

DATE ISSUED: September 13, 2001

REPORT NO. 01-192

ATTENTION: Natural Resources and Culture Committee
Agenda of September 19, 2001

SUBJECT: Sanitary Sewer Survey: Windansea Beach Storm Drain

REFERENCE: (1) Manager's Report No. 99-71, dated April 14, 1999: "DNA Testing of Storm Drain Effluent"
(2) Memo to Mayor and Council dated January 5, 2000: "DNA Testing of Storm Drains"
(3) Manager's Report No. 00-70, dated April 5, 2000: Sanitary Sewer Survey

SUMMARY

THIS IS AN INFORMATION ITEM ONLY. NO ACTION IS REQUIRED ON THE PART OF THE COMMITTEE OR THE COUNCIL.

BACKGROUND

During 1999, the City of San Diego Metropolitan Wastewater Department and the County of San Diego Department of Environmental Health (DEH) undertook a cooperative study to identify sources of persistent bacterial contamination in urban runoff at several locations along the San Diego coastline. This effort had been approved by the NR&C Committee on April 21, 1999. Spanning both the dry and wet weather periods, this work was completed and a report of its findings made to the Mayor and Council on January 5, 2000.

The study found a variety of sources for E. coli at the various sites. During dry weather conditions, human E. coli DNA matches were generally most abundant, while during wet weather, dogs and birds were the predominant sources.

In response to the findings of a high percentage of bacteria being from human sources, the Metropolitan Wastewater Department proposed a study to evaluate the potential for the sewer system to be a source for this contamination during dry weather. Obvious other human sources include homeless encampments, sewer spills originating from private property, unsanitary disposal of diapers and RV holding tanks, and individuals using storm drains as toileting areas. On April 12, 2000, the NR&C Committee approved the proposed study by the Metropolitan Wastewater Department. Because much of this work would be developmental in nature, it was decided to select one of the sites where the DNA work was conducted as a test case. In reviewing the DNA testing results, Windansea Beach storm drain showed the largest percentage of human E. Coli matches, 44.7% during dry weather. This drainage basin also shares drainage characteristics similar to other beach areas and has an interceptor system to divert dry weather flows to the sewer. It is also smaller in size than the others, making the study easier to conduct. For these reasons, it was selected as the test location.

DISCUSSION

The Windansea Beach storm drain is located at Bonair Street in La Jolla at the intersection with Neptune Place. The Bonair watershed encompasses 1.4 square miles consisting primarily of single-family residential zones and vegetated natural areas. Approximately 4 miles of 12 to 45 inch diameter storm drain pipe and 8.5 miles of 6 to 30 inch diameter sewer pipe service this region. Eight drainage basins were delineated based on the storm drain system layout and on area topography. Eight wastewater sub-basins were also delineated based on direction of flow in the wastewater collection system. Potential sites of cross-contamination were identified based on the proximity of sewer lines and pump stations to storm drains.

Dry weather nuisance flow and wastewater samples were collected from 33 locations throughout the storm drain and sewer systems in the Bonair Watershed. Samples were collected two to three times per day over five consecutive days. Samples were analyzed for indicator bacteria and chemical wastewater tracers by the Metropolitan Wastewater Department laboratory. The daily system-wide average values for Escherichia coli were two to three orders of magnitude greater in the sewer system than in the storm drain system. Values for Enterococcus, total coliform, and ammonia were one to two orders of magnitude higher in the sewer system than in the storm drain system. Storm drain sampling locations with the highest incidence of values in excess of the daily system-wide average were selected for dye testing. Dye testing was also performed at sites lacking a high incidence of above-average values but having a high probability for cross-contamination based on the proximity of sewer pipes to storm drain.

Indicated locations were tested for cross-contamination by injecting Rhodamine WT dye into points in the sewer system upstream of possible storm drain contamination locations and monitoring levels of dye in the storm drain downstream of the possible point of contamination. Dye testing was repeated two to three times at each site. High concentrations of dye were detected at two sampling point locations in the storm drain system. This indicated a leak from the sewer into the storm drain. Further testing determined that the same leak was responsible for both observations.

It was concluded that municipal wastewater is contaminating urban runoff at the eastern end of Bonair Street due to a leak in the wastewater system. This leak most likely has an effect on the urban water quality at the Bonair Street outfall.

Subsequent to this finding, a CCTV camera was run through both the sewer line and the storm drain in the affected area. Limited evidence of inflow to the storm drain was observed, but cracks in the sewer line at several points appeared severe enough to allow wastewater to escape.

CONCLUSIONS

At least some of the bacterial contamination in the Windansea storm drain appears to have originated from the sewer system. The source of this contamination was found by a study of the wastewater and storm water systems and verified by a camera. In response to this, the sewer line in the affected area will be rehabilitated in order to rectify the leaks that were observed. Upon completion of this work the storm drain will be tested again to verify that the problem has been resolved.

On a larger scale and as a result of the new Municipal Storm Water Permit, Order No. 2001-01 issued by the California Regional Water Quality Control Board, the Storm Water Pollution Prevention Program is currently expanding the existing City's Dry Weather Analytical Monitoring and Coastal Storm Drain Outfall Monitoring. The Storm Water Pollution Prevention Program has sampled 43 dry weather locations throughout the City since 1993. Beginning in the spring of 2002, the dry weather program will be expanded from 43 sites to approximately 300 strategic locations. Beginning in November 2001, sampling of the coastal storm drain outfalls and the surf will be conducted at 13 sites during the winter months. The City's program will compliment the County Department of Environmental Health state mandated recreational water monitoring program. The Department of Environmental Health conducts analytical monitoring of beaches in the surf zone from April through October. The Storm Water Pollution Prevention Program routinely evaluates the Department of Environmental Health water quality data sets. Source identification investigations will be initiated for chronic water quality exceedences.

The MWWD and the Storm Water Pollution Prevention Program are currently working together to identify and abate sources of storm drain pollution. Where elevated bacteria levels are believed to be of wastewater origin, the MWWD investigates the situation and takes appropriate action. Based upon the increased monitoring by the Storm Water Pollution Prevention Program and coordinated efforts with the MWWD, this program significantly enhances the ability to identify and address potential wastewater infrastructure issues on a city-wide basis.

Respectfully submitted,

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