

CHAPTER 1

INTRODUCTION

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The Terminal Island Treatment Plant (TITP) was mandated to conduct a comprehensive monitoring program of influent, effluent, and receiving waters of the Outer Los Angeles Harbor by directive of the National Pollutant Discharge Elimination System (NPDES) Permit No. CA0053856, under Waste Discharge Requirements (WDRs) contained in Order No. R4-2005-0024. This permit, which became effective May 27, 2005, was adopted by the California Regional Water Quality Control Board, Los Angeles Region (RWQCB). On September 7, 2007, following the completion of the major operational upgrade of the Advanced Wastewater Treatment Facility (AWTF), the official name of the Terminal Island Treatment Plant was changed to the Terminal Island Wastewater Reclamation Plant (TIWRP).

As directed by the RWQCB Monitoring and Reporting Program No. CI-2171 (unless otherwise specified), "Quarterly analysis and sampling shall be performed during the 1st quarter (January, February, and March), the 2nd quarter (April, May, and June), the 3rd quarter (July, August, and September), and the 4th quarter (October, November, and December). Semiannual analyses and sampling shall be performed during the 1st quarter (January, February, and March) and the 3rd quarter (July, August, and September). Annual analyses and sampling shall be performed during the 3rd quarter (July, August, and September). In the event that required monitoring

is not conducted during the specified period of time, it is the responsibility of TIWRP to notify the RWQCB stating the reason that monitoring could not be conducted and to obtain approval from the Executive Office for an alternative monitoring schedule. All results of quarterly, semiannual, and annual analyses are to be reported in the monthly monitoring report following the completed analysis.

Reporting requirements include monthly, annual, and biennial monitoring reports submitted to the RWQCB. The monthly reports, to be submitted by the fifteenth day of the third month following each monthly monitoring period, include water quality of receiving waters and microbiological monitoring (shoreline and harbor stations) data. An annual report, discussing the previous year's effluent and influent monitoring data, is to be submitted to the RWQCB by the 15th of April of the year following data collection. A biennial report, discussing the previous two year's Outer Los Angeles Harbor water quality, benthic sediments and organisms (infauna and sediment chemistry, trawling, and tissue chemistry), and microbiological monitoring (shoreline and harbor surface waters), is to be submitted by the first of August of every other year, beginning in 2006, to the RWQCB and USEPA Region IX. The in-depth analysis of biological and chemical data should follow the recommendations in "Design of 301(h) Monitoring Programs for

Municipal Wastewater Discharges to Marine Water” (USEPA 1982) and the Model Monitoring Program guidance document (Schiff, et al. 2001). Temporal and spatial trends in the data are to be analyzed in this report, with an emphasis on comparing stations with respect to the distance from the outfall and the data collected during previous years. Appropriate statistical tests and indices, subject to approval by the RWQCB Executive Officer, are to be calculated and included within the annual report.

Changes to the original 1993 NPDES sampling programs as a result of the construction of Pier 400 and the issuance of TIWRP’s new 2005 NPDES permit, are outlined in Table 1-1. New programs added to the 2005 permit include toxicity testing for both acute (2 stations) and chronic (2 stations) effects (performed on a quarterly basis) and participation in the Model Monitoring Program (Schiff, et. al. 2001). This document provided the principles, framework, and recommended design for effluent and receiving water monitoring elements which guided the development of the current TIWRP monitoring program (RWQCB 2005).

The Model Monitoring Program (Schiff, et. al. 2001) document is comprised of three parts that entail a range of spatial and temporal scales: (1) core monitoring; (2) regional monitoring; and (3) special studies. The “core monitoring” component is represented by the 2005 TIWRP NPDES permit issued by the RWQCB. The “regional monitoring” component is the required participation by the City of Los Angeles as outlined in the NPDES permit. The “regional monitoring” programs include participation in future Southern California Bight regional surveys based on levels of effort in prior surveys (CLA, EMD 1994, 1998, 2003) and the Santa Monica Bay Restoration Commission’s Seafood Safety Survey. The last component, “special studies”, are to be determined by the City of Los Angeles, RWQCB, and USEPA. These “special studies” are to focus on questions regarding specific effects or development of monitoring techniques that are to be of short duration and/or small scale, though multiyear studies could be needed (RWQCB 2005). During this reporting period

three special studies for TIWRP were approved by the RWQCB and USEPA and implemented by the Environmental Monitoring Division (EMD): 1) “Assessing Levels of Ammonia, MBAS (Methylene Blue Active Substances), and Trace Metals in the Ambient Waters of the Los Angeles Harbor;” 2) “White Croaker Tissue Study (monitor levels of DDT isomers, PCB congeners, and mercury in white croaker (*Genyonemus lineatus*) tissue collected at three popular fishing piers in Southern California);” 3: “Determining Total Organic Halides (TOX) in Los Angeles Harbor Sediment Samples.”

As mandated by the NPDES permit (RWQCB 1993), annual reports discussing the effluent quality of TIWRP and the comprehensive receiving water monitoring program were published for samples collected from 1993 through winter 1995 (CLA, EMD 1994-1996). These reports were based on the listed monitoring stations found in the NPDES permit (RWQCB 1993; Table 1-1) for all aspects of the receiving water monitoring program. Beginning in late 1994, dredge and fill activities associated with the Pier 300/400 Implementation Program (PIP) caused major disruptions in the TIWRP NPDES-mandated receiving-water monitoring program in Outer Los Angeles Harbor. Accessibility to sampling stations was either restricted or completely eliminated. The truncation of the existing TIWRP outfall terminus to the edge of Pier 300 and the initiation of dredge activities for the new TIWRP outfall extension through the future site of the Increment 3 landfill for Pier 400 restricted access to the terminus of the new discharge site (Figure 1-1). As a result, it was increasingly difficult to accurately assess the impacts of the discharge of TIWRP effluent into Outer Los Angeles Harbor. When further restrictions occurred with the progression of Increment 2 construction activities for Pier 400 (ACE 1992), a Los Angeles Harbor Interim Monitoring Program (that accounted for PIP) was proposed and submitted to the RWQCB in September 1995 (Table 1-1). The program was implemented upon approval by the RWQCB. Annual reports for 1995 and 1996 (CLA, EMD 1996-1997) that discussed the Outer Los Angeles Harbor comprehensive monitoring program included the summer 1995

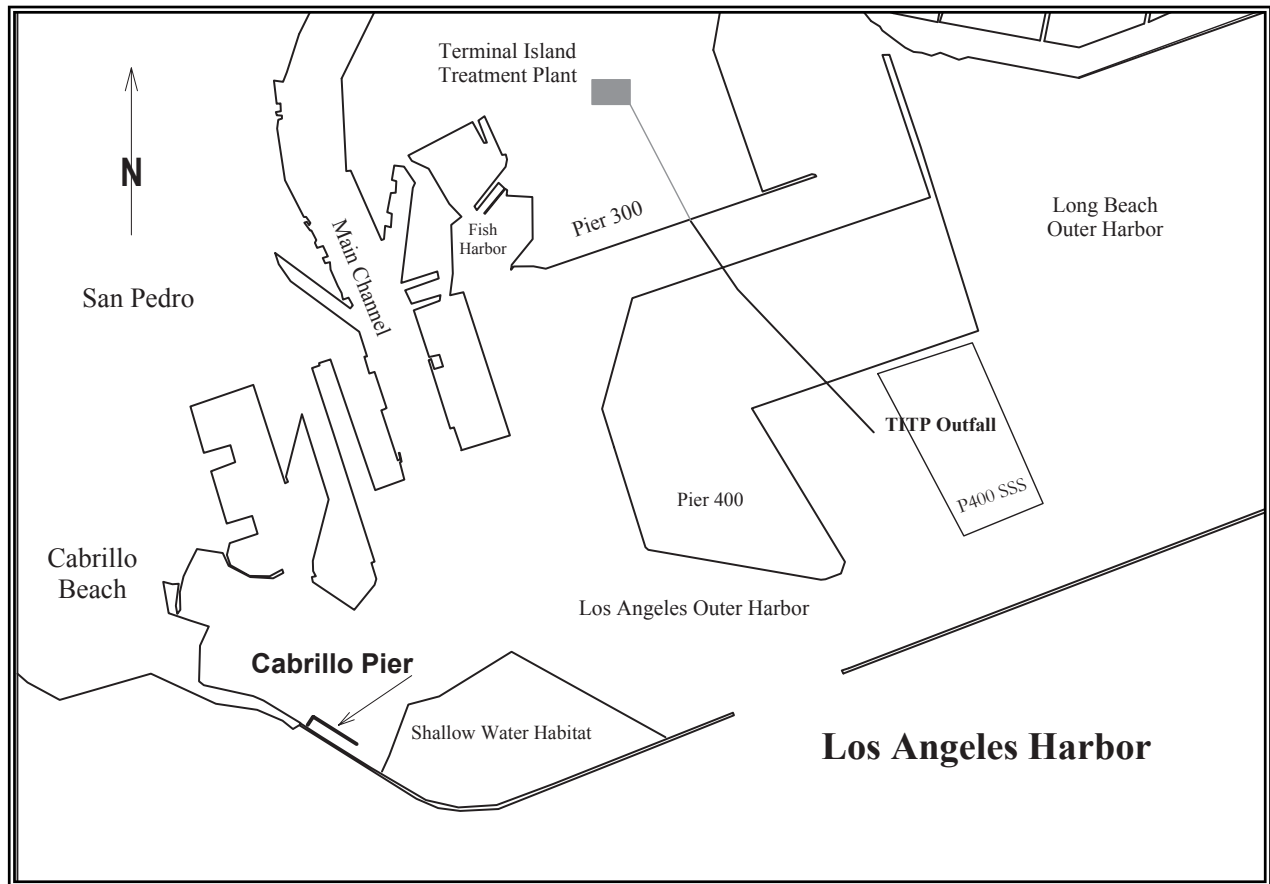


Figure 1-1. Map of Los Angeles Harbor.

and winter 1996 sampling that was based on the Interim Monitoring Program. By July 1996, the placement of the new TIWRP outfall extension in the proposed fill area of Pier 400 had been completed. In addition, the continued progression of rock-dike construction enclosing the Increment 2 phase of Pier 400 had created a new shoreline configuration for the Outer Los Angeles Harbor. This reconfiguration of Outer Los Angeles Harbor caused the complete elimination of a major portion of the original 1993 NPDES-mandated sampling stations, thus affecting the entire marine monitoring program and necessitating a re-evaluation of the entire program.

These newly proposed modifications to the marine monitoring program allowed the EMD to better assess environmental impacts due to the discharge of TIWRP secondary effluent at its new terminus off the southeastern corner of Pier 400. The Post-

Pier-400 Monitoring Program was submitted to the RWQCB in July 1996 (Table 1-1). The program was implemented in July 1996 with the approval of the RWQCB. Since the 1996 summer survey, with the exception of the 1998 and 2003 summer survey's, the annual reports that assessed the data collected for the TIWRP monitoring program (CLA, EMD 1997-2003 and this report) have been based on the Post-Pier-400 Monitoring Program.

At the same time that the new Post-Pier-400 Monitoring Program was initiated, treatment at TIWRP was upgraded. Since 1977, TIWRP had been a full secondary treatment facility. TIWRP was upgraded to include a filtration system, which became operational in December 1996. Since 1997, the effluent discharged from TIWRP to Outer Los Angeles Harbor has been filtered secondary-treated wastewater that, although lacking disinfection through chlorination, is considered tertiary treatment

Table 1-1. Summary of the Los Angeles Harbor Monitoring Programs, including the 1993 NPDES requirements, the Interim program, the Post-Pier 400 monitoring program, and the new 2005 NPDES requirements.

Sampling Program	1993 NPDES Permit	Interim Monitoring Program	Post-Pier 400 Monitoring Program	2005 NPDES Permit
Harbor Micro	9 stations, surface & depth; 5X's/month; total, fecal, entero	6 stations, surface and depth; 5X's/month; total, fecal, entero	Plume Tracking: 14 stations, fecal, surface, monthly. Water Quality Micro: 7 stations, total, fecal, entero, surface, 5X's/month.	Plume Tracking: 7 stations, fecal, surface, monthly. Water Quality Micro: 7 stations, total, fecal, entero, surface, 5X's/month.
Water Quality: CTD	22 stations; monthly	13 stations; monthly	23 stations; monthly	20 stations; monthly
Water Quality: Discrete Sampling	5 stations quarterly; 2 depths for ammonia & total, fecal, entero	5 stations quarterly; 2 depths for ammonia & total, fecal, entero	Plume Tracking: 14 stations, fecal, surface, monthly	Plume Tracking: 12 stations, fecal, surface, quarterly
Benthic: Infauna	18 stations; 2X's/year	6 stations; 2X's/year	13 stations; 2X's/year	11 stations; 1X/year
Benthic: Sediment Chemistry	18 stations; sulfides, TOC, & grain size- 2X's/year; priority pollutant analysis - 1X/year	6 stations; sulfides, TOC, & grain size- 2X's/year; priority pollutant analysis - 1X/year	13 stations; grain size 2X's/year; TOC, sulfides, & selected priority pollutants 1X/year	11 stations; grain size, TOC, sulfides, & selected priority pollutants 1X/year
Trawling	5 stations; 4X's/year	4 stations; 4X's/year	6 stations; 4X's/year	6 stations; 2X's/year
Tissue Chemistry: Fish Collection	10 croakers + 10 sportfish from Cabrillo Pier & Horseshoe Kelp 2X's/year	No sample required	5 croakers from each of 3 sites (outfall area, Cabrillo Pier area, and outside Harbor); muscle dissection & analysis annually	10 croakers from vicinity of outfall area; muscle & liver dissection & analysis annually; 10 sportfish from vicinity of outfall area; muscle dissection & analysis annually
Tissue Chemistry	Nine metals, Total DDT, DDT derivatives, total PCB, PCB derivatives, wet weight, % lipids	Nine metals, Total DDT, DDT derivatives, total PCB, PCB derivatives, wet weight, % lipids	Nine metals, Total DDT, DDT derivatives, total PCB, PCB derivatives, BNA, TOX, wet weight, % lipids	Total DDT, DDT derivatives, total PCB, PCB derivatives, wet weight, % lipids

(personal communication Dave Gumaer, TIWRP Shift Superintendent). In 1999, construction of an Advanced Wastewater Treatment Facility (AWTF) was initiated and completed in October 2001. The AWTF was designed to treat the TIWRP filtered secondary effluent further for the plant's water reclamation project as part of the Harbor Water Recycling Project/Dominguez Gap Barrier Project (RWQCB 2003). During 2002 and 2003, about 5 MGD of the TIWRP effluent received tertiary treatment (micro-filtration and reverse osmosis) at

AWTF before discharge into the Harbor.

Following the implementation of the Post-Pier-400 Monitoring Program, the discharge of effluent from TIWRP has averaged 15.9 (1996), 16.3 (1997), 16.6 (1998), 15.1 (1999), 15.7 (2000), 15.2 (2001), 15.1 (2002) 15.3 (2003), 15.6 (2004), 16.0 (2005), 14.5 (2006), and 14.8 (2007) MGD. The reduction of effluent volume in 2006 and 2007 is the result of diversion to the AWTF. Results from the Post-Pier-400 Monitoring Program (CLA, EMD 1997-2006;

and this report) have not indicated any effect from the TIWRP effluent on the harbor environment due to the masking effect created by the past dredging activities and fill operations in close proximity to the southeast corner of Pier 400 and the outfall terminus. Through 2000, results of sediment grain size and infauna and trawl community analyses indicated a continuing impact in relation to the past PIP construction activities; however, continued signs of recovery within the infaunal community have been noted in the Outer Los Angeles Harbor (CLA, EMD 2000-2006).

The final stage of dredging and landfill for Pier 400 was completed in April 2000. The disruptions that have occurred since 1994 in assessing the potential impacts of the TIWRP effluent discharge into Outer Los Angeles Harbor have resulted in modifications of the original permit requirements creating three separate monitoring programs (Table 1-1). With the completion of the Pier 400 construction, all required NPDES samples were collected pursuant to the Post-Pier-400 Monitoring Program between the years 2000 – 2002 without the disruption that had previously been incurred by the location of the dredge vessel or floating dredge pipe positioned over established sampling sites.

In October 2000, the Port of Los Angeles (POLA) authorized the Channel Deepening Project for Inner Los Angeles Harbor (ACE 2000a). This project would continue the deepening of shipping channels into Inner Los Angeles Harbor that were already completed in the Outer Los Angeles Harbor where dredged material was utilized to create Pier 400 (ACE 1992). The Channel Deepening Project began dredging operations in September 2002, with an initial estimated completion date of December 2004 (ACE 2003). This project was initiated to dredge the sediments from the primary navigation channels in Los Angeles Harbor (Los Angeles Main Channel, West Basin, East Channel, East Basin, and Cerritos Channel) to increase depths to accommodate the newer, deeper draft container vessels that will be docking within POLA. To accommodate the resulting dredged sediments several disposal alternatives were developed by the

Los Angeles Harbor Department (ACE 2000a, 2000b). One of these was the Pier 400 Submerged Storage Site (P400 SSS). POLA proposed to use this site as a temporary submerged storage site for clean, non-toxic sediments that were suitable for discharge at the LA-2 ocean disposal site. The dredge disposal site is approximately 120 acres in size and is located at the southeast edge of Pier 400, adjacent to the existing TIWRP outfall pipe. The P400 SSS will be used as a storage area for up to 3.9 million cubic yards (mcy) of sediments for future fill material at other sites in LAH, or will be left as base for construction of a fill that would expand Pier 400 (NMFS 2000; ACE 2000b, 2003). POLA entered into an interagency agreement which specifies that the P400 SSS will remain undisturbed for a minimum period of three years following construction, during which it will function as a temporary shallow water habitat. After this time, the deposited sediments could be reused (CSTF 2002). There has been no established time frame for the reuse of sediment from this storage site.

Construction of the P400 SSS was initiated in September 2002. With the placement of marker buoys denoting the area of construction, an immediate impact upon the Post-Pier 400 Monitoring Program was observed for water quality and trawl sampling locations. Construction involved the creation of a submerged dike that would be no higher than -15 feet (4.6 m) mean lower low water to contain the dredge material (ACE 2000a). Due to the area of construction for the P400 SSS, specific stations that are part of the TIWRP NPDES permit could not be accessed in November and December of 2002. The water quality stations HW21, HW22, HW41, HW42, and HW52 (Figure 4-1, this report) could not be reached due to construction activities. Similarly, the trawl stations HT7, HT8, HT9, and HT11 (Figure 7-1, this report) could not be sampled because the trawl transects of these stations occurred within the area under construction.

During 2003, access to the required TIWRP NPDES sampling stations for water quality (HW22, HW42, and HW52) and trawl (HT7, HT8, and HT11) was permanently blocked following the completion of

the construction of P400 SSS. The obstructed trawl station HT7 was relocated and stations HT8 and HT11 were replaced with stations HT12 and HT13 (see Figure 7-1, this report). In addition to these stations, the permanent loss of two infaunal stations (HM1 and HM5) occurred due to the deposition of dredged sediments into the P400 SSS.

As with the Southern California Bight 1998 Regional Monitoring Program (CLA, EMD 1999), changes occurred in the NPDES-required sampling program during the 2003 summer survey. These changes were a result of the Southern California Bight 2003 Regional Marine Monitoring Program (Bight '03) undertaken between July and September 2003. To participate in the Bight '03 regional survey, the City of Los Angeles, with the consent of the RWQCB, resource exchanged a portion of their required NPDES permit sampling effort from the 2003 summer survey (July-September) for samples to be collected as part of this regional survey.

Studies have shown that the time period for an area to recover to original population levels after being affected by dredging varies between 1-3 years (Reish 1961, 1963; HEP 1976; Oliver et al. 1977; Currie and Parry 1996; Kenny and Rees 1996; Ray 2000, Ellis 2003). When dredging activities for Pier 400 were completed in the vicinity of the TIWRP outfall in April 2000, it was felt that any potential effects of the TIWRP effluent on the marine communities of Outer Los Angeles Harbor could possibly begin to be assessed by the end of 2002. In early 2003, with the completed construction of the P400 SSS having eliminated portions of the required TIWRP NPDES water quality, infauna, and trawl stations, the chance to begin assessing the potential effect of the TIWRP effluent was again compromised. A new extended period of recovery will be required before the potential impacts of the TIWRP effluent on the harbor environment can be assessed. With the continued progression of deposition of dredged Los Angeles Harbor sediments and removal of these stored sediments as fill material for continuing Los Angeles Harbor construction projects, habitat recovery around the TIWRP outfall may not be possible in the foreseeable future.

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