**Attachment 3. Specific review comments (as prepared by Weston Solutions for Port of Long Beach):**

| REVIEW COMMENTS | DATE: JULY 8, 2008 | |
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| REVIEWED BY Weston Solutions, Inc.. | | |
| ACTIVITY: **Review of "Total Maximum Daily Loads for Toxic Pollutants in Dominguez Channel and Greater Los Angeles and Long Beach Harbor Waters Draft: Water Quality Assessment, Problem Statement, Numeric Targets", CA RWQCB and EPA Region 9, May 2008.** | | |

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| Pg 16, Table 2-3 | 1 | Chrysene is not included in the table, although it is included in the Functional Equivalency Document, Table 12. Should be included for comparison with Chrysene sediment results, as Chrysene is included in Table 2-17, assessment findings | |
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| Pg 19, Table 2-6 | 2 | Pollutant/waterbody combinations included in this table are not consistent with the final 2006 §303(d) list. We assume the document provides the review of data to assess the veracity of the original list and clarify the listing as a part of the Problem Statement; however, this is not clearly stated in Section 2 of the document. If so, these details should be included in the text. | |
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| Pg 20, 1st paragraph, lines 3 and 4 of Section 2.6 | 3 | "…data from various monitoring sources, for the period of 1992 to 2006." According to the Water Quality Control Policy, data of any age can be used in the assessment, although many states require that data of less than 5-10 years of age be used in water quality evaluations. Care should be taken during the current evaluation to ensure that these data (especially data collected prior to 1998) are representative of current conditions within the water body. Due to the large number of dredge and fill activities in the Harbor area over the time period since 1992, spatial evaluation of the applicability of data should be completed and presented within the text of this document. | |
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| Pg 21, Table 2-7 | 4 | There is not a clear line of evidence to demonstrate that sufficient data are available to list fish tissue in the Inner Harbors. Most fish data for Inner Harbors is relatively old. | |
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| Pg 26, 4th paragraph | 5 | "We extracted records from 1992 to 2001, including results from Bay Protection Toxic Cleanup Program (1992, 94, 96, 97), Bight 1998, Western EMAP 1999, and dredge studies." Evaluation studies of dredge material are not suitable sources of data for this water quality assessment. These sediments have been removed from the system, and the data collected to evaluate them are therefore not representative of current conditions within the Harbor. | |
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| Pg 26, 5th paragraph, last line | 6 | "Future monitoring efforts will benefit significantly from lower detection limits for comparison with these and other relevant sediment quality guidelines." What future studies will be included in the evaluation of discharge from upstream sources? Data from these outfalls is necessary for accurate TMDL load allocations. What data have been collected? These data should be included in TMDL development. | |
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| Pg 30, 3rd paragraph: CSTF Database | 7 | For DDT listing (4 of 18 fish samples) and PCB listing (7 of 18 fish samples) all fish data were combined from all four water bodies. In addition, the predominant fish evaluated were non-consumable fish.There does not seem to be sufficient data to characterization of Inner Harbor to list fish tissues. | |
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| Pg 31, 2nd paragraph | 8 | "2.3 Summary of data on pollutant basis" inconsistent header numbering. Prior heading is 2.6.3 Fish and Shellfish Tissue | |
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| Pg 31, 2nd paragraph, 1st line | 9 | "Copper, lead, and zinc were most commonly above numeric criteria for various waterbodies." Why is this comparison stated in the assessment portion of the document? Data should be compared to listing criteria and not numeric targets for the TMDL. | |
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| Pg 32. 5th paragraph: Sediment toxicity | 10 | There is insufficient sample number to list the sediments as toxic within the Inner and Outer Harbors, separately. It is assumed that Bight data are being used to determine the listing. If so, this limited data set uses only one whole sediment amphipod toxicity test, which may not be adequate to establish toxicity. Confounding factors such as grain size or ammonia may have impacted the organisms' responses. The developing sediment quality guidelines recommend 2 out of 3 tests be used to estimate toxicity and a range of species are available to mediate confounding factors. The Bight program only uses the *Eohaustoruis* amphipod which is well known to be less tolerant of fine grained sediments, often found in harbors. | |
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| Pg 32. 6th paragraph: Benthic Community | 11 | The use of the randomly collected data, including Bight and POLA/POLB sediment survey data would be most appropriate for evaluating the benthic health of the inner and outer harbors. The Port of LA and LB have just finished analyzing the benthic data that were collected concurrently with the POLA/POLB sediment survey collected in 2006. The data were evaluated using the Bight '03 protocols. Based on this randomly collected data we believe benthic listings for these large spatial areas may not be appropriate. The Ports will be providing this data under a separate submittal. | |
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| Pg 33. LA Inner Harbor | 12 | 1. Nomenclature used to describe the "Inner Harbor" needs to be consistent. The use of "LA Inner Harbor" implies this discussion only concerns the Port of LA's jurisdictional area within the "Inner Harbor". We recommend removing LA from this header for clarity.<br>2. It is unclear what toxicity data was used for listing assessment. Need to see toxicity data used to establish listing.<br>3. Sediment data from areas that have been dredged should be removed from the evaluation. The use of the 2006 sediment data, may be the most appropriate to evaluate listings.<br>4. Dredging activities are about to take place in the Cabrillo Marina, benzo[a]pyrene exceedances may be non-existent in the near future in this area.<br>5. SPME data may not be sufficient on a geographic scale to justify listing of DDT and PCBs for all waterbodies<br>6. Benthos: Bight '03 and POLA/POLB sediment survey data are available. You should note the Bight programs prior to '03 were evaluated using different calculation methods, therefore the older Bight and biobaseline data may not be used as a direct comparison to the Bight '03 data.<br>7. From page 30, DDT listing (4 of 18 fish samples) and PCB listing (7 of 18 fish samples) all fish data were combined from all four waterbodies. In addition, the predominant fish evaluated were non-consumable fish. Again there does not seem to be sufficient characterization of Inner Harbor to list fish tissues. | |
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| Pg 34. LA Outer Harbor | 13 | 1. Nomenclature used to describe the "Outer Harbor" needs to be consistent. The use of "LA Outer Harbor" implies this discussion only concerns the Port of LA's jurisdictional area within the "Outer Harbor". We recommend removing LA from this header for clarity.<br>2. Need to see toxicity data used to establish listing.<br>3. SPME data may not be sufficient on a geographic scale to justify listing of DDT and PCBs for all waterbodies<br>4. From page 30, DDT listing (4 of 18 fish samples) and PCB listing (7 of 18 fish samples) all fish data were combined from all four waterbodies. The predominant fish evaluated were non-consumable fish. Again there does not seem to be sufficient characterization of Inner Harbor to list fish tissues. | |
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| Pg 34. Cabrillo Marina | 14 | See comment No. 12 -4, the benzo[a]pyrene data for Cabrillo Marina may be obsolete in the near future. | |
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| Pg 37, Table 2-17 | 15 | Assessment findings in the table are not associated with any matrix. The reader must assume that metals and PAHs are associated with sediment; PCBs DDTs associated with tissue; and toxicity associated with sediment. Is this correct? | |
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| Pg. 38 last sentence through second paragraph on Pg. 39 | 16 | "these sediment targets are not put forth as dredge clean-up or action levels" this seems in conflict with "To develop TMDLs, it is necessary to translate the narrative objective into numeric targets that identify the measurable endpoint or goal of the TMDL and represent attainment of standards".<br>Therefore it is necessary for the Board and the EPA to draw a clear line of evidence on how the narrative objectives were determined.<br>The developing state sediment quality guidelines do not support the use of ER-Ls and ER-Ms in determining "impacted" or "unimpacted" sediments. The scientific committee for the developing State Sediment Quality Objectives recommend multiple lines of evidence be used to demonstrate an impact associated with specific chemical guidelines. Using one "clear-line" will not link exceedance to an impact.<br>If using the listing criteria, most of these analytes would not be listed for Inner and Outer Harbors, yet the "attainment" goals are not achieved.<br>Provide rational for using ER-L, ER-M and PELs as listing criteria and numeric targets. | |
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| Pg 39, 2nd paragraph | 17 | "The selection of ER-Ls as numeric targets over ER-M values provides an explicit margin of safety." No calculated value of how much of a margin of safety has been provided. Use of the ER-L vs. the ER-M is an implicit margin of safety, but no basis or justification for the action is presented in the text..<br>Provide scientific rational for use of ER-Ls and ER-Ms. | |

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| Page 40, Toxicity, Paragraph 2 | 18 | There are no established protocols by USEPA or by top scientists at top universities for evaluating sediment toxicity using the TUc (toxicity unit chronic). The TUc was designed for evaluating effluent-based toxicity only, where multiple concentrations of an effluent sample are evaluated. The Basin Plan applies to the evaluation of water pollution and thus the TUc is appropriate as an endpoint. The only published application of the toxic unit to sediment toxicity data has been for the TUa (toxic unit acute; Weston et al., 2008[1]). Here, TUa = measured concentration of a chemical in sediment/$LC_{50}$ for that specific chemical. However, to apply this approach, the concentration of each chemical in sediment must be known and the $LC_{50}$ for each corresponding chemical for the species of interest must also be known. This procedure is more routinely applied to the pore water testing and there are instructions for use as published by the USEPA. Based on the lack of use of the TUc for sediment evaluations by top scientists at both USEPA and public research institutions, this value is not recommended. Instead, following published guidelines, the TUa could be applied to the following cases: 1) where sediment chemical concentrations and $LC_{50}$ values are known for a specific species, 2) where pore water toxicity is evaluated, or 3) where sediment elutriate toxicity is evaluated. In cases 2 and 3, multiple concentrations of aqueous samples are evaluated.<br>Therefore, we believe the use of TUc are not appropriate for sediment we recommend comparison to control or reference material. | |

[1] Weston, DP, Zhang, M, Lydy, MJ. Identifying the cause and source of sediment toxicity in an agriculture-influenced creek. Environ Toxicol Chem. 2008 Apr ;27 (4):953-62.

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| Page 40, Sediment Toxicity | 19 | Regarding the statement "The proposed sediment toxicity target is set at no observable sediment toxicity with sediment samples defined as toxic by sediment toxicity testing if the following criteria are met: 1) there is a significant difference in mean organism response between a sample and control… and 2) the mean organism response in the toxicity test (expressed as a percent of the laboratory control) was less than the threshold based on the 90$^{th}$ percentile Minimum Significant Difference (MSD) value expressed as a percent of the control value"<br><br>The concept of the "90$^{th}$ percentile Minimum Significant Difference (MSD)" per the statement above is not being used in the correct context. The 90$^{th}$ percentile MSD is a value determined when comparing the variability of one test (i.e., for an amphipod such as *L. plumulosus*) with another test (i.e., with a worm such as *N. arenaceodentata*), given a specific sample size, such as in Anderson et al. (1998[2]). This concept should be kept separate from that which is described in the developing state sediment quality objectives document (State Water Resources Control Board Resolution No. 2008-0014) in which the following two results are the only results indicating that a sediment sample is nontoxic 1) there is NOT a significant difference in mean organism response between a test sample and control, and the percent response is $\geq$ 82%; OR 2) IF there is a significant difference in the mean organism response of a test sample and control, then the mean organism response in the test sediment must be at least 90% of the mean organism response of the control to be considered nontoxic. | |
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[2] Anderson, BS, Hunt, JW, Phillips, BM, Tudor, S, Fairey, R, Newman, J, Puckett, HM, Stephenson, M, Long, ER, an Tjeerdema, RS. Comparison of marine sediment toxicity test protocols for the amphipod *Rhepoxynius abronius* and the polychaete worm *Nereis (Neanthes) arenaceodentata*. Environmental toxicology and chemistry , 17(5):859-866.

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| Pg. 42 DDT sediment targets | 20 | Written "targets which, if achieved, will ensu(r)e that there is no impairment to beneficial uses".<br>1. Assurance of impairment due to DDT does not seem possible to ensure at this time. No amount of attainment within the "Harbors" will be adequate to ensure no impairment due to elevated levels in nearby areas and the migrating nature of fish.<br>2. All of the literature cited sediment quality values for DDT and metabolites (Table 3-5, page 42) are inappropriate because they were not developed to be indicative of bioaccumulative effects.<br>3. Any sediment target level established for DDT within the Inner Harbor will be ineffective in significantly reducing fish tissue concentrations in migrating, often consumable, fish. Based on recent randomly sampled surficial sediment data (Weston 2006 and Bight 94, Bight 98 and Bight 03) DDT concentrations are often lower within the Inner and Outer Harbor waters than in adjacent areas outside of the Harbor. Therefore attainment within LA Harbors prior to attainment in nearby source areas will be ineffective.<br>4. We cannot set a clean up standard in sediment for the reduction of fish tissue concentrations without drawing a clear relationship between the two media.<br>5. Most of the Inner and Outer Harbor areas meet the recommended CTR criteria discussed in Table 3-6. Attaining those values will not affect changes<br>6. From Bight 03 report "An estimated 71% of the Southern California Bight area had detectable levels of total DDT in sediments. Total DDTs averaged 20±17 ug/kg. The highest total DDT concentrations were observed on the Palos Verdes shelf." Sediment data suggests this area continues to be a major source of input into the Inner and Outer Harbors. Meeting numeric targets within this confined space, relatively small areal region in proportion to the entire southern California Bight, cannot effect a meaningful change in bioaccumulation of DDT in fish. | |
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| PCB sediment targets | 21 | PCB targets for sediment to attain fish tissue criteria were not discussed, but many of the concerns described in the above comment apply. Written "targets which, if achieved, will ensu(r)e that there is no impairment to beneficial uses".<br>1. Assurance of impairment due to PCB tissue concentrations by reducing sediment concentrations may not be adequate to ensure no impairment due to elevated levels in nearby areas and the migrating nature of fish.<br>2. All of the literature cited sediment quality values for PCBs are likely inappropriate because they were not developed to be indicative of bioaccumulative effects.<br>3. We cannot set a clean up standard in sediment for the reduction of fish tissue concentrations without drawing a clear relationship between the two media. | |
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| Pg 1, 2nd paragraph, lines 4 through 8 | 22 | The identification of contaminants on the 303(d) list should be updated to reflect the assessment performed in the problem statement (following revision) for specific pollutants. | |
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| Pg 24, 2nd paragraph | 23 | "The procedure for establishing initial conditions for contaminants in the sediment bed… approximately 250 to 300 data points were selected for each contaminant". Please provide the list of data used for contaminant sites. Were any of these data collected for dredge assessments for material that was subsequently removed? If so the inclusion of these data will not be indicative of existing conditions. The sources of these data are not clearly identified in the document. | |
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| Pg 30, Figure 14 | 24 | Please indicate data sources used and identify which data were excluded together with rationale for exclusion. | |
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| Pg 51 | 25 | Model calibration was not performed but rather a sensitivity analysis. It is unclear why calibration was not performed other than the concept that it would be cost prohibitive. What would be required in terms of number of samples, types of samples, etc. to calibrate the model? | |
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| Pg 53, 2nd paragraph, last sentence | 26 | "In water bodies having significant existing or legacy contaminant of the sediment bed, net flux of sediment, metals, and organics from the bed to the water column due to erosion and slower diffusive flux can represent a significant source to the water column." This is a general statement true of any waterbody. Does the model demonstrate this? And in what locations? Based on the data presented in Appendix C it appears to be a global statement. | |
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| Appendix C pg C3 | 27 | The summary suggests mitigation strategies and identifies sources as watershed based. Consideration in source analysis needs to be made of aerial derived sources of contaminants as well. The following calculations were made from the **METAL DRY DEPOSITION RATES ALONG A COASTAL TRANSECT IN SOUTHERN CALIFORNIA,** Lisa D. Sabin and Kenneth C. Schiff, Southern California Coastal Water Research Project, **March 20, 2007** Technical Report 509, and applying those results to a simple calculation to get a rough estimate of other sources of copper.<br>Cu:<br>1) From aerial deposition: 22 ug/m2/day * 365 days * 30205832m2 (area of water within the POLB and POLA jurisdiction)*1x10-12 metric tons = 0.24 metric tons (534 lb) per year are deposited directing onto the surface of the water, not accounting for runoff , indirect deposition from near land areas or wet deposition.<br>2) From Bight 03, 46% of the total Bight area is enriched<br>Zn:<br>3) From aerial deposition 160 ug/m2/day * 365 days * 30205832m2 (area of water within the POLB and POLA jurisdiction)*1x10-12 metric tons = 1.76 metric tons (3880 lb) per year are deposited directing onto the surface of the water, not accounting for runoff , indirect deposition from near land areas or wet deposition.<br>4) From Bight 03, 23.3% of the total Bight area is enriched<br>Pb:<br>5) From aerial deposition 14 ug/m2/day * 365 days * 30205832m2 (area of water within the POLB and POLA jurisdiction)*1x10-12 metric tons = 0.15 metric tons (330 lb) per year are deposited directing onto the surface of the water, not accounting for runoff , indirect deposition from near land areas or wet deposition.<br>6) From Bight 03, 17.9% of the total Bight area is enriched | |
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