

## **Attachment D to Resolution No. R21-001**

### **Proposed Amendment to the Water Quality Control Plan – Los Angeles Region to Revise the Ballona Creek Estuary Toxic Pollutants TMDL**

#### **Amendments:**

#### **Chapter 7. Total Maximum Daily Loads (TMDLs) Summaries, Section 7-14 (Ballona Creek Estuary Toxic Pollutants TMDL)**

This TMDL was adopted by the Regional Water Quality Control Board on July 7, 2005.

This TMDL was approved by:

The State Water Resources Control Board on October 20, 2005.  
The Office of Administrative Law on December 15, 2005.  
The U.S. Environmental Protection Agency on December 22, 2005.

This TMDL was revised by:

The Regional Water Quality Control Board on December 5, 2013.

This revised TMDL was approved by:

The State Water Resources Control Board on June 17, 2014.  
The Office of Administrative Law on May 4, 2015.  
The U.S. Environmental Protection Agency on October 26, 2015.

This TMDL was revised by:

The Regional Water Quality Control Board on [date].

This revised TMDL was approved by:

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

The following table includes all the elements of this TMDL.

**Table 7-14.1 Ballona Creek Estuary Toxic Pollutants TMDL: Elements**

Element	Key Findings and Regulatory Provisions															
<p><b>Problem Statement</b></p>	<p>Ballona Creek and Ballona Creek Estuary (Estuary) is on the Clean Water Act Section 303(d) list of impaired waterbodies for cadmium, copper, lead, silver, zinc, chlordane, DDT, PCBs, PAHs and toxicity in sediments. The following designated beneficial uses are impaired by these toxic pollutants: water contact recreation (REC1); non-contact water recreation (REC2); estuarine habitat (EST); marine habitat (MAR); wildlife habitat (WILD); rare and threatened or endangered species (RARE); migration of aquatic organisms (MIGR); reproduction and early development of fish (SPWN); commercial and sport fishing (COMM); and shellfish harvesting (SHELL).</p> <p>Recent data indicate that PAHs are <b>not</b> present at levels exceeding existing numeric targets and are not impairing the designated beneficial uses. Therefore, a TMDL for PAHs is not included.</p>															
<p><b>Numeric Target</b> <i>(Interpretation of the narrative and numeric water quality objective, used to calculate the allocations)</i></p>	<p>Sediment targets are based on the narrative standards of this Basin Plan, the narrative standards of the State Water Quality Control Plan for Enclosed Bays and Estuaries (EB&amp;E Plan Part 1), which contains the State’s Sediment Quality Objectives, the sediment quality guidelines compiled by the National Oceanic and Atmospheric Administration (NOAA), and associated sediments targets, required to achieve fish tissue targets, determined from various other sources.</p> <p><b>Sediment Targets for Direct Effects</b></p> <p>Numeric water quality targets are based on the sediment quality guidelines compiled by the National Oceanic and Atmospheric Administration, which are used in evaluating waterbodies within the Los Angeles Region for development of the 303(d) list. The NOAA Effects Range-Low (ERLs) guidelines are established as the numeric targets for metals in sediments in Ballona Creek Estuary.</p> <table border="1" data-bbox="586 1283 1414 1373"> <thead> <tr> <th colspan="5" style="text-align: center;"><b>Metal Numeric Targets (mg/kg)</b></th> </tr> <tr> <th style="text-align: center;">Cadmium</th> <th style="text-align: center;">Copper</th> <th style="text-align: center;">Lead</th> <th style="text-align: center;">Silver</th> <th style="text-align: center;">Zinc</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1.2</td> <td style="text-align: center;">34</td> <td style="text-align: center;">46.7</td> <td style="text-align: center;">1.0</td> <td style="text-align: center;">150</td> </tr> </tbody> </table> <p>In addition, the categories designated in the State’s SQOs as <b>Unimpacted</b> and <b>Likely Unimpacted</b> by the interpretation and integration of multiple lines of evidence shall be considered as the protective objective for sediment toxicity and benthic community direct effects. The thresholds established in the SQOs are based on statistical significance and magnitude of the effect. Therefore, this TMDL implicitly includes sediment toxicity and benthic community targets by its use of the SQO Part 1.</p> <p><b>Sediment Targets for Indirect Effects and Fish Tissue</b></p> <p>Fish tissue targets were determined from <i>Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene</i>, developed by the California Office of Environmental Health Hazard Assessment (2008) to assist agencies in developing fish tissue-</p>	<b>Metal Numeric Targets (mg/kg)</b>					Cadmium	Copper	Lead	Silver	Zinc	1.2	34	46.7	1.0	150
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<p><b>Numeric Target</b>  <i>(Interpretation of the narrative and numeric water quality objective, used to calculate the allocations)</i>  <i>(con't)</i></p>	<p>based criteria for pollution mitigation or elimination and to protect humans from consumption of contaminated fish. Fish tissue targets are set for the Chlordane, Total DDT, and Total PCBs based on these Fish Contaminant Goals.</p> <p>Fish tissue associated sediment targets are set for Chlordane and Total DDT based on the 2007 San Francisco Bay Estuary Institute Newport Bay Indirect Effects draft report and for Total PCBs based on the 2010 San Francisco Bay Bioaccumulation study of Gobas and Arnot.</p> <p>Fish Tissue Targets and Fish Tissue Associated Sediment Targets</p> <table border="1" data-bbox="591 621 1414 810"> <thead> <tr> <th data-bbox="591 621 797 716">Pollutant</th> <th data-bbox="797 621 1105 716">Fish Tissue target (µg/kg wet)</th> <th data-bbox="1105 621 1414 716">Associated sediment target (µg/kg dry)</th> </tr> </thead> <tbody> <tr> <td data-bbox="591 716 797 747"><b>Chlordane</b></td> <td data-bbox="797 716 1105 747"><b>5.6</b></td> <td data-bbox="1105 716 1414 747"><b>1.3</b></td> </tr> <tr> <td data-bbox="591 747 797 779"><b>Total DDT</b></td> <td data-bbox="797 747 1105 779"><b>21</b></td> <td data-bbox="1105 747 1414 779"><b>1.9</b></td> </tr> <tr> <td data-bbox="591 779 797 810"><b>Total PCBs</b></td> <td data-bbox="797 779 1105 810"><b>3.6</b></td> <td data-bbox="1105 779 1414 810"><b>3.2</b></td> </tr> </tbody> </table>	Pollutant	Fish Tissue target (µg/kg wet)	Associated sediment target (µg/kg dry)	<b>Chlordane</b>	<b>5.6</b>	<b>1.3</b>	<b>Total DDT</b>	<b>21</b>	<b>1.9</b>	<b>Total PCBs</b>	<b>3.6</b>	<b>3.2</b>
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<p><b>Source Analysis</b></p>	<p>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, zinc, and to a lesser degree cadmium) 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 estuarine sediments where they may pose a risk of toxicity. McPherson et al.<sup>1</sup> estimated that 83% of the cadmium and 86% of the lead were associated with the particle phase in Ballona Creek. Similar to metals, the majority of organic constituents in storm water are associated with particulates, measured concentrations of PAHs, phthalates, and organochlorine compounds in Sepulveda Channel, Centinela Creek, and Ballona Creek found that the majority of these compounds occurred in association with suspended solids. There is toxicity associated with suspended solids in urban runoff discharged from Ballona Creek, as well as with the receiving water sediments.</p> <p>Nonpoint sources are not considered a significant source of toxic pollutants in this TMDL. Nonpoint sources are urban runoff from the Ballona Wetland, since this area discharges directly to the Estuary through a tide gate, and direct atmospheric deposition. The Ballona Wetlands cover approximately 460 acres or 0.6% of the watershed, therefore, loading from this source is considered insignificant. Direct atmospheric deposition of metals is considered insignificant because the portion of the Ballona Creek watershed covered by water is small, approximately 480 acres or 0.6% of the watershed. Indirect atmospheric deposition reflects the process by which metals deposited on the land surface may be washed off during storm events and delivered to Ballona Creek and its tributaries. The loading of metals associated with indirect atmospheric deposition are accounted for in the storm water runoff.</p>												

<sup>1</sup> McPherson, T.N., S.J. Burian, H.J. Turin, M.K. Stenstrom and I.H. Suffet. 2002. Comparison of Pollutant Loads in Dry and Wet Weather Runoff in a Southern California Urban Watershed. *Water Science and Technology* 45:255-261.

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<p><b>Loading Capacity</b></p>	<p>TMDLs are developed for cadmium, copper, lead, silver, zinc, chlordane, DDT, and PCBs within the sediments of the Ballona Creek Estuary.</p> <p>The loading capacity for Ballona Creek Estuary is calculated by multiplying the numeric targets by the average annual deposition of fine sediment, defined as silts (grain size 0.0625 millimeters) and smaller, within the Estuary by the bulk density of the sediment. The average annual fine sediment deposited is 5,004 cubic meters per year (m<sup>3</sup>/yr) and the bulk density is 1.42 metric tons per cubic meter (mt/m<sup>3</sup>). The TMDL is set equal to the loading capacity.</p> <table border="1" data-bbox="589 632 1416 726"> <thead> <tr> <th colspan="5"><b>Metals Loading Capacity (kilograms/year)</b></th> </tr> <tr> <th>Cadmium</th> <th>Copper</th> <th>Lead</th> <th>Silver</th> <th>Zinc</th> </tr> </thead> <tbody> <tr> <td>8.5</td> <td>241.6</td> <td>332</td> <td>7.1</td> <td>1,066</td> </tr> </tbody> </table> <table border="1" data-bbox="589 751 1416 846"> <thead> <tr> <th colspan="3"><b>Organics Loading Capacity (grams/year)</b></th> </tr> <tr> <th>Chlordane</th> <th>DDTs</th> <th>Total PCBs</th> </tr> </thead> <tbody> <tr> <td>9.2</td> <td>13.5</td> <td>22.7</td> </tr> </tbody> </table>	<b>Metals Loading Capacity (kilograms/year)</b>					Cadmium	Copper	Lead	Silver	Zinc	8.5	241.6	332	7.1	1,066	<b>Organics Loading Capacity (grams/year)</b>			Chlordane	DDTs	Total PCBs	9.2	13.5	22.7																								
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<p><b>Load Allocations</b> <i>(for nonpoint sources)</i></p>	<p>Load allocations (LA) are assigned to nonpoint sources for Ballona Creek Estuary. Load allocations are developed for open space and direct atmospheric deposition.</p> <p>The mass-based load allocation for open space is equal to the percentage of the watershed covered by the Ballona Wetlands (0.6%) multiplied by the total loading capacity.</p> <table border="1" data-bbox="589 1129 1416 1224"> <thead> <tr> <th colspan="5"><b>Metals Load Allocations for Open Space (kg/yr)</b></th> </tr> <tr> <th>Cadmium</th> <th>Copper</th> <th>Lead</th> <th>Silver</th> <th>Zinc</th> </tr> </thead> <tbody> <tr> <td>0.05</td> <td>1.4</td> <td>2</td> <td>0.04</td> <td>6</td> </tr> </tbody> </table> <table border="1" data-bbox="589 1249 1416 1344"> <thead> <tr> <th colspan="3"><b>Organics Load Allocations for Open Space (g/yr)</b></th> </tr> <tr> <th>Chlordane</th> <th>DDTs</th> <th>Total PCBs</th> </tr> </thead> <tbody> <tr> <td>0.05</td> <td>0.08</td> <td>0.13</td> </tr> </tbody> </table> <p>The mass-based load allocation for direct atmospheric deposition is equal to the percentage of the watershed covered by water (0.6%) multiplied by the total loading capacity.</p> <table border="1" data-bbox="589 1495 1416 1610"> <thead> <tr> <th colspan="5"><b>Metals Load Allocations for Direct Atmospheric Deposition (kg/yr)</b></th> </tr> <tr> <th>Cadmium</th> <th>Copper</th> <th>Lead</th> <th>Silver</th> <th>Zinc</th> </tr> </thead> <tbody> <tr> <td>0.05</td> <td>1.4</td> <td>2</td> <td>0.04</td> <td>6</td> </tr> </tbody> </table> <table border="1" data-bbox="589 1635 1416 1730"> <thead> <tr> <th colspan="3"><b>Organics Load Allocations for Direct Atmospheric Deposition (g/yr)</b></th> </tr> <tr> <th>Chlordane</th> <th>DDTs</th> <th>Total PCBs</th> </tr> </thead> <tbody> <tr> <td>0.05</td> <td>0.08</td> <td>0.13</td> </tr> </tbody> </table>	<b>Metals Load Allocations for Open Space (kg/yr)</b>					Cadmium	Copper	Lead	Silver	Zinc	0.05	1.4	2	0.04	6	<b>Organics Load Allocations for Open Space (g/yr)</b>			Chlordane	DDTs	Total PCBs	0.05	0.08	0.13	<b>Metals Load Allocations for Direct Atmospheric Deposition (kg/yr)</b>					Cadmium	Copper	Lead	Silver	Zinc	0.05	1.4	2	0.04	6	<b>Organics Load Allocations for Direct Atmospheric Deposition (g/yr)</b>			Chlordane	DDTs	Total PCBs	0.05	0.08	0.13
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<p><b>Waste Load Allocations</b> (con't)</p>	<p>County MS4, Caltrans, General Construction and General Industrial permittees) by subtracting the load allocations from the total loading capacity. Concentration-based waste load allocations are developed for other point sources in the watershed. Waste load allocations are expressed as allowable sediment-bound pollutant load that can be deposited to the estuary.</p> <p style="text-align: center;"><b>Metals Waste Load Allocations for Storm Water (kg/yr)</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 20%;">Cadmium</th> <th style="width: 20%;">Copper</th> <th style="width: 20%;">Lead</th> <th style="width: 20%;">Silver</th> <th style="width: 20%;">Zinc</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">8.4</td> <td style="text-align: center;">238.8</td> <td style="text-align: center;">328</td> <td style="text-align: center;">7.02</td> <td style="text-align: center;">1,054</td> </tr> </tbody> </table> <p style="text-align: center;"><b>Organics Waste Load Allocations for Storm Water (g/yr)</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 33%;">Chlordane</th> <th style="width: 33%;">DDTs</th> <th style="width: 33%;">Total PCBs</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">9.13</td> <td style="text-align: center;">13.35</td> <td style="text-align: center;">22.48</td> </tr> </tbody> </table> <p>The storm water waste load allocations are apportioned between the MS4 permittees, Caltrans, the general construction and the general industrial storm water permits based on an areal weighting approach.</p> <p style="text-align: center;"><b>Metals Storm Water WLAs Apportioned between Permits (kg/yr)</b></p> <table border="1" style="width: 100%; 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Any future minor NPDES permits or enrollees under a general non-storm water NPDES permit</p>	Cadmium	Copper	Lead	Silver	Zinc	8.4	238.8	328	7.02	1,054	Chlordane	DDTs	Total PCBs	9.13	13.35	22.48		Cadmium	Copper	Lead	Silver	Zinc	MS4 Permittees	8.0	227.3	312.3	6.69	1003	Caltrans	0.11	3.2	4.4	0.09	14	General Construction	0.23	6.6	9.1	0.20	29	General Industrial	0.06	1.7	2.3	0.05	7		Chlordane	DDTs	Total PCBs	MS4 Permittees	8.69	12.70	21.40	Caltrans	0.12	0.18	0.30	General Construction	0.25	0.37	0.62	General Industrial	0.06	0.09	0.16	Cadmium	Copper	Lead	Silver	Zinc	0.1	3	4	0.1	13	Chlordane	DDTs	Total PCBs	0.11	0.16	0.28
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<p><b>Waste Load Allocations</b> (con't)</p>	<p>will also be subject to the concentration-based waste load allocations. Short-term discharges of potable water that are required by statute are not assigned WLAs but may be subject to alternative permit limits pursuant to the State Water Resources Control Board's Policy for Implementation of Toxic Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (2005).</p> <table border="1" data-bbox="589 470 1416 562"> <thead> <tr> <th colspan="5"><b>Metals Concentration-based Waste Load Allocations (mg/kg)</b></th> </tr> <tr> <th>Cadmium</th> <th>Copper</th> <th>Lead</th> <th>Silver</th> <th>Zinc</th> </tr> </thead> <tbody> <tr> <td>1.2</td> <td>34</td> <td>46.7</td> <td>1.0</td> <td>150</td> </tr> </tbody> </table> <table border="1" data-bbox="589 594 1416 686"> <thead> <tr> <th colspan="3"><b>Organic Concentration-based Waste Load Allocations (µg/kg)</b></th> </tr> <tr> <th>Chlordane</th> <th>DDTs</th> <th>Total PCBs</th> </tr> </thead> <tbody> <tr> <td>1.3</td> <td>1.9</td> <td>3.2</td> </tr> </tbody> </table>	<b>Metals Concentration-based Waste Load Allocations (mg/kg)</b>					Cadmium	Copper	Lead	Silver	Zinc	1.2	34	46.7	1.0	150	<b>Organic Concentration-based Waste Load Allocations (µg/kg)</b>			Chlordane	DDTs	Total PCBs	1.3	1.9	3.2
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1.3	1.9	3.2																							
<p><b>Margin of Safety</b></p>	<p>The addition of numeric targets for indirect effects and multiple compliance options listed in the implementation section for sediments serve as an implicit margin of safety.</p>																								
<p><b>Implementation</b></p>	<p>Compliance with the TMDL shall be determined through sediment and fish tissue monitoring and comparison with the WLAs and LAs and numeric targets.</p> <p>Compliance with the sediment TMDL for metals shall be based on achieving the LAs and WLAs or, alternatively, demonstrating attainment of the State's direct effects SQO through the sediment triad/multiple lines of evidence approach outlined therein.</p> <p>Compliance with the TMDL for chlordane, DDT and PCBs shall be based on achieving the LAs or WLAs, the 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.</p> <p>The regulatory mechanisms used to implement the TMDL will include the Los Angeles County Municipal Storm Water NPDES Permit (MS4), the State of California Department of Transportation (Caltrans) Storm Water Permit, minor NPDES permits, general NPDES permits, general industrial storm water NPDES permits, 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). Each NPDES permit 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.</p> <p>Table 7-14.2 presents the implementation schedule for the responsible permittees.</p>																								

Element	Key Findings and Regulatory Provisions
<p><b>Implementation</b> (con't)</p>	<p><b>Minor NPDES Permits and General Non-Storm Water NPDES Permits:</b></p> <p>The concentration-based waste load allocations for the minor NPDES permits and general non-storm water NPDES permits will be implemented through NPDES 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 (2005) or applying other applicable methodologies authorized under federal regulations. The minor and general non-storm water NPDES permittees are allowed until January 11, 2013 to achieve the waste load allocations.</p> <p><b>General Industrial and Construction Storm Water Permit:</b></p> <p>Waste load allocations will be incorporated into the State Board general permits upon renewal or into watershed specific permits developed by the Regional Board.</p> <p>General construction permittees must attain WLAs by January 11, 2015. General industrial permittees must attain WLAs by January 11, 2013. Permittees may demonstrate compliance with WLAs in one of two ways.</p> <p>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.</p> <p>Second, if permittees provide a quantitative demonstration that control measures and best management practices (BMPs) will achieve wet-weather WLAs consistent with the schedule in Table 7-14.2, then compliance may be demonstrated by implementation of those control measures and BMPs, subject to Executive Officer approval.</p> <p><b>MS4 and Caltrans Storm Water Permits:</b></p> <p>The County of Los Angeles, Los Angeles County Flood Control District, City of Los Angeles, Beverly Hills, Culver City, Inglewood, Santa Monica, and West Hollywood 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.</p> <p>Compliance with sediment WLAs for copper, lead, and zinc, may be demonstrated via any one of three different means:</p>

Element	Key Findings and Regulatory Provisions
<p><b>Implementation</b> (con't)</p>	<ul style="list-style-type: none"> <li>a. Sediment numeric targets are met in bed sediments.</li> <li>b. The qualitative sediment condition of Unimpacted or Likely Unimpacted via the interpretation and integration of multiple lines of evidence as defined in the SQOs is met.</li> <li>c. Final sediment allocations, as presented above, are met.</li> </ul> <p>Compliance with sediment WLAs for Chlordane, total DDT, and total PCBs may be demonstrated via any one of four different means:</p> <ul style="list-style-type: none"> <li>a. Sediment numeric targets are met in bed sediments.</li> <li>b. Fish tissue targets are met in species resident to Ballona Creek Estuary.</li> <li>c. Final sediment allocations, as presented above, are met.</li> <li>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.</li> </ul> <p>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 that control measures and BMPs will achieve wet-weather WLAs consistent with the schedule in Table 7-14.2, then compliance with wet-weather WQBELs may be demonstrated by implementation of 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. We expect that reductions to be achieved by each BMP will be documented and that sufficient monitoring will be put in place to verify that the desired reductions are achieved. The permits should also provide a mechanism to adjust the required BMPs as necessary to ensure their adequate performance.</p> <p>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 January 11, 2026. Baseline loading is defined as loading estimated when the TMDL was developed in 2005.</p>
<p><b>Seasonal Variations and Critical Conditions</b></p>	<p>There is a high degree of inter- and intra-annual variability in sediments deposited at the mouth of Ballona Creek. This is a function of the storms, which are highly variable between years. Studies by the Army Corps of Engineers have shown that sediment delivery to Ballona Creek is related to the size of the storm (USACE, 2003). The TMDL is based on a long-term average deposition patterns over a 10-year period from 1991 to 2001. This time period contains a wide range of storm conditions and flows in the Ballona Creek watershed. 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.</p>

Element	Key Findings and Regulatory Provisions
<p><b>Monitoring</b></p>	<p>Effective monitoring will be required to assess the on-going condition of Ballona Creek and Estuary and to assess attainment of WLAs and LAs assigned to dischargers and responsible parties to reduce toxic pollutants loading to the Ballona Creek Estuary. 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. The programs, reports, and studies shall be included in subsequent permits and the associated monitoring and reporting programs, or other orders.</p> <p><b>TMDL Effectiveness Monitoring</b></p> <p>The water quality samples collected during wet weather as part of the MS4 storm water monitoring program 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 cadmium, copper, lead, silver, zinc, chlordane, dieldrin, total DDT, total PCBs, total PAHs, and total organic carbon in the bulk sediment.</p> <p>Sediment quality evaluation for direct effects as detailed in the SQOs (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 SQOs shall be conducted and evaluated. Locations for sediment triad assessment and the methodology for combining results from sampling locations to determine sediment conditions shall be specified in the Coordinated Monitoring Plan to be approved by the Executive Officer. The sampling design shall be in compliance with the SQO Sediment Monitoring section (VII.E).</p> <p>A stressor identification, as required by the EB&amp;E Plan Part 1 (Section VII.F), shall be conducted if sediments fail to meet the narrative protective condition of <b>Unimpacted</b> or <b>Likely Unimpacted</b> in accordance with the revised coordinated monitoring plan or the Integrated Monitoring Program or Coordinated Integrated Monitoring Program from the MS4 permit is approved per Table 7-14.2.</p> <p>Sediment chemistry and sediment toxicity samples shall be collected annually (in addition to, the sediment triad sampling events as described above), to evaluate trends in general sediment quality constituents (TOC, grain size) and listed constituents (cadmium, copper, lead, silver, zinc, chlordane, total DDT, total PAHs, and total PCBs) relative to sediment quality targets.</p> <p>Monitoring of chlordane, total DDTs, and PCBs in fish and mussel tissue within the Estuary shall be conducted annually. 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.</p> <p><b>Special Studies</b></p>

Element	Key Findings and Regulatory Provisions
<p><b>Monitoring</b> (con't)</p>	<p>Special studies are recommended to refine source assessments, to provide better estimates of loading capacity, and to optimize implementation efforts. Special studies may include:</p> <ul style="list-style-type: none"> <li>• Evaluation and use of low detection level techniques to evaluate water quality concentrations for those contaminants where standard detection limits cannot be used to assess compliance for CTR standards or are not sufficient for estimating source loadings from tributaries and storm water.</li> <li>• Developing and implementing a monitoring program to collection the data necessary to apply a multiple lines of evidence approach.</li> <li>• Evaluation and use of sediment stressor identification in compliance with the EB&amp;E Plan Part 1 to evaluate causes of any recurring sediment toxicity.</li> <li>• Evaluate partitioning coefficients between water column and sediment to assess the contribution of water column discharges to sediment concentrations in the Estuary.</li> <li>• Studies to refine relationship between pollutants and suspended solids aimed at better understanding of the delivery of pollutants to the watershed.</li> <li>• Studies to understand transport of sediments to the estuary, including the relationship between storm flows, sediment loadings to the estuary, and sediment deposition patterns within the estuary.</li> <li>• Studies to evaluate effectiveness of BMPs to address pollutants and/or sediments.</li> </ul>

**Table 7-14.2 Ballona Creek Estuary Toxic Pollutants TMDL: Implementation Schedule**

Date	Action
January 11, 2006	Regional Board permit writers shall incorporate the waste load allocations for sediment into the NPDES permits. Waste load allocations will be implemented through NPDES permit limits in accordance with the implementation schedule contained herein, at the time of permit issuance, renewal or re-opener.
Within 6 months after the effective date of the State Board adopted sediment quality objectives and implementation policy	The Regional Board will re-assess the numeric targets and waste load allocations for consistency with the State Board adopted sediment quality objectives.
January 11, 2011	Responsible jurisdictions and agencies shall provide to the Regional Board result of any special studies.
January 11, 2012	The Regional Board shall reconsider this TMDL to re-evaluate the waste load allocations and the implementation schedule.
<b>MINOR NPDES PERMITS AND GENERAL NON-STORM WATER NPDES PERMITS</b>	
January 11, 2013	The non-storm water NPDES permits shall achieve the concentration-based waste load allocations for sediment per provisions allowed for in NPDES permits.
<b>GENERAL INDUSTRIAL STORM WATER PERMIT</b>	
January 11, 2013	The general industrial storm water permits shall achieve the mass-based waste load allocations for sediment per provisions allowed for in NPDES permits.
<b>GENERAL CONSTRUCTION STORM WATER PERMIT</b>	
January 11, 2015	The general construction storm water permits shall achieve the mass-based waste load allocations for sediment per provisions allowed for in NPDES permits.
<b>MS4 AND CALTRANS STORM WATER PERMITS</b>	
January 11, 2007	In response to an order issued by the Executive Officer, the MS4 and Caltrans storm water NPDES permittees must submit a coordinated monitoring plan, to be approved by the Executive Officer, which includes both ambient monitoring and TMDL effectiveness monitoring. Once the coordinated monitoring plan is approved by the Executive Officer, ambient monitoring shall commence within 6 months.
June 11, 2015	Revise the coordinated monitoring plan or the Integrated Monitoring Program or Coordinated Integrated Monitoring Program prepared in compliance with the Los Angeles County MS4 permit.
January 11, 2011 (Draft Report) July 11, 2011 (Final Report)	The MS4 and Caltrans storm water NPDES permittees shall provide a written report to the Regional Board outlining how they will achieve the waste load allocations for sediment to Ballona Creek Estuary. The report shall include implementation methods, an implementation schedule, proposed milestones, and any applicable revisions to the TMDL effectiveness monitoring plan.

Date	Action
January 11, 2013	<p>Compliance with the metals TMDLs may be demonstrated via any one of three different means:</p> <ol style="list-style-type: none"> <li>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 SQOs, is met; or</li> <li>2. Sediment numeric targets are met in bed sediments; or</li> <li>3. Interim allocations in the discharge are met, as described below:</li> </ol> <p>The MS4 and Caltrans storm water NPDES permittees shall demonstrate that 25% of the total drainage area served by the MS4 is effectively meeting the waste load allocations for sediment.</p> <p>Alternatively, permittees shall attain a 25% 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.</p> <p>Compliance with sediment WLAs for Chlordane, total DDT, and total PCBs may be demonstrated via any one of three different means:</p> <ol style="list-style-type: none"> <li>1. Sediment numeric targets are met in bed sediments.</li> <li>2. Fish tissue targets are met in species resident to Ballona Creek Estuary.</li> <li>3. 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.</li> <li>4. Interim allocations in the discharge are met, as described below:</li> </ol> <p>The MS4 and Caltrans storm water NPDES permittees shall demonstrate that 25% of the total drainage area served by the MS4 is effectively meeting the waste load allocations for sediment.</p> <p>Alternatively, permittees shall attain a 25% 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.</p>
January 11, 2016	<p>Compliance with the metals TMDLs may be demonstrated via any one of three different means:</p>

Date	Action
	<ol style="list-style-type: none"> <li>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 SQOs, is met; or</li> <li>2. Sediment numeric targets are met in bed sediments; or</li> <li>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.</li> </ol> <p>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.</p> <p>Compliance with sediment WLAs for Chlordane, total DDT, and total PCBs may be demonstrated via any one of three different means:</p> <ol style="list-style-type: none"> <li>1. Sediment numeric targets are met in bed sediments.</li> <li>2. Fish tissue targets are met in species resident to Ballona Creek Estuary.</li> <li>3. 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.</li> <li>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 DDT and chlordane. For PCBs, 25% of the total drainage area must meet the allocations required by the TMDL in effect in 2013<sup>2</sup>.</li> </ol> <p>Alternatively, for DDT and chlordane, 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. For PCBs, a 25% reduction in loading of the TMDL in effect in 2013<sup>2</sup> shall be obtained.</p>

<sup>2</sup> In 2013, the PCB target was 22.7 µg/kg and the WLA for stormwater was 159 g/yr.

Date	Action
January 11, 2017	<p>Compliance with the metals TMDLs may be demonstrated via any one of three different means:</p> <ol style="list-style-type: none"> <li>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 SQOs, is met; or</li> <li>2. Sediment numeric targets are met in bed sediments; or</li> <li>3. Interim allocations in the discharge are met, as described below:</li> </ol> <p>The MS4 and Caltrans storm water NPDES permittees shall demonstrate that 75% of the total drainage area served by the MS4 is effectively meeting the waste load allocations for sediment.</p> <p>Alternatively, permittees shall attain a 75% 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.</p> <p>Compliance with sediment WLAs for Chlordane, total DDT, and total PCBs may be demonstrated via any one of three different means:</p> <ol style="list-style-type: none"> <li>1. Sediment numeric targets are met in bed sediments.</li> <li>2. Fish tissue targets are met in species resident to Ballona Creek Estuary.</li> <li>3. 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.</li> <li>4. Interim allocations in the discharge are met, as described below:</li> </ol> <p>The MS4 and Caltrans storm water NPDES permittees shall demonstrate that 75% of the total drainage area served by the MS4 is effectively meeting the waste load allocations for Chlordane and DDT and for PCBs the MS4 and Caltrans storm water NPDES permittees shall demonstrate that 25% of the total drainage area is effectively meeting the waste load allocations.</p> <p>Alternatively, for DDT and Chlordane permittees shall attain a 75% 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.</p>

Date	Action
March 23, 2018	The Regional Board shall reconsider the TMDL based upon new data, technical studies, and revisions to State or regional water quality control plans or policies.
January 11, 2021	<p>Compliance with sediment WLAs for Chlordane, total DDT, and total PCBs may be demonstrated via any one of three different means:</p> <ol style="list-style-type: none"> <li>1. Sediment numeric targets are met in bed sediments.</li> <li>2. Fish tissue targets are met in species resident to Ballona Creek Estuary.</li> <li>3. 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.</li> <li>4. Final allocations in the discharge are met, as described below:</li> </ol> <p>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 Chlordane and DDT and for PCBs the MS4 and Caltrans storm water NPDES permittees shall demonstrate that 50% of the total drainage area is effectively meeting the waste load allocations.</p> <p>Alternatively, for DDT and Chlordane, permittees shall attain a 100% 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 and for PCBs 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.</p>

Date	Action
January 11, 2026	<p>Compliance with the metals TMDLs may be demonstrated via any one of three different means:</p> <ol style="list-style-type: none"> <li>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 SQOs, is met; or</li> <li>2. Sediment numeric targets are met in bed sediments; or</li> <li>3. Final allocations in the discharge are met, as described below:</li> </ol> <p>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.</p> <p>Alternatively, permittees shall attain a 100% 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.</p>
January 11, 2026	<p>Compliance with sediment WLAs total PCBs may be demonstrated via any one of three different means:</p> <ol style="list-style-type: none"> <li>1. Sediment numeric targets are met in bed sediments.</li> <li>2. Fish tissue targets are met in species resident to Ballona Creek Estuary.</li> <li>3. 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.</li> <li>4. Final allocations in the discharge are met, as described below:</li> </ol> <p>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.</p> <p>Alternatively, permittees shall attain a 100% 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.</p>