

San Clemente Urban Runoff Management Program

Brown and Caldwell's phased approach to implementing multi-level treatment Best Management Practices produced pro-active stormwater management for the City of San Clemente, California.



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The URMP includes an action-plan that lists problem areas with corresponding solutions and approximate priority or timing for implementation.

BACKGROUND

The City of San Clemente is located on the Pacific Ocean at the base of a steep coastal range. During rain events, nearly 75 percent of the area's stormwater discharges to the ocean via two major storm channels. This concentrated volume of stormwater causes bacterial contamination and trash to accumulate on the shoreline, resulting in periodic beach postings and closures.

As corporate headquarters of the Surfrider Foundation, the City of San Clemente is very

much in tune with water quality issues. While not yet required to comply with new stormwater regulations, the city had been watching the development of the municipal stormwater permit for adjacent San Diego County. Although the city fulfills its requirements under an existing regional stormwater program, it set out to enhance those efforts to protect its beaches and water quality.

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Knowing that it would be next in line to be required to treat stormwater, the city decided to take a proactive approach to water quality management. To help the city meet this objective, Brown and Caldwell developed a comprehensive URMP for the City of San Clemente to reduce urban runoff, improve stormwater quality and get ahead of pending regulations.

Project Elements

Condition Assessment—A database of the drainage basins and existing storm drain system was developed to formulate BMPs and other stormwater/urban runoff programs, with specific attention to future Geographic Information System (GIS) compatibility. Database development included:

- Delineation and mapping watershed and sub-basin boundaries
- Inventory and mapping of natural and man-made drainage systems, current and future land use and soils
- Inventory of potential pollution sources and associated pollutants of concern within each drainage basin
- Identification of planned storm drain improvements, including CIP projects and new development projects within the city
- Inventory of available water quality, sediment and pertinent biological data

Source Control and BMPs—For strategic areas within the city, various source-control and BMP opportunities were identified. A BMP manual was developed, and opportunities for low-flow diversion and first flush projects were recommended to improve urban runoff water quality.

For each BMP, target pollutants were identified and implementation and operation & maintenance costs were developed. BMP development specific-

Project Highlights

- **Custom-tailored BMPs**—To address the high runoff volumes, several customized scale-up BMPs were presented to treat varying runoff needs. Technologies are based on EPA design, combined with Brown and Caldwell's wastewater and wet-weather treatment experience. Several disinfection options also were evaluated. BMPs were designed to reduce pathogens, trash and first-flush sediment loads to the coast.
- **Public Participation and Education**—A detailed action plan for the formal public education program was developed to increase the knowledge of target audiences regarding the impacts of urban runoff and ways to improve ocean water quality.
- **Program Prioritization and Fiscal Analysis**—An implementation priority was established for each of the program elements by evaluating the estimated water quality improvements, costs, cost effectiveness, implementation schedule, fiscal impact and the community's needs and goals. Multiple options for generating revenue to fund the new program were analyzed and recommended.

ly considered the effects on sediment transport and the need to allow beneficial sediment load (for downstream channel stability and beach replenishment) to continue down the watercourse.

Monitoring and Reporting Program—Both dry-weather and wet-weather monitoring programs were developed to collect reliable data for characterizing the quality of runoff, support the objectives of the IC/ID program and evaluate the need for future BMPs.

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