

CHAPTER 1

INTRODUCTION

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The Hyperion Treatment Plant (HTP) during the years 2003-2004 conducted a comprehensive monitoring program of influent, effluent, and receiving waters of Santa Monica Bay under the directive of the National Pollutant Discharge Elimination System (NPDES) Permit No. CA0109991, Order No. 94-021. This permit, which became effective May 11, 1994, was adopted by the California Regional Water Quality Control Board, Los Angeles Region (Regional Board) and the U.S. Environmental Protection Agency, Region IX (USEPA).

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 shoreline, receiving waters, and sediments of Santa Monica Bay. These data are collected under the extensive NPDES marine monitoring program for the Hyperion Treatment Plant. This biennial assessment report presents summarized data collected from January 2003 through December 2004 and is submitted to the California Regional Water Quality Control Board, Los Angeles Region

and the U.S. Environmental Protection Agency, Region IX, in compliance with the HTP NPDES Permit.

Throughout the year, all raw data are tabulated and submitted to the Regional Board 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 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 infauna 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, Hyperion once again began discharging full secondary treated effluent into Santa Monica Bay. At the same time, associated marine monitoring programs were conducted to assess environmental effects of effluent disposal into the receiving waters of Santa Monica Bay from Hyperion Treatment Plant.

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. These 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 became effective in 1994 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 contained 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 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 Cooperative Water Quality Program with Los Angeles County Sanitation Districts and the Orange County Sanitation Districts
- (4) 1998 Santa Monica Bay Restoration Project's Seafood Consumption Study, and
- (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 Treatment Plant's normal NPDES monitoring program in 1997 and 1998. The details of these resource 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).

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

MONITORING PROGRAM	NO. OF STATIONS / REPLICATES	SAMPLE FREQUENCY	SAMPLES PER YEAR	ANALYSES
Microbiology Shoreline	18 / 1	Daily	6,570	Total and <i>E. coli</i> ; enterococcus 5x/s per month
Inshore	11 @ 2 depths	5x's per month	1,296	Total and fecal coliforms and enterococcus
Water Quality Profiles	54	Quarterly	216	CTD
Discrete samples	21 @ 4 depths	Quarterly	336	Fecal coliform and ammonia-N
Benthic macrofauna Winter	44	Semiannual	44	ID, biomass, community analysis
Summer	44 w/ 2 replicates at 5 stations		54	
Sediment Chemistry	44 summer	Annual	44	TOC, dissolved sulfide, grain size, metals, BNA's, chlorinated hydrocarbons, volatile organics
Trawling Community	9 w/2 replicates @ 5 stations	Quarterly	56	Count, measure and weigh all fish and invertebrates, community analysis
Tissue Analysis Trawl-caught fish	5 stations w/3 reps	Semiannual	60	Muscle and liver tissue for metals, chlorinated hydrocarbons, BNA's, %lipids
Trapped invertebrate	3 stations w/3 reps	Semiannual	18	Muscle tissue for metals, chlorinated hydrocarbons, BNA's, %lipids (Includes crab hepatopancrease which, due to the absence of an accepted protocol, this tissue was not dissected and analyzed.)
Rig-caught fish ZID	2 stations: 3 species w/3 reps	3x's per year	27	Metals, chlorinated hydrocarbons, BNA's, %lipids
Outside ZID	3 species w/6 reps		54	

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 ("footprint") that is impacted by the discharge, 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 HTP's new NPDES Permit No. CA0109991, Order No. R4-2005-0020, which became effective May 14, 2005. These monitoring reductions are due to the improved quality of effluent at the 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) Elimination of spring and fall surveys, elimination of all replicate samples, and elimination of stations A1 and A3 for trawl sampling;
- (3) Reduction of composited muscle and liver hornyhead tissue samples for bioaccumulation survey;

- (4) Elimination of winter and spring rig-fishing surveys for local seafood safety survey.

This "reduced" effort is being redirected toward more environmentally significant and higher priority issues such as the total maximum daily load (TMDL), Watershed Protection programs, Regional Monitoring, Ballona Lagoon, and Ballona Wetlands monitoring programs.

LITERATURE CITED

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