critical in their success. In fact, the facility targeted the direct dischargers first, and got them into pretreatment.

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[2] Even large, well known firms use this tactic. In one region, a large international firm (which has won environmental awards, though not in water) rarely corrects deficiencies within the allotted 30 day period. This firm will also often write complaint letters to the board. In this same POTW region, a manufacturer of appliances, also a well-known brand name, dumped large quantities of nickel into the sewer, upsetting the treatment plant.

[3] According to personnel from one of these POTWs, the city's draft of the new permit has been rejected because of a misunderstanding between the POTW and the Indiana Department of Environmental Management (IDEM) over a combined sewer overflow (CSO) storage facility. IDEM thought this facility was essentially a plant bypass rather than a storage unit.

IDENTIFYING INDUSTRIAL USERS

As with the California POTWs, most of the Indiana programs have developed effective ways to identify new industrial users in their communities, and generally think they have identified the regulated universe.[4] This includes reviewing yellow pages, obtaining information on construction permits or applications for water or sewer hookups, changes in water consumption, and site visits. One of the programs now requires a separate pipe for each tenant in a multi-tenant building. In the past, they sometimes had trouble determining who was responsible for a particular violation.

The coverage varied somewhat across communities, as did the reasons that POTWs felt they knew about all of the industrial users:

- For very small towns, any new business means jobs and new jobs attract a lot of attention. In such cases, new IUs are quickly identified.

- One POTW plan doesn't think it's missing any IUs because they have very good baseline information and do mass balances for discharges. New IUs are identified from phone books, direct contact with the local Chamber of Commerce, and from calls from other IUs.

In contrast, another POTW expects it is still missing many IUs. The city has not conducted an IU survey in six years. The last IU survey that was conducted got back many responses stating that the pretreatment requirements didn't apply to particular firms; however, the POTW never followed up on these to be sure. The pretreatment coordinator would like to visit every one of these locations. He believes that some IUs are permitted and shouldn't be, and that some aren't permitted and should be.

SAMPLING AND INSPECTION STRATEGY

Procedures for Inspections

Surprise inspections were an important component for all of the programs. In most cases, inspectors were able to determine their own schedules for visiting sites, although they were required to meet a minimum frequency of coverage. This frequency varied by community. One of the most effective program's felt quite strongly that sampling frequently was a very important component of their program. Most communities rotated inspectors to balance their knowledge of a specific site against a desire for them to become familiar with all the IUs.

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[4] One of the programs did think that it might be missing some auto repair shops.

- POTW A gives only 10-15 minutes warning on its unscheduled inspections. They rotate industries among inspectors every year; fresh eyes sometimes catch new things in the plant. The concept of rotating inspectors is also used by another facility.

- POTW B felt their current sampling frequency was adequate or could be reduced; there was not a need to "hammer" local industry if the POTW is meeting their limits. Current sampling is 4 times per year; self monitoring is required at least once every two weeks for any IU with compliance problems.

  -- The POTW does not compare sample results from IU self-monitoring with POTW testing to identify potential problems.
  -- This treatment facility has had to develop very specific procedures for dealing with split samples as a result of data quality challenges from local industry.

- POTW C uses maintenance workers to do IU sampling. The pretreatment coordinator is afraid that the current sampling program doesn't work because IUs manipulate flows. Since this region has a small number of IUs, the program coordinator would like to have dedicated samplers to overcome this problem.

  -- Another establishment has 10 dedicated samplers. This is easier for staff collecting samples and less disruptive for IUs.

- POTW D is a "maintenance" program, where nearly all IUs have processes in control and are in compliance. However, the pretreatment program still chooses to visit each facility at least four times per year. This higher frequency keeps the relationship "fresh" and the inspector and plant operators on a first-name basis.

- POTW E thought that better coordination between the inspector and the sampler would improve the efficiency of their program.

Slug Protection and IU Process Controls

Advance Detection of Incoming Chemicals and Tracing Discharges Back to their Source

- **Trunkline Sampling.** A number of the plants visited conduct trunkline sampling. In some cases, data are collected regularly and provide a baseline for any slugs. Most of the facilities, however, sampled trunklines and lift

stations only when a slug or strange discharge was detected in the system. Investigative testing was then conducted to work back from the main lines and identify the source of the non-permitted discharge.

- -- One facility conducts daily testing at a series of upstream lift stations. This data helps the POTW detect changes in the influent and catch illegal dischargers. Data are put into a database and evaluated for any spiking.
- -- Another of the POTWs has five interceptors, and tests all of them whenever a slug is detected. This approach gives them a reasonably good chance of finding the discharger. The interceptors are not tested on a regular basis.
- -- A third POTW does some trunkline sampling, but it's not necessary to do very often since the pretreatment program has discharges in control. They have done dye testing from each industry so they know the time of travel from each IU. This makes it easier to backtrack an illegal discharge.

- **Enlist Other Departments to do Testing.** An inexpensive sampling kit for each public works and utility vehicle has been developed by one of the POTWs. This kit, which their maintenance staff was able to assemble, allows them to collect a usable sample if they detect discoloration or a strange smell in the sewage. Prior to the kits, personnel would call the pretreatment staff, but the strange discharge that had prompted the initial call was usually gone by the time pretreatment staff arrived.

- **Unannounced Sampling.** As in California, unannounced sampling is used by the POTWs as an additional way to detect illegal discharges. The use of dedicated samplers (noted above), in addition to making sampling easier to do, also reduces the ability of the IU to alter production parameters to affect the sampling result.

Communication of Problems

- Rapid communication of potential problems is very important in identifying illegal discharges. One pretreatment program often does not hear about problems until it is too late even to take samples. This makes identifying the discharger virtually impossible.

Oversized Plants Less Susceptible to Slugs

- One of the POTWs felt that slugs were unlikely to lead to plant upsets because there was so much spare capacity at the plant. [It is likely that this protection is provided by a small industrial flow relative to total flow (about 15%) more than by the excess capacity in the plant].

Ensuring a Process is "In Control"

A common theme in the California site visits was the importance of ensuring that an IU's process was "in control." Such a process was less likely to be out of compliance, and, if out of compliance, the operators would know how to get it back into compliance quickly. One of the Indiana programs also stressed the importance of this approach. However, some of the other programs did not discuss this point. It is our observation that programs with little political power to take actions against IUs were less likely to be able to ensure IU processes were in control.

On a somewhat related topic, a nearby university, is helping one plant by conducting research into helping to make POTW digesters more resilient against upsets by varying certain parameters of treatment such as residence time.

ENFORCEMENT STRATEGY

Enforcement Action Sometimes Difficult to Take

As mentioned above, a couple of the POTWs visited have a working relationship with their IUs. For these facilities, they are notified early when there is a problem, and work together to quickly correct it. Others face a difficult task in trying to enforce due to political pressures.

- **Notice of Violations (NOVs) Not Escalated.** One of the treatment facilities visited traditionally enforced against IUs up to the legal requirements, treading carefully to avoid any action that might threaten the industry. NOVs were not escalated, even if the IU didn't comply. The first fines were not levied until this year; in prior years the city had generally been unwilling to fine industries.[5] Fines that are levied now are refundable if the IU meets certain deadlines in the appointed time frame. The city attorney is now helping the program to address non-compliant industries.

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[5] The recent change was due to a new mayor, a new city attorney, and a new member of the 3-member utility board.

- **Warning Letters Instead of NOVs Make it Easier for Pretreatment Operators to Regain Compliance.** Political pressures in one of the cities make it very difficult for the POTW to fine violators. This area has one of the highest unemployment rates in Indiana, so the city is wary of anything that might cause industry to leave. IUs have recently begun to respond to POTW concerns. The pretreatment coordinator thinks this is because the pretreatment program shifted to a less-threatening letter that still meets the requirements of the law:

  -- Reports self-monitoring test results and POTW test results, along with a paragraph explaining their violations.
  -- Top management is not required to sign these letters, so the pretreatment plant operator doesn't have go to the manager -- they just have to correct the problem. If the problem is not corrected, a formal NOV is sent.

  Another POTW also felt that such letters were often quite valuable because they gave the plant wastewater treatment operator the clout to make changes.

Sharing Information With IUs Makes Enforcement Response Less of a Surprise

Programs try to share information with the regulated community to make their enforcement response less of a surprise.

- **Regular Reporting of Test Results.** One POTW sends test results to the IUs even if they are in compliance.

- **Share Enforcement Response Plan (ERP) with IUs.** An enforcement response plan gives IUs a much better understanding of what happens if they don't comply. One of the facilities plans to send every IU a copy of their ERP once it has been completed.

  -- Many of the plans in Indiana are modeled after the ERP developed by Muncie.

Structure of Fines Can Help Support Program Goals

Fines are also structured to improve the likelihood of firms implementing the desired behavior:

- **High Fines for Grease and Oil Violations**. One POTW mentioned that it levies steep fines on companies that block the sewer lines with grease, forcing the POTW to clean them out. The purpose of this charge is as a deterrent, so that the restaurant owners see it in their economic self-interest to conduct proper maintenance of grease traps.

- **Conditional Penalties.** Two POTWs mentioned that they have been successful levying penalties that would kick in if stipulated changes weren't made by a certain date.

- **No Fines for Rapid Correction of Problems and Which Caused No Environmental Harm.** One facility allows 30 days for an IU to come back into compliance after a violation has been detected. They will resample in 30 days, and, if the violation has been corrected, they will not require an increase in sampling frequency unless the IU has a history of violations.

Publication of Significant Noncompliance (SNC) Often Not Noticed

- **Publication of SNC.** SNC notices are often buried in the legal section, to meet the requirements of the law at a minimum cost. This reduces the deterrent effect of adverse publicity. Providing greater visibility in local newspapers of SNC violators cited for direct environmental harm might make the SNC publicity more effective a deterrent. Similarly, one POTW thought that if EPA consolidated the SNC reports and published a complete list, it would be a more effective incentive to comply because patterns in corporate behavior across regions would be visible.

POLLUTION PREVENTION (P2)

Pollution prevention was not something that was well established in the programs we visited. In addition, a number of interviewees felt that the economic benefits of installing P2 equipment and processes were often not favorable, or, if favorable, not very significant in terms of the overall cost structure of a firm. More focus was placed on program maintenance and fulfilling the requirements of the NPDES permit in place.

Other Program Priorities Have Taken Precedence

- One pretreatment program said it has not been able to accomplish as much in the P2 area as it had hoped. With access to detailed information, their inspectors could help IUs reduce pollution, which would be of great interest to both the POTW and to their IUs.
  - -- This program is working with Purdue and Notre Dame to develop a strategy for introducing P2 into local industries. They are pursuing an economic approach, by trying to quantify the payback associated with specific P2 investments.
  - -- The Notre Dame researcher thinks that inspector training in P2 would lead to more viable opportunities for implementation being identified. Providing the inspectors with 1-2 page summaries of P2 options would also help.
  - -- He thinks an expert system approach might be useful, but he didn't have the expertise to judge its merits as compared to other approaches of providing information on pollution prevention alternatives.

- Purdue University is initiating a pollution prevention site on the World Wide Web. It will initially be geared to wood finishing, and will expand later to metal finishing. The site will list P2 options available to particular industries.

- Two of the other programs visited saw little interest from industry about P2 opportunities. They tended to receive many more requests for information on disposal options than on P2.

- A fourth program noted that while it does encourage P2, water conservation measures by large users could have a noticeable and detrimental impact on plant revenues.

Benefits from P2 Investments May Not Be That Large

- An electronics manufacturer in one POTW district discussed economic incentives for upgrading pretreatment equipment. All environmental compliance costs were less than one percent of his cost of goods sold (COGs),[6] implying that large changes in compliance costs will have little impact on environmental investment decisions. Wastewater discharge fees comprise an even smaller portion, less than 1/10 of one percent of COGs.

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[6] COGs includes the direct materials and labor that go into making a product, but exclude general administrative overhead.

- -- Environmental improvements, in this case, are driven partly by regulations and more significantly, by corporate culture.
- -- Acceptable paybacks on P2 is normally six months to a year; in some cases, paybacks of up to 2 1/2 years may be allowed.

- The fifth program visited felt as though P2 may be somewhat overrated. In their particular system, nearly one-third of the permitted industries are closed loop, a factor that may slow adoption of P2 by their industries.

  - -- Both pretreatment and process capital need to be near obsolescence at the same time in order for many retrofits to be economical.
  - -- Industries in this system don't have all the information they need to know their P2 options; the pretreatment coordinator thought that this information would be valuable.
  - -- A key question for their IUs is whether the P2 or pollution control equipment (PCE) will actually work as it is supposed to. This is very hard to tell ahead of time.
  - -- The impetus to invest in P2 varies widely by industry. Three IUs from here estimated that environmental costs, as a percent of their cost of goods sold, was 1.5 percent, 25 to 30 percent, and "the third highest expense after labor and operating costs."

EMPLOYEE ISSUES

Keeping the job interesting remained a key employee-related issue in Indiana as it had been in California. Some of the same solutions have been implemented, such as developing teams that cut across traditional organizational barriers.

- **Coordination Across Functions.** One POTW has developed multi-functional teams, combining personnel from sewer maintenance, laboratory, engineering, plant maintenance, and information systems. The teams meet once per week to discuss problems and develop solutions.

  - -- The teams were created to reduce the overlap between personnel in different departments and to encourage cooperative problem solving.
  - -- The utility manager consolidated water, wastewater, and the city's public works department for the same reasons. There are fewer personnel, but they are better educated.
  - -- The multi-functional team approach has proven quite successful, with staff quickly learning to work together.

- **Expanding Jobs to Keep them Challenging.** POTW A feels that staff retention depends more on keeping the tasks interesting than on salary levels. Their pretreatment program coordinator believes that they have many opportunities for professional development within the POTW for staff to grow into.

- **Retention**. Staff retention at most of the programs has been fairly good.

  -- POTW A retains staff for about four years. Two inspectors is the norm, although at the time of our visit, they only had one.
  -- POTW B has very low workforce turnover.
  -- POTW C has extremely long staff tenure. Sixty percent of the pretreatment staff has been there for more than 18 years. People who leave generally stay for 4 or 5 years, then go to similar places and become part of an informal network. Employees get high salaries and good benefits.

- **Some Staff Turnover is Useful**. While long-term institutional knowledge is important, the utility manager at one facility felt that some new employees were a critical aspect in the health of the program because they brought fresh ideas.

EDUCATION/TRAINING ACTIVITIES AND INITIATIVES

Training was a big issue at the Indiana programs visited, including both pretreatment staff and operators at the regulated industries. Perhaps the most unique training mechanism in Indiana was the "Call John" approach (John Craddock of Muncie), utilized at least once by every program we visited. State programs have relied on John for information on how to deal with political interference, how to finance aspects of a program, how to prepare an enforcement response plan or permit an industry, how to change a sewer ordinance, and how to conduct proper sampling. Many programs, afraid to call state or federal officials for help with a problem, have used John as a go-between.

There were some common problems facing pretreatment coordinators, especially in smaller programs:

- **Time Constraints**. Program staff don't have enough time to take advantage of training opportunities. One program manager would like to train his staff more, especially at lower levels of the organization. They even have a budget line item for training seminars, and think they would benefit from visiting other POTWs. However, they do not feel they have enough time to take

away from their regular operations. The city is training upper managers on managerial and leadership skills. Another program coordinator would like to visit other POTWs, but can't afford time out of the district.

- **New Coordinators Don't Know "Where to Begin" in Running a Pretreatment Program.** A couple of the IN facilities we visited noted that a "starter pack" for a new pretreatment employee would be extremely useful. This would provide some history on the pretreatment program, summarize everything one needs to do as a pretreatment coordinator, including required reports and plans. It would also provide a logical roadmap for how to sequence the many available materials into a strong training module.

We discussed with John Craddock of Muncie how a small program in trouble might get back on track. His recommendations:

- Get somebody from an established program to come to your plant and conduct a mini-seminar. This seminar should provide the staff with actual examples, supplementing the guidance manuals currently available so that the staff can see what something (e.g., an enforcement response plan) should actually look like.

  -- In 4 or 5 hours of discussion, he (or another individual) can give the coordinator general direction and help him or her set priorities.

- Shadowing another program is useful, and a number of people have shadowed him.[7] However, it is difficult for the "teacher" to complete his normal workload. Shadowing also has some other hitches: Muncie's insurance policy does not allow them to carry civilians in their field vehicles; and some industries may not want to have outsiders in their plants.

- Use state and federal water personnel as resources. They have a great deal of knowledge, and appear willing to help.

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[7] One facility's pretreatment coordinator came from the POTW lab, and had little training when the former coordinator (who was supposed to train him) left. Learning what to do in the program was extremely difficult. In retrospect, he thinks he would have been far more effective if he had spent the first two months of his job shadowing another POTW program.

Some of the other tactics used by smaller communities as training alternatives include:

- **Links with surrounding universities.** Our program has leveraged pretreatment staff by forging working relationships with nearby Notre Dame and Purdue. Students accompany staff on many IU inspections. The schools are also used to help fill openings within the POTW.

- **Links with surrounding POTWs.** Program staff from one of the POTWs participate in round table discussions with surrounding POTWs, orchestrated by the Indiana Water Environment Federation (IWEF). These round tables have become a useful problem-solving resource for the staff.

The interviewees also shared their views on training tools that would make their jobs easier or their programs more effective:

- **Certification.** In one case inspectors are certified operators, required to do continuing education. Another POTW thinks it would be useful if IUs had to have licensed pretreatment officers. This would ensure that on-site equipment was being operated properly.

- **Training Videos.** Most of the POTWs we visited felt that training videos would be useful to help train the industrial users as well as pretreatment staff, as many of the industries do not understand the regulatory requirements.

  -- Viewing inspector's notes from the audits on video would also be useful, to see what they are thinking as they go through a plant.
  -- One program manager thought the following videos would be useful: sampling, conducting a show-cause hearing; computer systems; how to perform an inspection; and how to determine an IUs industrial category (i.e., SIU or CIU).
  -- One might also be able to videotape Water Environment Federation (WEF) conferences.

- **Regulatory Changes.** Staying up-to-date on regulatory changes is a challenge. One site uses an intern to update the CFRs, though having this electronically would be easier to use and take up less space. They also rely on regulatory updates provided by the WEF and BNA. Another facility's IUs felt that a non-legalistic interpretation of the regulations would be extremely valuable in helping them to comply.

- **Targeted Training Materials.** One program thought that more background training on the new sludge regulations would be useful.

- **Training Manuals**. Better access to what's already available would help the program staff. Several facilities use EPA training manuals extensively. Being able to obtain them on-line would be useful. The Sacramento series of training books (by Ken Kerri) was again mentioned as of extremely high quality.

- **Seminars**. One pretreatment coordinator is a class 3 operator, and must spend 20 hours per year in continuing education. Unfortunately, the coordinator felt that many of these continuing education courses do not offer any new or valuable information.

  -- The coordinator felt that while SAIC seminars are the best available, they are still overly general.
  -- Topical seminars would be of more value.
  -- The timing of courses is also important. Seminars at night are very difficult for anybody with a family.
  -- The Rural Water Association (RWA) provides very useful training because they travel to plants. However, they don't currently provide any pretreatment training.

OUTREACH

Programs had different views on the importance of outreach to industry. Many felt that outreach was less important when there were not problems that needed working on.

- **Outreach less important as program matures**. One program used to give talks to different industries about pretreatment options, and formed a subcommittee at the local Chamber of Commerce to address water-related environmental issues. However, with their higher workload (due to staff vacancies and the need to train some new staff), they don't have enough time to do this anymore. Since most IUs now understand the program, this is less important than it was in the past. (Note that the pretreatment coordinator stated that he did not think it would be necessary to fill the two vacancies they currently had).

- **Some outreach is informal**. Continual refinement of the sewer ordinance has helped one program to put policies down on paper, making requirements clearer to IUs.

- **Outreach does help build trust**. One POTW formed a Clean Water Council in the early years of its program to educate industry about the regulations. This Council built trust with the IUs over the long-term; the pretreatment coordinator is now always notified whenever an IU is having a problem with discharges.

  -- Outreach to the community is also extremely important. The pretreatment coordinator spends substantial time meeting with neighborhood associations. As a result, requests for funding become less mysterious if the community understands the program's mission.
  -- This POTW also runs an awards program to recognize successful IU pretreatment efforts.

- **Internal publicity is also important.** Some of the pretreatment programs we visited are almost invisible to the rest of the utility. As a result, they do not get the information they need from these other divisions, and potential opportunities for cooperation are missed.

PRETREATMENT RESOURCES AND COST ACCOUNTING

As in California, the Indiana POTWs rely on a variety of budgeting and cost accounting approaches. In the most extreme situations, pretreatment programs either did not have a budget, or program managers did not know what that budget was. The degree of cost recovery for pretreatment from industrial users also varied widely.

Budgeting

- **Capital budgeting different for different asset purchases.** Capital replacement, new capital, and sewer line extensions were sometimes financed in different ways:

  -- One POTW has a replacement fund for capital equipment. This fund accrues interest as it accumulates. The utility manager said these the city sometimes targets these fund balances for "redeployment," but are promptly "reeducated" about their original purpose.
  -- New capital is not financed through these accruals in the POTW.
  -- Sewer line extensions are paid for using economic development grants, rather than through capacity charges on the beneficiary users. Capacity charges are levied if the users are outside of the facility's normal service area.

-- One of the other programs has a reserve fund for capital purchases, but the staff does not generally know how much is in the fund. Staff thought that the new NPDES permit might trigger large capital purchases that could not be financed in this way.

- **Lack of independent budget or budget information**. At a couple of the programs we visited, pretreatment staff had no budget and operated in the dark about what resources they had at their disposal. Rather, they would have to request permission to make most expenditures, and funds would be allocated from a general utility or POTW account.

  -- POTW A: The POTW submits a proposed budget to the utility general manager. This is taken to the utility board, and then to the city council. The city council must approve the budget, rate increases, and sewer ordinance changes. Historically, obtaining this approval hasn't been a problem. Staff believe this to be the case because the budgets have always been small. The staff don't know what final budget gets approved. The wastewater treatment and pretreatment programs simply make requests until they are denied by the utility manager.

  -- The pretreatment budget is part of the wastewater treatment budget. The utility manager estimates that pretreatment receives $50,000 per year out of a $1.6 million wastewater treatment budget (including both debt service and O&M).

  -- The city has spent a lot of money to build industrial parks with complete sewer hookups. Some of these parks have never been filled. The utility general manager also serves on the town's industrial development board.

  -- POTW B: 95 percent of the pretreatment funding is part of the lab budget. Staff, including the lab director, are not given budget information. Generally, it is not a problem to purchase consumables or small equipment. Expanding employees is a problem. This program has 1.5 full time equivalents (FTEs); they don't have a basis of comparison to see whether this is low or not given the size of their community.

Cost Accounting

Cross-Subsidies

It appears likely that a variety of cross-subsidies exist in the present rate structure of the Indiana POTWs. Many programs did not have detailed enough information on cost recovery for us to identify areas of cross subsidization. Common areas seem to be between industrial users and residential/commercial customers; between different industrial dischargers; and between the general taxpayer and the industrial discharger. The cost recovery approach is described on a program-by-program basis below.

POTW A Cost Recovery

- Charge structure: permit fee, discharge fee per gallon. Staff do not feel that there are cross-subsidies between water and sewer users.

- IU surcharges: IUs do pay surcharges based on what they discharge. However, ammonia nitrate is not included as a surcharge parameter, though it does force the POTW to incur costs. In the past, both Zn and Cu were parameters of concern relative to sludge quality.

  -- Surcharges were based on self-reported data. This facility had problems with a subset of IUs that consistently under-reported loadings. To address the problem, the POTW had to go in and conduct baseline measurements. Follow-up sampling is conducted if self-reported data appear aberrant.

- Lab fees: Only recently was a disposal charge added to the cost of lab tests performed. They now do full cost recovery for all laboratory samples. Costs are generally more expensive than contract labs.

  -- If the POTW requires more frequent sampling by IUs, the additional cost is usually enough for them to rapidly try to solve the problem.
  -- The cost of surveillance sampling is not charged to an industry until the POTW can identify who was responsible. Even then, the costs are often not charged back.

POTW B Cost Recovery

This site had problems with its billing for inspections of IUs and associated lab tests. To solve the problem, billing was transferred to the city's accounting department. Now, data goes directly from the lab to the accounting department.[8]

- The billing for inspections is an average of all activity, and not based on the number of samples or complexity of testing required. IUs are billed $146.50 per month, a fee that pays for lab costs and pretreatment. About 50 percent of the lab work is self-supporting through fees.
- Fees collected go to the utility district. Pretreatment and lab funds are budgeted by the utility and then approved by the city council.
- The pretreatment coordinator wanted to charge IUs the actual cost of providing the service, but the accounting department said this would be too complicated.
- When resampling is required, the IU is billed an additional $146, but the actual cost of doing the sample is closer to $450.
- They have done a cost-of-service study for lab tests, but the results weren't integrated into lab fees. If it were to be included, staff thought that the monthly fee might increase, but the structure of the charges would be unlikely to change.
- The pretreatment coordinator feels that higher charges would provide an incentive for improved operations. A proxy is the $500-$1000 fine levied on restaurants for oil and grease violations; this has proven more effective than other types of legal action.
- The utility director is trying to develop better cost accounting data to help bring their budget "under control."

[8] This system is also used to notify inspectors when an inspection is next required.

POTW C Cost Recovery

Charges are based on flow, with surcharges on BOD and suspended solids. Any lab tests performed are charged back to the IU, based on the average cost per test (with lower charges for pH). Lab test rates do include the cost of staff time, plus a flat fee for sampling. IUs also pay a permit fee and a one-time connect charge to the sewer. Staff doubt that industry is paying the full costs of the program, though they don't have enough information to evaluate it.

POTW D Cost Recovery

IUs discharging to this facility do not pay the full cost of the pretreatment program. The pretreatment coordinator is not apologetic at all about this. The city benefits from the jobs and the clean water the pretreatment program makes possible. In addition, despite the cross-subsidies, the sewer rates are in the lowest 25th percentile in the state. They have an $84 million bonding capacity; the debt is fully paid.

One of their users thought that the program's policy of not charging for testing and making results available was an important factor in their being able to come into compliance.

POTW E Cost Recovery

This program doesn't charge for any sampling and analysis costs, even if there are violations. Charges are based on the volume of discharge, plus a surcharge for biological oxygen demand (BOD) and suspended solids. There are no permit fees either. The pretreatment coordinator does not think that increased fees on permits or IU discharges would translate to higher revenues available to run the pretreatment program with; rather, revenues would go to the general fund.

Cost-Accounting and Beneficial Reuse of Effluent and Biosolids

Sludge currently produced by all of the POTWs visited meets land application requirements (though it is not all class A).[9] In the past, metals have contaminated the sludge, and, in some cases, upset the plant. The cost of these events was not charged back to the IUs, although some enforcement actions are proceeding for the most egregious violations.

With plentiful water, beneficial reuse of effluent is not an economic issue for the plants we visited.

INFORMATION SYSTEMS

There was a wide variation in the use of pretreatment information systems in the plants visited. There was universal recognition of the usefulness of these tools, and some program staff expressed frustration regarding their efforts to master existing software packages (most notably PCME). A number of the programs utilized information systems in a piece-meal, non-integrated fashion. This reduced the power of the systems to improve overall operations.

Improved Systems Would be Extremely Valuable

- One POTW conducts trends analysis by IU manually, by comparing test results with historical data. They do not have a laboratory information management system (LIMs) system, but would be interested in one. The lab director was concerned, however, that a LIMs would be difficult for a small staff to manage, and that it would be difficult to conduct quality assurance on sampling using the system.

- Inspection reports are a large paperwork burden for inspectors at one of the programs. Electronic reporting would be useful in helping the inspectors to do their jobs better.

- One of the programs tried PCME, and felt that it had been useful in developing annual reports. However, once billing functions were shifted to the city's accounting department system, all reporting and record keeping was done on an old mainframe computer (not compatible for PCME). They have invested hundreds of thousands of dollars in this system, and are starting a

[9] POTW A had past concerns with zinc and copper, and is now concerned with nitrogen levels in the sludge. POTW D has problems with bacteria and viruses. POTW B has had some problems from the use of copper root control. POTW C has had problems with nickel.

new round of programming soon. Nonetheless, they plan to scrap the system in 2-3 years for a Unix-based system. The program manager feels that the mainframe computer has been relatively inflexible to use.

  - -- The pretreatment program is not billed directly for the large pretreatment-programming expenses the town has incurred.
  - -- Their current system does not allow them to search IUs of concern to compare test results to allowable limits.
  - -- Queries can't be tailored to produce only data on IUs of concern; rather, thick reports are generated.

- One program finally got PCME to work after extensive experimenting. They would prefer a user-friendly program, as well as one with continuing on-line support.

- Another program uses a mix of computerization and handwritten forms. They have a LIMs system for lab management. Most other functions are computerized, with the exception of sampling reports for each IU: these are written into manual forms and are visually scanned for non-compliance (though the data are also entered into a computer). Report generation, record storage, and statistical data processing (for the lab and the biological lab) are heavily computerized.

- One facility thought they might benefit from some of the programming developed by other POTWs, but they would need good documentation. They have done some programming relative to CSO management that they thought other facilities might find useful.

Use of Geographic Information Systems (GIS)

GIS systems are evolving slowly in many of the communities visited. They will eventually provide a powerful tool to pretreatment coordinators, but this will take years to happen.

- One POTW has a partially completed GIS. The initial focus of the mapping effort is on sewer infrastructure, although links to pretreatment are planned. The GIS will also be extremely useful in helping the POTW manage CSOs.

- Another POTW is developing a GIS, also beginning with sewer infrastructure. They plan to add manhole cover locations and sampling data in the near future.

- A third POTW has just purchased the equipment to construct a GIS of sewer infrastructure. While pretreatment applications are still a few years off, the GIS will help the program to quickly identify discharges, and ease the effort required to respond to administrative tasks. The GIS mapping is being done within the POTW rather than using the city engineers, because the two groups would not necessarily have the same priorities.

OWNERSHIP PATTERNS

Indiana POTWs have come under increasing pressure to improve the efficiency of their operations, sometimes with the threat of privatization if they are unsuccessful. This has led some of them to begin to improve their cost accounting. Others have begun outsourcing functions previously done in-house, or expanded their provision of services to surrounding areas in order to bring in additional revenue.

- The mayor of one city gave the POTW two years to improve the efficiency of their program before he would evaluate privatization of POTW operations. The POTW hired an environmental consultant to update standard operating procedures and improve training. If privatized, the POTW anticipates that there would be less frequent sampling conducted.

- Another POTW subcontracts billing to the privately-run water provider (Indiana American Water Company). Underpayments are split equally between water and sewer.

Laboratory Operations

Laboratory functions have been outsourced, at least in part, by many of the plants visited. Generally, more complicated analyses such as metals and organics have been outsourced, while routine procedures remain in-house. This is not always the case, as two POTWs were extremely proud of their laboratory capabilities.[10] One issue that got a good deal of discussion during the visits was how to choose a good outside lab.

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[10] One of these POTWs conducts all of their tests in-house. They do not know if some tests would be more effectively outsourced. In terms of technical capabilities, they feel they have one of the best labs in the state. The lab is used only for internal samples; no samples from IU self-monitoring are evaluated, as this would pose a conflict of interest, as well as be unfair to the private labs.

- **Outsourcing Decision**. Pretreatment staff at one of the programs determine which tests to outsource using a number of considerations: the man hours required to conduct a test; the wastes generated; and the number of analyses required per year in comparison to the associated equipment expense. All organic analyses are outsourced.

- **Choosing a Lab**. Choosing the proper outside lab is extremely important. The lab director at this program requires a copy of the lab's Standard Operating Procedures (SOP) manual, and will visit the lab. If the lab will not send an SOP, or if pretreatment staff are not permitted to observe lab operations unannounced, the lab is disqualified from consideration.

  -- Once accepted, the lab must meet a two week turnaround time; if they fail, they are no longer used.
  -- Few POTWs know how to evaluate outside labs and how to structure workable agreements with them. This program does educate some of their IUs in this regard, but much more could be done, including the preparation of "simple English" guide.

- **Lab Accreditation is Lacking**. Another POTW believes that lab accreditation in Indiana is lacking. Quality Control by EPA is done only once per year, even though the entire pretreatment program depends on accurate lab results.

  -- Nobody has a "hammer" to force improvements in the lab.
  -- EPA evaluations have had very long delays. For example, the results of an evaluation done in April 1995 did not arrive until February 1996. This greatly reduces the usefulness of the review.
  -- The lab director would like to see EPA tests done four times per year, with results available within 30 days. This would also help to reduce the impact of a piece of equipment happening to be out of compliance on the day of the EPA audit.
  -- Voluntary accreditation would be a good thing, even if the state didn't make it mandatory.

- **POTW A** sends metals to a contract lab for analysis. The lab has a 4-5 week turnaround for sample results. This delay has created problems for the POTW in the past because they didn't detect nickel violations until they had a plant upset.

- **POTW B** does all of its tests in-house other than total toxic organics (TTOs), which it ships out due to a lack of space.

-- Lab is heavily utilized; nearly 50 percent of the tests they conduct are not required by state or federal law.
-- This includes lots of monitoring of the biological community in the river. The program director thinks this should be required of all POTWs, since it is the key measurement of whether all of the invested time and effort in treatment is working.

- **POTW C** conducts ammonia, BOD, coliform, and phosphate testing in-house. They used to do metals analysis in-house as well but the equipment became unusable. They now contract out metals and organics.

-- QA/QC information from the contract labs is required. Only after quality requirements have been met is cost considered.
-- The POTW also requires a lab that has been through legal proceedings and has proven the validity of its test results in court.

"In-Sourcing"

Common functions provided to outside areas by POTWs are sewage treatment, CSO management, and sewer cleaning. There are sometimes problems with the interjurisdictional agreements, affecting who controls pretreatment oversight.

- One site accepts flow from other jurisdictions. Surcharges on IUs are the same as those for industries within the POTW's normal service area. Charges are billed quarterly, to the surrounding town rather than the discharging IUs.

-- While they do write the permits for these IUs, enforcement is a bit muddy. Some of the IUs are not well characterized. Most of the surrounding areas have adopted this pretreatment program.
-- Staff did not know the flow that comes from outside jurisdictions.

- Another facility serves about 6,000 customers outside of the city (versus 38,000 inside). This includes an industrial area in OH. They would like to provide sewer cleaning services to smaller communities as well.

- A third POTW visited took over management of CSOs from the city. They also serve an area 10 miles greater than the city limits. These outer areas pay sewer charges, but don't pay the city tax. They don't want to become part of the city for that reason.

INDUSTRIAL USER ISSUES

- Replacement of vapor degreasers with alkaline cleaners at IUs has caused some problems with flocculation at the POTW.

- Vendors change the makeup of proprietary chemicals slightly, affecting the plating bath composition and sometimes the performance of the pretreatment equipment.

RESIDUALS MANAGEMENT

Biosolids for all the facilities visited meet land application standards, although some also have old, contaminated sludge stored on their property, that didn't meet these standards.[11] Key issues associated with biosolids include when it can be applied, meeting the class A standards, and improving the demand for this commodity. Effluent reuse is not a big issue since water is plentiful throughout most if Indiana.

- **Timing of Application**. One POTW's sludge land application permit limits the amount of frozen ground application allowed. This creates problems for marketing their sludge because farmer's are most open to sludge deliveries during the winter, when compaction of their fields is minimized and there is no interference with planting or harvesting.

- **Value comparison to chemical fertilizers**. One of the programs visited is planning to conduct a cost comparison between sludge applications and chemical fertilizers at the end of this year. The results could help them market they product more effectively.

- **Metals Levels Fluctuate**. Sludge from one facility is being land applied, and the quality is reasonably good. Currently, Lead limits have the least room for increased concentration. However, their metals values vary up and down, suggesting their industrial dischargers do not have their pretreatment entirely under control. In the past, they have had problems with Mb levels as well, but were able to address the problem by sending letters to all customers with large heating or cooling towers.

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[11] One of the programs has tons of sludge with high metals (from platers) stored near their plant. This was from an earlier period where the pretreatment program was not effectively run. New sludge meets Class A requirements, and will be blended with the old sludge over time.

- **Commingling with Compost Administratively Difficult.** Another program doesn't commingle biosolids with compost because it is administratively more difficult. Land application is cheap: about six cents per gallon of sludge.

- **Biosolids Amendments.** "Enviro soil" is a sludge amendment that binds metals so they will be inactive. One program thought that products such as this could help them to improve the quality and marketability of their biosolids.

- **Effluent Reuse.** Unlike California, water is not in short supply in Indiana. As a result, there is less pressure to reuse effluent. One of the sites does reuse some effluent to irrigate a golf course; the rest is discharged to a full-use stream and into a reservoir. They are constructing a wetlands that will likely receive effluent as well in the near future.

KEY FACTORS IN IMPROVING PERFORMANCE AT UNDERPERFORMING POTWS

Options for On-the-Job Training

- Some small programs, such as one of the sites visited, must operate under a compliance order with EPA. They often have few staff, and the staff they do have are not always fully trained. While the order gives the program greater leverage to make changes, it also creates difficult challenges for existing staff to meet. Opportunities for 1-2 day training modules, or resources (such as videos) that would be available for review on-site, would allow staff to upgrade skills without taking substantial time off from the job.

Challenges for Smaller POTWs

- **Meeting Pending NPDES Permit Renewals.** Three POTWs are operating under expired permits. Some are not now required to have dechlorination or conduct whole effluent toxicity testing. Another thinks it might also have problems with nickel limits under a new permit.

- **Implementing P2.** Requires fairly high staff expertise and understanding of options, and a substantial amount of outreach. Smaller programs don't necessarily have the expertise or the time.

- **Mass Based limits for categorical industries**. Industries don't keep accurate enough production records to allow the use of mass-based limits. Job shops have enormous variation between flow and metals concentration as their production runs change. Therefore, the POTW often must reconvert these mass-based limits into concentration limits.[12]

- **IUs Threatening to Leave**. This is a critical problem for small POTWs in regions with high unemployment. For example, one industrial laundry has lead exceedances and is threatening to leave if they are forced to comply with the local limits. According to the pretreatment coordinator, the lead discharges have no impact on the overall system, or on meeting allowable NPDES or sludge limits. However, not everybody thinks strong environmental requirements leads to loss of industry.

  -- One program manager thinks that a good pretreatment program means an industry has a stable regulatory environment. Industries can't afford <u>not</u> to have a strong pretreatment program.
  -- An IU in this program felt that stringent pretreatment regulations don't provide a competitive disadvantage, but perhaps provide an advantage because other communities will be playing a game of "catch up" in the near future.

- **Keeping permits up-to-date**. One former pretreatment staffer of a facility said that keeping permits up-to-date was a huge job. Very rarely would one person at the industry have all the answers needed to do so.

  -- The time consuming part was in measuring flows, verifying reported information, and communicating with the industrial users, rather than the mechanics of permit writing and modification. As a result, this staff person did not think information systems and standard templates would reduce the workload substantially.

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[12] Mass-based limits are often encouraged because they provide an incentive to conserve water. One consultant (who designs and installs pretreatment systems), thinks that there are other factors encouraging water conservation even without mass-based limits. Specifically, in areas with hard water, each doubling of water consumption increases residual sludges (which are expensive to dispose of) by one-third.

SUMMARY OF SUGGESTIONS TO EPA

Regulatory Flexibility

- Allow POTW to stop testing for pollutants that are not at an IU facility (e.g., cyanide or chromium).
- Encourage removal of metals from local ordinance if they have no impact on the plant or residuals quality.[13]
- Iron and aluminum standards don't make sense, given the use of these materials in wastewater treatment.
- De minimis exemption for categorical industries would be very helpful. New regulations, such as the Metal Products and Machinery (MP&M) standards, will hit small industries that don't have the resources to deal with them. Many of these small dischargers have no impact on POTW performance or sludge/effluent quality.
- Standard reporting requirements for the many different EPA regulations would make their job easier.

Faster response times on audits and reviews

- In order to be useful, EPA needs to get information back to the POTW much more quickly.
  - -- Lab QC audit took ten months at one facility.
  - -- Review of an enforcement response plan took two years in one program .
  - -- In one instance, a locality did not recall ever receiving a report from an audit (although EPA records do not support this claim).

[13] Barium, silver, tin, selenium, and fluoride were eliminated from one POTWs ordinance for this reason.

Don't Only Focus on Known Sources

- Find the new or unregulated sources in order to reduce loadings; don't simply tighten standards on the "known" universe.

Don't Forget Enforcement

- One facility proposes tenaciously seeking out non-performing programs and forcing them to comply.

SUGGESTIONS FOR THE CSI PROJECT

- Provide very short, user-friendly guides to sampling that could be distributed to the IUs. One sampler felt as though self-monitoring samples were often taken incorrectly, rendering the test results inaccurate.

- Many people in the smaller communities fear that requiring compliance with discharge regulations will lead to industries leaving town. To the extent that EPA could illustrate why this is not the case (using examples from small towns with high unemployment), pretreatment coordinators could use this information to their benefit.

  -- In one of the communities, an IU was fined $12,000 and forced to clean up their process. They later said that they were winning contracts that they didn't think they could have won if they hadn't cleaned up their process.

- If a POTW is already way below its NPDES permit levels and have results-based measures in place, EPA should allow them to do certain things that might be considered "outside the envelope", such as allowing IUs to reduce their testing frequency.[14]

- EPA could educate POTWs about the flexibility that already exists in the pretreatment regulations.

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[14] According to Pat Bradley, of EPA's Office of Water Permits Division, this can already be done because a POTW can modify permits to IUs without EPA regional approval.

Attachment 6:

SUMMARY OF VIRGINIA POTW SITE VISITS, MAY 6 -10, 1996

SITES VISITED

Hampton Roads Sanitation District
Hopewell Regional Wastewater Treatment Facility
City of Richmond Wastewater Treatment Plant
Alexandria Sanitation Authority

Interview Team: Patrick Bradley, OW; Wendy Miller, OECA; Doug Jamieson, OECA (for Hampton Roads and Hopewell); Doug Koplow, IEc.

The Virginia facilities differed from those in California and Indiana. In Virginia, no programs had experienced recent enforcement action, although some were definitely struggling more than others. An additional difference was a wide range in the level of industrial discharge, from a low of two percent IU flow/average daily flow to a high of 80 percent. The POTWs varied in the complexity of operations, from a small geographic area with a single plant, to a large geographic area with a multi-plant network. While many issues were similar across these facilities, the diversity of facilities raised some interesting issues that did not surface during the first two trips.

NEW INSIGHTS FROM THE VIRGINIA VISITS

- **The POTW as** an **informational resource remains a critical factor in IU compliance**. As in IN and CA, POTWs with effective treatment programs have become an informational resource for IUs to turn to when they have a potential discharge problem.

- **Interjurisdictional agreements often fail to give the pretreatment program the leverage it needs to control contaminants in influent**. Some programs we visited received discharges from industries outside their districts. While generally there were agreements with the municipalities where these industries were located, sometimes these agreements were inadequate.

- **Operating a network of treatment plants provides additional flexibility to operators, but also creates additional challenges.** One of the programs we visited manages a network of plants, many of which have cross-connections to allow flow diversion. Initially, communication between the interceptor staff and plant personnel affected by diverted flows was

inadequate, causing operational problems. By requiring pre-notification to plants for any diversion, these problems were solved. Another complication of a multi-plant network involves setting charges and discharge limits. Since the plants have different discharge points, cost structures, and IU profiles, choices on allowable discharges and pricing have important implications on where new IUs locate and how much they invest in pretreatment.

- **Serving military customers creates substantial challenges.** One Virginia POTW receives a significant flow from military customers. Even though the Clean Water Act (CWA) does not allow the military to pay fines for discharge violations, the POTW should assess them anyway. Assessing fines, even if they are uncollectible, is an effective enforcement measure because of the military officer's concerns that the resulting adverse publicity might harm his or her prospects for promotion. Other effective tools include enhanced education and suspension of service until stipulated conditions are met.

- **Partnering between city managers and industries creates opportunities and challenges.** To promote economic growth and protect the environment, one POTW established very strong contacts with large industrial dischargers and city managers. The coordination gave them opportunities to jointly resolve problems, but many checks and balances had to be built into the system in order for the public to trust the arrangement.

- **Don't require pretreatment where effective centralized treatment already exists.** If a plant can handle a specific industrial discharge, the EPA should not force pretreatment industry-wide for that material. The net result, rather than improved environmental quality, is that industries will stop discharging to the POTW, leaving it underutilized and expensive for the remaining customers.

- **POTWs built to serve primarily industrial customers address important public policy issues regarding pollution.** The EPA's "polluter pays" principle strives to make industries responsible for the full cost of controlling emissions and tries to ensure that the price of their products adequately reflects the associated environmental harm of production. Two of the programs visited in Virginia used some public funds (either EPA grant money or tax-exempt municipal bonds) to construct waste water treatment plants serving primarily industrial customers (though both also serve some residential customers as well). While in both cases the industries also contributed funds, the cost of water pollution control was, in effect, subsidized by public taxpayers. While it may make sense to share infrastructure between municipalities and industries to take advantage of

economies of scale, EPA may want to be sure that industrial rate structures recover these subsidies from industrial customers so that the industries pay the full cost of managing their pollution. It should be noted that these subsidies are likely to be small relative to the other inducements local governments build into the municipal tax structure and use to lure new industry.

- **Pretreatment is sometimes seen as peripheral to plant operations, rather than central to it.** One pretreatment coordinator expressed frustration that the plant operations staff did not see the importance of pretreatment in ensuring continually-solid plant operations. He thought pretreatment should drive plant operations, not vice versa.

- **Politics influences ability to meet pretreatment program objectives.** As in Indiana, politics remained an important issue in pretreatment performance, but one that was difficult for program coordinators to speak openly about. Problems tended to be worst with strong, politically-connected firms. Political influence was brought to bear in the areas of whether or not sewage treatment would be provided and the economic terms of that service, as well as the area of enforcement for violations that came out so clearly on the Indiana trip.

MOST CRITICAL FACTORS IN RUNNING A SUCCESSFUL PROGRAM

As with California and Indiana, many critical factors in running a successful pretreatment program were the same.

- **Regular communication with, and visibility to, the IUs.** Programs that maintain frequent contact with their dischargers have developed a working relationship that supports early problem identification and are tools for rapid solutions. One program shows up unannounced quite frequently. However, since the IUs know they will be treated fairly by the pretreatment staff, the frequent visits support rather than impede the working relationship. Another gets weekly reports from its (albeit smaller) group of SIUs, and holds monthly meetings with environmental representatives from the IUs.

- **Establish individual accountability for performance of IU pretreatment units.** Frequent contact with IUs is one method of establishing accountability. Another method employed by one of the programs is to set up regular public meetings between the citizens and the SIUs to discuss environmental performance, including wastewater treatment. This same

program has the home phone numbers of every environmental manager at the SIUs, and calls these individuals any time there is a problem. This creates very different responses than holding the company in general responsible.

- **Ensure technical competency in IU pretreatment staff.** Without technically-competent staff at the IU, it is much more difficult for the POTW to control the quality of effluent. IUs must have the ability to detect and control problems quickly. Since this competence is highly dependent on the personnel in charge, one of the programs requires the slug plans of each IU to be updated any time there is a change in pretreatment personnel. This requirement gives the POTW indications of when there might be staff-related problems in the operation of the pretreatment equipment.

- **Balancing enforcement and education during inspections.** As with the CA and IN trips, this was a common theme in a number of the Virginia programs. Programs have long-term relationships with many the staff at their IUs that help them to achieve compliance. One of the pretreatment coordinators went so far as to define his program as successful because they can easily communicate with the industrial dischargers and are notified as soon as there is a problem at one of the plants. To him, this was a more important indicator of good performance than measures such as the number of NOVs or industries in SNC.

- **Political support is important.** As in Indiana, political pressure was sometimes brought to bear on program staff to influence the direction of activity or enforcement. Some of the programs felt that they did not have complete support from their utility-district, city managers, or city attorneys to enforce the Clean Water Act, even against large industries. This undermined the ability to do their job, and created a more difficult working environment.

- **Federal enforcement is a good thing.** A common feeling on the part of the pretreatment programs was that strong enforcement was sometimes the only way to get the resources needed to adequately run a pretreatment program or to overcome political pressure from industries or local politicians. One program stated unambiguously: "EPA enforcement will turn programs around." This response echoes perspectives we heard in both CA and IN.

- **Have direct oversight for all IUs.** A number of the programs we visited accepted discharges from industries outside of their districts. While there were generally agreements with the municipalities in which these industries were located, these interjurisdictional agreements (IJAs) were often inadequate. In some cases, the pretreatment program did not have the ability

to inspect these discharging industries, could not levy surcharges directly on them, and could not work freely to verify discharges and identify unreported discharges in the area outside of their area of primary domain. Where reporting was required, the notification process regarding discharges or violations from the surrounding municipalities was sometimes far too slow.

Some of the POTWs actually have an IJA with a surrounding area that in turn has an IJA with the municipality in which the IU was located. This dilution of oversight power greatly diminishes the leverage that the plant actually treating the wastes has over ensuring that discharges do not cause operational problems or NPDES violations. Where the IU in question is also large and politically powerful, pretreatment leverage declines still further.

- **A credible threat of enforcement by POTW is a necessary tool.** Two of the programs, did not have the delegated authority to take civil enforcement action against violators. Rather, civil action had to go through the regular city bureaucracy, where it would be subjected to the many competing interests of other departments, greatly reducing the POTW's ability to induce rapid compliance.

- **Consent agreements with suspended fines work very well.** As in Indiana, a couple of Virginia facilities noted the power of consent agreements with financial penalties which kicked in if the industry didn't comply on a stipulated time schedule. These agreements seemed to provide a strong incentive for rapid correction of problems, and allowed funds to be applied to long-term solutions to the environmental problems.

IDENTIFYING INDUSTRIAL USERS

The POTWs in Virginia used similar methods to identify new industrial dischargers as were applied in CA and IN, ranging from phone books and communications with other municipal departments, to drive throughs of industrial areas. Some of the VA programs even tracked unregulated industries if they felt there was a potential concern that discharge from these industries could affect the plant. In some cases, the POTW's plan to extend regulation to these sectors (e.g., photo processors) in the future, although doing so may require modifying the existing sewer ordinance.

One program in particular was unhappy with their inventory of industrial users. A survey done in the 1980s identified 200 potential IUs (including dry cleaning and radiator shops). They felt that a major area of weakness was from IUs located in surrounding areas with whom they had an IJA but not much direct access. This program felt that they had fairly good communication with other municipal offices within the city (such as being notified of new water hookups and large water

consumers), but few links to information on new businesses or water hookups in the other jurisdictions. For example, the program does not even get sent a copy of the sewer connect lists from the two adjacent counties that discharge into their sewage system. The pretreatment coordinator is anxious to complete a survey for specific commercial uses to identify unknown facilities.

SAMPLING AND INSPECTION STRATEGY

A number of familiar elements came up on the Virginia trip, as well as some new issues that the programs have creatively tried to address.

- **Rotating Inspectors.** A theme that came up in visits to other sites was echoed by an inspector in Virginia: rotating which plants you visit is important because it's "hard to stay focused when you inspect the same plants year after year." There remains a balance between familiarity with a specific plant and its personnel and retaining a fresh, inquisitive view of the inspection process.

- **Good relationship with IUs makes inspections non-adversarial.** One program said that its industries didn't mind being inspected because they had a long relationship with the POTW and its personnel, and trusted that the program would treat them fairly.

- **Frequency of Inspection.** One plant said that it does not conduct annual inspections at each IU because this was not necessary and the program did not have enough resources to do so. Since the Clean Water Act requires SIUs be inspected a minimum of once per year, this comment seemed strange. On further examination, this facility did "audit" the IUs more frequently, but viewed an inspection as a much more detailed undertaking. It may just be a matter of semantics since the regulations do not establish what an inspection must include.

  -- Inspections, as defined, would require about 1 week per SIU. This time was broken out as follows: one day to review files; one day to review and assemble relevant data on the plant, one day to visit the plant (2 days if the plant is new), and one day to write-up the visit and ask for additional information.

  -- At this particular plant, only one person conducted the full inspections. In addition, they had very little in the way of information systems that would have made file review and data review and assembly much easier.

-- The SIUs in this particular region conduct substantial self-monitoring, and report on a weekly basis. Because SIU discharges have large financial ramifications for the industries (they share plant costs on a pro-rated basis), many parameters are tested every day. This frequency increases the likelihood that any problems in the IU's processes will be detected early, and reduces the need somewhat for frequent external inspections.
-- Many of the large SIUs in another district are also required to sample daily. Better compliance leads to reduced monitoring requirements.

- **Sampling and Inspection of POTWs is inadequate**. Many of the programs mentioned that they did not think the Virginia DEQ did a good job overseeing the state's delegated pretreatment program. One program coordinator has not had a full audit since 1981. While the DEQ would visit once per year to review the program, they did not do a full program audit, the type of multi-day review that would provide program staff with useful information on ways they could improve.

- **Time of travel data useful in detecting source of slugs**. One of the programs has modeled their interceptors to estimate how long wastes take to flow from one point to another. This makes it easier for them to trace back discharges, and to prepare other plants in their system for diverted slugs. Testing points at the bar screen and lift stations also help identify and trace unknown discharges.

- **Sampling at military facilities requires different strategies**. One facility has a substantial number of military dischargers. Some of these dischargers tried to restrict pretreatment staff from entering their facilities because of the top secret nature of their operations. The POTW took a hard line on this: their staff required entry or the military would not be permitted to discharge to their plant. The POTW was willing to have its staff go through security clearance, so long as, in the end, they could inspect unannounced as necessary.

- **Municipal permits offer an alternative to interjurisdictional agreements where inspection is a problem**. One program, faced with restricted oversight of industrial discharges entering its system from another city, used a municipal permit to solve the problem. This permit simply allows no industrial discharge from the other city. The POTW can stop regular service

to the other jurisdiction if it detects problem discharges. This provides a relatively strong incentive for the other district to adequately monitor its own industries.[1]

- **Refusal to split samples with IUs.** One of the programs says it does not split samples with IUs, because doing so has been problematic, with certain SIUs in the past always splitting the sample and challenging the results. Since this program does not have penalty authority, the costs of allowing splitting outweighed the benefits.

- **Expanding Oversight to Include Direct Dischargers.** One program in IN felt that their success in protecting environmental quality owed a great deal to their ability to inspect and regulate direct as well as indirect dischargers affecting the water quality in their receiving waters. The one program in VA that we discussed this with thought that this approach made a lot of sense, but was wary of being given large new mandates without the necessary additional funding.

ENFORCEMENT STRATEGY

Causes of Non-compliance

Most program staff felt that their IUs wanted to "do the right thing" with regard to minimizing the impact of their discharges on the environment. One program felt that non-compliance among metal finishers was an issue of expertise rather than malice. Another noted the importance of well-trained staff. In this district, problems often occurred when the one dedicated pretreatment operator went on vacation.[2]

A Lack of Penalty Authority Weakens the Program

Programs that are unable to levy financial fines have little leverage to force recalcitrant industries into compliance. In Indiana, a couple of programs faced pressure from their utility managers or boards not to fine violating industries. In Virginia, a new constraint existed: a lack of legal authority. The impact of this constraint is the same: less leverage to improve IU performance.

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[1] While this approach is contained in the EPA model sewer ordinance, the pretreatment staff did not think it was applied very frequently.

[2] One implication of this finding is that IUs should have a plan for backup responsibility.

One program that does have this authority illustrates its importance. The program has recently begun issuing fines more often than it used to, making fines automatic in certain circumstances. Pretreatment managers have noted that firms have been getting back into compliance more quickly.[3]

Two programs had local laws that did not give the POTW penalty authority. One used back charges for enforcement sampling as a way to force IUs to incur some costs, but this approach did not allow for a large financial impact (with maximum charges of about $2,500). Larger fines could be brought only through formal litigation in the judicial system using the city's attorney. Unfortunately, in an apparent blatant conflict of interest, this attorney sits on the board of the biggest IU in the region, and therefore doesn't want to support the cases, especially against this firm. The pretreatment coordinator has resorted to the "nuisance factor" to promote compliance, calling compliance meetings at the sewer authority and requiring upper managers of the violating IUs to come. This approach has worked to some degree. The coordinator of the other program remarked that the lack of penalty authority greatly weakened the power of consent agreements, since such agreements could not have the financial penalties associated with missing stipulated deadlines commonly put in by other POTWs. Adding this power would require changing the city charter, but the city doesn't want the POTW to have this ability and is unlikely to make the change.

Another Virginia program regulated a number of military dischargers. Under a special exclusion in the Clean Water Act, military installations cannot pay fines due to sovereign immunity. Thus, this program is also unable to collect fines. This program has creatively used the fears of military officers regarding how adverse publicity will affect their careers to ensure responsiveness on the part of the installations to water quality problems. Interestingly, this program assesses the fine and publishes the amount even though it can't collect the funds, as an added component of the use of public pressure.

Stringency of NPDES Permits Drives Enforcement Strategy

Since a POTW is judged in large part based on its compliance with its NPDES permit, actions taken against IUs are often derived from the stringency of the permit. Virginia provided two extreme examples of this point:

- One program has extremely strict discharge requirements for certain constituents, and has had to regulate even minor industrial users such as 1-hour photo labs in order to comply. They have been successful in this regard by conducting a large amount of outreach and by working with the trade associations.

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[3] Another program visited in VA also had penalty authority and made frequent use of consent agreements with suspended fines. This pretreatment coordinator noted that technique worked very well, and that it was always difficult to figure out what to do with the fine money anyway.

- Another program has an NPDES permit that expired five years ago (and is therefore less stringent than the newer ones), and a very low contribution to flow from industries. The biggest contributors of discharges of concern are small shops, but any single one has minimal impact on the overall system. This program does not face the same pressures to regulate industries as the first case.

Reward the Positive as Well as Punishing the Negative

- One of the programs has an awards program for industries that have superior compliance records. Program managers felt that this was an important incentive for the industries (and military commanders) to do as good a job as possible with their pretreatment.

- Another program would recognize IUs as exemplary if they went all year without a violation.

Enforcement Actions Slowly Escalated

A range of enforcement responses has been noted as a useful tool by a number of programs. One Virginia program actually uses a point system, with more serious and/or more frequent violations earning more points and a more severe enforcement response. Monitoring requirements also vary by IU, based on their assessment of need. The program tries to work out cooperative agreements when there is a problem before shifting to more adversarial approaches.

There is not universal agreement on what a substantial violation is, however. The primary area of disagreement is reporting violations, with many programs (in VA and elsewhere) treating paperwork violations as insignificant. However, one VA program questioned this assumption. The pretreatment coordinator felt strongly that timely reporting is an important part of compliance for an IU, because it can greatly affect the ability of the POTW to quickly identify and address problems. Therefore, he did not have any problem putting somebody in SNC for reporting violations.

Another program felt that paperwork violations were not worthy of much action. They wanted the focus of enforcement to be health and safety, and did not see a connection between paperwork and improved health and safety. This same program viewed a pattern of lapse, improve, lapse as particularly serious, because it suggested the IU did not take their pretreatment responsibility seriously.

Multiple Enforcement Units of Different Stringency Can Cause Problems

Both the CA and IN trips brought out the transitory conflicts between the POTW and other direct dischargers, where firms discharging into the POTW faced more stringent requirements than the direct dischargers, even though both used the same receiving waters. One of the VA programs had a new angle on this issue: some of the IUs it serviced discharged a portion of their effluent to the POTW, and a portion directly to receiving waters. In this situation, the state did not enforce NPDES permits as aggressively as the POTW enforces its local limits. Thus, facilities regulated by both the POTW and the VA DEQ sometimes resent the POTW in comparison. This makes it harder for pretreatment staff to work with these particular plants.

Public Oversight through Meetings and Information Sharing

The Toxic Release Inventory demonstrated how powerful public disclosure can be in encouraging sound environmental practices. Following a large chemical accident in the early 1970s, one of the VA facilities visited had to devise a way to retain its strong industry base while simultaneously reestablishing public trust that the city government could protect the health and safety of its citizens.[4] They devised a host of mechanisms to establish accountability and rebuild public trust:

- **Public Meetings.** The large IUs in the town meet with the City Council in open meetings to provide the city with information on their production and discharges. There are additional meetings directly with citizens to explain the discharges and to address any questions the public may have.

- **Emergency Preparedness.** Detailed plans have been worked out with the town regarding actions in the case of an emergency. Following the accident in the 1970s, the town passed an ordinance making it a felony for an industry not to report any accident to the local government that must be reported at the state or federal level.

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[4]One concern with extremely strong local industries is that the pretreatment program would be unable to take enforcement action against them due to political pressure. This particular POTW claims that they have not had a problem in this regard. To support this claim, they point out that they have taken enforcement action against most of the large industrial users at least once. Some have had continue compliance problems and schedules. It is worth considering, even if this POTW has been able to mount effective oversight, whether another district that did not have such heightened public sensitivity due to a past industrial accident, would be able to do the same.

- **Information Dissemination**. A variety of detailed information on the industries, discharges, and any accidents, is provided to public quickly using the Internet and a system of telephone information lines, where citizens can dial in different extensions to get information on particular topics.

- **City Safety Office**. The city has established a safety office as an information source for citizens to help them understand the technical aspects of IU data. The safety office will also act as a go-between for the citizen and the IUs, to help citizens access information.

- **Third Party Verification**. The state of Virginia has offered to provide additional information to local citizens and to oversee that the information presented to the citizens by IUs and the POTWs is accurate.

Although there are two local environmental groups, they have not placed themselves in opposition to the plant or its SIUs. The plant personnel credit their extensive safety/outreach effort for this.

Technically-Sophisticated IUs Sometimes More Difficult to Enforce Against

While technically sophisticated industries are able to purchase and operate pretreatment equipment correctly, they also sometimes cause problems for the treatment plant. They are often large, so that their discharge can adversely affect the plant. They may also be well connected politically. In one of the cities visited, a large industry would always split samples with the POTW and often challenged the results. The industry also knew the regulations so well that in some cases they met the letter of the law while violating the spirit (and increasing loadings to the system).

Compartmentalized Dischargers Cause Problems for Regulators.

Large, compartmentalized dischargers, such as hospitals, cause problems for pretreatment staff. Responsibility for hospital discharge may be fragmented, even though all the flows end up at the POTW. Thus, identifying the cause of a problem or the best method to have it corrected is more difficult.

Obtaining Compliance for Small, Non-Categorical Dischargers

As was common in California, some of the VA POTWs required installation of certain recovery equipment to prevent problems at small non-categorical industries such as photo processors. However, these programs have some problems with shops that don't properly maintain the systems.

POLLUTION PREVENTION

As in Indiana, most pretreatment programs felt that pollution prevention was a good idea, but ensuring their IUs were in compliance was a higher priority. One program also felt that P2 was likely a "tough sell on a cost/benefit basis." The pretreatment coordinator said that P2 was unfunded, and probably unfundable. The large IUs, he said, were already implementing on their own, due to TRI and Chemical Manufacturers Association (CMA) goals. Their technical knowledge was far beyond that of the POTW staff. He thought that broader application of P2 (i.e., by smaller industries) was unlikely to have much positive impact on plant operations or residuals quality. A local household hazardous waste collection program was classified as "costly with intangible benefits."

Another program stated that their inspectors were not that well versed in P2 alternatives for their IUs. They thought that their current access to detailed info on P2 was not great, and that it would be very useful to have an on-line resource center with this information.

EMPLOYEE ISSUES

Keeping the job interesting remained a key employee-related issue in Virginia as in the other two states. Staff retention was an important component of an effective program, since staff understood their programs, knew the IUs, and built up relationships that made them effective regulators over a period of years.

Staff retention at the VA POTWs has been relatively good. One program had very long staff retention, generally over 10 years. They attributed this to a fair program for staff (i.e., not every minor situation is written up), salaries at the upper-end of the pay scale, good benefits, and preferential promotion from within.

Another program felt that while its staff retention was relatively good, the costs of training new staff (both direct and indirect) were so high that they wanted to improve retention even further. In contrast, a third program had relatively high turnover, with a staff tenure of only about two years. The pretreatment coordinator thought this was due primarily to low salary levels and numerous higher salary opportunities for their skills. He did not see an easy solution to increase retention.

As in Indiana, some of the programs made an effort to restructure their employees to provide better overall service to customers while also making the jobs more interesting for staff. The best example of this was the development of cross-functional workgroups by one plant as part of a total quality initiative. Departments meet as a whole, and then form workgroups to address issues brought up at the departmental meetings; an effort is made to mix functional staff to solve these problems.

EDUCATION/TRAINING ACTIVITIES AND INITIATIVES

Staff training was an important aspect of staff retention, as well as improving the expertise of program managers. Pretreatment staff sounded some familiar themes in this area, as well as some new issues. The training challenges facing small programs was clearly delineated by one program manager as follows:

> Small programs don't have enough funds for anything, let alone training. The state used to go out and reach this audience, but has cut way back. Even at Virginia Association of Metropolitan Wastewater Authorities (VAMWA) meetings, the big programs show up, the little ones don't. Small plants are the biggest problems -- they may not even have VCRs on which to watch a training video.

This program viewed certification of operators as one solution. In their view, certified lab technicians and WWT operators would go a long way to improving compliance at the smaller programs by ensuring a minimum level of competence at both the POTW and the IU.

Training Budgets Sometimes Limited Training Opportunities

One of the smaller programs felt that their training budget was adequate to meet their needs; however, they were located close to a major city, and therefore had low travel costs to attend the variety of training activities held there. Other programs had training budgets that covered training fees but didn't cover travel costs, and therefore were of limited value and restricted them to the local area. This theme was mentioned by a number of programs on other trips as well, demonstrating the importance of local training options and the problems associated with federal budget cuts in this area. The result of the lack of funds or restricted funds, in conjunction with high daily demands on the staff at smaller programs, was that the bulk of the training occurred on-the-job.[5]

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[5]One of the pretreatment coordinators wanted to prepare a complete step-by-step manual for the program as a way to make the on-the-job training easier.

Views on Written Training Materials

- **Ken Kerri Training Manuals Again Highly Rated.** The Ken Kerri guidebooks (sponsored by EPA) were once again mentioned as important and valuable resources.

- **Other Useful Training Materials.**

  -- One program mentioned that the Industrial Waste Primer (Austin, Jack Gatlin) and Streamline (from St. Louis) were both useful.
  -- Another program taught Ken Kerri's California State University (CSU) self-study course on "Pretreatment Facility Inspection" once in-house.

- **EPA Guidances and Manuals.**

  -- EPA's sampling and inspection guidance was good. The ERP manual was not as good because it had too many "cookie cutter" plans.
  -- Preventing slugs and interference guidance was worthless.
  -- Treating trucked wastes was extremely confusing.
  -- A number of older guidances are still very useful, including "Establishing a Pretreatment Program," "Permitting," and "Model Ordinance.".
  -- EPA should update the local limits guidance and the environmental criteria (plant inhibition data).
  -- EPA's internal methods manuals or guidance memorandum also useful.
  -- EPA should have all of its guidances available on PIPES.

Seminars, Trade Associations, and Local Pretreatment Groups

- **National Trade Associations Are a Useful Resource.** Programs continue to rely on WEF and AMSA for training materials and information. One program especially mentioned the AMSA Pretreatment and Hazardous Wastes Committee as a good information sharing resource.

- **Virginia Association of Metropolitan Wastewater Authorities (VAMWA).** This organization has the potential to be a strong regional resource. However, some of the pretreatment coordinators felt that pretreatment was getting ignored by the group. One program coordinator hypothesized this was because the plant operators didn't want pretreatment

to focus on problems at the plant that might cause action by EPA or the state.[6] However, VAMWA has organized inexpensive, local workshops that provided access to training for smaller POTWs that might not otherwise have been available. Topics have included sampling and inspection.

- **Are there Other Programs Like VAMWA?** One of the programs felt that VAMWA was a powerful initiative because it was willing to take responsibility for bringing training to a more local level. The coordinator wondered if similar initiatives existed in other parts of the country.

- **Training Courses.** One of the larger POTWs recently hosted (with partial EPA funding) a P2 training course by SAIC that they felt had been useful.

PIPES Needs to Play a Central Role in Disseminating Training Information

- **PIPES needs to meet a broader range of needs.** Programs generally felt that PIPES was an extremely valuable resource, and one that should be developed into a much more effective communications tool that it currently was:

  -- PIPES needs to be more user-friendly and consistent.
  -- A user should be able to view information on-line before downloading to be sure it's what they want.
  -- PIPES would be a very useful resource to them, but they don't currently have on-line access in their program.
  -- PIPES is a very good resource but all EPA guidance should be available through it.

Unmet Training Needs

- **Skills.** Improved communications and investigative skills for inspectors. Learning to do good inspections is the most difficult part of the job.

- **Cross-Training.** One program felt strongly that all POTW employees should understand all operations of the plant, including plant operations, laboratory operations, and pretreatment. Even if not experts, they should

[6] VAMWA does have a pretreatment committee.

have a general understanding. The program said they are working in this direction through "cross-crafting" (cross-training) employees, but that it was a slow process and most staff remained specialized.

- **Videos.** Industry-specific videos would be useful. A training video would be good for both pretreatment staff and IUs. Videos of value include sampling, flow meter measurement, and inspection of CIUs (one per CIU category). This support for videos was not universal; one program thought they would not be useful, because inspectors need to learn by accompanying other inspectors on site visits. Videos could not substitute for the very important role that on-the-job training provided.

- **Pollution Prevention.** Easy-to-understand guidance on P2 is needed to inform IUs and commercial dischargers. Most IUs have a tough time understanding pretreatment requirements in general unless they have an environmental manager.

- **Local Limits.** Additional guidance on technically-based local limits would be useful.

Regional Training

A number of programs felt that training support by EPA Region 3 had evaporated, and that more input was needed. This regional presence is not consistent across the country. Each Region approaches training differently, and focuses on what they feel are priority areas for their Region.

At the very least, these programs wanted to be made aware of training that was going on in the region already. Pretreatment staff named a couple of examples of where Region 3 programs were poorly advertised, and others where they didn't even know about it until after it was gone. They supported the concept of creating regional calendars on PIPES allowing local and regional training to be publicized to other programs quickly and easily.

OUTREACH

Outreach programs varied by POTW and local needs.

- **Targeted industry efforts.** One program has initiated outreach for the ship repair and printing industries, areas of concern in their district. They also began an outreach program for P2 in 1994, run jointly with their public relations department.

- **Structuring IU Reporting**. One program was having difficulty getting accurate and consistent data from their IUs. To address the problem, pretreatment staff developed "notebooks" to help educate the IUs and improve their reports. The notebooks contain the sewer ordinance, the enforcement response plan, a list of abbreviations, and relevant P2 information. In addition, the notebook contains facility-specific information such as a permit application form, a copy of the IU's permit, a fact sheet on the program, sampling results, and pretreatment system plans.

- **Outreach to other parts of the POTW is important**. Letting other parts of the WWTP and the municipality know about pretreatment and its important role in protecting plant quality helps garner support for pretreatment activities. The degree to which programs did such outreach varied. For example, one of the smaller programs felt that other departments knew about the pretreatment program, but not much. While the coordinator felt that there was support for the program at upper management levels, the coordinator's reporting line was quite indirect, with two or three tiers to go before upper management. Often, such a reporting line suggests a reduced view of the importance of the pretreatment position in the eyes of upper managers.

- **Outreach to the IUs driven by past incidents**. One of the programs visited had extensive outreach due to a significant environmental accident in the 1970s at one of its SIUs. The POTW set up a number of committees and systems to oversee SIU operations following the accident.

  -- *Technical Advisory Committee*: reviews potential projects, and shares information among major industries. Each industrial partner has an environmental liaison that sits on this committee. Also deals with budget issues.

  -- *Environmental Liaison Program*: has monthly meetings to address environmental issues, and includes environmental representatives from smaller dischargers as well.

  -- *Industrial Community Partnership:* Works with community on issues of concern.

  According to pretreatment staff, the frequent, informal contact and communication with IUs makes enforcement easier.

- **EPA outreach to programs needs improvement**. There have been a number of instances during the visits where the POTWs misunderstanding the regulations or not recognizing flexibility that exists has led the POTW to regulate industries that have no impact on their treatment plant. For instance, one POTW on the Virginia trip was regulating a seafood processor as a SIU

because it had a flow greater than 25,000 gpd. The POTW wanted to stop regulating the seafood processor, but did not think it was allowed to because of the 40 CFR 403 regulations. This was not the case; the problem they faced was that they wrote their local regulations in such a way that they did not provide themselves with the flexibility available in the federal regulations

- **EPA education of public with regards to pretreatment needs improvement.** One program coordinator felt that EPA gave a great deal of publicity to sewage treatment in general (such as at Earth Day celebrations), but rarely publicized the role of pretreatment in the sewage treatment equation.

PRETREATMENT RESOURCES AND COST ACCOUNTING

As with the other states visited, programs in Virginia had a wide variety of budgeting approaches and varying degrees of sophistication with regard to their cost accounting systems.

Budgeting

- **IU Influence.** One of the programs has its SIUs on their board, and vote on the budget for the plant. While the city council (on which the SIUs do not sit) has veto power, this structure poses potential conflicts of interest. Because the SIUs at this particular plant are *de facto* equity holders in the facility, they can be expected to make more financially responsible decisions than if they simply discharged to it.

- **Budget Size.** The programs have a wide range of financial support for pretreatment, ranging from $150,000 per year to $2.5 million. Lab costs in the first program represented 1/3 of the budget; lab costs in the second program represented 50 percent. These budgets do not always represent the total resources available for pretreatment; for example, the smaller of these programs pays computer costs out of an entirely different budget.

- **No Budget Details for Pretreatment.** Two of the programs do not have a pretreatment-specific budget. Therefore, its difficult to identify how much is being spent on the program overall.

Cost Accounting

Cost accounting, the process by which the POTW assesses how much particular discharges or dischargers cost for their plant to handle, was a weak area in both CA and IN. Widespread cross-subsidies led to reduced resources for pretreatment and poor price signals to dischargers about the most important areas in which to improve pretreatment or reduce water consumption. Virginia proved to be similar, although with some interesting twists not found in the other states. For example, despite some cost accounting problems, one of the programs received more in surcharges *overall* than the cost to run the pretreatment program. Virginia POTWs also faced politically-induced cross-subsidies, where particular dischargers paid less than their fair share due to political influence. Virginia also brought out the complex issue of government-subsidized sewage treatment to large industries fully capable of paying the entire cost of these services on their own.

- **Program A.** Program A spread the cost of treatment and administration throughout its customer base and estimates that its surcharges cover the incremental costs of serving industrial users and other dischargers of high-strength wastes. There are no cross-subsidies between residential and commercial/industrial customers as occurred in some other programs. There do appear to be some cross-subsidies among IUs (such as through flat discharge fees across the entire plant network).[7] Fines levied against non-compliant firms are directed into a special pretreatment budget item that funds local programs including an industrial awards program, community education and the POTW's P2 program.

- **Program B.** Although testing is a large part of their budget, they don't charge back analytics based on the specific cost per test. In addition, they don't charge smaller dischargers for required tests. Thus, the large IUs subsidize the smaller ones to some degree.

  -- The program experienced large cost increases when the cluster rule came into effect, when they began WET and bioaccumulation testing, and when their new discharge permit increased their monitoring requirements.

  -- Nonetheless, their rates for commercial customers have remained flat between 1986 and 1994.

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[7] Plant personnel note that they are required by Federal law to have a uniform fee structure; additional research would be needed to determine whether this precludes the use of differential charges within a large geographic area, based on difference in the cost of providing service.

This program is somewhat unique since the core IUs are allocated fractions of fixed costs based on loadings (flow and strength), almost as though they were equity holders in the plant (in fact, they "own" set proportions of the treatment capacity. As a result, aggregate charges are quite sensitive to loadings; thus, the SIUs want accurate and frequent data on those loadings. In fact, they want daily numbers for BOD and suspended solids. Thus, each plant has permanent samplers and uses a flow-through sampler with large volume samples to try to be sure the reading is representative. This is expensive: capital costs associated with this equipment is about $4,000 per site, and about 50% of the lab costs are associated with this frequent in-plant sampling.

Since reducing the flow or strength of discharge can reduce the proportion of fixed costs that a particular SIU bears, there is an incentive for the firms to reduce billable elements in discharge. These gains somewhat offset by similar reductions by the handful of other major firms, since certain fixed costs still remain to be spread. For new expenditures of $500,000 or less, the overall cost allocation formula used to allocate fixed costs associated with the basic treatment capital holds. For larger investments, a separate cost accounting study is done to determine what discharge is driving the investment; costs for it are allocated based on this study.

- **Program C**. This program charges IUs based on flow, with a surcharge for strength (BOD, TSS) as most programs do. However, unlike other programs, it does not levy separate charges for lab tests, inspections, or violations. The decision not to levy any fines associated with pretreatment violations is a political one. The program also incurs a permitting cost of between $5,000 and $12,000 for each IU permitted, a cost that is not recovered from the beneficiary industry. It is this program that faces political pressure even in its flow and surcharge fees. One particular industry, a national firm with a plant in this service area, always under-reports BOD to reduce their surcharge. Yet, it is extremely difficult politically for the POTW to take action.

- **Program D**. This program does charge industries for their permits ($250 for non-CIU permits, $375 for CIU), although this level of charges is unlikely to cover the full costs. The POTW also charges for samples taken plus a handling fee. Since lab tests are sent to an outside lab, it is relatively easy for the POTW to figure out the cost per test. Unlike nearly every other plant visited, this program does not surcharge industrial dischargers for the strength

of their waste, though they have talked about doing so for years. According to the pretreatment coordinator, a strong local restaurant lobby has long opposed such surcharges and successfully prevented their implementation.

-- Despite charging for lab tests, laboratory costs continue to require about 1/3 of a very small budget, suggesting that more extensive cost recovery might be possible.

-- In addition, this plant does not charge industries for violations that force the plant to incur substantial costs to rectify. Given the large number of restaurants, this particular POTW has had frequent problems with oil and grease discharges. In fact, oil and grease from these restaurants plugs the pump station on a regular basis, forcing a sewage maintenance team to flush the pipes as frequently as 2 or 3 times per week. The cost of these activities is never calculated, and no effort has been made to charge the cost back to the responsible dischargers.

-- Despite the very low rates at this POTW (only 61 percent as high as an adjacent community), the POTW has still found it extremely difficult to increase charges sufficiently for IUs to cover the costs of running the pretreatment program.

Cross-Subsidies

The biggest issue with cross-subsidies in Virginia involved the provision of wastewater treatment plant infrastructure to industry at below-market rates. At two locations, at least one of the WWTPs serviced primarily industrial customers, with industrial flow a high percentage of total flow. Although the industries generally contributed to plant construction and sometimes held an equity interest in the facility, the financing arrangements appear to have subsidized the industries:

- The capital cost of the plants was paid, in part, using EPA grants. While the net result was cleaner water, the cost of pollution control was substantially borne by federal or local taxpayers, rather than by the industries causing the pollution. This subsidy reduced the incentive for these industries to invest in pollution prevention or waste minimization.

- Where construction was financed by municipal bonds rather than grants, industries benefitted from access to lower cost municipal financing.[8]

[8] Because interest on municipal bonds is exempt from federal taxation, borrowers are able to pay a lower interest rate than would otherwise be possible.

- Where the firms took an equity interest in the plant, it is possible that they receive an ongoing subsidy from the municipality in the form of services provided by the POTW staff but not charged back entirely to the specific plant servicing the industry.

One other area of potential subsidization involves line extensions to IUs outside of the service area. Unless the POTW has very good cost accounting systems (which few appear to), there is a good chance that the cost of these extensions is not accurately charged to the IU or town being added to the system.

Cost-Accounting for Multi-plant Networks and Interjurisdictional Agreements

Cost accounting for a single waste water treatment plant is complicated; doing so for a multi-plant network is even more so. A similar situation holds for IJAs; where the plant can't even get information on what industries are discharging what effluent at what contaminant levels from surrounding communities, figuring out how much those discharges cost the POTW is nearly impossible. Since both multi-plant networks and IJAs bring out other general management issues as well, they are each addressed in separate sections; the cost accounting component is mentioned there.

RUNNING A MULTI-PLANT NETWORK

Operating a single sewage treatment plant is difficult enough: local limits must be set, IUs identified and inspected, and effluent quality protected. Multiple plant networks add an additional layer of complexity. Since the plants have different capacities and capabilities, controlling influent parameters becomes more complicated. Multiple outfalls, sometimes in different receiving waters, make setting local limits more complicated as well. While most of these systems are set up as utility districts, protecting them in part from multiple political jurisdictions, difficulties over political boundaries remain. For example, collection systems may be owned by a variety of different governments, be in differing condition, and be maintained to differing levels.

One of the programs visited managed a number of plants together.

- **Local Limits.** This plant network had cross-connections between plants, allowing influent to be shifted from one plant to another. The benefit of this approach is that treatment capacity can be balanced system-wide, offering buffering capacity against influent increases in particular regions. However, since one can't be sure ahead of time what outfall particular influent will end up going to, local limits had to be set system-wide, based on the worst-case scenario (i.e., most sensitive discharge point drives the entire system).

-- The most sensitive treatment process also influences local limits. One plant has metals-sensitive technology to treat wastes; pretreatment managers had to be sure their local limits were protective enough to prevent plant upsets.

- **Discharge prices.** Given the mix of technologies used in a plant network, the cost to treat particular discharges can vary widely across the system. POTW managers have chosen to have universal charges to dischargers, regardless of what part of the system they are located in. This has the benefit of simplicity. However, the drawback is that the POTW itself does not know how much its costs vary across their system. A system of differential charges could also encourage increased industrialization in the portions of their network most capable of handling it; or encourage increased investment in P2 in the parts of their network most constrained.

- **Cross-Connections Automatic.** A series of cross-connections between plants have been fairly automated so that discharges flow to the point of least resistance, using a floating valve system. Prior to this system, interceptor personnel from one plant would divert influent to other plants without notifying the plant personnel that it was coming. This caused substantial problems for the receiving plant, and led to a formal notification system.

INTERJURISDICTIONAL AGREEMENTS

A number of the programs we visited accepted discharges from industries outside of their districts. The details of these agreements and how they limit pretreatment oversight for discharges located in other municipalities was discussed above under the section on the "Most Critical Factors in Running a Successful Program." This lack of oversight makes proper cost accounting virtually impossible, and makes cross-subsidies extremely likely.

- Understating the cost of sewer line expansions and may lead to artificially low charges to industries at the periphery of a sewer network and inhibit the adaption of P2 or smaller scale technologies that are alternative ways to treat wastes. In Virginia, one program is expanding its sewer network earlier than originally planned in order to service a large industry in another jurisdiction (along with the residential customers). The County is contributing construction funds and the industry is paying sewage treatment charges that include the debt service on the line extension. The industry will pay treatment charges, but none of the cost of the line extension. This type of arrangement may require additional evaluation to ensure that wastewater treatment charges to industries are not being subsidized, thereby reducing their incentive to invest in P2.

- Another program receives large flows from an electronics company in another service area. Again, the impact of these flows on plant costs and operations is not incorporated into the prices charged to the IU, since charges are levied against the adjacent municipality, leaving it up to that municipality whether to surcharge the industry correctly.

INFORMATION SYSTEMS

Improved Systems Would be Extremely Valuable

- **Information Systems Can Provide a Program History.** In a number of the programs visited, including one in Virginia, a new pretreatment coordinator arrived and found very little history on how the program had operated under prior management. This lack of history greatly reduces the ability of the new coordinator to do his job and further improve the program. Information systems help retain and organize core information on the program and the IUs, information that would be available for new staff.

Information Systems in Use at POTWs

- **Program A.** This program uses an Advanced Revelation Database program to track pretreatment. Their software gives them automated calculations for violations, and SNC, and allows them to track monitoring results (such as comparing self-reported and compliance reporting results). While the program staff expect to upgrade their systems in the coming years, they expect this to be a significant challenge because their staff are scientists, not computer specialists.

  -- Staff would like to replace most of their paper records with electronic to reduce the space they take up and to make them more easily accessible.
  -- Staff also want better linking between the lab system and main database and to have a standard info system across the POTW.
  -- Despite being a large and complicated facility, the POTW has no digital maps of its sewer infrastructure (not always owned by the POTW itself), and therefore no GIS.
  -- Staff liked the idea of interchangeable program modules that could be shared among pretreatment programs.

- **Program B**. This program relies on the Access Database for analytical data and NOV information. They use MS Word for general correspondence. The program does not have a software package specifically targeted to pretreatment and the coordinator did not think that the city would be willing to buy one even if he found one he liked. The coordinator had used Prelim 4.0 (for setting local limits) in the past, and thought that while it was generally useful, it had bugs.

- **Program C**. The program coordinator mentioned a number of the software packages that Program C relied on. This included Pretreatment Manager from ARCCA, which the coordinator said was helpful, but rather old and not very flexible.[9] The program also uses Word Perfect and Quattro for calculating local limits and other headworks data. Overall, the software does help them to produce their annual report more quickly.

- **Program D**. This program retains a hard copy of most materials in their files and relies on spreadsheets and word processing for their data manipulation and standard correspondence. Despite being a large, complex program, they have no overall information system -- this is a recognized problem. They want to improve the pretreatment information systems and improve the links between pretreatment and other POTW functions. One example where such sharing would be beneficial is to provide access to routine information such as sampling results to the plant's operations staff. The pretreatment coordinator would also like to be able to transmit quarterly and annual reports electronically. The program has tried a number of pretreatment programs, including PCME, Operator 1.0, and ARCCA; however, they discarded each of them because they weren't flexible enough.

Use of Geographic Information Systems

None of the programs were making use of GIS at this point in time; nor did they have a particular vision of how GIS might help them to manage their pretreatment program more effectively.

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[9] A number of specific problems with the ARCCA package included that it was not Windows compatible, operated too much like a "black box" making it difficult for them to see their analysis, and contained standard forms (that could not be changed) that didn't fit the needs of their program that well.

OWNERSHIP PATTERNS

In addition to the reliance on outside laboratories for some types of procedures (described below), some POTWs outsourced other aspects of their operations as well. Some pretreatment staff also shared their views on the issue of privatization.

Outsourcing (Other than Laboratory)

- **Collection systems.** While the POTW owns the major force lines, the cities and towns own peripheral lines and smaller trunk lines. This pattern seems to be rather common for many POTWs.

- **Biosolids management.** One program outsources biosolids management.

Laboratory Operations

The Virginia programs had a wide range in how they managed their laboratory operations, from conducting everything in-house to almost nothing in-house.

- **All Tests Conducted In-house.** One program owns and operates a state-of-the art laboratory facility and conducts all tests in-house. This allows them to have precise control over the quality and speed of testing. The POTW provides services to other municipalities and government agencies, but not to any private entities. The facility also does all of their biological tests in-house.

- **Only Conventionals Conducted In-house.** In contrast, another of the POTWs visited ships everything out to a contract laboratory other than conventionals.

- **Program C.** A third program contracts out cyanide, oil and grease, and organics. In addition, it shipped out metals while upgrading metals testing equipment. This program worked hard to choose a good contract laboratory, developing criteria for choosing that included a variety of performance measures before considering price. Despite it's work choosing a lab for itself, it does not have a list of approved labs for dischargers because it has no authority to prepare such a list.

- **Program D.** The final program visited does conventional pollutants and metals in-house. Airborne total hydrocarbons are measured at the IUs using continuous emissions monitors (CEMS). Organic priority pollutants and

some metals, cyanide and whole effluent toxicity are all contracted out. The plant also contracts out bioaccumulation testing which is required in their NPDES permit due to discharge of one of their IUs that bioaccumulates.[10]

Despite using contract labs, this program has had problems with every single one they've used. For example, they have never seen Hg results they believed. They choose a lab based on QA/QC, an on-site inspection, and price -- though quality much more important. Lab contracts are put out for competitive bid.

"In-Sourcing"

- **Lab Services.** One program provides laboratory services (at a fee) to other municipal entities.

- **Service Area Expansion.** One program continues to expand its service district to an ever wider area. Based on descriptions by program staff, this expansion seemed rather haphazard, initiated by requests by particular IUs or surrounding government entities. There did not seem to be a strategy based on what parts of their existing infrastructure were underutilized.

- **Billing system.** Cities in one region may shift to radio metering for water/wastewater, at which point they would use the POTW's billing system.

Views on Privatizing POTWs and Effluent Trading

- **Program A.** This program felt that contract-operated POTWs were fine, and might even work for pretreatment. However, full privatization of pretreatment would be much more difficult. They also thought that effluent trading on the NPDES side was a good idea, and might even work within a pretreatment program. However, they did not think it would work with a multiple-plant network where effluent flows could be easily shifted.

- **Program B.** The pretreatment coordinator said that there has been some talk of contract management for the plant, but that the operations staff were holding costs down to stave off the threat. The coordinator said that privatization of pretreatment would be unacceptable because he didn't see

[10] Since these tests must be conducted due to one particular IU, proper would charge that IU the full cost of these tests.

how it could then protect the environment. In terms of effluent trading, the coordinator thought that point-nonpoint source trading might be useful, but that the state of VA didn't have enough of an NPS program to support it. He thought that trading within the pretreatment system would be unlikely because all the IUs had already installed their treatment equipment, and because implementing it would also require the POTW to shift from concentration-based to mass-based limits.

- **Program C.** This plant is already sort of privatized. Although built with EPA construction grants, IUs bought rights to 85% of the plant capacity from the outset. They did not actually take ownership in the plant infrastructure. According to the industry, this involvement has had certain risks, because the plant initially didn't work.

  -- IUs can sell this capacity.
  -- Industries pay for all O&M on a pro-rated basis. Thus, bear some risk; if a recession reduces production and discharges from all the SIUs, charges from the POTW don't necessary decrease.

  We did not have enough information to compare the incentives associated with this ownership structure of this POTW to those of a standard contract managed plant or a fully-privately owned one.

RESIDUALS MANAGEMENT

There was a greater diversity of residuals management techniques used in VA than in the other states.

Biosolids

Two of the Virginia programs incinerated most of their biosolids rather than land applying it. One of them incinerates biosolids because it is cheaper than land application. They think that this is partly the case because the incinerators have already been built, and that as they wear out, land application may become more attractive. The other facility that incinerates their biosolids does so because of concerns that relatively high levels of organics may remain in the biosolids. Incineration will successfully burn off any of these residuals. The ash from this second program is composted with paper mill biosolids and resold.

The other two plants rely on land application. One facility has biosolids that meets the Class B standards; metals concentrations in the biosolids have been flat for a number of years. The other facility produces biosolids that meets the Class A standards, and contracts with a third party to manage their biosolids operations.

Effluent Reuse

Aside from minimal reuse on golf courses, treated effluent is simply discharged. For one facility, this lack of reuse is due to concerns of the local department of health regarding pathogens remaining in the effluent that the pretreatment managers think is somewhat unfounded. Since the region experiences substantial water shortages every summer, the inability to reuse the effluent for irrigation is, in the minds of program staff, unfortunate.

SUMMARY OF SUGGESTIONS TO EPA

Information Sharing

- **Impact of New Chemicals on Treatment System.** Help POTWs evaluate how new products (e.g., poly vinyl alcohol from hospital garments) might affect the operations of the plant.
- **Increased Information Flow from EPA.** More discussions and info sharing between EPA HQ and pretreatment coordinators would be useful. A regional news section on PIPES that could also be used to announce seminars in the area would be useful as well.
- **Increased Training.** More regular/basic training.

Don't Forget Delegated Programs

- **Region Needs to Pay More Attention to Delegated States.** A number of the Virginia facilities felt as though the Region 3 EPA had pretty much abandoned them, since VA is a delegated state and PA isn't. Although delegated, they felt as though they also needed support from the Region in order to be more effective programs. Region 3 should be running regional seminars.

- **EPA Should Continually Assess Capabilities of Delegated States.** Approval authority for state water programs is erratic. Some states are delegated when they do not have programs capable of ensuring water quality. VA fit into this category.

Regulatory Flexibility

- **New CIUs increase workload but not necessarily POTW performance.** New CIUs, as well as the industries requiring oversight under the MP&M rules, would create a workload challenge in coming years. For example, the MP&M rule would add over 100 new entities to be regulated in one region, as compared to only about 13 regulated now. Programs felt it was a waste of resources to treat small CIUs as SIUs, and that their oversight should be based on risk.

- **Required pretreatment standards can sometimes hurt, rather than help, the POTW**. Not all pretreatment programs were designed to meet the same needs; the regulatory approach treats them as such, and therefore causes problems for some plants. This subset of plants were specially designed to treat industrial wastes, and certain EPA requirements regarding organics don't really apply. For example, methanol discharges are a VOC, and therefore regulated. However, this is also a food source for the bacteria at the POTW.

  -- If pulled from the influent, POTW would have to pay for other food sources.
  -- If regulated to such an extent that discharger had to pretreat for it, the IU might decide to stop discharging to the POTW outright, with significant implications on the economic viability of the plant for all remaining IUs.[11]
  -- To address this concern, one plant would like to see a new category: Publicly Owned Industrial Treatment Work to address some of these issues. While §307(b) of the CWA gives POTW's some flexibility to issue IUs a "credit" reflecting the POTW's ability to treat a pollutant, the plant stated that the process to do so is costly and administratively cumbersome. In addition, it does not allow an adjustment to reflect the full ability of the POTW to treat particular wastes.

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[11] This is especially an issue related to the technology-based standards for the pulp and paper and the OCPSF categories. The plant in question would become uneconomical if these industries pulled out, even though their plant is already built and capable of treating the organic wastes for these industries (they have few metals).

-- A related regulatory issue involves where "compliance" is measured: at the discharge point of the SIU, or at the point of discharge from the POITW. This plant wants the latter, but says that the former applies, ignoring the ability of the plant to treat the discharges.[12]

- **Latitude for permit modifications unclear**. One program felt that it was not always clear how to differentiate a substantial versus a non-substantial modification. Minor modifications do not go through a formal approval process, as long as the Approval Authority does not object they can be implemented immediately. Additional guidance might be in order.

- **Simpler Annual Report**. One POTW felt that Annual Reports should be a summary of program changes for the year, rather than a compilation of inspection reports and compliance status. This coordinator felt that EPA should be concerned with whether the POTW itself was meeting its permit rather than the activities of each IU.

Faster response times on audits and reviews

- One program implements new policies before getting official EPA approval. Their ERP and sewer use ordinance has taken three years thus far. The program manager got a call a few days before our visit from EPA asking for new copies of these materials because EPA had lost theirs.

SUGGESTIONS FOR THE CSI PROJECT

- **Increased EPA Resources to Education and Field Inspections.** One program wanted EPA to refocus resources to more targeted inspections, industry education, more field inspections. CSI can help encourage this shift.

- **Less micro management by EPA.** Focus on POTW as Control Authority and states and EPA as Approval Authority. The implication of this suggestion is less micro management of POTW operations. This can only work if the POTW is able to demonstrate to EPA, the states, and citizens, that its performance is good.

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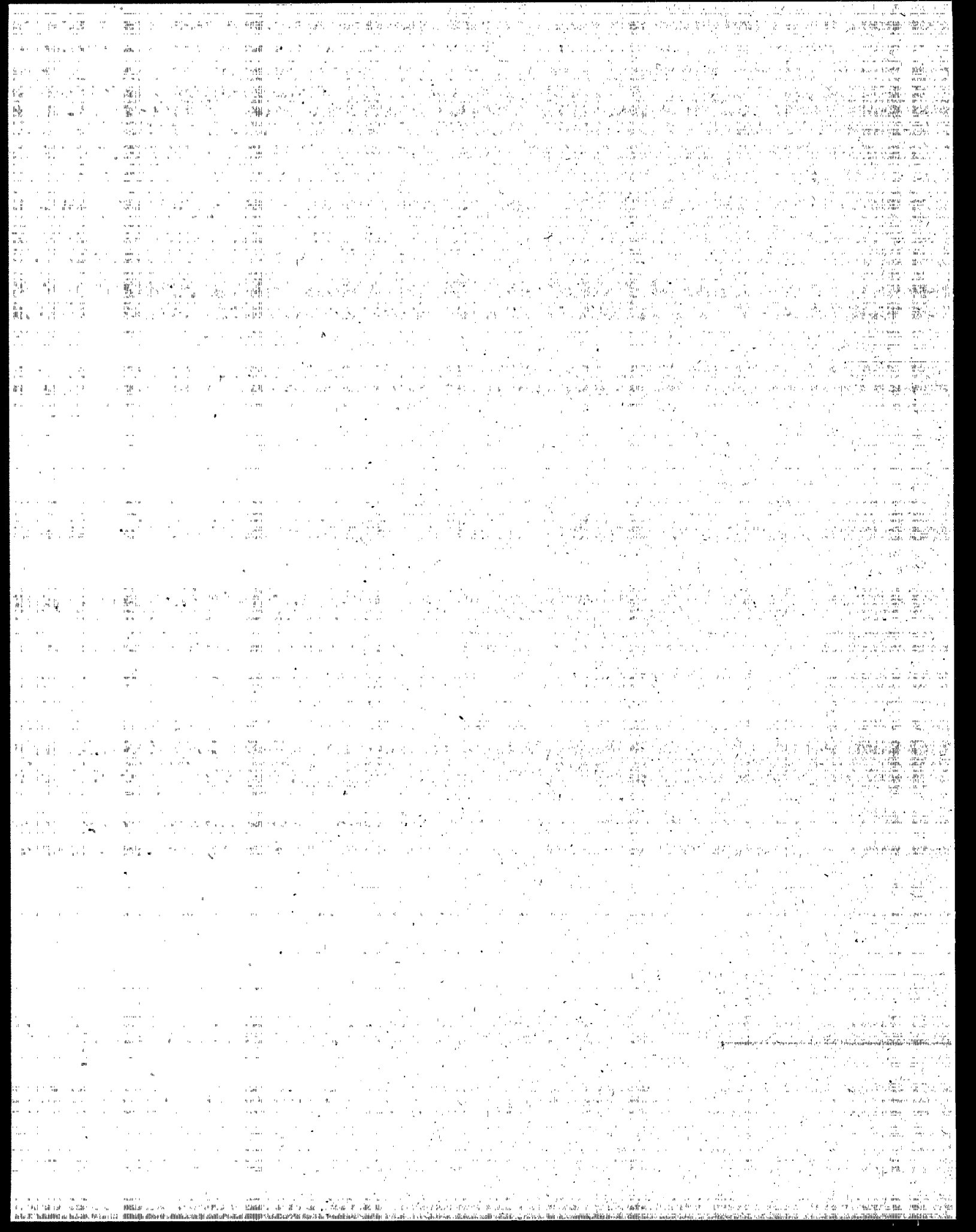
[12] Program staff said that fugitive emissions (that would be lost between the two different measuring points) were less than one percent.

- **Focus on environmental results; give programs increased flexibility to achieve.** Increased flexibility in the pretreatment program would be very useful. One program felt that the current program was too prescriptive and not enough oriented on environmental results. This coordinator favors outcome-based standards rather than technology-based standards. The key outcome-oriented measures in his mind are: meeting all worker health and safety standards; quality effluent; quality biosolids; quality air emissions; CSO and SSO quality and abatement; recycling and reuse of water, air, biosolids, and biosolids byproducts.

- **Identify Better Results-Based Measures of Performance.** CSI can help develop better ways to describe the impact of the pretreatment program through performance measures. These measures must be measurable and understandable. What is the POTW doing? How well? It is a common problem across programs that politicians disregard the importance of pretreatment. In addition, the measures would help support a shift to increased flexibility for programs to decide for themselves how best to expend their resources.

- **Paperwork and certain other violations are not important.** De-emphasize enforcement of violations that have no impact on environmental quality such as paperwork (excluding falsification or non-reporting) and instantaneous pH (which this program manager characterized as "meaningless").



Attachment 7:

SUMMARY LIST OF ALL POTENTIAL PILOT PROJECTS SUGGESTED DURING SITE VISITS

Potential Project	Purpose
1. Upgrades to PIPES	Meet expressed needs of POTW pretreatment staff.
a. Put old EPA guidance manuals on the system.	Old guidance still useful but difficult to obtain for programs with high staff turnover.
b. Allow document viewing before downloading.	Avoids wasting time downloading documents erroneously.
c. Provide industry-specific, user-friendly information on P2 tailored for pretreatment staff.	Helps both POTWs and IUs; reduces the current duplication of effort.
c. (1) Prepare support materials to show the economic benefits of P2/Collect Performance data on equipment and technologies.	Give inspectors and programs packaged information to encourage small businesses to commit to P2; help them overcome resistance to new investment.
d. Expand access to PIPES/ upgrade to full World Wide Web capacity.	Increased dissemination of information to interested parties.
d. (1) Restart National Pretreatment Bulletin	Provides an off-line mechanism to keep pre-treatment staff up-to-date. Supplements or duplicates on-line information?
e. "Plain English" updates and summaries of regulations of concern.	Small programs have a difficult time tracking and understanding regulations relevant to their operations.
f. Compilation of SNC/NOVs for the nation.	Small newspaper adds attract little attention; compilation would give small programs in politically-difficult regions the leverage to obtain behavior change from SIUs.
g. PIPES regional calendar, to which states and regions could add activities.	Seminars/workshops of interest are often not publicized sufficiently for nearby POTWs to benefit.
h. Permit "helper" for holders of out-of-date NPDES permits.	POTWs with long-expired NPDES permits do not know what areas they will need to upgrade when their permit is finally rewritten; therefore, they have a difficult time making the proper incremental improvements to their programs.
2. Cost Accounting and Budgeting: Sending the Right Price Signals to Polluters	Both dischargers and the POTWs make decisions, in part, based on costs. If the cost information they use in these decisions is wrong, they may underinvest in pretreatment equipment, or in the pretreatment program overall.
a. Escondido cost accounting	Escondido had numerous cost accounting issues that affected pretreatment economics. It would provide a good case study to illustrate how "getting the prices right" would change pretreatment behavior.
b. Model budgeting system	Some programs provided pretreatment staff with no information on available resource. Others did not budget capital purchases properly. This project would illustrate how successful budgeting systems would help managers to better protect the environment.
3. Model Inter-Jurisdictional Agreement (IJA)	Many POTWs accept industrial discharge from IUs in surrounding areas, but have no direct enforcement or monitoring controls. This project would create a model IJA that, if implemented, would ensure pretreatment programs had adequate control over their dischargers.

4. Staff Training	Address a variety of the training needs communicated by pretreatment staff.
a. Training Videos: *(1) Program basics, including how a strong pretreatment program helps business* *(2) Sampling* *(3) Doing an inspection* *(4) Conducting a show-cause hearing* *(5) Classifying IUs* *(6) Computer systems* *(7) Industry-specific guidance and training videos.*	To bring targeted expertise to remote programs without travel budgets; to help IUs improve their pretreatment systems by giving them insights into what a pretreatment inspector is looking for during a site visit.
b. "Guidance" to the guidance: "ramp-up" course for a new pretreatment coordinator	To provide a simple "roadmap" for a new pretreatment coordinator abo what they are responsible for, where they can get a quick overview of each area of responsibility, and resources they can use for upgrading their knowledge base.
b. (1) Develop strategies to assist small pretreatment programs.	Targets many of the programs most in need of help. A number of possible strategies have already been listed, including the guidance to t guidance, other training initiatives, and increased regional meetings.
b. (2) New employee pretreatment orientation manual.	Similar to main guidance, but targeted to the employee rather than the program manager. (Unclear how different this would be from the main guidance).
c. Choosing a contract laboratory	To help pretreatment staff understand how to evaluate the contract labs on which much of their program effectiveness relies. This was identifi as an area of concern by a number of the programs we visited.
c. (1) Laboratory certification program	Develop national certification for laboratories to improve the quality a reliability of POTW and IU sampling data.
d. Initiate regional pretreatment meetings, supported (though not funded) by EPA regions	To provide additional training opportunities that many programs felt w lacking.
d. (1) Develop strategy to leverage state pretreatment organizations (e.g., VAMWA) to provide training and support.	Leverage non-EPA resources.
d. (2) Initiate exchange programs between POTWs	Would allow mentoring across POTWs, with managers from the small programs spending some time at the best ones.
e. Prepare new guidance materials: *(1) Sludge regulations.* *(2) Short, concise guide to proper sampling techniques.* *(3) Update local limits guidance.*	Address informational gaps people felt currently exist.
5. Information Systems Transfer	Programs are duplicating a great deal of effort to develop pretreatment information systems. This project would develop ways to reduce this duplication and facilitate exchange/sale of existing systems among POTWs.
a. Data sharing between related functions	Use GIS approach to demonstrate environmental and financial benefit of data sharing between WWTP, storm water manager, CSO manager, industrial waste manager, and collection systems manager.
b. Upgrade PCME software	Modify existing software (almost universally disliked by POTWs) to meet the needs of more POTWs and improve the compatibility with other systems.

c. Develop IU data management system	Would help IUs manage pretreatment and other data reporting needs and improve report quality.
d. Pilot and implement electronic reporting	Reduce paperwork and potentially reduce costs of reporting.
6. Inspection streamlining	IUs face inspections from numerous federal and state environmental inspectors; each visit requires them to take time away from operating their businesses. This project would test out how to combine and consolidate inspection visits in a particular geographic region.
7. Evaluating impact of new discharges on POTW	New materials are constantly entering the marketplace; residuals often then enter the POTW system. This project would develop an organized way of testing these materials to be sure they didn't inhibit POTW functioning.
8. Place-based regulation of water quality.	POTWs regulate only indirect dischargers, though direct dischargers can have a substantial impact on the quality of receiving waters into which the POTW discharges. This project would compare the quality of receiving waters between regions that have locally-based regulatory control over the entire water-body with those that don't (i.e., most POTWs).
9. Regulatory modifications	While not pilot projects, *per se*, there were a number of suggested areas for improvement from the programs we visited.
a. De minimis exemptions for categorical users.	Small CIUs take up substantial staff time even when they don't contribute very much loadings to the POTW. Exempting the small CIUs from regulation will free staff time for more important dischargers.
a. (1) Increased flexibility for permit modifications	With some safeguards, allow good programs to modify permits and local limits with approval.
a (2) Pilot and implement risk-based performance measures/environmental indicators	As with the projects listed above, this would allow POTWs greater discretion on resource utilization, to focus on high risk areas.
b. Standardize reporting for the many state and federal requirements.	Would reduce the redundancy of collected information, reducing the burden and costs on pretreatment program staff.
c. Certify IU pretreatment operators and/or pretreatment inspectors.	Would professionalize these personnel, reducing discharge violations due to poor staff training.
d. Change definition of SNC.	Some programs felt the current definition of SNC doesn't highlight the proper "bad actors."
e. Reduce or eliminate required testing for pollutants not in use at an IU.	Reduce testing costs/burden on IUs for materials they don't even use (but could, theoretically, use in their processes).
10. Other potential projects *a. Develop glossy PR package for the pretreatment program.*	Some programs felt that the pretreatment program didn't sell itself well to compete for funds and management attention. This package would help increase the program's visibility.