Appendix III:

Supplemental Technical Information for TMDLs for Toxic Pollutants in Dominguez Channel and Greater Los Angeles and Long Beach Harbor Waters

Appendix III Sections

Appendix III.1 – TMDL Loading Calculations for Saltwater Waterbodies

Contents

Appendix III.1 Summary

The information below was used for TMDL calculations, existing load calculations, and to support distribution of allocations.

EFDC model simulations to support TMDL development were based on a four-year simulation period (2002 through 2005). This period was selected because it contained the vast majority of the calibration data as well as it overlapped with the LSPC simulation period (1995-2005). More information on EFDC model calibration is documented in Appendix I.

Data and information below were used to support TMDL calculations and allocations. The direct air deposition rates (see Section III.6) and percent of nearshore contributions (see Table 2 through Table 7 in Section III.8) were also used to support allocations. Additional details on the TMDL and existing load calculations as well as allocations are described below.

Section III.1-1. TMDL and Existing Load Calculations

Information Used:

- Sediment Deposition Rates (Table III.1-1)
- Numeric Targets for TMDL Calculations (TMDL Staff Report, Section 3)
- Existing Sediment Concentrations (Table III.1-2)

Methodology:

Sediment deposition rates were used in the calculation of both TMDLs and existing loads (Table III.1-1). Sediment deposition rates were calculated by approximating the average mass of total sediment (fine and coarse particles) deposited in each waterbody annually based on average annual 2002-2005 EFDC model output. Sediment flux for each grid cell, which is dependent on watershed inputs as well as tidal movements between waterbodies, was obtained from the EFDC model output. These values were summarized across each TMDL zone, resulting in the average deposition of both sediment fines and sand by waterbody. Total deposition rate is simply the sum of the rates for fines and sand and this value is the waterbody-specific average annual (clean) sediment deposition rate. The total deposition rate was ultimately used for TMDL calculations and existing load calculations.

To determine the loading capacities for each pollutant, the total deposition rate (Table III.1-1) was multiplied by the applicable sediment target (TMDL Staff Report, Section 3) and a conversion factor (to yield TMDLs in kilograms or grams per year, depending on the pollutant) (see equation and sample calculation below). TMDLs for other pollutants (cadmium, chromium, mercury, chlordane, dieldrin, and toxaphene) are concentration-based loading capacities in sediment (see TMDL Staff Report, Section 3).

TMDL = Sediment Deposition Rate *x* Numeric Target *x* Conversion Factor

Example: Copper in Dominguez Channel Estuary

Cu TMDL = 84 kg/yr =	2,470,201 kg/yr	*x*	34 mg/kg	*x*	$1x10^{-6}$	
	(sed. dep. rate) Table III.1-1		*(Cu target) Table III.1-2*		*(conv. factor)*	

Similarly, to calculate existing loads, the total deposition rate (Table III.1-1) was multiplied by the applicable existing sediment concentration (Table III.1-2), and a conversion factor (to yield current loads in kilograms or grams per year, depending on the pollutant) (see equation and sample calculation below). The existing sediment concentrations for copper,

lead, zinc, DDT, PAHs and PCBs were based on the average simulated sediment concentration in the top 5 cm of sediment during the 2002-2005 EFDC simulation period (Table III.1-2), while the existing concentration for mercury (Table III.1-3) was based on the average sediment concentration associated with AMEC and Bight 03 data in the Consolidated Slip.

Existing Load = Sediment Deposition Rate *x* Existing Concentration *x* Conversion Factor

Example: Copper in Dominguez Channel Estuary

Cu Existing = 327.6 kg/yr = 2,470,201 kg/yr *(sed. dep. rate) Table III.1-1* *x* 133 mg/kg *(Cu Avg. [Existing]) Table III.1-2* *x* $1x10^{-6}$ *(conv. factor)*

Table III.1-1. Waterbody Information

Waterbody Name	TMDL Zone	Area (acres)[1]	Area (m^2)[1]	Avg Fines Deposition (kg/yr)[2]	Avg Sand Deposition (kg/yr)[2]	Total Deposition (kg/yr)[2]
Dominguez Channel Estuary	01	140	567,900	465,680	2,004,522	2,470,201
Consolidated Slip	02	36	147,103	282,935	72,625	355,560
Inner Harbor - POLA	03	1,539	6,228,431	1,564,089	16,720	1,580,809
Inner Harbor - POLB	08	1,464	5,926,130	666,968	7,636	674,604
Fish Harbor	04	91	368,524	29,994	599	30,593
Cabrillo Marina	05	77	310,259	35,575	3,284	38,859
Cabrillo Beach	06	82	331,799	26,904	186	27,089
Outer Harbor - POLA	07	1,454	5,885,626	570,489	1,860	572,349
Outer Harbor - POLB	09	2,588	10,472,741	1,827,320	1,088	1,828,407
Los Angeles River Estuary	10	207	837,873	(2,152,248)	23,762,530	21,610,283
San Pedro Bay	11	8,173	33,073,517	9,055,624	10,000,647	19,056,271

[1] Area obtained from GIS layer of the 2006 303(d) list. Available at: http://www.waterboards.ca.gov/water_issues/programs/tmdl/303d_lists2006_gis.shtml

[2] Sediment deposition rates were calculated by approximating the average mass of total sediment (fine and coarse particles) deposited in each waterbody annually based on 2002-2005EFDC output. Sediment flux for each grid cell, which is dependent on watershed inputs as well as tidal movements between waterbodies, was obtained from the EFDC model output. These values were summarized across each TMDL zone, resulting in the average deposition of both sediment fines and sand by waterbody. The total deposition rate is simply the sum of the rates for fines and sand and this value is the waterbody-specific average annual (clean) sediment deposition rate.

Table III.1-2. Sediment Concentration Information per model zone (top 5 cm)

Waterbody Name	TMDL Zone	Total Cu (mg/kg)	Total Pb (mg/kg)	Total Zn (mg/kg)	Total DDT (total) (ug/kg)	Total PAH (total) (ug/kg)	Total PCB (total) (ug/kg)
Target		34	46.7	150	1.58	4022	3.2
Average Existing Concentration[1]							
Dominguez Channel Estuary	01	133	185	728	22	11,368	23
Consolidated Slip	02	259	358	1,122	138	32,373	236
Inner Harbor - POLA	03	85	51	261	11	1,940	15
Inner Harbor - POLB	08	66	37	192	7	679	8
Fish Harbor	04	47	20	138	5	113	2
Cabrillo Marina	05	236	59	235	43	6,083	27
Cabrillo Beach	06	110	24	167	36	889	11
Outer Harbor - POLA	07	62	21	147	19	586	27
Outer Harbor - POLB	09	46	30	174	11	159	11
Los Angeles River Estuary	10	75	122	930	11	404	19
San Pedro Bay	11	66	91	429	11	191	6

[1] Average existing sediment concentrations for total copper, total lead, total zinc, total DDT, total PAHs and total PCBs were based on the average simulated concentration in the top 5 cm of sediment. These average concentrations were determined for each TMDL zone by summarizing EFDC model output of contaminant flux by grid cell. The EFDC model was run for 2002-2005 and initial sediment bed concentrations (which were inputs to the model) were based on observed data from 2000-2006 (see Appendix I for additional details).

Table III.1-3. Sediment Concentration Information for Other Pollutants

Waterbody Name	Parameter	Units	Target Conc.	Existing Conc.	Notes
Dominguez Channel Estuary	Total Cadmium	ug/kg	1.2	3.2	WEMAP 99 & Bight 03 data
Dominguez Channel Estuary	Total Copper	ug/kg	34	191	WEMAP 99 & Bight 03 data
Dominguez Channel Estuary	Total Chlordane	ug/kg	0.5	43.6	WEMAP 99 & Bight 03 data
Dominguez Channel Estuary	Dieldrin	ug/kg	0.02	ND	WEMAP 99 data
Consolidated Slip	Total Cadmium	mg/kg	1.2	5.5	AMEC & Bight 03 data
Consolidated Slip	Total Chromium	mg/kg	81	167	AMEC & Bight 03 data
Consolidated Slip	Total Mercury	mg/kg	0.15	1.11	AMEC & Bight 03 data
Consolidated Slip	Total Chlordane	ug/kg	0.5	25.6	AMEC & Bight 03 data
Consolidated Slip	Dieldrin	ug/kg	0.02	7.2	AMEC & Bight 03 data
Consolidated Slip	Toxaphene	ug/kg	0.10	n/a	No sediment data available
Fish Harbor	Total Mercury	mg/kg	0.15	1.15	Bight 98 & Bight 03 data

Section III.1-2. Allocations

Information Used:

- Relative load contribution from watersheds (Appendix III.8, Tables 2 through 7)
- Contribution to each waterbody by jurisdictional area (Table III.1-4 and III.1-5)

Methodology:

As described in Appendix III.8, the EFDC model was used to generate a baseline as well as several other management scenarios and to evaluate relative contributions from various inputs. The baseline scenario started with the initial conditions and then simulated four years ahead to determine average water and sediment conditions if no implementation occurs) to characterize existing contaminant loads. Pollutant load reduction scenarios were performed to support allocation analyses and implementation alternatives. The "no upland sources" scenario, which simulates conditions assuming no upland (watershed) contaminant loads, was used to support allocation of the TMDL loads. Generally speaking, the baseline scenario is "let it run for four years under normal conditions"; whereas no upland scenario is "assume no contaminants come from watershed sources and let it run for four years."

Results of the "no upland sources" scenario were compared with results from the baseline scenario to quantify the relative contributions from the watersheds (see Tables 2 through 7 in Appendix III.8). Specifically, the model was run for 2002-2005 for these two scenarios and the resulting average sediment bed concentrations in the top 5 cm of sediment in each waterbody were quantified. The waterbody-specific values from each scenario were compared and the difference between them was represented as a percentage. This percentage was interpreted as the waterbody-specific percent contribution of the contaminant to the bed sediments from the upstream watersheds; i.e., the freshwater contributions. These percentages were ultimately applied to both the TMDLs and the existing conditions to determine the wasteload allocation and existing load, respectively, associated with watershed inputs.

The resulting WLAs were further distributed among MS4 permits based on the area draining to each waterbody. Specifically, the areas and percent area draining to each waterbody for MS4 permittees were calculated from GIS analyses of the nearshore areas (Table III.1-4 and III.1-5, respectively). Assumptions were made regarding the width of state and US highways under Caltrans jurisdiction (see footnote to Table III.1-4). The percent area for each MS4 permittee (Table III.1-5) was applied to the previously calculated WLA to determine the WLA for each responsible MS4 permittee(s) based on land area. See equation and sample calculation below.

Watershed WLA = TMDL *x* Relative Watershed Contribution (%)

Individual WLAs = Watershed WLA *x* Relative Drainage Area (%) by Permittee

Example: Copper in Dominguez Channel Estuary

Watershed (WS) WLA = 23 kg/yr =	84 kg/yr *(Cu TMDL)* *Staff Report* *Table 6-3*	*x*	28% *(WS%)* *Table 2,* *App. III.8*	

County LA WLA = 22.4 kg/yr = 23 kg/yr *(WS WLA) Staff Report Table 6-3* *x* 95.7% *(Juris. %) Table III.1-5*

City LB WLA = 0.6 kg/yr = 23 kg/yr *(WS WLA) Staff Report Table 6-3* *x* 2.7% *(Juris. %) Table III.1-5*

Caltrans WLA = 0.384 kg/yr = 23 kg/yr *(WS WLA) Staff Report Table 6-3* *x* 1.6% *(Juris. %) Table III.1-5*

Table III.1-4. Jurisdictional Area by TMDL Waterbody

Waterbody	Area (m^2)[1]				
	Caltrans	Long Beach	Seal Beach	Los Angeles County	Total Draining to Waterbody
Alamitos Bay	1,532,228	47,845,709	9,755,623	19,470,250	78,603,810
Cabrillo Marina	83,979	0	0	8,565,770	8,649,748
Consolidated Slip	68,532	0	0	4,316,131	4,384,663
Fish Harbor	1,868	0	0	577,108	578,976
Inner Cabrillo Beach Area	0	0	0	754,681	754,681
Los Angeles River Estuary	34,870	2,574,272	0	242,130	2,851,272
Inner Harbor	639,325	9,281,439	0	33,932,244	43,853,008
Outer Harbor (inside breakwater)	4,002	1,392,732	0	2,010,330	3,407,063
San Pedro Bay Near/Off Shore Zones	69,278	10,808,304	767,157	1,588,764	13,233,503
Dominguez Channel Estuary	1,357,065	2,225,713	0	79,292,407	82,875,185

[1] Area calculations using the following data sources:
Watershed boundaries: Calwater GIS layer (http://www.atlas.ca.gov/) delineated using stream reach and storm drain layers (see Appendix II for more information)
City boundaries: County of Los Angeles, DPW GIS data (http://gis.dpw.lacounty.gov/oia/site_options.cfm)
Caltrans areas calculated based on US Highway and State Highway lengths (GIS layers from http://www.atlas.ca.gov/) multiplied by assumed average widths. Average widths determined from average lane and shoulder widths and average number of lanes (US highway width = 172 feet; State highway width = 101 feet)

Table III.1-5. Contribution of freshwater inputs (relative to each other)

Waterbody	Percent of Total Area by Waterbody				
	Caltrans	Long Beach	Seal Beach	Los Angeles County	Total Draining to Waterbody
Alamitos Bay	1.9%	60.9%	12.4%	24.8%	100.0%
Cabrillo Marina	1.0%	0.0%	0.0%	99.0%	100.0%
Consolidated Slip	1.6%	0.0%	0.0%	98.4%	100.0%
Fish Harbor	0.3%	0.0%	0.0%	99.7%	100.0%
Inner Cabrillo Beach Area	0.0%	0.0%	0.0%	100.0%	100.0%
Los Angeles River Estuary	1.2%	90.3%	0.0%	8.5%	100.0%
Inner Harbor	1.5%	21.2%	0.0%	77.4%	100.0%
Outer Harbor (inside breakwater)	0.1%	40.9%	0.0%	59.0%	100.0%
San Pedro Bay Near/Off Shore Zones	0.5%	81.7%	5.8%	12.0%	100.0%
Dominguez Channel Estuary	1.6%	2.7%	0.0%	95.7%	100.0%

Appendix III.2 – Dominguez Channel Freshwater Metals Loading Calculations

Contents

Appendix III.2 Summary

The following sections present the wet weather LSPC modeling results for the freshwater sections of Dominguez Channel and the wet weather TMDLs calculated for total copper, total lead, and total zinc. In addition, input information used to calculate the TMDLs and allocations are defined.

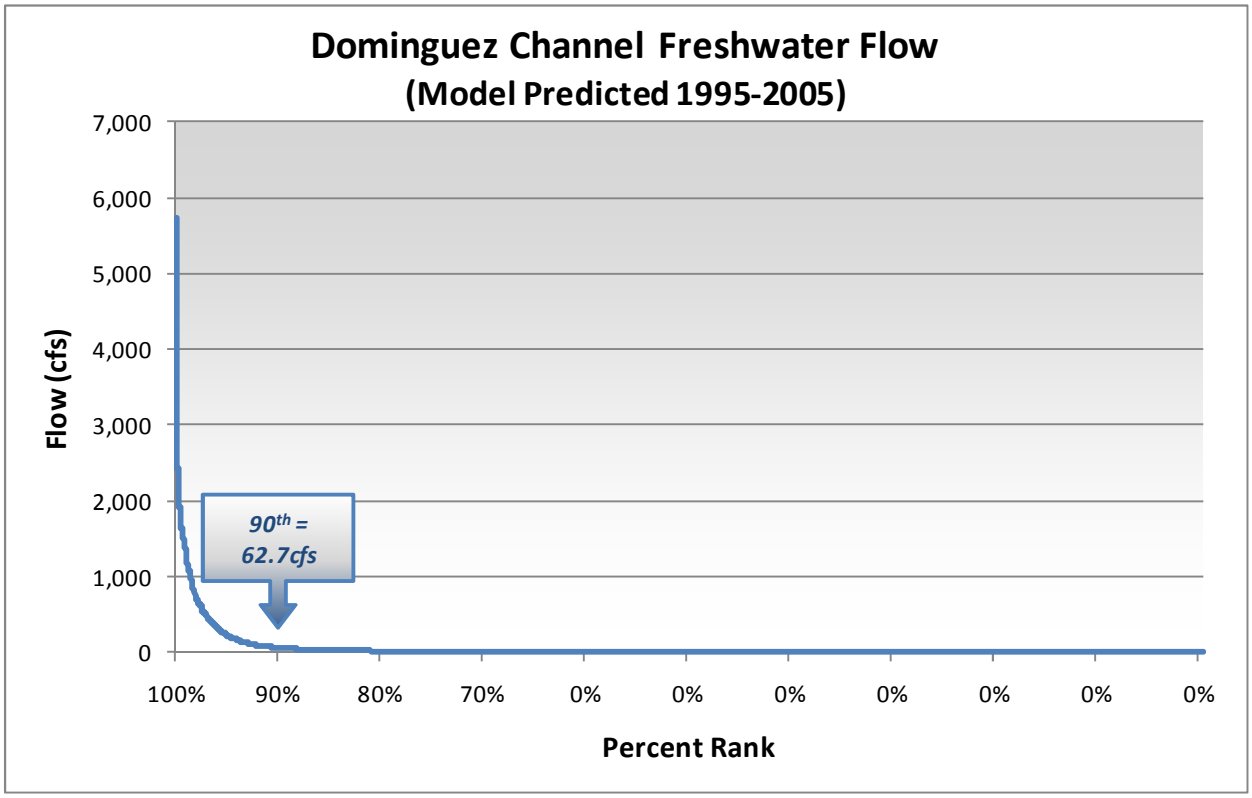
The LSPC model was run for an 11-year period (1995-2005) and output included daily average model results for flow and metals concentrations. Wet weather days were identified as greater than 62.7 cfs (90^{th} percentile modeled flow; Figure III.2-1). Output associated with these wet days over the 11-year period were used to develop load duration curves. The loading capacity (blue lines in the figures below) was determined by multiplying the simulated water volume and the applicable numeric target (allowable load), while existing loads were calculated from the volume and associated simulated metals concentrations (modeled load). Copper and zinc existing loads were consistently above the allowable load, requiring 72 percent and 76 percent reductions, respectively. The overall average annual existing lead load is below the average annual allowable lead load (based on wet days in the 11-year modeling period); however, in certain instances, lead exceeds the allowable daily load, as indicated by the red bars in the lead load duration curve figure below (Figure III.2-3) (requiring a 3.1 percent reduction).

Section III.2-1. Wet Weather Modeling Results

Wet weather was defined as the 90th percentile flow (or greater). Using the 1995-2005 LSPC watershed model results, the 90th percentile flow is 62.7 cfs. The 90th percentile observed flow for 2001-2006 was 61.5 cfs, which is nearly identical to the modeled flow (less than a 2% difference). The LSPC modeled flows are presented by percent rank in Figure III.2-1.

Figure III.2-1. Model-Predicted Freshwater Flows in Dominguez Channel

Note: 90th percentile predicted flow is 62.7 cfs. 90th percentile observed flow is 61.5 cfs.



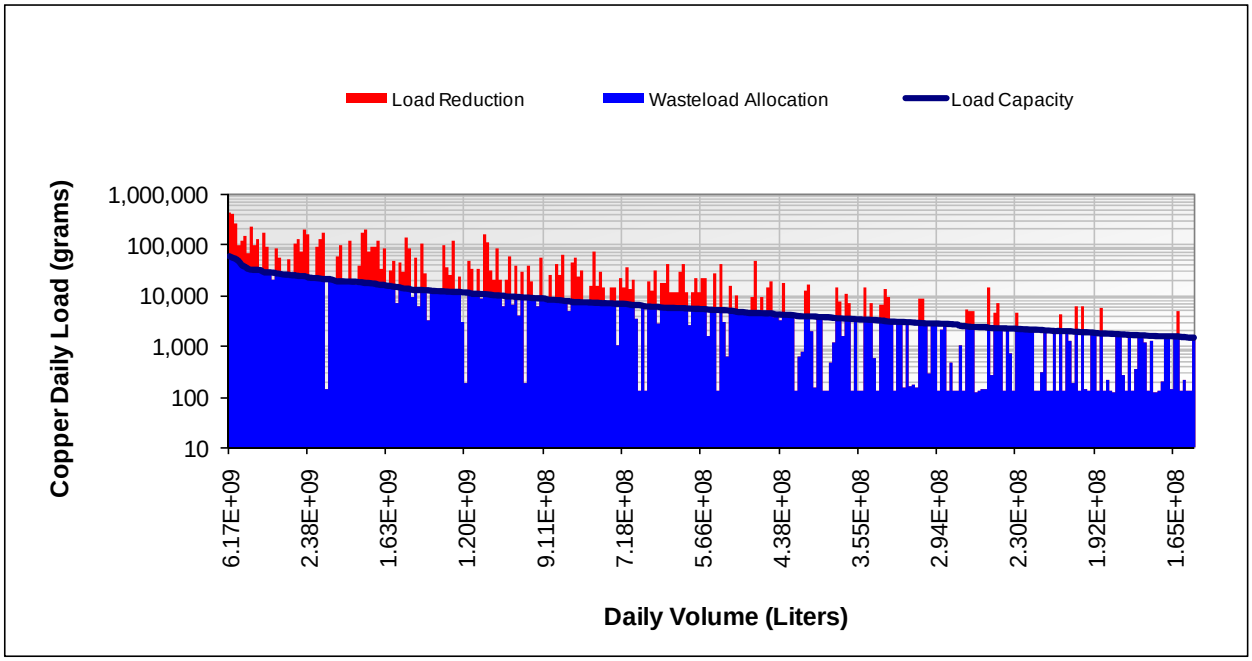
The loads presented in Table III.2-1 below are based the load duration curves; therefore, the numbers used in these calculations are from the bars in the load duration curves presented for each metal or the total loads under the loading capacity curves (Figures III.2-2 to III.2-4). Specifically, for the existing loads, the loads associated with all bars in the load duration curves are summed, but for the average annual allowable loads, the total possible loads below the loading capacity curve are summed. These total existing loads or total allowable loads (which are based solely on wet days over the eleven-year modeling period) were divided by eleven to yield average annual wet weather loads. It is important to note that these "annual" loads are only based on the wet days. If they are converted to average daily loads for comparison with the TMDL loads in Table III.2-2, they should be divided by an average of 28 wet days per year (in the eleven-year simulation period, there were a total of 307 wet days). The percent reductions

for all three metals in Table III.2-1 are estimates to provide readers with an approximate level of pollutant reductions required based on daily loads.

Table III.2-1. Dominguez Channel Freshwater – Modeled Annual Loading Summary

Dominguez Channel (freshwater), 1995-2005 Model Simulation (kg/year)			
	Total Copper	**Total Lead**	**Total Zinc**
Average Annual Allowable Load	245	1,080	1,763
Average Annual Modeled Load	776	440	6,747
Percent Reduction	**72.0%**	**3.1%**	**76.4%**

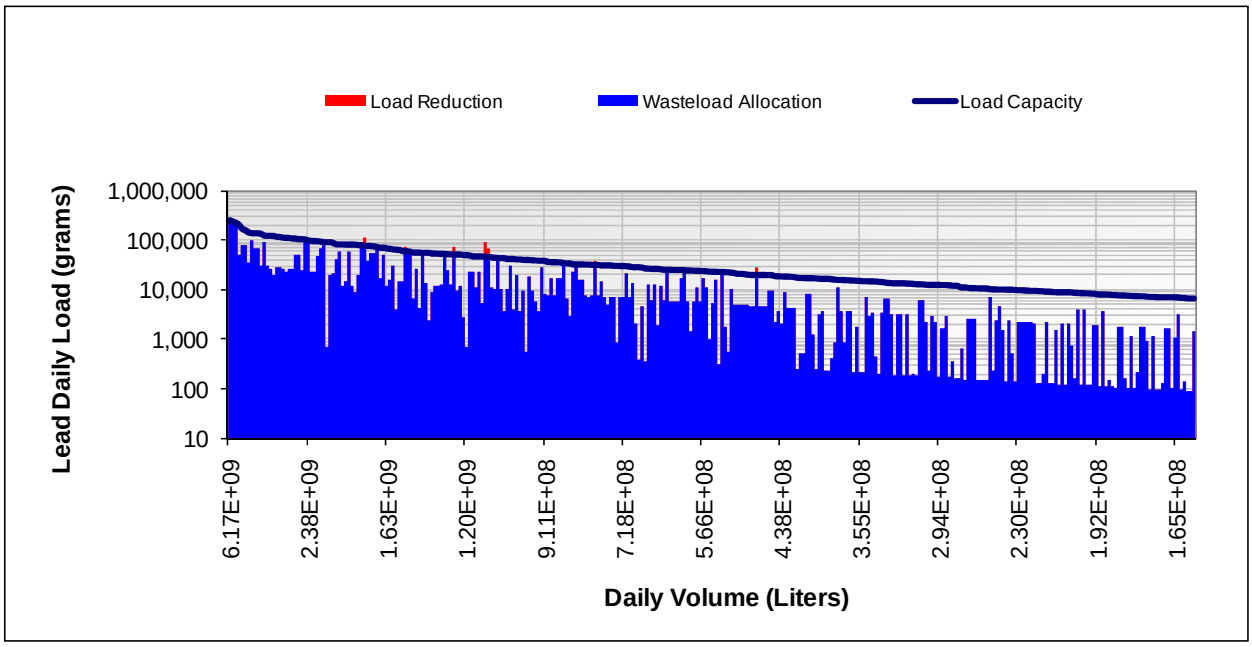
Figure III.2-2. Copper Load Duration Curve (by volume) for Wet Days



Computed Load Indicators:	Value	Units
Total Storms Over 11-Year Period	307	none
Total Below Load Capacity Curve:	2,695	kg
Existing Condition (Red and Blue)	8,538	kg
Existing Load Below Load Capacity Curve (Blue):	2,392	kg
Existing Load Above Load Capacity Curve (Red):	6,146	kg
TMDL Wasteload Reduction:	72.0%	none

Summary of Annual Average Loads	Value	Units
Average Annual Volume	24,305	million liters
Average Annual Existing Load	776	kg
Average Annual Exceedance Load	559	kg
Average Annual Load Capacity	245	kg
% Reduction	72.0%	none

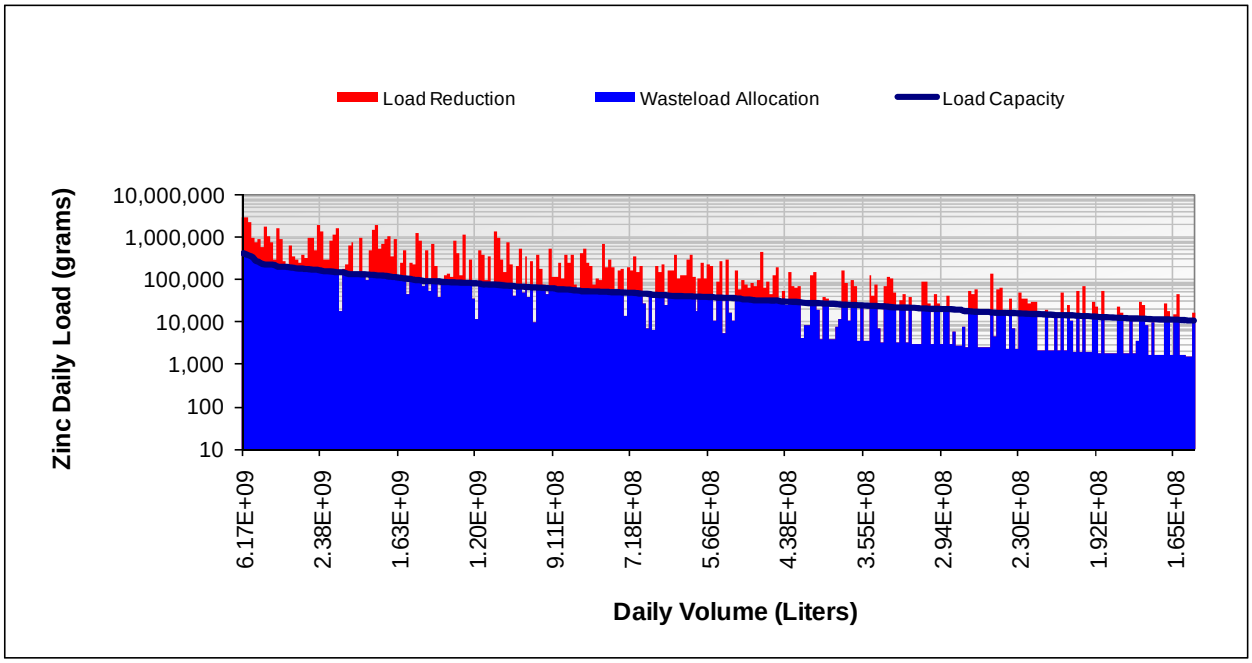
Figure III.2-3. Lead Load Duration Curve (by volume) for Wet Days



Computed Load Indicators:	Value	Units
Total Storms Over 11-Year Period	307	none
Total Below Load Capacity Curve:	11,885	kg
Existing Condition (Red and Blue)	4,837	kg
Existing Load Below Load Capacity Curve (Blue):	4,685	kg
Existing Load Above Load Capacity Curve (Red):	152	kg
TMDL Wasteload Reduction:	3.1%	none

Summary of Annual Average Loads	Value	Units
Average Annual Volume	24,305	million liters
Average Annual Existing Load	440	kg
Average Annual Exceedance Load	14	kg
Average Annual Load Capacity	1,080	kg
% Reduction	3.1%	none

Figure III.2-4. Zinc Load Duration Curve (by volume) for Wet Days



Computed Load Indicators:	Value	Units
Total Storms Over 11-Year Period	307	none
Total Below Load Capacity Curve:	19,393	kg
Existing Condition (Red and Blue)	74,220	kg
Existing Load Below Load Capacity Curve (Blue):	17,486	kg
Existing Load Above Load Capacity Curve (Red):	56,735	kg
TMDL Wasteload Reduction:	76.4%	none

Summary of Annual Average Loads	Value	Units
Average Annual Volume	24,305	million liters
Average Annual Existing Load	6,747	kg
Average Annual Exceedance Load	5,158	kg
Average Annual Load Capacity	1,763	kg
% Reduction	76.4%	none

Section III.2-2. Dominguez Channel Freshwater Wet Weather TMDL Calculations and Allocations

The TMDLs, or allowable loads, presented in Table III.2-2 below are based the numeric targets (values on the left side) (see Table III.2-3 for calculation of the total recoverable numeric targets using conversion factors). Allowable daily loads and allocations (values on the right side) are presented based on an example daily storm volume of 62.7 cfs (90th percentile observed flow; Figure III.2-1). Allocations for Los Angeles County Department of Public Works MS4 Permit and Caltrans Stormwater Permit are based on the percentages presented in Table III.2-4. Additional information is provided in Section 6.1 of the Staff Report.

Table III.2-2. TMDL Calculations and Allocations

	CONCENTRATIONS (µg/L) (x 10^{-6} x storm volume)			**LOADS based on 62.7 cfs (gram/day)**		
Calculation	**Total Copper**	**Total Lead**	**Total Zinc**	**Total Copper**	**Total Lead**	**Total Zinc**
TMDL	**9.7**	**42.7**	**69.7**	**1,485.1**	**6,548.8**	**10,685.5**
10% Explicit MOS	0.968	4.269	6.966	148.5	654.9	1,068.6
TMDL minus MOS (available for allocations)	8.713	38.422	62.692	1,336.6	5,894.0	9,617.0
	Allocations: µg/L (x 10^{-6} x storm volume)			**Allocations based on 62.7 cfs (gram/day)**		
Direct Deposition (0.3%)	0.0261	0.1153	0.1881	4.0	17.7	28.9
TMDL minus Direct Dep	8.687	38.307	62.504	1,332.6	5,876.3	9,588.1
Los Angeles County Dept. of Public Works MS4 Permit	8.476	37.378	60.988	1,300.3	5,733.7	9,355.5
Caltrans Stormwater Permit	0.211	0.929	1.516	32.3	142.6	232.6

Note: Allocations in the bottom half of the table for Los Angeles County Department of Public Works MS4 Permit and Caltrans Stormwater Permit are based on the percentages presented in Table III.2-4 below. Both the concentrations (left-hand set of allocations) and the loads (right-hand set of allocations) are distributed from the associated TMDL values above using these percentages.

Table III.2-3. Wet-weather numeric targets expressed as dissolved and total recoverable values

Metal	Target* (µg/L)	Dissolved to Total Conversion Factor	Target (µg/L)
	Dissolved		Total Recoverable
Copper	6.99	0.722	9.7
Lead	30.14	0.706	42.7
Zinc	65.13	0.935	69.7

** Targets are based on a median hardness of 50 mg/L (sample size = 35).*

Table III.2-4. Watershed Area by Permittee

Category	Area in Acres[1]	Percent of Watershed Area
Los Angeles County Dept. of Public Works MS4 Permit[2]	24,846	97.3%
Caltrans Stormwater Permit	618	2.4%
Water	76	0.3%
Total	**25,540**	**100%**

[1] Area calculations using the following data sources:
Watershed boundaries: County of Los Angeles, DPW GIS data (http://gis.dpw.lacounty.gov/oia/site_options.cfm)
City boundaries: County of Los Angeles, DPW GIS data (http://gis.dpw.lacounty.gov/oia/site_options.cfm)
Caltrans areas calculated based on US Highway and State Highway lengths (GIS layers from http://www.atlas.ca.gov/) multiplied by assumed average widths. Average widths determined from average lane and shoulder widths and average number of lanes (US highway width = 172 feet; State highway width = 101 feet)

[2] LACDPW MS4 Permit area used for the TMDL allocations was 97.6% since the total area used was 25,464 (land area only; i.e., water area was subtracted from the total area above).

Appendix III.3 – Initial Conditions for EFDC Model

Contents

Appendix III.3 Summary

The following three tables include the initial chemical (organics and metals concentrations) and physical conditions used to populate the EFDC model. The distribution of initial concentrations were based on the observed data presented below. Specifically, observed concentrations were used to represent the grid cell at their specific location and the concentrations between the individual data points were estimated by interpolating between the known concentrations. See Appendix I, Section 7.1 for additional information.

Table III.3-1. Sediment Bed Initial Conditions – Organics Concentrations

Longitude	Latitude	Total DDT (mg/kg)	Total PAHs (mg/kg)	Total PCBs (mg/kg)	Year	TMDL Zone
-118.266129	33.761856	0.0324	21.566999	0.013700	2006	Los Angeles Inner Harbor
-118.276443	33.757252	0.03099	0.957900	0.025840	2006	Los Angeles Inner Harbor
-118.276642	33.757084	0.0316	4.114500	0.018200	2006	Los Angeles Inner Harbor
-118.250229	33.763939	0.03478	1.181600	0.036320	2006	Los Angeles Inner Harbor
-118.275215	33.765251	0.02057	0.842900	0.030000	2006	Los Angeles Inner Harbor
-118.270973	33.74873	0.003	0.265200		2006	Los Angeles Inner Harbor
-118.254234	33.761452	0.04197	1.090200	0.030190	2006	Los Angeles Inner Harbor
-118.260147	33.758026	0.04065	1.301400	0.025990	2006	Los Angeles Inner Harbor
-118.261147	33.756371	0.03684	1.526600	0.016910	2006	Los Angeles Inner Harbor
-118.27507	33.748257	0.0487	2.446400	0.043400	2006	Los Angeles Inner Harbor
-118.258835	33.727703	0.0153	0.123300		2006	Los Angeles Inner Harbor
-118.273338	33.728874	0.0244	0.747650	0.019150	2006	Los Angeles Inner Harbor
-118.262131	33.729378	0.0125	0.079700		2006	Los Angeles Inner Harbor
-118.275398	33.740715	0.007	0.221500	0.003600	2006	Los Angeles Inner Harbor
-118.251671	33.748417	0.0129	1.782500	0.060700	2006	Los Angeles Inner Harbor
-118.268829	33.730362	0.0486	10.178000	0.035500	2006	Los Angeles Inner Harbor
-118.270348	33.7257	0.0032	0.114500		2006	Los Angeles Inner Harbor
-118.276863	33.720718	0.1876	37.855999	0.207200	2006	Los Angeles Harbor - Cabrillo Marina
-118.264336	33.726715	0.02985	0.720500		2006	Los Angeles Inner Harbor
-118.247612	33.734066	0.0136	0.231400	0.001100	2006	Los Angeles Inner Harbor
-118.28009	33.712036	0.1515	1.113300	0.032700	2006	Los Angeles Harbor - Inner Cabrillo Beach
-118.281494	33.710442	0.0229	0.300400		2006	Los Angeles Harbor - Inner Cabrillo Beach
-118.276978	33.715755	0.1107	0.294900	0.006400	2006	Los Angeles Outer Harbor
-118.235764	33.714821	0.0586	0.220700	0.001500	2006	Los Angeles Outer Harbor
-118.274979	33.714191	0.0946	1.987300	0.023900	2006	Los Angeles Outer Harbor
-118.271591	33.711048	0.0279	0.611900	0.008000	2006	Los Angeles Outer Harbor
-118.271805	33.707703	0.0105	0.291300		2006	Los Angeles Outer Harbor
-118.251648	33.715622	0.0884	0.231000	0.009400	2006	Los Angeles Outer Harbor
-118.249382	33.711052	0.067	0.115700	0.006200	2006	Los Angeles Outer Harbor
-118.27108	33.713184	0.0394	0.911300	0.010200	2006	Los Angeles Outer Harbor
-118.217407	33.774048	0.075	5.394900	0.055600	2006	Long Beach Inner Harbor
-118.23262	33.766983	0.0241	0.815500	0.021500	2006	Long Beach Inner Harbor
-118.20472	33.771378	0.0025	0.740200		2006	Los Angeles River Estuary
-118.219826	33.768177	0.0696	2.940100	0.068600	2006	Long Beach Inner Harbor
-118.221428	33.765331	0.057	1.783900	0.023000	2006	Long Beach Inner Harbor
-118.21241	33.774307	0.0182	3.088300	0.014200	2006	Long Beach Inner Harbor
-118.223022	33.768414	0.0703	1.100500	0.047300	2006	Long Beach Inner Harbor
-118.211823	33.771019	0.0233	4.626000	0.036500	2006	Long Beach Inner Harbor

Longitude	Latitude	Total DDT (mg/kg)	Total PAHs (mg/kg)	Total PCBs (mg/kg)	Year	TMDL Zone
-118.217552	33.757893	0.01213	0.456800	0.006170	2006	Long Beach Inner Harbor
-118.220612	33.772102	0.02679	1.130800	0.009200	2006	Long Beach Inner Harbor
-118.19619	33.743042	0.0178	0.417900		2006	Long Beach Inner Harbor
-118.21376	33.755638	0.0169	0.746400	0.013700	2006	Long Beach Inner Harbor
-118.206978	33.746826	0.0292	3.657900	0.053100	2006	Long Beach Inner Harbor
-118.201187	33.742382	0.0039	0.120100		2006	Long Beach Inner Harbor
-118.232559	33.754124	0.0179	2.361300	0.037100	2006	Long Beach Inner Harbor
-118.227867	33.75016	0.0157	0.504800	0.024500	2006	Long Beach Inner Harbor
-118.187904	33.737217	0.01022	0.126550		2006	Long Beach Inner Harbor
-118.204094	33.740528	0.00496	0.950300		2006	Long Beach Inner Harbor
-118.225174	33.748158	0.0078	0.225800	0.001300	2006	Long Beach Inner Harbor
-118.203789	33.743156	0.0086	0.393700		2006	Long Beach Inner Harbor
-118.229446	33.721703	0.0518	0.312500		2006	Los Angeles Outer Harbor
-118.184067	33.753365	0.0332	0.651800	0.008500	2006	San Pedro Bay Near/Off Shore Zones
-118.221809	33.734745	0.0127	0.389300		2006	Los Angeles Outer Harbor
-118.222313	33.732468	0.00977	0.233200	0.001070	2006	Los Angeles Outer Harbor
-118.215019	33.731087	0.01536	0.201300	0.002130	2006	Los Angeles Outer Harbor
-118.232841	33.724655	0.01075	0.200150		2006	Los Angeles Outer Harbor
-118.19281	33.732067	0.0414	0.319400		2006	Los Angeles Outer Harbor
-118.213501	33.737457	0.01651	0.240700	0.001650	2006	Los Angeles Outer Harbor
-118.23111	33.735413	0.0405	0.403800	0.016600	2006	Los Angeles Outer Harbor
-118.212311	33.73381	0.0249	0.360900	0.001360	2006	Los Angeles Outer Harbor
-118.227898	33.807991	0.9132	5.226200	0.314800	2003	Dominguez Channel Estuary
-118.227898	33.807991	0.6092	3.567400	0.177000	2003	Dominguez Channel Estuary
-118.240547	33.820023	0.4073	4.529200	0.322500	2003	Dominguez Channel Estuary
-118.228149	33.809132	1.1469	4.109900	0.378300	2003	Dominguez Channel Estuary
-118.227058	33.803066	0.022	1.861800	0.012320	2003	Dominguez Channel Estuary
-118.235512	33.815979	0.057	3.868800	0.062300	2003	Dominguez Channel Estuary
-118.227112	33.802235	0.0093	9.086000	0.013230	2003	Dominguez Channel Estuary
-118.265999	33.844379	0.445	6.100000	1.500000	2002	Dominguez Channel Estuary
-118.265999	33.844379	0.9866	14.000000	0.840000	2002	Dominguez Channel Estuary
-118.269821	33.848305	0.219	2.700000	0.130000	2002	Dominguez Channel Estuary
-118.269821	33.848305	1.89	32.000000	2.000000	2002	Dominguez Channel Estuary
-118.287285	33.866657	1.17	24.000000	1.200000	2002	Dominguez Channel Estuary
-118.287285	33.866657	0.515	3.700000	0.150000	2002	Dominguez Channel Estuary
-118.287277	33.868874	0.0791	0.630000	0.068000	2002	Dominguez Channel Estuary
-118.287277	33.868874	0.0748	0.850000	0.056000	2002	Dominguez Channel Estuary
-118.287277	33.868874	0.506	2.500000	1.100000	2002	Dominguez Channel Estuary
-118.288803	33.870327	0.0349	59.000000	0.059000	2002	Dominguez Channel Estuary
-118.288803	33.870327	0.0643	1.000000	0.086000	2002	Dominguez Channel Estuary

Longitude	Latitude	Total DDT (mg/kg)	Total PAHs (mg/kg)	Total PCBs (mg/kg)	Year	TMDL Zone
-118.247208	33.826752	0.694	4.900000	0.500000	2002	Dominguez Channel Estuary
-118.249153	33.826534	0.1834	10.000000	0.170000	2002	Dominguez Channel Estuary
-118.258202	33.836483	0.831	2.800000	0.130000	2002	Dominguez Channel Estuary
-118.259247	33.837593	0.898	6.200000	0.260000	2002	Dominguez Channel Estuary
-118.26033	33.838703	0.2083	1.700000	0.170000	2002	Dominguez Channel Estuary
-118.228409	33.810669	0.55	3.300000	0.200000	2002	Dominguez Channel Estuary
-118.236168	33.81588	0.7	4.600000	1.200000	2002	Dominguez Channel Estuary
-118.238693	33.816574	1.736	1.700000	0.170000	2002	Dominguez Channel Estuary
-118.240646	33.821323	0.337	64.000000	0.780000	2002	Dominguez Channel Estuary
-118.240837	33.822742	0.8929	1.300000	0.180000	2002	Dominguez Channel Estuary
-118.235443	33.784019	0.1932	4.100000	2.300000	2002	Dominguez Channel Estuary
-118.228981	33.793499	0.015	0.440000	0.028000	2002	Dominguez Channel Estuary
-118.227829	33.798519	0.37	4.000000	0.470000	2002	Dominguez Channel Estuary
-118.226898	33.803123	0.1089	8.300000	0.099900	2002	Dominguez Channel Estuary
-118.26268	33.839687	0.144	20.000000	0.074000	2002	Dominguez Channel Estuary
-118.26268	33.839687	0.2097	4.400000	0.400000	2002	Dominguez Channel Estuary
-118.26265	33.841099	0.172	2.700000	0.120000	2002	Dominguez Channel Estuary
-118.26265	33.841099	0.1823	4.600000	0.140000	2002	Dominguez Channel Estuary
-118.263229	33.841599	0.1363	0.960000	0.075000	2002	Dominguez Channel Estuary
-118.263229	33.841599	1.563	18.000000	1.300000	2002	Dominguez Channel Estuary
-118.26326	33.841709	0.436	3.800000	0.220000	2002	Dominguez Channel Estuary
-118.26326	33.841709	0.864	9.000000	0.730000	2002	Dominguez Channel Estuary
-118.263672	33.842049	2.539	6.500000	0.260000	2002	Dominguez Channel Estuary
-118.263672	33.842049	0.392	14.000000	0.980000	2002	Dominguez Channel Estuary
-118.129417	33.755322	0.0029	0.084100		2003	Alamitos Bay
-118.111816	33.764885	0.0099	0.662000	0.015700	2003	Alamitos Bay
-118.112839	33.755314	0.0038	0.160900		2003	Alamitos Bay
-118.111633	33.75106	0.0051	0.409500	0.004200	2003	Alamitos Bay
-118.112694	33.765686	0.0169	0.431700		2003	Alamitos Bay
-118.279144	33.722775	0.16069	3.193100	0.051930	2003	Los Angeles Harbor - Cabrillo Marina
-118.241241	33.776897	0.0403	1.300000	0.027200	2002	Los Angeles Harbor - Consolidated Slip
-118.241241	33.776897	0.033	0.140250	0.023400	2002	Los Angeles Harbor - Consolidated Slip
-118.241241	33.776897	0.033	8.900000	0.020700	2002	Los Angeles Harbor - Consolidated Slip
-118.241241	33.776897	0.009	5.600000	0.022400	2002	Los Angeles Harbor - Consolidated Slip
-118.241241	33.776897	0.009	490.000000	0.023000	2002	Los Angeles Harbor - Consolidated Slip
-118.247131	33.77655	1.209	53.000000	0.910000	2002	Los Angeles Harbor - Consolidated Slip
-118.247131	33.77655	0.463	77.000000	0.177000	2002	Los Angeles Harbor - Consolidated Slip
-118.247131	33.77655	0.422	8.900000	0.119000	2002	Los Angeles Harbor - Consolidated Slip
-118.247131	33.77655	0.0102	14.000000	0.025300	2002	Los Angeles Harbor - Consolidated Slip
-118.247131	33.77655	0.0102	66.000000	0.024100	2002	Los Angeles Harbor - Consolidated Slip

Longitude	Latitude	Total DDT (mg/kg)	Total PAHs (mg/kg)	Total PCBs (mg/kg)	Year	TMDL Zone
-118.247131	33.77655	0.0084	8.100000	0.020300	2002	Los Angeles Harbor - Consolidated Slip
-118.247131	33.77655	0.0078	5.500000	0.160700	2002	Los Angeles Harbor - Consolidated Slip
-118.247131	33.77655	0.0078	130.000000	0.019000	2002	Los Angeles Harbor - Consolidated Slip
-118.241966	33.776291	1.922	50.000000	0.905000	2002	Los Angeles Harbor - Consolidated Slip
-118.241966	33.776291	0.579	5.700000	1.645000	2002	Los Angeles Harbor - Consolidated Slip
-118.241966	33.776291	0.1683	11.000000	0.265000	2002	Los Angeles Harbor - Consolidated Slip
-118.241966	33.776291	0.0126	110.000000	0.152000	2002	Los Angeles Harbor - Consolidated Slip
-118.241966	33.776291	0.0096	8.500000	0.021700	2002	Los Angeles Harbor - Consolidated Slip
-118.241966	33.776291	0.0096	7.000000	0.022400	2002	Los Angeles Harbor - Consolidated Slip
-118.241966	33.776291	0.0078	490.000000	0.018800	2002	Los Angeles Harbor - Consolidated Slip
-118.241966	33.776291	0.0084	0.429560	0.019600	2002	Los Angeles Harbor - Consolidated Slip
-118.242188	33.775982	1.911	0.430000	0.949000	2002	Los Angeles Harbor - Consolidated Slip
-118.242188	33.775982	0.892	11.000000	1.530000	2002	Los Angeles Harbor - Consolidated Slip
-118.242188	33.775982	0.0336	11.000000	0.020300	2002	Los Angeles Harbor - Consolidated Slip
-118.242188	33.775982	0.0078	63.000000	0.018200	2002	Los Angeles Harbor - Consolidated Slip
-118.242188	33.775982	0.0078	0.142420	0.018900	2002	Los Angeles Harbor - Consolidated Slip
-118.242188	33.775982	0.0078	7.100000	0.018200	2002	Los Angeles Harbor - Consolidated Slip
-118.242188	33.775982	0.0072	11.000000	0.016100	2002	Los Angeles Harbor - Consolidated Slip
-118.242188	33.775982	0.009	3.000000	0.020300	2002	Los Angeles Harbor - Consolidated Slip
-118.242554	33.775982	0.474	0.014000	0.302500	2002	Los Angeles Harbor - Consolidated Slip
-118.242554	33.775982	0.326	0.590000	0.230000	2002	Los Angeles Harbor - Consolidated Slip
-118.242554	33.775982	1.189	130.000000	0.739000	2002	Los Angeles Harbor - Consolidated Slip
-118.242554	33.775982	1.373	86.000000	1.850000	2002	Los Angeles Harbor - Consolidated Slip
-118.242554	33.775982	1.7038	25.000000	1.858500	2002	Los Angeles Harbor - Consolidated Slip
-118.242554	33.775982	0.3438	9.000000	1.140000	2002	Los Angeles Harbor - Consolidated Slip
-118.242554	33.775982	0.4974	10.000000	1.755000	2002	Los Angeles Harbor - Consolidated Slip
-118.242554	33.775982	0.5582	30.000000	3.785000	2002	Los Angeles Harbor - Consolidated Slip
-118.244102	33.775574	0.2028	0.280000	1.444000	2002	Los Angeles Harbor - Consolidated Slip
-118.244102	33.775574	0.4222	6.751800	0.671000	2002	Los Angeles Harbor - Consolidated Slip
-118.244102	33.775574	1.1928	19.000000	0.688500	2002	Los Angeles Harbor - Consolidated Slip
-118.244102	33.775574	1.7636	73.000000	1.908000	2002	Los Angeles Harbor - Consolidated Slip
-118.244102	33.775574	0.637	200.000000	3.575000	2002	Los Angeles Harbor - Consolidated Slip
-118.244102	33.775574	0.2558	0.530000	0.765000	2002	Los Angeles Harbor - Consolidated Slip
-118.244102	33.775574	0.009	0.390000	0.021000	2002	Los Angeles Harbor - Consolidated Slip
-118.244102	33.775574	0.0072	196.899994	0.016800	2002	Los Angeles Harbor - Consolidated Slip
-118.244186	33.774967	0.3906	8.370400	0.572500	2002	Los Angeles Harbor - Consolidated Slip
-118.244186	33.774967	0.508	12.590000	0.540000	2002	Los Angeles Harbor - Consolidated Slip
-118.244186	33.774967	0.975	30.669001	0.710500	2002	Los Angeles Harbor - Consolidated Slip
-118.244186	33.774967	1.6288	59.346001	1.298500	2002	Los Angeles Harbor - Consolidated Slip
-118.244186	33.774967	1.6158	0.016000	1.129000	2002	Los Angeles Harbor - Consolidated Slip

Longitude	Latitude	Total DDT (mg/kg)	Total PAHs (mg/kg)	Total PCBs (mg/kg)	Year	TMDL Zone
-118.244186	33.774967	1.3832	6.000000	1.745500	2002	Los Angeles Harbor - Consolidated Slip
-118.244186	33.774967	0.3128	8.600000	1.395000	2002	Los Angeles Harbor - Consolidated Slip
-118.244881	33.777294	0.1956	0.066000	0.428000	2002	Los Angeles Harbor - Consolidated Slip
-118.244881	33.777294	0.2566	0.023000	0.403500	2002	Los Angeles Harbor - Consolidated Slip
-118.244881	33.777294	0.3848	1.725800	1.456000	2002	Los Angeles Harbor - Consolidated Slip
-118.244881	33.777294	1.8486	9.100000	1.088000	2002	Los Angeles Harbor - Consolidated Slip
-118.244881	33.777294	0.5532	0.400000	0.562500	2002	Los Angeles Harbor - Consolidated Slip
-118.244881	33.777294	0.0133	0.055000	0.023600	2002	Los Angeles Harbor - Consolidated Slip
-118.244881	33.777294	0.0084	17.285000	0.019600	2002	Los Angeles Harbor - Consolidated Slip
-118.244881	33.777294	0.0078	130.000000	0.018200	2002	Los Angeles Harbor - Consolidated Slip
-118.245354	33.775436	0.2602	0.380000	0.491500	2002	Los Angeles Harbor - Consolidated Slip
-118.245354	33.775436	0.4336	4.347800	0.542500	2002	Los Angeles Harbor - Consolidated Slip
-118.245354	33.775436	0.5552	0.390000	0.801500	2002	Los Angeles Harbor - Consolidated Slip
-118.245354	33.775436	1.3258	7.800000	0.909000	2002	Los Angeles Harbor - Consolidated Slip
-118.245354	33.775436	0.3536	0.119760	0.483000	2002	Los Angeles Harbor - Consolidated Slip
-118.245354	33.775436	0.0072	220.000000	0.017500	2002	Los Angeles Harbor - Consolidated Slip
-118.245354	33.775436	0.0081	0.066000	0.018900	2002	Los Angeles Harbor - Consolidated Slip
-118.245354	33.775436	0.0072	7.000000	0.017500	2002	Los Angeles Harbor - Consolidated Slip
-118.245857	33.774441	0.4254	330.000000	0.458000	2002	Los Angeles Harbor - Consolidated Slip
-118.245857	33.774441	0.2645	5.800000	0.305500	2002	Los Angeles Harbor - Consolidated Slip
-118.245857	33.774441	0.4947	9.200000	0.799500	2002	Los Angeles Harbor - Consolidated Slip
-118.245857	33.774441	1.2354	31.000000	1.028500	2002	Los Angeles Harbor - Consolidated Slip
-118.245857	33.774441	0.4115	85.000000	1.238500	2002	Los Angeles Harbor - Consolidated Slip
-118.245857	33.774441	0.2334	680.000000	2.068000	2002	Los Angeles Harbor - Consolidated Slip
-118.245857	33.774441	0.0694	180.000000	0.163800	2002	Los Angeles Harbor - Consolidated Slip
-118.245857	33.774441	0.0225	11.000000	0.235400	2002	Los Angeles Harbor - Consolidated Slip
-118.246857	33.774662	0.2346	12.000000	0.462000	2002	Los Angeles Harbor - Consolidated Slip
-118.246857	33.774662	0.4169	0.061000	0.623000	2002	Los Angeles Harbor - Consolidated Slip
-118.246857	33.774662	0.2828	0.380000	0.441000	2002	Los Angeles Harbor - Consolidated Slip
-118.246857	33.774662	0.9141	0.400000	0.800500	2002	Los Angeles Harbor - Consolidated Slip
-118.246857	33.774662	1.7619	0.140000	1.599000	2002	Los Angeles Harbor - Consolidated Slip
-118.246857	33.774662	0.8366	140.000000	1.386500	2002	Los Angeles Harbor - Consolidated Slip
-118.246857	33.774662	0.0353	0.350000	0.123000	2002	Los Angeles Harbor - Consolidated Slip
-118.247139	33.773693	0.3573	0.063000	0.733000	2002	Los Angeles Harbor - Consolidated Slip
-118.247139	33.773693	0.3909	1800.000000	0.388500	2002	Los Angeles Harbor - Consolidated Slip
-118.247139	33.773693	0.6159	750.000000	0.869000	2002	Los Angeles Harbor - Consolidated Slip
-118.247139	33.773693	1.6908	0.100000	0.958000	2002	Los Angeles Harbor - Consolidated Slip
-118.247139	33.773693	1.2369	0.710000	1.299000	2002	Los Angeles Harbor - Consolidated Slip
-118.247139	33.773693	0.3465	0.390000	1.065000	2002	Los Angeles Harbor - Consolidated Slip
-118.247139	33.773693	0.0078	190.000000	0.019400	2002	Los Angeles Harbor - Consolidated Slip

Longitude	Latitude	Total DDT (mg/kg)	Total PAHs (mg/kg)	Total PCBs (mg/kg)	Year	TMDL Zone
-118.247139	33.773693	0.0078	140.000000	0.019000	2002	Los Angeles Harbor - Consolidated Slip
-118.248001	33.773724	0.7172	0.018890	16.822001	2002	Los Angeles Harbor - Consolidated Slip
-118.248001	33.773724	0.9409	18.000000	15.319000	2002	Los Angeles Harbor - Consolidated Slip
-118.248001	33.773724	1.7906	69.000000	0.657500	2002	Los Angeles Harbor - Consolidated Slip
-118.248001	33.773724	0.2552	0.127080	0.454000	2002	Los Angeles Harbor - Consolidated Slip
-118.248001	33.773724	0.1261	0.384820	0.203000	2002	Los Angeles Harbor - Consolidated Slip
-118.248001	33.773724	0.009	0.022000	0.021800	2002	Los Angeles Harbor - Consolidated Slip
-118.248001	33.773724	0.0078	21.000000	0.019000	2002	Los Angeles Harbor - Consolidated Slip
-118.248001	33.773724	0.0078	0.230000	0.018500	2002	Los Angeles Harbor - Consolidated Slip
-118.248032	33.772915	0.4308	5.837400	0.569000	2002	Los Angeles Harbor - Consolidated Slip
-118.248032	33.772915	0.3928	10.000000	0.749500	2002	Los Angeles Harbor - Consolidated Slip
-118.248032	33.772915	1.2598	6.000000	1.009000	2002	Los Angeles Harbor - Consolidated Slip
-118.248032	33.772915	0.6822	190.000000	1.366500	2002	Los Angeles Harbor - Consolidated Slip
-118.248032	33.772915	1.3644	640.000000	1.942000	2002	Los Angeles Harbor - Consolidated Slip
-118.248032	33.772915	0.0447	330.000000	0.110500	2002	Los Angeles Harbor - Consolidated Slip
-118.248032	33.772915	0.0084	12.000000	0.019700	2002	Los Angeles Harbor - Consolidated Slip
-118.248032	33.772915	0.0078	21.000000	0.021000	2002	Los Angeles Harbor - Consolidated Slip
-118.247948	33.772247	0.009	22.000000	0.026500	2002	Los Angeles Harbor - Consolidated Slip
-118.247948	33.772247	0.009	7.000000	0.022500	2002	Los Angeles Harbor - Consolidated Slip
-118.247948	33.772247	0.0096	9.200000	0.025800	2002	Los Angeles Harbor - Consolidated Slip
-118.247948	33.772247	0.0096	290.000000	0.026000	2002	Los Angeles Harbor - Consolidated Slip
-118.247948	33.772247	0.0078	0.230000	0.020300	2002	Los Angeles Harbor - Consolidated Slip
-118.247948	33.772247	0.0078	0.156880	0.020600	2002	Los Angeles Harbor - Consolidated Slip
-118.247948	33.772247	0.0078	14.000000	0.020300	2002	Los Angeles Harbor - Consolidated Slip
-118.249397	33.770981	0.2672	24.000000	2.392000	2002	Los Angeles Inner Harbor
-118.249397	33.770981	0.4011	530.000000	3.331500	2002	Los Angeles Inner Harbor
-118.249397	33.770981	0.4977	12.000000	0.967000	2002	Los Angeles Inner Harbor
-118.249397	33.770981	0.009	18.000000	0.023100	2002	Los Angeles Inner Harbor
-118.249397	33.770981	0.0084	54.000000	0.021100	2002	Los Angeles Inner Harbor
-118.249397	33.770981	0.0078	120.000000	0.023200	2002	Los Angeles Inner Harbor
-118.249397	33.770981	0.0072	13.000000	0.020400	2002	Los Angeles Inner Harbor
-118.249397	33.770981	0.0078	15.000000	0.019200	2002	Los Angeles Inner Harbor
-118.2481	33.766891	0.08285	0.807320	0.117210	2003	Los Angeles Inner Harbor
-118.261627	33.724464	0.1068	0.186050	0.002130	2003	Los Angeles Inner Harbor
-118.215065	33.745552	0.0099	0.113380		2003	Los Angeles Outer Harbor
-118.217766	33.752518	0.02441	0.334970		2003	Long Beach Inner Harbor
-118.277214	33.766346	0.0251	2.496200	0.075370	2003	Los Angeles Inner Harbor
-118.207733	33.762493	0.03621	2.580700	0.023910	2003	Long Beach Inner Harbor
-118.198273	33.748741	0.0307	3.184500		2003	Long Beach Inner Harbor
-118.205421	33.765663	0.0033	0.320100	0.000380	2003	Los Angeles River Estuary

Longitude	Latitude	Total DDT (mg/kg)	Total PAHs (mg/kg)	Total PCBs (mg/kg)	Year	TMDL Zone
-118.205421	33.773895	0.278	4.807200	0.712600	2003	Los Angeles River Estuary
-118.204819	33.779449	0.1556	3.035600	0.515700	2003	Los Angeles River Estuary
-118.205536	33.770031	0.0064	0.380800	0.002330	2003	Los Angeles River Estuary
-118.168518	33.74403	0.04039	0.355240	0.034190	2003	San Pedro Bay Near/Off Shore Zones
-118.156792	33.728451	0.05114	0.205590	0.005090	2003	San Pedro Bay Near/Off Shore Zones
-118.163353	33.754883	0.04113	0.287590	0.026270	2003	San Pedro Bay Near/Off Shore Zones
-118.234344	33.710922	0.0605		0.090000	2001	San Pedro Bay Near/Off Shore Zones
-118.234344	33.710922	0.02666		0.248100	2002	San Pedro Bay Near/Off Shore Zones
-118.234344	33.710922	0.0368		0.035900	2003	San Pedro Bay Near/Off Shore Zones
-118.234344	33.710922	0.0506		0.035900	2004	San Pedro Bay Near/Off Shore Zones
-118.10218	33.754917	0.0015	0.037800		2003	San Gabriel River Estuary
-118.113335	33.746525	0.0028	0.176960	0.000800	2003	San Gabriel River Estuary
-118.104942	33.752922	0.0022	0.157000		2003	San Gabriel River Estuary
-118.098228	33.758781	0.0037	1.876800		2003	San Gabriel River Estuary
-118.110046	33.749508	0.002	0.054100		2003	San Gabriel River Estuary
-118.1008	33.755856	0.00227	0.357500	0.000960	2003	San Gabriel River Estuary
-118.257408	33.712337	0.11952	0.181990		2003	Los Angeles Outer Harbor
-118.223854	33.724758	0.02767	0.157020		2003	Los Angeles Outer Harbor
-118.233002	33.73838	0.07416	0.268910		2003	Los Angeles Outer Harbor
-118.211411	33.722389	0.07928	0.242530		2003	Los Angeles Outer Harbor
-118.240974	33.724262	0.04558		0.090000	2001	Los Angeles Outer Harbor
-118.240974	33.724262	0.03196		0.248100	2002	Los Angeles Outer Harbor
-118.244949	33.713669	0.05758		0.090000	2001	Los Angeles Outer Harbor
-118.244949	33.713669	0.0264		0.310000	2002	Los Angeles Outer Harbor
-118.244949	33.713669	0.0345		0.036900	2004	Los Angeles Outer Harbor
-118.258713	33.712418	0.0529		0.090000	2001	Los Angeles Outer Harbor
-118.258713	33.712418	0.0676		0.310000	2002	Los Angeles Outer Harbor
-118.258713	33.712418	0.059		0.036900	2004	Los Angeles Outer Harbor
-118.270607	33.712944	0.0909		0.090000	2001	Los Angeles Outer Harbor
-118.270607	33.712944	0.04122		0.310000	2002	Los Angeles Outer Harbor
-118.270607	33.712944	0.054		0.036900	2004	Los Angeles Outer Harbor
-118.244507	33.72316	0.04051		0.090000	2001	Los Angeles Outer Harbor
-118.244507	33.72316	0.04706		0.310000	2002	Los Angeles Outer Harbor
-118.244507	33.72316	0.045		0.036900	2004	Los Angeles Outer Harbor
-118.242256	33.722816	0.04533		0.090000	2001	Los Angeles Outer Harbor
-118.242256	33.722816	0.03266		0.248100	2002	Los Angeles Outer Harbor
-118.242256	33.722816	0.0483		0.036900	2003	Los Angeles Outer Harbor
-118.242256	33.722816	0.0287		0.036900	2004	Los Angeles Outer Harbor
-118.231773	33.72599	0.0512		0.090000	2001	Los Angeles Outer Harbor
-118.231773	33.72599	0.02676		0.248100	2002	Los Angeles Outer Harbor

Longitude	Latitude	Total DDT (mg/kg)	Total PAHs (mg/kg)	Total PCBs (mg/kg)	Year	TMDL Zone
-118.231773	33.72599	0.0181		0.036900	2004	Los Angeles Outer Harbor
-118.239975	33.722561	0.0851		0.090000	2001	Los Angeles Outer Harbor
-118.239975	33.722561	0.04489		0.248100	2002	Los Angeles Outer Harbor
-118.243538	33.721428	0.03362		0.090000	2001	Los Angeles Outer Harbor
-118.243538	33.721428	0.05182		0.310000	2002	Los Angeles Outer Harbor
-118.243538	33.721428	0.039		0.036900	2004	Los Angeles Outer Harbor
-118.228813	33.722149	0.03973		0.090000	2001	Los Angeles Outer Harbor
-118.228813	33.722149	0.02896		0.248100	2002	Los Angeles Outer Harbor
-118.228813	33.722149	0.0393		0.036900	2004	Los Angeles Outer Harbor
-118.239738	33.718784	0.07452		0.090000	2001	Los Angeles Outer Harbor
-118.239738	33.718784	0.04313		0.310000	2002	Los Angeles Outer Harbor
-118.239738	33.718784	0.0173		0.036900	2004	Los Angeles Outer Harbor
-118.237854	33.716152	0.05626		0.090000	2001	Los Angeles Outer Harbor
-118.237854	33.716152	0.03318		0.248100	2002	Los Angeles Outer Harbor
-118.237854	33.716152	0.0481		0.036900	2004	Los Angeles Outer Harbor
-118.211411	33.722389		0.242530		2003	Los Angeles Outer Harbor
-118.200935	33.731632		0.059750		2003	Los Angeles Outer Harbor
-118.205360	33.780640		0.032900		2003	Los Angeles River Estuary
-118.116272	33.741222		0.027700		2003	San Pedro Bay Near/Off Shore Zones
-118.191193	33.730927		0.109760		2003	Los Angeles Outer Harbor

Table III.3-2. Sediment Bed Initial Conditions – Metals Concentrations

Longitude	Latitude	Total Copper (mg/kg)	Total Lead (mg/kg)	Total Zinc (mg/kg)	Year	TMDL Zone
-118.266129	33.761856	133.100006	42.509998	165.75	2006	Los Angeles Inner Harbor
-118.276443	33.757252	101.360001	27.684000	154.190002	2006	Los Angeles Inner Harbor
-118.276642	33.757084	104.300003	32.125000	153.399994	2006	Los Angeles Inner Harbor
-118.250229	33.763939	133.960007	52.504002	229.190002	2006	Los Angeles Inner Harbor
-118.275215	33.765251	48.683998	16.554001	93.677002	2006	Los Angeles Inner Harbor
-118.270973	33.74873	35.650002	9.371000	65.831001	2006	Los Angeles Inner Harbor
-118.254234	33.761452	97.984001	45.264000	207.589996	2006	Los Angeles Inner Harbor
-118.260147	33.758026	79.194000	38.383999	153.889999	2006	Los Angeles Inner Harbor
-118.261147	33.756371	99.524002	39.034000	191.389999	2006	Los Angeles Inner Harbor
-118.27507	33.748257	75.430000	35.680000	117.639999	2006	Los Angeles Inner Harbor
-118.258835	33.727703	51.916000	19.377001	91.051003	2006	Los Angeles Inner Harbor
-118.273338	33.728874	40.320000	17.170000	72.640999	2006	Los Angeles Inner Harbor
-118.262131	33.729378	45.136002	11.437000	86.960999	2006	Los Angeles Inner Harbor
-118.275398	33.740715	61.610001	8.859000	57.140999	2006	Los Angeles Inner Harbor
-118.251671	33.748417	72.825996	34.657001	123.449997	2006	Los Angeles Inner Harbor
-118.268829	33.730362	220.199997	50.119999	226.550003	2006	Los Angeles Inner Harbor
-118.270348	33.7257	70.599998	20.059999	116.139999	2006	Los Angeles Inner Harbor
-118.276863	33.720718	376.320007	74.077003	287.149994	2006	Los Angeles Harbor - Cabrillo Marina
-118.264336	33.726715	53.849998	13.800000	98.960999	2006	Los Angeles Inner Harbor
-118.247612	33.734066	58.529999	14.760000	106.550003	2006	Los Angeles Inner Harbor
-118.28009	33.712036	134.020004	21.806999	166.550003	2006	Los Angeles Harbor - Inner Cabrillo Beach
-118.281494	33.710442	48.226002	9.010000	96.901001	2006	Los Angeles Harbor - Inner Cabrillo Beach
-118.276978	33.715755	54.796001	16.747000	101.349998	2006	Los Angeles Outer Harbor
-118.235764	33.714821	51.390999	20.922001	101.300003	2006	Los Angeles Outer Harbor
-118.274979	33.714191	209.520004	28.226999	162.550003	2006	Los Angeles Outer Harbor
-118.271591	33.711048	75.475998	16.787001	121.849998	2006	Los Angeles Outer Harbor
-118.271805	33.707703	43.546001	7.230000	82.801003	2006	Los Angeles Outer Harbor
-118.251648	33.715622	51.355999	18.847000	100.25	2006	Los Angeles Outer Harbor
-118.249382	33.711052	50.175999	17.487000	94.280998	2006	Los Angeles Outer Harbor
-118.27108	33.713184	103.720001	19.927000	136.350006	2006	Los Angeles Outer Harbor
-118.217407	33.774048	94.671997	50.376999	363.880005	2006	Long Beach Inner Harbor
-118.23262	33.766983	77.476997	29.892000	152.830002	2006	Long Beach Inner Harbor
-118.20472	33.771378	8.863000	5.332000	44.296001	2006	Los Angeles River Estuary
-118.219826	33.768177	126.970001	50.257000	227.279999	2006	Long Beach Inner Harbor
-118.221428	33.765331	87.552002	36.067001	176.080002	2006	Long Beach Inner Harbor
-118.21241	33.774307	81.889999	41.060001	152.050003	2006	Long Beach Inner Harbor
-118.223022	33.768414	103.269997	44.777000	233.380005	2006	Long Beach Inner Harbor
-118.211823	33.771019	142.300003	46.380001	203.350006	2006	Long Beach Inner Harbor

Longitude	Latitude	Total Copper (mg/kg)	Total Lead (mg/kg)	Total Zinc (mg/kg)	Year	TMDL Zone
-118.217552	33.757893	70.374001	26.264000	144.339996	2006	Long Beach Inner Harbor
-118.220612	33.772102	116.059998	40.344002	226.990005	2006	Long Beach Inner Harbor
-118.19619	33.743042	76.781998	17.877001	99.876999	2006	Long Beach Inner Harbor
-118.21376	33.755638	64.489998	23.480000	119.75	2006	Long Beach Inner Harbor
-118.206978	33.746826	159.399994	30.150000	147.449997	2006	Long Beach Inner Harbor
-118.201187	33.742382	20.261999	5.521000	47.327	2006	Long Beach Inner Harbor
-118.232559	33.754124	56.251999	17.707001	95.357002	2006	Long Beach Inner Harbor
-118.227867	33.75016	49.962002	19.316999	97.647003	2006	Long Beach Inner Harbor
-118.187904	33.737217	47.923000	15.790000	102.589996	2006	Long Beach Inner Harbor
-118.204094	33.740528	15.653000	6.088000	41.176998	2006	Long Beach Inner Harbor
-118.225174	33.748158	29.172001	10.337000	67.647003	2006	Long Beach Inner Harbor
-118.203789	33.743156	94.142998	36.139999	193.089996	2006	Long Beach Inner Harbor
-118.229446	33.721703	38.952000	14.217000	90.167	2006	Los Angeles Outer Harbor
-118.184067	33.753365	80.309998	62.490002	278.549988	2006	San Pedro Bay Near/Off Shore Zones
-118.221809	33.734745	31.202000	19.327000	92.806999	2006	Los Angeles Outer Harbor
-118.222313	33.732468	27.413000	10.890000	75.046997	2006	Los Angeles Outer Harbor
-118.215019	33.731087	44.403000	20.610001	107.089996	2006	Los Angeles Outer Harbor
-118.232841	33.724655	67.321999	11.587000	136.679993	2006	Los Angeles Outer Harbor
-118.19281	33.732067	29.152000	14.337000	80.806999	2006	Los Angeles Outer Harbor
-118.213501	33.737457	45.333000	21.980000	111.690002	2006	Los Angeles Outer Harbor
-118.23111	33.735413	62.882000	30.337000	135.179993	2006	Los Angeles Outer Harbor
-118.212311	33.73381	47.912998	22.990000	119.690002	2006	Los Angeles Outer Harbor
-118.227898	33.807991	175	493	789	2003	Dominguez Channel Estuary
-118.240547	33.820023	248	288	666	2003	Dominguez Channel Estuary
-118.228149	33.809132	171	720	822	2003	Dominguez Channel Estuary
-118.227058	33.803066	26.400000	37.900002	86.900002	2003	Dominguez Channel Estuary
-118.235512	33.815979	117	139	461	2003	Dominguez Channel Estuary
-118.227112	33.802235	205	94.300003	254	2003	Dominguez Channel Estuary
-118.265999	33.844379	9.200000	29	57	2002	Dominguez Channel Estuary
-118.265999	33.844379	15	81	81	2002	Dominguez Channel Estuary
-118.269821	33.848305	73	270	290	2002	Dominguez Channel Estuary
-118.269821	33.848305	190	630	710	2002	Dominguez Channel Estuary
-118.287285	33.866657	51	300	460	2002	Dominguez Channel Estuary
-118.287285	33.866657	28	200	1600	2002	Dominguez Channel Estuary
-118.287277	33.868874	17	160	180	2002	Dominguez Channel Estuary
-118.287277	33.868874	13	370	140	2002	Dominguez Channel Estuary
-118.287277	33.868874	46	510	410	2002	Dominguez Channel Estuary
-118.288803	33.870327	38	43	190	2002	Dominguez Channel Estuary
-118.288803	33.870327	49	230	210	2002	Dominguez Channel Estuary
-118.247208	33.826752	91	490	590	2002	Dominguez Channel Estuary

Longitude	Latitude	Total Copper (mg/kg)	Total Lead (mg/kg)	Total Zinc (mg/kg)	Year	TMDL Zone
-118.249153	33.826534	400	170	490	2002	Dominguez Channel Estuary
-118.258202	33.836483	58	120	200	2002	Dominguez Channel Estuary
-118.259247	33.837593	100	190	450	2002	Dominguez Channel Estuary
-118.26033	33.838703	71	170	360	2002	Dominguez Channel Estuary
-118.228409	33.810669	79	310	430	2002	Dominguez Channel Estuary
-118.236168	33.81588	100	380	590	2002	Dominguez Channel Estuary
-118.238693	33.816574	84	160	370	2002	Dominguez Channel Estuary
-118.240646	33.821323	82	110	390	2002	Dominguez Channel Estuary
-118.240837	33.822742	110	160	320	2002	Dominguez Channel Estuary
-118.235443	33.784019	63	90	130	2002	Dominguez Channel Estuary
-118.228981	33.793499	40	30	87	2002	Dominguez Channel Estuary
-118.227829	33.798519	220	220	500	2002	Dominguez Channel Estuary
-118.226898	33.803123	140	55	150	2002	Dominguez Channel Estuary
-118.26268	33.839687	16	13	76	2002	Dominguez Channel Estuary
-118.26268	33.839687	8.700000	22	48	2002	Dominguez Channel Estuary
-118.26265	33.841099	11	31	61	2002	Dominguez Channel Estuary
-118.26265	33.841099	13	24	68	2002	Dominguez Channel Estuary
-118.263229	33.841599	6.700000	16	35	2002	Dominguez Channel Estuary
-118.263229	33.841599	30	160	190	2002	Dominguez Channel Estuary
-118.26326	33.841709	11	22	63	2002	Dominguez Channel Estuary
-118.26326	33.841709	30	110	170	2002	Dominguez Channel Estuary
-118.263672	33.842049	12	38	61	2002	Dominguez Channel Estuary
-118.263672	33.842049	41	160	150	2002	Dominguez Channel Estuary
-118.129417	33.755322	92.099998	67	190	2003	Alamitos Bay
-118.111816	33.764885	87.300003	61.549999	248	2003	Alamitos Bay
-118.112839	33.755314	85	44.400002	175	2003	Alamitos Bay
-118.111633	33.75106	60.799999	43.599998	175	2003	Alamitos Bay
-118.112694	33.765686	121	66.400002	260	2003	Alamitos Bay
-118.279144	33.722775	202	44.700001	180	2003	Los Angeles Harbor - Cabrillo Marina
-118.241241	33.776897	49	21	100	2002	Los Angeles Harbor - Consolidated Slip
-118.241241	33.776897	27	8.300000	70	2002	Los Angeles Harbor - Consolidated Slip
-118.241241	33.776897	25	7.400000	65	2002	Los Angeles Harbor - Consolidated Slip
-118.241241	33.776897	25	6.800000	57	2002	Los Angeles Harbor - Consolidated Slip
-118.241241	33.776897	43	14	84	2002	Los Angeles Harbor - Consolidated Slip
-118.247131	33.77655	3600	1100	1600	2002	Los Angeles Harbor - Consolidated Slip
-118.247131	33.77655	520	720	590	2002	Los Angeles Harbor - Consolidated Slip
-118.247131	33.77655	170	2700	5400	2002	Los Angeles Harbor - Consolidated Slip
-118.247131	33.77655	40	56	98	2002	Los Angeles Harbor - Consolidated Slip
-118.247131	33.77655	38	22	98	2002	Los Angeles Harbor - Consolidated Slip
-118.247131	33.77655	35	19	74	2002	Los Angeles Harbor - Consolidated Slip

Longitude	Latitude	Total Copper (mg/kg)	Total Lead (mg/kg)	Total Zinc (mg/kg)	Year	TMDL Zone
-118.247131	33.77655	12	4.100000	42	2002	Los Angeles Harbor - Consolidated Slip
-118.247131	33.77655	18	7.900000	51	2002	Los Angeles Harbor - Consolidated Slip
-118.241966	33.776291	1800	1100	1500	2002	Los Angeles Harbor - Consolidated Slip
-118.241966	33.776291	1800	660	1600	2002	Los Angeles Harbor - Consolidated Slip
-118.241966	33.776291	1400	660	1000	2002	Los Angeles Harbor - Consolidated Slip
-118.241966	33.776291	230	2900	4000	2002	Los Angeles Harbor - Consolidated Slip
-118.241966	33.776291	35	24	90	2002	Los Angeles Harbor - Consolidated Slip
-118.241966	33.776291	40	22	96	2002	Los Angeles Harbor - Consolidated Slip
-118.241966	33.776291	35	16	80	2002	Los Angeles Harbor - Consolidated Slip
-118.241966	33.776291	19	7.100000	64	2002	Los Angeles Harbor - Consolidated Slip
-118.242188	33.775982	170	1100	1000	2002	Los Angeles Harbor - Consolidated Slip
-118.242188	33.775982	730	820	930	2002	Los Angeles Harbor - Consolidated Slip
-118.242188	33.775982	31	43	84	2002	Los Angeles Harbor - Consolidated Slip
-118.242188	33.775982	14	7	45	2002	Los Angeles Harbor - Consolidated Slip
-118.242188	33.775982	18	7.400000	66	2002	Los Angeles Harbor - Consolidated Slip
-118.242188	33.775982	20	7.500000	59	2002	Los Angeles Harbor - Consolidated Slip
-118.242188	33.775982	24	8.100000	61	2002	Los Angeles Harbor - Consolidated Slip
-118.242188	33.775982	41	15	78	2002	Los Angeles Harbor - Consolidated Slip
-118.242554	33.775982	140	240	790	2002	Los Angeles Harbor - Consolidated Slip
-118.242554	33.775982	110	190	560	2002	Los Angeles Harbor - Consolidated Slip
-118.242554	33.775982	200	500	1200	2002	Los Angeles Harbor - Consolidated Slip
-118.242554	33.775982	220	950	1100	2002	Los Angeles Harbor - Consolidated Slip
-118.242554	33.775982	190	1000	1200	2002	Los Angeles Harbor - Consolidated Slip
-118.242554	33.775982	120	180	600	2002	Los Angeles Harbor - Consolidated Slip
-118.242554	33.775982	1000	730	1200	2002	Los Angeles Harbor - Consolidated Slip
-118.242554	33.775982	2500	770	2200	2002	Los Angeles Harbor - Consolidated Slip
-118.244102	33.775574	150	200	650	2002	Los Angeles Harbor - Consolidated Slip
-118.244102	33.775574	120	220	630	2002	Los Angeles Harbor - Consolidated Slip
-118.244102	33.775574	170	480	1000	2002	Los Angeles Harbor - Consolidated Slip
-118.244102	33.775574	170	690	950	2002	Los Angeles Harbor - Consolidated Slip
-118.244102	33.775574	740	680	1400	2002	Los Angeles Harbor - Consolidated Slip
-118.244102	33.775574	1100	590	890	2002	Los Angeles Harbor - Consolidated Slip
-118.244102	33.775574	33	26	81	2002	Los Angeles Harbor - Consolidated Slip
-118.244102	33.775574	13	6.100000	44	2002	Los Angeles Harbor - Consolidated Slip
-118.244186	33.774967	130	200	640	2002	Los Angeles Harbor - Consolidated Slip
-118.244186	33.774967	110	190	560	2002	Los Angeles Harbor - Consolidated Slip
-118.244186	33.774967	190	370	870	2002	Los Angeles Harbor - Consolidated Slip
-118.244186	33.774967	170	880	1100	2002	Los Angeles Harbor - Consolidated Slip
-118.244186	33.774967	170	1100	1100	2002	Los Angeles Harbor - Consolidated Slip
-118.244186	33.774967	160	710	840	2002	Los Angeles Harbor - Consolidated Slip

Longitude	Latitude	Total Copper (mg/kg)	Total Lead (mg/kg)	Total Zinc (mg/kg)	Year	TMDL Zone
-118.244186	33.774967	1900	680	1200	2002	Los Angeles Harbor - Consolidated Slip
-118.244881	33.777294	85	130	380	2002	Los Angeles Harbor - Consolidated Slip
-118.244881	33.777294	150	170	660	2002	Los Angeles Harbor - Consolidated Slip
-118.244881	33.777294	99	180	510	2002	Los Angeles Harbor - Consolidated Slip
-118.244881	33.777294	170	940	1100	2002	Los Angeles Harbor - Consolidated Slip
-118.244881	33.777294	830	560	1100	2002	Los Angeles Harbor - Consolidated Slip
-118.244881	33.777294	180	540	1000	2002	Los Angeles Harbor - Consolidated Slip
-118.244881	33.777294	8.200000	5.400000	39	2002	Los Angeles Harbor - Consolidated Slip
-118.244881	33.777294	6.700000	3.300000	47	2002	Los Angeles Harbor - Consolidated Slip
-118.245354	33.775436	130	170	570	2002	Los Angeles Harbor - Consolidated Slip
-118.245354	33.775436	170	180	570	2002	Los Angeles Harbor - Consolidated Slip
-118.245354	33.775436	150	230	600	2002	Los Angeles Harbor - Consolidated Slip
-118.245354	33.775436	170	660	830	2002	Los Angeles Harbor - Consolidated Slip
-118.245354	33.775436	85	190	310	2002	Los Angeles Harbor - Consolidated Slip
-118.245354	33.775436	5.500000	3.100000	31	2002	Los Angeles Harbor - Consolidated Slip
-118.245354	33.775436	7.500000	3.700000	47	2002	Los Angeles Harbor - Consolidated Slip
-118.245354	33.775436	5.400000	3	32	2002	Los Angeles Harbor - Consolidated Slip
-118.245857	33.774441	98	190	620	2002	Los Angeles Harbor - Consolidated Slip
-118.245857	33.774441	75	170	470	2002	Los Angeles Harbor - Consolidated Slip
-118.245857	33.774441	160	320	860	2002	Los Angeles Harbor - Consolidated Slip
-118.245857	33.774441	210	490	890	2002	Los Angeles Harbor - Consolidated Slip
-118.245857	33.774441	160	670	1100	2002	Los Angeles Harbor - Consolidated Slip
-118.245857	33.774441	920	660	1300	2002	Los Angeles Harbor - Consolidated Slip
-118.245857	33.774441	480	640	1000	2002	Los Angeles Harbor - Consolidated Slip
-118.245857	33.774441	440	200	180	2002	Los Angeles Harbor - Consolidated Slip
-118.246857	33.774662	120	150	590	2002	Los Angeles Harbor - Consolidated Slip
-118.246857	33.774662	160	200	780	2002	Los Angeles Harbor - Consolidated Slip
-118.246857	33.774662	220	170	610	2002	Los Angeles Harbor - Consolidated Slip
-118.246857	33.774662	170	360	610	2002	Los Angeles Harbor - Consolidated Slip
-118.246857	33.774662	220	690	1100	2002	Los Angeles Harbor - Consolidated Slip
-118.246857	33.774662	980	600	1200	2002	Los Angeles Harbor - Consolidated Slip
-118.246857	33.774662	120	1600	2300	2002	Los Angeles Harbor - Consolidated Slip
-118.247139	33.773693	170	200	850	2002	Los Angeles Harbor - Consolidated Slip
-118.247139	33.773693	110	150	590	2002	Los Angeles Harbor - Consolidated Slip
-118.247139	33.773693	170	480	3000	2002	Los Angeles Harbor - Consolidated Slip
-118.247139	33.773693	160	780	990	2002	Los Angeles Harbor - Consolidated Slip
-118.247139	33.773693	230	510	870	2002	Los Angeles Harbor - Consolidated Slip
-118.247139	33.773693	1600	950	1500	2002	Los Angeles Harbor - Consolidated Slip
-118.247139	33.773693	41	75	93	2002	Los Angeles Harbor - Consolidated Slip
-118.247139	33.773693	12	4.700000	38	2002	Los Angeles Harbor - Consolidated Slip

Longitude	Latitude	Total Copper (mg/kg)	Total Lead (mg/kg)	Total Zinc (mg/kg)	Year	TMDL Zone
-118.248001	33.773724	140	190	490	2002	Los Angeles Harbor - Consolidated Slip
-118.248001	33.773724	140	280	720	2002	Los Angeles Harbor - Consolidated Slip
-118.248001	33.773724	150	680	810	2002	Los Angeles Harbor - Consolidated Slip
-118.248001	33.773724	280	450	580	2002	Los Angeles Harbor - Consolidated Slip
-118.248001	33.773724	250	470	660	2002	Los Angeles Harbor - Consolidated Slip
-118.248001	33.773724	52	190	290	2002	Los Angeles Harbor - Consolidated Slip
-118.248001	33.773724	6.500000	2.200000	24	2002	Los Angeles Harbor - Consolidated Slip
-118.248001	33.773724	27	7	56	2002	Los Angeles Harbor - Consolidated Slip
-118.248032	33.772915	120	200	450	2002	Los Angeles Harbor - Consolidated Slip
-118.248032	33.772915	150	290	670	2002	Los Angeles Harbor - Consolidated Slip
-118.248032	33.772915	180	600	800	2002	Los Angeles Harbor - Consolidated Slip
-118.248032	33.772915	190	560	880	2002	Los Angeles Harbor - Consolidated Slip
-118.248032	33.772915	290	560	1000	2002	Los Angeles Harbor - Consolidated Slip
-118.248032	33.772915	670	950	1900	2002	Los Angeles Harbor - Consolidated Slip
-118.248032	33.772915	35	35	90	2002	Los Angeles Harbor - Consolidated Slip
-118.248032	33.772915	20	6.800000	58	2002	Los Angeles Harbor - Consolidated Slip
-118.247948	33.772247	47	21	120	2002	Los Angeles Harbor - Consolidated Slip
-118.247948	33.772247	44	16	96	2002	Los Angeles Harbor - Consolidated Slip
-118.247948	33.772247	32	13	100	2002	Los Angeles Harbor - Consolidated Slip
-118.247948	33.772247	14	4.600000	49	2002	Los Angeles Harbor - Consolidated Slip
-118.247948	33.772247	19	5.800000	56	2002	Los Angeles Harbor - Consolidated Slip
-118.247948	33.772247	22	6.700000	71	2002	Los Angeles Harbor - Consolidated Slip
-118.247948	33.772247	22	6.700000	72	2002	Los Angeles Harbor - Consolidated Slip
-118.249397	33.770981	140	140	340	2002	Los Angeles Inner Harbor
-118.249397	33.770981	140	150	560	2002	Los Angeles Inner Harbor
-118.249397	33.770981	150	260	580	2002	Los Angeles Inner Harbor
-118.249397	33.770981	27	13	63	2002	Los Angeles Inner Harbor
-118.249397	33.770981	43	15	73	2002	Los Angeles Inner Harbor
-118.249397	33.770981	34	12	84	2002	Los Angeles Inner Harbor
-118.249397	33.770981	26	7.700000	68	2002	Los Angeles Inner Harbor
-118.249397	33.770981	23	5.900000	66	2002	Los Angeles Inner Harbor
-118.2481	33.766891	191	90.599998	240	2003	Los Angeles Inner Harbor
-118.261627	33.724464	51.400002	8.030000	80.699997	2003	Los Angeles Inner Harbor
-118.215065	33.745552	20.600000	5.110000	46.200001	2003	Los Angeles Outer Harbor
-118.217766	33.752518	45.700001	10.600000	84.699997	2003	Long Beach Inner Harbor
-118.277214	33.766346	87.099998	28.600000	126	2003	Los Angeles Inner Harbor
-118.207733	33.762493		23.900000	139	2003	Long Beach Inner Harbor
-118.198273	33.748741	71.300003	70	241	2003	Long Beach Inner Harbor
-118.27504	33.77705	71		130	2001	Los Angeles Inner Harbor
-118.27504	33.77705	56		110	2002	Los Angeles Inner Harbor

Longitude	Latitude	Total Copper (mg/kg)	Total Lead (mg/kg)	Total Zinc (mg/kg)	Year	TMDL Zone
-118.27504	33.77705	26		56	2003	Los Angeles Inner Harbor
-118.278671	33.771515	78		140	2001	Los Angeles Inner Harbor
-118.278671	33.771515	63		120	2002	Los Angeles Inner Harbor
-118.278671	33.771515	25		52	2003	Los Angeles Inner Harbor
-118.281456	33.764576	38		75	2001	Los Angeles Inner Harbor
-118.281456	33.764576	31		26	2002	Los Angeles Inner Harbor
-118.281456	33.764576	36		68	2003	Los Angeles Inner Harbor
-118.20536	33.78064	5.740000	4.320000	49.049999	2003	Los Angeles River Estuary
-118.205421	33.765663	28.200001	33	98.800003	2003	Los Angeles River Estuary
-118.205421	33.773895	61.299999	37.200001	211	2003	Los Angeles River Estuary
-118.204819	33.779449	12.700000	7.610000	55.700001	2003	Los Angeles River Estuary
-118.205536	33.770031	24.600000	19.400000	101	2003	Los Angeles River Estuary
-118.116272	33.741222	7.460000	4.730000	22	2003	San Pedro Bay Near/Off Shore Zones
-118.168518	33.74403	51.500000	59.900002	180	2003	San Pedro Bay Near/Off Shore Zones
-118.156792	33.728451	51.700001	46.700001	168	2003	San Pedro Bay Near/Off Shore Zones
-118.163353	33.754883	71.800003	69.300003	240	2003	San Pedro Bay Near/Off Shore Zones
-118.234344	33.710922	10	6.500000	33	2001	San Pedro Bay Near/Off Shore Zones
-118.234344	33.710922	10.100000	8.090000	42.900002	2002	San Pedro Bay Near/Off Shore Zones
-118.234344	33.710922	9.440000	5.050000	47.099998	2003	San Pedro Bay Near/Off Shore Zones
-118.234344	33.710922	10.900000	3.290000	44.299999	2004	San Pedro Bay Near/Off Shore Zones
-118.10218	33.754917	9.120000	11.500000	37.200001	2003	San Gabriel River Estuary
-118.113335	33.746525	17	18.299999	47	2003	San Gabriel River Estuary
-118.104942	33.752922	13.500000	15.800000	43.5	2003	San Gabriel River Estuary
-118.098228	33.758781	14.500000	10.800000	39.599998	2003	San Gabriel River Estuary
-118.110046	33.749508	11.300000	21.400000	36.099998	2003	San Gabriel River Estuary
-118.110046	33.749508	11.600000	11.300000	37.299999	2003	San Gabriel River Estuary
-118.1008	33.755856	8	9.770000	48.299999	2003	San Gabriel River Estuary
-118.191193	33.730927	24.799999	10.400000	87.5	2003	Los Angeles Outer Harbor
-118.257408	33.712337	54.900002	7.950000	84.699997	2003	Los Angeles Outer Harbor
-118.223854	33.724758	48.700001	8.610000	76.199997	2003	Los Angeles Outer Harbor
-118.233002	33.73838	87	20.700001	122	2003	Los Angeles Outer Harbor
-118.200935	33.731632	43.599998	14.700000	118	2003	Los Angeles Outer Harbor
-118.211411	33.722389	43	12.800000	85.400002	2003	Los Angeles Outer Harbor
-118.244949	33.713669	20	7	41	2001	Los Angeles Outer Harbor
-118.244949	33.713669	38.900002	12.900000	85.699997	2002	Los Angeles Outer Harbor
-118.244949	33.713669	27.600000	0.610000	70.199997	2004	Los Angeles Outer Harbor
-118.258713	33.712418	28	8	55	2001	Los Angeles Outer Harbor
-118.258713	33.712418	54.700001	16.200001	109	2002	Los Angeles Outer Harbor
-118.258713	33.712418	61.099998	6.610000	116	2004	Los Angeles Outer Harbor
-118.270607	33.712944	57	13	63	2001	Los Angeles Outer Harbor

Longitude	Latitude	Total Copper (mg/kg)	Total Lead (mg/kg)	Total Zinc (mg/kg)	Year	TMDL Zone
-118.270607	33.712944	106	25.799999	132	2002	Los Angeles Outer Harbor
-118.270607	33.712944	76.400002	0.810000	134	2004	Los Angeles Outer Harbor
-118.240974	33.724262	19	8.100000	48	2001	Los Angeles Outer Harbor
-118.240974	33.724262	35.700001	15.200000	84.199997	2002	Los Angeles Outer Harbor
-118.244507	33.72316	21	7.100000	50	2001	Los Angeles Outer Harbor
-118.244507	33.72316	28.200001	10.600000	73	2002	Los Angeles Outer Harbor
-118.244507	33.72316	31.100000	2.900000	78.199997	2004	Los Angeles Outer Harbor
-118.242256	33.722816	21	8	50	2001	Los Angeles Outer Harbor
-118.242256	33.722816	43.400002	17	96.300003	2002	Los Angeles Outer Harbor
-118.242256	33.722816	32.299999	2.790000	90.099998	2003	Los Angeles Outer Harbor
-118.242256	33.722816	57	4.150000	117	2004	Los Angeles Outer Harbor
-118.231773	33.72599	22	12	52	2001	Los Angeles Outer Harbor
-118.231773	33.72599	38.299999	17.799999	89.5	2002	Los Angeles Outer Harbor
-118.231773	33.72599	61.400002	8.440000	123	2004	Los Angeles Outer Harbor
-118.239975	33.722561	29	14	58	2001	Los Angeles Outer Harbor
-118.239975	33.722561	40.099998	18.500000	90.099998	2002	Los Angeles Outer Harbor
-118.243538	33.721428	14	5	38	2001	Los Angeles Outer Harbor
-118.243538	33.721428	44.900002	14.800000	93.800003	2002	Los Angeles Outer Harbor
-118.243538	33.721428	55.599998	2.990000	109	2004	Los Angeles Outer Harbor
-118.228813	33.722149	20	10	48	2001	Los Angeles Outer Harbor
-118.228813	33.722149	27	30.299999	67.199997	2002	Los Angeles Outer Harbor
-118.228813	33.722149	46.299999	6.460000	100	2004	Los Angeles Outer Harbor
-118.239738	33.718784	17	14	43	2001	Los Angeles Outer Harbor
-118.239738	33.718784	24.100000	10.500000	60.799999	2002	Los Angeles Outer Harbor
-118.239738	33.718784	59.799999	2.240000	111	2004	Los Angeles Outer Harbor
-118.237854	33.716152	16	6.300000	41	2001	Los Angeles Outer Harbor
-118.237854	33.716152	34.400002	17.400000	82.400002	2002	Los Angeles Outer Harbor
-118.237854	33.716152	59.299999	1.680000	114	2004	Los Angeles Outer Harbor

Table III.3-3. Initial Physical Conditions

(Note: BDEN = density; PORO = porosity, –99 = not measured)

Longitude	Latitude	SAND	FINE	BDEN	PORO	YEAR	Study Name	Waterbody Name
-118.23000	33.79333	0.3984	0.6016	-99	-99	1999	Western EMAP 1999	Dominguez Channel Estuary
-118.22768	33.80225	0.32315	0.67685	1.53388	0.67644	2003	Bight 2003	Dominguez Channel Estuary
-118.22763	33.80308	0.82112	0.17888	1.81054	0.50876	2003	Bight 2003	Dominguez Channel Estuary
-118.22848	33.80801	0.16335	0.83665	1.4653	0.718	2003	Bight 2003	Dominguez Channel Estuary
-118.22874	33.80915	0.2929	0.7071	1.51079	0.69043	2003	Bight 2003	Dominguez Channel Estuary
-118.23612	33.81599	0.414	0.586	1.45205	0.72603	2003	Bight 2003	Dominguez Channel Estuary
-118.24117	33.82003	0.15396	0.84604	1.45997	0.72123	2003	Bight 2003	Dominguez Channel Estuary
-118.27700	33.71800	0.46486	0.53515	1.51793	0.6861	1998	POLA/POLB Special Studies (CSTF 1998-2002)	Los Angeles Harbor - Cabrillo Marina
-118.27720	33.72055	0.05265	0.94735	1.293	0.82242	2006	POLA/POLB 2006	Los Angeles Harbor - Cabrillo Marina
-118.27924	33.72082	0.00747	0.99252	-99	-99	2000	Biological Baseline Study 2000	Los Angeles Harbor - Cabrillo Marina
-118.27700	33.72100	0.33869	0.66131	1.48977	0.70317	1998	POLA/POLB Special Studies (CSTF 1998-2002)	Los Angeles Harbor - Cabrillo Marina
-118.27949	33.72260	0.1118	0.8882	1.2756	0.83297	2003	Bight 2003	Los Angeles Harbor - Cabrillo Marina
-118.24535	33.77488	0.08534	0.91466	-99	-99	2000	Biological Baseline Study 2000	Los Angeles Harbor - Consolidated Slip
-118.26592	33.72913	0.5675	0.4325	-99	-99	1997	BPTCP 1997	Los Angeles Harbor - Fish Harbor
-118.26128	33.73110	0.06	0.94	1.38446	0.76699	1998	Bight 1998	Los Angeles Harbor - Fish Harbor
-118.26760	33.73610	0.30063	0.69937	-99	-99	2000	Biological Baseline Study 2000	Los Angeles Harbor - Fish Harbor
-118.26673	33.73818	0.4542	0.5458	1.43904	0.73391	1999	POLA/POLB Special Studies (CSTF 1998-2002)	Los Angeles Harbor - Fish Harbor
-118.28180	33.71025	0.39936	0.60064	1.477	0.71091	2006	POLA/POLB 2006	Los Angeles Harbor - Inner Cabrillo Beach Area
-118.28040	33.71185	0.05847	0.94153	1.506	0.69333	2006	POLA/POLB 2006	Los Angeles Harbor - Inner Cabrillo Beach Area
-118.28220	33.71538	0.1844	0.8156	-99	-99	1997	BPTCP 1997	Los Angeles Harbor - Inner Cabrillo Beach Area
-118.18450	33.75340	0.125	0.875	1.572	0.65333	2006	POLA/POLB 2006	Los Angeles River Estuary
-118.18510	33.75560	0.35	0.65	1.4653	0.718	1998	Bight 1998	Los Angeles River Estuary
-118.20589	33.76568	0.62363	0.37637	1.45469	0.72443	2003	Bight 2003	Los Angeles River Estuary
-118.20601	33.77005	0.27087	0.72913	1.90504	0.45149	2003	Bight 2003	Los Angeles River Estuary
-118.20520	33.77140	0.95646	0.04353	2.096	0.33576	2006	POLA/POLB 2006	Los Angeles River Estuary
-118.20591	33.77392	0.17139	0.82861	1.39772	0.75896	2003	Bight 2003	Los Angeles River Estuary
-118.20532	33.77948	0.54152	0.45848	1.8291	0.49752	2003	Bight 2003	Los Angeles River Estuary
-118.26198	33.72433	0.258	0.742	1.38805	0.76482	2003	Bight 2003	Los Angeles/Long Beach Inner Harbor
-118.27070	33.72555	0.10943	0.89057	1.44	0.73333	2006	POLA/POLB 2006	Los Angeles/Long Beach Inner Harbor

Longitude	Latitude	SAND	FINE	BDEN	PORO	YEAR	Study Name	Waterbody Name
-118.25528	33.72611	0.1077	0.8923	-99	-99	1999	Western EMAP 1999	Los Angeles/Long Beach Inner Harbor
-118.26470	33.72658	0.29935	0.70065	1.583	0.64667	2006	POLA/POLB 2006	Los Angeles/Long Beach Inner Harbor
-118.25920	33.72758	0.14194	0.85805	1.465	0.71818	2006	POLA/POLB 2006	Los Angeles/Long Beach Inner Harbor
-118.27064	33.72796	0.18	0.82	1.40875	0.75227	1998	Bight 1998	Los Angeles/Long Beach Inner Harbor
-118.27370	33.72872	0.48595	0.51404	1.776	0.5297	2006	POLA/POLB 2006	Los Angeles/Long Beach Inner Harbor
-118.26250	33.72925	0.27107	0.72894	1.682	0.58667	2006	POLA/POLB 2006	Los Angeles/Long Beach Inner Harbor
-118.26920	33.73022	0.26103	0.73897	1.391	0.76303	2006	POLA/POLB 2006	Los Angeles/Long Beach Inner Harbor
-118.25312	33.73160	0.15958	0.84042	-99	-99	2000	Biological Baseline Study 2000	Los Angeles/Long Beach Inner Harbor
-118.27128	33.73322	0.6121	0.3879	1.79036	0.52099	2002	POLA/POLB Special Studies (CSTF 1998-2002)	Los Angeles/Long Beach Inner Harbor
-118.24800	33.73397	0.22501	0.775	1.529	0.67939	2006	POLA/POLB 2006	Los Angeles/Long Beach Inner Harbor
-118.24238	33.73459	0.2	0.8	1.48426	0.70651	1998	Bight 1998	Los Angeles/Long Beach Inner Harbor
-118.18928	33.73671	0.598	0.402	1.89828	0.45559	2001	POLA/POLB Special Studies (CSTF 1998-2002)	Los Angeles/Long Beach Inner Harbor
-118.18830	33.73723	0.07722	0.92278	1.594	0.64	2006	POLA/POLB 2006	Los Angeles/Long Beach Inner Harbor
-118.18843	33.73727	0.06258	0.93742	-99	-99	2000	Biological Baseline Study 2000	Los Angeles/Long Beach Inner Harbor
-118.27648	33.73842	0.75336	0.24664	-99	-99	2000	Biological Baseline Study 2000	Los Angeles/Long Beach Inner Harbor
-118.24558	33.73985	0.78882	0.21118	-99	-99	2000	Biological Baseline Study 2000	Los Angeles/Long Beach Inner Harbor
-118.20450	33.74052	0.83493	0.16507	2.039	0.3703	2006	POLA/POLB 2006	Los Angeles/Long Beach Inner Harbor
-118.27580	33.74057	0.82526	0.17474	1.854	0.48242	2006	POLA/POLB 2006	Los Angeles/Long Beach Inner Harbor
-118.20160	33.74238	0.55903	0.44096	2.073	0.3497	2006	POLA/POLB 2006	Los Angeles/Long Beach Inner Harbor
-118.25361	33.74278	0.5614	0.4386	-99	-99	1999	Western EMAP 1999	Los Angeles/Long Beach Inner Harbor
-118.19660	33.74305	0.17516	0.82484	1.681	0.58727	2006	POLA/POLB 2006	Los Angeles/Long Beach Inner Harbor
-118.20420	33.74315	0.19112	0.80888	1.668	0.59515	2006	POLA/POLB 2006	Los Angeles/Long Beach Inner Harbor
-118.19620	33.74370	0.24377	0.75622	-99	-99	2000	Biological Baseline Study 2000	Los Angeles/Long Beach Inner Harbor
-118.23175	33.74400	0.25432	0.74568	-99	-99	2000	Biological Baseline Study 2000	Los Angeles/Long Beach Inner Harbor
-118.20915	33.74433	0.59823	0.40173	1.74687	0.54735	1998	POLA/POLB Special Studies (CSTF 1998-2002)	Los Angeles/Long Beach Inner Harbor
-118.21548	33.74553	0.78473	0.21527	1.72313	0.56174	2003	Bight 2003	Los Angeles/Long Beach Inner Harbor

Longitude	Latitude	SAND	FINE	BDEN	PORO	YEAR	Study Name	Waterbody Name
-118.22293	33.74600	0.23036	0.76965	-99	-99	2000	Biological Baseline Study 2000	Los Angeles/Long Beach Inner Harbor
-118.21973	33.74630	0.2474	0.7526	-99	-99	1997	BPTCP 1997	Los Angeles/Long Beach Inner Harbor
-118.20740	33.74682	0.16889	0.83111	1.544	0.6703	2006	POLA/POLB 2006	Los Angeles/Long Beach Inner Harbor
-118.21060	33.74707	0.16672	0.83328	-99	-99	2000	Biological Baseline Study 2000	Los Angeles/Long Beach Inner Harbor
-118.25053	33.74782	0.05083	0.94917	-99	-99	2000	Biological Baseline Study 2000	Los Angeles/Long Beach Inner Harbor
-118.27550	33.74812	0.44573	0.55427	1.577	0.6503	2006	POLA/POLB 2006	Los Angeles/Long Beach Inner Harbor
-118.22560	33.74812	0.67036	0.32964	1.948	0.42545	2006	POLA/POLB 2006	Los Angeles/Long Beach Inner Harbor
-118.25210	33.74833	0.01886	0.98114	1.655	0.60303	2006	POLA/POLB 2006	Los Angeles/Long Beach Inner Harbor
-118.27140	33.74860	0.24092	0.75909	1.826	0.49939	2006	POLA/POLB 2006	Los Angeles/Long Beach Inner Harbor
-118.19870	33.74875	0.1904	0.8096	1.37734	0.77131	2003	Bight 2003	Los Angeles/Long Beach Inner Harbor
-118.22000	33.74900	0.90934	0.09066	2.01751	0.38333	1998	POLA/POLB Special Studies (CSTF 1998-2002)	Los Angeles/Long Beach Inner Harbor
-118.21703	33.74910	0.10651	0.89349	-99	-99	2000	Biological Baseline Study 2000	Los Angeles/Long Beach Inner Harbor
-118.22830	33.75012	0.38429	0.61572	1.816	0.50545	2006	POLA/POLB 2006	Los Angeles/Long Beach Inner Harbor
-118.22010	33.75100	0.73986	0.26015	1.96325	0.41621	1998	POLA/POLB Special Studies (CSTF 1998-2002)	Los Angeles/Long Beach Inner Harbor
-118.22580	33.75140	0.39381	0.60618	1.72869	0.55837	1998	POLA/POLB Special Studies (CSTF 1998-2002)	Los Angeles/Long Beach Inner Harbor
-118.22170	33.75180	0.36259	0.6374	1.71393	0.56731	1998	POLA/POLB Special Studies (CSTF 1998-2002)	Los Angeles/Long Beach Inner Harbor
-118.21820	33.75250	0.3964	0.6036	1.49811	0.69812	2003	Bight 2003	Los Angeles/Long Beach Inner Harbor
-118.27473	33.75273	0.4477	0.5524	1.77258	0.53177	2001	POLA/POLB Special Studies (CSTF 1998-2002)	Los Angeles/Long Beach Inner Harbor
-118.21890	33.75290	0.44747	0.55253	1.70484	0.57283	1998	POLA/POLB Special Studies (CSTF 1998-2002)	Los Angeles/Long Beach Inner Harbor
-118.22750	33.75330	0.61655	0.38345	1.72683	0.55949	1998	POLA/POLB Special Studies (CSTF 1998-2002)	Los Angeles/Long Beach Inner Harbor
-118.23280	33.75350	0.50853	0.49148	1.78837	0.5222	1998	POLA/POLB Special Studies (CSTF 1998-2002)	Los Angeles/Long Beach Inner Harbor
-118.26805	33.75357	0.2802	0.718	1.63374	0.61592	1999	POLA/POLB Special Studies (CSTF 1998-2002)	Los Angeles/Long Beach Inner Harbor
-118.27525	33.75373	0.4784	0.5215	1.81259	0.50752	2001	POLA/POLB Special Studies (CSTF 1998-2002)	Los Angeles/Long Beach Inner Harbor

Longitude	Latitude	SAND	FINE	BDEN	PORO	YEAR	Study Name	Waterbody Name
-118.27037	33.75382	0.6923	0.3077	-99	-99	1997	BPTCP 1997	Los Angeles/Long Beach Inner Harbor
-118.23300	33.75408	0.52004	0.47996	1.818	0.50424	2006	POLA/POLB 2006	Los Angeles/Long Beach Inner Harbor
-118.23050	33.75410	0.50832	0.49168	1.70484	0.57283	1998	POLA/POLB Special Studies (CSTF 1998-2002)	Los Angeles/Long Beach Inner Harbor
-118.27238	33.75463	0.3492	0.6507	1.67287	0.5922	1999	POLA/POLB Special Studies (CSTF 1998-2002)	Los Angeles/Long Beach Inner Harbor
-118.28328	33.75488	0.06491	0.93509	-99	-99	2000	Biological Baseline Study 2000	Los Angeles/Long Beach Inner Harbor
-118.21420	33.75563	0.18464	0.81536	1.505	0.69394	2006	POLA/POLB 2006	Los Angeles/Long Beach Inner Harbor
-118.26160	33.75627	0.25064	0.74935	1.648	0.60727	2006	POLA/POLB 2006	Los Angeles/Long Beach Inner Harbor
-118.27710	33.75695	0.1552	0.84479	1.56	0.66061	2006	POLA/POLB 2006	Los Angeles/Long Beach Inner Harbor
-118.27690	33.75712	0.12867	0.87134	1.547	0.66848	2006	POLA/POLB 2006	Los Angeles/Long Beach Inner Harbor
-118.21800	33.75788	0.20383	0.79618	1.101	0.93879	2006	POLA/POLB 2006	Los Angeles/Long Beach Inner Harbor
-118.27780	33.75788	0.7493	0.2507	1.90957	0.44875	2000	POLA/POLB Special Studies (CSTF 1998-2002)	Los Angeles/Long Beach Inner Harbor
-118.26060	33.75793	0.27559	0.72441	1.634	0.61576	2006	POLA/POLB 2006	Los Angeles/Long Beach Inner Harbor
-118.21508	33.75860	0.2578	0.7422	1.40875	0.75227	1998	POLA/POLB Special Studies (CSTF 1998-2002)	Los Angeles/Long Beach Inner Harbor
-118.20830	33.75948	0.00553	0.99446	-99	-99	2000	Biological Baseline Study 2000	Los Angeles/Long Beach Inner Harbor
-118.25780	33.75960	0.3877	0.6136	1.66421	0.59745	1999	POLA/POLB Special Studies (CSTF 1998-2002)	Los Angeles/Long Beach Inner Harbor
-118.27598	33.76010	0.4695	0.5305	1.73993	0.55156	2000	POLA/POLB Special Studies (CSTF 1998-2002)	Los Angeles/Long Beach Inner Harbor
-118.25470	33.76137	0.19939	0.80061	1.59	0.64242	2006	POLA/POLB 2006	Los Angeles/Long Beach Inner Harbor
-118.26660	33.76175	0.36801	0.632	1.687	0.58364	2006	POLA/POLB 2006	Los Angeles/Long Beach Inner Harbor
-118.18375	33.76203	0.0658	0.9342	-99	-99	1997	BPTCP 1997	Los Angeles/Long Beach Inner Harbor
-118.25972	33.76218	0.58795	0.41206	1.78638	0.52341	1998	POLA/POLB Special Studies (CSTF 1998-2002)	Los Angeles/Long Beach Inner Harbor
-118.20819	33.76250	0.0816	0.9184	1.3564	0.784	2003	Bight 2003	Los Angeles/Long Beach Inner Harbor
-118.25485	33.76265	0.28322	0.71678	-99	-99	2000	Biological Baseline Study 2000	Los Angeles/Long Beach Inner Harbor
-118.25070	33.76387	0.25627	0.74373	1.521	0.68424	2006	POLA/POLB 2006	Los Angeles/Long Beach Inner Harbor
-118.27460	33.76452	0.63146	0.36854	-99	-99	2000	Biological Baseline Study 2000	Los Angeles/Long Beach Inner Harbor

Longitude	Latitude	SAND	FINE	BDEN	PORO	YEAR	Study Name	Waterbody Name
-118.27570	33.76513	0.61961	0.3804	1.669	0.59455	2006	POLA/POLB 2006	Los Angeles/Long Beach Inner Harbor
-118.22190	33.76532	0.2365	0.7635	1.617	0.62606	2006	POLA/POLB 2006	Los Angeles/Long Beach Inner Harbor
-118.23643	33.76597	0.5612	0.4387	1.73056	0.55724	1999	POLA/POLB Special Studies (CSTF 1998-2002)	Los Angeles/Long Beach Inner Harbor
-118.27770	33.76622	0.2405	0.7595	1.34279	0.79225	2003	Bight 2003	Los Angeles/Long Beach Inner Harbor
-118.24132	33.76646	0.26	0.74	1.40137	0.75674	1998	Bight 1998	Los Angeles/Long Beach Inner Harbor
-118.24858	33.76683	0.2613	0.7387	1.41247	0.75002	2003	Bight 2003	Los Angeles/Long Beach Inner Harbor
-118.23310	33.76695	0.18673	0.81327	1.66	0.6	2006	POLA/POLB 2006	Los Angeles/Long Beach Inner Harbor
-118.23192	33.76718	0.5477	0.4523	1.76478	0.53649	1999	POLA/POLB Special Studies (CSTF 1998-2002)	Los Angeles/Long Beach Inner Harbor
-118.23255	33.76737	0.1988	0.80121	-99	-99	2000	Biological Baseline Study 2000	Los Angeles/Long Beach Inner Harbor
-118.22030	33.76817	0.10928	0.89071	1.432	0.73818	2006	POLA/POLB 2006	Los Angeles/Long Beach Inner Harbor
-118.22350	33.76840	0.11249	0.8875	1.592	0.64121	2006	POLA/POLB 2006	Los Angeles/Long Beach Inner Harbor
-118.22453	33.76916	0.3	0.7	1.50091	0.69642	1998	Bight 1998	Los Angeles/Long Beach Inner Harbor
-118.22313	33.76928	0.0611	0.9389	-99	-99	2000	Biological Baseline Study 2000	Los Angeles/Long Beach Inner Harbor
-118.21230	33.77103	0.23987	0.76012	1.52	0.68485	2006	POLA/POLB 2006	Los Angeles/Long Beach Inner Harbor
-118.21028	33.77133	0.5462	0.4538	1.36718	0.77747	1998	POLA/POLB Special Studies (CSTF 1998-2002)	Los Angeles/Long Beach Inner Harbor
-118.22270	33.77167	0.26013	0.73987	1.46664	0.71719	1998	POLA/POLB Special Studies (CSTF 1998-2002)	Los Angeles/Long Beach Inner Harbor
-118.22110	33.77210	0.12003	0.87997	1.648	0.60727	2006	POLA/POLB 2006	Los Angeles/Long Beach Inner Harbor
-118.21790	33.77405	0.37455	0.62546	1.591	0.64182	2006	POLA/POLB 2006	Los Angeles/Long Beach Inner Harbor
-118.21290	33.77432	0.39507	0.60493	1.644	0.6097	2006	POLA/POLB 2006	Los Angeles/Long Beach Inner Harbor
-118.21467	33.77508	0.27817	0.7218	1.64827	0.60711	1998	POLA/POLB Special Studies (CSTF 1998-2002)	Los Angeles/Long Beach Inner Harbor
-118.21371	33.77515	0.30909	0.69092	-99	-99	2000	Biological Baseline Study 2000	Los Angeles/Long Beach Inner Harbor
-118.26752	33.70712	0.72508	0.27493	-99	-99	2000	Biological Baseline Study 2000	Los Angeles/Long Beach Outer Harbor
-118.27210	33.70753	0.155	0.845	1.463	0.71939	2006	POLA/POLB 2006	Los Angeles/Long Beach Outer Harbor
-118.27390	33.70782	0.12165	0.87835	-99	-99	2000	Biological Baseline Study 2000	Los Angeles/Long Beach Outer Harbor
-118.27517	33.70897	0.07865	0.92135	-99	-99	2000	Biological Baseline Study 2000	Los Angeles/Long Beach Outer Harbor

Longitude	Latitude	SAND	FINE	BDEN	PORO	YEAR	Study Name	Waterbody Name
-118.27517	33.70903	0	1	-99	-99	1997	BPTCP 1997	Los Angeles/Long Beach Outer Harbor
-118.26325	33.70905	0.52801	0.47199	-99	-99	2000	Biological Baseline Study 2000	Los Angeles/Long Beach Outer Harbor
-118.27018	33.71000	0	1	-99	-99	1997	BPTCP 1997	Los Angeles/Long Beach Outer Harbor
-118.24497	33.71053	0.9586	0.0414	-99	-99	1994	Bight 1994	Los Angeles/Long Beach Outer Harbor
-118.27190	33.71088	0.00786	0.99213	1.414	0.74909	2006	POLA/POLB 2006	Los Angeles/Long Beach Outer Harbor
-118.24970	33.71093	0.07314	0.92686	1.582	0.64727	2006	POLA/POLB 2006	Los Angeles/Long Beach Outer Harbor
-118.25773	33.71220	0.2346	0.7654	1.38685	0.76554	2003	Bight 2003	Los Angeles/Long Beach Outer Harbor
-118.27140	33.71302	0.00975	0.99026	1.361	0.78121	2006	POLA/POLB 2006	Los Angeles/Long Beach Outer Harbor
-118.27530	33.71402	0.01487	0.98513	1.304	0.81576	2006	POLA/POLB 2006	Los Angeles/Long Beach Outer Harbor
-118.27115	33.71440	0.036	0.964	-99	-99	1997	BPTCP 1997	Los Angeles/Long Beach Outer Harbor
-118.23610	33.71473	0.14348	0.85652	1.426	0.74182	2006	POLA/POLB 2006	Los Angeles/Long Beach Outer Harbor
-118.25198	33.71550	0.04235	0.95765	1.472	0.71394	2006	POLA/POLB 2006	Los Angeles/Long Beach Outer Harbor
-118.27730	33.71558	0.04602	0.95397	1.463	0.71939	2006	POLA/POLB 2006	Los Angeles/Long Beach Outer Harbor
-118.27258	33.71598	0.5912	0.4088	-99	-99	1997	BPTCP 1997	Los Angeles/Long Beach Outer Harbor
-118.26894	33.71787	0.07298	0.92702	-99	-99	2000	Biological Baseline Study 2000	Los Angeles/Long Beach Outer Harbor
-118.24025	33.71917	0.29412	0.70589	-99	-99	2000	Biological Baseline Study 2000	Los Angeles/Long Beach Outer Harbor
-118.23250	33.71944	0.2448	0.7552	-99	-99	1999	Western EMAP 1999	Los Angeles/Long Beach Outer Harbor
-118.22980	33.72163	0.3613	0.63869	1.62	0.62424	2006	POLA/POLB 2006	Los Angeles/Long Beach Outer Harbor
-118.21177	33.72235	0.3393	0.6607	1.45997	0.72123	2003	Bight 2003	Los Angeles/Long Beach Outer Harbor
-118.23530	33.72300	0.26	0.74	1.49532	0.69981	1998	Bight 1998	Los Angeles/Long Beach Outer Harbor
-118.21389	33.72389	0.7696	0.2304	-99	-99	1999	Western EMAP 1999	Los Angeles/Long Beach Outer Harbor
-118.21389	33.72389	0.7588	0.2412	-99	-99	1999	Western EMAP 1999	Los Angeles/Long Beach Outer Harbor
-118.23320	33.72458	0.04472	0.95528	1.318	0.80727	2006	POLA/POLB 2006	Los Angeles/Long Beach Outer Harbor
-118.22422	33.72470	0.3473	0.6527	1.45205	0.72603	2003	Bight 2003	Los Angeles/Long Beach Outer Harbor
-118.19209	33.72833	0.35773	0.64227	-99	-99	2000	Biological Baseline Study 2000	Los Angeles/Long Beach Outer Harbor
-118.23380	33.72910	0.37	0.63	1.4653	0.718	1998	Bight 1998	Los Angeles/Long Beach Outer Harbor
-118.19158	33.73093	0.5415	0.4585	1.59639	0.63855	2003	Bight 2003	Los Angeles/Long Beach Outer Harbor
-118.21540	33.73105	0.15377	0.84623	1.48	0.70909	2006	POLA/POLB 2006	Los Angeles/Long Beach Outer Harbor

Longitude	Latitude	SAND	FINE	BDEN	PORO	YEAR	Study Name	Waterbody Name
-118.23526	33.73108	0.27	0.73	1.44163	0.73235	1998	Bight 1998	Los Angeles/Long Beach Outer Harbor
-118.20132	33.73162	0.2859	0.7141	1.45469	0.72443	2003	Bight 2003	Los Angeles/Long Beach Outer Harbor
-118.19320	33.73207	0.24808	0.75192	1.829	0.49758	2006	POLA/POLB 2006	Los Angeles/Long Beach Outer Harbor
-118.22270	33.73242	0.43151	0.5685	1.791	0.52061	2006	POLA/POLB 2006	Los Angeles/Long Beach Outer Harbor
-118.23817	33.73273	0.49727	0.50272	-99	-99	2000	Biological Baseline Study 2000	Los Angeles/Long Beach Outer Harbor
-118.23817	33.73273	0.80179	0.19821	-99	-99	2000	Biological Baseline Study 2000	Los Angeles/Long Beach Outer Harbor
-118.23685	33.73313	0.36956	0.63043	-99	-99	2000	Biological Baseline Study 2000	Los Angeles/Long Beach Outer Harbor
-118.22334	33.73333	0.24121	0.75879	-99	-99	2000	Biological Baseline Study 2000	Los Angeles/Long Beach Outer Harbor
-118.21270	33.73378	0.1318	0.8682	1.871	0.47212	2006	POLA/POLB 2006	Los Angeles/Long Beach Outer Harbor
-118.23149	33.73426	0.74	0.26	1.72498	0.56062	1998	Bight 1998	Los Angeles/Long Beach Outer Harbor
-118.22220	33.73470	0.20092	0.79907	1.84	0.49091	2006	POLA/POLB 2006	Los Angeles/Long Beach Outer Harbor
-118.22098	33.73490	0.241	0.759	-99	-99	1997	BPTCP 1997	Los Angeles/Long Beach Outer Harbor
-118.23150	33.73535	0.08421	0.91579	1.51	0.69091	2006	POLA/POLB 2006	Los Angeles/Long Beach Outer Harbor
-118.21390	33.73743	0.10932	0.89067	1.539	0.67333	2006	POLA/POLB 2006	Los Angeles/Long Beach Outer Harbor
-118.23340	33.73832	0.1462	0.8538	1.30674	0.8141	2003	Bight 2003	Los Angeles/Long Beach Outer Harbor
-118.11375	33.74664	0.83373	0.16627	1.81196	0.5079	2003	Bight 2003	San Gabriel River Estuary/Alamitos Bay
-118.11047	33.74963	0.8207	0.1793	1.80123	0.5144	2003	Bight 2003	San Gabriel River Estuary/Alamitos Bay
-118.11206	33.75118	0.51556	0.48444	1.58194	0.64731	2003	Bight 2003	San Gabriel River Estuary/Alamitos Bay
-118.11273	33.75187	0.2175	0.7825	-99	-99	1997	BPTCP 1997	San Gabriel River Estuary/Alamitos Bay
-118.10537	33.75305	0.94561	0.05439	1.90959	0.44873	2003	Bight 2003	San Gabriel River Estuary/Alamitos Bay
-118.10261	33.75505	0.89197	0.10803	1.8615	0.47788	2003	Bight 2003	San Gabriel River Estuary/Alamitos Bay
-118.12985	33.75543	0.08047	0.91953	1.34795	0.78912	2003	Bight 2003	San Gabriel River Estuary/Alamitos Bay
-118.11327	33.75544	0.39829	0.60171	1.51123	0.69016	2003	Bight 2003	San Gabriel River Estuary/Alamitos Bay
-118.10123	33.75599	0.9169	0.0831	1.88355	0.46452	2003	Bight 2003	San Gabriel River Estuary/Alamitos Bay
-118.09866	33.75892	0.68269	0.31731	1.69496	0.57881	2003	Bight 2003	San Gabriel River Estuary/Alamitos Bay
-118.11226	33.76502	0.46831	0.53169	1.55267	0.66505	2003	Bight 2003	San Gabriel River Estuary/Alamitos Bay
-118.11314	33.76582	0.3233	0.6767	1.46924	0.71561	2003	Bight 2003	San Gabriel River Estuary/Alamitos Bay
-118.16028	33.71783	0.7081	0.2919	-99	-99	1994	Bight 1994	San Pedro Bay Near/Off Shore Zones

Longitude	Latitude	SAND	FINE	BDEN	PORO	YEAR	Study Name	Waterbody Name
-118.13125	33.72158	0.954	0.046	-99	-99	1994	Bight 1994	San Pedro Bay Near/Off Shore Zones
-118.20733	33.72203	0.9	0.1	-99	-99	1994	Bight 1994	San Pedro Bay Near/Off Shore Zones
-118.15718	33.72850	0.1575	0.8425	1.34956	0.78814	2003	Bight 2003	San Pedro Bay Near/Off Shore Zones
-118.16562	33.73125	0.2008	0.7992	-99	-99	1997	BPTCP 1997	San Pedro Bay Near/Off Shore Zones
-118.14163	33.73240	0.1879	0.8121	-99	-99	1997	BPTCP 1997	San Pedro Bay Near/Off Shore Zones
-118.14513	33.73405	0.237	0.763	-99	-99	1994	Bight 1994	San Pedro Bay Near/Off Shore Zones
-118.18411	33.73478	0.178	0.822	1.66248	0.59849	2001	POLA/POLB Special Studies (CSTF 1998-2002)	San Pedro Bay Near/Off Shore Zones
-118.18292	33.73871	0.245	0.755	1.67987	0.58796	2001	POLA/POLB Special Studies (CSTF 1998-2002)	San Pedro Bay Near/Off Shore Zones
-118.18310	33.73923	0.87221	0.12779	-99	-99	2000	Biological Baseline Study 2000	San Pedro Bay Near/Off Shore Zones
-118.11668	33.74133	1	0	1.97533	0.40889	2003	Bight 2003	San Pedro Bay Near/Off Shore Zones
-118.17722	33.74139	0.194	0.806	-99	-99	1999	Western EMAP 1999	San Pedro Bay Near/Off Shore Zones
-118.14000	33.74333	0.2859	0.7141	-99	-99	1999	Western EMAP 1999	San Pedro Bay Near/Off Shore Zones
-118.16893	33.74408	0.2182	0.7818	1.47608	0.71147	2003	Bight 2003	San Pedro Bay Near/Off Shore Zones
-118.15472	33.75444	0.5192	0.4808	-99	-99	1999	Western EMAP 1999	San Pedro Bay Near/Off Shore Zones
-118.16379	33.75495	0.0832	0.9168	1.26157	0.84147	2003	Bight 2003	San Pedro Bay Near/Off Shore Zones
-118.18723	33.75892	0	1	-99	-99	1997	BPTCP 1997	San Pedro Bay Near/Off Shore Zones
-118.18983	33.75925	0	1	-99	-99	1997	BPTCP 1997	San Pedro Bay Near/Off Shore Zones

Appendix III.4 – Applicable Maps

Contents

GIS Data Sources:

Watershed boundaries: Calwater GIS layer (http://www.atlas.ca.gov/) delineated using stream reach and storm drain layers (see Appendix II for more information) or County of Los Angeles, DPW GIS data (http://gis.dpw.lacounty.gov/oia/site_options.cfm)

City boundaries: County of Los Angeles, DPW GIS data (http://gis.dpw.lacounty.gov/oia/site_options.cfm)

GIS layer of the 2006 303(d) list (http://www.waterboards.ca.gov/water_issues/programs/tmdl/303d_lists2006_gis.shtml)

Monitoring data: location information from Statewide Sediment Database or study-specific information

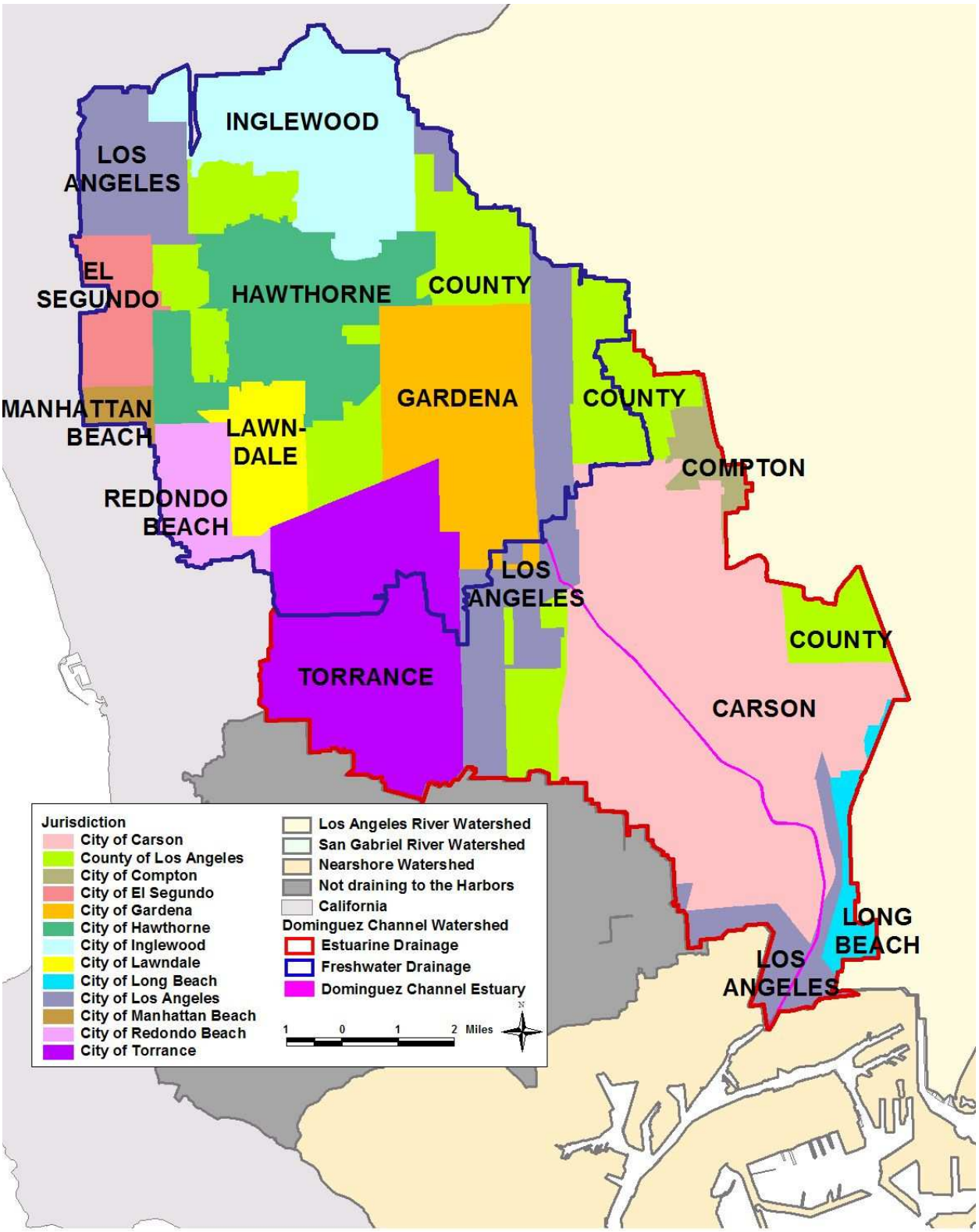


Figure III.4-1. Jurisdictions Draining to Freshwater and Estuarine Segments of the Dominguez Channel

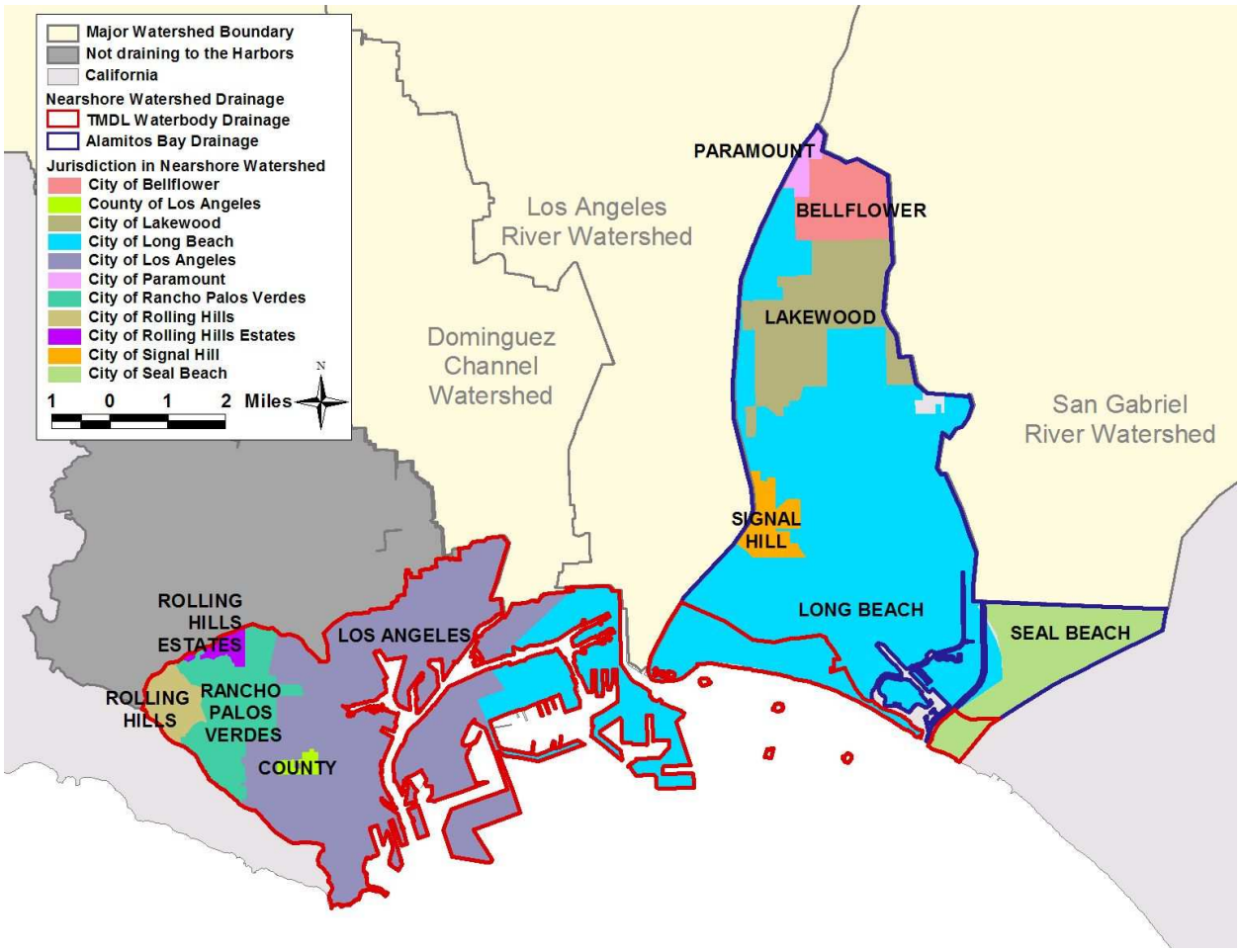


Figure III.4-2. Jurisdictions Draining to the Nearshore Subwatersheds

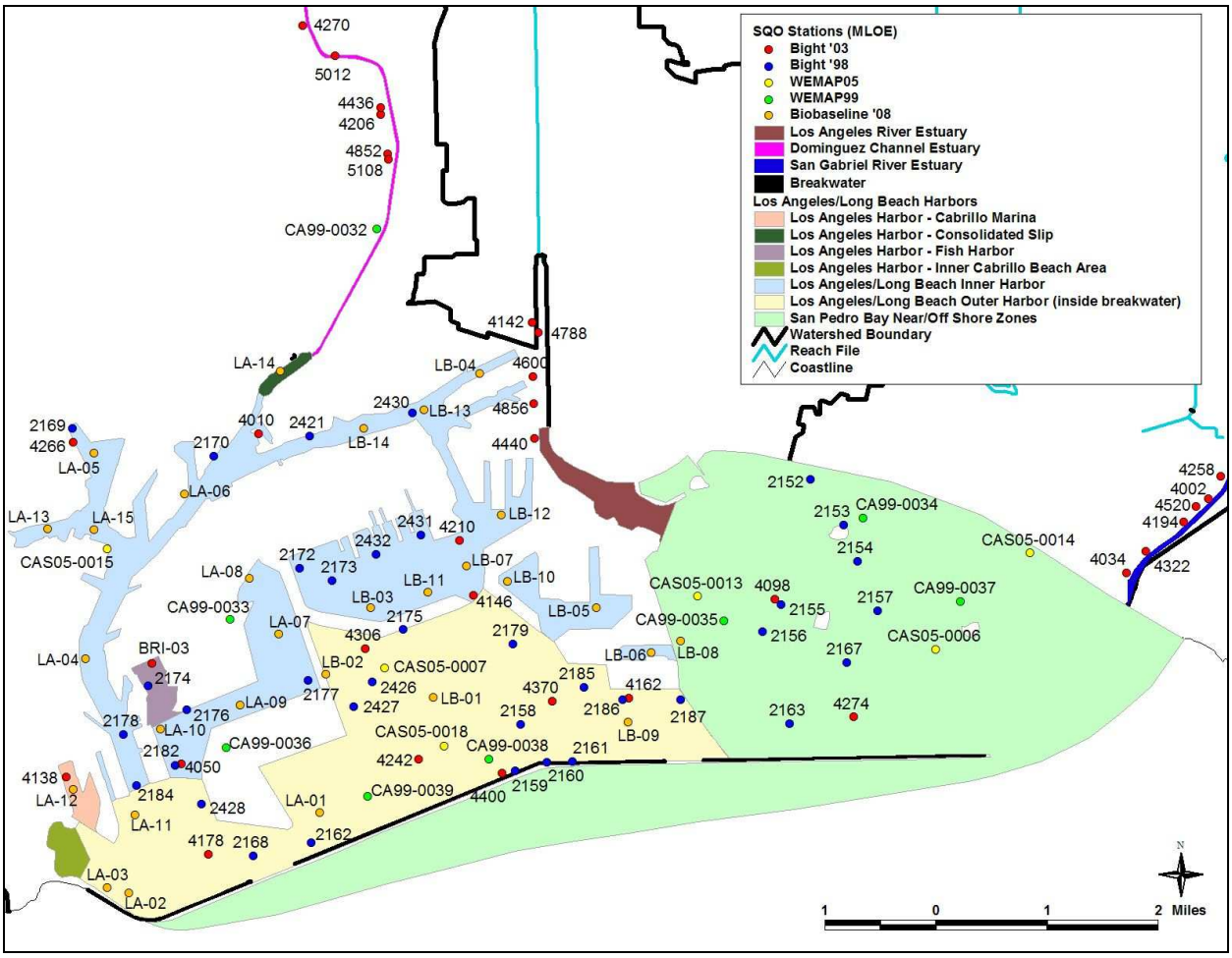


Figure III.4-3. SQO Monitoring Stations by Study

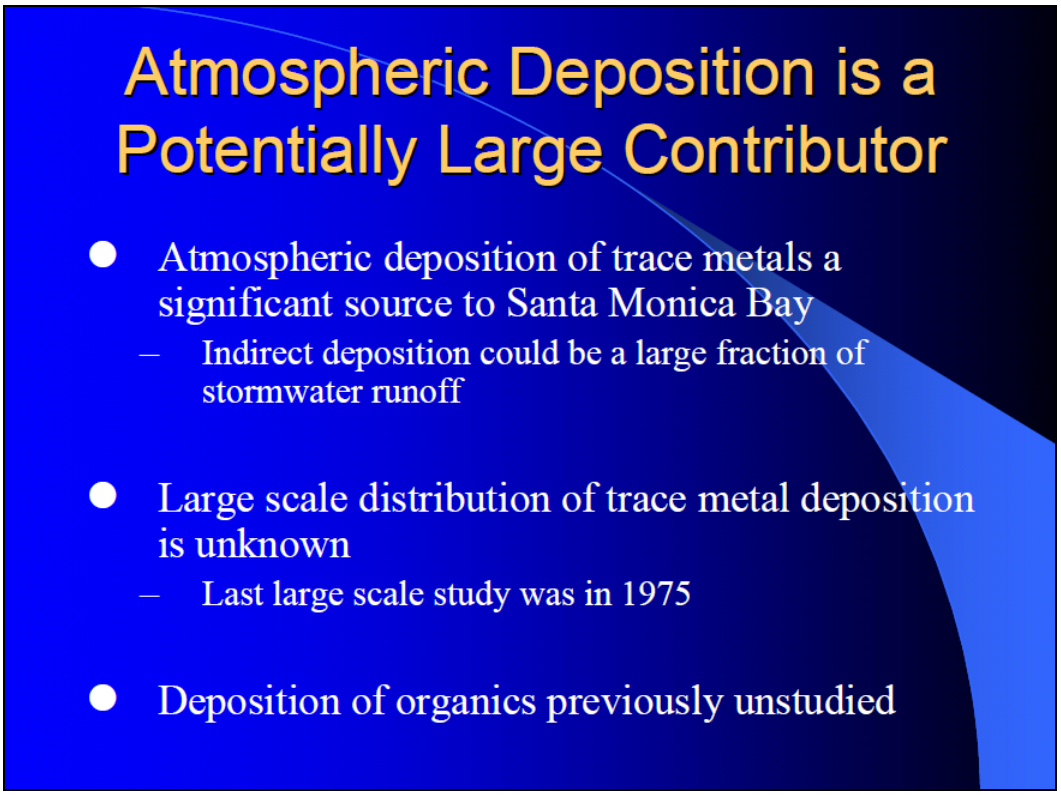
Note: the SQO Monitoring Station map illustrates stations that have sediment triad results by study (for data collected from 1998 to 2008; Bight 2008 data are not included in this map).

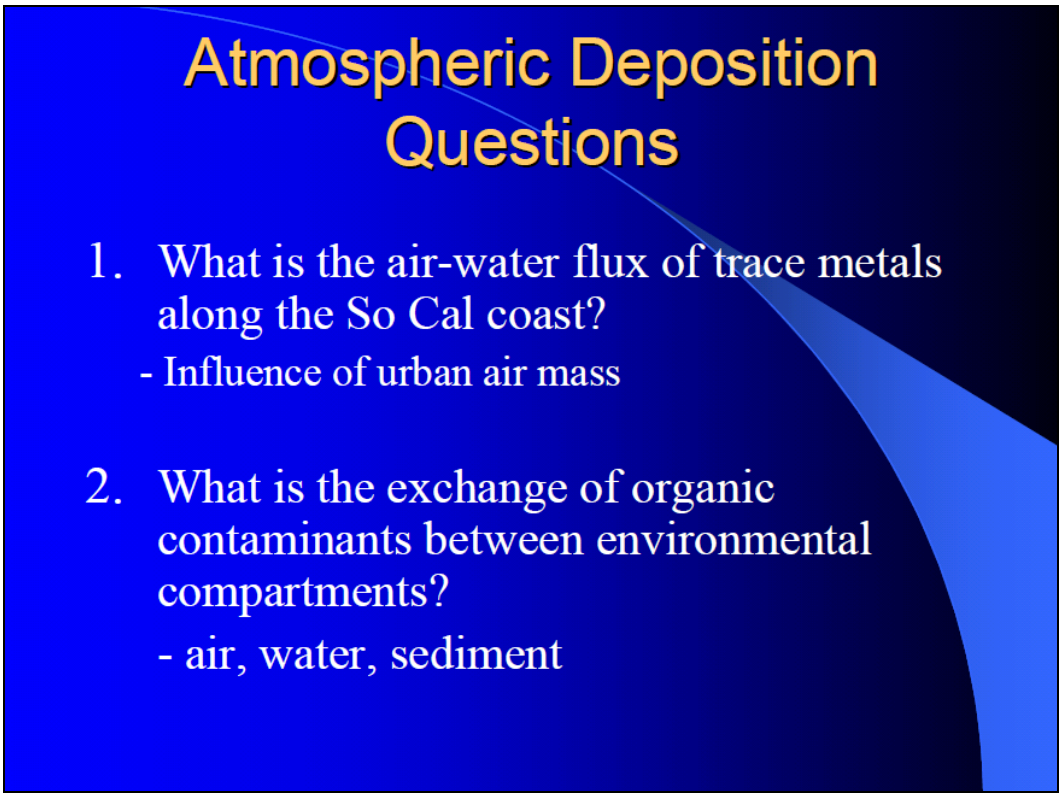
Appendix III.5 – SCCWRP Flux Monitoring Study

Contents

Appendix III.5 Summary

The following section includes a presentation (by K. Schiff, SCCWRP) describing results of air-water and sediment-water flux for trace metals and organics, to Harbor Toxics TMDLs Technical Advisory Group on Sept. 17, 2009.

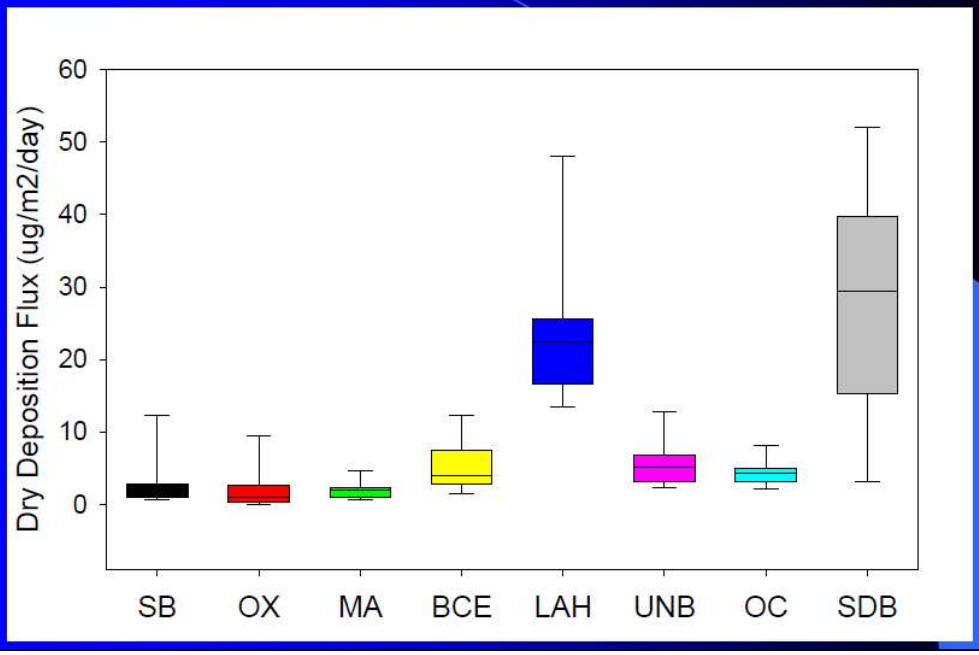

Atmospheric Deposition is a Potentially Large Contributor
Atmospheric deposition of trace metals a significant source to Santa Monica Bay
– Indirect deposition could be a large fraction of stormwater runoff
Large scale distribution of trace metal deposition is unknown
– Last large scale study was in 1975
Deposition of organics previously unstudied

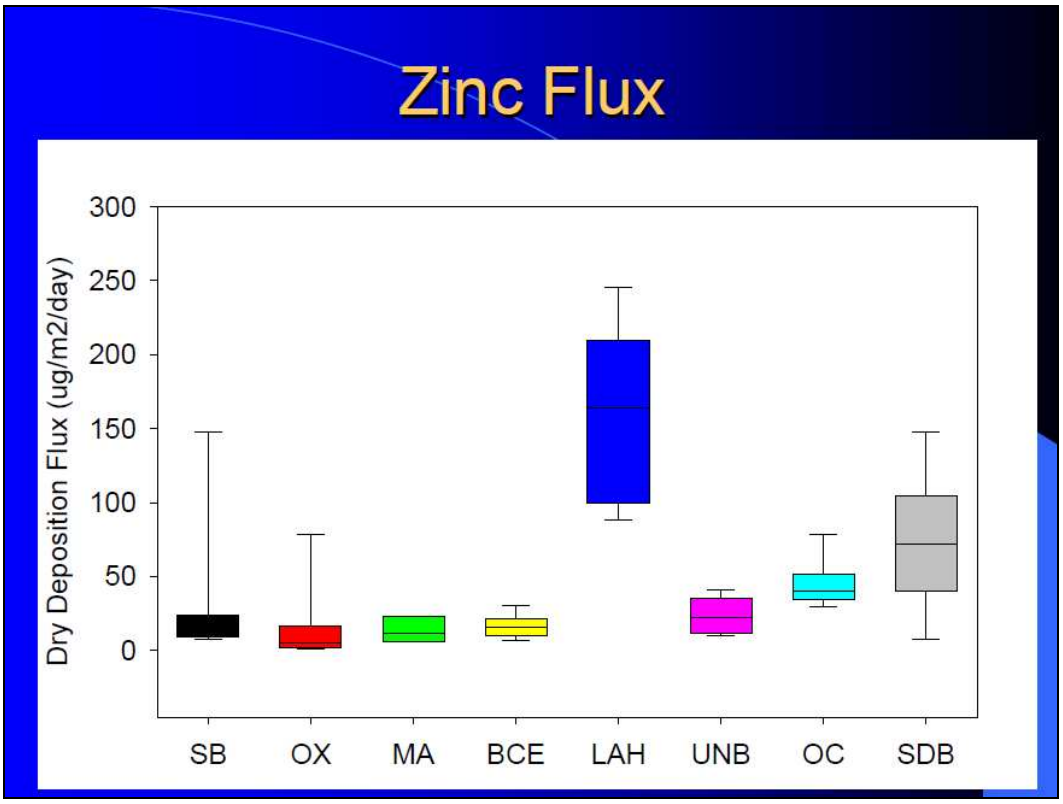

Atmospheric Deposition Questions
1. What is the air-water flux of trace metals along the So Cal coast?
- Influence of urban air mass
2. What is the exchange of organic contaminants between environmental compartments?
- air, water, sediment

Methods

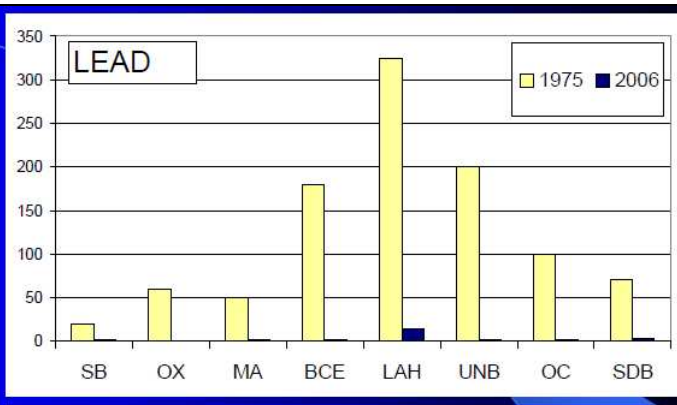
- Trace metals – coastal transect study
  - Dry particle deposition
  - 8 sites between Santa Barbara and San Diego
  - Comparison with data from 1970's
- Organics – multimedia study at 4 sites
  - Concentrations in air/water/sediment
    - DDT, PCB, PAH, Chlordane, other pesticides
  - Air-water Flux = gas exchange; dry particle deposition
  - Water-Sediment Flux = diffusive flux; sedimentation

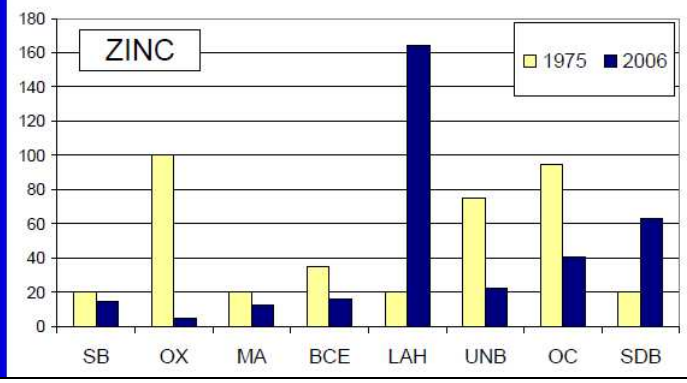
Copper Flux





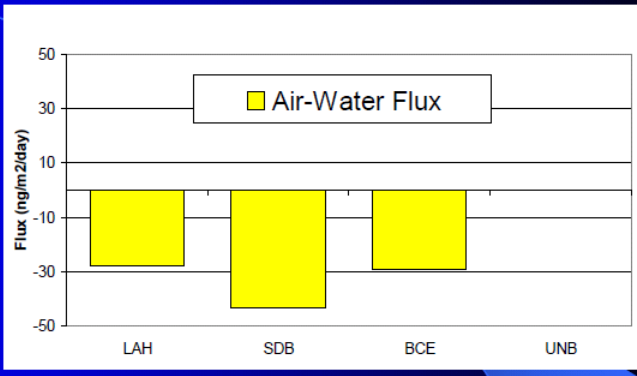
- Lead flux has decreased dramatically since 1975 at all sites
- Zinc flux has increased at LAH and SDB since 1975

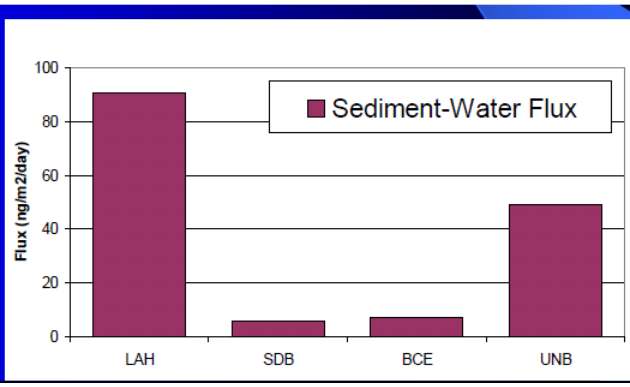




DDT

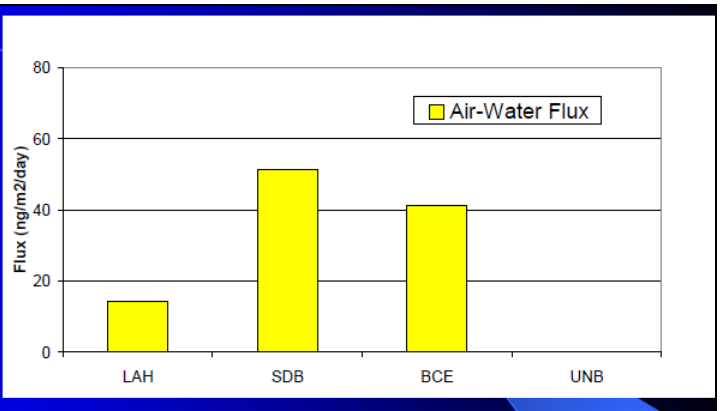
- Atmosphere is a source of DDT to the water column through gas exchange and dry deposition
- Sediment is a source of DDT to the water column
- LAH-sediment is larger source to water than air (~3x)
- SDB-air is larger source to water than sediment

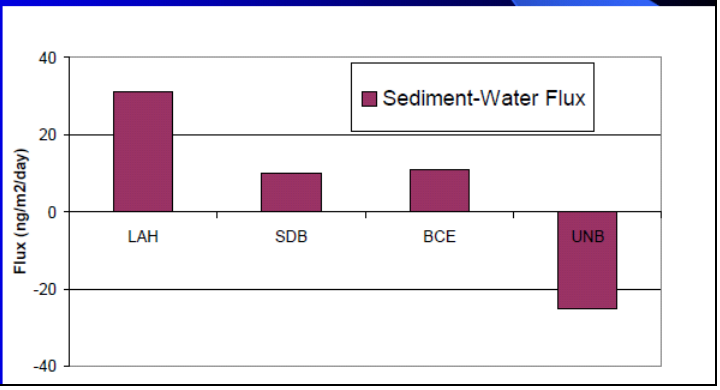




PCB

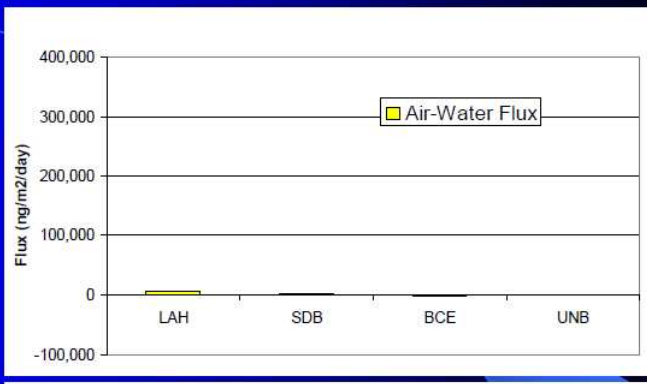
- Water column is a source of PCB to the atmosphere through gas exchange
- Sediment is a source of PCB to the water column through diffusive flux (except at UNB, due to high sedimentation flux)

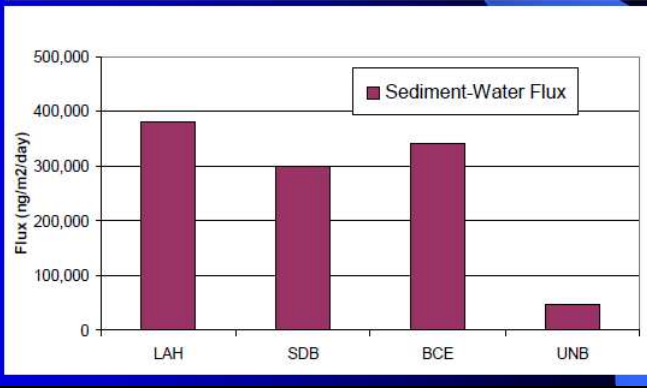




PAH

- Water is a source to the atmosphere through gas exchange
- Sediment is a source to water column through diffusive flux
- Sediment source to water is >> larger than loss to air





Current Status

- Trace metals
  - SCCWRP Technical Report
  - In press at ET&C
- Organics
  - Drafting SCCWRP Technical Report

Appendix III.6 – Metals Aerial Deposition Rates

Contents

Appendix III.6 Summary

The section below provides a summary on the source of data used to estimate direct aerial deposition rates. It also presents the calculated loads for each waterbody using this information.

Note: Tables III.6-1 and III.6-1 2 were extracted from: Sabin, L.D. and K.C. Schiff. 2007. Metal Dry Deposition Rates Along a Coastal Transect in Southern California. SCCWRP Technical Report #509. March 2007.

Available at:
ftp://ftp.sccwrp.org/pub/download/DOCUMENTS/TechnicalReports/509_metal_deposition_SoCaltransect_1975to2006.pdf

Calculation of Direct Air Deposition Rates

Direct air deposition estimates are included for Cu, Pb, Zn and PAHs based on atmospheric monitoring results cited by Sabin & Schiff (2007) or Sabin et al., (2010). Load estimates for certain waterbodies – Dominguez Channel Estuary, Consolidated Slip, Inner Harbor and LAR Estuary – were calculated using air monitoring results collected at the Wilmington sampling site (~3 km inland) close to Los Angeles/Long Beach Harbor.

For waterbodies with more coastal geographical position, we first determined the average deposition for each metal measured at six coastal sites; this was then applied to the following waterbodies: Fish Harbor, Cabrillo Marina, Inner Cabrillo Beach Area, Outer Harbor and San Pedro Bay.

See Table III.6-1 for information on dry deposition site measurements. See Table III.6-2 for monitoring results from various monitoring sites per Sabin & Schiff (2007). Table III.6-3 below provides dry deposition rates, waterbody surface areas, and estimates of current annual loading amounts for metals and PAHs.

Table III.6-1. Inventory of samples collected at each site by sampling week.

	Site							
Sampling Week	Santa Barbara	Oxnard	Malibu	Santa Monica Bay	Los Angeles Harbor	Upper Newport Bay	Oceanside	San Diego Bay
27-Jun-06								2
05-Jul-06	1	1	1	2				
11-Jul-06						1	1	2
18-Jul-06	1	1	1	1		1	1	1
26-Jul-06	1	1	1	1				
02-Aug-06						1	1	
08-Aug-06	1	1	1	1		1	1	1
16-Aug-06					1	1	1	1
22-Aug-06	1	1	1	1	1	1	1	1
30-Aug-06	1	1	1	1				
06-Sep-06					1	2	1	1
12-Sep-06	1	1	1	1				
19-Sep-06	1	1	1	1	1	1	1	1
26-Sep-06	1	1	1	1	1	1	1	1
03-Oct-06		1	1	1	1	1	1	1
17-Oct-06	1				2			
23-Oct-06					3			
01-Nov-06					1			
Number of Samples Collected at Each Site	10	10	10	11	12	11	10	12

Source: Sabin & Schiff, 2007

Table III.6-2. Comparison of metal dry deposition flux rates (µg/m^2-day).

	Chromium	Copper	Lead	Zinc
Lim et al., 2006				
Urban Sites in Los Angeles and Orange County, CA USA				
Los Angeles River -1	6	21	15	130
Los Angeles River -2	2.3	30	31	160
Los Angeles River -3	9	16	32	110
Ballona Creek	2.7	18	20	77
Dominguez Channel	3.3	12	11	74
Santa Ana River	4.3	30	10	180
Yi et al., 2001				
Chicago, IL USA	5.7	63	38	120
South Haven, MI USA	0.7	31	23	51
Sleeping Bear Dunes, MI USA	1.6	79	35	68
This Study				
Santa Barbara	0.34	2.0	1.3	14
Oxnard	0.23	0.89	0.52	4.8
Malibu	0.29	1.9	1.0	12
Hyperion	0.39	3.9	1.0	16
Los Angeles Harbor	3.6	22	14	160
Newport	0.64	5.1	1.8	22
Oceanside	0.48	4.2	1.4	40
San Diego Bay	0.99	29	3.3	63

Source: Sabin & Schiff, 2007

Table III.6-3. Estimates of current direct air deposition loading for metals and PAHs based on monitoring results from Sabin & Schiff (2007) and Sabin et al. (2010).

Waterbody	Area (m^2)	Wilmington site* (ug/m^2-day) Cu 22	Pb 14	Zn 160	Coastal sites (n= 6) * (ug/m^2-day) Cu 3	Pb 1.17	Zn 18.1	(ng/m^2-d) PAHs** 244	NAAQS (ug/m^3) Pb 0.15
Annual Load (kg/year)									
Dominguez Channel Estuary	567,900	4.56	2.90	33.2				0.051	0.03
Consolidated Slip	147,103	1.18	0.75	8.59				0.013	0.01
Inner Harbor	12,154,560	97.6	62.1	709.8				1.08	0.67
LAR Estuary	837,873	6.73	4.28	48.93				0.075	0.05
Fish Harbor	368,524				0.40	0.16	2.43	0.033	0.02
Cabrillo Marina	310,259				0.34	0.13	2.05	0.028	0.02
Inner Cabrillo Beach Area	331,799				0.36	0.14	2.19	0.03	0.02
Outer Harbor	16,358,366				17.9	6.99	108.1	1.46	0.90
San Pedro Bay	33,073,517				36.2	14.1	218.5	2.95	1.81

*Metal deposition rates replicated (Wilmington site) or averaged (coastal sites) from Sabin & Schiff (2007)

**PAHs deposition rates from Sabin et al. (2010)

Appendix III.7 – Justification for Addition of Waterbody-Pollutant Combinations (in addition to 2006 303(d) list)

Contents

Appendix III.7 Summary

The following data and maps present data and information assessed to identify additional waterbody-pollutant combinations that are impaired (but are not currently on the 2010 303(d) list). These are associated with the TS19 Tributary Monitoring Station in the Dominguez Channel Watershed.

Note: The following data were obtained from 2008-2009 and 2009-2010 Annual Reports, Appendix B Wet Weather Mass Emission and Tributary Station Concentrations (County of Los Angeles, Department of Public Works)

TS19 Wet Weather Monitoring Data 2008-2009

WEATHER CONDITION					Wet				
EVENT CODE					2008-09 Event03	2008-09 Event06	2008-09 Event09	2008-09 Event21	2008-09 Event23
DATE	Sample Type	EPA Method	PQL[3]	Units	11/4/2008	11/25/2008	12/15/2008	2/5/2009	2/13/2009
General									
Hardness	Comp	SM2340C	2.00	mg/L	90	55	60	55	30
Metals									
Dissolved Aluminum	Comp	EPA200.8	100.00	ug/L	64	-99	-99	-99	241
Total Aluminum	Comp	EPA200.8	100.00	ug/L	1150	255	243	580	1990
Dissolved Antimony	Comp	EPA200.8	0.50	ug/L	3.25	1.72	1.83	2.24	1.78
Total Antimony	Comp	EPA200.8	0.50	ug/L	6.8	3.98	2.81	4.29	3.57
Dissolved Arsenic	Comp	EPA200.8	1.00	ug/L	2.12	1.21	1.77	1.53	1.15
Total Arsenic	Comp	EPA200.8	1.00	ug/L	6.2	2.14	2.32	2.73	2.11
Dissolved Barium	Comp	EPA200.8	10.00	ug/L	38.1	22.7	22.2	23.4	21.8
Total Barium	Comp	EPA200.8	10.00	ug/L	319	96.3	55.2	102	105
Dissolved Beryllium	Comp	EPA200.8	0.50	ug/L	-99	-99	-99	-99	-99
Total Beryllium	Comp	EPA200.8	0.50	ug/L	0.29	-99	-99	0.13	0.13
Dissolved Cadmium	Comp	EPA200.8	0.25	ug/L	0.38	-99	0.2	0.11	0.16
Total Cadmium	Comp	EPA200.8	0.25	ug/L	2.81	0.81	0.47	1.49	0.73
Dissolved Chromium	Comp	EPA200.8	0.50	ug/L	3.56	1.75	2.88	2.08	2.46
Total Chromium	Comp	EPA200.8	0.50	ug/L	32.3	8.71	8.02	14.2	12.6
Dissolved Chromium +6	Comp	EPA218.6	0.25	ug/L	-99	-99	0.67	0.36	0.62
Total Chromium +6	Comp	EPA218.6	0.25	ug/L	-99	-99	0.67	0.36	0.62
Dissolved Copper	Comp	EPA200.8	0.50	ug/L	28.7	13.6	15	10	11.9
Total Copper	Comp	EPA200.8	0.50	ug/L	235	59.4	36.5	60.9	45.2
Dissolved Iron	Comp	EPA200.8	100.00	ug/L	786	124	85.7	88.5	210
Total Iron	Comp	EPA200.8	100.00	ug/L	12300	2420	2110	4310	4060
Dissolved Lead	Comp	EPA200.8	0.50	ug/L	6.95	1.47	2.31	1.36	3.04
Total Lead	Comp	EPA200.8	0.50	ug/L	97.6	31.2	16.3	33.1	31.2
Dissolved Mercury	Comp	EPA245.1	0.10	ug/L	-99	-99	-99	-99	-99
Total Mercury	Comp	EPA245.1	0.10	ug/L	-99	-99	-99	-99	0.18
Dissolved Nickel	Comp	EPA200.8	1.00	ug/L	10.2	5.97	5.04	3.75	2.9
Total Nickel	Comp	EPA200.8	1.00	ug/L	30.4	13.3	8.03	11.1	9.12
Dissolved Selenium	Comp	EPA200.8	1.00	ug/L	0.61	-99	-99	-99	-99
Total Selenium	Comp	EPA200.8	1.00	ug/L	0.91	1.28	0.67	-99	-99
Dissolved Silver	Comp	EPA200.8	0.25	ug/L	-99	-99	-99	-99	-99
Total Silver	Comp	EPA200.8	0.25	ug/L	0.65	-99	0.4	0.21	0.19
Dissolved Thallium	Comp	EPA200.8	0.50	ug/L	-99	-99	-99	-99	-99
Total Thallium	Comp	EPA200.8	0.50	ug/L	-99	-99	-99	-99	-99
Dissolved Zinc	Comp	EPA200.8	10.00	ug/L	141	130	158	129	112
Total Zinc	Comp	EPA200.8	10.00	ug/L	1540	414	282	416	306

Note:
1) blank cell indicates sample was not analyzed
2) -99 indicates concentration below minimum detection level
3) PQL = minimum level

TS19 Wet Weather Monitoring Data 2009-2010

WEATHER CONDITION			Wet				
EVENT CODE			2009-10 Event13	2009-10 Event15	2009-10 Event16	2009-10 Event19	2009-10 Event21
DATE	Analysis Method	Units	10/13/2009	12/7/2009	12/11/2009	1/17/2010	2/5/2010
General							
Hardness as CaCO3	SM2340C	mg/L	210	90	70	50	90
Metals							
Dissolved Aluminum	EPA200.8	ug/L	109	<50	<50	<50	<50
Dissolved Antimony	EPA200.8	ug/L	4.02	1.63	1.76	1.25	2.04
Dissolved Arsenic	EPA200.8	ug/L	2.84	1.73	1.82	1.7	2.42
Dissolved Barium	EPA200.8	ug/L	48.9	26.9	16.6	18.2	25.4
Dissolved Beryllium	EPA200.8	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1
Dissolved Cadmium	EPA200.8	ug/L	0.294	<0.1	<0.1	<0.1	0.639
Dissolved Chromium	EPA200.8	ug/L	2.3	2.14	1.52	1.22	1.91
Dissolved Chromium +6	EPA218.6	ug/L	<0.25	<0.25	<0.25	<0.25	<0.25
Dissolved Copper	EPA200.8	ug/L	17.2	14.3	9.73	7.78	9.74
Dissolved Iron	EPA200.8	ug/L	297	115	<50	<50	<50
Dissolved Lead	EPA200.8	ug/L	2.99	1.15	0.647	1.16	0.769
Dissolved Mercury	EPA245.1	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1
Dissolved Nickel	EPA200.8	ug/L	15.4	4.26	3.28	2.24	3.26
Dissolved Selenium	EPA200.8	ug/L	1.93	<0.5	<0.5	1.45	<0.5
Dissolved Silver	EPA200.8	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1
Dissolved Thallium	EPA200.8	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1
Dissolved Zinc	EPA200.8	ug/L	175	126	124	81.1	112
Aluminum	EPA200.8	ug/L	146	1020	348	3230	2830
Antimony	EPA200.8	ug/L	4.04	2.99	2.46	3.09	4.06
Arsenic	EPA200.8	ug/L	2.93	2.53	2.19	2.99	3.8
Barium	EPA200.8	ug/L	52.1	71.5	32.2	89.3	108
Beryllium	EPA200.8	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1
Cadmium	EPA200.8	ug/L	0.345	0.486	<0.1	0.665	0.818
Chromium	EPA200.8	ug/L	2.62	6.2	3.32	10.1	12.5
Chromium +6	EPA218.6	ug/L	<0.25	<0.25	<0.25	<0.25	<0.25
Copper	EPA200.8	ug/L	23.2	44.8	24.2	39	46.2
Iron	EPA200.8	ug/L	366	1440	725	4830	5000
Lead	EPA200.8	ug/L	3.66	15.4	6.72	31.7	33
Mercury	EPA245.1	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	EPA200.8	ug/L	16.2	8.97	5.14	9.21	9.79
Selenium	EPA200.8	ug/L	2.07	<0.5	<0.5	1.72	<0.5
Silver	EPA200.8	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1
Thallium	EPA200.8	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1
Zinc	EPA200.8	ug/L	186	255	137	312	314

Note:
Values reported with a "< "are not detected (ND) at the method detection level, and reported as <MDL

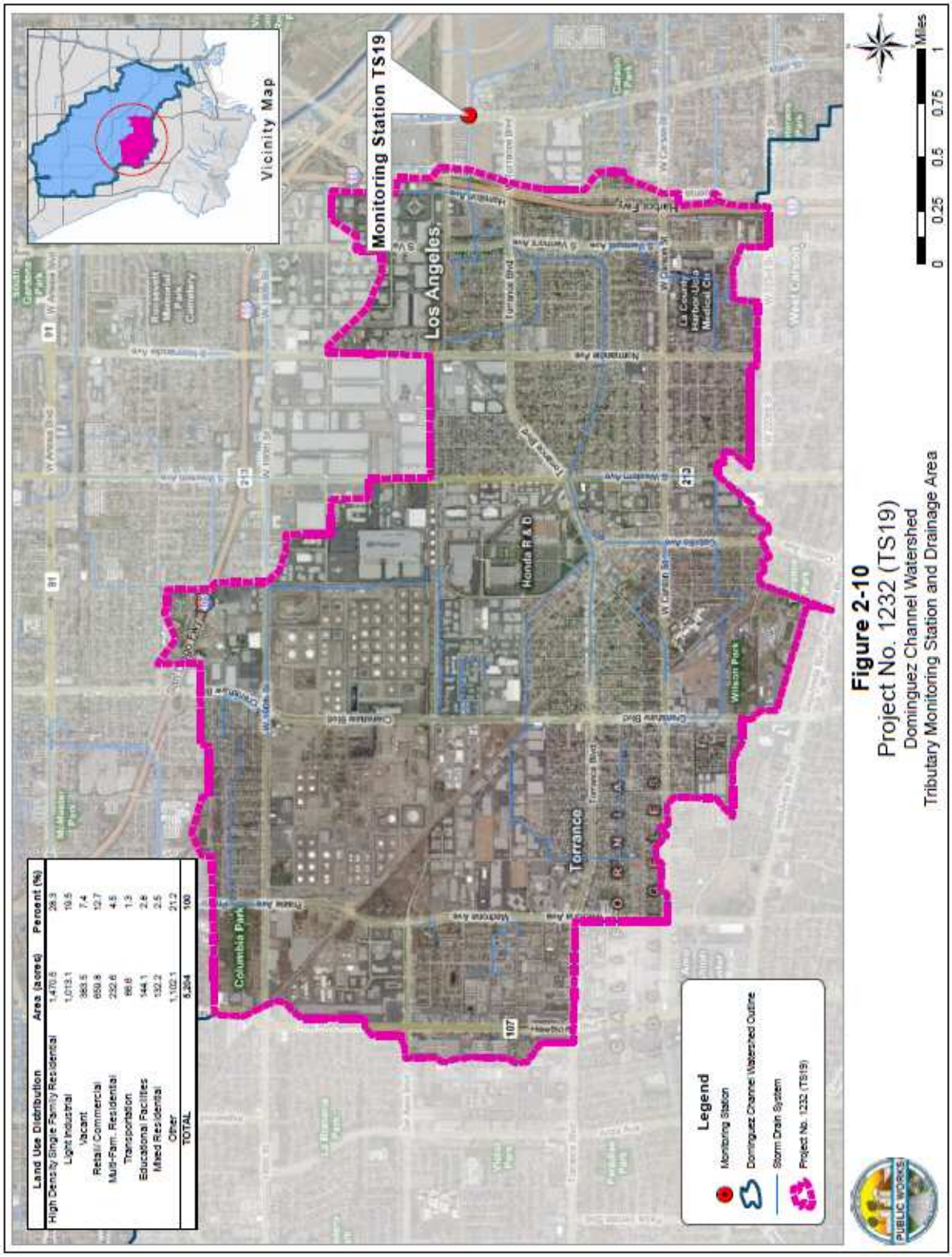


Figure III.7-1. Dominguez Channel Watershed – Tributary Monitoring Station (TS19)
Map source: County of Los Angeles, Department of Public Works

Appendix III.8 – Tetra Tech Memo on TMDL Scenarios

Contents

Appendix III.8 Summary

The technical memorandum included in this section summarizes the scenarios simulated to support TMDL development. This includes a discussion of the role of upland sources to the receiving waterbody sediment for metals and organic contaminants. These results were ultimately used to support TMDL allocations and calculate existing loads in each TMDL zone.

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MEMORANDUM

DATE: April 14, 2011

TO: Peter Kozelka, USEPA Region 9

FROM: Stephen Carter, Amy King, Andrew Parker, John Hamrick, and John Craig

SUBJECT: Los Angeles-Long Beach Harbors TMDL Scenario Development

Model Simulation Process

Results from LSPC (freshwater) model output for Dominguez Channel, Los Angeles River, San Gabriel River and nearshore areas were used as input to the EFDC model of receiving (saline) waters in greater LA/LB Harbor area. To determine the waterbodies in greater Los Angeles/Long Beach Harbor area not meeting applicable sediment quality criteria and to develop load reductions to attain the TMDL condition, EFDC model output for sediment pollutant concentrations in 11 TMDL zones (Table 1 and Figure 1) were examined.

Table 1. Waterbody Name and TMDL Zone

Waterbody Name	TMDL Zone
Dominguez Channel Estuary	01
Consolidated Slip	02
Inner Harbor – Port of Los Angeles	03
Fish Harbor	04
Cabrillo Marina	05
Inner Cabrillo Beach Area	06
Outer Harbor – Port of Los Angeles	07
Inner Harbor – Port of Long Beach	08
Outer Harbor – Port of Long Beach	09
Los Angeles River Estuary	10
San Pedro Bay	11

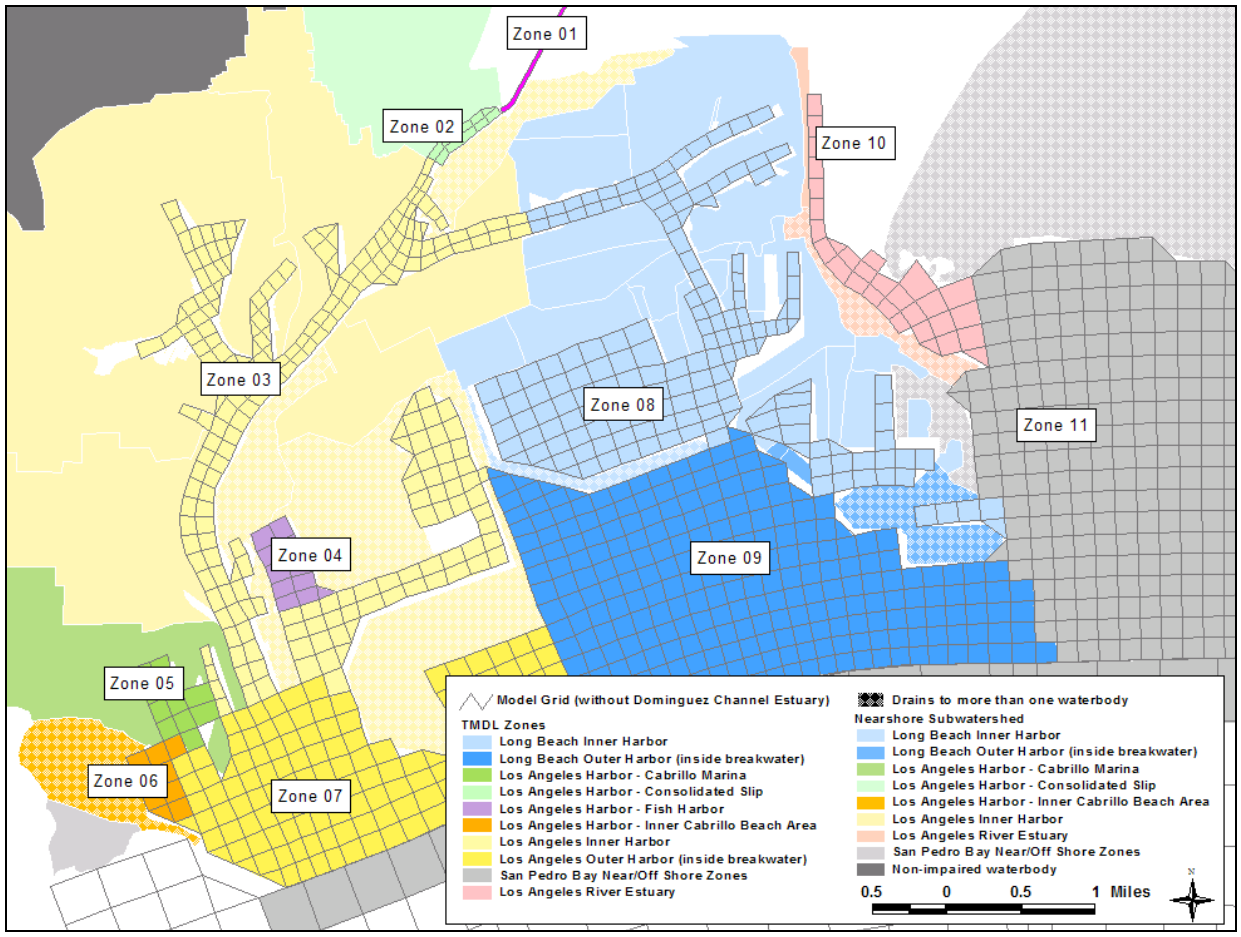

Figure 1. TMDL Zones

Model simulation runs were performed as described in the modeling report, Appendix I: Los Angeles-Long Beach Harbors and San Pedro Bay Hydrodynamic and Sediment-Contaminant Transport Model Calibration (Tetra Tech, Inc. 2011). Simulation time period consisted of four years, 2002-2005; the 2005 water year ranks in 97th percentile of annual rainfall levels dating back to 1944. Four day average water column and bed concentrations, external loads and advective fluxes in the water column and fluxes between the sediment bed and water column were accumulated as the model executed for each water column and bed cell. A post processor was used to aggregate the grid cell output into four-day average concentrations and mass of sediments and contaminants in 11 TMDL zones, as well as fluxes between the zones, fluxes between the bed and water column in each zone, and external loads to the zones.

For the purposes of TMDL development, model runs focused on sediment quality impairments. Analysis of model scenario outputs considered pollutant concentrations in the upper 5 centimeters (cm) of the sediment bed corresponding to approximately the top bed layer of the model. Additional model runs yielding information for the top 20 cm, corresponding to the top two bed layers of the model (top 5 cm plus the subsequent 15 cm), are available but not presented here. In general, results for the top 20 cm of the bed show similar trends to the top 5 cm, but slower responses since a larger mass of material is considered with the underlying 15 cm not changing significantly over the course of the model simulation.

Model Scenarios

Various scenarios were performed to evaluate implementation alternatives associated with the TMDL and/or to support allocation of the TMDL. These included the following scenarios:

1. Base scenario—simulation of existing contaminant loads

2. No upland sources scenario—simulation without upland contaminant loads
3. No Dominguez Channel scenario— simulation of existing contaminant loads excluding the Dominguez Channel
4. No LA River scenario— simulation of existing contaminant loads excluding the LA River
5. No Nearshore scenario— simulation of existing contaminant loads excluding the Nearshore areas
6. Hot spot cleanup scenario— simulation of setting contaminant loads in hot spots to levels at or below the applicable criteria

Analysis of the "no upland sources" scenario focused on determining sources of sediment quality violations, data trends, and required load reductions. Dominguez Channel Estuary, Consolidated Slip, and Inner Harbor-POLA (zones 01-03) are most impacted by the Dominguez Channel watershed. Nearshore watershed areas impacted Fish Harbor, Cabrillo Marina, Inner Cabrillo Beach Area, Inner Harbor-POLB and Outer Harbor-POLA (zones 04–08). Outer Harbor- POLB, LA River Estuary, and San Pedro Bay (zones 09–11) are dominated by loads from the LA River. These results are useful to support TMDL allocations and the average base scenario results were used to calculate existing loads in each zone for comparison with the TMDL results. Results are discussed and presented graphically below.

The "no upland sources" scenario was ultimately inclusive of scenarios #3 through #5; therefore, only results for the "no upland sources" scenario (scenario #2) are presented below and were used to support assignment of WLAs in the TMDL (see Appendix III.1 for more information on the process used to assign allocations). This scenario determined the extent of watershed sources of pollutants causing sediment quality violations. Overall, upland sources were contributing to the sediment bed impairments for metals in some zones, but model results suggest that upland sources are not contributing significantly to the sediment organics impairments.

The hot spot scenario (scenario #6) was performed to consider implementation alternatives. Specifically, copper hot spots within all zones were reduced so the average copper sediment concentration throughout each zone met the sediment quality target. Metal hotspots were in similar locations (depositional areas) for all metals, thus the copper reductions also resulted in sediment criteria being met for lead and zinc because copper contamination represents the worst-case scenario for metals. The copper based approach also results in reducing PAH concentrations in Cabrillo Marina (zone 05) below the PAH bed sediment criteria. Meeting copper criteria did not reduce PAH levels in Dominguez Channel Estuary and Consolidated Slip (zones 01 and 02) to criteria levels. DDT proved to be the most sensitive pollutant. Ultimately, reducing DDT to criteria in each zone resulted in all other pollutants achieving their respective targets. However, it should be noted that DDT remediation is required in all zones as the bed sediment concentrations were well above targets throughout the study area.

The remainder of this memo describes modeling results associated with the TMDL allocation scenarios, which are represented by the difference between the base scenario and the no upland sources scenario (scenarios #1 and #2, respectively). The model simulations incorporate the interactions between waterbodies, so sediment and pollutant movement between TMDL zones is accounted for in the loading estimates.

Allocation Scenario: Sediment Metals Contamination

Metals contamination modeled included copper (Cu), lead (Pb), and zinc (Zn). Tables 2 through 4 present the average and maximum Cu, Pb, and Zn sediment concentrations by zone for the base and no upland sources scenario, as well as the percent difference between the two scenarios. Concentrations that exceed the applicable criteria are highlighted in orange. An analysis of both initial conditions and current ambient bed conditions for the three metals indicates that copper is the critical metal. Reduction of bed copper concentrations (i.e., average zone concentration equal to the criteria) will also result in corresponding zone average lead and zinc concentrations meeting the criteria. A reduction of either lead or zinc will not result in the copper criteria being met in any of the zones.

Copper

The maximum and four day average copper sediment concentrations exceeded criteria in all zones for both scenarios with a single exception. The four day average concentration in LA River Estuary (zone 10) did meet criteria for the no upland sources scenario. In addition, after eliminating the upland sources, most zones appear to be in a trend of decreasing concentrations, suggesting that over time, the concentrations may ultimately achieve criteria. In many zones, achievement of criteria would take considerable time; thus additional remediation actions will likely be required. The percent difference in concentrations between the two scenarios shows that loading from upland sources is contributing to sediment copper concentrations for Dominguez Channel Estuary, Consolidated Slip, and Inner Harbor-POLA (zones 01–03) and Outer Harbor-POLB, LA River Estuary, and San Pedro Bay (zones 09–11). These reductions are likely due to both the reduction in watershed loads as well as the dilution in the bed due to the deposition of clean sediment. Concentrations in Fish Harbor, Cabrillo Marina, Inner Cabrillo Beach Area, and Outer Harbor-POLA (zones 04–07) are relatively stable and do not respond significantly to upland load reduction. These behaviors are illustrated in the time series plots of copper concentrations in Figures 2–7 in addition to being summarized in Table 2.

The model results show that the accumulation of contaminated sediments in Dominguez Channel Estuary, Consolidated Slip, and Inner Harbor-POLA (zones 01–03) are due to the Dominguez Channel and the elimination of the Dominguez Channel loading results in substantially decreasing levels in Dominguez Channel Estuary and Consolidated Slip as show in Figures 2 and 3. The increasing levels of copper in Outer Harbor-POLB, Los Angeles River Estuary, and San Pedro Bay (zones 09–11) are due to the LA River and elimination of the LA River copper load results in decreasing concentrations over time as shown in Figures 3 through 7. Near shore areas do not appear to be causing significant loading of copper contaminated sediments to Fish Harbor, Cabrillo Marina, Inner Cabrillo Beach Area, Outer Harbor-POLA, and Inner Harbor-POLB (zones 04-08).

Table 2. Sediment copper concentrations for the base and no upland sources scenarios

Zone	Waterbody Name	Cu in top 5 cm of sediment (mg/kg)					
		Criteria: 34.0 mg/kg					
		Base Scenario Avg	Base Scenario Max	No Upland Sources Scenario Avg	No Upland Sources Scenario Max	% Diff Avg	% Diff Max
01	Dominguez Channel Estuary	132.62	146.70	95.63	121.72	27.89	20.52
02	Consolidated Slip	259.15	269.62	199.62	262.76	22.97	2.61
03	Inner Harbor – POLA	84.79	90.65	80.43	81.33	5.14	11.47
04	Fish Harbor	46.87	47.75	46.87	46.90	-0.02	1.82
05	Cabrillo Marina	235.82	239.66	239.34	239.68	-1.49	-0.01
06	Inner Cabrillo Beach Area	110.00	110.92	110.87	110.91	-0.79	0.01
07	Outer Harbor – POLA	62.04	63.60	62.10	62.15	-0.09	2.34
08	Inner Harbor – POLB	65.83	68.20	65.46	65.53	0.57	4.07
09	Outer Harbor – POLB	45.66	51.88	43.98	44.15	3.67	17.51
10	Los Angeles River Estuary	74.59	112.29	32.33	51.24	56.65	119.16
11	San Pedro Bay	65.64	89.73	48.54	51.83	26.05	73.13

Base Avg = model run 2002-2005, average existing condition; Base Max = existing conditions with maximum values output
No Upland Avg = model run 2002-2005, no upstream inputs; No Upland Max = no upstream input with maximum
% Difference Avg = between Base Avg and No Upland Avg scenarios;
% Difference Max = between Base Max and No Upland Max scenarios
Orange color indicates average zone concentration exceeds contaminant sediment criteria

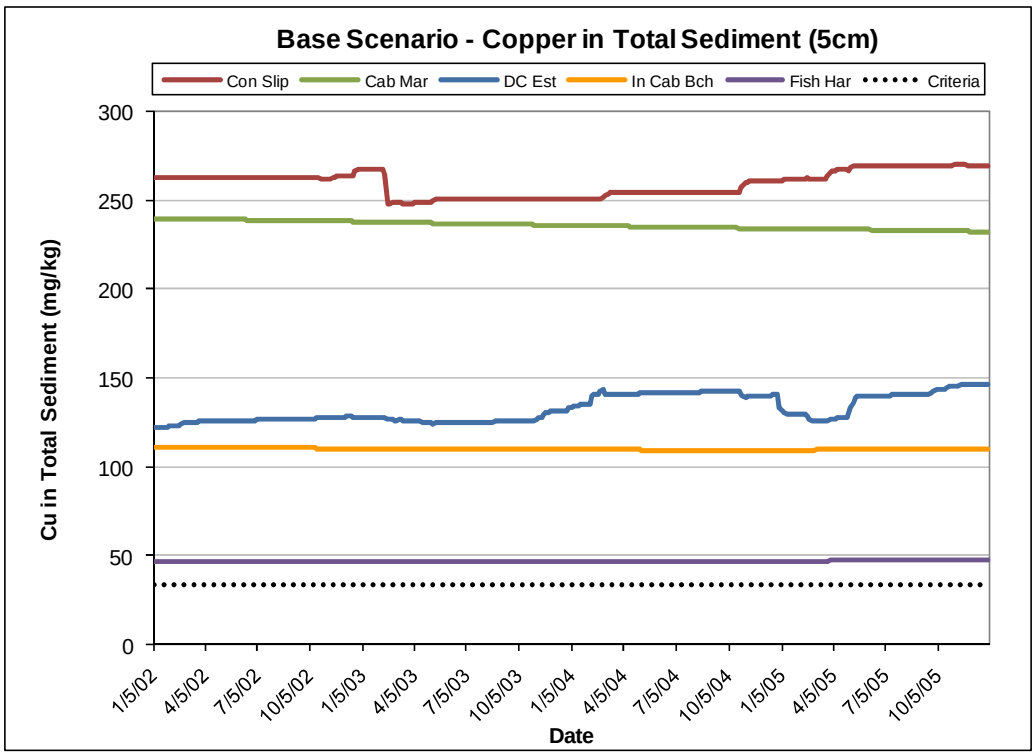

Figure 2. Sediment copper concentrations for the base scenario (Consolidated Slip, Dominguez Channel Estuary, Inner Cabrillo Beach Area, Cabrillo Marina, and Fish Harbor)

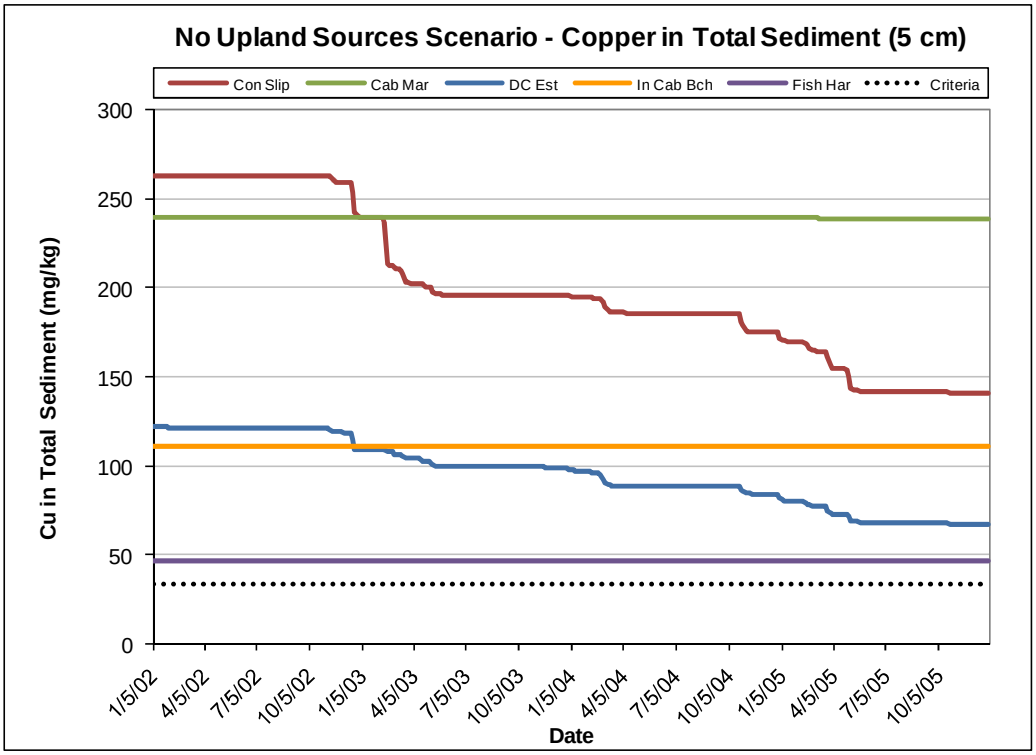

Figure 3. Sediment copper concentrations for the no upland sources scenario (Consolidated Slip, Dominguez Channel Estuary, Inner Cabrillo Beach Area, Cabrillo Marina, and Fish Harbor)

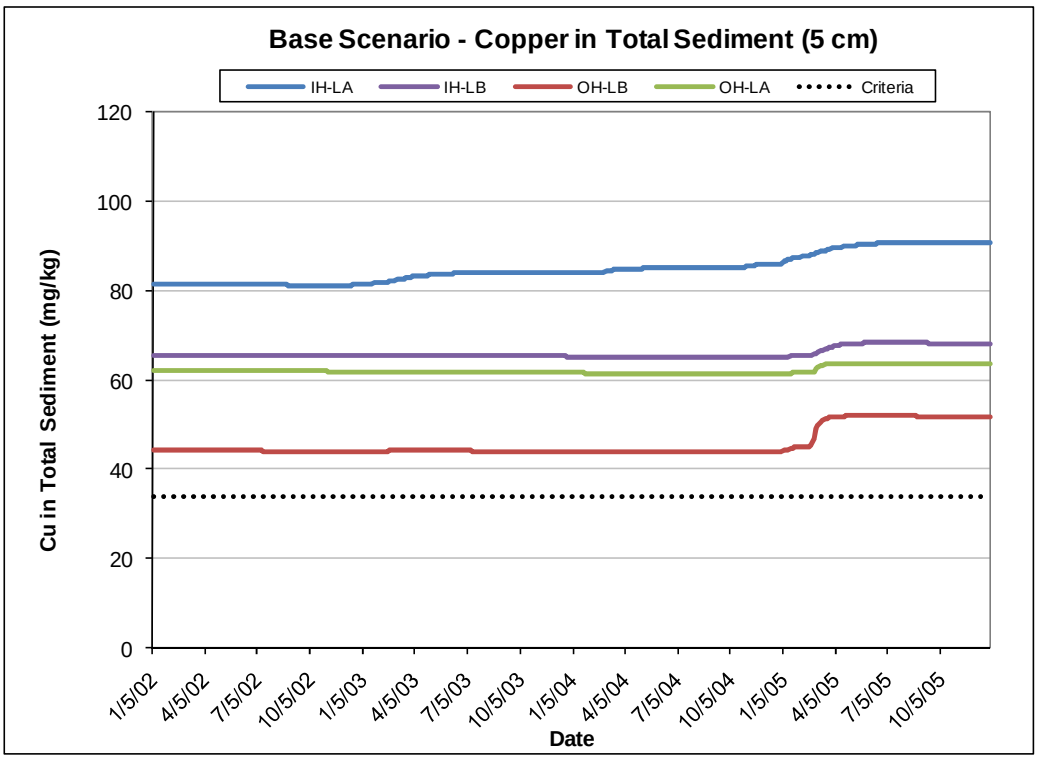

Figure 4. Sediment copper concentrations for the base scenario (Inner and Outer Harbors)

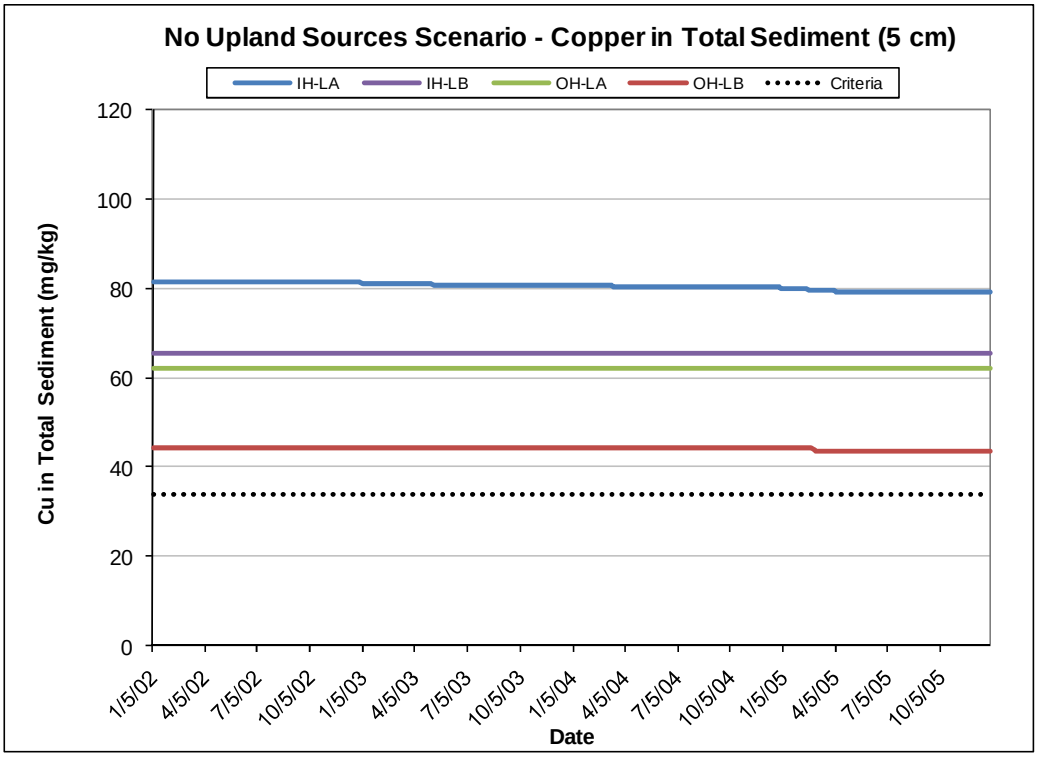

Figure 5. Sediment copper concentrations for the no upland source scenario (Inner and Outer Harbors)

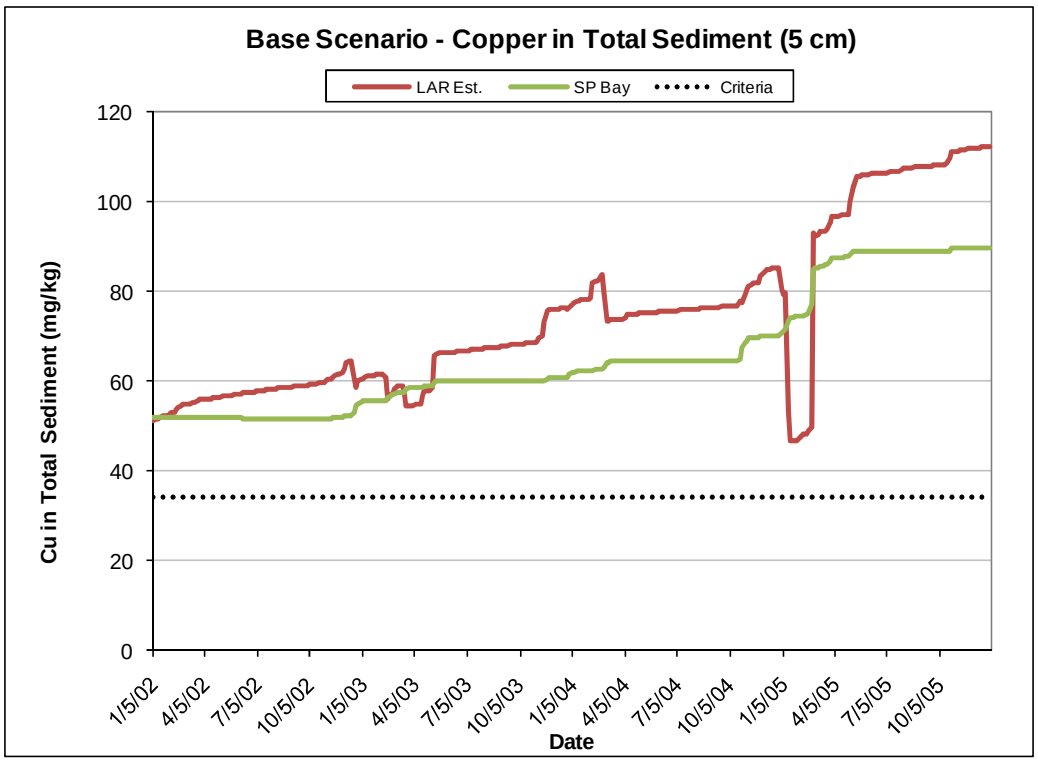

Figure 6. Sediment copper concentrations for the base scenario (San Pedro Bay and LA River Estuary)

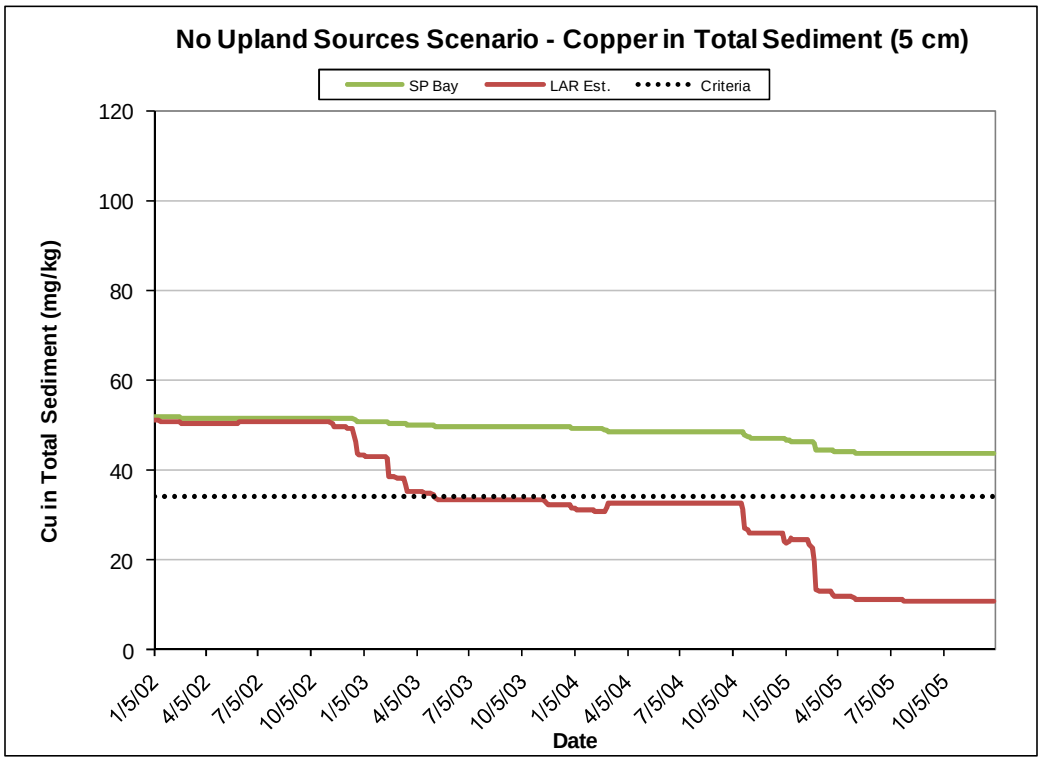

Figure 7. Sediment copper concentrations for the no upland sources scenario (San Pedro Bay and LA River Estuary)

Lead

The maximum lead sediment concentrations exceeded criteria in six zones for the base scenario and in four zones for the no upland sources scenario (Table 3). The six zones where maximum lead sediment concentrations exceeded criteria include Dominguez Channel Estuary, Consolidated Slip, Inner Harbor-POLA, Cabrillo Marina, LA River Estuary, and San Pedro Bay (zones 01-03, 05, 10, and 11). For the no upland sources scenario, maximum lead sediment concentrations exceeded criteria in Dominguez Channel Estuary, Consolidated Slip, Cabrillo Marina, and San Pedro Bay (zones 01, 02, 05, and 11). The average concentration exceeded criteria in the same zones as the maximum concentrations in the base scenario, but in only three of the four for the no upland sources scenario. The LA River Estuary (zone 10) did not violate the criteria. The percent difference in concentrations between the two scenarios shows that lead loading from upland scenarios is impacting bed sediment concentrations in all zones, but most noticeably in Dominguez Channel Estuary, Consolidated Slip, Inner Harbor-POLA, LA River Estuary, and San Pedro Bay (zones 01, 03, 10, and 11), which all showed increases in the average sediment concentration of over 45 percent. Similar to copper, these reductions are likely due to both the reduction in watershed loads as well as dilution in the bed due to the deposition of clean sediment. Temporal changes in lead concentrations for both scenarios follow similar trends as those shown for copper (Figures 2-7).

Table 3. Sediment lead concentrations for the base and no upland sources scenarios

Zone	Waterbody Name	Pb in top 5 cm of sediment (mg/kg)					
		Criteria: 46.7 mg/kg					
		Base Scenario Avg	Base Scenario Max	No Upland Sources Scenario Avg	No Upland Sources Scenario Max	% Diff Avg	% Diff Max
01	Dominguez Channel Estuary	185.37	192.66	94.35	120.05	49.10	60.48
02	Consolidated Slip	357.91	402.48	278.39	360.66	22.22	11.59
03	Inner Harbor – POLA	51.38	58.28	27.93	28.35	45.64	105.57
04	Fish Harbor	19.60	21.37	12.14	12.15	38.03	75.92
05	Cabrillo Marina	59.37	60.94	49.81	49.93	16.09	22.05
06	Inner Cabrillo Beach Area	24.18	25.68	19.89	19.90	17.73	29.03
07	Outer Harbor – POLA	21.42	23.95	13.85	13.86	35.37	72.87
08	Inner Harbor – POLB	36.60	40.50	22.72	22.75	37.91	78.04
09	Outer Harbor – POLB	29.79	38.15	16.78	16.84	43.66	126.50
10	Los Angeles River Estuary	122.22	204.49	28.47	44.66	76.71	357.86
11	San Pedro Bay	91.15	119.59	44.47	47.42	51.21	152.20

Orange color indicates average zone concentration exceeds contaminant sediment criteria

Zinc

The maximum zinc sediment concentration exceeded criteria in all zones but Fish Harbor (zone 04) for the base scenario, and exceeded criteria in Dominguez Channel Estuary, Consolidated Slip, Cabrillo Marina, Los Angeles River Estuary, and San Pedro Bay (zones 01, 02, 05, 10, and 11) for the no upland sources scenario (Table 4). The average concentration for the base scenario exceeded criteria in the same zones as the maximum concentrations, except Outer Harbor-POLA (zone 07). Four of the five zones that had maximum zinc concentrations violate criteria for the no upland sources scenario also had an average sediment concentration that violated criteria. Los Angeles River Estuary (zone 10) was the exception that did not violate criteria. The percent difference in concentrations between the two scenarios shows that zinc loadings from upland sources are impacting bed sediment concentrations in all zones, but most noticeably in Dominguez Channel Estuary, Consolidated Slip, Inner Harbor-POLA, Los Angeles River Estuary, and San Pedro Bay (zones 01, 02, 03, 10, and 11). These all showed that upland sources were contributing at least 50 percent of the average sediment concentration. Temporal changes in zinc concentrations for both scenarios follow similar trends as those shown for copper (Figures 2-7).

Table 4. Sediment zinc concentrations for the base and no upland sources scenarios

Zone	Waterbody Name	Zn in top 5 cm of sediment (mg/kg)					
		Criteria: 150.0 mg/kg					
		Base Scenario Avg	Base Scenario Max	No Upland Sources Scenario Avg	No Upland Sources Scenario Max	% Diff Avg	% Diff Max
01	Dominguez Channel Estuary	728.30	1,250.64	169.92	218.84	76.67	471.48
02	Consolidated Slip	1,122.01	1,585.41	508.32	653.84	54.70	142.48
03	Inner Harbor – POLA	261.04	327.61	128.36	130.13	50.83	151.75
04	Fish Harbor	137.57	144.02	88.76	88.81	35.48	62.17
05	Cabrillo Marina	235.32	243.14	205.12	205.43	12.83	18.36
06	Inner Cabrillo Beach Area	166.78	172.16	141.64	141.67	15.07	21.53
07	Outer Harbor – POLA	147.49	159.57	98.38	98.45	33.30	62.07
08	Inner Harbor – POLB	191.87	213.77	119.44	119.78	37.75	78.48
09	Outer Harbor – POLB	174.48	233.97	98.80	99.18	43.37	135.91
10	Los Angeles River Estuary	929.93	1,869.70	112.45	178.78	87.91	945.79
11	San Pedro Bay	428.55	686.35	162.43	173.61	62.10	295.34

Orange color indicates average zone concentration exceeds contaminant sediment criteria

Allocation Scenario: Sediment Organics Contamination

Organics contamination modeled in the harbor included total dichlorodiphenyltrichloroethane (DDT), total polycyclic aromatic hydrocarbons (PAH), and total polychlorinated biphenyls (PCB). Tables 5–7 present the average and maximum PAHs, DDT, and PCBs sediment concentrations by zone for the base and no upland sources scenarios, as well as the percent difference between the two scenarios. Similar to Tables 2–4, concentrations that exceed the applicable criteria are highlighted in orange. Temporal behavior of sediment PAH concentrations are shown in Figures 8 through 13. Behavior of DDT and PCBs follow similar trends in all of the zones; however, ambient sediment concentrations of DDT and PCBs are farther above their respective targets than PAHs. The temporal behavior for both scenarios and all zones is described by an exponential decay like reduction of bed concentration in the top 5 cm of the bed towards a diffusive equilibrium level. The high initial pollutant concentrations in the sediment bed pore water compared to the water column drive a significant diffusion flux from the top of the bed, which approaches equilibrium as the curve flattens out. This is due to the fact that the model sediment bed was

initialized to a uniform concentration over the thickness of the bed. The behavior of PAH concentration over a thicker bed region does not show such a rapid decrease in concentration.

PAHs

The maximum and average PAHs bed sediment concentration exceeded criteria for both the base and no upland sources scenarios in Dominguez Channel Estuary, Consolidated Slip and Cabrillo Marina (zones 01, 02, and 05) (Table 5). The percent difference in concentrations between the two scenarios shows that there appears to be no or minimal loadings from upland sources. This is shown in the time series plots of PAHs concentrations in Figures 8–13. In addition, most zones appear to be in a trend of decreasing concentrations, suggesting that over time, the concentrations may ultimately achieve criteria. In many zones, achievement of criteria would take considerable time; thus additional remediation actions will likely be required.

The concentrations of PAHs were approximately the same in all waterbodies for the base and no upland sources scenarios. Slight exceptions can be found in LA River Estuary and San Pedro Bay (zones 10 and 11), which show approximately 31 and 19 percent greater average concentrations, respectively, for the base scenario. This suggests that the LA River Estuary is contributing small loads of PAHs to bed sediments in these waterbodies, but less than what is required to maintain current concentrations and significantly less than what is necessary to cause violations of the applicable criteria (Figure 12). This generally indicates that PAHs contamination is a legacy issue and the combination of clean sediment deposition and the diffusion of legacy PAHs contamination are causing bed sediment concentrations to gradually decrease over time. In fact, by the end of the simulation period sediment quality standards are met in Cabrillo Marina (zone 05), which had exceeded criteria initially. It is noteworthy that reducing copper to criteria also results in meeting PAHs sediment target in Cabrillo Marina.

Table 5. Sediment PAHs concentrations for the base and no upland sources scenarios

Zone	Waterbody Name	PAHs (total) in top 5 cm of sediment (ug/kg)					
		Criteria: 4,022 ug/kg					
		Base Scenario Avg	Base Scenario Max	No Upland Sources Scenario Avg	No Upland Sources Scenario Max	% Diff Avg	% Diff Max
01	Dominguez Channel Estuary	11,368.33	24,688.59	11,208.22	24,688.43	1.41	0.00
02	Consolidated Slip	32,372.88	73,510.71	32,240.56	73,510.71	0.41	0.00
03	Inner Harbor – POLA	1,939.55	3,869.77	1,915.24	3,869.77	1.25	0.00
04	Fish Harbor	113.09	168.61	107.05	168.61	5.35	0.00
05	Cabrillo Marina	6,083.00	14,345.76	6,089.34	14,345.76	-0.10	0.00
06	Inner Cabrillo Beach Area	889.18	1,771.06	891.98	1,771.06	-0.32	0.00
07	Outer Harbor – POLA	586.29	1,180.22	583.60	1,180.22	0.46	0.00
08	Inner Harbor – POLB	678.75	1,246.81	670.25	1,246.81	1.25	0.00
09	Outer Harbor – POLB	159.08	265.25	153.93	265.25	3.24	0.00
10	Los Angeles River Estuary	403.60	682.03	277.28	681.38	31.30	0.10
11	San Pedro Bay	190.72	294.32	154.20	294.32	19.15	0.00

Orange color indicates average zone concentration exceeds contaminant sediment criteria

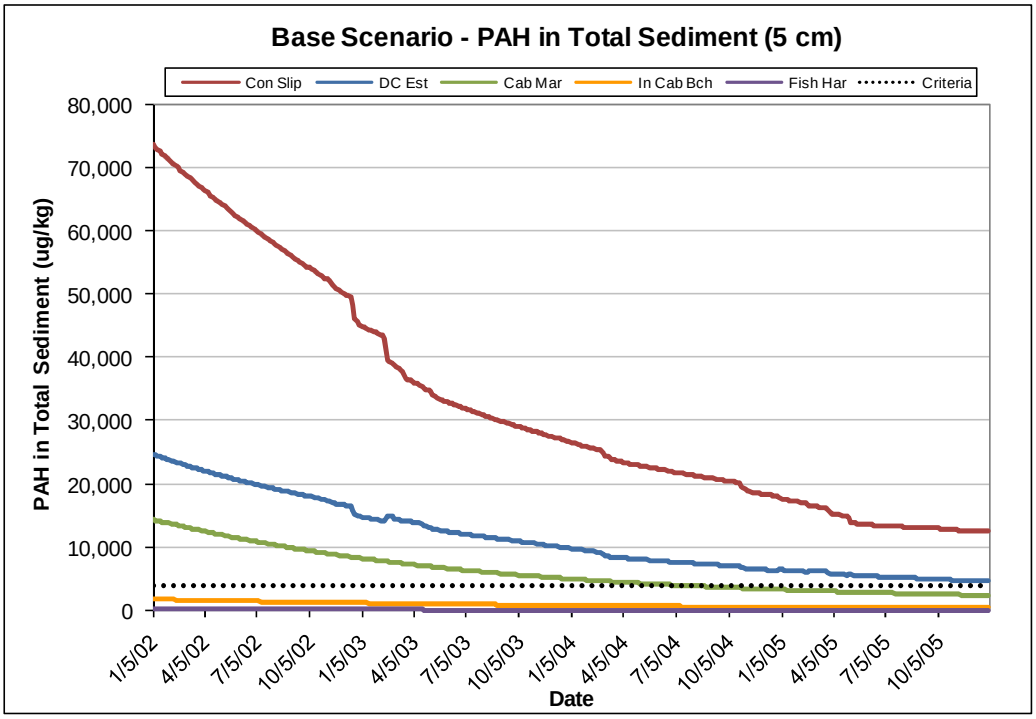

Figure 8. Sediment PAH concentrations for the base scenario (Consolidated Slip, Dominguez Channel Estuary, Inner Cabrillo Beach Area, Cabrillo Marina, and Fish Harbor)

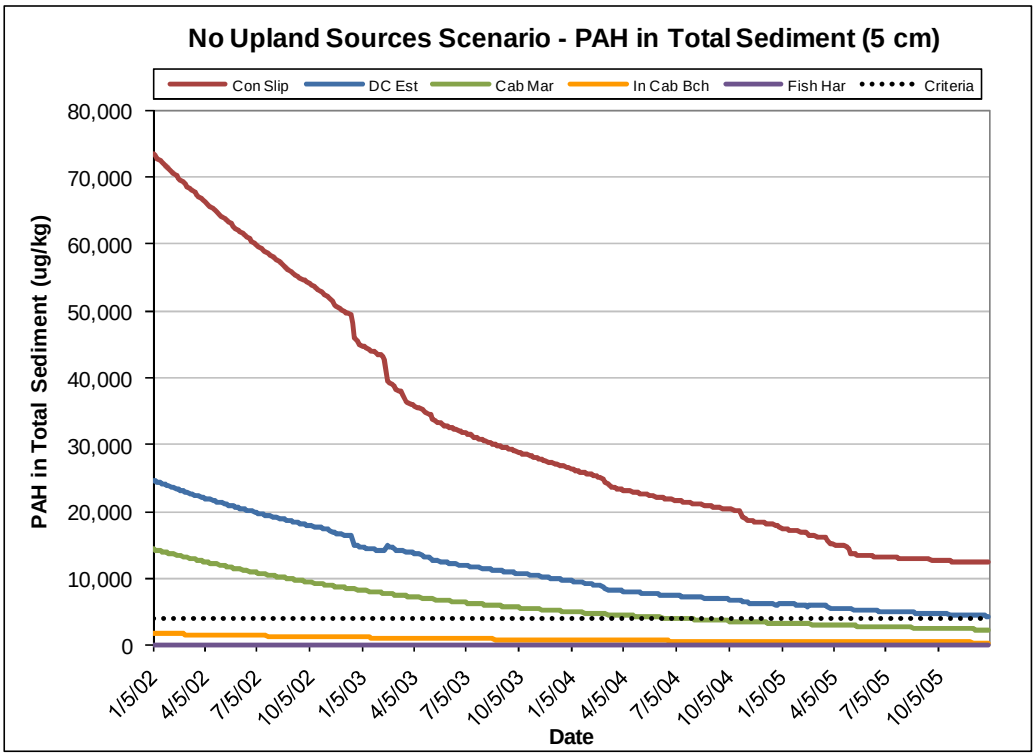

Figure 9. Sediment PAH concentrations for the no upland sources scenario (Consolidated Slip, Dominguez Channel Estuary, Inner Cabrillo Beach Area, Cabrillo Marina, and Fish Harbor)

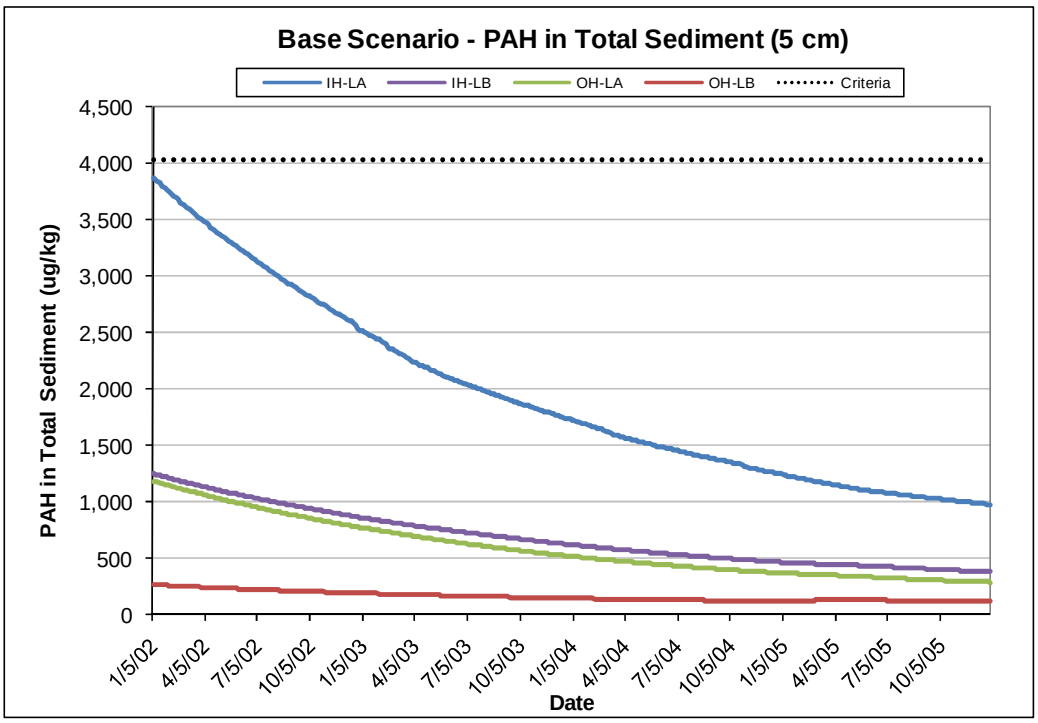

Figure 10. Sediment PAH concentrations for the base scenario (Inner and Outer Harbors)

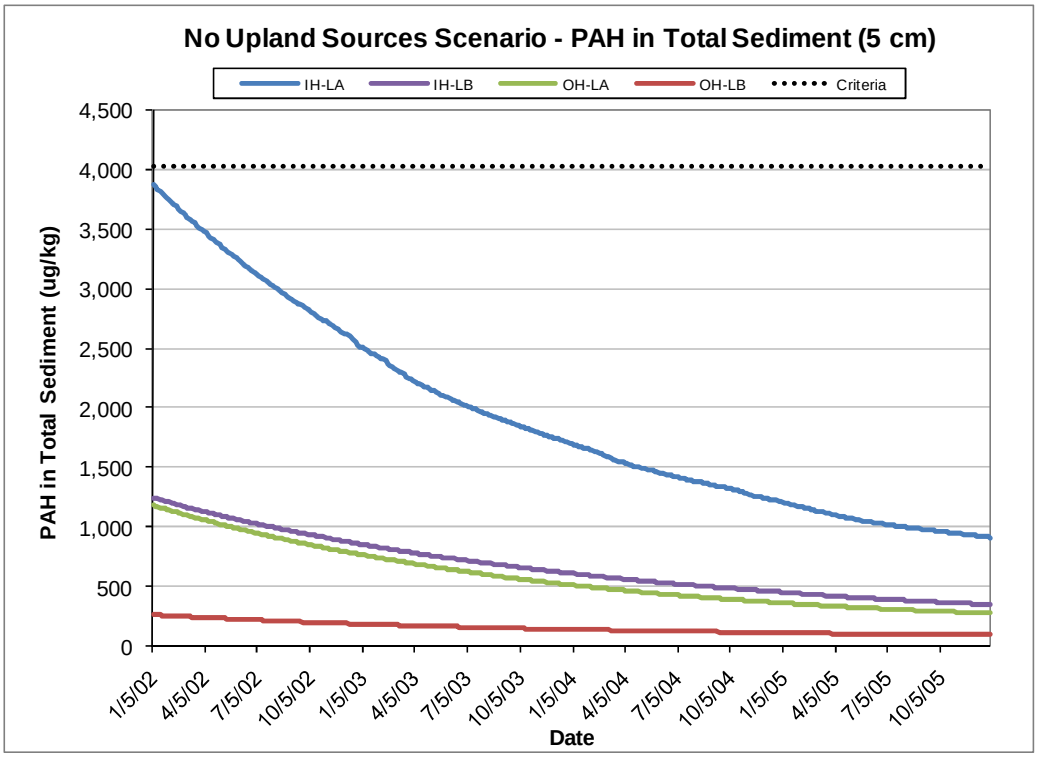

Figure 11. Sediment PAH concentrations for the no upland sources scenario (Inner and Outer Harbors)

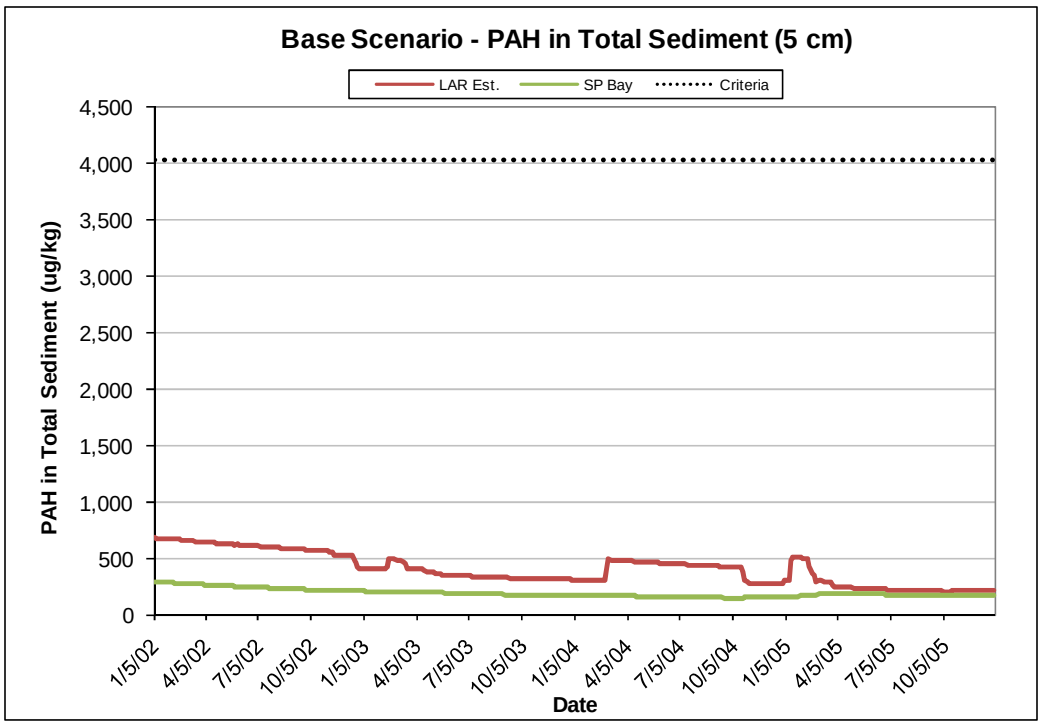

Figure 12. Sediment PAH concentrations for the base scenario (San Pedro Bay and LA River Estuary)

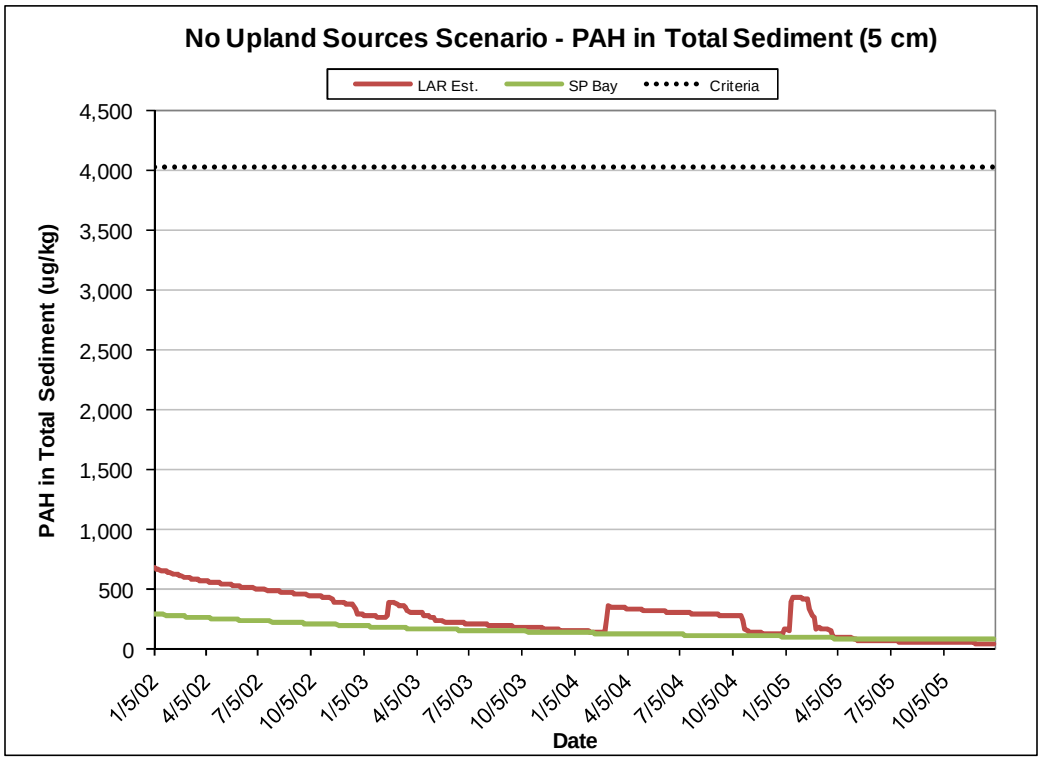

Figure 13. Sediment PAH concentrations for the no upland sources scenario (San Pedro Bay and LA River Estuary)

DDT

The maximum and average DDT sediment concentration exceeded criteria in all zones for both the base and no upland sources scenarios (Table 6). The percent difference in concentrations between the two scenarios shows that there appears to be minimal influence of loadings from upland sources. All waterbodies show approximately the same concentrations for the base and no upland sources scenarios. This indicates that DDT bed sediment contamination is predominantly a legacy issue and upland sources appear to be contributing loads of sediment that are cleaner than what is currently in bed sediments. Essentially, bed concentrations are well above the standards in each zone (for both scenarios), suggesting that sediment remediation is required in each zone to achieve sediment targets. The model shows that the combination of clean sediment deposition and the diffusion of legacy DDT contamination are causing bed sediment concentrations to gradually decrease over time. DDT is the most sensitive pollutant evaluated – ultimately, achieving sediment targets for DDT results in all other pollutants meeting their respective targets.

Table 6. Sediment DDT concentrations for the base and no upland sources scenarios

Zone	Waterbody Name	DDT (total) in top 5 cm of sediment (ug/kg)					
		Criteria: 1.58 ug/kg					
		Base Scenario Avg	Base Scenario Max	No Upland Sources Scenario Avg	No Upland Sources Scenario Max	% Diff Avg	% Diff Max
01	Dominguez Channel Estuary	21.85	66.16	20.38	66.16	6.70	0.00
02	Consolidated Slip	137.74	472.59	135.59	472.59	1.56	0.00
03	Inner Harbor – POLA	10.62	31.27	10.32	31.27	2.84	0.00
04	Fish Harbor	5.49	16.87	5.45	16.87	0.63	0.00
05	Cabrillo Marina	42.70	160.14	42.72	160.14	-0.05	0.00
06	Inner Cabrillo Beach Area	36.19	107.98	36.13	107.98	0.17	0.00
07	Outer Harbor – POLA	18.66	59.93	18.64	59.93	0.11	0.00
08	Inner Harbor – POLB	7.23	20.98	7.17	20.98	0.86	0.00
09	Outer Harbor – POLB	11.02	33.82	10.98	33.82	0.34	0.00
10	Los Angeles River Estuary	10.72	35.41	10.34	35.41	3.46	0.00
11	San Pedro Bay	10.77	34.30	10.62	34.30	1.36	0.00

Orange color indicates average zone concentration exceeds contaminant sediment criteria

PCBs

The maximum and average PCBs bed sediment concentrations exceeded criteria in all zones for both the base and no upland sources scenarios, except in Fish Harbor (zone 04) for which the average PCBs concentration met criteria (Table 7). The percent difference in concentrations between the two scenarios shows that there appears to be no or minimal loadings from upland sources. Similar to the DDT and PAHs results, PCBs concentrations were generally the same in both scenarios. This indicates that PCBs contamination is a legacy issue and upland sources appear to be contributing loads of sediment that are cleaner than what is currently in bed sediments. Similar to DDT, bed concentrations for both scenarios are well above the standards in each zone except for Fish Harbor (zone 04), suggesting that sediment remediation is required in most waterbodies to achieve sediment targets. The model shows that the combination of clean sediment deposition and the diffusion of legacy PCBs contamination are causing bed sediment concentrations to gradually decrease over time.

Table 7. Sediment PCBs concentrations for the base and no upland sources scenarios

Zone	Waterbody Name	PCBs (total) in top 5 cm of sediment (ug/kg)					
		Criteria: 3.20 ug/kg					
		Base Scenario Avg	Base Scenario Max	No Upland Sources Scenario Avg	No Upland Sources Scenario Max	% Diff Avg	% Diff Max
01	Dominguez Channel Estuary	23.26	72.89	22.62	72.89	2.74	0.00
02	Consolidated Slip	236.06	811.83	235.20	811.83	0.36	0.00
03	Inner Harbor – POLA	15.07	45.92	14.88	45.92	1.20	0.00
04	Fish Harbor	2.46	7.26	2.41	7.26	1.92	0.00
05	Cabrillo Marina	27.18	99.47	27.19	99.47	-0.02	0.00
06	Inner Cabrillo Beach Area	11.41	34.49	11.37	34.49	0.34	0.00
07	Outer Harbor – POLA	26.92	85.98	26.90	85.98	0.09	0.00
08	Inner Harbor – POLB	8.45	23.76	8.37	23.76	0.90	0.00
09	Outer Harbor – POLB	10.57	33.71	10.49	33.71	0.78	0.00
10	Los Angeles River Estuary	18.61	55.06	17.58	55.06	5.51	0.00
11	San Pedro Bay	5.81	17.62	5.46	17.62	6.04	0.00

Orange color indicates average zone concentration exceeds contaminant sediment criteria

References

Tetra Tech, Inc. 2011. Los Angeles-Long Beach Harbors and San Pedro Bay Hydrodynamic and Sediment-Contaminant Transport Model Calibration. Prepared for US EPA Region 9 and Los Angeles Regional Water Quality Control Board. May 2011. Fairfax, VA., 73 pp. (note: included as Appendix I to TMDL report)

Appendix III.9 – SQO Sediment Triad Results

Contents

Appendix III.9 Summary

Using available sediment triad results (Bight 98, 03; WEMAP 99,05; BioBaseline 2008; see map in Figure III.4-3), staff performed an assessment for each waterbody using the SQO Part I-Direct Effects methodology. An exceedance of SQO Part I was considered for Possibly Impacted, Likely Impacted or Clearly Impacted at each station. Following the CA Listing Policy procedures outlined in Table 3-2 of that document, two or more exceedances per waterbody was interpreted as impaired. These assessment results confirmed impairment within two estuaries and marine waters identified in Table 2-18.

Table III.9-1. Sediment Triad Results Using Multiple Lines of Evidence

Study ID	Station ID	Waterbody Name	TOX LOE5	Chem LOE5	Benthic LOE5	MLOE Final5	MultiCondition5
Bight '03	4852	Dominguez Channel	1	2	3	2	Likely unimpacted
Bight '03	5108	Dominguez Channel	1	3	3	3	Possibly impacted
Bight '03	4206	Dominguez Channel	4	4	3	5	Clearly impacted
Bight '03	4270	Dominguez Channel	4	4	4	5	Clearly impacted
Bight '03	4436	Dominguez Channel	4	4	4	5	Clearly impacted
Bight '03	5012	Dominguez Channel	1	4	3	4	Likely impacted
WEMAP99	CA99-0032	Dominguez Channel	4	4	4	5	Clearly impacted
							Impaired (6 of 7 exceed SQO)
Biobaseline 2008	LA-14	Consolidated Slip	3	4	4	5	Clearly impacted
Bight '03	BRI-05	Consolidated Slip	4	3	2	3	Possibly impacted
							Impaired (2 of 2 exceed SQO)
Bight '03	BRI-03	Fish Harbor	3	4	2	4	Likely impacted
Bight '98	2174	Fish Harbor	1	3	2	1	Unimpacted
							(1 of 2 exceed SQO)
Bight '03	4138	Cabrillo Marina	4	4	2	4	Likely impacted
Biobaseline 2008	LA-12	Cabrillo Marina	2	3	2	3	Possibly impacted
							Impaired (2 of 2 exceed SQO)
Biobaseline 2008	LA-12	Inner Harbor	2	3	2	3	Possibly impacted
Biobaseline 2008	LA-14	Inner Harbor	3	4	4	5	Clearly impacted
Biobaseline 2008	LA-04	Inner Harbor	2	2	2	2	Likely unimpacted
Biobaseline 2008	LA-05	Inner Harbor	2	2	2	2	Likely unimpacted
Biobaseline 2008	LA-06	Inner Harbor	1	2	2	1	Unimpacted
Biobaseline 2008	LA-07	Inner Harbor	2	2	2	2	Likely unimpacted
Biobaseline 2008	LA-08	Inner Harbor	2	3	3	4	Likely impacted
Biobaseline 2008	LA-09	Inner Harbor	1	2	2	1	Unimpacted
Biobaseline 2008	LA-10	Inner Harbor	1	2	2	1	Unimpacted
Biobaseline 2008	LA-13	Inner Harbor	2	3	2	3	Possibly impacted
Biobaseline 2008	LA-15	Inner Harbor	2	2	2	2	Likely unimpacted
Biobaseline 2008	LB-03	Inner Harbor	2	3	2	3	Possibly impacted
Biobaseline 2008	LB-04	Inner Harbor	1	3	2	1	Unimpacted
Biobaseline 2008	LB-05	Inner Harbor	1	2	2	1	Unimpacted
Biobaseline 2008	LB-06	Inner Harbor	2	3	2	3	Possibly impacted
Biobaseline 2008	LB-07	Inner Harbor	1	3	2	1	Unimpacted
Biobaseline 2008	LB-10	Inner Harbor	1	3	2	1	Unimpacted
Biobaseline 2008	LB-11	Inner Harbor	1	3	2	1	Unimpacted
Biobaseline 2008	LB-12	Inner Harbor	1	3	2	1	Unimpacted
Biobaseline 2008	LB-13	Inner Harbor	1	3	2	1	Unimpacted

Study ID	Station ID	Waterbody Name	TOX LOE5	Chem LOE5	Benthic LOE5	MLOE Final5	MultiCondition5
Biobaseline 2008	LB-14	Inner Harbor	2	3	2	3	Possibly impacted
WEMAP05	CAS05-0015	Inner Harbor	2	2	2	2	Likely unimpacted
Bight '03	4146	Inner Harbor	1	1	1	1	Unimpacted
Bight '03	4050	Inner Harbor	1	2	2	1	Unimpacted
Bight '03	4210	Inner Harbor	1	2	2	1	Unimpacted
Bight '03	4266	Inner Harbor	1	3	2	1	Unimpacted
Bight '03	4010	Inner Harbor	3	4	3	5	Clearly impacted
WEMAP99	CA99-0033	Inner Harbor	1	2	1	1	Unimpacted
WEMAP99	CA99-0036	Inner Harbor	3	2	2	3	Possibly impacted
Bight '98	2176	Inner Harbor	3	2	3	4	Likely impacted
Bight '98	2177	Inner Harbor	3	2	4	4	Likely impacted
Bight '98	2182	Inner Harbor	2	2	4	3	Possibly impacted
Bight '98	2172	Inner Harbor	2	3	2	3	Possibly impacted
Bight '98	2173	Inner Harbor	2	3	2	3	Possibly impacted
Bight '98	2178	Inner Harbor	2	3	2	3	Possibly impacted
Bight '98	2421	Inner Harbor	2	3	2	3	Possibly impacted
Bight '98	2431	Inner Harbor	1	3	2	1	Unimpacted
Bight '98	2432	Inner Harbor	1	3	3	3	Possibly impacted
Bight '98	2169	Inner Harbor	3	4	3	5	Clearly impacted
Bight '98	2170	Inner Harbor	4	4	2	4	Likely impacted
Bight '98	2184	Inner Harbor	1	4	2	2	Likely unimpacted
Bight '98	2430	Inner Harbor	3	4	2	4	Likely impacted
							Impaired (20 of 40 exceed SQO)
Biobaseline 2008	LA-01	Outer Harbor	2	3	2	3	Possibly impacted
Biobaseline 2008	LA-02	Outer Harbor	2	3	2	3	Possibly impacted
Biobaseline 2008	LA-03	Outer Harbor	2	2	2	2	Likely unimpacted
Biobaseline 2008	LA-11	Outer Harbor	2	3	2	3	Possibly impacted
Biobaseline 2008	LB-01	Outer Harbor	1	2	2	1	Unimpacted
Biobaseline 2008	LB-02	Outer Harbor	1	2	1	1	Unimpacted
Biobaseline 2008	LB-09	Outer Harbor	1	2	2	1	Unimpacted
WEMAP05	CAS05-0007	Outer Harbor	1	2	2	1	Unimpacted
Bight '03	4162	Outer Harbor	1	2	1	1	Unimpacted
Bight '03	4242	Outer Harbor	1	2	1	1	Unimpacted
Bight '03	4400	Outer Harbor	3	2	2	3	Possibly impacted
Bight '03	4178	Outer Harbor	3	3	1	2	Likely unimpacted
Bight '03	4306	Outer Harbor	4	3	2	3	Possibly impacted
Bight '03	4370	Outer Harbor	3	3	2	3	Possibly impacted
WEMAP99	CA99-0038	Outer Harbor	1	1	1	1	Unimpacted
WEMAP99	CA99-0039	Outer Harbor	2	2	2	2	Likely unimpacted
Bight '98	2426	Outer Harbor	1	1	2	1	Unimpacted
Bight '98	2158	Outer Harbor	1	2	1	1	Unimpacted
Bight '98	2159	Outer Harbor	3	2	1	2	Likely unimpacted
Bight '98	2185	Outer Harbor	2	2	2	2	Likely unimpacted
Bight '98	2186	Outer Harbor	1	2	1	1	Unimpacted
Bight '98	2187	Outer Harbor	1	2	1	1	Unimpacted
Bight '98	2428	Outer Harbor	3	2	3	4	Likely impacted
Bight '98	2160	Outer Harbor	2	3	2	3	Possibly impacted

Study ID	Station ID	Waterbody Name	TOX LOE5	Chem LOE5	Benthic LOE5	MLOE Final5	MultiCondition5
Bight '98	2161	Outer Harbor	2	3	1	2	Likely unimpacted
Bight '98	2162	Outer Harbor	1	3	4	3	Possibly impacted
Bight '98	2168	Outer Harbor	3	3	2	3	Possibly impacted
Bight '98	2175	Outer Harbor	1	3	1	1	Unimpacted
Bight '98	2179	Outer Harbor	3	3	2	3	Possibly impacted
Bight '98	2427	Outer Harbor	4	3	2	3	Possibly impacted
							Impaired (12 of 30 exceed SQO)
Biobaseline 2008	LB-08	San Pedro Bay	1	2	2	1	Unimpacted
WEMAP05	CAS05-0014	San Pedro Bay	1	1	3	2	Likely unimpacted
WEMAP05	CAS05-0006	San Pedro Bay	1	2	1	1	Unimpacted
WEMAP05	CAS05-0013	San Pedro Bay	2	3	3	4	Likely impacted
Bight '03	4098	San Pedro Bay	3	3	1	2	Likely unimpacted
Bight '03	4274	San Pedro Bay	1	3	1	1	Unimpacted
WEMAP99	CA99-0034	San Pedro Bay	2	2	2	2	Likely unimpacted
WEMAP99	CA99-0037	San Pedro Bay	1	2	1	1	Unimpacted
WEMAP99	CA99-0035	San Pedro Bay	3	3	2	3	Possibly impacted
Bight '98	2153	San Pedro Bay	1	1	1	1	Unimpacted
Bight '98	2152	San Pedro Bay	1	2	1	1	Unimpacted
Bight '98	2154	San Pedro Bay	1	2	2	1	Unimpacted
Bight '98	2157	San Pedro Bay	3	2	2	3	Possibly impacted
Bight '98	2155	San Pedro Bay	2	3	2	3	Possibly impacted
Bight '98	2163	San Pedro Bay	2	3	1	2	Likely unimpacted
Bight '98	2167	San Pedro Bay	2	3	2	3	Possibly impacted
Bight '98	2156	San Pedro Bay	2	4	2	3	Possibly impacted
							Impaired (6 of 17 exceed SQO)
Bight '03	4142	LAR Estuary	1	2	4	2	Likely unimpacted
Bight '03	4440	LAR Estuary	3	2	2	3	Possibly impacted
Bight '03	4856	LAR Estuary	1	2	3	2	Likely unimpacted
Bight '03	4788	LAR Estuary	1	3	4	3	Possibly impacted
Bight '03	4600	LAR Estuary	3	4	3	5	Clearly impacted
							Impaired (3 of 5 exceed SQO)
Bight '03	4002	SGR Estuary	1	1	3	2	Likely unimpacted
Bight '03	4034	SGR Estuary	1	1	2	1	Unimpacted
Bight '03	4194	SGR Estuary	1	1	3	2	Likely unimpacted
Bight '03	4258	SGR Estuary	1	1	3	2	Likely unimpacted
Bight '03	4322	SGR Estuary	1	1	3	2	Likely unimpacted
Bight '03	4520	SGR Estuary	1	1	3	2	Likely unimpacted
							Likely unimpacted