Amendment to the Water Quality Control Plan – Los Angeles Region to incorporate the Marina del Rey Harbor Toxic Pollutants TMDL

Adopted by the California Regional Water Quality Control Board, Los Angeles Region on October 6, 2005 and revised on [Insert Date].

Amendments:

Chapter 7. Total Maximum Daily Loads (TMDLs) Summaries, Section 7-18 (Marina del Rey Harbor Toxic Pollutants TMDL)

This TMDL was adopted by the Regional Water Quality Control Board on October 6, 2005.

This TMDL was approved by:

The State Water Resources Control Board on January 13, 2006.
The Office of Administrative Law on March 13, 2006.
The U.S. Environmental Protection Agency on March 13, 2006.

This TMDL was revised by the Regional Water Quality Control Board on [Insert Date].

This revised TMDL was approved by:

The State Water Resources Control Board on [Insert Date].
The Office of Administrative Law on [Insert Date].
The U.S. Environmental Protection Agency on [Insert Date].

The following tables include the elements of this TMDL.

Table 7-18.1. Marina del Rey Harbor Toxic Pollutants TMDL: Elements

Element	Key Findings and Regulatory Provisions
Problem Statement	Marina del Rey Harbor is on the Clean Water Act Section 303(d) list of impaired waterbodies for chlordane, copper, lead, zinc, PCBs, DDT, dieldrin, sediment toxicity and a fish consumption advisory. Review of available data during the development of this TMDL indicated that dieldrin is no longer a cause of impairment, and that there is a dissolved copper impairment in the water column as well as in the sediment. The following designated beneficial uses are impaired by chlordane, copper, lead, zinc, PCBs, DDT, and sediment toxicity: water contact recreation (REC1); marine habitat (MAR); wildlife habitat (WILD); commercial and sport fishing (COMM); and shellfish harvesting (SHELL).
Numeric Target *(Interpretation of the narrative and numeric water quality objective, used to calculate the allocations)*	**Numeric Targets for Sediment** Sediment targets were established based on the narrative objectives of this Basin Plan, the State's Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (EBE Plan Part 1), the sediment quality guidelines compiled by the National Oceanic and Atmospheric Administration (NOAA), and associated sediments targets required to achieve fish tissue targets. The EBE Plan Part 1 includes sediment objectives to protect aquatic life (direct effects) and human health (indirect effects of sediment contamination in fish tissue), and the lower objective is used as the numeric target. The NOAA Effects Range-Low (ERLs) guidelines are established as the numeric targets for copper, lead, zinc, chlordane, Total DDTs, and p,p'-DDE in sediments in Marina del Rey Harbor. The numeric target for total PCBs in sediment is selected to protect humans from consumption of contaminated fish tissue and is based on the fish tissue target and the food web bioaccumulation model developed by Gobas and Arnot (2010)[1]. **Numeric Targets for Metals in Sediment (mg/kg)** Copper: 34 | Lead: 46.7 | Zinc: 150 **Numeric Targets for Organic Compounds in Sediment (µg/kg)** Chlordane: 0.5 | Total PCBs: 3.2 | Total DDTs: 1.58 | p,p'-DDE: 2.2 In addition to the above numeric sediment targets, the categories designated in the EBE Plan Part 1 as Unimpacted and Likely Unimpacted by the interpretation and integration of multiple lines of evidence shall be considered as the protective narrative objective for sediment toxicity and benthic community effects. The thresholds established in the EBE Plan Part 1 are based on statistical significance

[1] Gobas F. A.P.C. and J.A. Arnot. 2010. Food web bioaccumulation model for polychlorinated biphenyls in San Francisco Bay, California, USA. *Environmental Toxicology and Chemistry* 23(6): 1385-1395.

Element	Key Findings and Regulatory Provisions
	and magnitude of the effect. Therefore, this TMDL implicitly includes sediment toxicity and benthic community targets by its application of the EBE Plan Part 1. **Numeric Targets for Water Column and Fish Tissue** In addition to the sediment numeric targets, water column and fish tissue targets are set to address the PCB impairment in fish tissue and a water column target is set to address the dissolved copper impairment. The California Toxics Rule (CTR) criterion for the protection of human health from the consumption of aquatic organisms is selected as the final numeric target for total PCBs in the water column. **Final Target for total PCBs in the Water Column:** 0.00017 μg/L The numeric target for PCBs in fish tissue is the Office of Environmental Health Hazard Assessment (OEHHA) Fish Contaminant Goal (FCG). **Numeric Target for total PCBs in Fish Tissue:** 3.6 μg/Kg The numeric targets for copper in the water column are set equal to the CTR saltwater copper criteria for the protection of aquatic life. **Numeric Targets for Dissolved Copper in the Water Column:** Acute (single sample maximum): 4.8 μg/L Chronic (four-day average): 3.1 μg/L
Source Analysis	Urban storm water has been recognized as a substantial source of metals. Numerous researchers have documented that the most prevalent metals in urban storm water (i.e., copper, lead, and zinc) are consistently associated with suspended solids. Because metals are typically associated with fine particles in storm water runoff, they have the potential to accumulate in marine sediments where they may pose a risk of toxicity. Similar to metals, the majority of organic constituents in storm water are associated with particulates. Once the particles accumulate in the sediments in the harbor, the sediments themselves can become a source through sediment re-suspension and are thus assigned load allocations. Copper-based anti-fouling paints are recognized as substantial sources of dissolved copper to the water column. Site-specific modeling supports the conclusion that copper-based anti-fouling paints are the primary source of dissolved copper to the water column and a major contributor to the copper impairment in the water column. The contribution from passive leaching to the water column impairment was modeled and shown to contribute 94% of the copper loading from anti-fouling hull paint. The remaining 6% of the impairment results from hull cleaning activities. Copper-based anti-fouling paints are also a potential source of copper to the sediments. Addressing the copper impairment in the water column should consequently address the contribution of this source to the sediment impairment.

<table>
<tr><th>Element</th><th>Key Findings and Regulatory Provisions</th></tr>
<tr><td></td><td>Direct deposition of airborne particles to the water surface may be responsible for contributing copper, lead, zinc, chlordane, PCBs, and DDTs to Marina del Rey Harbor. The estimated contribution from this source is minor. Indirect atmospheric deposition reflects the process by which metals and organic compounds deposited on the land surface may be washed off during storm events and delivered to Marina del Rey Harbor. The loading of metals and organic compounds associated with indirect atmospheric deposition is accounted for in the storm water runoff.</td></tr>
<tr><td>Loading Capacity</td><td>TMDLs are developed for copper, lead, zinc, chlordane, DDTs, and PCBs within the sediments of Marina del Rey Harbor.

The loading capacity for Marina del Rey Harbor is calculated by multiplying the numeric targets by the average annual total suspended solids (TSS) loading to the harbor sediment. The average annual TSS discharged to the harbor is 84,612 kilograms per year (kg/yr). The TMDL is set equal to the loading capacity.

<u>Metals Loading Capacity (kilograms/year)</u>
<table><tr><th>Copper</th><th>Lead</th><th>Zinc</th></tr><tr><td>2.88</td><td>3.95</td><td>12.69</td></tr></table>
<u>Organics Loading Capacity (grams/year)</u>
<table><tr><th>Chlordane</th><th>Total PCBs</th><th>Total DDTs</th><th>p,p’-DDE</th></tr><tr><td>0.04</td><td>1.92</td><td>0.13</td><td>0.19</td></tr></table>
A TMDL is also developed for dissolved copper in the water column. Based on modeling results, the loading capacity for copper in the water column is 557 kg/yr.</td></tr>
<tr><td>Load Allocations (for nonpoint sources)</td><td>Load allocations (LA) are developed for nonpoint sources in Marina del Rey Harbor. Non-point sources of the sediment impairment include direct atmospheric deposition and internal sources from the harbor sediments. Non-point sources of the water column copper impairment include the discharge of dissolved copper from boat hulls through passive leaching and hull cleaning.

LAs for Sediment Impairments

The load allocations for atmospheric deposition are not assigned to a particular nonpoint source or group of nonpoint sources. The mass-based load allocation for direct atmospheric deposition is equal to the percentage of the watershed covered by water (11.7%) multiplied by the total loading capacity.

<u>Metals Load Allocations for Direct Atmospheric Deposition (kg/yr)</u>
<table><tr><th>Copper</th><th>Lead</th><th>Zinc</th></tr></table></td></tr>
</table>

Element	Key Findings and Regulatory Provisions
	0.34 0.46 1.49 **Organics Load Allocations for Direct Atmospheric Deposition(g/yr)** Chlordane Total PCBs Total DDTs p,p'-DDE 0.005 0.225 0.016 0.022 The in-harbor LAs for concentrations in sediment are set equal to the numeric targets. **Load Allocations for Metals in Sediment (mg/kg)** Copper Lead Zinc 34 46.7 150 **Load Allocations for Organic Compounds in Sediment (µg/kg)** Chlordane Total PCBs Total DDTs p,p'-DDE 0.5 3.2 1.58 2.2 **LAs for Copper Water Column Impairment** The LAs for discharges of dissolved copper from boats is an 85% reduction in the baseline copper load from boats of 3609 kg/yr. Compliance with the load allocations may be demonstrated by any one of three means: a. Meeting numeric targets in the water column, or b. Demonstrating that 85% of boats in the harbor are using copper free hull paints, or c. Another acceptable means of demonstrating compliance as approved by the Executive Officer of the Regional Board that would result in attainment of copper numeric targets in the water column (e.g. demonstrating that 100% of boats in the harbor are using hull paint that discharges 85% less copper than the baseline load).
Waste Load Allocations *(for point sources)*	Waste load allocations (WLA) are assigned to point sources for the Marina del Rey watershed. A grouped mass-based waste load allocation is developed for the storm water permittees (Los Angeles County MS4, Caltrans, General Construction and General Industrial) by subtracting the load allocations from the total loading capacity. Concentration-based waste load allocations are developed for other point sources in the watershed. **Metals Waste Load Allocations for Storm Water (kg/yr)** Copper Lead Zinc 2.54 3.49 11.20 **Organics Waste Load Allocations for Storm Water (g/yr)** Chlordane Total PCBs Total DDT p,p'-DDE 0.04 1.70 0.12 0.16

Element	Key Findings and Regulatory Provisions
	The storm water waste load allocations are apportioned between the MS4 permittees, Caltrans, the general construction and the general industrial storm water permittees based on an estimate of the percentage of land area covered under each permit.

~~**Metals Storm Water WLAs Apportioned between Permitees (kg/yr)**~~

	~~Copper~~	~~Lead~~	~~Zinc~~
~~MS4 Permittees~~	~~1.96~~	~~2.69~~	~~8.64~~
~~Caltrans~~	~~0.032~~	~~0.04~~	~~0.14~~
~~General Construction~~	~~0.20~~	~~0.28~~	~~0.89~~
~~General Industrial~~	~~0.010~~	~~0.014~~	~~0.046~~

Metals Storm Water WLAs Apportioned between Permittees (kg/yr)

	Copper	Lead	Zinc
MS4 Permittees	2.26	3.10	9.96
Caltrans	0.036	0.05	0.16
General Construction	0.23	0.32	1.02
General Industrial	0.012	0.016	0.053

~~**Organics Storm Water WLAs Apportioned between Permitees (g/yr)**~~

	~~Chlordane~~	~~Total PCBs~~	~~Total DDT~~	~~p'p-DDE~~
~~MS4 Permittees~~	~~0.0288~~	~~1.31~~	~~0.091~~	~~0.13~~
~~Caltrans~~	~~0.0005~~	~~0.021~~	~~0.0015~~	~~0.0020~~
~~General Construction~~	~~0.0030~~	~~0.13~~	~~0.0094~~	~~0.013~~
~~General Industrial~~	~~0.0002~~	~~0.0069~~	~~0.0005~~	~~0.0007~~

Organics Storm Water WLAs Apportioned between Permittees (g/yr)

	Chlordane	Total PCBs	Total DDT	p'p-DDE
MS4 Permittees	0.0332	1.51	0.10	0.15
Caltrans	0.0005	0.024	0.0017	0.0024
General Construction	0.0034	0.16	0.011	0.015
General Industrial	0.0002	0.0080	0.0006	0.0008

Each storm water permittee enrolled under the general construction or industrial storm water permits will receive an individual waste load allocation on a per acre basis, based on the acreage of their facility.

~~**Metals per Acre WLAs for Individual General Construction or Industrial Storm Water Permittees (g/yr/ac)**~~

~~Copper~~	~~Lead~~	~~Zinc~~
~~1.7~~	~~2.3~~	~~7.3~~

Metals per Acre WLAs for Individual General Construction or Industrial Storm Water Permittees (g/yr/ac)

Element	Key Findings and Regulatory Provisions
	Copper 1.9 Lead 2.6 Zinc 8.5 ~~**Organics per acre WLAs for Individual General Construction or Industrial Storm Water Permittees (mg/yr/ac)**~~ ~~Chlordane 0.02 Total PCBs 1.1 Total DDTs 0.08 p,p'-DDE 0.11~~ **Organics per acre WLAs for Individual General Construction or Industrial Storm Water Permittees (mg/yr/ac)** Chlordane 0.03 Total PCBs 1.3 Total DDTs 0.09 p,p'-DDE 0.12 Concentration-based waste load allocations are assigned to the minor NPDES permits and general non-storm water NPDES permits that discharge to Marina del Rey Harbor. Any future minor NPDES permits or enrollees under a general non-storm water NPDES permit will also be subject to the concentration-based waste load allocations. **Metals Concentration-based Waste Load Allocations (mg/kg)** Copper 34 Lead 46.7 Zinc 150 **Organic Concentration-based Waste Load Allocations (µg/kg)** Chlordane 0.5 Total PCBs 3.2 Total DDTs 1.58 p,p'-DDE 2.2
Margin of Safety	An implicit margin of safety is applied through the use of the more protective numeric targets, including the ERL sediment quality guideline values and Fish Contaminant Goal fish tissue value for PCBs. An implicit margin of safety is included by virtue of the selection of multiple numeric targets, including targets for water, sediment and fish tissue, and the use of multiple lines of evidence (benthic community, sediment chemistry, and sediment toxicity) required by the EBE Plan Part 1. Conservative modeling assumptions provide a margin of safety in addressing copper in the water column.
Implementation	Compliance with the TMDL shall be determined through water, sediment, and fish tissue monitoring. Compliance with the sediment TMDLs for metals, chlordane, total DDTs, and p,p'-DDE shall be based on achieving the LAs and WLAs or, alternatively, demonstrating attainment of the Sediment Quality

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	Objectives in the EBE Plan Part 1 through the sediment triad/multiple lines of evidence approach outlined therein. Compliance with the TMDL for total PCBs shall be based on achieving the LAs or WLAs, the PCB fish tissue related sediment target, or, alternatively, by meeting fish tissue targets. If monitoring data or special studies indicate that load and waste load allocations will be attained, but fish tissue targets may not be achieved, the Regional Board shall reconsider the TMDL to modify the waste load and load allocations to ensure that the fish tissue targets are attained. The regulatory mechanisms used to implement the TMDL will include the Los Angeles County Municipal Separate Storm Sewer System (MS4) NPDES Permit, the State of California Department of Transportation (Caltrans) Storm Water Permit, minor NPDES permits, general NPDES permits, general industrial storm water NPDES permits, and general construction storm water NPDES permits. Nonpoint sources will be regulated through the authority contained in sections 13263 and 13269 of the Water Code, in conformance with the State Water Resources Control Board's Nonpoint Source Implementation and Enforcement Policy (May 2004). The NPDES permit for each point source assigned a WLA shall be reopened or amended at re-issuance, in accordance with applicable laws, to incorporate the applicable WLAs as a permit requirement. Table 7-18.2 presents the implementation schedule for the responsible entities. **Minor NPDES Permits and General Non-Storm Water NPDES Permits:** The concentration-based waste load allocations for the minor NPDES permittees and general non-storm water NPDES permittees will be implemented as permit limits. Permit writers may translate applicable waste load allocations into effluent limits for the minor and general NPDES permits by applying the effluent limitation procedures in Section 1.4 of the State Water Resources Control Board's Policy for Implementation of Toxic Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California or applying other applicable methodologies authorized under federal regulations. The minor and currently enrolled general non-storm water NPDES permittees are allowed up to March 22, 2016 to achieve the waste load allocations. **General Industrial and Construction Storm Water Permits:** Waste load allocations will be incorporated into the State Board general permits or into watershed specific permits developed by the Regional Board. General construction permittees must attain WLAs by March 22, 2016. General industrial permittees must attain WLAs by March 22, 2016. Permittees may demonstrate compliance with WLAs in one of two

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	ways. First, general industrial and construction storm water permittees may be deemed in compliance with permit limitations if they demonstrate that there are no exceedances of the permit limitations at their discharge points or outfalls. Second, if permittees provide a quantitative demonstration, similar to the "reasonable assurance analysis" required by the recently adopted Los Angeles County MS4 Permit (Order No. R4-2012-0175), that control measures and best management practices (BMPs) will achieve WLAs consistent with the schedule in Table 7-18.2, then compliance may be demonstrated by implementation of those control measures and BMPs, subject to Executive Officer approval. **MS4 and Caltrans Storm Water Permits:** The County of Los Angeles, County of Los Angeles Flood Control District, City of Los Angeles, and Culver City are jointly responsible for meeting the mass-based waste load allocations assigned to the MS4 permittees. Caltrans is responsible for meeting its mass-based waste load allocations, however, it may choose to work with the other MS4 permittees. Compliance with the sediment WLAs for Cu, Pb, Zn, Chlordane, p'p-DDE and total DDT may be demonstrated via any one of three different means: a. The qualitative sediment condition of Unimpacted or Likely Unimpacted via the interpretation and integration of multiple lines of evidence as defined in the EBE Plan Part 1, is met. b. Sediment numeric targets are met in bed sediments**.** c. Final sediment WLAs, as presented above, are met. Compliance with the sediment WLAs for PCBs may be demonstrated via any of four different means: a. Fish tissue targets are met in species resident to the waterbody. b. Final sediment allocations, as presented above, are met. c. Sediment numeric targets to protect fish tissue are met in bed sediments. d. Demonstrate that the sediment quality condition protective of fish tissue is achieved per the Statewide Enclosed Bays and Estuaries Plan, as amended to address contaminants in resident finfish and wildlife. Each municipality and permittee will be required to meet the waste load allocations. If permittees provide a quantitative demonstration as part of a watershed management program similar to the "reasonable assurance analysis" required by the recently adopted Los Angeles County MS4 Permit (Order No. R4-2012-0175) that control measures and BMPs will achieve WLAs consistent with the schedule in Table 7-18.2, then compliance with permit water quality based effluent limitations (WQBELs) may be demonstrated by implementation of

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	those control measures and BMPs, subject to Executive Officer approval. A phased implementation approach, using a combination of non-structural and structural BMPs may be used to achieve compliance with the waste load allocations. The administrative record and the fact sheets for the MS4 and Caltrans storm water permits must provide reasonable assurance that the BMPs selected will be sufficient to implement the numeric waste load allocations. The quantitative demonstration must include an estimate of the reductions to be achieved by each BMP and sufficient monitoring must be conducted to verify that the necessary reductions are achieved. The permits must also provide a mechanism to adjust the required BMPs as necessary to ensure their adequate performance. The implementation schedule for the MS4 and Caltrans permittees consists of a phased approach, with compliance to be achieved in prescribed percentages of the watershed or as a reduction from the baseline loading, with total compliance to be achieved by March 22, 2018. **Load Allocations for In-Harbor Sediments** The County of Los Angeles is the responsible party for the load allocations assigned to in-harbor sediments. Load allocations shall be implemented through the following: (1) Memorandum of Agreement (MOA), or (2) Cleanup and Abatement Order or other regulatory order The County of Los Angeles shall be allowed one year from the effective date of the TMDL reconsideration to enter into a MOA with the Regional Board, detailing the voluntary efforts that will be undertaken to attain the load allocations. The MOA shall include development of a contaminated sediment management plan. The MOA shall comply with the Water Quality Control Policy for Addressing Impaired Waters: Regulatory Structure and Options ("Policy"), including part II, section 2.c.ii. and related provisions, and shall be consistent with the requirements of this TMDL. If the MOA is timely adopted, and so long as it is implemented, the program described in the MOA shall be deemed "certified", pursuant to the Policy, subject to the conditions of section 2.e. of the Policy. The MOA must be approved by the Executive Officer, and may be amended with Executive Officer approval, as necessary. If an MOA is not established within one year or if the responsible party does not comply with the terms of the MOA, a cleanup and abatement order pursuant to California Water Code section 13304 or another appropriate regulatory order shall be issued to implement the load allocations. The MOA shall contain interim deliverables so that compliance can be assessed throughout implementation of the MOA and prior to the final sediment remediation deadline. **Load Allocations for Discharges of Dissolved Copper**

Element	Key Findings and Regulatory Provisions
	The responsible parties for the load allocations assigned to discharges of dissolved copper from boats are the County of Los Angeles, individual anchorages, and persons owning boats moored in the Marina. The Regional Board has the authority to implement LAs through waste discharge requirements (WDRs), conditional waivers of WDRs, or other regulatory mechanisms in accordance with the Nonpoint Source Implementation and Enforcement Policy. The Regional Board will develop a regulatory mechanism(s) to implement the LAs within two years of the effective date of the TMDL. Should a voluntary program be developed by responsible parties and approved by the Executive Officer within two years of the effective date of the TMDL, such a program may be reflected in the regulatory mechanism. Compliance with the load allocations may be demonstrated by any one of three means: a. Meeting numeric targets in the water column, or b. Demonstrating that 85% of boats in the harbor are using copper free hull paints, or c. Another acceptable means of demonstrating compliance as approved by the Executive Officer of the Regional Board that would result in attainment of copper numeric targets in the water column (e.g. demonstrating that 100% of boats in the harbor are using hull paint that discharges 85% less copper than the baseline load). **Reconsideration of TMDL** The TMDL may be reconsidered to revise the implementation schedule in order to ensure that pollutant sources are controlled and a suitable location for contaminated sediment disposal is available prior to remediation of contaminated sediments if the County has made a good faith effort to plan, fund, and permit sediment remediation activities.
Seasonal Variations and Critical Conditions	There is a high degree of inter- and intra-annual variability in total suspended solids discharged to Marina del Rey Harbor. This is a function of the storms, which are highly variable between years. The TMDL is based on a TSS load derived from long-term average rainfall over a 52-year period from 1948 to 2000. This time period contains a wide range of storm conditions and drain discharges to Marina del Rey Harbor. Use of the average condition for the TMDL is appropriate because issues of sediment effects on benthic communities and potential for bioaccumulation to higher trophic levels occurs over long time periods.
Monitoring	Monitoring will be required to assess the on-going condition of Marina del Rey Harbor and to assess attainment of WLAs and LAs assigned to dischargers and responsible parties in the Marina del Rey Watershed. Special studies may also be appropriate to provide further information about new data, new or alternative sources, and revised scientific assumptions. Below the Regional Board identifies the various goals of monitoring efforts and studies that shall be developed in a coordinated manner. The programs, reports, and studies will be included as requirements in subsequent permits or other orders issued by the

Element	Key Findings and Regulatory Provisions
	Executive Officer. **MS4 and Caltrans Monitoring** MS4 permittees and Caltrans are jointly responsible for TMDL monitoring. Discharge water quality samples shall be collected during wet weather, and shall be analyzed for total dissolved solids, settleable solids and total suspended solids. Sampling shall be designed to collect sufficient volumes of settleable and suspended solids to allow for analysis of copper, lead, zinc, chlordane, total PCBs, total DDTs, p,p'-DDE, and total organic carbon in the sediment. Receiving water quality samples shall be collected monthly in accordance with an approved TMDL coordinated monitoring plan, or integrated monitoring program or coordinated integrated monitoring program under the Los Angeles County MS4 Permit, and analyzed for total PCBs at detection limits that are at or below the minimum levels. The minimum levels are those published by the State Water Resources Control Board in Appendix 4 of the Policy for the Implementation of Toxic Standards for Inland Surface Water, Enclosed Bays, and Estuaries of California, March 2, 2000. Special emphasis should be placed on achieving detection limits that will allow evaluation relative to the CTR standards. Receiving water quality samples shall also be collected monthly and analyzed for copper. For metals water column analysis, methods that allow for (1) the removal of salt matrix to reduce interference and avoid inaccurate results prior to the analysis; and (2) the use of trace metal clean sampling techniques, should be applied. Examples of such methods include EPA Method 1669 for sample collection and handling, and EPA Method 1640 for sample preparation and analysis. Sediment quality objective evaluation as detailed in the EBE Plan Part 1 (sediment triad sampling) shall be performed every five years beginning in 2008. Sampling and analysis for the full chemical suite, two toxicity tests and four benthic indices as specified in the EBE Plan Part 1 shall be conducted and evaluated. In addition, one of the toxicity tests shall be a 10-day mortality test with *Leptocheirus plumulosus* as previous investigations in Marina del Rey Harbor have shown toxicity to this organism. Locations for sediment triad assessment and the methodology for combining results from sampling locations to determine sediment conditions shall be specified in the CMP to be approved by the Executive Officer. The sampling design shall be in compliance with the EBE Plan Part 1 Sediment Monitoring section (VII.E). A stressor identification is required by the EBE Plan Part 1 (VII.F) if sediments fail to meet SQOs. Based on the fact that the failure to meet

Element	Key Findings and Regulatory Provisions
	SQOs has been documented, the MS4 and Caltrans permittees shall conduct a stressor identification in Marina del Rey Harbor and submit a report detailing the results of the stressor identification by December 15, 2016. Sediment chemistry and toxicity samples shall also be collected annually (in addition to, and in between, the sediment triad sampling events as described above) to evaluate trends in general sediment quality constituents (total organic carbon, grain size) and listed constituents (copper, lead, zinc, chlordane, PCBs, Total DDTs, and p,p'-DDE) relative to sediment quality targets. Monitoring of fish and mussel tissue within the Harbor shall be conducted annually for total PCBs, chlordane and Total DDTs. The permittees are required to submit for approval of the Executive Officer a monitoring plan that will provide the data needed to assess the effectiveness of the TMDL. Currently, several of the constituents of concern have numeric targets that are lower than the readily available detection limits. As analytical methods and detection limits continue to improve (i.e., development of lower detection limits) and become more environmentally relevant, responsible parties shall incorporate new method detection limits in the monitoring plan. **Oxford Basin Monitoring** The Los Angeles County Flood Control District shall monitor any discharges of sediment from Oxford Basin to the harbor. This monitoring shall be initiated after completion of the Oxford Basin Enhancement Project and shall be used to determine attainment of numeric targets in the area of Oxford Basin that mixes with the water in Basin E of the harbor. Effectiveness monitoring developed as part of the Proposition 84 grant agreement for the Oxford Basin Enhancement Project may be used to meet this requirement; however, the monitoring shall continue beyond the term of the Proposition 84 grant. **Other Permittees and Responsible Parties Monitoring** Monitoring for other permittees, general industrial and construction stormwater permittees, and responsible parties for the in-harbor sediment and dissolved copper load allocations shall be included in the regulatory mechanisms developed to implement the load and waste load allocations for these sources.

Table 7-18.2. Marina del Rey Harbor Toxic Pollutants TMDL: Implementation Schedule

Date	Action
March 22, 2006	Effluent limitations consistent with the assumptions and requirements of waste load allocations will be implemented through NPDES permits in accordance with the implementation schedule contained herein, at the time of permit issuance, renewal or re-opener.
1 year after effective date of the TMDL as amended by Resolution No. R14-XXX	Memorandum of Agreement (MOA) between County of Los Angeles and Regional Board to address LAs for in-harbor sediments
2 years after effective date of the TMDL as amended by Resolution No. R14-XXX	Develop regulatory mechanism for implementation of LAs for discharges of dissolved copper from boats
March 22, 2024	The LAs for discharges of dissolved copper from boats shall be attained.
March 22, 2029	The LAs for in-harbor sediments shall be attained.
MINOR NPDES PERMITS AND GENERAL NON-STORM WATER NPDES PERMITS	
March 22, 2013	The non-storm water NPDES permits shall achieve the concentration-based waste load allocations for sediment per provisions allowed for in NPDES permits.
GENERAL INDUSTRIAL STORM WATER PERMIT	
Up to March 22, 2016	The general industrial storm water permits shall achieve the mass-based waste load allocations for sediment per provisions allowed for in NPDES permits.
GENERAL CONSTRUCTION STORM WATER PERMIT	
Up to March 22, 2016	The general construction storm water permits shall achieve the mass-based waste load allocations for sediment per provisions allowed for in NPDES permits.
MS4 AND CALTRANS STORM WATER PERMITS	
June 22, 2015	The MS4 and Caltrans storm water NPDES permittees shall submit a revised coordinated monitoring plan or the MS4 Permit required Integrated Monitoring Program or Coordinated Integrated Monitoring Program, reflecting the revised requirements of this TMDL as amended by Resolution No. R14-XXX.

Date	Action
December 15, 2016	The MS4 and Caltrans storm water NPDES permittees shall conduct a stressor identification in Marina del Rey Harbor and submit a report detailing the results to the Regional Board.
Schedule for MS4 and Caltrans Permittees for Marina del Rey Harbor Back Basins (Basins D, E, and F)	
March 22, 2016	Compliance with the interim sediment allocations for Cu, Pb, Zn, chlordane, p'p-DDE, and total DDTs may be demonstrated via any one of three different means: 1. Demonstrate that the sediment quality condition of Unimpacted or Likely Unimpacted via the interpretation and integration of multiple lines of evidence as defined in the EBE Plan Part 1, is met; or 2. Sediment numeric targets are met in bed ~~sediments over a three-year averaging period~~; or 3. Interim allocations in the discharge are met as described below: The MS4 and Caltrans storm water NPDES permittees shall demonstrate that 50% of the total drainage area served by the MS4 is effectively meeting the waste load allocations for sediment. Alternatively, permittees shall attain a 50% reduction in the difference between the baseline loadings and WLAs, as measured at the relevant existing MS4 permit monitoring location and/or at relevant MS4 monitoring stations identified in an approved coordinated monitoring plan. Compliance with the interim sediment allocations for total PCBs may be demonstrated via any of four different means: 1. Fish tissue targets are met in species resident to Marina del Rey Harbor; or 2. Demonstrate that the sediment quality condition protective of fish tissue is achieved per the Statewide Enclosed Bays and Estuaries Plan, as amended to address contaminants in resident finfish and wildlife; or 3. Sediment numeric targets are met in bed sediments ~~over a three-year averaging period~~; or 4. Interim allocations in the discharge are met as described below: The MS4 and Caltrans storm water NPDES permittees shall demonstrate that 50% of the total drainage area served by the MS4 is effectively meeting the waste load allocations for sediment. Alternatively, permittees shall attain a 50% reduction in the difference between the baseline loadings and WLAs, as

Date	Action
	measured at the relevant existing MS4 permit monitoring location and/or at relevant MS4 monitoring stations identified in an approved coordinated monitoring plan.
March 22, 2018	Compliance with the sediment TMDLs for Cu, Pb, Zn, chlordane, p'p-DDE and total DDTs may be demonstrated via any one of three different means: 1. Demonstrate that the sediment quality condition of Unimpacted or Likely Unimpacted via the interpretation and integration of multiple lines of evidence as defined in the EBE Plan Part 1, is met; or 2. Sediment numeric targets are met in bed sediments ~~over a three-year averaging period~~; or 3. Final allocations in the discharge are met as described below: The MS4 and Caltrans storm water NPDES permittees shall demonstrate that 100% of the total drainage area served by the MS4 is effectively meeting the waste load allocations for sediment. Compliance with the sediment TMDL for total PCBs may be demonstrated via any of four different means: 1. Fish tissue targets are met in species resident to Marina del Rey Harbor; or 2. Demonstrate that the sediment quality condition protective of fish tissue is achieved per the Statewide Enclosed Bays and Estuaries Plan, as amended to address contaminants in resident finfish and wildlife; or 3. Sediment numeric targets are met in bed sediments ~~over a three-year averaging period~~; or 4. Final allocations in the discharge are met as described below: The MS4 and Caltrans storm water NPDES permittees shall demonstrate that 100% of the total drainage area served by the MS4 is effectively meeting the waste load allocations for sediment.
Schedule for MS4 and Caltrans Permittees for Marina del Rey Harbor Front Basins (Basins A, B, C, G, and H)	
March 22, 2019	Compliance with the interim sediment allocations for Cu, Pb, Zn, chlordane, p'p-DDE, and total DDTs may be demonstrated via any one of three different means: 1. Demonstrate that the sediment quality condition of Unimpacted or Likely Unimpacted via the interpretation and

Date	Action
	integration of multiple lines of evidence as defined in the EBE Plan Part 1, is met; or 2. Sediment numeric targets are met in bed sediments ~~over a three-year averaging period~~; or 3. Interim allocations in the discharge are met as described below: The MS4 and Caltrans storm water NPDES permittees shall demonstrate that 50% of the total drainage area served by the MS4 is effectively meeting the waste load allocations for sediment. Alternatively, permittees shall attain a 50% reduction in the difference between the baseline loadings and WLAs, as measured at the relevant existing MS4 permit monitoring location and/or at relevant MS4 monitoring stations identified in an approved coordinated monitoring plan. Compliance with the interim sediment allocations for total PCBs may be demonstrated via any of four different means: 1. Fish tissue targets are met in species resident to Marina del Rey Harbor; or 2. Demonstrate that the sediment quality condition protective of fish tissue is achieved per the Statewide Enclosed Bays and Estuaries Plan, as amended to address contaminants in resident finfish and wildlife; or 3. Sediment numeric targets are met in bed ~~sediments over a three-year averaging period~~; or 4. Final allocations in the discharge are met as described below: The MS4 and Caltrans storm water NPDES permittees shall demonstrate that 50% of the total drainage area served by the MS4 is effectively meeting the waste load allocations for sediment. Alternatively, permittees shall attain a 50% reduction in the difference between the baseline loadings and WLAs, as measured at the relevant existing MS4 permit monitoring location and/or at relevant MS4 monitoring stations identified in an approved coordinated monitoring plan.
March 22, 2021	Compliance with the sediment TMDLs for Cu, Pb, Zn, chlordane, p'p-DDE and total DDTs may be demonstrated via any one of three different means: 1. Demonstrate that the sediment quality condition of Unimpacted or Likely Unimpacted via the interpretation and integration of multiple lines of evidence as defined in the EBE Plan Part 1, is met; or 2. Sediment numeric targets are met in bed sediments ~~over a~~

Date	Action
	~~three-year averaging period~~; or 3. Final allocations in the discharge are met as described below: The MS4 and Caltrans storm water NPDES permittees shall demonstrate that 100% of the total drainage area served by the MS4 is effectively meeting the waste load allocations for sediment. Compliance with the sediment TMDL for total PCBs may be demonstrated via any of four different means: 1. Fish tissue targets are met in species resident to Marina del Rey Harbor; or 2. Demonstrate that the sediment quality condition protective of fish tissue is achieved per the Statewide Enclosed Bays and Estuaries Plan, as amended to address contaminants in resident finfish and wildlife; or 3. Sediment numeric targets are met in bed sediments ~~over a three-year averaging period~~; or 4. Final allocations in the discharge are met as described below: The MS4 and Caltrans storm water NPDES permittees shall demonstrate that 100% of the total drainage area served by the MS4 is effectively meeting the waste load allocations for sediment.