



THE CITY OF SAN DIEGO

**Annual
Receiving Waters Monitoring
& Toxicity Testing
Quality Assurance Report
2014**



**City of San Diego
Ocean Monitoring Program**

**Public Utilities Department
Environmental Monitoring and Technical Services Division**

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Prepared by:

**City of San Diego
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Public Utilities Department
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2014 Quality Assurance Report

INTRODUCTION

The Environmental Monitoring and Technical Services (EMTS) Division of the City of San Diego's Public Utilities Department performs comprehensive Quality Assurance/Quality Control (QA/QC) activities to ensure the accuracy and reliability of receiving waters monitoring and toxicity testing data provided to regulatory agencies in compliance with the reporting requirements specified in several National Pollutant Discharge Elimination System (NPDES) permits (Table 1). These QA/QC procedures assure the quality of field sampling, laboratory analysis, record keeping, data entry, electronic data collection/transfer, as well as data analysis and reporting. The procedures are regularly reviewed and revised as necessary to reflect ongoing changes in NPDES permit requirements, sample collection, methods, technology, and applicability of new analytical methods.

Details of the division's QA/QC program for receiving waters monitoring and toxicity testing is documented in a separate Quality Assurance Plan that is currently under revision (City of San Diego, in prep). Additionally, the EMTS Division maintains certification through the International Organization for Standardization 14001 Environmental Management Systems program (ISO 14001). As a part of continuation in the ISO 14001 certification process, EMTS underwent and passed an external audit in 2014 conducted by a third-party auditor. This report summarizes the QA/QC activities that were conducted during calendar year 2014 by EMTS staff in support of NPDES permit requirements for receiving waters monitoring and toxicity testing for the City's Point Loma Wastewater Treatment Plant and South Bay Water Reclamation Plant, as well as similar ocean monitoring activities required for the South Bay International Wastewater Treatment Plant owned and operated by the International Boundary and Water Commission, U.S. Section.

FACILITIES AND STAFF

The EMTS Division includes laboratories from three different sections that participate in the receiving waters monitoring activities associated with the above NPDES permits: (1) the Marine Biology and Ocean Operations section (Marine Biology and Toxicology Labs); (2) the Microbiology section (Marine Microbiology Lab); (3) Environmental Chemistry Services section. The Marine Biology, Toxicology and Marine Microbiology Labs are located at the Division's laboratory facility located at 2392 Kincaid Road, San Diego, CA 92101. Staff scientists of these three labs are responsible for conducting most field sampling operations and subsequent biological and oceanographic laboratory assessments associated with the City's Ocean Monitoring Program (e.g., water quality, benthic sediments and macrofauna, trawl-caught fishes and invertebrates, contaminant bioaccumulation in fishes). Laboratory personnel are organized into different work groups based on their major work responsibilities and areas of expertise (see Appendices A.1, A.2). Brief descriptions of the areas of emphasis for each work group are given in the following sections.

The Environmental Chemistry Services (ECS) section is located at other City facilities and is responsible for performing chemical analyses of the various seawater, sediment and fish tissue samples collected by Marine Biology staff. Descriptions of the ECS section and their QA procedures are presented in a separate QA report each year.

Table 1

NPDES permits and associated Orders issued by the San Diego Regional Water Quality Control Board for the City of San Diego's Point Loma Wastewater Treatment Plant (PLWTP) and South Bay Water Reclamation Plant (SBWRP), and the U.S. Section of the International Boundary and Water Commission's South Bay International Wastewater Treatment Plant (SBIWTP).

Facility	NPDES Permit No.	Order No.	Effective Dates	Notes
PLWTP	CA0107409	R9-2009-0001	August 1, 2010 – July 31, 2015	
SBWRP	CA0109045	R9-2013-0006	April 4, 2013 – April 3, 2018	Amended by Order R9-2014-0071 on November 12, 2014
SBIWTP	CA0108928	R9-2014-0009 ^a	August 1, 2014 – July 31, 2019	Amended by Order R9-2014-0094 on November 12, 2014

^a Replaced previous Order No. 96-50 effective through July 31, 2014

Marine Biology and Ocean Operations

Data Management and Reporting (DM&R): The primary responsibility of the DM&R work group is to analyze and report receiving waters monitoring data. This includes data QA, data analysis, and the interpretation of results from the receiving waters monitoring activities and other contract work. DM&R personnel work closely with the IT/GIS group (described below) to perform QA of all receiving waters monitoring data that are entered into the laboratory's database. Various software packages for data management, data manipulation, statistical analysis, and presentation are used to manage and analyze data from every aspect of receiving waters monitoring. The results and interpretation of these analyses are reported to regulatory and contract agencies in the form of monthly and annual reports.

Information Technology and Geographic Information Systems (IT/GIS): The IT/GIS work group is primarily responsible for the administration of the lab's database, performing geospatial data analysis, and generating all map products needed for the ocean monitoring program. Daily responsibilities include entry and archiving of ocean monitoring data, validation of data accuracy, maintenance of database structure and integrity, oversight of database access/security issues, and management of database enhancements. This group is also responsible for IT project planning, workflow automation programming, and website maintenance to support Marine Biology and other EMTS laboratory staff.

Ocean Operations: This work group comprises two subsections, Ocean Operations and Vessel Operations. Ocean Operations personnel oversee and conduct water quality sampling, benthic sediment and macrofauna sampling, trawling and rig-fishing, diving operations, and ocean outfall inspections. These staff members maintain and calibrate all oceanographic instrumentation, SCUBA equipment, and the laboratory's remotely operated vehicle (ROV). Vessel operations personnel are primarily responsible for the operation and maintenance of the City's two monitoring vessels (*Oceanus* and *Monitor III*). When in port, the group's boat operators schedule and oversee all regular vessel maintenance as well as any modifications that may become necessary. While at sea, they are responsible for ensuring the safety of the crew, locating and maintaining position at monitoring stations, and assisting with various deck activities during field operations.

Table 2

ELAP certifications for EMTS Division Marine Microbiology and Toxicology labs located at 2392 Kincaid Road, San Diego, CA. 92101.

Laboratory	Phone	EPA Lab ID	ELAP Cert. No.
Marine Microbiology	619-758-2360	CA01393	2185
Toxicology	619-758-2348	CA01302	1989

Taxonomy: The Taxonomy work group coordinates and manages the processing of all benthic macrofauna and trawl invertebrate samples, maintains the taxonomic literature and voucher collections, and conducts taxonomic training. In addition, taxonomy staff members produce in-house identification sheets and keys for important species and other taxa. Members of this group participate in a regional taxonomic standardization program and perform all QA/QC procedures to ensure the accuracy of the taxonomic identifications made by laboratory personnel.

Toxicology: The Toxicology Laboratory is certified by the State of California Department of Health Services, Environmental Laboratory Accreditation Program (ELAP), which is renewed on a biennial basis (see Table 2). Toxicology personnel are responsible for conducting all acute and chronic toxicity testing required by the City's NPDES permits and contractual obligations. Primary responsibilities include collection of wastewater effluent or other types of samples, maintaining test organisms and laboratory supplies, calibration of test instruments, conducting acute and chronic bioassays, record keeping, and the statistical evaluation, interpretation and reporting of all toxicology data. In addition, the Toxicology Lab maintains a separate Quality Assurance Manual in accordance with ELAP requirements that contains up-to-date revisions to reflect current laboratory practices and procedures, and to ensure timely document version control.

Marine Microbiology

Marine Microbiology: The Marine Microbiology Laboratory is also certified by ELAP (see Table 2). This lab is responsible for the identification and quantification of bacteria found in environmental samples. Responsibilities include the preparation of microbiological media, reagents, sample bottles, supplies and equipment, the collection of field samples along the shore, and a variety of laboratory analyses to measure concentrations of fecal indicator bacteria (e.g., membrane filtration, multiple tube fermentation, and Colilert-18 and Enterolert chromogenic substrate analyses) as appropriate to the sample type and as required by the NPDES permits. In addition, the group is responsible for the physical maintenance and quality assurance of large instruments such as autoclaves, incubators, water baths, ultra-freezers, a bacteriological safety cabinet, and three reagent-grade water point-of-use systems. Members are also responsible for developing sampling, analytical, and quality assurance protocols for special projects or studies involving microbiology.

Members of the Marine Microbiology Lab also provide for monitoring, surveillance, control and prevention of insects and other pests that are capable of transmitting diseases or causing harm to humans. The primary methods of control include environmental conservation measures, education, and water management techniques aided by appropriate chemical and biological control technology. The vector control program uses methods to census animal populations to determine control effectiveness and trends. Areas of responsibility include wastewater treatment plants, pump stations,

buildings and office facilities. Biological assessments (bioassessments) of urban creeks and streams are conducted to evaluate and analyze short and long-term impacts of sewage spills into watersheds and receiving waters. Field samples of aquatic communities are collected and field water quality indicators are measured. Physical habitat characteristics and anthropogenic changes are evaluated. Measures, evaluations, and comparisons are made to yield relative ratings of conditions within a specified community.

SCOPE OF WORK

Treated effluent from the Point Loma Wastewater Treatment Plant (PLWTP) is discharged to the Pacific Ocean through the Point Loma Ocean Outfall (PLOO), whereas the South Bay Ocean Outfall (SBOO) accepts commingled effluent from the South Bay Water Reclamation Plant (SBWRP) and South Bay International Wastewater Treatment Plant (SBIWTP). The separate NPDES permits associated with each of these treatment facilities define the requirements for toxicity testing and the monitoring of receiving waters for each discharge site. The permits define the sampling plans, compliance criteria, laboratory analyses, statistical analyses and reporting guidelines.

The core receiving waters monitoring requirements for the Point Loma and South Bay monitoring programs that were in effect throughout calendar year (CY) 2014 are summarized in Tables 3 and 4, respectively, while the permanent, fixed position sampling sites for each program are shown in Figure 1. These core monitoring activities include: (1) weekly sampling of ocean waters from recreational areas located along the shoreline and within the Point Loma and Imperial Beach kelp beds to assess nearshore water quality conditions, (2) monthly or quarterly sampling of ocean waters at offshore sites in order to document water quality conditions throughout the region, (3) semiannual or annual benthic sampling to monitor sediment conditions and the status of resident macrobenthic invertebrate communities, (4) quarterly or semiannual trawl surveys to monitor the ecological health of demersal fish and megabenthic invertebrate communities, and (5) semiannual or annual collection of fish tissue samples to monitor levels of chemical constituents that may have ecological or human health implications. Toxicity testing presently consists of acute and chronic bioassays of influent, effluent, and groundwater samples. The general toxicity testing required by the NPDES permits for the PLWTP and SBWRP are outlined in Table 5. The results of these receiving waters monitoring activities and effluent toxicity tests are analyzed and presented in various regulatory reports that are submitted to the San Diego Regional Water Quality Control Board (SDRWQCB).

In addition to the above core monitoring efforts, the City also conducts “strategic process studies” (i.e., special projects) as part of its regulatory requirements and as defined by the Model Monitoring Program developed for large ocean dischargers in southern California (Schiff et al. 2001). These special studies are determined by the City in coordination with the SDRWQCB and the United States Environmental Protection Agency (USEPA), and are generally designed to address recommendations for enhanced environmental monitoring of the San Diego coastal region put forth in a peer-reviewed report coordinated by scientists at the Scripps Institution of Oceanography (SIO 2004). Data for these directed studies are subject to similar QA/QC procedures as the routine monitoring data, although the projects themselves do not necessarily conform to the same analysis and reporting schedules. Thus, details and results of ongoing QA/QC activities associated with these special studies are not included in this report unless otherwise indicated.

Table 3

NPDES-permit mandated receiving waters sampling effort for the Point Loma Ocean Outfall region, excluding resamples, QA/QC analyses (e.g., field and laboratory duplicates), or special studies.

Monitoring Component	Location	Stations/Zones	Sample Type	Discrete No. Samples/Site	Sampling Frequency	Sampling Times/Yr	Discrete No. Samples/Yr	Parameters	No. "Samples" Analyzed/Yr	Notes
Water Quality, Microbiology & Oceanographic Conditions	shore	8	Seawater - Bacti	1	weekly	52	416	T, F, E ^a	1248	1 sample/station
	kelp	8	Seawater - Bacti	3	5x/month	60	1440	T, F, E ^a	4320	3 depths/station
		8	Seawater - NH ₄	3	quarterly	4	96	NH ₄	96	3 depths/station/quarter
		8	CTD	1	5x/month	60	480	CTD profile ^c	3840	1 cast/station
	offshore	3	Seawater - Bacti	3	quarterly	4	36	E ^b	36	3 depths/station (18-m stns)
	(n=36)	11	Seawater - Bacti	3	quarterly	4	132	E ^b	132	3 depths/station (60-m stns)
		11	Seawater - Bacti	4	quarterly	4	176	E ^b	176	4 depths/station (80-m stns)
		11	Seawater - Bacti	5	quarterly	4	220	E ^b	220	5 depths/station (98-m stns)
		3	Seawater - NH ₄	3	quarterly	4	36	NH ₄	36	3 depths/stn (18-m stns, State Waters)
		9	Seawater - NH ₄	3	quarterly	4	108	NH ₄	108	3 depths/stn (60-m stns, State Waters)
		3	Seawater - NH ₄	4	quarterly	4	48	NH ₄	48	4 depths/stn (80-m stns, State Waters)
		36	CTD	1	quarterly	4	144	CTD profile ^d	1296	1 cast/station
Sediment Quality	offshore	22	Grab	1	semiannual	2	44	sediment constituents ^e	396	1 grab/station (Jan, Jul)
Benthic Macrofauna	offshore	22	Grab	2	semiannual	2	88	community structure	88	2 replicate grabs/station (Jan, Jul)
Demersal Fishes & Invertebrates	offshore	6	Trawl	1	semiannual	2	12	community structure	12	1 trawl/station (Jan, Jul)
Bioaccumulation in Fish Tissues	offshore	4	Trawl	3	annual	1	12	liver tissue contaminants ^f	48	3 composites/zone (Oct)
	offshore	2	Hook & Line/Trap	3	annual	1	6	muscle tissue contaminants ^f	24	3 composites/zone (Oct) (2 rig-fishing sites/zones)
Totals							3,494		12,124	

^a T, F, E = total coliform, fecal coliform, and *Enterococcus* bacteria (n = 3 parameters) required at shore and kelp stations

^b E = *Enterococcus* only required at offshore stations

^c CTD profile = depth, temperature, salinity, dissolved oxygen, light transmittance (transmissivity), chlorophyll a, pH, density (n = 8 parameters)

^d CTD profile = depth, temperature, salinity, dissolved oxygen, light transmittance (transmissivity), chlorophyll a, pH, density, and CDOM (n = 9 parameters)

^e Sediment constituents = sediment grain size, total organic carbon, total nitrogen, sulfides, metals, PCBs, chlorinated pesticides, PAHs, BOD (n = 9 parameters) for complete list of constituents; BOD = voluntary

^f Fish tissue contaminants = lipids, PCBs, chlorinated pesticides, metals (n = 4 parameter categories; see NPDES permit for complete list of constituents)

Table 4

NPDES-permit mandated receiving waters sampling effort for the South Bay Ocean Outfall region, excluding resamples, QA/QC analyses (e.g., field and laboratory duplicates), or special studies.

Monitoring Component	Location	Number of Stations	Sample Type	Discrete No. Samples/Site	Sampling Frequency	Sampling Times/Yr	Discrete No. Samples/Yr	Parameters	No. "Samples" Analyzed/Yr	Notes
Water Quality, Microbiology & Oceanographic Conditions	shore	11	Seawater - Bacti	1	weekly	52	572	T, F, E ^a	1716	1 sample/station
	kelp	3	Seawater - Bacti	3	5x/month	60	540	T, F, E ^a	1620	3 depths/station
		3	CTD	1	5x/month	60	180	CTD profile ^b	1440	1 cast/station
	offshore	25	Seawater - Bacti	3	monthly	12	900	T, F, E ^a	2700	3 depths/station
	(n=37)	37	CTD	1	monthly	12	444	CTD profile ^c	3996	1 cast/station
		28	TSS	3	monthly	12	1008	TSS	1008	3 depths/station
		28	Oil & Grease	1	monthly	12	336	O&G	336	1 depth/station
Sediment Quality	offshore	27	Grab	1	semiannual	2	54	sediment constituents ^d	432	1 grab/station (Jan, Jul)
Benthic Macrofauna	offshore	27	Grab	2	semiannual	2	108	community structure	108	2 replicate grabs/station (Jan, Jul)
Demersal Fishes & Invertebrates	offshore	7	Trawl	1	quarterly	4	28	community structure	28	1 trawl/station
Bioaccumulation Fish Tissues	offshore	7	Trawl	3	semiannual	2	42	liver tissue contaminants ^e	210	3 composites/station (Apr, Oct) (trawl sites)
	offshore	2	Hook & Line/Trap	3	semiannual	2	12	muscle tissue contaminants ^e	60	3 composites/station (Apr, Oct) (rig-fishing sites)
"Regional Survey"										
Sediment Quality	random array	40	Grab	1	annual	1	40	sediment constituents ^d	320	1 grab/station (Jul)
Benthic Macrofauna	random array	40	Grab	1	annual	1	40	community structure	40	1 grabs/station (Jul)
Totals							4,304		14,014	

^a T, F, E = total coliform, fecal coliform, and *Enterococcus* bacteria (n = 3 parameters)

^b CTD profile = depth, temperature, salinity, dissolved oxygen, light transmittance (transmissivity), chlorophyll a, pH, density (n = 8 parameters)

^c CTD profile = depth, temperature, salinity, dissolved oxygen, light transmittance (transmissivity), chlorophyll a, pH, density, CDOM (n = 9 parameters)

^d Sediment constituents = sediment grain size, total organic carbon, total nitrogen, sulfides, metals, PCBs, chlorinated pesticides, PAHs (n = 8 parameter categories; see NPDES permit for complete list of constituents)

^e Fish tissue contaminants = total lipids, metals, PCBs, chlorinated pesticides, PAHs (n = 5 parameter categories; see NPDES permit for complete list of constituents)

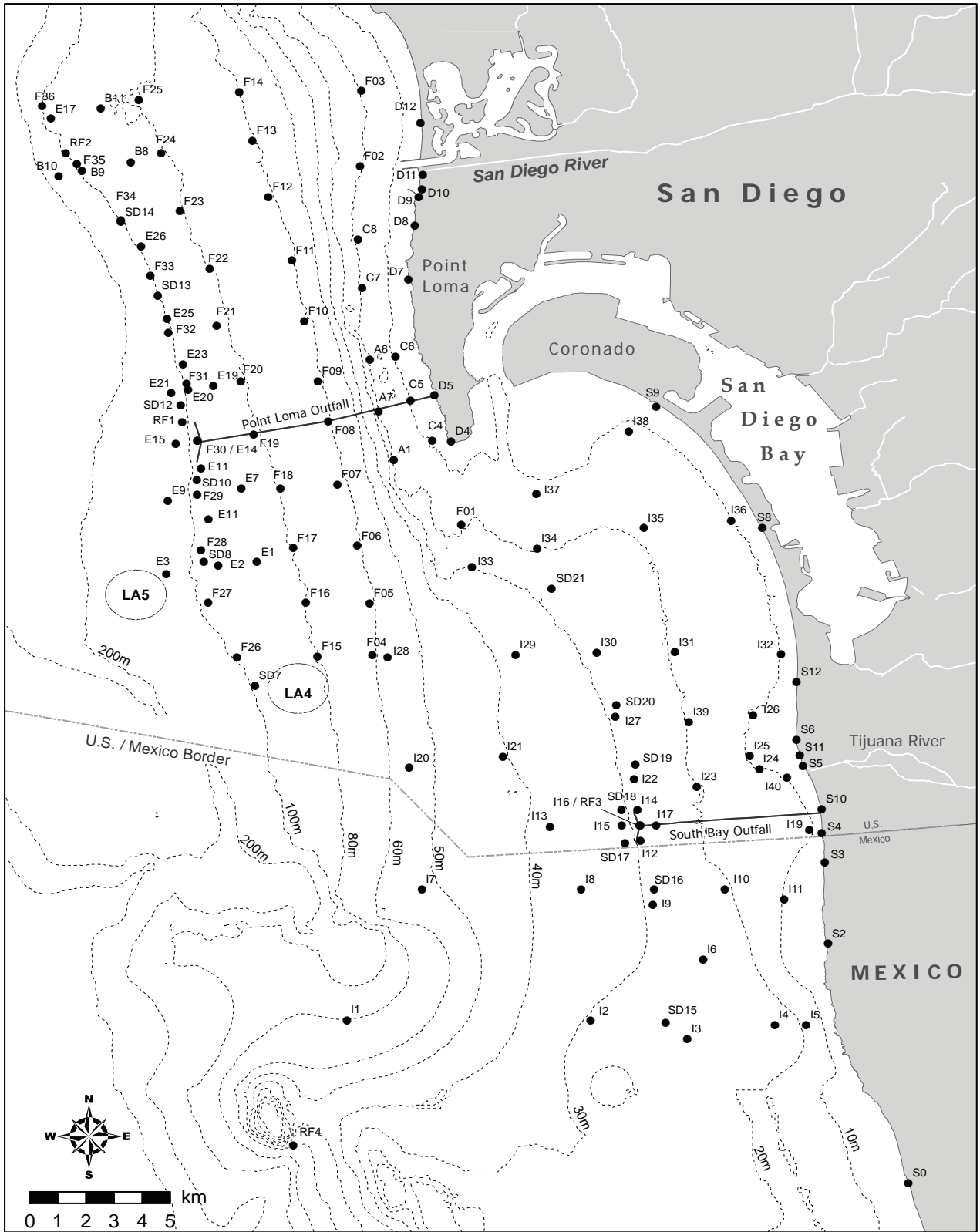


Figure 1

NPDES permit mandated (fixed-grid) water quality, benthic, trawl and rig fishing stations for the City of San Diego's Ocean Monitoring Program for the Point Loma and South Bay Ocean Outfall regions.

Table 5

Toxicity testing conducted by EMTS staff in accordance with various NPDES permits. Listed effort excludes accelerated testing requirements (e.g., triggered by Notice of Violation), additional QA/QC procedures, or special studies.

Testing Component	Location/Project	Sample Type	No. samples	Sampling Frequency	Sampling Times/Yr	No. test Species	Effluent/Ref Tox Tests/Yr	Total Tests/Yr	Endpoints	Dilutions per bioassay	Notes
Point Loma Acute toxicity	PLWTP	final effluent	1	semi-annual	2	1	2 + 2 Ref Tox	4	survival	5 + control	species = topsmelt
	(Biennial screening)	final effluent	1	3 x per 2 yrs	3 x per 2 yrs	2	6 + 6 Ref Tox per 2 yrs	12 per 2 yrs	survival	5 + control	screening spp: mysid and topsmelt
	PLWTP	final effluent	1	monthly	12	2	24 + 24 Ref Tox	48	sensitive lifestage	5 + control	species = giant kelp plus red abalone or purple sea urchin
	(Biennial screening)	final effluent	1	3 x per 2 yrs	3 x per 2 yrs	4	12 + 12 Ref Tox per 2 yrs	24 per 2 yrs	sensitive lifestage	5 + control	screening spp: giant kelp, red abalone, topsmelt, and purple sea urchin
South Bay Acute toxicity	SBWRP/SBIWTP	comb. effluent	1	annual	1	1	1 + 1 Ref Tox	2	survival	5 + control	Combined effluent testing program terminated in October 2014
	(Biennial screening)	comb. effluent	1	3 x per 2 yrs	3 x per 2 yrs	2	6 + 6 Ref Tox per 2 yrs	12 per 2 yrs	survival	5 + control	
	SBWRP	final effluent	1	monthly	12	1	12 + 12 Ref Tox	24	sensitive lifestage	5 + control	species = red abalone or purple sea urchin
	(Biennial screening)	final effluent	1	3 x per 2 yrs	3 x per 2 yrs	4	12 + 12 Ref Tox per 2 yrs	24 per 2 yrs	sensitive lifestage	5 + control	screening spp: giant kelp, red abalone, topsmelt, and purple sea urchin
Chronic toxicity	SBWRP/SBIWTP	comb. effluent	1	quarterly	4	1	4 + 4 Ref Tox	8	sensitive lifestage	5 + control	Combined effluent testing program terminated in October 2014
	(Biennial screening)	comb. effluent	1	3 x per 2 yrs	3 x per 2 yrs	4	12 + 12 Ref Tox per 2 yrs	24 per 2 yrs	sensitive lifestage	5 + control	

Comb. Effluent = combined SBWRP + SBIWTP effluent samples

Ref Tox = Reference Toxicant Test

Sensitive lifestage endpoints: (1) red abalone = development; (2) giant kelp = germination and growth; (3) topsmelt = survival and growth; (4) purple sea urchin = fertilization

As a part of its regulatory requirements, the City also participates in regional monitoring activities for the entire Southern California Bight coordinated by the Southern California Coastal Water Research Project (SCCWRP). The intent of the regional programs is to maximize the efforts of the various partner agencies (e.g., municipal dischargers, research agencies) using a more cost-effective monitoring design and to best utilize the pooled scientific resources of the region. These bight-wide surveys have included the 1994 Southern California Bight Pilot Project (SCBPP) and subsequent Bight'98, Bight'03, Bight'08, and Bight'13 regional monitoring efforts that began in 1998, 2003, 2008, and 2013, respectively. During these programs, the City's regular sampling and analytical effort may be reallocated as necessary with approval of the SDRWQCB and USEPA. For example, significant modifications to the Point Loma and South Bay monitoring requirements specified above were in effect during 2014 as part of an approved resource exchange agreement to allow City participation in the Bight'13 Regional Monitoring Program (see Appendix B for details). As with special studies, the regional monitoring efforts are typically subject to QA/QC procedures similar to those for routine monitoring data, although these projects also do not conform to the same analysis and reporting schedules. Thus, the details and results of the bight-wide monitoring efforts are not included in this report unless otherwise indicated. However, the planning documents for Bight'13, including the project's Quality Assurance Plan, are available upon request or for download from SCCWRP's website (www.sccwrp.org).

SUMMARY OF WORK PERFORMED IN 2014

During CY 2014, a total of 7,356 discrete samples were collected by EMTS staff, including samples collected as part of permit-mandated special studies (Table 6). Of these, about 7% (n=514) were QC samples such as field duplicates. In addition, a total of 1,673 QA tests were conducted to validate quality of specific analyses such as macrofauna sorting, microbiological analyses and toxicity tests. The results of the QA/QC activities presented in the following sections support the accuracy and precision of the resultant data and validate their use in permit-mandated monitoring or environmental testing and reporting. These include: (1) intercalibration of the Conductivity-Temperature-Depth (CTD) instruments used to sample water quality parameters; (2) results of the bacteriological QA procedures; (3) results of the macrofaunal community sample resorts; (4) results of toxicology QA procedures.

CTD Calibration and Maintenance

Ocean Operations personnel carry out semiannual in-house CTD intercalibration exercises to ensure consistency between the two Sea-Bird Electronics Model 25 CTD instruments used to collect water column profiling data for the City's ocean monitoring program. For CY 2014, the intercalibration exercises were conducted in July and December. The instrument designated as Unit #3 is a combination CTD/carousel sampler, while Unit #4 is a standalone CTD unit. During each exercise, the two CTDs are attached to each other with similar probes aligned and then deployed to a depth of 120 m and retrieved three separate times. For each cast, data from depths greater than 100 m were discarded in an effort to minimize bottom effects. After all three casts were completed, comparisons of the results for temperature, salinity, dissolved oxygen (DO), pH, chlorophyll *a*, and transmissivity were performed to assess whether deviations between the instruments and sensors were within acceptable limits.

Table 6

Number of discrete samples collected and analyzed by EMTS staff for NPDES permit-related activities during 2014. NA=not applicable; ECS=Environmental Chemistry Services.

Sample Type	Number of Samples Collected		Number of Analyses per Sample Type	
	Regular	QC	Regular	QA
Sediment Grabs				
Particle Size Subsample	146 ^a	NA	(performed by ECS)	
Chemistry Subsamples	628 ^{ab}	NA	(performed by ECS)	
Benthic Infauna Grabs [§]	146 ^a	NA	179 ^d	21 ^d
Otter Trawl [§]	26	NA	26	NA
Fish Tissue [§]	37	NA	(performed by ECS)	
Water Quality [§]				
CTD Casts	965	NA	7992 ^e	NA
Microbiology	4011 ^c	454	10,812 ^f	1581 ^f
Suspended Solids	408	40	(performed by ECS)	
Oil and Grease	136	20	(performed by ECS)	
Ammonia (as nitrogen)	288	NA	288	NA
Toxicology				
Acute Bioassay	6	NA	6	14
Chronic Bioassay	45	NA	45	57

[§] Reduced samples reflect resource exchange for participation in Bight'13 (see Appendix B)

^a Includes Old Outfall special study stations

^b PLOO stations had five subsamples per grab; all other stations had four subsamples per grab

^c includes resamples

^d includes Bight'13 samples collected by other agencies

^e includes up to nine parameters per cast (depth, temperature, salinity, dissolved oxygen, light transmittance, chlorophyll a, pH density, CDOM)

^f includes up to three types of fecal indicator bacteria (total coliform, fecal coliform, *Enterococcus*)

The results are summarized in Table 7.A and Figure 2, and compared to results from previous years in Table 7.B. The intercalibration exercises conducted in July and December demonstrated acceptable variability between CTDs for all parameters: temperature, salinity, DO, pH, fluorometer and transmissivity. The transmissivity variability in both exercises was slightly higher than prior years and was most likely due to drift of instrument after being in service for a year.

In addition to the semi-annual CTD intercalibration exercises, manufacturers of various probes recommend annual recalibrations at their factories. Since four sets of conductivity, temperature, pressure, pH, and DO probes and pumps are inventoried in-house, each instrument is rotated out of service and sent back to the factory every six months for recalibration along with the system pump. Because there are only three sets of fluorometers and transmissometers, and two CDOM probes, these sensors are rotated out for external/factory recalibration service on an annual basis. However, if in-house calibration results indicate a problematic probe, it will be serviced earlier than scheduled. The

Table 7

Summary of the CTD intercalibration casts. (A) casts conducted during 2014. Values are the mean difference (Mean Δ) and maximum difference (Max Δ) between Unit #3 and Unit #4, as well as the cast number (i.e., 1, 2, or 3), and depth (m) at which the maximum difference occurred; (B) results of CTD intercalibration exercises conducted from 2009 through 2014. Values are the differences between Unit #3 and Unit #4 averaged over all depths (0–100 m).

A Parameter	July 2014				December 2014			
	Mean Δ	Max Δ	Cast	Depth (m)	Mean Δ	Max Δ	Cast	Depth (m)
Temperature (°C)	0.057	0.766	2	23	0.013	0.141	3	27
Salinity (psu)	0.012	0.083	3	35	0.003	0.015	2	49
DO (mg/L)	0.077	0.640	3	56	0.079	0.215	3	26
pH	0.047	0.076	3	99	0.016	0.031	3	42
Transmissivity (%)	4.430	10.83	2	100	4.267	4.784	1	74
Chlorophyll a (μ g/L)	0.044	0.664	3	11	0.030	0.107	1	52

B Parameter	2009	2010	Jun 2011	Jan 2012	Aug 2012	Dec 2012	Jun 2013	Dec 2013	Jul 2014	Dec 2014
	Temperature (°C)	0.07	0.03	0.03	0.01	0.04	0.04	0.02	0.01	0.057
Salinity (psu)	0.02	0.01	0.01	0.01	0.01	0.01	0.005	0.005	0.012	0.003
DO (mg/L)	0.44	0.1	0.17	1.02	0.37	0.5	0.06	0.05	0.077	0.079
pH	0.02	0.01	0.02	0.02	0.03	0.31	0.03	0.037	0.047	0.016
Transmissivity (%)	0.47	1.61	1.74	0.76	0.65	1.02	2.92	1.435	4.430	4.267
Chlorophyll a (μ g/L)	0.49	0.07	0.08	0.03	1.63	2.55	0.76	0.074	0.044	0.030

overall rotation schedule of the probes between CTDs is staggered by six months to ensure that each instrument receives a replacement set within the annual calibration period.

The probes actively in use on each CTD undergo further in-house evaluations prior to and during each survey. The DO probe on each instrument is calibrated monthly to check for sensor drift. If the sensor drift is $\geq 5\%$ from factory calibration, the sensor coefficients are changed; if the sensor drift reaches 10%, it is removed from service, returned to manufacturer for service and replaced with a factory calibrated probe. The pH and transmissivity probes are checked in the morning prior to each sampling cruise to ensure proper function. For pH calibrations, three buffer solutions (7.0, 8.0 and 9.0) are used to bracket the expected pH range. If the reading of a particular buffer solution deviates by more than 0.05 pH units, the probe is adjusted electronically using a factory provided software and then recalibrated. The transmissometer is checked by cleaning the windows of the LED light path and then noting the zero reading by blocking the light path and the full range reading by removing the obstruction. If any probe fails to calibrate or seems to have drifted out of range, it is removed from the instrument and replaced with a spare. Additionally, the results of each probe are evaluated by reviewing the data following each cast. If any probe is determined to be faulty and a field repair cannot

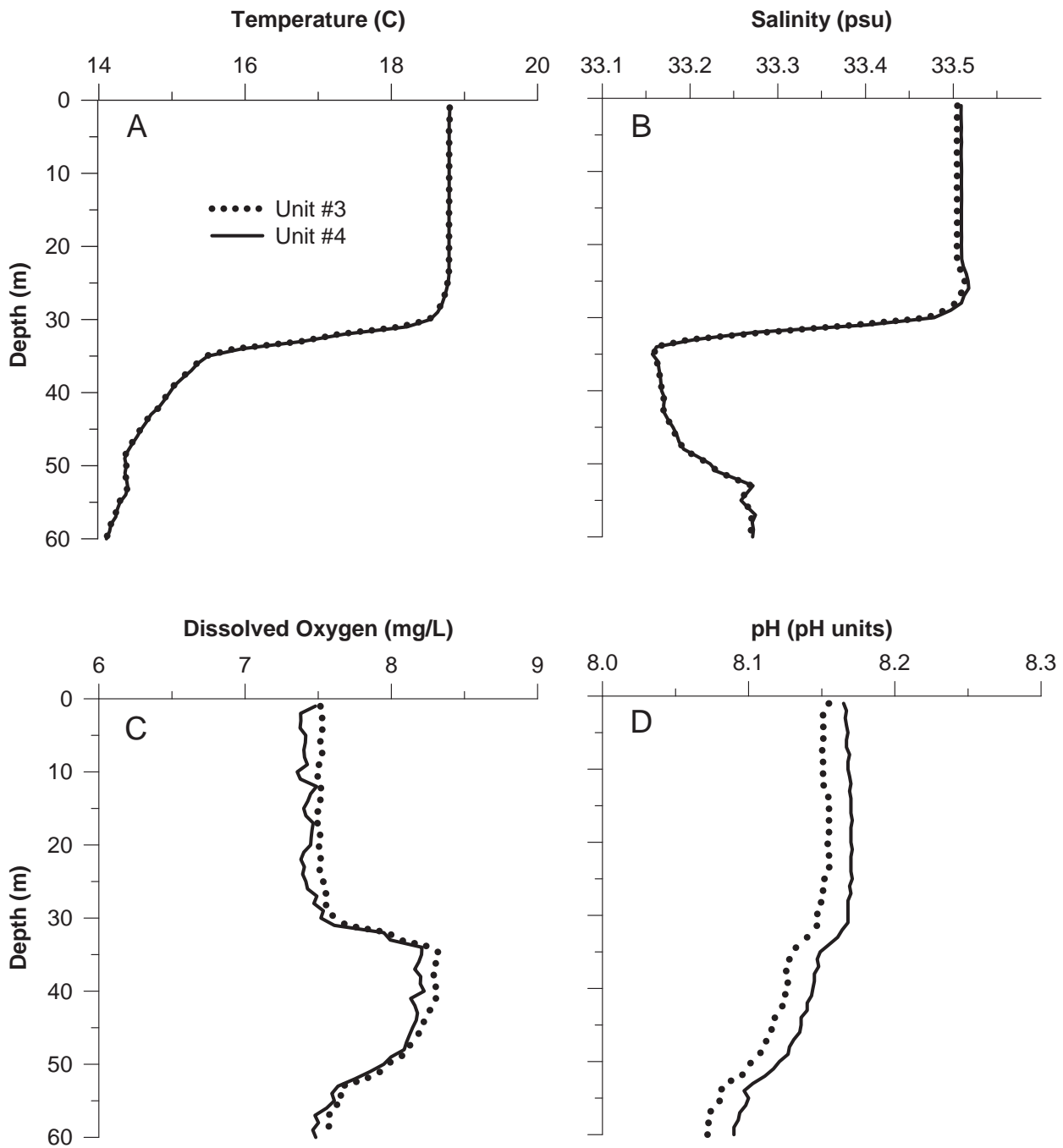


Figure 2

Comparison of results from CTD Units #3 and #4 from one representative cast made during the 2014 CTD intercalibration exercises. Data include cast profiles for (A) temperature, (B) salinity, (C) dissolved oxygen, (D) pH, (E) transmissivity, and (F) chlorophyll *a*.

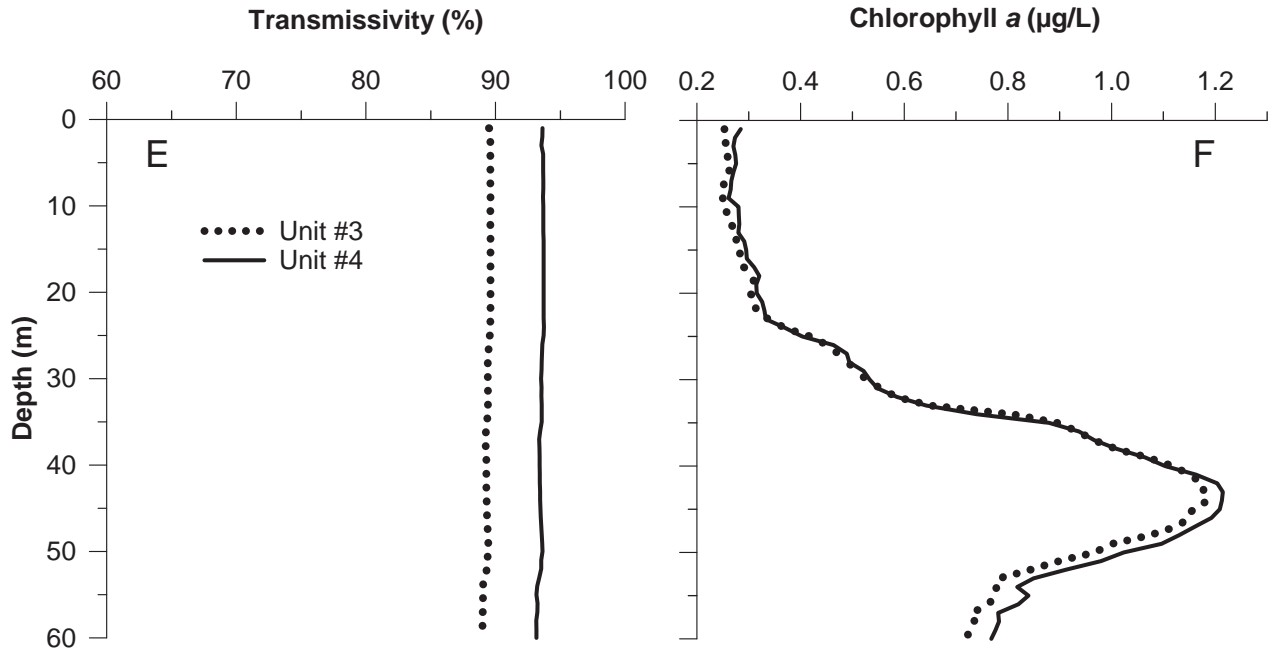


Figure 2 *continued*

be completed, sampling will be terminated immediately so that the needed repairs can be completed back at the laboratory.

Bacteriological Quality Assurance Analyses

Duplicate analyses are run throughout the year as QA checks on bacteriological data reported by the City. Field duplicates are two separate samples taken from the same station at the same time and then processed by a single analyst to measure variability between samples. Laboratory duplicates are designed to test whether analysts can replicate their own results, and consist of two samples that are diluted, filtered, and plated from a single sample container by a single analyst to measure analyst precision. A total of 454 bacteriological QA samples were collected during CY 2014, while duplicate laboratory analyses were performed on ~15% (n=1581) of the water quality monitoring samples collected for the Point Loma and South Bay outfall programs (Table 6). The raw data for these analyses have been reported previously in the Point Loma and South Bay monthly receiving waters monitoring reports.

The sign test (Gilbert, 1987) was used to compare the results from the paired laboratory and field duplicate analyses performed in CY 2014 (Table 8). When matched pairs of samples are used, the sign test assumes that the probability of observing samples with differing plate counts is equally distributed among positive (sample A > sample B) and negative (sample A < sample B) results. Samples that do not differ (i.e., A - B = 0) are ignored. During CY 2014, results from duplicate field and laboratory analyses were not significantly different ($p > 0.05$) for each of the three tested fecal indicator bacteria (i.e., total coliforms, fecal coliforms, *Enterococcus*), indicating low variability between samples and repeatability of laboratory measurements.

Table 8

Summary of bacteriological QA analyses conducted during 2014 for the City of San Diego's Ocean Monitoring Program. n=number of sample pairs with different colony counts (samples without differences are not considered); B=the number of positive differences between pairs; Z_b =sign test outcome; H_o =the probability of observing positive and negative differences in plate counts between paired samples is equal (see text). Paired samples were compared using the sign test (see Gilbert 1987) at a $p=0.05$ level of significance.

Sample Type	Parameter	n	B	Z_b	p	H_o
Field Duplicate	Total	112	60	0.756	>0.05	Accept
	Fecal	87	47	0.750	>0.05	Accept
	Enterococci	89	46	0.318	>0.05	Accept
Lab Duplicate	Total	53	32	1.511	>0.05	Accept
	Fecal	62	32	0.254	>0.05	Accept
	Enterococci	62	26	-1.270	>0.05	Accept

In addition to the above QA analyses, the Marine Microbiology Lab conducts monthly comparisons of bacterial colony counts to quantify the counting precision of each analyst. Counts are performed on a single plate by pairs of analysts, with the criterion being that counts by any two analysts must fall within 10% of each other. This calculation is known as the Relative Percent Difference (RPD). During CY 2014, 195 count comparisons were performed, and all results were within the required RPD.

Macrofaunal Community – Resort Analysis

Laboratory analyses of benthic macrofaunal samples involve three processes: (1) sample washing and preservation; (2) sample sorting; (3) identification and enumeration of all invertebrate organisms. Quality control of sorting is essential to assuring the value of the subsequent steps in the sample analysis process. The sorting of benthic samples to the major taxonomic groups is contracted to an outside laboratory, with a 95% removal efficiency expected. Ten percent of the sorted samples from each technician (sorter) at the contract lab are subject to resorting as QA for the contract. The original sorting of a sample fails the QA criterion if the resorted sample contains more than 5% of the total abundance of all animals from that sample. More than one failure requires the re-sorting of all samples previously sorted by that sorter. The resort results for the January 2014 and July 2014 benthic samples, as well as the Bight' 13 benthic samples collected by other agencies but processed by City of San Diego, are shown in Table 9. Percentages of animals found in all re-analyzed PLOO and SBOO samples were $\leq 5\%$ of the total sample abundance.

Toxicology Quality Assurance Analyses

The Toxicology Laboratory conducts routine reference toxicant testing as a part of its quality assurance program. A reference toxicant is a standard chemical used to measure the sensitivity of the test organisms and test precision. Consistency among the reference toxicant test results enhance confidence in the concurrent toxicity data obtained from the test material (e.g., wastewater effluent). A specific reference toxicant is used for each combination of test material, test species,

Table 9

Results of benthic macrofauna sample resort analyses conducted during 2014 for the City of San Diego's Ocean Monitoring Program. Percent=(the # of animals found in the resorted sample/the total sample abundance) X 100; NA indicates that taxonomic analysis of samples remains incomplete (i.e., total sample abundance unknown).

Survey	Station	Percent	Survey	Station	Percent
	PLOO			SBOO	
Jan-14	B-9	0.86	Jan-14	I-13	0.00
	E-5	0.00		I-2	0.12
	E-26	0.00		I-18	0.00
				I-35	1.38
Jul-14	E-5	0.44	Jul-14	I-35	0.00
	B-9	0.00		I-2	0.00
	E-17	0.40		I-14	1.32
	E-26	1.08		I-23	2.26
	Old Outfall			Bight '13	
Jul-14	B-3	0.00	Jul-13	9383	NA ^a
	A-6	NA ^a		9457	0.00
				9476	NA ^a
				9373	NA ^a

^aprojected to fail (>5%) based on preliminary sorting numbers

test conditions, and endpoints, and the material is chosen from a list developed by the USEPA. The reference toxicant is purchased from a supplier in aqueous form (stock solution), and the supplier must verify the concentration of the stock solution and provide written documentation of such analysis.

In most instances, a reference toxicant test is performed at the same time the test material is evaluated. A control chart for each test method is maintained by the QA officer and/or Laboratory Supervisor using results from no fewer than 20 of the most recent reference toxicant tests. Charted parameters include control performance, percent minimum significant difference, effect concentrations (e.g., no observable effect concentration and point estimate), and coefficient of variability (CV).

Using a nominal error rate of 5.0%, results from 19 of the most recent 20 reference toxicant tests are expected to fall within two standard deviations of the simple moving average (i.e., unweighted running mean), while one of these tests may fall outside the control chart limits by chance alone. Additionally, a series of USEPA-recommended quality control limits are also used to further evaluate test sensitivity.

Each violating run would trigger an investigation of animal supply, reference toxicant stock quality, and laboratory practices. Additional testing may also be conducted to determine whether an exceedance is anomalous or if remedial measures are needed. All NPDES mandated tests conducted with the affected animals are flagged, reviewed for anomalous responses, and, in certain cases, repeated with a new batch of animals. In CY 2014, all reference toxicant control charts met the acceptability criteria.

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City of San Diego. (in prep). Quality Assurance Plan for Coastal Receiving Waters Monitoring. City of San Diego Ocean Monitoring Program, Public Utilities Department, Environmental Monitoring and Technical Services Division, San Diego, CA.

Gilbert, R.O. (1987). Statistical Methods for Environmental Pollution Monitoring. Van Nostrand Reinhold Co., New York.

Schiff, K.C., J.S. Brown, and S.B. Weisberg. (2001). Model Monitoring Program for Large Ocean Discharges in Southern California. Technical Report No. 357. Southern California Coastal Water Research Project, Westminster, CA.

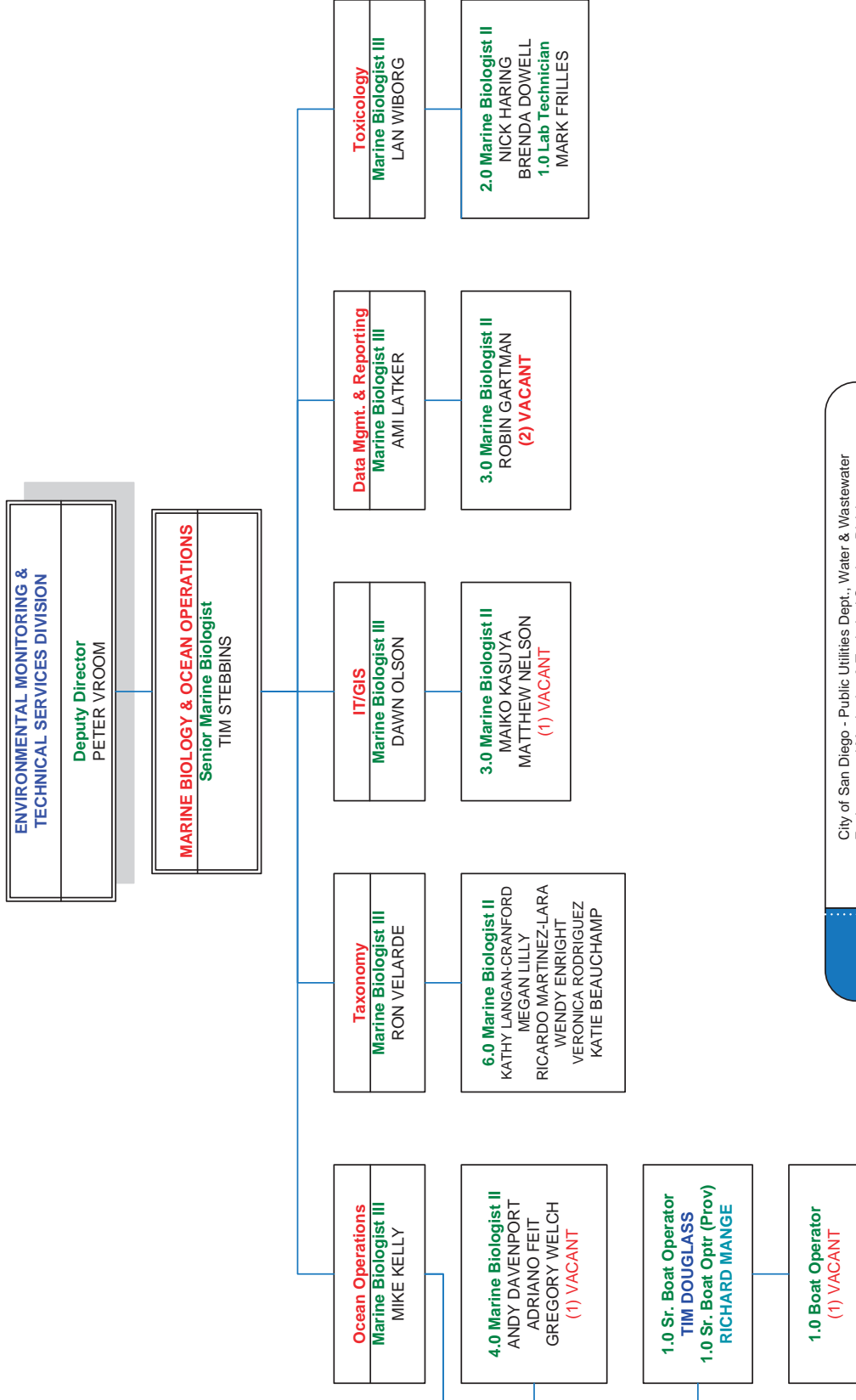
[SIO] Scripps Institution of Oceanography. (2004). Point Loma Outfall Project, Final Report, September 2004. Scripps Institution of Oceanography, University of California, San Diego, CA.

APPENDIX A

Organizational Charts

Appendix A.1

Organizational chart for the Marine Biology and Ocean Operations section of EMTS.

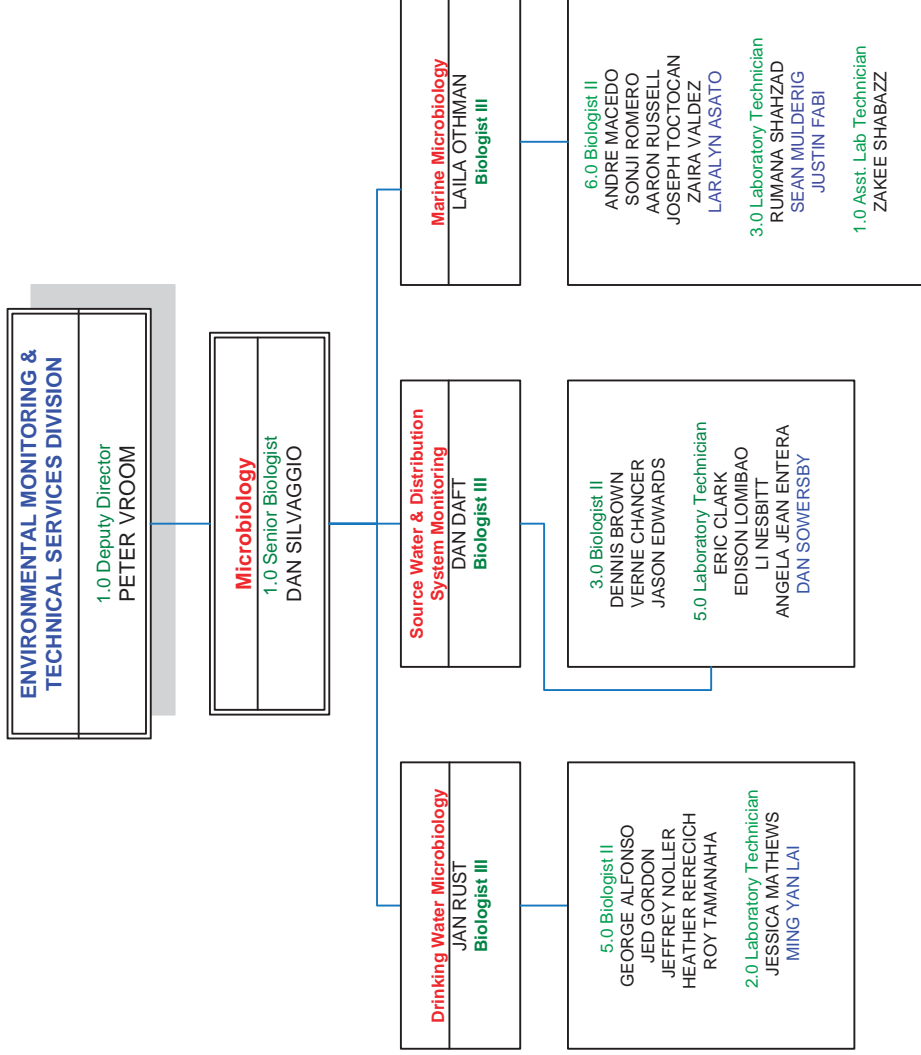



 City of San Diego - Public Utilities Dept., Water & Wastewater Environmental Monitoring & Technical Services Division Marine Biology & Ocean Operations Section	
Organization Chart – FY2015	01/06/2015

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Appendix A.2

Organizational chart for the Microbiology section of EMTS.





City of San Diego-Public Utilities Dept. Water & Wastewater
Environmental Monitoring & Technical Services Division
Microbiology

Organization Chart – FY2015

01/06/2015

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APPENDIX B

Resource Exchange Letters



EDMUND G. BROWN JR.
GOVERNOR



MATTHEW RODRIGUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

July 10, 2013

Mr. Steve Meyer
Deputy Public Utilities Director
City of San Diego
2392 Kincaid Road
San Diego, CA 92101-0811

In reply refer to / attn:

Place IDs:248796:257821:257831:cnagoda

**Subject: Resource Exchange for Bight'13 Regional Monitoring Program
Point Loma and South Bay Ocean Outfall Receiving Waters Monitoring**

Mr. Meyer:

The purpose of this letter is to approve the revisions that you have proposed in your letter dated June 19, 2013 for the Point Loma Ocean Outfall (PLOO) and South Bay Ocean Outfall (SBOO) receiving waters monitoring to participate in the Bight '13 program. The PLOO receives wastewater from the Point Loma Wastewater Treatment Plant, and the SBOO receives water from the South Bay Water Reclamation Plant and the South Bay International Wastewater Treatment Plant.

The approved proposed revisions (or exchange of resources) include:

- PLOO Benthic Sampling – Eliminate the second (replicate) infauna sample from all 22 sediment core stations. One sediment grab and one infauna grab sample will be collected at each of the 22 stations. This will affect the July 2013, January 2014 and July 2014 surveys.
- SBOO Benthic Sampling - Eliminate the second (replicate) infauna sample from all 27 sediment core stations. One sediment grab and one infauna grab sample will be collected at each of the 27 stations. This will affect the July 2013, January 2014 and July 2014 surveys.
- Regional Benthic Sampling – Eliminate sediment and infauna sampling at all 40 randomized sites.
- SBOO Trawling – Reduce the frequency of trawling at the 7 stations from quarterly (January/April/July/October) to biannually (January/July). This will affect the trawling requirements that were scheduled for October 2013, April 2014, and October 2014.
- SBOO Fish Tissues – Reduce the frequency of the fish tissue analyses (collected at the trawl and rig stations) from biannual to annual. This would result in dropping the SBOO tissue sampling requirement scheduled for April 2014.

TOMÁS MORALES, CHAIR | DAVID GIBSON, EXECUTIVE OFFICER

9174 Sky Park Court, Suite 100, San Diego, CA 92123-4353 | (858) 467-2952 | www.waterboards.ca.gov/sandiego



- SBOO Offshore Water Quality Sampling – Reduce the frequency of the offshore water quality sampling at 34 of the 37 stations (excludes I-12, I-14, and I-16) from monthly to quarterly. Data will be provided for February, May, August, and November 2014. Data will not be collected in July, September and October 2014.

The exchange of resources between June 1, 2013 and June 30, 2014 (with some monitoring dates that fall outside of this range, as explained above) does not require an amendment to your permit since the exchange meets the requirements in Order Nos. R9-2009-0001 (Attachment E, Section VIII.C, Regional Monitoring) and R9-2013-2006 (Attachment E, Section X.B, Regional Monitoring).

The San Diego Water Board appreciates your participation in the Bight program and support of a regional approach to monitoring and assessment.

In the subject line of any response, please include the reference number POTW:248796:257821:257831:cnagoda. For questions or comments, please contact Carey Nagoda by phone at (858) 627-3933, or by email at carey.nagoda@waterboards.ca.gov.

Respectfully,



DAVID W. GIBSON
Executive Officer

DWG:jh:cn

cc (via email):

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THE CITY OF SAN DIEGO

June 19, 2013

Mr. David Gibson, Executive Officer
California Regional Water Quality Control Board
San Diego Region 9
9174 Sky Park Court, Suite 100
San Diego, CA 92123

Dear Mr. Gibson:

SUBJECT: Resource Exchange for Bight'13 Regional Monitoring Program
Point Loma and South Bay Ocean Outfall Receiving Waters Monitoring

The City of San Diego Public Utilities Department [City] is participating in the 2013 Southern California Bight Regional Monitoring Program (Bight'13) that is being coordinated by the Southern California Coastal Water Research Project (SCCWRP). As requested in a letter from your office regarding Bight'13 participation dated May 2, 2013 (POTW: 248796, 257821, 257831: bposthumus; referred to hereafter as *POTW Letter*), the City would like to request modifications to Monitoring and Reporting Program (MRP) requirements for the Point Loma Wastewater Treatment Plant (PLWTP: Order No. R9-2009-0001, NPDES Permit CA0107409) and South Bay Water Reclamation Plant (SBWRP: Order No. R9-2013-0006, NPDES Permit CA0109045). Additionally, as specified in a letter from former Executive Officer John Robertus dated June 19, 2007 (SCR: 257831 and 257821: MVALD), changes in ocean monitoring requirements for the SBWRP shall also apply to requirements for the South Bay International Wastewater Treatment Plant (SBIWTP: Order No. 96-50, NPDES Permit CA0108928), which is owned and operated by the International Boundary and Water Commission, U.S. Section.

The City has been actively involved in Bight'13 planning and will be providing significant in-kind services and other support in order to fully participate in the following project components: (1) Contaminant Impact Assessment (C.I.A.); (2) Nutrient Impact; (3) Debris Assessment; (4) Microbiology. The proposed resource exchange will allow the City to reallocate resources effectively so that it can successfully conduct field operations and collect, process and analyze the appropriate ocean samples required of Bight'13, as well as participate in the subsequent data analysis, assessment, and reporting activities over the next several years. Table 1 (page 5) provides a summary of the City's planned commitment and associated resource exchange for the field sampling and laboratory analysis parts of the C.I.A. component, which begins July 1, 2013. Additional effort required for these and other activities, as well as the Nutrient Impact and Microbiology components, will be determined once all project plans are finalized.

The City's proposed requests are consistent with the guidelines specified in the aforementioned *POTW Letter* regarding "which portions of the 2013-2014 intensive monitoring may be reduced or excluded." Although some modifications to those guidelines are included below, all requests



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Mr. David Gibson
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are designed to minimize impacts on ongoing long-term monitoring and spatial coverage of the City's ocean monitoring program, and are also consistent with the goals and objectives of the new "Framework for Monitoring and Assessment in the San Diego Region" supported by Regional Board Resolution No. R9-2012-0069. For example, the emphasis is on a) trading off duplicate sampling at regular stations instead of maintaining duplicate sampling at some sites and excluding all sampling from other sites, or b) aligning the sampling effort for the Pt Loma and South Bay outfall regions. Additionally, although the *POTW Letter* states that resource exchange "is valid only during the year in which data are collected for Bight'13 (June 2013-June 2014)," some of our requests extend throughout calendar year 2014. Doing so will allow the City to maintain the most efficient and balanced sampling design for its regular monitoring activities, participate in post-sampling activities for Bight'13, and reflects the reality that work for the various Bight'13 components represents a multi-year commitment.

City of San Diego Requested Resource Exchange for Bight'13

Benthic Monitoring: Permissible exchanges identified in the *POTW Letter* for benthic sediment and infauna monitoring include sampling for a) 10 Pt Loma Ocean Outfall (PLOO) "secondary" grid stations, b) 13 South Bay Ocean Outfall (SBOO) "secondary" grid stations, and c) 40 randomized "regional" stations.

- 1) **PLOO Benthic Sampling:** The PLWTP MRP requires two infauna grabs and one sediment grab be collected and analyzed for each of 22 PLOO benthic stations sampled semiannually (e.g., January/July). Instead of excluding all sampling at the 10 secondary stations mentioned above, the City requests that only the requirement to collect the second (replicate) infauna sample be dropped for all 22 stations, and that this request apply to the July 2013, January 2014, and July 2014 surveys. This modification will result in continued full spatial coverage of the Pt Loma region along with a balanced sampling design (i.e., 1 sediment grab + 1 infauna grab/station/survey). Approval of this request will allow reallocation of effort and expense for 66 infauna samples to the Bight'13 program over the next two years.
- 2) **SBOO Benthic Sampling:** The SBWRP and SBIWTP MRPs require collection and analysis of two infauna grabs and one sediment grab at 27 SBOO benthic stations sampled semiannually (e.g., January/July). Instead of excluding all sampling at the 13 secondary stations mentioned above, the City requests only the requirement to collect the second (replicate) infauna sample be dropped for all 27 stations, and that this request apply to the July 2013, January 2014, and July 2014 surveys. This modification will result in continued full spatial coverage of the South Bay outfall region along with a balanced sampling design (i.e., 1 sediment grab + 1 infauna grab/station/survey). Approval of this request will allow reallocation of effort and expense for 81 infauna samples to the Bight'13 program.
- 3) **Regional Benthic Sampling:** The SBWRP and SBIWTP MRPs require that one infauna grab and one sediment grab be collected and analyzed at each of 40 "randomized" benthic stations selected each year. The City requests that the July 2013 regional sampling of 40 randomly selected benthic stations be dropped as specified in the *POTW Letter*. This will allow reallocation of the effort for 40 sediment and 40 infauna samples to the Bight'13 program.

Trawl Monitoring: Permissible exchanges identified in the *POTW Letter* for trawling of demersal fish and megabenthic invertebrate communities include sampling at four PLOO stations, while no *a priori* exchange is listed for the SBOO stations.

- 4) **PLOO Trawling:** The PLWTP MRP requires trawling of six stations on a semiannual basis (e.g., January/July). Although the *POTW Letter* provides for reduced sampling at all but the two stations located nearest the outfall, no resource exchange is requested. Instead, the City requests that modification be applied to the SBOO trawling effort as described below.
- 5) **SBOO Trawling:** The SBWRP and SBIWTP MRPs require trawling of seven stations on a quarterly basis (e.g., January/April/July/October), which is twice as extensive as the semiannual sampling requirement for the Pt Loma region (see above). Consequently, the City requests that trawling for the SBOO region be modified to match the PLOO sampling effort for the remainder of calendar year 2013 through CY 2014. This would result in dropping the trawling requirement for all seven SBOO stations presently scheduled for October 2013, April 2014, and October 2014. Trawling of all seven stations would be maintained during the January and July surveys similar to the Pt Loma region. Approval of this request will allow reallocation of effort and expense for 21 community trawls to the Bight'13 program.

Bioaccumulation: Permissible exchanges are not identified in the *POTW Letter* for the bioaccumulation of contaminants in fish tissues component of the City's monitoring program.

- 6) **PLOO/SBOO Fish Tissues:** The PLWTP MRP requires annual sampling and analysis of liver tissues collected from fishes at the six trawl stations and muscle tissues from fish collected at two rig fishing stations. The SBWRP and SBIWTP MRPs have similar requirements for seven trawl and two rig fishing stations, but on a semiannual basis (i.e., twice the PLOO requirement). Consequently, the City requests that tissue sampling for the SBOO region be modified to match the PLOO effort for the remainder of calendar year 2013 through CY 2014. This would result in dropping the SBOO tissue sampling requirement scheduled for April 2014. Approval of this request will allow reallocation of the effort associated with collecting and processing (i.e., performing laboratory chemical analyses) tissue samples from the seven trawl and two rig fishing stations for this survey to the Bight'13 program.

Water Quality Monitoring: Permissible exchanges identified in the *POTW Letter* allow for modification of intensive water quality monitoring requirements for stations located greater than 1,000 feet from the ocean outfalls.

- 7) **PLOO Offshore WQ Sampling:** The PLWTP MRP requires quarterly sampling of 36 offshore water quality stations. Quarterly sampling at these stations is typically conducted during February, May, August, and November to correspond with similar sampling for the Central Bight Regional Water Quality Monitoring Program (CBRWQMP) conducted off Orange County, Los Angeles County, and Ventura County. In order to maintain this bight-wide regional monitoring effort, no resource exchange is requested for the PLOO region.

Mr. David Gibson
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Instead, the City requests that modification be applied to the SBOO offshore effort as described below in order to align it with PLOO sampling and the CBRWQMP.

- 8) SBOO Offshore WQ Sampling: The SBWRP and SBIWTP MRPs require monthly sampling of 37 offshore water quality stations, of which three "near-outfall" stations (I-12, I-14, I-16) are located within 1,000 ft of the SBOO discharge site (diffuser legs). The City requests that water quality sampling for the 34 stations located > 1,000 ft from the outfall be reduced to quarterly sampling in calendar year 2014 to coincide with the similar quarterly efforts described above. This would result in full sampling of all 37 offshore stations during February, May, August, and November 2014; full sampling at the three near-outfall stations would be maintained during all months. Approval of this request will align the SBOO and PLOO programs with the CBRWQMP, and allow the City to reallocate the effort and expense necessary to fully participate in the Nutrient Impact component of Bight'13.

The above resource exchange, including any additional exchanges to those identified in the *POTW Letter* of May 2, 2013, have been discussed with Mr. Bruce Posthumus and Ms. Carey Nagoda of your technical staff. However, if you or your staff has any questions, please call Tim Stebbins, our Senior Marine Biologist, at 619-758-2329. We look forward to participating in another successful Southern California Bight regional monitoring project and to hearing from you regarding the above requests.

Sincerely,



Steve Meyer
Deputy Public Utilities Director

SM/tds

cc (via email):

Ken Schiff, Deputy Director
Southern California Coastal Water Research Project
kens@sccwrp.org

David Smith, Manager NPDES Permits
U.S. EPA Region 9, Water Division
smith.davidw@epa.gov

Steve Smullen, Area Operations Manager
South Bay International Wastewater Treatment Plant
steve.smullen@ibwc.gov

Table 1. Summary of City of San Diego planned effort for participation in Bight'13 Contaminants Impact Assessment component and associated resource exchange requests. Bight'13 Effort = number of stations or samples assigned to City.

Component	Bight'13 Effort	Resource Exchange	Notes
<i>Benthic Sampling</i>			
Field collection	53	40	USA/Mexico border to N. of Oceanside; Exchange = Jul13 Regionals
Infauna identifications	76	187	Exchange = Jul13, Jan14, Jul14 replicate samples for PLOO & SBOO, plus Jul13 randomized stations
Sediment grain size	396	40	City to analyze all B'13 samples
Sediment chemistry	108-172	40	Effort varies for TOC, CHCs, metals, PAHs, PBDEs, pyrethroids
Sediment Toxicity	24	0	+ Special Studies TBD
<i>Trawling</i>			
Demersal Fishes & Inverts	30	21	USA/Mexico border to N. of Oceanside; Exchange = Oct13, Apr14, Oct14 SBOO surveys
<i>Contaminant Bioaccumulation</i>			
Bird Eggs	TBD	—	Details under development
Fish Tissues	NA	9	Exchange = Apr14 SBOO survey

NA = not applicable (fish tissue sampling is not a component of Bight'13)

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