

CHAPTER 1

INTRODUCTION

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The Hyperion Treatment Plant (HTP) was mandated to conduct a comprehensive monitoring program of influent, effluent, and receiving waters of Santa Monica Bay by directive of the National Pollutant Discharge Elimination System (NPDES) Permit No. CA0109991, under the Waste Discharge Requirements (WDR's) contained in Order No. 94-021 (RWQCB 1994). This permit, which became effective May 11, 1994, was issued jointly by the California Regional Water Quality Control Board, Los Angeles Region (RWQCB) and U.S. Environmental Protection Agency, Region IX (USEPA). Order No. 94-021 expired on March 10, 1999, but under Section 122.6 of Title 40, Code of Federal Regulations and section 2235.4 of Title 23, California Code of Regulations, an expired permit continues in force until the effective date of a new permit, provided the permittee has made a timely submittal of a complete application for a new permit. The City of Los Angeles fulfilled this obligation on March 8, 1999 by filing a Report of Waste Discharge and applying to the RWQCB for the re-issuance of WDR's and an NPDES permit to discharge secondary-treated wastewater into Santa Monica Bay. The WDR's contained in Order No. R4-2005-0020 that serves as an NPDES permit for HTP was issued by the RWQCB and USEPA and became effective May 14, 2005 (RWQCB 2005).

As stated in the HTP NPDES permit, the receiving water monitoring program "must document water

quality at the 5-Mile Outfall, at reference stations, and at areas beyond the zone of initial dilution where discharge impacts might reasonably be expected." Each year, staff from the City of Los Angeles' Bureau of Sanitation, Environmental Monitoring Division (EMD) collect and assess vast amounts of oceanographic, bacteriological, chemical, physical, and biological data from the shoreline, receiving waters, and sediments of Santa Monica Bay. These data are collected under the extensive NPDES Permit marine monitoring program for the Hyperion Treatment Plant. This biennial assessment report presents summarized data collected from January 2005 through May 2005 (Order No. 94-021) and May 2005 through December 2006 (Order No. R4-2005-0020) and is submitted to the RWQCB and the USEPA, in compliance with the HTP NPDES permit.

Throughout the year, all raw data are tabulated and submitted to the RWQCB and USEPA on a monthly, quarterly, semiannual, and annual basis as mandated in the Hyperion NPDES Permit. After submission, these data are available to interested parties either through requests to these regulatory agencies or to the City of Los Angeles. The data collected include bacteriological information from nearshore and shoreline waters, extensive measurements of water column physical parameters, sediment and tissue chemistry, and community composition and species abundance of benthic macrofauna and demersal

fish and invertebrates. These data were collected, analyzed, and reported by the EMD staff (Appendix A).

HISTORICAL BACKDROP

Wastewater from the City of Los Angeles has been discharged into the waters of Santa Monica Bay since 1894 from the Hyperion Treatment Plant. As the population of Los Angeles grew, so did the flow of sewage to this site. Treatment practices at Hyperion changed to cope with population growth and the resultant increased sewage flows to the plant. In late 1951, Hyperion initiated full secondary treatment. By 1957, treatment volume increased to where HTP was discharging only partial secondary effluent into Santa Monica Bay through the 5-Mile Outfall. On November 23, 1998, following plant reconstruction and upgrades to the treatment process, Hyperion once again began discharging full secondary-treated effluent into Santa Monica Bay.

Since 1941, the monitoring program at HTP has evolved dramatically with changing treatment and disposal practices at the plant coupled with a changing regulatory environment and public concerns. Revisions and modifications of the monitoring program have continued through the present to improve the quality of information, reduce effort leading to non-informative data, and move toward a regional concept of monitoring. The scope of this program has grown over the years as flows from Hyperion increased, new facilities were constructed, methods of treatment and disposal changed, and environmental laws promulgated.

The NPDES monitoring program reported herein originally became effective in 1994, and subsequently in 2005 with significant modifications, and represents one of the largest in the country in terms of area covered, frequency and numbers of samples collected, and the numbers of analyses performed (Table 1-1). As detailed in HTP's NPDES Permit, the monitoring program was designed to ensure that discharges from HTP were in conformity with goals and objectives of the California Ocean

Plan (SWRCB 1990). The Ocean Plan contains water quality objectives for the coastal waters of California. Assessments of the data generated by this program and the previous program conducted under the 1987 permit have answered questions regarding the quality of Hyperion's effluent, the environmental impact of Hyperion's 5-Mile and 7-Mile Outfalls on Santa Monica Bay, recovery of sea-bottom communities in response to the abatement of sludge discharge from the 7-Mile Outfall and diminished solids in the 5-Mile Outfall effluent, and information on the safety of swimming in the Bay and consumption of its sportfish.

As a combined result of the information generated during the 1987 and 1994 NPDES Permit programs and the development of regionally-based monitoring in Southern California (SCBPP 1994), the NPDES ocean monitoring program was substantially modified in 1997 and 1998 to incorporate participation in several special projects. By coordinating efforts with other agencies and organizations, the scope of effort was increased to address new issues or old ones in greater detail than previously possible. These modifications included:

- (1) 1997 regional monitoring interlaboratory calibration exercises and special studies;
- (2) 1997 Retrospective Evaluation of Sediments of Santa Monica Bay with the United States Geological Survey (USGS) and the Southern California Coastal Water Research Project (SCCWRP);
- (3) 1998 Central Bight Water Quality Cooperative Program with Los Angeles County Sanitation Districts, Orange County Sanitation Districts and the City of Oxnard;
- (4) 1998 Santa Monica Bay Restoration Project's Seafood Consumption Study;
- (5) Southern California Bight 1998 Regional Monitoring Program.

In order to offset the extra effort required to conduct the above five special studies, the Regional Board and USEPA agreed to suspend some of Hyperion's normal NPDES monitoring program in 1997 and 1998. The details of these resource

Table 1-1. Summary of the City of Los Angeles' current ocean monitoring program for Santa Monica Bay, with 1998-99 modifications and 2005 permit changes.

Sampling Program	1994 Permit	1998 - 1999 Modifications	2005 Permit
Shoreline			
Total coliforms	17 stations; daily	18 stations; daily	Moved to MS4 Permit
Fecal coliforms	17 stations; daily	18 stations; daily	Replaced by <i>E. coli</i> and moved to MS4 Permit
Enterococcus	17 stations; 5x's/month	18 stations; 5x's/ month	Moved to MS4 Permit
<i>E. coli</i>	N/A	N/A	Substituted for fecal coliforms and moved to MS4 Permit
Nearshore			
Total, fecal, enterococcus	11 stations; surface 5x's/ month	No change	11 stations; surface & middepth, Annually
Water Quality, CTD			
Continuous profiles for D.O., temp., salinity, transmissivity, pH	31 stations	54 stations	54 stations, chlorophyll added to continuous profile
Ammonia-N	31 stations/ 4 depths	21 stations/ 4 depths	21 stations/ 4 depths
Total coliforms	N/A	N/A	21 stations/ 4 depths
Fecal coliforms	31 stations/ 4 depths	21 stations/ 4 depths	Replaced by <i>E. coli</i>
Enterococcus	N/A	N/A	21 stations/ 4 depths
<i>E. coli</i>	N/A	N/A	Substituted for fecal coliforms, 21 stations/ 4 depths
Visual observations	31 stations	21 stations	21 stations
Benthic Infauna			
	40 stations/ semi-annual; 5 replicates at 7 stations annually in summer	44 stations/ semi-annual; 24 fixed (3 replicates at 5 stations) plus 20 random (sets A and B sampled in alternate years)	44 stations/ annually; 24 fixed plus 20 random (sets A and B sampled in alternate years)
Sediment Chemistry			
	40 stations annually in summer (TOC, dissolved sulfides, grain size, metals, organics)	44 stations annually in summer; 24 fixed plus 20 random (sets A and B sampled in alternate years)	44 stations annually in summer for TOC and grain size; 9 stations annually in summer for metals and organics; 4 stations annually in summer for dissolved sulfides
Trawling			
Community Analysis	9 stations/ quarterly; 5 stations with 2 reps	No change	13 stations/ semi-annual; 7 fixed plus 3 random (sets A and B sampled in alternate years)
Tissue Bioaccumulation	5 stations/ semi-annual; hornyhead turbot; 3 reps, 6 ind/rep (muscle and liver)	No change	2 zones + nearfield; hornyhead turbot; 10 individuals composited (muscle and liver)
Rigfish			
Seafood Safety	2 stations (within ZID, outside ZID); 3x/year (spring, summer, winter); within ZID 3 species/ 3 ind., outside ZID 6 species/ 3 ind.; muscle only	No change	2 zones; 10 individuals (5 fish groups) composited; muscle only

exchanges along with the goals and objectives of each special study were discussed in the City of Los Angeles, Environmental Monitoring Division Biennial Assessment Report (CLA, EMD 1999). A similar suspension of some elements of HTP's normal NPDES monitoring program in 2003 was approved by the Regional Board and USEPA to offset the City's participation efforts for the Southern California Bight 2003 Regional Monitoring Survey (Bight'03).

PROGRAM CHANGES TO MONITOR EFFECTS OF FULL SECONDARY TREATMENT

As stated above, the Hyperion Treatment Plant has been discharging full secondary-treated effluent into Santa Monica Bay since November 1998. In order to assess the subtle changes in the benthic community as a result of the changes from partial to full secondary treatment and to determine the

geographic area around the outfall impacted by the discharge (“footprint”), a new benthic sampling program was submitted and approved by the Regional Board. This new program shifted the sampling array from the previous equidistant, depth contour-based grid to a combination fixed station/random station array (see Chapters 5 and 6). The implementation of this new benthic sampling program began in winter 1999. The benefits of this new program include the following:

- (1) Increased sensitivity to any changes resulting from implementation of full secondary treatment;
- (2) Elimination of scientifically unnecessary replication (reduction from 5 replicates to 3);
- (3) Elimination of artificially imposed depth effects;
- (4) Elimination of stations that do not provide meaningful information to the monitoring program (i.e., reduction of redundant information);
- (5) Implementation of a biannual sampling regimen; and
- (6) A 3% reduction in sampling and analytical effort with this program improvement while obtaining additional information and reducing duplications.

Data resulting from this new benthic program provided information necessary to significantly reduce the Hyperion Treatment Plant’s monitoring program in Santa Monica Bay in Hyperion’s new NPDES Permit No. CA0109991, Order No. R4-2005-0020, which became effective May 14, 2005 (Table 1-1). These monitoring reductions are due to the improved quality of effluent at HTP as a result of full secondary treatment and through recommendations made by the Southern California Coastal Water Research Project’s Model Monitoring Program (Schiff et al., 2001) and include the following:

- (1) Elimination of winter sampling and summer replicates for infauna;
- (2) Reduction of sediment chemistry analyses;
- (3) Elimination of spring and fall surveys,

elimination of all replicate samples, and elimination of stations A1 and A3 for trawl sampling;

- (4) Reduction of composited hornyhead muscle and liver tissue samples for the bioaccumulation survey;
- (5) Elimination of winter and spring rig-fishing surveys for the local seafood safety survey, reduction of summer sampling to years 1, 3, and 5 of the permit, change from stations to zones and use of specific species groups (see Chapter 7);
- (6) Reduction of Inshore Bacteriological Sampling; from 5X/month to annual;
- (7) Transfer of requirements for shoreline sampling from HTP NPDES Permit to the Municipal Separate Storm Sewer System (MS4) permit;
- (8) Development of Special Studies to focus on specific effects or development of monitoring techniques for effluent, receiving water, discharge impacts, or ocean processes.

This “reduced” effort is being redirected toward more environmentally significant and higher priority issues such as the total maximum daily load (TMDL), watershed programs, regional monitoring, Ballona Lagoon, and Ballona Wetlands monitoring programs.

LITERATURE CITED

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CLA, EMD. See City of Los Angeles, Environmental Monitoring Division.

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RWQCB. See Regional Water Quality Control Board, Los Angeles Region.

SCBPP. See Southern California Bight Pilot Project.

Schiff, Kenneth, J. Brown and S. Weisberg. 2001. Model Monitoring Program for Large Ocean Discharges in Southern California. Southern California Coastal Water Research Project, Westminster, California. Technical Report 357. 105 pp.

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SWRCB. See California State Water Resources Control Board.