Needs and Challenges of Major Water and Wastewater Systems

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> Associated Press, February 6, 2001, Washington - A study commissioned by a group comprising sewer and water authorities, contractors, the U.S. Conference of Mayors and others estimated the overall cost of replacing old water and sewer pipes and upgrading aging treatment plants around the country could cost $1 trillion over the next two decades. An independent study by the EPA said that there would be a gap of $23 billion a year over the next 20 years between what's spent on drinking water and wastewater systems and what's needed. Last year, Congress created a $1.5 billion two-year grant program to help municipalities deal with part of the infrastructure problem; combined systems that use the same conduits for sewage and rainwater...Sen. George Voinovich, R-Ohio, has now introduced legislation to allow the EPA to give states up to $3 billion a year to deal with other wastewater infrastructure improvements

While there is national attention to the country's infrastructure needs, the challenge for the water and wastewater system manager is to determine the condition of the system, the repair and replacement needs, the materials to be utilized, and the financing and schedule required. While the County Sanitation Districts of Los Angeles County (Districts) is on the last leg of a marathon program to upgrade our sewerage system, many municipalities are still playing catch up with the condition assessments and renewal efforts.

The Districts challenge began in the early 1970s when the task was to evaluate the condition of the larger diameter sewers in the regional system that serves the needs of 5 million residents in Los Angeles County. The Districts own and operate 11 wastewater treatment plants, 48 pumping stations, and 1,300 miles of the more than 11,000 miles of sewers that serve the 78 cities and unincorporated areas within the county. This initial assessment of sewers ranging in size from 60 to 144 inches in diameter indicated that the backbone of the regional system, which dated to the late 1920s, was still in good condition. Unfortunately, this positive assessment did not last long. Mandated tightening of the regulations on industrial discharges to publicly owned treatment works (POTW) in the late 1970s and early 1980s resulted in as much as a 20-fold increase in the rate of deterioration in portions of the system. Suddenly the Districts' infrastructure was crumbling at a rate that stressed the ability to design and constructs the necessary repairs.

After presenting our concerns about this infrastructure crisis to the state regulatory authority, the Districts was informed that state funds were only available if a public health or environmental problem existed. Preventive efforts to forestall public health or environmental affects were not fundable. Thereafter, the Districts implemented an aggressive infrastructure inspection program to prioritize the condition of the sewerage system, to develop the master plans needed to determine the replacement and rehabilitation needs, and to simultaneously research methods to control the rate of deterioration. Funding of these efforts was obtained by a 20% increase in the service charge rate beginning in 1987. The annual service charge for a single-family home (the baseline sewage unit for the Districts' service charge program) was raised from an average of $65 to $78.

Since then the Districts have replaced or rehabilitated 104 miles of concrete sewers at a cost of $297 million. The innovative spraying of the exposed portions of the gravity sewers with acid neutralizing chemicals, such

as sodium hydroxide, calcium hydroxide and magnesium hydroxide has controlled the deterioration of another 280 miles of concrete sewers. An annual 200 mile spraying program with magnesium hydroxide, utilizing both Districts' staff and contractors costs $2 million.

Growing concern about the water quality impacts of sanitary sewer overflows (SSOs) -- particularly those that cause beach closures -- has brought increased scrutiny, enforcement actions, and substantial fines of sewerage system operators by state and federal agencies in the last several years. SSOs are currently prohibited by the federal Clean Water Act and state regulations; however, the design, operation and maintenance of sewers have always been strictly within the purview of local governments. At the federal level, the EPA recently completed development of new regulations that will:

- require agencies that own and/or operate local or regional sewers to obtain a National Pollutant Discharge Elimination System (NPDES) operating permit;

- re-emphasize and clarify the existing prohibition of all sanitary sewer overflows except for those caused by severe natural conditions (such as hurricanes, tornadoes, widespread flooding, earthquakes, tsunamis, and other similar conditions) or where the overflow was exceptional, unintentional, temporary and caused by factors beyond the reasonable control of the collection system owner/operator;

- require local agencies to establish a formal Capacity, Management, Operations and Maintenance (CMOM) Program;

- require within the CMOM, goals, legal authorities, design specifications, emergency response plans, detailed maintenance provisions, condition assessment and rehabilitation programs, capacity assurance plans, a method for continuous updates, and yearly self-audits (periodic outside audits by the state will occur);

- require local agencies to develop and implement a sewage spill emergency response plan that ensures that overflows are appropriately responded to and that immediate notification to responsible state and local agencies are made.

These regulations will represent a major challenge for most wastewater system managers. Some of the specific concerns that the Districts has with the proposed regulations are:

- EPA has proposed a regulatory framework which gives the NPDES (National Pollutant Discharge Elimination System) permit writer discretion on how to permit municipal satellite

collection systems such as those operated by cities that connect to Districts' trunk sewers. The permit writer for California is the State Water Resources Control Board acting through its Regional Water Quality Control Boards. Options include issuance of NPDES permits, as individual or general permits, directly to the satellite agencies. Alternately, the POTW into which the satellite systems discharge, such as the Districts, could become responsible for CMOM compliance for all sewers tributary to their facilities. This latter option has, historically, not been the mission of the Districts, and involves the complicating issue of transfer of local control and local funding to the POTW. Ideally, it would benefit all parties if EPA requires the permit writer to work with the permit holder on a case-by-case basis, in order to accommodate the vast array of different collection system arrangements that exist.

- Exceptions to the prohibition of SSOs include overflows caused by severe natural conditions such as widespread flooding, earthquakes, tsunamis, and other similar conditions or where the overflow was caused by factors beyond the reasonable control of the collection system owner/operator. However, because the rule places a burden on the permit holder to prove that no feasible alternatives to the discharge exist, industry experts expect that the vast majority of overflows will be deemed to be violations. Recognizing that some SSOs are simply unavoidable, it would be more practical and reasonable to come up with an accepted standard that would establish an allowable threshold for overflows, such as allowing for overflows caused by storms that exceed a certain design criteria.

- Compliance with these new requirements may necessitate significant upgrades of local sewer systems, as well as higher expenditures for sewer operations and maintenance programs. It is expected that substantial funds will be required to implement the CMOM rule if an equivalent program is not already in place. The EPA estimates an average compliance cost of $6,000 per 7,500 people, which corresponds to roughly $2 per sewage unit. This rate is felt to underestimate the cost associated with preventing SSOs. The cost could range from $5 per sewage unit for municipalities with well-established maintenance programs in place to $25 per sewage unit if significant construction and rehabilitation is needed. Unfortunately, the rule does not provide for any monetary assistance except for noting that State Revolving Funds could possibly be available for some sanitary sewer collection system projects.

These requirements will be self-implementing. However, if an overflow occurs, the CMOM plan will be evaluated to determine if it was adequate to prevent overflows and if the plan was followed. Compliance with both factors will influence what enforcement action is taken and the amount of the fine levied. Since very few overflows are likely to fall within the exception criteria outlined above; it is expected that most overflows will be subject to enforcement actions and substantial fines.

On January 5, 2001, then EPA Administrator Carol Browner signed the proposed SSO rule and forwarded it to the Office of the Federal Register for publication. On January 20, 2001, President Bush placed a

moratorium on all new rules pending review by the new administration's appointees. As a result, the proposed SSO rule has not yet been published in the *Federal Register* pending review by new EPA Administrator Christine Todd Whitman.

You may find more information about the proposed SSO regulations on the Web at www.epa.gov/owm/sso.htm.

If you have any questions, please contact **Dr. C.Vipulanandan**