

# Conclusions & Recommendations

## Developing Updated Sediment Quality Objectives

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### Comments on:

*“Draft Staff Report Substitute Environmental Document Proposed  
Amendments to the Water Quality Control Plan for Enclosed Bays and  
Estuaries – Part 1 Sediment Quality for the Protection of Fish and Wildlife”*  
Report of State Water Resources Control Board Division of Water Quality  
January 28, 2011

Comments Submitted to SWRCB March 14, 2011

## SWRCB SQO Plan Adopted in 2008

- Has Several Significant Technical Problems That Can Be Expected to Lead to
  - Unreliable & Incorrect Classification of “Sediment Quality”
  - Inappropriate Sediment “Remediation” Goals
  - Ineffective, Wasteful “Source” Control
  - Failure to Appropriately Identify & Address Real Sediment Quality Problems & Their Causes
  - Squandered Resources
- Most Deficiencies Were Not Remedied in SWRCB Staff 2011 Draft Update

## Recommendations

- Focus Sediment Quality Evaluation on Water Quality Problem Identification, Not Contaminant Concentrations
  - Sediment Toxicity
  - Bioaccumulatable Chemicals in Edible Aquatic Organisms at Levels That Pose a Threat to Human Health
- Adopt Proposed Narrative Sediment Quality Assessment/Objectives
  - Provide Appropriate Guidance on Assessing Sediment Toxicity Based on Toxicity Test Results
- Abandon Trying to Estimate Sediment Toxicity Based on
  - Total Chemical Composition
    - Chemical Composition Not Reliable Indicator of (or Screen for) Sediment Toxicity
    - Few Chemicals of Potential Concern Are Considered in 2008 Plan
  - Altered Benthic Organism Assemblages
    - Many Factors Besides Toxicity Affect Benthic Organism Assemblages

## Recommendations

- Abandon Statistical Correlations for Identifying “Cause” of Sediment Toxicity
  - Not Based in Demonstrated Cause-and-Effect Relationship
  - For Locations Where Sediment Toxicity Found
    - Provide Reliable, Technically Valid Guidance for Identification of Cause of Toxicity
      - Needed to Direct:
        - Sediment Remediation
        - Source Control

**See Discussion:** Lee, G. F. and Jones-Lee, A., “Appropriate Incorporation of Chemical Information in a Best Professional Judgment ‘Triad’ Weight of Evidence Evaluation of Sediment Quality,” Presented at the 2002 Fifth International Symposium on Sediment Quality Assessment (SQA5), IN: Munawar, M. (ed.), Aquatic Ecosystem Health and Management 7(3):351-356 (2004).

<http://www.gfredlee.com/Sediment/BPJWOEpaper.pdf>

# Assessing Sediments as Source of Excessive Bioaccumulation

- Abandon Cumbersome Unreliable Modeling to Try to Determine Role of Sediment-Associated Chemicals as Source of Bioaccumulatable Chemicals

- Use Direct Benthic Organism Uptake

- Use US EPA Guidance as Described in:

Lee, G. F., Jones-Lee, A., and Ogle, R. S., "Preliminary Assessment of the Bioaccumulation of PCBs and Organochlorine Pesticides in *Lumbriculus variegatus* from City of Stockton Smith Canal Sediments, and Toxicity of City of Stockton Smith Canal Sediments to *Hyalella azteca*," Report to the DeltaKeeper and the Central Valley Regional Water Quality Control Board, G. Fred Lee & Associates, El Macero, CA, July (2002).

[<http://www.gfredlee.com/HazChemSites/SmithCanalReport.pdf>]



# Key Problems Needing Rectification by SWRCB in Updated SQO Plan

- Draft Update Fails to Address/Correct Significant Technical Deficiencies in September 16, 2008 SQO Plan
  - Co-Occurrence-Based SQOs Allowed to Continue if Incorporated into TMDL Goals Prior to February 19, 2008
    - Well-Known That There Is No Cause & Effect Relationship between Total Concentrations of Chemicals in Sediment & Sediment Toxicity or Bioaccumulation as Used in Co-Occurrence Guidelines
    - Co-Occurrence-Based Objectives & Regulatory Instruments Are Unreliable & Misleading
    - 2011 Draft Report Needs to State Emphatically That Screening, Evaluation, & Management Are Not to Be Based on or Incorporate
      - Co-Occurrence-Based Approaches
      - Total Concentrations of Chemicals in Sediment

# Key Problems Needing Rectification by SWRCB in Updated SQO Plan

- Draft Update Plan Maintains Limited Scope of Pollutant Types Addressed
  - Deliberately Excludes Key Pollutants Demonstrated to Be Adversely Impacting Water Quality, Including:
    - Ammonia
    - Aquatic Plant Nutrients That Contribute to Low-DO Problems
    - Pyrethroid-Based Pesticides
  - Focuses on a Few Well-Known but Less Concerning Pollutants
    - Large Amounts of Money Will Be Spent “Remediating” Sediments Unreliably Targeted for Heavy Metal & Legacy Pesticide Content
      - May or May Not Be Causing Water Quality Problems
  - Ignores Known, More Important Causes of Sediment Water Quality Impacts

# Key Problems Needing Rectification by SWRCB in Updated SQO Plan

- Part 1 2008 SQO Plan Should Be Amended to
  - Eliminate “Grandfathering” of Previously Adopted, Co-Occurrence-Based TMDL Remediation Goals
  - Eliminate Incorporation of Total Contaminant Concentrations from SQO Protocols for Evaluation of “Sediment Quality” and Sediment Toxicity
    - Narrative SQOs Based on Direct Measurement of Toxicity Should Become Primary Tool for Assessing Toxicity-Related Sediment Quality
  - Eliminate Reliance on Statistical Correlations for Identifying Cause of Sediment Toxicity



# April 2, 2011 Staff Responses to Comments on September 2008 SQO Plan & Revisions

[[http://www.waterboards.ca.gov/water\\_issues/programs/bptcp/docs/sediment/final\\_rtc\\_2011\\_04\\_01.pdf](http://www.waterboards.ca.gov/water_issues/programs/bptcp/docs/sediment/final_rtc_2011_04_01.pdf)]

- Staff Did Not Adequately Address Significant Technical Deficiencies in September 2008 Plan Raised in Our Comments
- Response to Essentially All of Our Comments:
  - “Comments Outside the Scope of the Proposed Amendments or Not Enough Information to Respond*
  - This acts as a general response to the following comments. The following comments do not warrant any changes to the proposed amendments at this current time because they*
    - (1) are outside the scope of the proposed amendments by raising issues that are not under Board consideration at this time;*
    - (2) do not address the specific amendments proposed for the Board's consideration; or*
    - (3) do not provide sufficient information for staff to respond. Staff is therefore unable to respond to these comments at this time. However, staff will consider and evaluate these comments when the Enclosed Bays and Estuaries Plan, Part 1: Sediment Quality is next reviewed.”*
- Until SWRCB Makes Appropriate Revisions in 2008 SQO Plan, State of CA Will Be Without Reliable & Implementable Regulatory Program for Controlling Significant Adverse Impacts of Chemical Contaminants in Aquatic Sediments

## Action Needed

- SWRCB/State of CA Needs to Take Necessary Steps to Prevent US EPA Region 9 from Further Imposition of
  - Technically Invalid Co-Occurrence-Based TMDLs
  - Technically Invalid Co-Occurrence-Based Remediation Goalson CA Stormwater Management Agencies & Other Dischargers

## Conclusions

- SWRCB 2008 SQO Plan
  - Overly Cumbersome
  - Overly Expensive
  - Can Readily Lead to Incorrect Assessment of
    - Sediment Quality
    - Remediation Goals
    - Sources/Causes of Toxicity & Bioaccumulation Problems
- 2008 SQO Plan Needs Revision to Focus on
  - Reliable Identification of Chemicals in Aquatic Sediments as Cause of Waterbody Impairment
  - Assessment of Excessive Bioaccumulation of Sediment-Associated Contaminants Based on Direct Benthic Organism Uptake Assessment Rather Than Models

# Conclusions

- These Conclusions & Recommendations Based on ~5 Decades of
  - Study of Relationships between Sediment Chemical Composition and Toxicity
  - Development of Sediment Quality Objectives
  - Implementation of Sediment Remediation Programs
  - ~\$1.5-million Studies
  - ~90 Professional Papers & Reports on Sediment Quality Issues
- 2011 Staff Draft Update Should Be Remanded Back to Staff to Address Issues Raised in These Comments

## Conclusions

- CA Water Code § 13393 Requires SWRCB to Develop Sediment Quality Objectives (SQOs) for Toxic Pollutants in CA's Enclosed Bays & Estuaries
- SWRCB Has Still Not Developed Technically Valid, Implementable SQOs That Can Be Used to Effectively & Reliably Regulate Water Quality Impacts of Chemical Contaminants in Aquatic Sediments



**Further Information**  
Consult Website of  
**Drs. G. Fred Lee and Anne Jones-Lee**



**<http://www.gfredlee.com>**

See “Contaminated Sediments” Section

**<http://www.gfredlee.com/psedqual2.htm>**