

Appendix B

Human Health Expert and Stakeholder Meeting Summaries

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Summary of the August 14 – 15, 2002, Experts Workshop on Public Health Impacts of Sewer Overflows

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Abstract

In embarking upon the task of assessing the human health impact portion of Congress' request for a report on the impacts and control of sewer overflows in the United States, initial research revealed that relatively little data were available that linked waterborne illness or other exposures to combined sewer overflows (CSOs) and sanitary sewer overflows (SSOs). In response to these challenges, EPA held a Public Health Impacts Experts Workshop on August 14 and 15, 2002. A group of nine external and EPA experts in public health, epidemiology, and wastewater treatment attended the workshop. Observers included representatives of stakeholder groups and EPA personnel. This workshop did not constitute an advisory committee under the Federal Advisory Committees Act (FACA), but rather solicited individual opinions and provided a forum for information exchange related to this Report to Congress.

Background

In the Consolidated Appropriations Act for fiscal year 2001, also known as the “Wet Weather Water Quality Act of 2000” or “2000 Amendments to the Clean Water Act” (CWA), Congress made several changes to the CWA regarding combined sewer overflows (CSOs) (P.L. 106-554). Among these changes was a requirement for the U.S. Environmental Protection Agency (EPA) to provide two Reports to Congress. The first report, *Implementation and Enforcement of the Combined Sewer Overflow Control Policy* (EPA 833-R-01-003), was delivered on January 29, 2002. The second report, which is due to Congress on December 15, 2003, is to investigate:

- The extent of the human health and environmental impacts caused by municipal CSOs and sanitary sewer overflows (SSOs), including the location of discharges causing such impacts, the volume of pollutants discharged, and the constituents discharged;
- The resources spent by municipalities to address these impacts; and
- An evaluation of the technologies used by municipalities to address these impacts.

Rationale for the Public Health Experts Workshop

In embarking upon the task of assessing the human health impact portion of Congress' request, initial research revealed that relatively little data were available that linked waterborne illness or other exposures to CSOs and SSOs. Factors complicating collection of information and data in this arena include public perception of reporting overflows in recreational areas; difficulty in contributing CSO/SSO loadings of pathogens in our nation's waters from other background sources; multiple possible pathways for fecal-related illness; underreporting of certain types of waterborne illnesses; and a lack of comprehensive local or national tracking for such illnesses.

In response to these challenges, EPA held a Public Health Impacts Experts Workshop on August 14 and 15, 2002. The purpose of this workshop was to enlist technical and subject matter experts from federal agencies, local health departments, and academia to ensure that EPA frames the study questions correctly, benefits from all pertinent data, and develops a methodology that bears out actual experiences. A group of recognized experts in the field of public health and interested observers met with the goals and objectives of:

- Fully elucidating the issues and the magnitude of those issues associated with health impacts of CSOs and SSOs;
- Reviewing and supplementing data and information sources identified to date; and
- Critiquing the proposed methodology for gathering and analyzing the public health information and data for the 2003 report.

The experts were asked to give individual opinions relating to the study questions. No consensus opinions or policy recommendations were solicited.

This Public Health Experts workshop is part of a larger public involvement process for the 2001 and 2003 CSO/SSO Reports to Congress. It occurs between two broader stakeholders' meetings (June 2001 and summer 2003, anticipated), at which a broad range of stakeholders discuss and provide input on draft report findings and recommendations, experiences in CSO control, and future policy and program directions. For a more detailed discussion of the overall stakeholder approach, please refer to Appendix D of this summary.

B.2 Stakeholder Meeting Summary, Washington, D.C.

2003 Report to Congress on the Impacts and Control of Combined Sewer Overflows and Sanitary Sewer Overflows

Stakeholder Meeting Summary Washington, D.C.

On June 23 and 24, 2003, the U.S. Environmental Protection Agency held a meeting in Washington, D.C., to discuss the upcoming Report to Congress on the impacts and control of CSOs and SSOs. The meeting held at the Renaissance Hotel, 999 9th St. NW, provided an opportunity for EPA to present the results of the data collection, request verification of information and data sources, and solicit feedback on preliminary findings and interpretation.

The main goals of the meeting were to:

- Discuss the data, report methodology, and analysis of the 2003 Report to Congress;
- Discuss implications of the major analyses in the report; and
- Discuss participants' experiences in controlling impacts from CSOs and SSOs.

The summary below describes the presentations given to outline the contents of the report and recounts the resulting discussions. The summary is organized into the following major sections, which correspond to the meeting agenda:

- Opening Remarks
- Background on the Report
- Characterization of CSOs and SSOs
- Environmental Impacts of CSOs and SSOs
- Closing Remarks, Day One
- Recap of Day One and Agenda Review for Day Two
- Welcome and Opening Remarks, Day Two
- Human Health Impacts of CSOs and SSOs
- Technologies for CSO and SSO Control
- Resources Spent Addressing CSOs and SSOs
- Common Themes Heard During the Meeting
- Closing Remarks, Day Two

Opening Remarks

James A. Hanlon – Director, Office of Wastewater Management, EPA

Mr. Hanlon opened the meeting by welcoming the participants to Washington, D.C., and providing an overview of the 2000 Wet Weather Water Quality Act, the 2001 CSO Report to Congress, and its associated stakeholder meeting. Mr. Hanlon reminded the participants that this Report was not intended to set policy, instead it was intended to present data and cite additional data sources that Congress could look to when entering into policy discussions. He mentioned that responding to the charge from Congress had proven difficult, specifically in identifying loadings and in correlating discharges with environmental and human health impacts.

Background on the 2003 Report to Congress

Kevin DeBell – Office of Wastewater Management, EPA

Mr. DeBell presented the background to the 2003 Report to Congress. He started by mentioning the near-term EPA policies that directly led to the request for the 2003 Report to Congress. First, he described the 1994 National CSO Control Policy which formalized EPA's management expectations for CSS communities. Next, a summary of the 2001 *Report to Congress – Implementation and Enforcement of the Combined Sewer Overflow Control Policy* was presented. This report acted as a program evaluation in which success of CSO Control Policy implementation was assessed; one useful product of the 2001 Report is the CSO database, which includes information on all CSO permits. Mr. DeBell then mentioned the draft SSO Notice of Proposed Rulemaking, and the 2000 Wet Weather Water Quality Act, which required the 2003 Report. The statutory requirements for the 2003 Report are stated below:

The Administrator of the Environmental Protection Agency shall transmit to Congress a report summarizing:

- a. *the extent of human health and environmental impacts caused by municipal combined sewer overflows and sanitary sewer overflows, including the location of discharges causing such impacts, the volume of pollutants discharged, and the constituents discharged;*
- b. *resources spent by municipalities to address these impacts; and*
- c. *an evaluation of the technologies used by municipalities to address these impacts.*

Mr. DeBell next explained that EPA is not required to have a public review of Reports to Congress, but that this particular program has a legacy of stakeholder collaboration, which EPA values.

Finally, Mr. DeBell presented the report outline. The report is organized as follows:

- Introduction
- Background
- Methodology
- Characteristics of CSOs and SSOs
- Environmental Impacts of CSOs and SSOs
- Human Health Impacts of CSOs and SSOs
- Federal and State Actions to Control CSOs and SSOs
- Technologies Used to Reduce the Impacts of CSOs and SSOs
- Findings and Recommendations

Stakeholder Questions and Comments on the Background Presentation

Questions and comments received after the background presentation are summarized below. The comments represent stakeholder opinion(s) and may not reflect EPA's position.

- Are data collected during the Report to Congress effort also being used to inform the SSO economic analysis?
- Is EPA still attempting to make an economic model to justify the SSO Rule, despite the fact that the public health experts (during the August 2002 Experts Workshop) said that an economic model was not feasible?
- In relation to municipalities' actions on CSOs and SSOs, will the Report to Congress help municipalities prioritize resources spent on CSO/SSO versus other wet weather events?
- Regarding the Pretreatment Rule streamlining, enforcement of this rule may reduce the human health risks associated with CSOs and SSOs fed by industrial wastewater flows during wet weather. Has EPA consulted with municipalities regarding enforcement of this rule?
- Will the SSO/CSO data (compiled for both Reports to Congress) be publicly available? When?
- Some stakeholders were worried about the lack of representation at the stakeholder meeting from certain stakeholder groups (i.e., NOAA and public health officials) and urged EPA to try to increase representation from each group.

- A stakeholder pointed out that many enforcement actions and consent decrees are currently in place (for CSO and SSO violations), and wanted to ensure that these actions were represented in the report.

Characterization of CSOs and SSOs

Kevin DeBell – Office of Wastewater Management, EPA

Mr. DeBell presented data on the location of CSO and SSO discharges, the volume of pollutants discharged, the constituents discharged, and the frequency of discharge events.

This presentation defined a CSO as a mixture of untreated sewage and storm water discharged from a combined sewer system at a point prior to the headworks of the POTW. Generally, CSOs occur during wet weather when the CSS becomes overloaded. SSO is defined as a discharge of untreated or partially treated wastewater from a sanitary sewer system at any point prior to the headworks of a POTW. Backups of wastewater to private property are not included in the definition of SSO used for this Report to Congress.

Data Sources for the Characterization Chapter

EPA used the following data sources to characterize CSOs and SSOs.

- State databases for tracking CSO and SSO events;
- NPDES permit files;
- Approximately 80 interviews with state and municipal officials;
- LTCPs and other capital improvement documentation;
- Literature review; and
- Existing EPA documentation, including technical reports and products of cooperative agreements.

Key Research Questions for the Characterization Chapter

This presentation introduced three key research questions for the characterization chapter:

- How many NPDES permits exist for combined sewer systems and sanitary sewer systems?
- What are the common pollutants found in CSOs and SSOs?
- What are the volume, frequency, and location of CSOs and SSOs?

Stakeholder Questions and Comments for the Characterization Chapter

Questions and comments received after the characterization presentation are summarized below. The comments represent stakeholder opinion(s) and may not reflect EPA's position.

- With respect to the pollutants and pathogens found in CSOs and SSOs, specifically concentrations, stakeholders questioned the accuracy of the data presented in the meeting and asked that it be verified. Stakeholders identified possible data sources, including the Nationwide Urban Runoff Program and Hydraulic Characteristic Reports (needed for NPDES permits).
- The concentrations of constituents within CSOs, SSOs, and storm water vary widely, depending on many factors, such as the amount of precipitation or sources contributing to the wastewater. Therefore, it is very difficult to present general characteristics. Stakeholders questioned whether CSOs and SSOs should be characterized in this fashion. Some suggested concentrating on specific and acute impacts.
- Stakeholders suggested that EPA take a look at “hot spots” or incidents of the most dangerous, concentrated CSOs and SSOs.
- Stakeholders suggested that EPA express to Congress what can be supported by available data– local, acute impacts can be terrible, while the national impact looks relatively small; both are very difficult to track or assess.

- Stakeholders said the information presented in this section needed to be placed in the context of the environmental and human health impacts.
- Do not present data in aggregate format. For example, separate wet weather and dry weather SSO data.
- Characteristics of the receiving water need to be addressed.
- More specificity is needed. Add community data where available, including volume, cause, and receiving water information. A stakeholder thought that this would help Congress better understand why national data are and are not representative.
- Stakeholders asked for clarification of the charge from Congress. Was the directive to look at municipalities only or also at decentralized wastewater treatment systems?
- Stakeholders were concerned that describing the volume of current CSO discharges as “a large amount” would give Congress the impression that municipalities were not doing anything to correct the CSO problem.
- Were small communities contacted and interviewed in this methodology?
- A clarifying question was asked regarding the statistic on the amount of SSOs that reach waterbodies and how researchers were estimating the impact on sensitive areas.
- Concerns were raised about how information presented in this report was going to inform Congress’s decisions regarding wet weather policy as a whole.

Environmental Impacts of CSOs and SSOs

Julia Moore – Limno-Tech, Inc.

Ms. Moore began by defining “environmental impacts” as water quality, aquatic life, and aesthetic impacts that affect designated uses. Violations of water quality standards were used as an indicator for environmental impacts. While researching this chapter, EPA used previously completed national, state, and local assessments. Literature and web searches were performed and interviews with state and municipal officials were carried out.

EPA sought to characterize types of environmental impacts from CSOs and SSOs. First, EPA presented ranges in concentrations of the constituents typically found in CSOs and SSOs. EPA presented the results of assessments of environmental impacts caused by CSOs and SSOs. EPA acknowledged that while beach closures and shellfish bed closures have been traced to CSOs and SSOs, the data are not complete.

EPA described planned national assessments in which CSO outfall locations will be integrated with EPA’s WATERS database. This will allow CSO locations to be associated with information such as 303(d) impaired reaches and drinking water intakes.

Conclusions for the Environmental Impacts Chapter

EPA presented preliminary conclusions regarding the environmental impacts from CSOs and SSOs. These included:

- CSOs and SSOs contain pollutants that cause impairments to designated uses, as reported in national assessments.
- CSOs and SSOs can be a principal cause or a contributing cause of an environmental impact.
- National data are inconsistent in tracking CSOs and SSOs as a direct cause of impairment.
- While data are not comprehensive, some national estimates of use impairment have been made.
- State and local examples of cause and effect exist where CSO and SSO reporting and tracking are undertaken.

EPA asked the stakeholders present at the meeting for additional information on documented environmental impacts from CSOs and SSOs.

Stakeholder Questions and Comments on the Environmental Impacts Chapter

Questions and comments received after the environmental impacts presentation are summarized below. The comments represent stakeholder opinion(s) and may not reflect EPA's position.

- Need to put a greater emphasis on water quality impacts.
- Need to do a better job of conveying that the data are all anecdotal.
- Researchers have only presented suspicion of impacts.
- Regarding the concentrations of metals in CSOs, some stakeholders commented that most metal contamination comes from storm water and that CSO controls would not make a difference.
- In the presentation, it was stated that dry weather SSOs were responsible for 7 percent of the total volume discharged annually. Stakeholders were interested in the characteristics of the other 93 percent of the SSO events contributing to the volume to determine if dry weather overflows are a problem.
- Some stakeholders expressed the opinion that in urban watersheds, current water quality standards are impossible to meet during wet weather and that even without CSO or SSO discharges, waterbodies would exceed water quality standards.
- Stakeholders questioned the source of pathogen data. They stated that municipalities would argue strongly against the source allocation and mentioned the new Santa Ana Regional Water Quality Control Board beach closure study in California, which attributed most beach closures to urban runoff. The stakeholders also mentioned the Four Mile Run TMDL study, in Virginia, in order to clarify pathogen source information. As a follow up to this comment, it was mentioned that stormwater may be impacted by cross-connections or SSOs.
- Stakeholders reiterated the need to characterize both dry and wet weather SSOs and CSOs, specifically stating that the sources of pathogens vary widely depending on whether the event takes place during dry weather or wet weather.
- A stakeholder commenting on the North Carolina example stated that none of the overflows highlighted in the presentation appeared to be attributed to wet weather.
- Stakeholders questioned the concentration of metals being contributed to receiving waters via CSOs.
- Regarding shellfish advisories, stakeholders commented that over 90 percent of these were due to stormwater, not CSOs.
- Stakeholders challenged the research team to find fish kills that occurred during wet weather as a result of CSOs or SSOs. They doubted this had happened.
- Regarding the Ohio River study, stakeholders commented that urban runoff contributes more pollutants and pathogens than the CSOs, so removal of CSOs will not show different results.
- Stakeholders stated that many pathogen source studies performed to date showed that primary sources of pathogens were not of human origin (specifically mentioned studies in Chicago, Detroit, and Milwaukee). Other stakeholders disagreed, citing Lake Michigan studies.
- Stakeholders pointed out that constituents in CSOs and SSOs can vary. One stakeholder was particularly concerned about hospital sewage and radionuclide contamination.
- One stakeholder mentioned that it is still very difficult to attribute pathogens to their source. The stakeholder said that source tracking is still in the research stage and suggested that the technology be used to monitor CSOs and SSOs. The stakeholder did not agree that current data “show no human impact” and mentioned that some studies have shown higher human viral concentrations at overflow sites.
- From a local perspective, stakeholders mentioned that there are other wet weather sources about which Congress needs to know in order to prioritize funding. Stakeholders wanted to know if this report would help Congress do that.
- Stakeholders wanted to know what studies were chosen and why.
- Can we make gross estimates about how often CSOs or SSOs will push waterbodies into non-attainment?
- Regarding the amount of Great Lakes shoreline reported impaired, does EPA know the amount of shoreline assessed?

- Regulations currently focus on the most easily regulated communities. There is much disagreement over how much implementing control regulations will cost. Will the Report to Congress help remedy this?

Closing Remarks, Day One

Benita Best-Wong – Office of Wastewater Management, EPA

Ms. Best-Wong stated that stakeholder comments would inform the report. She also reminded the audience that the report was not intended to cover all wet weather events and policy, and therefore, some of the stakeholder questions were beyond the scope of this report. Ms. Best-Wong then touched on the Office of Water's watershed management approach, which focuses on many of the other issues raised during the first day.

Recap of Day One & Agenda Review for Day Two

Linda Manning – Facilitator, SRA International

Ms. Manning described some of the main themes from the previous day, which centered around the accuracy of data. The themes included:

- Do not oversell the data or paint with too broad a brush;
- Get a local flavor; it is important to present local impacts;
- Fully explain the limitations in the data and be clear about the data gaps;
- Do not have interpretational bias;
- Be clear about the data gaps and provide the clear message that more data are needed;
- Make sure the report is useful by providing context and placing the issues in relation to other wet weather events;
- Acknowledge variability in the data; and
- Address big picture policy questions.

Welcome and Opening Remarks, Day Two

Ben Grumbles – Deputy Assistant Administrator for Water, EPA

Mr. Grumbles talked about the importance of the report as well as the importance of the stakeholder involvement process. He mentioned the challenges confronting the Office of Water in the 21st century and the resulting shift of EPA's focus from point source controls to a more holistic watershed approach. Mr. Grumbles touched on the history of the Wet Weather Water Quality Act and Congress's intention for the Report. He stressed the need for increased monitoring and data gathering to make more informed policy decisions. Mr. Grumbles addressed the following comments and questions from the stakeholders.

Question/Comment: Progress needs to be made regarding EPA's policy on the blending of treated and partially untreated wastewater at POTWs during wet weather.

Response: EPA is very much engaged in the blending issue and asked the stakeholders to provide any information they have on the use of blending to manage wet weather flows.

Question/Comment: Too much government regulation and intervention runs the risk of dictating technology, which, in turn, may stymie development of innovative alternatives.

Response: The current EPA leadership is very sensitive to the danger of dictating too much and understands that EPA needs to be open-minded when considering technologies in order to achieve water quality standards. But, wet weather issues also need to be addressed. We will do our best to be cost effective and environmentally responsible.

Question/Comment: We currently have decades of data from California, yet will never have enough data.

Please do not continue to say that we lack enough data. Instead, take our collective knowledge and make conclusions carefully. Do not skew the data one way or the other.

Question/Comment: At the Expert Workshop, public health officials said that it was not feasible to make an economic argument for preventing SSOs. What is happening with the EA?

Response: EPA is looking to the report to inform policy decisions.

Human Health Impacts of CSOs and SSOs

Greg Frey – SRA International

Mr. Frey began by introducing the key questions addressed in this chapter:

- What constituents of CSOs and SSOs cause human health impacts?
- Of what consequence are these impacts?
- Which exposure pathways are the most significant and what populations are most sensitive?
- What are the impediments to understanding the linkages between CSOs and SSOs, exposures, and the human health impacts?
- What is the institutional framework to assess and address potential human health impacts of CSOs and SSOs?

Mr. Frey explained that EPA first performed an extensive literature review. Then, EPA held an experts workshop in order to verify the accuracy of data already collected, find new sources, and ascertain an understanding of experts' opinions of the human health impacts of CSOs and SSOs. EPA next performed a series of state and community interviews for the purpose of understanding local and state health agency staff's opinions of the impacts of CSOs and SSOs and to characterize the current activities being carried out that address this potential threat.

Mr. Frey went on to present the range of human health symptoms resulting from exposure to the pollutants typically found in CSOs and SSOs. Next, Mr. Frey discussed exposure pathways and the groups facing the most frequent exposure, as well as the groups most sensitive to waterborne illnesses.

Mr. Frey described the limitations of the major data sources used to identify and describe waterborne disease outbreaks, one potential indicator of human health impacts from CSOs and SSOs. He next presented local, site specific examples of outbreaks attributed to exposure to sewage in order to illustrate the potential for acute health impacts.

Next, EPA outlined the challenges to identifying the human health impacts of CSOs and SSOs. These include:

- The lack of connectivity in the monitoring and reporting systems for CSO and SSO events, human exposures, and human health impacts.
- The difficulty identifying the source of pathogens.
- The difficulty in attributing disease outbreaks to specific CSO and SSO events.
- The fact that outbreak reporting to CDC is voluntary.
- The understanding that many people who become ill do not seek medical treatment due to the nature of such illnesses.
- There are inconsistent probabilities of diagnoses within the health care system.
- The general tendency towards underreporting.

Conclusions for the Human Health Impacts Chapter

Finally, Mr. Frey identified the actions that are currently being taken by state and local governments to address the human health impacts from CSOs and SSOs and EPA's preliminary conclusions. These include:

- The pathogens and pollutants found in CSOs and SSOs have the potential to cause human health impacts.
- Exposures to the pathogens and pollutants resulting from CSOs and SSOs occur, but are difficult to quantify.
- Human health impacts from waterborne diseases are underreported.
- Responsibilities for protecting human health from waterborne illnesses are distributed among many agencies and institutions.

Stakeholder questions and comments on the Human Health Impacts Chapter

Questions and comments received after the human health presentation are summarized below. The comments represent stakeholder opinion(s) and may not reflect EPA's position.

- Regarding the Austin example, there are no CSOs in Austin, and since there is no source attribution, the slide on the predictive closings at Barton Springs makes the observer think that all the pathogens are due to CSOs or SSOs. Be careful which examples you use.
- Does EPA have data on bacterial concentrations in different effluents? If so, add it.
- In the slide that attempts to put the outbreaks of E. coli into perspective, shellfish pathways would be listed under foodborne, but actually may be exacerbated by an SSO or CSO issue.
- Why did EPA not include shellfish advisories for the Great Lakes?
- Remember to add specific information whenever possible.
- Some stakeholders questioned whether the Brushy Creek, Texas, incident was related to an SSO. Because it was caused by a power failure, they did not think it was a good example.
- Stakeholders debated how much disease and antibody production could be attributed to SSOs or CSOs (i.e., how many cases are from human sources).
- Was the Milwaukee outbreak due to a CSO? If so, please clarify.
- There is a Great Lakes Watershed pathogen source study underway, but it will not be completed in time to inform the Report to Congress.
- Stakeholders questioned the proportion of illness attributable to CSOs or SSOs and thought the presentation was misleading.
- Rather than stating that quantification of exposure is difficult, EPA should say why it is difficult. EPA has data about what is "coming out of the pipe" but needs to better understand receiving water characteristics.
- Regarding the responsibilities slide, there has been a 25-year lag between legislation and the production of a comprehensive communication system. Will EPA state who should take responsibility for this?
- Are the pathogen measurements from the sediment or do they just represent the water column concentrations?
- Why did EPA not include aerosols as a pathway?
- Some stakeholders said that there is no way to attribute a portion of mercury loadings to CSOs and SSOs.
- Has EPA found characteristics from the different agencies that lead to communication difficulties?
- How do our pathogen concentrations compare to concentrations internationally? Should we be concerned with migration if pathogen concentration and type is partially dependent on demographics?
- Make sure that EPA's findings are not biased. Everything presented in the report should be definitely attributed to CSOs and SSOs.
- How did EPA come up with those populations who are most frequently exposed to pathogens from CSOs and SSOs? It looks like the majority of illnesses are from drinking water.
- What about the risks to people who are exposed to mold after basement backups?
- Clarify difference between storm water and sewer overflows.
- There is potential to contract the SARS virus from CSOs that are contaminated with hospital waste.
- Include all state and community interviews in the Report to Congress, giving specific examples.
- There have been thousands of beach water samples that show CSOs are not a problem. Attainment issues are wet weather problems.

- Beach closures are based on a 24-hour time lag from the time the sample is collected. There have been 150-200 closures in Indiana and yet no one has reported sicknesses (despite this time lag); therefore, the indicators are wrong.
- Need to remove the fish advisories from PCBs and mercury since these constituents are not in CSOs and SSOs.
- Make a distinction between events occurring during dry weather and wet weather.
- Maybe drinking water monitoring and treatment should be improved, rather than spending on CSO and SSO controls.
- How would proper enforcement of the long-term surface drinking water rule address Cryptosporidium issues, especially since so much is attributable to animals?
- Two percent of beach closures are due to CSOs. This may mislead people, since CSOs are concentrated geographically and therefore the local impacts may be much more significant.
- The report should comment on the relative risks of human versus non-human bacteria.

Technologies for CSO and SSO Control

Kevin DeBell – Office of Wastewater Management, EPA

Mr. DeBell described the key data sources for the technology chapter. These included:

- Extensive literature reviews of existing EPA documentation as well as other sources;
- Interviews with municipal officials;
- Meetings with key EPA staff; and
- Informal peer review by internal and external experts.

Key Questions for the Technologies Chapter

Mr. DeBell introduced the key questions that were addressed:

- What technologies have been used by municipalities to control CSOs and SSOs?
- What factors influence the effectiveness of these technologies?
- Have there been any recent technological innovations in the control of CSOs and SSOs?

While researching this chapter, EPA identified common and promising technologies used by municipalities to address CSOs and SSOs. From this research, EPA developed technology descriptions summarizing available technologies and factors influencing their effectiveness. Mr. DeBell explained that it is very difficult to compare certain types of technologies, as they are designed to deal with different aspects of wet weather challenges. Therefore, the technologies were not ranked for effectiveness against each other within this chapter.

Presentation of Technologies

Mr. DeBell said that a wide range of technologies are available and that, within the report, they had been grouped into five key categories:

- Operations and maintenance activities;
- Collection system controls;
- Storage facilities;
- Treatment technologies; and
- Low impact development techniques.

Mr. DeBell mentioned that EPA developed case studies on each of the researched technologies, and presented preliminary findings pertaining to the relative cost of implementing the systems, the type of system for which the technology was designed, and the pollutants or problems controlled by the technology.

Stakeholder Questions and Comments on the Technologies Chapter

Questions and comments received after the technologies presentation are summarized below. The comments represent stakeholder opinion(s) and may not reflect EPA's position.

- This information is not useful from a policy perspective, as it does not evaluate the technologies. At least “tell the story” on a community basis. Things that should be included in these evaluations include volume, flow, constituents, what the community did to address the problem, results, etc.
- Available technologies are dependent on what EPA allows communities to use, so defining the technology type takes decisions out of municipalities' hands.
- How will the technology clearinghouse be managed?
- What about technologies used for satellite facilities?
- What about blending technologies?
- Most of the technologies were better suited to combined sewer systems. Stakeholders were concerned that SSO control was not looked at extensively enough.
- Some pollution prevention activities should be the responsibility of the individual and not the municipality, but municipalities still have to enforce the regulations and the ultimate responsibility is theirs.
- EPA needs to get more specific. This report needs a discussion of the effectiveness of technologies.
- EPA needs to add data on collateral damage from implementing technologies, for example, in- or off-line storage can lead to contamination of groundwater.

Resources Spent on CSO and SSO Control

Kevin DeBell – Office of Wastewater Management, EPA

Mr. DeBell outlined the methodological approach to this chapter which included:

- Data analysis which tabulated information of past investments in clean water infrastructure and compiled information on what has been spent on CSO and SSO control.
- EPA's estimate of the investment needed to meet the current requirements for CSO and SSO controls.
- EPA's acknowledgement of the fact that costs of CSO and SSO control are borne almost exclusively by local governments and utilities but local governments and utilities have not been requested to report the costs incurred for CSO and SSO control.

Stakeholder Questions and Comments on the Resources Chapter

Questions and comments received after the resources presentation are summarized below. The comments represent stakeholder opinion(s) and may not reflect EPA's position.

- EPA cited funding of \$9.1 billion in 1980 (in the presentation) – the stakeholder believed that Congress never appropriated more than \$2.4 billion through construction grants.
- All State Revolving Funds money has to be paid back, so these really are local expenditures, not federal.
- At least one community had money earmarked from the federal government. EPA needs to distinguish between local and federal expenditures.
- EPA should do an analysis of per capita costs.
- Stakeholders questioned the term “significant” with respect to past grant funding.
- Emphasize the need for grants to move things forward, especially for communities with small populations. Expanding grant money to small communities can result in huge benefits to water quality.
- The “knee of the curve” diagram is right on target. EPA needs to understand that it is not cost effective to eliminate all overflows. EPA should understand how the level of CSO control compares

to water quality – four overflows per year would be cost effective and we would have improved water quality (provided that we capture the first flush). See Akron Regional Sewer District for more “knee of the curve” information.

- Make sure to reflect what caused the environmental benefits. Is it CSO and SSO prevention or controls for other wet weather events?
- There are many agencies and organizations that have done financial analyses, including the Army Corps of Engineers
- The reference to EPA’s Gap Analysis is good. Stakeholders suggested that EPA include a summary of the Gap Analysis in this report.
- EPA should reference growing interest in a clean and safe water trust fund.
- Qualify the reference to 106 grants and how they contribute to CSO or SSO control.
- Community cost estimates are larger than in the Gap Analysis. Will both be reflected in the report?
- Distinguish between points of fact and policy suggestions.
- In the presentation, the Gap Analysis information was presented two different ways, make sure that this information is presented in such a way that it can be compared. Use a common denominator.
- All of the analysis is based on anecdotal evidence; there are no real data.
- Put numbers in the context of per capita flow and the time frame of the project.
- Estimates will be different if blending is allowed. EPA should indicate the difference in cost if blending is allowed.
- A goal of the CSO Control Policy was to move forward with realistic plans and make sure that they are economically sound.

Common Themes Heard During the Meeting

The following comments are paraphrases and summaries of actual stakeholder comments that emerged at many points throughout the meeting. They reflect recurring themes. Because the statements came from different stakeholders at the meeting, there are conflicts and disagreements among them. Additionally, all of the comments listed below are stakeholder opinion(s) and may not reflect EPA’s position.

Specific Policy and Program-Related Questions and Comments

- The report should help municipalities prioritize resources spent on CSOs and SSOs versus other wet weather events.
- The report should help Congress make more informed decisions about wet weather issues and other water quality issues as a whole, not just look at CSOs and SSOs in a vacuum.
- The report should help Congress prioritize funding for wet weather issues.
- The report states that there is a significant lag (25 years) between the development of water quality laws and the comprehensive communication system regarding detecting, reporting and tracking waterborne diseases related to water quality issues.
- Are data collected during the Report to Congress effort also being used to inform the SSO economic analysis?
- Enforcement of the Pretreatment Rule may reduce the human health risks associated with CSOs and SSOs, which include an industrial wastewater component. This was brought up with regard to hospital waste.
- Does EPA have an understanding of the total costs of all of the regulations that are coming?
- Are all wet weather events extreme events? What are acceptable levels of discharge?

Across the presentations, there were questions related to the completeness, accuracy, and representation of the information and data. While some of the comments are a product of the limited amount of information that can be conveyed in presentation format during a two-day meeting, they are all included here. All of the comments listed below are stakeholder opinion(s) and may not reflect EPA’s position.

- Make sure that the data EPA uses are as current, correct, and complete as possible. When a clear source of information is not apparent, feel free to provide Congress with conflicting data, but explain them.

- Make sure that data are unbiased in selection and presentation. On one hand, make sure that EPA does not lead the reader to draw unsupported conclusions of the negative impacts of CSOs and SSOs – avoid guilt by association. On the other hand, do not limit inclusion of information and data to national-scale, complete data sets. Local information and experience is valuable.
- Draw conclusions that are appropriate for the scale of the available data.
- Whenever possible, provide ranges in your data and interpretations in order to adequately describe the variability. All data should be transparent and the reader should be able to understand how EPA is using the data.
- Provide context to your information. For example, if the report states that something is 5 percent of something else, make sure that the overall universe is clear.
- Describe data in a manner that is useful to Congress, municipalities, and other stakeholders.
- Because the data are so variable and include so much anecdotal evidence, it is important to present it in a useful way. While there may not be enough information to completely inform policy decisions, there are conclusions that EPA should draw to help Congress, municipalities, and other stakeholders understand the data presented. One of the biggest findings of this report may be that we have a serious lack of data and an incomplete picture.

**Report To Congress
Stakeholder Meeting Attendee List**

Washington D.C.

June 24-25, 2003

Name, Office/Organization

Angela Akridge, Louisville & Jefferson County Metropolitan Sewer District
David Baron, Earthjustice
Benita Best-Wong, USEPA
Steve Bieber, Metropolitan Washington Council of Governments
Joe Boles, New Iberia (Louisiana) Municipal Government
Karl Boone, ADS Corporation
Linda Boornazian, USEPA
Walter Brodtman, USEPA
Jason Brooks, Knoxville Utilities Board
Ted Brown, Center for Watershed Protection of Ellicott City MD
Thomas Brueckner, Narragansett Bay Commission
Deb Caraco, Center for Watershed Protection of Ellicott City MD
Sharie Centilla, USEPA
Shellie Chard McClary, Oklahoma Department of Environmental Quality
John Chorlog, Miami-Dade County Water and Sewer Department
Victoria Cluck, Indianapolis Department of Public Works
Gary Cohen, Hall & Associates
Hubert Colas, BPR CSO
Anna Collery, Engineering Field Activities (EFA) Chesapeake
Lamont "Bud" Curtis, The TAF Group
Kimberly V. Davis, Hazen and Sawyer
Kevin DeBell, USEPA
Mike Domenica, Black & Veatch
Gary A. DuVal, City of Richmond Public Utilities
Janet Faulk, New Iberia (Louisiana) Municipal Government
Erin Flanagan, Rockefeller Family Fund
Ruth Fontenot, New Iberia (Louisiana) Municipal Government
Peter Fortin, City of Norfolk, VA
Tom Franza, San Francisco Public Utilities Commission
Greg Frey, SRA
Wil Garland, ADS Corporation
Heather Gewandter, SRA
Paul Greenfield, University of Queensland
Frank Greenland, Northeast Ohio Regional Sewer District
Ben Grumbles, USEPA
Ahmad Habibian, Ph.D., P.E., Black & Veatch Corporation
Art Hamid, MWH Americas, Inc.
Jim Hanlon, USEPA
Eric M. Harold, P.E., Buchanan Street Consulting
Marvin Hayes, Parsons
Jim Heist, CDS Technologies Inc.
Roy A. Herwig, Brown and Caldwell
John Hills, Irvine Ranch Water District
Bud Hixson, Friends of Beargrass Creek
Lisa E. Hollander, Northeast Ohio Regional Sewer District
Chris Hornback, AMSA
Carol Hufnagel, Tetra Tech
J. Leonard Ignatowski, P.E., EFA Chesapeake

Rick Karasiewicz, PBS&J
Rachel Katonak, Michigan State University
Ifty Khan, Wastewater Collection Division, DPWES
Don Killinger, Cuyahoga County Board of Health
Carol Kocheisen, National League of Cities
Fred Krieger
Jane Lavelle
Norman E. LeBlanc, Hampton Roads Sanitation District
Stewart T. Leeth, McGuireWoods LLP
Carol Leftwich, Environmental Council of the States
Roger Lemasters, Tennessee Department of Environment and Conservation
Federico Maisch, Greeley and Hansen LLC
Linda Manning, SRA
George L. Martin, Greenwood Metropolitan District
Bob Matthews, CDM, Inc
Michael J. McCabe, Milwaukee Metropolitan Sewerage District
Nate McConoughey, Cuyahoga County Board of Health
Jane McLamarrah, MWH
Heather McTavish, American Public Works Association
James B. Meyer, Meyer & Wyatt, P.C.
Sarah Meyland, Citizens Campaign for the Environment
Peter Moffa, Brown and Caldwell
Julia Moore, Limno-Tech, Inc.
John Murphy, P.E., City of Bangor
Gary Nault, United States Air Force
Sharon Nicklas
Paul Novak, U.S. Environmental Protection Agency, Ohio
Jan Oliver, Allegheny County Sanitary Authority (ALCOSAN)
Laurel O'Sullivan, Lake Michigan Federation
Betsy Otto, American Rivers
Karen L. Pallansch, Alexandria Sanitation Authority
Stacy Passero, P.E., Water Environment Federation
Tom Ripp, USEPA
J. Alan Roberson, P.E., American Water Works Association
Dr. Joan Rose, Michigan State University
Nelson Ross, Tennessee Izaak Walton League
Lesley Schaaff, U.S. Environmental Protection Agency
Nancy Schultz, CH2M
Eric Seaman, Department of Natural Resources
Michael J. Sharp, Sonny Callahan and Associates, LLC
Mohsin R. Siddique, DC Water and Sewer Authority
Nancy Stoner, Natural Resources Defense Council
Mike Sullivan, Limno-Tech, Inc.
Chris Swann, Center for Watershed Protection of Ellicott City MD
Rod Thornhill, White Rock Consultants
Peter Trick, SRA
Betsy Valente, Limno-Tech, Inc.
Tara Van Atta, SRA
Lynn Vendinello, EPA, Evaluation Support Division
Mark G. Wade, P.E., Wade & Associates, Inc.
Robert C. Weaver, Kelly & Weaver, P.C.
Neil Weinstein, The Low Impact Development Center, Inc.
Nancy Wheatley, Water Resources Strategies

Clyde Wilber, Greeley and Hansen LLC
Gus Willis, CDS Technologies Inc.
George Zukovs, XCG Consultants Ltd.

B.3. Stakeholder Meeting Summary, Huntington Beach, CA

2003 Report to Congress on the Impacts and Control of Combined Sewer Overflows and Sanitary Sewer Overflows

Stakeholder Meeting Summary Huntington, CA

On July 8, 2003, the U.S. Environmental Protection Agency held a meeting in Huntington Beach, California, at the Huntington Beach Public Library to discuss the upcoming Report to Congress on the impacts and control of CSOs and SSOs. The meeting provided an opportunity for EPA to present the results of the data collection, request verification of information and data sources, and solicit feedback on preliminary findings and interpretations.

The main goals of the meeting were to:

- Discuss the data, report methodology, and analyses for the 2003 Report to Congress;
- Discuss implications of the major analyses in the report; and
- Discuss participants' experiences in controlling impacts from CSOs and SSOs.

The summary below describes the presentations that outline the contents of the Report to Congress and the resulting discussions. The summary is organized into the following major sections which correspond to the meeting agenda:

- Welcome
- Goals and Agenda for the Meeting
- Background on the Report
- Characterization Presentation
- Environmental Impacts Presentation
- Human Health Presentation
- Resources Spent Addressing CSO and SSO Issues
- Technology Presentation
- Presentation of Stakeholder Comment and Question Themes

Welcome

Benita Best-Wong – Office of Wastewater Management, EPA

Ms. Best-Wong thanked the Orange County Sanitation District for alerting EPA to the region's interest in the Report to Congress. She mentioned that this meeting was the second of two – the first was held in Washington, D.C., the previous week. She next answered some of the questions that were repeatedly heard at the previous meeting but would not be covered during the presentations.

Ms. Best-Wong gave updates on the blending issue, the SSO Rule, and the Storm Water Phase II Rule.

Ms. Best-Wong next touched on the desire of Assistant Administrator for Water, Tracy Mehan, to ensure policy that facilitates a watershed approach. He would like EPA to focus on efficient ways of doing things and be aware of areas where EPA can help municipalities economize and make the best decisions possible. She went on to say that EPA hopes to focus on environmental outcomes, such as water quality and swimmer safety, and not outputs. She reminded the participants that the information gathered for this report forms a baseline and is something from which to work. EPA hopes that the report can be used not only to inform decision making but also for stakeholders to use as a resource.

Goals and Agenda for the Meeting

Linda Manning – Facilitator, SRA International

Ms. Manning began by setting “ground rules” for the meeting. The ground rules were as follows:

- Do not repeat points. This meeting is simply a way to collect perspectives and the number of times a comment was made will not be presented.
- Remember that participants are only being presented with representational data.
- Please provide us with additional information sources.
- Remember that this is the first effort to pull together all available information on this topic. The data are incomplete.

Background on the 2003 Report to Congress

Kevin DeBell – Office of Wastewater Management, EPA

Mr. DeBell presented the background to the 2003 Report to Congress. He started by mentioning the near-term EPA policies that directly led to the request for the 2003 Report to Congress. First, he described the 1994 National CSO Control Policy which formalized EPA’s management expectations for CSS communities. Next, a summary of the 2001 *Report to Congress – Implementation and Enforcement of the Combined Sewer Overflow Control Policy* was presented. This report acted as a program evaluation in which success of CSO Control Policy implementation was assessed; one useful product of the 2001 Report is the CSO database, which includes information on all CSO permits. Mr. DeBell then mentioned the draft SSO Notice of Proposed Rulemaking, and the 2000 Wet Weather Water Quality Act, which required the 2003 Report. The statutory requirements for the 2003 Report are stated below:

The Administrator of the Environmental Protection Agency shall transmit to Congress a report summarizing:

- a. the extent of human health and environmental impacts caused by municipal combined sewer overflows and sanitary sewer overflows, including the location of discharges causing such impacts, the volume of pollutants discharged, and the constituents discharged;*
- b. resources spent by municipalities to address these impacts; and*
- c. an evaluation of the technologies used by municipalities to address these impacts.*

Mr. DeBell next explained that EPA is not required to have a public review of reports to Congress, but that this particular program has a legacy of stakeholder collaboration, which EPA values.

Finally, Mr. DeBell acknowledged the research team and presented the report outline. The Report to Congress is organized as follows:

- Introduction
- Background
- Methodology
- Characteristics of CSOs and SSOs
- Environmental Impacts of CSOs and SSOs
- Human Health Impacts of CSOs and SSOs
- Federal and State Actions to Control CSOs and SSOs
- Technologies Used to Reduce the Impacts of CSOs and SSOs
- Findings and Recommendations

Stakeholder Questions and Comments on the Background Presentation

Questions and comments received after the background presentation are summarized below. The comments represent stakeholder opinion(s) and may not reflect EPA’s position.

- Is EPA taking this opportunity to weigh in on the blending rule?
- In the Wet Weather Water Quality Act of 2000, is there a context for larger wet weather events in the act language?

Characterization of CSOs and SSOs

Kevin DeBell – Office of Wastewater Management, EPA

Mr. DeBell presented data on the location of CSO and SSO discharges, the volume of pollutants discharged, the constituents discharged, and the frequency of discharge events.

This presentation defined a CSO as a mixture of untreated sewage and storm water discharged from a combined sewer system at a point prior to the headworks of the POTW. Generally, CSOs occur during wet weather when the CSS becomes overloaded. SSO is defined as a discharge of untreated or partially treated wastewater from a sanitary sewer system at any point prior to the headworks of a POTW. Backups of wastewater to private property are not included in the definition of SSO used for this Report to Congress.

Data Sources for the Characterization Chapter

EPA used the following data sources to characterize CSOs and SSOs.

- State databases for tracking CSO and SSO events;
- NPDES permit files;
- Approximately 80 interviews with state and municipal officials;
- LTCPs and other capital improvement documentation;
- Literature review; and
- Existing EPA documentation, including technical reports and products of cooperative agreements.

Key Research Questions for the Characterization Chapter

This presentation introduced three key research questions for the characterization chapter:

- How many NPDES permits exist for combined sewer systems and sanitary sewer systems?
- What are the common pollutants found in CSOs and SSOs?
- What are the volume, frequency, and location of CSOs and SSOs?

Stakeholder Questions and Comments for the Characterization Chapter

A list presenting the questions and comments received after the characterization presentation are summarized below. The comments represent stakeholder opinion(s) and may not reflect EPA's position.

- The term “basement backup” is misleading. EPA should replace it with “private property” backup, as many areas of the county do not have basements. The critical link in this phenomenon is the laterals. Private citizens do not know how to clean the laterals and plumbers do not report the problem.
- EPA needs to highlight the lack of consistency between different jurisdictions. There is no baseline for SSO reporting. It is important to let Congress understand that this information is missing.
- Look at WERF reports for other estimates on pollutant concentrations and other CSO/SSO characteristics.
- Differentiate between major and minor sources.
- Make sure to assess benefits versus the costs of elimination, so that we know where we can best put our resources to help the environment.
- Can the federal government fund this collection system program like they did for secondary treatment? Municipalities cannot do it.
- Stakeholders commented that communities had SSO tracking systems.

- How were sewer systems rated in the report? Some stakeholders wanted to know if they would be able to see how their system compared to a national average.
- Characterize SSO by volume per 100 miles of pipe in order to compare systems.
- Present SSO events by cause. EPA may also want to break out events regionally. Doing this will help identify extreme weather events.
- SSO should only be defined based on what agencies are responsible for (i.e., agencies are not responsible for all laterals).
- It will be very difficult to compare systems nationally, due to the differences in reporting requirements.
- In the slides, how do the volume and frequencies of SSOs compare to the amount of sewage collected?
- Is EPA distinguishing between the SSO effluent that actually gets to surface water versus how much is collected and disposed of properly?
- Does EPA have details about how many of the SSOs in the database were due to wet weather and I/I?
- It is not possible to design sewers based on every potential storm event. The report should address what can not be contained in the system.
- The conclusion “On a local scale, pollutant loads from CSOs and SSOs can be significant”—the opposite can also be true. On a local scale, pollutant loads may not have significant impacts.
- Regarding reporting thresholds, maybe there is a reason for thresholds, the report should discuss the rationale.
- Excluded from the study is storm water, but a significant source of pathogens found in storm water are from SSOs.
- Need to understand the water quality issues in receiving waters.
- In the SSO database, has EPA identified repeated, chronic, or preventable spills? Sewage collection agencies are responsible for these incidents and they need to correct them. This type of spill may skew or misrepresent the real problem.
- EPA could describe money spent versus pipe miles versus spills to compare communities.
- What percent of the spills reach receiving waters? A stakeholder said that during wet weather, very little of the amount spilled was contained, but during dry weather most was contained.
- Stakeholders mentioned that flood control systems are designed to withstand 195-year floods but there are no standards for sewer systems.
- Stakeholders said that the report needed to focus on impacts and focus on specifics.

Environmental Impacts of CSOs and SSOs

Hans Holmberg – Limno-Tech, Inc.

Mr. Holmberg began by defining “environmental impacts” as water quality, aquatic life, and aesthetic impacts that affect designated uses. Violations of water quality standards were used as an indicator for environmental impacts. While researching this chapter, EPA used previously completed national, state, and local assessments. Literature and web searches were performed and interviews with state and municipal officials were carried out.

EPA sought to characterize types of environmental impacts from CSOs and SSOs. First, EPA presented ranges in concentrations of the constituents typically found in CSOs and SSOs. EPA presented the results of assessments of environmental impacts caused by CSOs and SSOs. They acknowledged that while beach closures and shellfish bed closures have been traced to CSOs and SSOs, the data are not complete.

EPA described planned national assessments in which CSO outfall locations will be integrated with EPA’s WATERS database. This will allow CSO locations to be associated with information such as 303(d) impaired reaches and drinking water intakes.

Conclusions for the Environmental Impacts Chapter

EPA presented preliminary conclusions regarding the environmental impacts from CSOs and SSOs. These included:

- CSOs and SSOs contain pollutants that cause impairments to designated uses, as reported in national assessments.
- CSOs and SSOs can be a principal cause or a contributing cause of an environmental impact.
- National data are inconsistent in tracking CSOs and SSOs as a direct cause of impairment.
- While data are not comprehensive, some national estimates of use impairment have been made.
- State and local examples of cause and effect exist where CSO and SSO reporting and tracking are undertaken.

EPA asked the stakeholders present at the meeting for additional information on documented environmental impacts from CSOs and SSOs.

Stakeholder Questions and Comments on the Environmental Impacts Chapter

Questions and comments received after the environmental impacts presentation are summarized below. The comments represent stakeholder opinion(s) and may not reflect EPA's position.

- Most impacts seem very locally specific.
- Because of the ambiguity of the data, should you split them into separate categories in order to direct policy talks and funding allocations?
- There may be a time lapse between the event and the environmental impact. Does the report measure that?
- The beach closure chart should clarify miles by including the total miles of beach.
- Is EPA saying that municipal point sources, specifically CSOs and SSOs, are leading sources of water quality impairment?
- Stakeholders said that within their jurisdictions, a significant amount of water contamination is due to failing septic tanks.
- Stakeholders thought that EPA should try to gain an understanding of the concentration of pathogens from SSO to storm water, which leads to beach closing.
- Distinguish between beach advisories, which (in California) are based on bacteria levels from ongoing water quality monitoring, and beach closures, which (in California) happen after every reported SSO/CSO event.
- For SSO, EPA cannot blame natural phenomenon, such as rain and snowmelt, for overflows.

Human Health Impacts of CSOs and SSOs

Heather Gewandter – SRA International

Ms. Gewandter began by introducing the key questions addressed in this chapter:

- What constituents of CSOs and SSOs cause human health impacts?
Of what consequence are these impacts?
- Which exposure pathways are the most significant and what populations are most sensitive?
- What are the impediments to understanding the linkages between CSOs and SSOs, exposures, and the human health impacts?
- What is the institutional framework to assess and address potential human health impacts of CSOs and SSOs?

Ms. Gewandter explained that EPA first performed an extensive literature review. Then, EPA held an experts workshop in order to verify the accuracy of data already collected, find new sources, and ascertain an understanding of experts' opinions of the human health impacts of CSOs and SSOs. EPA next performed a series of state and community interviews for the purpose of understanding local and state health agency staff's opinions of the impacts of CSOs and SSOs and to characterize the current activities being carried out that address this potential threat.

Ms. Gewandter went on to present the range of human health symptoms resulting from exposure to the pollutants typically found in CSOs and SSOs. Next, she discussed exposure pathways and the groups facing the most frequent exposure, as well as the groups most sensitive to waterborne illnesses.

Ms. Gewandter described the limitations of the major data sources used to identify and describe waterborne disease outbreaks, one potential indicator of human health impacts from CSOs and SSOs. She next presented local, site specific examples outbreaks attributed to exposure to sewage in order to illustrate the potential for acute health impacts.

Next, EPA outlined the challenges to identifying the human health impacts of CSOs and SSOs. These include:

- The lack of connectivity in the monitoring and reporting systems for CSO and SSO events, human exposures, and human health impacts.
- Difficulty identifying the source of pathogens.
- The difficulty in attributing disease outbreaks to CSO and SSO events.
- The fact that outbreak reporting to CDC is voluntary.
- The understanding that many people who become ill do not seek medical treatment due to the nature of the illness.
- There are inconsistent probabilities of diagnoses within the health care system.
- The general tendency towards underreporting.

Conclusions for the Human Health Impacts Chapter

Finally, Ms. Gewandter identified the actions that are currently being taken by state and local governments to address the human health impacts from CSOs and SSOs and EPA's preliminary conclusions. These conclusions include:

- The pathogens and pollutants found in CSOs and SSOs have the potential to cause human health impacts.
- Exposures to the pathogens and pollutants resulting from CSOs and SSOs occur, but are difficult to quantify.
- Human health impacts from waterborne diseases are underreported.
- Responsibilities for protecting human health from waterborne illnesses are distributed among many agencies and institutions.

Stakeholder Questions and Comments on the Human Health Impacts Chapter

Questions and comments received after the human health impacts presentation are summarized below. The comments represent stakeholder opinion(s) and may not reflect EPA's position.

- Comment on warnings: In California, in event of SSO, beaches close immediately and there is no lag time.
- Clarify between postings, advisories, and closures.

- CDC released a paper in 1999 that said there were 300 cases of Cryptosporidiosis annually. This is contradictory to the information EPA presented and shows that there is a lot of uncertainty.
- The information regarding sensitive populations is all speculation.
- EPA needs to distinguish between large and small potential exposures; break out one-time exposure risk (metals) versus chronic exposures.
- There are no criteria for metals for recreational use.
- Just because a person has Cryptosporidiosis does not mean they get sick.
- Did EPA coordinate with the new epidemiology studies?
- Did EPA do risk assessment with pathogen data? Has EPA put the risk (of health impacts from CSO and SSO) in context with other risks?
- Did the literature review find epidemiological studies on WWTP workers? Did they build immunity?
- The material is inconclusive.
- Tie in anticipated exposure levels.
- Make sure to qualify that the pathogens and pollutants are coming from human waste and wastewater in the table.
- If groundwater impacts are a concern, many parameters are attenuated.

Resources Spent on CSO and SSO Control

Kevin DeBell – Office of Wastewater Management, EPA

Mr. DeBell outlined the methodological approach to this chapter which included:

- Data analysis which tabulated information of past investments in clean water infrastructure and compiled information on what has been spent on CSO and SSO control.
- EPA's estimate of the investment needed to meet the current requirements for CSO and SSO controls.
- EPA's acknowledgement of the fact that costs of CSO and SSO control are borne almost exclusively by local governments and utilities but local governments and utilities have not been requested to report the costs incurred for CSO and SSO control.

Stakeholder Questions and Comments on the Resources Chapter

Questions and comments received after the resources presentation are summarized below. The comments represent stakeholder opinion(s) and may not reflect EPA's position.

- Are SSO control expenditure needs distinguished from overall needs?
- Is the cost EPA has designated as SSO cost incremental or is it the total cost of running the sewage collection system? Since all money spent on the sewage collection system is aimed at getting sewage to the plant and preventing sewage spills, the total number may be more accurate.
- Do you plan to use other financial studies besides EPA's Gap Analysis (i.e., Waste Infrastructure (WIN) report)? The two studies have contradictory findings and a stakeholder did not want Congress to be confused if it heard the findings from the WIN report and they were not mentioned in this report.
- Stakeholders were concerned about private spills. Since municipalities do not pay for those, some stakeholders did not want them included, or they wanted these estimates to at least be called out.

Technologies for CSO and SSO Control

Kevin DeBell – Office of Wastewater Management, EPA

Mr. DeBell described the key data sources for the technology chapter. These included:

- Extensive literature reviews of existing EPA documentation as well as other sources;
- Interviews with municipal officials;

- Meetings with key EPA staff; and
- Informal peer review by internal and external experts.

Key Questions for the Technologies Chapter

Mr. DeBell introduced the key questions that were addressed:

- What technologies have been used by municipalities to control CSOs and SSOs?
- What factors influence the effectiveness of these technologies?
- Have there been any recent technological innovations in the control of CSOs and SSOs?

While researching this chapter, EPA identified common and promising technologies used by municipalities to address CSOs and SSOs. From this research, EPA developed technology descriptions summarizing available technologies and factors influencing their effectiveness. Mr. DeBell explained that it is very difficult to compare certain types of technologies, as they are designed to deal with different aspects of wet weather challenges. Therefore, the technologies were not ranked for effectiveness against each other within this chapter.

Presentation of Technologies

Mr. DeBell said that a wide range of technologies are available and that, within the report, they had been grouped into five key categories:

- Operations and maintenance activities;
- Collection system controls;
- Storage facilities;
- Treatment technologies; and
- Low impact development techniques.

Mr. DeBell mentioned that EPA developed case studies on each of the researched technologies and presented preliminary findings pertaining to the relative cost of implementing the systems, the type of system for which the technology was designed, and the pollutants or problems controlled.

Stakeholder Questions and Comments on the Technologies Chapter

Questions and comments received after the technologies presentation are summarized below. The comments represent stakeholder opinion(s) and may not reflect EPA's position.

- There is a lack of innovative technologies investigated, especially the decentralized technologies.
- Did EPA discuss odor control?
- What about the fats, oils, and grease requirements, will they be included in the SSO rule?
- Do you have any understanding about the total cost of all of the regulations that are coming?

**Report To Congress
Stakeholder Meeting Attendee List**

Huntington Beach, CA

July 8, 2003

Name, Office/Organization

Andy Aguilar, Surfrider Foundation
Richard Alcorn, City of Rancho Cucamonga
Jody Allen, Sacramento County
Ric Amador, City of San Diego
Rodney Andersen, City of Burbank
Nick Arhontes, Orange County Sanitation Districts
Daniel Askenaizer, MWH
Regan Bailey, City of Riverside
Dennis Baker, Earth Resource Foundation
Richard Bardin, Boyle Engineering Corporation
Danilo Batson, City of Glendale
Cindy Beck, Irvine Ranch Water District
Matthew Bequette, City of Los Angeles
Benita Best-Wong, USEPA
Thomas Blanda, Orange County Sanitation Districts
M. Todd Broussard, City of Huntington Beach
Bryan Brown, City of Los Angeles
Ray Burk, City of Santa Ana
Ed Burt, City of Newport Beach
John Butcher, NCPI
Olson Childress, City of Chino Hills
Marvin Chiong, Los Angeles County Department of Public Works
James Clark, Black & Veatch
Daniel Cooper, Lawyers for Clean Water
Lee Cory, Yorba Linda Water District
Kevin DeBell, USEPA
Jim Delicce, City of Newport Beach
Bill Denhart, City of San Diego
Parivash Dezhnam, Inland Empire Utilities Agency
Dick Dietmeier, South Coast Water District
Rick Donahue, City of San Diego
Mike Dunbar, South Coast Water District
Bill Echols, Central Contra Costa County Sanitary District
Michele Farmer, Orange County Sanitation Districts
Tom Fauth, Costa Mesa Sanitary District
Michael Feroz, Jacobs Civil Inc.
Ken Fischer, City of Burbank
Michael Flores, HDR
Paul Forsthoefel, ADS Environmental Services
Phil Friess, LACSD
Kevin Gensler, City of San Diego
Heather Gewandter, SRA
Marco Gonzalez, Surfrider Foundation
Chris Gray, City of Huntington Beach
Don Greek, DGA Consultants
Ken Greenberg, U.S. EPA, Region 9
Paul Guzman, Costa Mesa Sanitary District

Roy Hafar, City of Folsom
Roger Ham, Union Sanitary District
Robin Hamers, Costa Mesa Sanitary District
Daniel Hardgrove, City of Glendale
Alan Harrell, Coachella Valley Water District
F. Patrick Hassey, Sacramento County
Jonathan Hasson, ADS Environmental Services
Brent Hayes, Garden Grove Sanitary District
Jeannie Heimberger, City of Fountain Valley
Penny Hill, Los Angeles County Sanitation Districts
Hans Holmberg, Limno-Tech, Inc.
Larry Honeybourne, County of Orange
Lisa Marie Kay, MEC Analytical Systems Inc.
Zeki Kayiran, AKM Consulting Engineers
Bill Knitz, DGA Consultants
Ruth Kolb, City of San Diego
Bob Kreg, Southern California Alliance of Publicly Owned Treatment Plants
Patty Lambaren, City of Fullerton
Winnie Lee, PBS&J
Sylvie Lee, Inland Empire Utilities Agency
Albert Lee, Jr., City of Glendale
Keith Linker, City of Anaheim
Russell Maguire, City of Anaheim
Linda Manning, SRA
Lisa Mattered, City of Orange
Ziad Mazboudi, City of San Juan Capistrano
Monica Mazur, County of Orange
Joe McDivitt, South Coast Water District
Charles McGee, Orange County Sanitation Districts
Patrick McNelly, Orange County Sanitation Districts
Dayna Michaelsen, Midway City Sanitary District
Victor Moraga, City of Ontario
Andy Morrison, Union Sanitary District
Margie Nellor, Sanitation Districts of Los Angeles County
Bryan Ortega, City of Glendale
Ralph Palomares, El Toro Water District
Diann Pay, AKM Consulting Engineers
Ken Payne, City of Folsom
John Perry, City of San Bernardino
Michele Pla, CH2M Hill
Denis Pollock, MGD Technologies Inc.
Craig Proctor, Inland Empire Utilities Agency
Lloyd Prosser, EMA
Ronn Rathbun, City of Huntington Beach
Robert Reid, West Valley Sanitation District
Don Rhoads, Central Contra Costa County Sanitary District
Kenny Robbins, Midway City Sanitary District
Manuel Romero, City of Santa Barbara
Dick Runge, South Coast Water District
Jeff Sadler, ECA
Dale Schindler, Crestline Sanitation District
Kathy Schindler, Crestline Sanitation District

Don Schulz, Surfrider Foundation
John Shaffer, Environmental Engineering & Consulting
David Shissler, City of Laguna Beach
Mike Shope, Camp Pendleton
Gary Skipper, MGD Technologies Inc.
Mary Snyder, County of Sacramento
Stan Steinbach, Environmental Engineering & Consulting
Ken Theisen, California Regional Water Quality Control Board
Leo Truttmann, LTEC
Roger Turner
Tara Van Atta, SRA
Clarence Van Corbach, City of Manhattan Beach
Gonzalo Vazquez, City of Cypress
Konya Vivanti, Garden Grove Sanitary District
Jeff Walker, City of Chino Hills
Dan Wall, City of Burbank
Stephanie Warren, Surfrider Foundation
Jason Wen, City of Downey
Dave Williams, East Bay Municipal Utility District
James Wilson, City of Fresno
Rick Wilson, Surfrider Foundation
Hu Yi, Los Angeles County