WPHA
Western Plant Health Association

VIA ELECTRONIC MAIL: cbeegan@waterboards.ca.gov

November 30, 2007

Mr. Chris Beegan
State Water Resources Control Board (SWRCB)
Division of Water Quality
P.O. Box 100
Sacramento, CA 95812-0100

Re: Draft Staff Report Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality

Dear Mr. Beegan:

On behalf of the Western Plant Health Association (WPHA) I am providing this response to the State Water Resources Control Board (SWRCB's) report entitled "Draft Staff Report Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality" dated September 27, 2007. Both general and specific review comments are presented below.

WPHA represents the interests of fertilizer and crop protection manufacturers, distributors, formulators and retailers in California, Arizona, and Hawaii, and our members comprise more than 90 percent of all the companies marketing crop protection products in these states. WPHA welcomes the opportunity to comment on this document that proposes a strategy to address sediment quality in enclosed embayments and estuaries of California.

General Comments:
This report represents the SWRCB's formal water quality planning and substitute environmental document for the adoption of sediment quality objectives (SQOs) and program of implementation that would apply to enclosed bays and estuaries of California. These SQOs would provide the State and Regional Water Quality Control Board (RWQCB) stakeholders and citizens of California with a technically robust mechanism to differentiate sediments impacted by toxic pollutants from those not impacted by toxic pollutants in coastal regions. The SQOs proposed through this program do not address excessive sediment loading (siltation or sedimentation) related impairment or degradation.

Support of MLOE approach. This report represents a "science-based" effort that uses a well documented Multiple Lines of Evidence (MLOE) approach for assessing impairments due to toxic chemicals in sediment. The MLOE approach for sediment that includes sediment chemistry, sediment toxicity and benthic community assessments is essential to reduce uncertainty in determining sediment impairment determinations. In contrast to water column impairment issues where one line of evidence (i.e., water quality criterion or objective) may be sufficient (but not preferred), sediment contaminant issues are much more complex.

Complexity issues with sediment make an objective based approach premised on a single line of evidence such as chemical criterion problematic for the following reasons:

- Variations in the bioavailability of sediment associated contaminants;
- Multiple pathways of exposure resulting from both direct effects (contact with sediment); and
- Indirect effects (as a result of bioaccumulation and transfer to higher trophic levels).

Therefore, WPHA supports the SWRCB's MLOE approach for SQOs in bays and estuaries of California.

Consistency across Regions. Due to the complexity of sediment impairment issues as discussed above, it is critical that this program have consistent testing and sampling procedures, data analysis and data interpretation among regions in California to ensure success. Therefore, WPHA encourages the SWRCB to provide guidance and oversight to all nine RWQCB for SQOs. The current format used for water column impairment issues where each Region conducts assessments and interprets data on a region specific basis (and often differently) will not work for SQOs due to the complexity of sediment issues discussed above. For example, if one RWQCB only uses one line of evidence for sediment impairment and other RWQCB use all three lines of evidence there will be inconsistent impairment assessments conducted across the State. Section 3 (Environmental Setting) supports our point as 4 regions currently use benthic community degradation for impairment listings, but the other regions do not. WPHA understands that suggesting that the SWRCB should provide guidance to RWQCB is a policy issue. However, this type of oversight and control by the SWRCB will be necessary for successful implementation of this program. WPHA would also support having the panel of experts like the Scientific Steering Committee (SSC) be involved with the development of this report, or a panel of experts with similar expertise be retained to help guide the implementation of this program and provide transparency.

Future vision for freshwater systems. As discussed above, the MLOE approach adopted in this report is science based, well documented in the peer-reviewed literature and has been used in other areas of the country (and world) to assessment impairment in sediment. However, the MLOE approach discussed in this report only addresses bays and estuaries per the stated objectives. Due to potential sediment toxicity issues in freshwater aquatic systems in California, WPHA suggests that it would be useful to include a section (i.e., future vision section) in the report to show how the state will expand the MLOE approach to freshwater lotic (i.e., streams and rivers) and/or lentic (i.e., ponds and lakes) of California. WPHA firmly believes it is critical that a consistent MLOE approach be used for assessing sediment impairments in all types of water bodies in California. The financial considerations section below also applies here.

Dealing with uncertainty. Uncertainty is an extremely important but often overlooked issue with all methods used in science. The report's narrative of the MLOE approach, the backbone of the SQOs method described in the document, needs to have a specific section that clearly states the uncertainty with all three lines of evidence proposed: sediment chemistry, sediment toxicity, and benthic community assessments.

Below are few of WPHA's brief examples for each line of evidence that should be further reviewed and expanded by the SWRCB staff:

- Uncertainty with sediment chemistry would include such issues as consistent sediment sampling methods and analytical sediment chemistry methods for all sediment, limitations with the suite of chemicals measurements, and spatial/temporal scale completeness issues.

- Uncertainty with sediment toxicity would include testing only a limited group of species (i.e. primarily amphipods) and assuming that these species represent the biological community and are indicators of sediment impairment.

- Uncertainty with assessments of resident biological (benthic) communities would include establishing a reference baseline for comparison (reference sites or reference conditions), and the influence of physical and chemical factors (i.e., grain size, salinity) on benthic assemblages.

Specific beneficial uses. This report describes an approach to develop SQOs for the reasonable protection of beneficial uses for bays and estuaries in California. A generic list of beneficial uses for all bays and estuaries is described in Table 5.1 and the report states that Commercial and Sports Fishing and Marine/Estuarine Habitat should be protected. However, there is no specific listing of beneficial uses for each bay and estuary that will be subjected to the SQO described in this document. This critical information on specific beneficial uses for all bays and estuaries should be included in the report.

Species sensitivity. A major goal of the proposed SQOs is to protect the most sensitive aquatic organisms. If SQOs are to protect the most sensitive aquatic organisms then the authors should state how they plan to do accomplish this goal. For example, will a species sensitivity distribution (SSD) be developed to determine which species are most sensitive to the various toxic chemicals measured in sediment? It is highly likely that species sensitivity will be chemical specific. Is there a comprehensive sediment toxicity data base that will be used to determine the sensitivity of various resident benthic species to various chemicals measured in sediment? WPHA would appreciate the SWRCB's response to these critical scientific questions.

Description of receptors. Selection of appropriate receptors for the assessment of sediment quality is a critical element described in the report. The report states that the sediment-related exposure receptors for the SQOs are benthic communities exposed directly to pollutants in sediment and humans exposed indirectly through fish and shellfish tissue. These are appropriate receptors. A general description of data sets for benthic communities is documented in the report (Appendix C). However, a description and documentation of the fish and shellfish data sets that will be used to address the human health receptor is not described (other than a general reference to SWRCB, 2006). For example, what species of fish are included in the data set and are these fish resident or migratory? Migratory fish may bio-accumulate toxic chemicals from areas other than the locations from which they are collected. This would complicate source identification. Other variables such as fish size and life stage should also be described. For shellfish tissue data, factors such as spawning periods - which can impact lipid in tissue and influence bio-accumulation of toxic chemicals would also need to be described. Are the fish and shellfish data sets that will be used for these SQOs available within one state agency?

Is there a well documented Quality Assurance/Quality Control program in place to ensure the quality of these data? Once again, WPHA would appreciate the SWRCB's response to these critical scientific questions.

Sediment deposition rates. A primary goal of the proposed SQOs is to protect benthic species, and the sediment used to make this determination will be collected from the top 2 cm (biologically active layer) in the sediment bed. Are data available from depositional studies in coastal California bays and estuaries that would provide insight on the annual depositional rates in these areas (i.e. sediment trap studies)? For example, does the top 2 cm of sediment represent one year of deposition? This type of analysis should differentiate new sediment from resuspended sediment on an annual basis. It is also possible that annual depositional rates may differ spatially and by water body type (bays and estuaries).

Financial considerations. The spatial and temporal scale of coupled chemical exposure and biological data sets needed for successful development of SQOs will be a key issue. At present the only areas with adequate data sets for benthic communities are Southern California's enclosed bays and marine lagoons and polyhaline San Francisco. For other bays and estuaries, the data sets are inadequate. WPHA poses two key financial questions for the SWRCB:

- Will financial resources be available to collect the data needed to make this program successful in all coastal areas of California?
- Who will be responsible for funding this effort? It will be prudent and less expensive in the long term to use the comprehensive MLOE approach initially to avoid the error and expense associated with "false positives" (incorrect impairment designations).

Potential contradictions in existing laws. The Regulatory Baseline Section (Section 4) provides a very useful overview of the various State and Federal laws and associated objective plans and policies that relate to the development of SQOs. Are there any examples where these various laws contradict each other (i.e., allowing possible lawsuits) or are they all in agreement and complementary in terms of establishing SQOs?

Specific Comments- by page are listed below:

Page iii – An executive summary is needed for the report.

Page i (List of Tables) – The page numbering is incorrect as this page should be vi and the next page should be vii and so on.

Page viii (correct page number) – The Appendix D should be Economic Consideration report (not High Priority Bay Protection Sites).

Page 1, par. 1, lines 6-10 – This sentence is missing an important word (see bolded suggestion listed below). It should read "SQOs would provide the State and RWQCB stakeholders and interested parties with a technically sound mechanism to differentiate sediments impacted by toxic pollutants from those that are not consistently **impacted** throughout the coastal regions".

Page 1, last sentence – WPHA would suggest including benthic community assessments as another source of information that should be used as the basis for SQOs.

Page 2, Section 1.3 – Scientific Peer Review – The report should clearly state the legal obligations and process associated with the peer-review. How are qualified peer-reviewers selected if they are not included within an existing institutional agreement? How are review comments addressed and who decides which comments to include or disregard?

Page 3, Scientific Steering Committee (SSC) – The use of a SSC with highly recognized experts is an excellent idea. WPHA recommends that this panel (or a panel of similar experts) be retained throughout the implementation process of the SQOs.

Page 4, second line from the bottom – It would be useful if the authors can provide an example of how economic considerations are used in the development of water quality objectives.

Page 6, 1.8 PROPOSED PROJECT AND DESCRIPTION, definition of the Sacramento-San Joaquin Delta – The estuary definition for the Sacramento-San Joaquin Delta includes the entire legal Delta as defined by Section 12220 of the California Water Code. Certain of the channels found in this large inland geographical area contain fresh water. WPHA recommends that the intent of Phase II of the project be clarified with respect to the applicability of future MLOE SQOs to inland fresh surface waters as distinct from the mixing zones for fresh and ocean waters. See also the general comment above on freshwater systems.

Page 8, par. 3, line 1 – Figure 1 should be Figure 2.1

Page 8, par. 4, line 2 – Figure 2 should be Figure 2.2

Page 9, par. 2, line 6 – Figure 2 should be Figure 2.2

Page 9, par. 4, line 12 – Figure 1 should be Figure 2.1

Pages 12 – 27 (Environmental Settings) – Maps are needed to show the spatial extent of all 9 Regions.

Page 15, Table 3.1 and all the tables in this section that include impairment listings based on sediment chemistry – Which aquatic benchmarks were used for various chemical derived listings (ERMs, ERLs, TELs etc)? For PAHs and PCBs were the data normalized for TOC? What frequency of exceedence of the benchmark was used for the listings (i.e., more than once in 3 years, only one exceedence)?

Page 15, Table 3.2 and all tables in this section that include listings based on tissue concentrations of chemicals – Which tissue thresholds were used for the tissue derived listings? Please refer to WPHA's concerns on the use of fish and shellfish tissue data as listed above in the General Comments section.

Page 16, Table 3.3 – WPHA is quite concerned that hydrophobic chemicals such as DDT and dieldrin are used for listing of impaired sites based on measurements in the water column. Can the authors provide any insight on this issue?

Page 17, Table 3.4 – Which specific pesticides were used for the pesticide listings in this table. The same comment would apply to all the other tables in this section where pesticides were used for a listing.

Page 27, Section 4.1.1, par. 2 – Section 13392.5 of the Bay Protection and Toxic Cleanup Program (BPTCP) requires the RWQCBs in consultation with the SWRCB develop monitoring and surveillance, and suggested guidelines to promote standardized analytical methodologies and consistency in data reporting and identification of additional monitoring and analyses needed to complete the toxic hot spot assessment for each enclosed bay and estuary. This law would seem to promote the idea that the **State Board should be the controlling agency** ensuring standardization of methods and interpretation of data for all California regions associated with environmental regulations such as the development of SQOs. This law would support WPHA's general comments (see previous section) that the SWRCB should provide guidance and oversight to the RWQCBs to ensure uniformity and consistency with the SQO process.

Page 28 (bottom of page) and page 29 (top of page) – The report states that biological effects at a site were determined to be associated with toxic chemicals if chemical analysis demonstrated significantly higher levels compared to reference sites. More details are needed to describe the reference sites and how they were selected.

Page 30, top of page – It is not clear, what is actually Appendix D (Economic Analysis or High Priority Protection Sites)?

Page 36, Basin Plan Narratives – Please explain why are all of the basin plan narratives different for each of the Regions?

Page 36, Water Quality Control Plan for the North Coast Region – second bullet – Does this mean that any detected concentration of a chemical found in tissue is a violation?

Page 36, Water Quality Control Plan (Basin Plan) for the San Francisco Bay Basin –second bullet – How are controllable water quality factors defined?

Page 39, Section 4.4.2 – The Bruns et al 2007 reference (which is missing from the reference section) states that the Central Valley RWQCB cannot use bio-assessment data due to lack of assessment tools. Bio-assessments have been conducted in the Central Valley for many years; therefore, the assessment tools are certainly available to use bio-assessment data in a regulatory context as other Regions in California have done. The Central Valley approach to use only **one line of evidence** for impairment designations will lead to the increased probability of "false positive" results.

Page 40, par. 1, line 9 – There is no Smith et al 1999 reference in the reference section.

Page 41, Section 4.4.3, par. 1, line 12 – How are mixing zones defined in California?

Page 50, Section 4.8.6, par. 1 – There seems to be contradiction in this paragraph that needs to be resolved. Sentence 3 states that atmospheric deposition potentially accounts for 57-100% of the total trace metal loads in storm-water within Los Angeles. However, the last sentence in this paragraph states that direct atmospheric deposition accounts for a very small fraction of the NPS pollution.

Page 52, last line – Appendix A needs a Table of Contents.

Page 54, par. 2 - More details are needed on the reference envelope approach discussed in this paragraph.

Page 55, Staff Recommendation – Alternative 2, use only surficial sediment, is recommended. If data sets are available from studies where sediment is collected below 2 cm then how will these data be used?

Page 61 – last two lines – It is stated that PAHs do not bio-accumulate in tissues. This is incorrect as there are numerous examples in the literature demonstrating that PAHs can bio-accumulate in tissues of aquatic organisms (see Salazar et al. 2005).

Page 68, Table 5.4 – One issue that should be considered with the use of *Ampelisca* is that this is a high salinity species ($\geq$ 28 ppt). Therefore, it would not be appropriate to use it in low salinity areas of bays or estuaries.

Page 69, Section 5.5.2.3, par. 1 – WPHA **does not** support the use of best professional judgment by RWQCB staff to interpret sediment toxicity data. A consistent set of guidelines should be used by all RWQCBs (as supported by Staff Recommendation, Alternative 2 on page 74).

Page 70, par. 3 – The initial words in this sentence should be Figure 5.1 not Plate 5.1.

Page 70, Basis for Thresholds, line 3 – Should be Figure 5.1 not Plate 5.1.

Page 70, Low Toxicity Threshold, last line – Should be Figure 5.1 not Plate 5.1.

Page 71, par. 3, line 3 – Plate XX needs to be filled in and described as Figure "XX".

Page 72, line 5 – Plate 5.1 should be Figure 5.1.

Page 74, middle of page for Staff Recommendation – WPHA agrees with the three categories of low, moderate, and high sediment toxicity in Table 5.5 as magnitude of toxicity is addressed. Perhaps this point could be added to support these categories. This approach also provides a better assessment of data for toxicity ranking as opposed to using either toxic or non-toxic (binary approach).

Page 75, par. 2, line 9 – Another possible scenario exists if pollutant concentrations are very low or not detected but significant effects are observed. Joint toxicity, such as synergistic or additive effects, may be occurring from low concentrations of several or many chemicals.

Western Plant Health Association • 4460 Duckhorn Drive, Suite A • Sacramento, CA 95834
Phone (916) 574-9744 • Fax (916) 574-9484 • Web site: www.healthyplants.org

Page 78, par. 3 – This paragraph contains two very important points which WPHA is quite concerned that may be lost in this document and should be highlighted in the Executive Summary. The points made by the authors are:

1. **The new benthos based CSI SQG provided greater accuracy for predicting benthic community condition than did SQGs based on toxicity, and**
2. **The accuracy and ecological relevance of chemical SQGs can be improved by incorporating benthic response data into SQG development.**

Page 80, top of page, Alternative 3 – It is still not clear why the national data sets in concert with data sets from California cannot be used for this sediment chemistry approach. The national data sets are much larger and it is doubtful that the benthos from California Bays and estuaries will have different sensitivity to chemicals in sediment.

Page 81, bottom third of the page under benthic indices – WPHA would encourage the use the macro-invertebrate Observed/Expected (O/E) ratio that is commonly used in freshwater wadeable streams of the U.S. and Europe (See U.S. EPA, 2006; Wadeable Stream Assessment Report and Hawkins, 2006). The O/E ratio measures a specific aspect of biological health: taxa lost at a site. The taxa expected (E) at individual sites are predicted from a model developed from data collected at least-disturbed reference sites; thus, the model allows a precise matching of sampled taxa with those that should occur under specific conditions. By comparing the list of taxa observed (O) at a site with those expected to occur, the proportion of expected that have been lost can be quantified as the ratio O/E. It is stated by the authors that RIVPACS will be used but it is not clear if this is the O/E approach recommended above.

Page 82, Summary of Findings – One finding of this effort is that the judgment of benthic experts provided accurate information on benthic impairment when compared with various indices. WPHA would therefore strongly suggest that a panel of benthic experts should be involved with the development of SQOs.

Page 85, par. 3, line 6 – Plate 5.2 should be Figure 5.2.

Page 87, last bullet on page – Can the authors provide any insight on how often the "Inconclusive Category" will (or may) be found based on previous experience? This is important because an assessment of impact cannot be made with the inconclusive category.

Page 90, Combination of Sediment Chemistry and Toxicity, lines 5 and 6 – A re-occurring theme in this report is that organism response in embayments is drastically different than estuaries. Is there benthic taxa assemblage data or other data available to support this point?

Page 91, Three LOE: Chemistry, Toxicity and Benthic Community – More details are needed to explain how the baseline conditions or reference envelope for the area of interest would be developed. The selection and justification of reference sites is critical for this science based process to succeed. It is also stated in this paragraph that "Statistically significant differences relative to the reference envelope among two of the three lines of evidence would trigger an impacted designation for the study site". Does this mean that significant differences for any two lines of evidence could drive an impairment designation? This approach may be problematic if for example chemistry and toxicity suggest impairment

but the benthic community analysis does not. WPHA recommends that benthic community data (the most important line of evidence) must be one of the two lines of evidence suggesting adverse effects before an impairment designation is assigned.

Page 99, Section 5.7.4, Staff Recommendation at bottom of page – Proposing that the narrative SQOs be applied in NPDES permits as receiving water limits will be problematic. Therefore, WPHA cannot support this recommendation without additional information. All hydrophobic chemicals from an effluent would need to be measured and some type of fingerprinting analysis would need to be conducted to identify specific sources. For example, if copper was in the effluent and also reported in sediment near the outfall how would you tease out natural copper versus the effluent derived copper or perhaps other sources of copper in the area?

Page 116, Section 7.2, par. 2 – This paragraph states the following: *"The implementation language proposed in the draft plan provides direction on how the SQOs shall be implemented within Regions, however within the draft plan each Regional Board retains the authority and flexibility to apply the SQOs in the appropriate regulatory program"*. Providing too much flexibility to the RWQCBs without oversight and control by the SWRCB will result in the inconsistent application of SQOs across the state. (please refer to WPHA's general comment on this issue).

Page 119, Table 7.2 – Does the PAH suite proposed for analysis only include the standard 16 PAHs typically measured by EPA or does this list include the 43 parent and homologues recommended by the Western States Petroleum Association (WSPA). The WSPA list is much more comprehensive as it includes the parent and isomer-specific 2 through 6 ring compounds. Using the WSPA list will aid in the confident identification of the nature and source of PAH assemblages in sediment (petrogenic versus pyrogenic) which will aid in source identification.

The list of chemicals to be measured should also include tributyltin (TBT). Although TBT (an organometallic used in antifouling paint) has been banned on small watercraft, it has a very long half life, is very toxic and may still be a sediment stressor near marinas and harbors.

What background information was used to develop the list of chemicals to be measured? It would seem that an extensive review of all point and non-point sources in the area of study should precede the selection of chemicals to be measured. The "one size fits all approach" may not work.

Does the list of bulk metals to be measured also include an analysis of SEM/AVS to provide insight on the bioavailabilty of metals?

Page 120, Table 7.3 – Various values are listed in the number of samples column ranging from 5 to 30 for the various regions. Do these sample values represent a composite of samples collected within a station grid or is this only one sample collected at a site? This is a critical sampling design issue.

Economic Considerations of Proposed Sediment Quality Plan for Enclosed Bays and Estuaries in California; Executive Summary, Incremental Impact of the Plan, Pages ES-1-2 – *"Under the Plan, Regional Water Boards would list sediment as exceeding the SQOs if multiple lines of evidence (with sufficient data) indicate impairment. This requirement for additional evidence of impairment could potentially reduce the number of water bodies that would be incorrectly listed as impaired for toxic*

substances. Potential costs or cost savings associated with implementing the SQOs depend on the relative stringency of the objectives."

Although the analysis of economic factors is necessarily complicated by various sources of uncertainty, the statement regarding potential reduction in the number of water bodies that would be incorrectly listed as impaired for toxic substances is credible. Reliance on MLOE to make listing decisions logically should provide greater confidence in the decision-making process and result in fewer false positives (and false negatives). The outcome will be greater efficiency in the use of State resources to administer sediment quality programs and reduction in the amount of unnecessary economic burden on the regulated community, while still protecting sediment quality.

Thank you for your consideration of WPHA's general and specific comments, and questions concerning the SWRCB's Draft Staff Report Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality. WPHA appreciates your diligence, and looks forward to reviewing your complete and timely responses to questions raised within this important document. WPHA continues to welcome all opportunities to work with SWRCB on this and other important water and sediment quality issues.

Sincerely,

/s/ Nasser Dean

Nasser Dean
Director, Environmental & Regulatory Affairs

cc via email: George Gomes, CDFA
Cindy Tuck, Cal/EPA
Mary-Ann Warmerdam, DPR
Pamela Creedon, CVWQCB
Ken Landau, CVWQCB
Mark Rentz, DPR
Darrin Polhemus, SWRCB
Steve Schaffer, CDFA
Dr. John Sanders, DPR

References

Hawkins, C. P. 2006. Quantifying biological integrity by taxonomic completeness: Evaluation of a potential indicator for use in regional- and global-scale assessments. Ecological Applications 16:1251-1266.

Salazar, M. H., S. M. Salazar, D. T. Burton and L. W. Hall, Jr. 2005. An integrated case study for evaluating the impacts of an oil refinery effluent on aquatic biota in the Delaware River: Bivalve bioavailability studies. Human and Ecological Risk Assessment 11: 837-859.

USEPA. 2006. Wadeable Streams Assessment: A Collaborative Survey of the Nation's Streams. EPA 841-B-06-002, Office of Research and Development, Office of Water, Washington, DC.