



California Regional Water Quality Control Board Los Angeles Region



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TO: Charles Hoppin, Chair
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FROM: Samuel Unger *SU*
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DATE: January 27, 2012

SUBJECT: DOMINGUEZ CHANNEL AND GREATER LOS ANGELES AND LONG BEACH
HARBOR WATERS TOXIC POLLUTANTS TMDL (HARBORS TOXICS TMDL)

At the December 6, 2011 meeting of the State Water Resources Control Board (State Water Board) regarding the Harbors Toxics TMDL, Board Chair Hoppin, Vice Chair Spivy-Weber, and Board Member Doduc requested clarification on five issues regarding the Harbors Toxics TMDL:

- (1) The use of ERL sediment values as TMDL numeric targets vis-à-vis the State Water Board's sediment quality objectives (SQOs);
- (2) The selection and application of fish tissue goals in deriving TMDL allocations;
- (3) Whether the TMDL numeric targets will require dredging of the entire harbors;
- (4) Municipal requirements for TMDL compliance; and
- (5) Opportunities to refine the TMDL in the future to respond to results of special studies and new policies.

The Los Angeles Water Board appreciates the opportunity to clarify these issues, and show that the TMDL complies with all state and federal requirements, including the State Water Board's SQOs contained in the *Enclosed Bays and Estuary Plan – Part 1 Sediment Quality*, and provides a reasonable implementation plan of twenty years to meet the TMDL. This memorandum addresses these issues in detail.

Briefly as background, the most significant impairments addressed by the TMDL are related to pollutant loads associated with sediment; these pollutant loads both directly impact aquatic life and indirectly impact human health through consumption of contaminated fish. Therefore, the TMDL is designed to achieve both the narrative SQOs to protect aquatic life and the narrative SQOs to protect human health that are contained in the State Water Board's *Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality* (hereafter EB&E Plan). To achieve these objectives, numeric sediment targets are set forth in the TMDL for each narrative SQO and allocations are based on the more stringent of the sediment targets for a

particular pollutant. In establishing the TMDL and its implementation plan, the Los Angeles Water Board employed the approaches and processes set forth in Part 1 of the EB&E Plan, while fulfilling the federal requirements for a TMDL.

The schedule and nature of the TMDL implementation plan recognize the challenges and complexities of addressing the impairments in the Dominguez Channel and Greater Harbor Waters. The implementation plan provides 20 years to achieve the final wasteload and load allocations, and provides multiple avenues to enhance the scientific foundation, prioritize implementation, and refine the TMDL targets and allocations based on the results of special studies prior to the final implementation deadline. Further, the TMDL allows compliance to be demonstrated in multiple ways, imparting flexibility when the TMDL is incorporated into relevant permits.

ISSUE 1: SELECTION OF SEDIMENT TARGETS TO PROTECT AQUATIC LIFE AND CONSISTENCY WITH STATE WATER BOARD SQOs

The TMDL fully complies with State Water Board SQOs for protection of aquatic life ('direct effects') and federal requirements for establishing TMDLs.

In 2009, the State Water Board established SQOs for protection of aquatic life using a multiple line of evidence (MLOE) approach. The MLOE approach requires that three lines of evidence – sediment chemistry, sediment toxicity, and benthic community condition – are all considered when assessing sediment condition. Data for each line of evidence are distilled into numeric ranges called 'categorization values', which are then integrated to arrive at a qualitative categorical assessment.

Both TMDLs and the State Water Board's SQOs require the use of numeric criteria. Federal requirements stipulate that TMDLs include numeric targets and numeric allocations. The SQOs require that one line of evidence of the MLOE is based on sediment chemistry concentrations as compared to numeric screening ranges.¹ However, the SQOs also rely upon additional lines of evidence, which are ultimately integrated to derive a non-numeric categorical assessment of

¹ The ERL values generally compare well with the SQO sediment chemistry "Low" disturbance category concentration ranges found in Table 6 of the EB&E Plan.

Metals	Concentration Range (mg/kg) (Low Disturbance Category)	Marine Sediment ERL (mg/kg)
Cadmium	NA	1.2
Copper	52.8-96.5	34
Lead	26.4-60.8	46.7
Mercury	0.09-0.45	0.15
Zinc	112-200	150
Chlordane, total	Chlordane, -alpha 0.50-1.23 Chlordane, -gamma 0.54-1.45	0.50
Total PCBs	11.9-24.7	22.7
Hi MW PAHs	312-1325	1700
Lo MW PAHs	85.4-312	552
Total DDT	0.50-1.52	1.58

the waterbody. It is not possible to calculate numeric TMDLs or allocations from a categorical assessment such as the SQOs provide. To fully comply with both sets of requirements, the Los Angeles Water Board included numeric targets for sediment quality to protect aquatic life, and established that compliance with these sediment targets and allocations may be demonstrated using the multiple lines of evidence in the State's Aquatic Life ('Direct Effects') SQOs.

More specifically:

- The multiple lines of evidence (MLOE) approach in the SQOs was used to perform individual waterbody assessments to confirm impairment during TMDL development. (TMDL Staff Report, sections 2.6-2.8, pp. 27-32)
- Initial sediment numeric targets to protect aquatic life and corresponding allocations were determined by the narrative Direct Effects Aquatic Life SQO (EB&E Plan – Part 1 Sediment Quality, Section IV.A.), and the widely used sediment quality guidelines of Long et al. (1998) and MacDonald et al. (2000). ERL values, that representing the levels below which adverse biological effects are not expected to occur, are set as the initial sediment quality thresholds for the calculation of loading capacity and allocations.² The use of ERLs as numeric targets is consistent with existing TMDLs in the Los Angeles Region that were adopted by the Los Angeles Water Board and approved by the State Water Board. This TMDL includes additional reliance upon the State's SQOs for compliance determination and other aspects of implementation (described below)³.
- The Basin Plan amendment language clearly states that while ERLs are used as the initial numeric targets, they are not intended to be used as 'clean-up standards'.⁴ (BPA, pp. 4-5)
- The TMDL anticipates that site-specific sediment quality values (SQVs) may be developed and replace the ERL values as numeric targets (BPA, pp. 2-4).
- The Harbor Toxics TMDL embraces the use of the Direct Effects Aquatic Life SQOs (categorical assessment based on MLOE approach) as a means of demonstrating compliance with the TMDLs for direct effects. That is, if monitoring demonstrates that a location falls within the *Unimpacted* or *Likely Unimpacted* category, the location is conclusively determined to be in compliance with the TMDL, even if the sediment targets are exceeded. (BPA, pp. 17-21).
- The Harbor Toxics TMDL specifies the use of the Direct Effects Aquatic Life SQOs (categorical assessment based on MLOE approach and stressor identification process)

² Relative to ERM values, which indicate levels that are expected to be toxic to a large percentage of aquatic organisms, ERL values are the appropriate metrics for TMDL targets, which are intended to support the goal of eliminating waterbody impairments.

³ At its most fundamental level, a TMDL is a mathematical equation; as such, it is necessary to translate the narrative SQOs into numeric targets and to calculate numeric allocations for each source. While the MLOE categorical assessment approach used in the EB&E Plan is useful for compliance determination, it is not conducive to use in a mathematical equation. The State Water Board's EB&E Plan recognizes that it may not be possible to strictly follow the approach therein in calculating a TMDL, stating that "[n]othing in this section [Section VII.] shall limit a Water Board's authority to develop and implement waste load allocations for Total Maximum Daily Loads" (p. 14).

⁴ The BPA explicitly sets forth that, "[t]hese sediment targets [referring to the sediment targets table on p. 4] are not intended to be used as 'clean-up standards' for navigational, capital or maintenance dredging or capping activities; rather they are long-term sediment concentrations that should be attained after reduction of external loads, targeted actions addressing internal reservoirs of contaminants, and environmental decay of contaminants in sediment" (BPA, p. 5).

to perform prioritization assessment for contaminated sediment management. (BPA, p. 31; Staff Report, figure 7-1)

- The Harbor Toxics TMDL anticipates that the stressor identification process set forth in Section VII.F. will be undertaken (BPA, p. 33; Staff Report figure 7-1). The results of this process may be evaluated during the reconsideration of the TMDL, or at any time to prioritize implementation actions.

Attachment A provides a schematic of the TMDL's approach to address protection of aquatic life using the State Water Board's Direct Effects SQO and accompanying assessment methodology.

ISSUE 2: SELECTION OF SEDIMENT TARGETS TO ADDRESS FISH TISSUE IMPAIRMENTS AND CONSISTENCY WITH STATE WATER BOARD SQOs

The TMDL fully complies with the existing narrative State Water Board SQOs for protection of human health ('indirect effects') and federal requirements for establishing TMDLs. The TMDL allows several methods to assess compliance with the indirect effects TMDLs, including the use of the quantitative assessment methodology to be established as part of Phase 2 of the State Water Board SQOs.

As described above, the Harbor Toxics TMDL is comprised of two categories of TMDLs, those that address direct effects, i.e. impairments that directly impact aquatic life beneficial uses, and those that address indirect effects, i.e. impairments of sediment and fish tissue due to organic compounds that bioaccumulate in fish and then impact human health through consumption of the contaminated fish. We refer to the latter as 'Indirect Effects' TMDLs.

The Harbor Indirect Effects TMDLs are fully consistent with the *Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality* (EB&E Plan) (Section IV.B. Sediment Quality Objectives – Human Health; Section VI. Human Health; Section VII.H. Development of Site-Specific Sediment Management Guidelines).

The Harbor Toxics TMDLs for indirect effects address fish tissue impairments due to primarily DDT and PCBs. These fish tissue impairments pose risks to human health when fish contaminated with carcinogens such as DDT and PCBs are consumed. The Greater Harbor Waters are designated with Commercial and Sport Fishing (COMM) beneficial use, and fishing takes place within the Harbor from piers and boats. The State Office of Environmental Health Hazard Assessment (OEHHA) has issued "do not eat" advisories for five fish species and advisories to restrict consumption for 14 other fish species in the Greater Harbor waters. Federal regulations require that these impairments are addressed in this TMDL, to the extent that they are caused by conditions in the Harbors.

Summary of Sediment Quality Objective for Protection of Human Health and Its Implementation

The State Water Board's SQOs include, at this time, a narrative SQO for protection of human health:

"Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health."

This narrative objective is to be implemented as specified in Section VI of the EB&E Plan. The EB&E Plan requires that on a case-by-case basis, based upon a human health risk assessment, considering any applicable and relevant information, including OEHHA policies for fish consumption and risk assessment and USEPA human health risk assessment policies. Further guidance is provided in Section VII.H. of the EB&E Plan, which states that Regional Water Boards may develop site-specific sediment management guidelines where toxic stressors have been identified and controllable sources exist and/or remedial goals are desired. These site-specific sediment management guidelines may be established based on scientifically credible values from other studies combined with mechanistic or empirical models of bioavailability or toxic potency.

Implementation of State's Sediment Quality Objective for Protection of Human Health in the Harbors Toxics TMDL

The narrative SQO for protection of human health is implemented in the Harbor Toxics TMDL consistent with the approach set forth in the State Water Board's EB&E Plan (described above) by:

- Establishing numeric targets for pollutants bound to sediment based on biota-sediment accumulation factors (BSAFs). The BSAFs account for the sediment concentration, the associated food web, and the targeted fish tissue level to protect human health. The use of BSAFs is consistent with the current direction being taken for Phase II of the State Water Board's SQOs (i.e., development of a methodology for applying the narrative SQO for bioaccumulatives and human health) and USEPA guidance (USEPA 1995). The BSAFs used in the Harbor Toxics TMDL are taken from studies conducted on the West Coast.
- The targeted fish tissue levels to protect human health are based on OEHHA's Fish Contaminant Goals (FCGs). This is consistent with the direction in the EB&E Plan to consider OEHHA policies for fish consumption and risk assessment and USEPA human health risk assessment policies⁵.

FCGs are estimates of contaminant levels in fish that pose no significant health risk to individuals consuming fish. OEHHA developed FCGs for agencies needing to use criteria values for management decisions. These values *can provide a starting point* to develop fish tissue-based criteria with a goal toward pollution mitigation or elimination⁶. FCGs are based purely on public health considerations and were set using a maximum risk level of 1×10^{-6} at the standard consumption rate of 32 g/day⁷. The 10^{-6} risk level is used by USEPA in

⁵ The use of FCGs is also consistent with other approved TMDLs in California, including Colorado Lagoon OC Pesticides, PCBs, Sediment Toxicity, PAHs and Metals TMDL (in effect June 2011) and Machado Lake Pesticides and PCBs TMDL (approved by the State Water Board on December 6, 2011).

⁶ Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish, OEHHA, June 2008.

⁷ FCGs prevent consumers from being exposed to a risk level greater than 1×10^{-6} for carcinogens (not more than one additional cancer case in a population of 1,000,000 people consuming fish at the given consumption rate over a lifetime). Similar to national water quality criteria, FCGs are based solely on public health considerations (OEHHA

regulatory criteria pursuant to CWA section 304(a) and is provided as an example of an acceptable risk level in USEPA's Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories – Volume 2 (USEPA 2000). The use of FCGs is consistent with the purpose of the TMDL -- to eliminate the impairment in the listed waterbody.

Whereas there is not, at this time, a method equivalent to the MLOE approach for human health-related bioaccumulative sediment targets, the technical direction being taken by State Board staff in the development of Phase II of the State Water Board's SQOs is using a foodweb spreadsheet model to determine sediment concentrations (derived from BSAFs) that correspond to required fish tissue levels. The Harbor Toxics TMDL anticipates the completion of Phase II and includes a compliance pathway for the Indirect Effects TMDLs using the State Water Board's SQO for indirect effects with any associated assessment methodology that is incorporated into the EB&E Plan. (BPA p. 21).

Until the EB&E Plan is revised to incorporate a quantitative methodology for assessing indirect effects, the Harbor Toxics TMDL allows compliance to be demonstrated via several ways (BPA p. 21):

1. Final sediment allocations are met;
2. Sediment numeric targets to protect fish tissue are met in bed sediments over a three-year averaging period; or
3. Fish tissue targets are met *in species resident to the TMDL waterbodies*.

Compliance with the indirect effects TMDLs is not required until the end of the 20-year implementation schedule. Prior to final compliance, the TMDL identifies several studies that are to be undertaken (BPA, p. 33) and policies that may be further developed, including but not limited to:

- A site-specific study to determine resident species and foraging ranges of targeted fish;
- Studies to further refine the site specific link between sediment pollutant concentrations and fish tissue concentrations, which may lead to site-specific sediment quality values;

2008). It should be noted, however, that a seafood consumption study conducted in 1991-92 documented an average consumption rate of 49.6 g/day (and a 90th percentile consumption rate of 107.1 g/day) among anglers in adjacent Santa Monica Bay. This is significantly higher than the standard 32 g/day consumption rate used by OEHHA. Advisory Tissue Levels (ATLs) on the other hand are derived to prevent consumers from being exposed to a risk level greater than 1×10^{-4} for carcinogens (not more than one additional cancer case in a population of 10,000 people consuming fish at the given consumption rate over a lifetime) (OEHHA 2008). A risk level of 10^{-4} represents a significant health risk and is only used in the ATLs in an effort to balance the risk of consuming contaminated fish with the benefits derived from consumption of omega-3 fatty acids contained in fish. In this balancing, restrictions are imposed on the number of meals per week that can be consumed. While ATLs may be appropriate for issuing fish consumption advisories, in order to encourage some consumption of fish in the context of balancing risks and benefits, FCGs are the appropriate goal to reduce the risk of consumption to acceptable levels. OEHHA states that, "[t]here are key differences between fish consumption advisories and other environmental risk criteria; advisories consider the significant benefits of fish consumption, while criteria may be strictly risk-based and may not take into account other factors" (p. 3). The significant health risk and resulting restriction on consumption associated with ATLs is not consistent with fully supporting the COMM beneficial use. Full support of the COMM beneficial use would not require consumers to either incur significant risk to their health from anthropogenic pollutants, in order to reap other benefits, or limit their consumption of fish due to anthropogenic pollutants. In developing its recommended national human health criteria pursuant to CWA section 304(a), the USEPA routinely uses a 10^{-6} risk factor for carcinogens (USEPA 2002).

- Stressor identifications (BPA, p. 33; Staff Report, figure 7-1); and
- A methodology for applying the narrative sediment quality objective for protection of human health (indirect effects) contained in the State's SQOs similar to the MLOE approach applied to the narrative SQO for protection of aquatic life (direct effects).

Additional studies may also be conducted, including a seafood consumption study focused on Harbor-specific fish consumption patterns.

The TMDL anticipates that the results of these studies will be used to evaluate changes in TMDL targets, WLAs and LAs at the scheduled reconsideration of the TMDL in Year 6. For example, studies on the linkage between pollutant concentrations and fish tissue concentrations may lead to revisions in the fish tissue-associated sediment targets (i.e. development of site-specific sediment quality values, SQVs). Studies of seafood consumption patterns within Harbor Waters may also lead to revisions in the fish tissue targets to protect human health.

Los Angeles Water Board staff will reconsider TMDL allocations once sufficient progress toward attaining allocations is made and data on resident species, foraging ranges of targeted fish, and the site-specific linkage between sediment pollutant concentrations and the desired fish tissue concentrations to protect human health are available from these special studies.

Attachment B provides a schematic of the TMDL's approach to address protection of human health using the State Water Board's Indirect Effects SQO and accompanying guidance.

At the Los Angeles Water Board hearing, concerns were raised in public comments and reiterated during board discussion that there needed to be a process to re-evaluate the TMDL if evidence showed that fish tissue targets to protect human health were not being achieved though the wasteload and load allocations were met (hearing transcript, pp. 56, 141-155, 221, 234-244). The following language was added to the BPA to address the concern:

"If at any point during the implementation plan, 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."

This language does not result in a substantive change to the TMDL.⁸ Whether or not explicitly stated in the amendment language, a regional water board may at any time choose to reconsider a TMDL through the basin plan amendment process. However, in the case of the

⁸ The Dominguez Channel and Greater Los Angeles and Long Beach Harbor Waters were listed on the CWA Section 303(d) List for impairments in the water column, bed sediments and fish tissue. Therefore, to address the fish tissue impairments, the publicly noticed TMDL included:

- FCGs as numeric targets for fish tissue,
- BSAF derived sediment targets to achieve fish tissue targets, and
- Sediment-based allocations based on the lower of the direct effects sediment targets (ERLs) or BSAF derived sediment targets. For PCBs, the allocations are based on the BSAF derived sediment target, while for DDT, the allocations are based on the ERL value (the ERL value of 1.58 µg/kg is slightly lower than the BSAF derived value of 1.9 µg/kg).

Harbor Toxics TMDL, any decision to reconsider the TMDL prior to the scheduled reconsideration in Year 6 would only be made after significant progress toward attaining the allocations was made and only once sufficient new information based on the above-mentioned special studies was available. Los Angeles Water Board staff recognizes the complexities surrounding the selection of resident fish species to track implementation of the Harbor Toxics TMDL and the value of additional Harbor-specific information on the linkage between tissue concentrations and sediment concentrations, and would not recommend reconsideration of the allocations to achieve fish tissue targets absent sufficient information in these areas.

Further, when the TMDL is reconsidered based on new monitoring data and the results of special studies, the Los Angeles Water Board can also consider at that time whether more time would be necessary to achieve the Indirect Effects TMDLs.

ISSUE 3: CLARIFICATION REGARDING WHETHER THE TMDL NUMERIC TARGETS WILL COMPEL DREDGING OF THE ENTIRE HARBORS

The TMDL will not require dredging of the entire Harbors. The TMDL is focused on known toxic "hot spots."

At the State Water Board meeting, several responsible parties testified that the TMDL mandates dredging of the entire Los Angeles/Long Beach Harbor complex. This section addresses the misconceptions associated with this testimony and provides several reasons why this TMDL does not mandate dredging the entire harbor complex.

First, the Water Code prohibits Regional Water Boards from specifying the manner of compliance with permits and orders (Water Code § 13360(a)). Although stakeholders have testified that the TMDL compels dredging as the only means of compliance, the Ports have discussed in meetings at the Los Angeles Water Board, or presented materials in comment letters, several additional approaches to remediating contaminated sediment, including capping and monitored natural attenuation.

Second, given that compliance can be demonstrated using the SQOs and prioritization for contaminated sediment management is to be determined based on the MLOE approach and stressor identification, there will be no compelling reason to dredge to ERL levels. At the December 6, 2011 State Water Board meeting, some stakeholders showed maps of the harbors illustrating an interpretation of the distribution of contaminants in the bed sediment and alleged that the TMDL will require dredging of the entire harbors' footprint. However, there are very sparse sediment quality data in large areas of the Harbors that the stakeholders alleged would need to be dredged. In order to construct the maps, stakeholders extrapolated the sparse data set over large areas that have not yet been sampled.

Attachment C, Figure 1 depicts *sediment condition as assessed using the MLOE approach of the SQOs for protection of aquatic life*. This map clearly shows that the Harbors are characterized by discrete hot spots that probably need to be remediated, while indicating that the majority of the harbors currently supports aquatic life beneficial uses.

Regarding indirect effects, Attachment C, Figures 2 and 3⁹ show the distribution of PCBs and DDT in the Harbors. These figures represent the most current sediment data available (2002-2008) and show the distribution of these contaminants in the Harbors is highly variable. Again, there are hot spots with some overlapping areas of highly elevated DDT and PCB levels. Attachment C, Figures 2 and 3 also show that a significant number of sites throughout the harbors are currently below or near the BSAF levels for PCBs and DDT to protect fish tissue. These data show that other remedial technologies (e.g. natural attenuation) can be considered to address contaminants in larger areas, such as Outer Harbor. In concert with fish tracking studies to characterize the feeding habits and locations of resident fish species, this means that removal of all greater Harbor sediments, especially given a 20 year implementation schedule, will not be necessary.

Finally, as described in Issue 2, an assessment methodology for protection of human health, i.e. indirect effects (SQO Phase 2), is expected to be available from the State Water Board in the near future. As discussed, the Harbors Toxics TMDL anticipates the completion of Phase 2 and includes a compliance pathway for the Indirect Effects TMDLs using the State Water Board's SQO for indirect effects (BPA p. 21). To clarify the Los Angeles Water Board's intent, it is suggested that language is included in the State Water Board's approving resolution to make clear that compliance with the indirect effects TMDL may be demonstrated using the assessment methodology that will be adopted as Phase 2 of the SQOs or, alternatively, using site-specific sediment quality values to address the fish tissue impairment.

ISSUE 4A: TMDL REQUIREMENTS OVER 20-YEAR IMPLEMENTATION SCHEDULE AND ASSOCIATED RESPONSIBLE AGENCIES

Requirements for upstream cities (i.e., those that do not directly discharge to waterbodies covered by the Harbor Toxics TMDL) are limited. Upstream cities that are already covered under metals TMDLs are only required to monitor to demonstrate that they do not discharge contaminated sediments that may settle in the LA and LB Harbors. During the 20 year implementation plan, municipalities are only required to comply with interim wasteload allocations which are set at the 95th percentile of current pollutant concentrations.

Clarification on municipal requirements for TMDL compliance is provided in Attachments D and E. Attachment D identifies, for each responsible agency, whether it is assigned a wasteload allocation, a load allocation, and/or monitoring and reporting requirements. Attachment E provides an overview of implementation requirements for three time periods – the first five years, years 5-20, and by the end of the 20-year schedule – for groupings of responsible agencies (generally, subwatershed-based).

Generally:

⁹ Figures 2 and 3 of Attachment C were generated using data provided by the Ports. The data were also used by the Ports for Figure 1 and other figures presented at the State Board hearing.

- Compliance with the final wasteload and load allocations is not required until 2032. This will afford responsible agencies the time to conduct studies to support refinement of the TMDL and to put in place implementation measures/BMPs to achieve final allocations, taking into consideration natural attenuation that will also occur over the 20-year time period.
- The TMDL only requires compliance with interim allocations – set at the 95th percentile of existing pollutant concentrations – in the next 20 years.
- The Harbor Toxics TMDL does not assign any wasteload allocations to municipalities within the Los Angeles River and San Gabriel River watersheds. Only limited monitoring and reporting are required of these municipalities, consistent with their obligations under separate approved TMDLs.
- The Harbor Toxics TMDL assigns bed sediment load allocations to four groups of responsible agencies:
 - Greater Harbor Waters load allocations: cities of Los Angeles (POLA) and Long Beach (POLB) and the State Lands Commission
 - Los Angeles River Estuary load allocations: cities of Los Angeles, Long Beach and Signal Hill, Los Angeles County, Los Angeles County Flood Control District and Caltrans
 - Dominguez Channel Estuary load allocations: cities of Los Angeles, Long Beach, Carson, Compton, Gardena and Torrance, Los Angeles County, Los Angeles County Flood Control District, and Caltrans
 - Consolidated Slip load allocations: City of Los Angeles, Los Angeles County and Los Angeles County Flood Control District
- The TMDL requires implementation of actions at prioritized hot spots according to an approved Sediment Management Plan as early as possible¹⁰.
- Beginning three years after the effective date, the TMDL requires submission of annual monitoring and implementation progress reports.
- The TMDL recommends special studies be undertaken in support of reconsideration at Year 6.

ISSUE 4B: IMPLEMENTATION OF ALLOCATIONS IN PERMITS

The TMDL provides several options for municipalities to demonstrate compliance with interim and final wasteload allocations.

- Compliance with the interim concentration-based sediment allocations may be demonstrated via any one of three different means in permits (consistent with Section VII.B. of the EB&E Plan):

¹⁰ See BPA, p. 31, which states that "[p]rioritized sites shall include known hot spots, including but not limited to Consolidated Slip and Fish Harbor. For these prioritized sites, the sediment management plan shall include concrete actions and milestones, including numeric estimates of load reductions or removal, to remediate these priority areas and shall demonstrate that actions to address prioritized hot spots will be initiated and completed as early as possible during the 20-year TMDL implementation period."

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 SQO Part 1 (Direct Effects SQOs), is met in the receiving water; or
 2. Meet the interim allocations in bed sediment over a three-year averaging period; or
 3. Meet the interim allocations in the discharge over a three-year averaging period.
- Where the Implementation Plan(s) demonstrates a reasonable assurance that the interim allocations will be met, and progress will be made toward achieving final allocations, the Los Angeles Water Board may specify an action-based/BMP compliance path in permits.
 - Compliance with permit effluent and/or receiving water limitations based on the final mass-based allocations is not required until 2032. Final mass-based allocations may be expressed in permits in a variety of ways based on the permit's administrative record. These may include any one or a combination of the following:
 - As receiving water limitations consistent with the SQO Part 1 (for direct effects, and when available, indirect effects);
 - As receiving water limitations expressed as three-year average bed sediment concentrations (using site-specific sediment quality guidelines (SQVs), once developed);
 - As effluent limitations based on sediment quality values and applying a factor to account for the fraction of the load deposited in the bed sediments of the receiving water (as determined based on special studies and/or modeling);

ISSUE 5: IDENTIFICATION OF TMDL PROVISIONS AND OPPORTUNITIES TO RESPOND TO NEW DATA AND INFORMATION AND REVISE TMDL TARGETS, ALLOCATIONS, AND RELATED REQUIREMENTS

The Regional Board will reconsider the TMDL in light of special studies that inform our current understanding of loading, fisheries life histories, and sediment and tissue linkages, and effects.

The Harbors Toxics TMDL recognizes that a TMDL is built on current data and information, but that there will be opportunities to refine our scientific understanding of the Greater Harbors system during the TMDL's implementation period. In this sense, the TMDL is a living document and provides opportunities to conduct special studies, collect new data, and address new policies. Given the scope and complexity of the TMDL, Vice Chair Spivy-Weber indicated that it would be helpful to elucidate areas of current knowledge and direction and those areas where we anticipate continuing research and development – the results of which can be used to refine the TMDL well in advance of the final implementation deadline.

TMDL Components/Guidance currently available	Future Policies/Special Studies included in Implementation Schedule to refine TMDL
A. Numeric Targets <ul style="list-style-type: none"> • Water Column – CTR • Fish Tissue – OEHHA FCGs 	<ul style="list-style-type: none"> • SQO Phase 2 assessment methodology for Indirect Effects • Toxicity Policy

TMDL Components/Guidance currently available	Future Policies/Special Studies included in Implementation Schedule to refine TMDL
<ul style="list-style-type: none"> • Sediment <ul style="list-style-type: none"> ○ Narrative SQOs for Direct Effects and Indirect Effects (See SQO Part 1, pp. 1, 3) ○ Numeric: NOAA TECs and ERLs 	<ul style="list-style-type: none"> • Special Studies: <ul style="list-style-type: none"> ○ Stressor Identification Studies ○ Foraging ranges of targeted fish; resident species ○ Linkage between sediment concentrations and desired fish tissue concentrations ○ Fish consumption study
<p>B. Sediment Allocations</p> <ul style="list-style-type: none"> • Calculated based on the sediment quality value (SQV) for chemical identified in the SQO Part 1 TMDL = Sediment dep. rate x SQV • SQV is initially set equal to <u>lower of</u> ERL value or BSAF derived value¹¹ 	<ul style="list-style-type: none"> • Initial SQVs may be replaced based on future site-specific (toxic or benthic impact) studies or stressor identification studies. • BSAF derived values may be replaced based on harbor-specific sediment and fish tissue linkage studies that focus on resident species. • Evaluation of need for additional allocations to address impairments.
<p>C. Model and Linkage Analysis</p> <ul style="list-style-type: none"> • Hydrodynamic and Sediment- Contaminant Transport Model (EFDC) • The Watershed Model Development for Simulation of Loadings to the Los Angeles/Long Beach Harbors Report (LSPC) 	<ul style="list-style-type: none"> • Additional information/monitoring data may be used to refine the existing watershed/receiving model • The Los Angeles Water Board and the Ports of LA/LB will work together to refine the EFDC/LSPC models
<p>D. Assigned WLAs among responsible parties (Staff Report, Appendix III)</p> <ul style="list-style-type: none"> • $TMDL_{Watershed} = Sed. \text{ dep. rate} \times SQV$ • $WLA_{Watershed} = TMDL \times \% \text{ Watershed contribution}$ • $WLA_{Permittee} = WLA_{Watershed} \times \% \text{ Drainage Area}$ 	<ul style="list-style-type: none"> • Additional information may be used to refine the distribution of allocations among responsible parties • Special study on fraction of suspended sediment in discharge that is deposited to bed sediment
<p>E. Alternative compliance pathways for fish tissue targets by 2032:</p> <ol style="list-style-type: none"> a. Fish tissue targets are met in species resident to the TMDL waterbodies¹² b. Final sediment allocations are met c. Sediment numeric targets to protect fish tissue are met in bed sediments over a three-year averaging period d. Demonstrate that the sediment quality condition protective of fish tissue is achieved per the Statewide Enclosed Bays and Estuaries Plan, as amended ('SQO Phase 2'). 	<ul style="list-style-type: none"> • Special studies for foraging ranges of targeted fish will be used to select appropriate species of fish to determine compliance with fish tissue target relative to the condition of the Greater Harbor waters and bed sediments.

¹¹ The BSAF accounts for the sediment concentration, the associated food web, and the target fish tissue level.

¹² A site-specific study to determine resident species shall be submitted to the Executive Officer for approval.

TMDL Components/Guidance currently available	Future Policies/Special Studies included in Implementation Schedule to refine TMDL
<ul style="list-style-type: none"> Required monitoring includes fish tissue testing for several species (i.e., white croaker; a sport fish; a prey species). 	

Although this is arguably the most studied TMDL in the region (work has been ongoing since 2005), the Los Angeles Water Board recognizes that our scientific understanding of the impairments in the Dominguez Channel and Greater Harbor Waters and the dynamics of the system will continue to increase as new monitoring data are collected and special studies completed. This TMDL has been developed in recognition of this, and as such, multiple avenues to refine the TMDL are included in the implementation plan, as indicated above.

While our understanding will continue to expand over the 20 year term of the implementation of this TMDL, the Los Angeles Water Board and USEPA have determined based on extensive analysis that there is compelling evidence of impairment and sufficient knowledge of the sources contributing to the impairment to embark on actions to restore these waterbodies in order to protect human health and ensure a healthy ecosystem. Please let me know if I can provide any additional information or if there are any other issues that we should further elucidate before the State Water Board meeting to consider approval of this TMDL.

Attachments:

- A. Process Diagram for Direct Effects TMDLs
- B. Process Diagram for Indirect Effects TMDLs
- C. Maps of Distribution of Contaminants in Harbor Sediments
- D. Table of Requirements for Each Municipality and Other Responsible Agencies
- E. Table of TMDL Requirements over 20-year Implementation Period

cc (w/ attachments):

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