

## Experience Summary

Jeff Sharon has 33 years of experience in all phases of water and wastewater projects including planning, design and construction administration. He has worked as field engineer, staff engineer, project engineer, project manager and project principal on assignments ranging in size from very small-scale individual facilities to large master plans for entire metropolitan areas and design of facilities costing nearly \$200 million. He specializes in wet weather collection system and treatment projects, particularly combined sewer overflow (CSO) and sanitary sewer overflow (SSO) mitigation.

### Education

*M.S., Water Resources, Hydraulics,  
University of Cincinnati, 1972*

*B.S., Civil Engineering, Bucknell  
University, 1971*

### Registration

*Professional Engineer:*

*Pennsylvania, Ohio, Kentucky, Michigan,  
New York, Oregon, Virginia, West Virginia,  
Wisconsin, District of Columbia*

### Experience

*27 years*

### Joined Firm

*2000*

## Environmental Planning/Design

### Capacity, Management, Operations and Maintenance (CMOM) Program, Division of Sewerage and Drainage, City of Columbus, Ohio

**Project Manager** for the development of a Wet Weather Management Plan for the City of Columbus' Division of Sewerage and Drainage (DOSD). The assignment included an analysis of the collection and treatment system for the entire city including flows from 23 satellite communities as well as the evaluation of the Division's operations. The multi-billion dollar recommended plan includes increasing treatment capacity and efficiency at the two treatment plants; on-site and off-site high rate treatment for wet weather flow spikes; large tunnels capable of conveying and storing flow to meet current needs as well as ultimate build-out conditions; local storage and conveyance projects for mitigating overflows in the upstream portions of the system; and a robust infiltration/inflow control program that will ultimately include satellite communities. The plan was developed in response to two consent orders with the intention of reducing system overflows: (1) for the separate sewer system CMOM and (2) for the combined sewer system (Long Term Control Plan Update). The plan recommended a complete 40 year capital improvement program incorporating all system elements. Formulation of the plan involved a thorough public outreach program, a detailed affordability analysis, and the teamwork of over 50 individuals including consultants and DOSD staff members.

### In-System Storage Devices, Water and Sewerage Department, Detroit, Michigan

**Principal-In-Charge.** Guided design team in investigation, evaluation, comparison and selection of system of nearly 30 in-line storage devices located throughout Detroit's combined sewer system in pipes ranging from 8 to 20 feet in diameter.

### SSO Abatement Study, Shreveport, Louisiana

**Chief Engineer.** Led system-wide SSO abatement study, including complete data management program for organizing and using extensive data collected by previous consultant. Identified potential short- and long-term improvements.

**CSO Long Term Control Plan, Fort Wayne, Indiana**

**Principal-In-Charge.** Led team peer review of plan prepared by another consulting firm. Peer review was requested by new city administration when the existing team was almost 90% complete. Numerous cost-saving suggestions were developed, including integration of City's other collection system and treatment programs.

**Trenchless Interceptor System Improvements, Metropolitan Sewerage District, Milwaukee, Wisconsin**

**Principal-In-Charge.** Guided technical review committee for several trenchless projects, including design of two siphons carrying flow under Monomonee River. Incorporated new collection system elements to reduce flooding and collect additional flows in combined sewer interceptor tunnel system.

**CSO Long Term Control Plan, Middletown, Ohio**

**Principal-In-Charge.** Provided technical guidance for plan development, including modeling, regulatory issues, plan development, receiving water analysis, and integration with operation of treatment plant and separate sanitary system.

**CSO Mitigation Facilities, Erie, Pennsylvania**

**Principal-In-Charge.** Guided design of augmentation interceptor and regulator system to reduce frequency and volume of CSOs into Mill Creek Tube and Presque Isle Bay. Project also included high-rate disinfection facilities for wet weather flows exceeding treatment plant capacity.

**Flood Mitigation/CSO Facilities, Avon Lake, Ohio**

**Principal-In-Charge.** Led study phase of program to identify sources of excessive wet weather flows creating basement flooding along Lake Road Interceptor. Analysis used modeling and cost/non-cost comparisons to evaluate best way to reduce flooding and still position City for compliance with CSO regulations. Source control, off-line storage, in-line storage and flow management via improved regulator devices were investigated.

**Mill Creek Watershed and CSO Study, Northeast Ohio Regional Sewer District, Cleveland, Ohio**

**Principal-In-Charge.** Led evaluation of pollutant sources in completely urban watershed serving 150,000 people in 11 communities. Sewer system is 25 percent separate, 50 percent combined and 25 percent dual sewers. Deep tunnel system was recommended as major improvement for reducing sewer overflows and basement flooding.

**Mill Creek CSO Study Facilities Design, Northeast Ohio Regional Sewer District, Cleveland, Ohio**

**Principal-In-Charge.** Led design of numerous regulator structures with such innovations as bending weirs; collector sewers, such as trunk lines and interceptor replacements and extensions using open cut and trenchless techniques; drop shafts and brick interceptor rehabilitation.

**CSO Facilities Phase I Study, Northeast Ohio Regional Sewer District, Cleveland, Ohio**

**Principal-In-Charge.** Provided thorough understanding via monitoring, sampling, field investigations and computer modeling of physical properties of CSO system, covering 49,000 acres of combined sewer areas in 9 communities with 525 CSO regulators discharging into Lake Erie, Cuyahoga River and numerous urban streams. Enhancing operation of existing CSO control system, developing facilities plans for high-public-use areas, and developing foundation of master plan for CSO abatement were goals.

**Interceptor Design for CSO Abatement, Northeast Ohio Regional Sewer District, Cleveland, Ohio**

**Principal-In-Charge.** Designed 12,000-foot-deep, 72-inch-diameter tunnel to collect overloaded sanitary sewers, reducing SSOs and basement flooding.

**CSO Evaluation of Heights Interceptor Design, Northeast Ohio Regional Sewer District, Cleveland, Ohio**

**Principal-In-Charge.** Reevaluated 10-year-old design to update CSOs using state-of-the-art tunneling methods, considering routes of relief sewers and tie-ins to major interceptor. Evaluated extensive in-line storage system.

**CSO Operations and Maintenance Plan and Basement Flooding Study, Avon Lake, Ohio**

**Principal-In-Charge.** Focused on balancing reduction of CSO pollution in Lake Erie with reducing hydraulic grade line along Lake Road Interceptor. Used EXTRAN modeling and detailed field reconnaissance was to increase comprehension of system with 17 CSOs.

**CSO Operations and Maintenance Plan, Lakewood, Ohio**

**Project Manager.** Provided detailed evaluation and definition of system to delineate combined and separate sewer areas for area with 34 CSOs discharging into Lake Erie. Applied common-sense solutions.

**Evaluation of 10,000 Acre Combined Sewer Area, Akron, Ohio**

**Project Manager.** Developed plan for seven CSOs discharging into Ohio Canal, site of ongoing and proposed urban renovation. Considered integration of CSO abatement technologies with downtown Akron's development program. Used SWMM modeling. Recommended vortex separators, tunnels and in-line storage.

**System-Wide CSO Abatement, Phase 2 Study, Akron, Ohio**

**Project Manager.** Conducted detailed flow monitoring, sampling, biological investigations and modeling to evaluate impacts of CSOs on receiving streams; compare effects of CSOs with other pollutant sources; and determine pragmatic use-attainability for streams. Developed preliminary alternatives for stream water quality improvements.

**Phase 2 CSO Facilities Plan, Cincinnati, Ohio**

**Project Manager.** Evaluated combined sewer system with more than 250 CSOs discharging into Ohio River and smaller streams. Modeled collection

system and evaluated pragmatic use-attainability of receiving streams concerning pending CSO regulations.

#### **CSO Study, Middletown, Ohio**

**Project Manager.** Conducted in-field investigations using extensive flow monitoring system, made nine minimum-control recommendations and upgraded and calibrated stormwater management model (SWMM) model.

#### **CSO Regulatory Assistance, Toledo, Ohio**

**Project Manager.** Evaluated U.S. EPA's position on Toledo's CSO program and provided opinion on how to most cost-effectively comply with U.S. EPA's mandates, given recently issued federal CSO policy.

#### **CSO-Related National Pollutant Discharge Elimination System (NPDES) Permitting Assistance, Lima, Ohio**

**Project Manager.** Reviewed draft permit language for City's wastewater treatment plant and collection system regarding current regulations and pending legislation for CSOs and SSOs.

#### **CSO/SSO Permit Compliance Plan, Elyria, Ohio**

**Project Manager.** Developed plan to meet regulatory mandates for CSO and SSO abatement. Analyzed receiving stream water quality and pragmatic use-attainability by examining pollution sources and stream morphology. Used flow monitoring and EXTRAN modeling to find cost-effective improvements.

#### **CSO Facilities Planning, Metropolitan Sewer District, Cincinnati, Ohio**

**Project Manager.** Completed CSO facility plan for more than 200 CSOs on Mill Creek. Also completed plans for Duck Creek, Clough Creek and Daly Road area.

#### **Conveyance and Treatment of Combined Sewer (Stormwater and Process Wastewater), Hilton-David Chemical Co., Cincinnati, Ohio**

**Project Manager.** Designed facilities for conveyance and handling of flows up to 65 mgd, including storage tanks and pump station/force main system to convey flow to pretreatment facilities before release to combined sewer system. Process considerations were exacerbated by 2-12 pH variation, depending on industrial effluent.

#### **SSO Abatement Study, Shreveport, Louisiana**

**Chief Engineer.** Led system-wide SSO abatement study, including complete data management program for organizing and using extensive data collected by previous consultant. Identified potential short- and long-term improvements.

#### **CSO Abatement Study, Paducah, Kentucky**

**Project Manager.** Evaluated 15 CSOs covering several streams, including Ohio River. Conducted flow monitoring/sampling to support SWMM model and made recommendations to improve system operations and maintenance (O&M). Developed plan to capture first flush using knee-of-the-curve analysis.

**CSO Abatement Study/Elimination Design, Louisville, Kentucky**

**Project Manager.** Conducted detailed field investigation and hydraulic analysis for CSO abatement in downtown area. Later, designed CSO improvement design eliminating direct connection discharging into Ohio River.

**CSO Reduction Study, Hartford, Connecticut**

**Project Manager.** Designed improvements to reduce CSOs, including adding new barrel to Connecticut River Interceptor, short- and long-term process upgrades at treatment plant to provide for additional wet weather flow treatment, and other options to improve system performance.

**CSO Value Engineering Study, Flushing Bay, New York**

**Project Manager.** Performed value engineering study for \$350 million CSO facilities plan for New York City Department of Environmental Protection. Study evaluated recommendations for entire combined sewer system including floatables control, disinfection and in-line/off-line storage.

**Collection and Treatment Planning/Design****Design and Construction Administration, Main Line Interceptor, Northeast Ohio Regional Sewer District, Cleveland, Ohio**

**Project Manager.** Designed 1-mile, 132-inch sewer entering Easterly Wastewater Treatment Plant. Most construction was open cut with tunnel segments under freeways and railroads (including ground freezing).

**Headworks Design, Easterly Wastewater Treatment Plant, Northeast Ohio Regional Sewer District, Cleveland, Ohio**

**Project Manager.** Designed additional 400-mgd capacity for wastewater treatment plant headworks to increase capacity to 1,350 mgd.

**Design and Construction Administration, Broadview-Ravine Relief Sewer Tunnel, Northeast Ohio Regional Sewer District, Cleveland, Ohio**

**Project Manager.** Designed 10,000-foot intercepting sewer with inside diameter ranging from 36 to 60 inches, most constructed via rock tunneling and 50 to 100-foot depths.

**Deep Tunnel Odor and Control Evaluation, Northeast Ohio Regional Sewer District, Cleveland, Ohio**

**Project Manager.** Evaluated air handling throughout 50-plus miles of tunnels, which reach depths of 300 feet. Recommendations and design included ventilation system and six strategically placed biofilters.

**Interceptor Design, Northeast Ohio Regional Sewer District, Cleveland, Ohio**

**Project Manager.** Designed 15,000-foot-long tunnel to reach depths of 300 feet with ten-foot final pipe diameter. In-line storage provided throughout entire length for peak flow control.

### **Hilltop Interceptor Design, Northeast Ohio Regional Sewer District, Cleveland, Ohio**

**Project Manager.** Designed 45,000-foot-long tunnel to reach depths of 250 feet with finished diameter of 60 inches in shales/sandstone. Reduces CSOs and provides direct, priority treatment of separate sanitary sewage at Easterly wastewater treatment plant.

### **Hilltop Tunnel System Redesign, Northeast Ohio Regional Sewer District, Cleveland, Ohio**

**Project Manager.** Designed 78-inch diameter tunnels in shales/soft ground. Provided construction administration services.

### **Miscellaneous Tunnel Design Projects, Northeast Ohio Regional Sewer District, Cleveland, Ohio**

**Project Manager.** Planned, designed and supervised of more than 25 miles of deep tunnels (costing more than \$200 million) in Cleveland area.

### **Sewer System Evaluation Survey, Cleveland, Ohio**

**Project Manager.** Conducted flow monitoring and field investigations to help design new sewers to correct flooding problems.

### **Study, Design and Construction Administration, Collection System Improvements, Solon, Ohio**

**Project Manager.** Evaluated feasibility, design and supervised construction of 7.5-mgd wastewater pumping station and 5-mile-long, 18-inch force main to replace Northeast wastewater treatment plant.

### **Study and Design, Hawkins District Relief Sewer, Akron, Ohio**

**Project Manager.** Designed 2,000-foot-long trunk sewer in urbanized area, designed to convey flows up to 10-year storm with peak flows of 18 mgd.

### **Study and Design, Walker Road Trunk Sewer, Avon Lake, Ohio**

**Project Manager.** Designed three miles of 24- to 36-inch gravity sewer built via open-cut methods deep into rock. Evaluated pumping options. Peak design flow is 10.5 mgd.

## **Wastewater/Stormwater Master Planning**

### **Wastewater System Master Plan, Springfield, Missouri**

**Project Manager.** Conducted comprehensive study and developed plan for wastewater collection and treatment facilities through 2020.

### **Sanitary Sewer Master Plan, Richmond Heights, Ohio**

**Project Manager.** Developed sanitary sewer master plan for City, served by local treatment plants and septic systems.

### **Comprehensive Stormwater Management Plan, St. Louis, Missouri**

**Project Manager.** Served as lead consultant for entire county investigation for the St. Louis Metropolitan Sewer District.

## **Water Resources Engineering**

### **Stormwater and Wastewater Pollution Control Study, Hopkins International Airport, Cleveland, Ohio**

**Project Manager.** Identified sources of pollution by extensive field investigation of sanitary sewer system, storm sewer system, operations facilities and terminals. Pollutants investigated include storm drain and sanitary sewer cross-connections, runway and aircraft deicing agents, jet fuels and oils.

### **Water Conservation Study, Metroparks Zoo, Cleveland, Ohio**

**Project Manager.** Conducted system-wide analysis to help the zoo reduce 1.5-mgd average water usage.

### **Storm Drainage Analysis, Cleveland Ohio**

**Project Manager.** Developed findings presented as evidence by City's lawyers, who offered engineer's observations about allegations set forth in lawsuit.

### **Storm Drainage Analysis, Parma, Ohio**

**Project Manager.** Analyzed storm drainage and found relatively inexpensive solutions for alleviating flooding.

### **Smoke and Dye Testing Study, NASA Lewis Research Center, Cleveland, Ohio**

**Project Manager.** Conducted study to see how to reduce pollution from stormwater outfalls.

### **Waste Load Allocation Study, Chagrin River, Lake County, Ohio**

**Project Manager.** Collected and modeled data, and made recommendations, for a proposed wastewater treatment plant serving proposed 1,000-unit development to surround Bass Lake, an area of relatively pristine ecological setting, at headwaters of Chagrin River.

### **Waste Load Analysis, Ohio EPA, Various Ohio Locations**

**Project Manager.** Performed waste load analysis of Muskingum River and Tinkers Creek watersheds in central and northern Ohio.

### **Baldwin Lake Sedimentation Study, Berea, Ohio**

**Project Manager.** Analyzed why Lake sedimentation had increased and made recommendations to reduce excessive amounts.

### **Drainage Study, Bay Village, Ohio**

**Project Manager.** Investigated six major streams to develop flood mitigation plans. Field measurements and SWMM modeling supported analysis, including prediction of flow contributions from two upstream communities. Public participation was major factor in program development.

### **Drainage Plan, Ward 8, Cuyahoga Falls, Ohio**

**Project Manager.** Developed stormwater master plan for 5,000-acre undeveloped area, which City recently annexed and intends to develop.

Using extensive field investigation and modeling. Presented plan to reduce runoff peaks from development and to preserve natural beauty.

#### **Drainage Study, Pinellas Park, Florida**

**Project Manager.** Conducted ditch review and made recommendations after reviewing capabilities of street drainage laterals. Used HEC-2 modeling.

### **Water Infrastructure**

#### **Water Main Design/Systemwide Water Distribution Study, Youngstown, Ohio**

**Project Manager.** Designed three water main projects ranging from 12 to 16 inches with a length of more than three miles to help augment distribution system deficiencies. Conducted systemwide water distribution study.

#### **Water Distribution Studies, Miami County, Ohio and Other Locations**

**Project Manager.** Completed water distribution studies for Miami County, Ohio; Sheridan, New York; and Chautauqua County, New York.

### **Memberships**

Water Environment Federation

Chairman, WEF Wet Weather Pollution Control Specialty Conference—Louisville, KY (1994); Quebec City, QB (1996); Cleveland, OH (1998) and Rochester, NY (2000).

Member, WEF Collection System Committee, Watershed Committee and Conference Committee  
 CSO Regulatory Affairs Work Group  
 Editorial Advisory Board, Watershed and Wet Weather Technical Bulletin  
 Reviewer, Water Environment Research Federation

Water Pollution Control Federation

Chairman, Work Group, "Manual of Practice on Combined Sewer Overflow Pollution Abatement"

Chairman, Pre-Conference Workshop, "Simulation and Real-Time Control for Urban Drainage Systems," Washington, D.C., October 1990.

Chairman, Pre-Conference Workshop, "Combined Sewer Overflow Pollution Abatement," San Francisco, CA, October 1989.

American Society of Civil Engineers

American Public Works Association

### **Publications and Presentations**

1. "Deep Tunnel In-Line Storage System Has Multiple Uses," National WEF Conference, Chicago, IL, October 1996.
2. "Management and Public Policy," "Combined Sewers - Were We Right The First Time?" and "Breaking the Paradigm of Sewer Configuration," Facilitator for Three Sessions, Sewers of the Future Conference, Houston, TX, September 1995.
3. "A Guide to Efficiently Isolate I/I Sources Related to Basement Flooding Occurrences," Sewers of the Future Conference, Houston, TX, September 1995.
4. "Swimming in Midwestern Towns: CSO Investigations in Smaller Communities Using SWMM," National WEF Conference, Anaheim, CA, October 1993.
5. "Cleveland Area's Heights-Hilltop Interceptor: An Ongoing Success Story," ASCE Pipeline Infrastructure Conference, Cleveland, OH, July 1993.



6. "A Common Sense Approach for Modern CSO Control," WEF Specialty Conference in Collection Systems O&M, Tucson, AZ, June 1993.
7. "Approach to CSO Control in the Cleveland Area," National WEF Conference, New Orleans, LA, September 1992.
8. "Big Wastewater Collection Project Continues On Schedule and Under Budget," Water/Engineering and Management Magazine, August 1992.
9. CSO Legislation/Applicable State-of-the-Art Technologies," ASCE Conference, Akron, OH, May 1991.
10. "Weathering the Storm," ORSANCO Conference, Fort Mitchell, KY, April 1991.
11. "Development of the WPCF's Manual of Practice on CSO Pollution Abatement," Water Pollution Control Federation Specialty Conference, Boston, MA, April 1990.
12. "The Heights-Hilltop Interceptor System – An Overview," Ohio Water Pollution Control Federation State Conference, June 1990.
13. "A Chilling Tale: How Ground Freezing Solved Tunneling Problems," Public Works Magazine, October 1988.
14. "REGQUAL: A Useful Tool for Analysis of Combined Sewer Overflows," EPA SWMM Users Group, October 1982
15. "The Need for Detailed Analysis of Stream Responses to Combined Sewer Overflow Loads," Second International Conference on Urban Storm Drainage, June 1981.
16. "CSO Facilities Planning in Cincinnati, Using SWMM (A Case Study)," EPA SWMM Users Group Meeting, November 1978.
17. "Verification and Testing of the U.S. EPA Stormwater Management Model," Masters program research report at University of Cincinnati, 1972.