California Regional Water Quality Control Board
Central Valley Region
Katherine Hart, Chair

Linda S. Adams
Secretary for
Environmental Protection

11020 Sun Center Drive #200, Rancho Cordova, California 95670-6114
Phone (916) 464-3291 • FAX (916) 464-4645
http://www.waterboards.ca.gov/centralvalley

Arnold Schwarzenegger
Governor

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To: Interested Parties

SUPPLEMENTAL INFORMATION FOR THE STAKEHOLDER MEETING FOR A PROPOSED BASIN PLAN AMENDMENT TO ADDRESS ORGANOCHLORINE PESTICIDES IN SEVERAL CENTRAL VALLEY WATERBODIES

This document provides supplemental information for the upcoming stakeholder meeting on 17 June 2010 at the Regional Board offices in Rancho Cordova for a proposed Basin Plan Amendment (BPA) to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins. The proposed Amendment will develop Total Maximum Daily Loads (TMDLs) for Organochlorine (OC) pesticides in several waterbodies located in the Sacramento River basin, San Joaquin River basin and Sacramento-San Joaquin Delta.

This supplemental packet provides some background on OC pesticides, the applicable waterbodies and project area for the OC TMDL, possible sources of OC pesticides and potential alternatives for numeric targets. This information is provided to encourage early stakeholder discussion about potential alternatives and approaches for the OC TMDL and no policy or regulation is either expressed or intended. These stakeholder meetings are to encourage early involvement and will be followed by the formal BPA process, for example formal comment periods on the Public Review Draft and revised Final Draft Staff Report (including draft BPA text) prior to Regional Board adoption hearing (August 2011). Staff encourages comments on additional options or any other relevant information that should be considered during the BPA process.

This proposed Amendment will include:

- Development of TMDLs to implement numeric targets/water quality objectives in several Central Valley waterbodies.
- Program of implementation for the TMDLs
- Surveillance and monitoring program
- Compliance schedule

A series of stakeholder meetings in the form of Modules are proposed. Preliminary draft BPA text associated with each module will be provided approximately two weeks prior to each meeting. Below are the proposed modules and tentative meeting dates.

Module #	Topic	Proposed Dates
1	Project Scope, Watershed background, Sources, Potential Targets	June 17th
2	Linkage Analysis and Allocations (Load Allocations and Waste Load Allocations)	Aug. 3rd
3	Implementation and Early Action Items	Sept. 20th
4	Compliance Schedule/Monitoring and Surveillance	Nov. 3rd
5	Synthesis of all previous Modules	Jan. 18th 2011

1.0 Purpose of Meeting

The purpose of the stakeholder meetings is to provide a forum for public consultation in an informal setting on the development of a proposed amendment to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins to establish TMDLs to address Organochlorine Pesticides in several Central Valley waterbodies.

2.0 Background

OC pesticides have been detected in the water column, sediment and biota collected from several waterbodies in the San Joaquin River, Sacramento River and the Bay Delta watersheds at concentrations high enough to warrant the listing of the affected reaches on the 2006 Clean Water Act (CWA) section 303(d) list of impaired waterbodies. This proposed Amendment includes 21 waterbody reaches listed for OC pesticides impairment within the Central Valley (See Table 1).

Historically, OC pesticides were primarily used as insecticides, fungicides and antimicrobial chemicals in residential properties and agricultural pest control and were banned in the mid-1970s (US EPA, 1972). Despite this ban, sampling events conducted over three decades continue to detect these pesticides in fish (OEHHA 2001; de Vlaming, 2008) as well as in the water column and sediment (Larson et al., 1997).

Organochlorine pesticides mainly consist of DDT and Group A compounds. Dichloro-Diphenyl-Trichloroethane (DDT) is persistent, binds tightly to soil/sediment and breakdowns very slowly in the environment. It is degraded to its isomers: o,p'- and p,p'- DDT, o,p'- and p,p'- Dichloro-Diphenyl-Dichloroethylene (DDE) and o,p'- and p,p'- Dichloro-Diphenyl-Dichloroethane (DDD). Group A pesticides consist of a total concentration from the following organochlorine pesticides: aldrin, dieldrin, endrin, heptachlor, heptachlor epoxide, chlordane (total), hexachlorocyclohexane (total) including lindane, endosulfan (total), and toxaphene. They have similar chemical properties to DDT and are persistent in the environment.

3.0 Watershed and Project Area Description

The project area for the proposed Amendment includes watersheds of the 21 waterbody reaches listed in Table 1. These waterbodies are located in the Sacramento River Basin, the San Joaquin River Basin and the Sacramento-San Joaquin Delta. A detail description of the waterbody reaches, watersheds, and the project area can be found in the Handout that was used for the CEQA Scoping Meeting at:
http://www.waterboards.ca.gov/centralvalley/water_issues/tmdl/central_valley_projects/central_valley_organochlorine_pesticide/2009jul07_ceqa_scoping_mtg/oc_ceqa_scoping_handout.pdf

Below is a brief overview of the three watersheds.

3.1 Sacramento River Watershed

Two of the waterbodies in the proposed Amendment are located within the Sacramento River watershed, the Colusa Basin Drain and the lower Feather River (Lake Oroville Dam to confluence with the Sacramento River). The Colusa Basin Drain conveys runoff and agricultural return flows from about 1 million acres of watershed and discharges to the Sacramento River at Knights Landing. The Feather River is one of the principal rivers of the Sacramento River watershed, and flows approximately 60 miles through the Sacramento Valley from Oroville Dam to the confluence with the Sacramento River at Verona.

Table 1. 303(d) Listings for OC Pesticides in Several Central Valley Waterbodies

Waterbody Reach	Watershed	Pollutant	Size
San Joaquin River (Mendota Pool to Bear Creek)	San Joaquin Basin	DDT* Group A Pesticides**	88 miles
San Joaquin River (Bear Creek to Mud Slough)		DDT Group A Pesticides	14 miles
San Joaquin River (Mud Slough to Merced River)		DDT Group A Pesticides	3 miles
San Joaquin River (Merced River to Tuolumne River)		DDT Group A Pesticides	29 miles
San Joaquin River (Tuolumne River to Stanislaus River)		DDT Group A Pesticides	8.4 miles
San Joaquin River (Stanislaus River to Delta Boundary)		DDT Group A Pesticides Toxaphene	3 miles
Tuolumne River, Lower (Don Pedro Reservoir to San Joaquin River)		Group A Pesticides	60 miles
Stanislaus River, Lower		Group A Pesticides	59 miles
Orestimba Creek (Below Kilburn Road)		DDE***	2.7 miles
Orestimba Creek (Above Kilburn Road)		DDE***	9.1 miles
Merced River, Lower (McSwain Reservoir to San Joaquin River)		Group A Pesticides	50 miles
Feather River, Lower (Oroville Dam to confluence with Sacramento River)	Sacramento Basin	Group A Pesticides	42 miles
Colusa Basin Drain		Group A Pesticides	42 miles
Delta Waterways (Stockton Ship Channel)	Sacramento-San Joaquin Delta	DDT Group A Pesticides	1,603 Acres
Delta Waterways (Eastern portion)		DDT Group A Pesticides	2,792 Acres
Delta Waterways (Western portion)		DDT Group A Pesticides	14,524 Acres
Delta Waterways (Southern portion)		DDT Group A Pesticides	3,125 Acres
Delta Waterways (Northern portion)		DDT Group A Pesticides	6,795 Acres
Delta Waterways (Central portion)		DDT Group A Pesticides	11,425 Acres
Delta Waterways (Export area)		DDT Group A Pesticides	583 Acres
Delta Waterways (Northwestern portion)		DDT Group A Pesticides	2,587 Acres

* DDT: refers to Total DDT which is the sum of ortho and para DDTs, DDDs and DDEs.
** Group A pesticides consist of a total concentration from the following organochlorine pesticides: aldrin, dieldrin, endrin, heptachlor, heptachlor epoxide, chlordane (total), hexachlorocyclohexane (total) including lindane, endosulfan (total), and toxaphene.
*** Orestimba Creek listed for DDE in the water column.

3.2 San Joaquin River Watershed

As shown in Table 1, the San Joaquin River (SJR) watershed has eleven reaches in the proposed Amendment stretching from Mendota Pool to Airport Way Bridge near Vernalis. The project area for these reaches includes the entire area draining to the SJR downstream of the Mendota Dam and upstream of the Airport Way Bridge near Vernalis. The SJR Basin includes the lower reaches of the major eastside tributaries, downstream of the major dams and reservoirs. Also included in the proposed Amendment are smaller watersheds within the SJR Basin including the watersheds of the lower SJR, lower Tuolumne River (Don Pedro Reservoir to San Joaquin River), Orestimba Creek (Below Kilburn Road), Orestimba Creek (Above Kilburn Road), and the lower Merced River (McSwain Reservoir to San Joaquin River).

3.3 Sacramento-San Joaquin Delta

The legal boundary of the Sacramento-San Joaquin Delta comprises over 700 miles of interconnected waterways and encompasses 1,153 square miles of diked islands and tracts. On the 2006 303(d) List, the Delta is divided into 8 portions designated as Delta waterways including the Stockton Ship Channel. Many of the Delta waterways follow natural courses while others have been constructed to provide deepwater navigation channels, to improve water circulation, or to obtain material for levee construction. Four rivers, the Sacramento, the San Joaquin, the Mokelumne, and the Cosumnes feed the Sacramento-San Joaquin Delta.

4.0 Beneficial Uses

The beneficial uses associated with the waterbodies in the proposed Amendment are presented in the Basin Plan (Basin Plan, 2007) which are summarized in Table 2a. The beneficial uses of the waterbodies most applicable to OC pesticides are based on the protection of human health (MUN), and aquatic life in the water column, sediment and tissue.

The beneficial uses for Orestimba Creek, a tributary of the lower San Joaquin River, were determined based on the State Water Board Resolution No. 88-63 (Sources of Drinking Water Policy) and Basin Plan Page II-2.0, which states, “The beneficial uses of any specifically identified waterbody generally apply to its tributary streams”.

5.0 Possible Sources of OC Pesticides

Current sources of OCs are predominantly related to their historic applications in urban, residential and agricultural settings. Potential sources for OCs in the project area could be point sources (storm sewer discharges and historic spills), nonpoint sources (agricultural fields, previous residential applications, open space and channel erosion), as well as some background sources through wet and dry atmospheric deposition. With most of the OCs previously deposited on terrestrial soils, erosion and transport of these contaminated sediments continues to contribute to detectable levels in stream bed sediment. Currently available data in the Central Valley reveals presence of OCs in the water column, sediment and fish tissue.

Table 2a. Beneficial Uses of the Impaired Reaches summarized from Basin Plan

Waterbody (Included Reach)	MUN	AGR	REC1	REC2	SPWN	WARM	COLD	MIGR	WILD	IND	NAV
San Joaquin River - (Mendota Dam to Sack Dam)	P	E	E	E	E	E		E	E	E	
San Joaquin River – (Mouth of Merced to Vernalis)	P	E	E	E	E	E		E	E	E	
San Joaquin River (Sack Dam to Mouth of Merced River)	P	E	E	E	E	E		E	E	E	
San Joaquin River (Mouth of Merced River to Vernalis)	P	E	E	E	E	E		E	E	E	
Tuolumne River (New Don Pedro Dam to San Joaquin River)	P	E	E	E	E	E	E	E	E		
Stanislaus River (Goodwin Dam to San Joaquin River)	P	E	E	E	E	E	E	E	E	E	
Merced River (McSwain Reservoir to San Joaquin River)	E	E	E	E	E	E	E	E	E	E	
Feather River (Fish Barrier Dam to Sacramento River)	E	E	E	E	E	E	E	E	E		
Colusa Basin Drain		E	E		E	E	P	E	E		
Sacramento-San Joaquin Delta[1] (Stockton Ship Channel) (Eastern portion) (Western portion) (Southern portion) (Northern portion) (Central portion) (export area) (Northwestern 5 E portion)	E	E	E	E	E	E	E	E	E	E	E

E = Existing beneficial use
P = Potential beneficial use
MUN = Municipal and domestic supply
AGR = Agriculture (irrigation)
REC1 = Contact Recreation
REC2 = Other non-contact recreation
SPWN = Spawning (Warm/Cold)
WARM = Freshwater habitat
COLD = Freshwater habitat
MIGR = Migration of aquatic organisms
WILD = Wildlife habitat
IND = Industrial service supply
NAV = Navigation

Table 2b. Beneficial Uses of the Impaired Reaches not included in Table II-1

Water body	MUN	AGR	REC1	REC2	SPWN	WARM	COLD	MIGR	WILD	IND	NAV
Orestimba Creek (Below Kilburn Road) (1)	P	E	E	E	E	E		E	E	E	
Orestimba Creek (Above Kilburn Road) (1)	P	E	E	E	E	E		E	E	E	

The pages that follow are clarification on the Target Options presented in the partial preliminary draft BPA Text (June 2010), pgs. 2-4.

[1] Table 2a footnote: (8) Beneficial uses vary throughout the Delta and will be evaluated on a case-by-case basis.

6.0 Potential Numeric Targets

TMDLs require quantitative numeric target(s) and allocations to implement water quality standards (water quality objectives and the beneficial uses). TMDL targets could consist of numeric water quality objectives (existing or new) and/or targets may be used to interpret narrative water quality objectives. Suitable numeric target(s) will be evaluated based on all available guidelines relevant to OC pesticides. The potential targets presented in this document are provided for discussion purposes only, and are not intended to be inclusive of all possible target options. Additional targets may be proposed for consideration by the public.

Water Column Target Options

The Basin Plan has a narrative toxicity water column objective. (Basin Plan III-6.01): *No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses.* OC pesticides affect human and aquatic life beneficial uses which makes this narrative objective pertinent to the proposed Amendment.

6.1. Potential Water Column Targets

Option 1: Combination of existing A) Basin Plan Objective AND B) CTR Criteria

Option 1A.

Basin Plan Water Quality Objective

The Basin Plan States that: *Total identifiable persistent chlorinated hydrocarbon pesticides shall not be present in the water column at concentrations detectable within the accuracy of analytical methods approved by the Environmental Protection Agency or the Executive Officer.* (Basin Plan III-6.01).

As an example, typical current detection limits (http://www.emalab.com/epa_mrl.htm) for OCs analyzed using EPA method 8081A for the water column are presented in the Table below. Detection limits will vary with the medium of extraction and method of analysis used. Detection limits likely will change over time. (Text in this paragraph updated: See Addendum pg. 1)

Constituent	Common Method Detection Limits using EPA Method 8081A for the Water Column Maximum Residue Limits (MRL), µg/L
DDT and its isomers	
DDTs (total)*	0.10
p,p'-DDD	0.10
p,p'-DDT	0.10
p,p'-DDE	0.04
Group A Pesticides	
Aldrin	0.04
Dieldrin	0.02
Endrin	0.04
Heptachlor	0.03
Heptachlor epoxide	0.80
Chlordane (total)**	2.50
Hexachlorocyclohexane	
gamma-BHC (Lindane)	0.04
alpha-BHC	0.05
beta-BHC	0.05
delta-BHC	0.05
Endosulfan (total)	
alpha-Endosulfan	0.14
beta-Endosulfan	0.04
Endosulfan Sulfate	0.04
Toxaphene	2.50

Table update: 06/15/10
See Addendum Pg. 1

* Sum of ortho and para DDTs, DDDs and DDEs
** Sum of alpha and gamma chlordane, cis- and trans-nonachlor and oxychlordane
------ Constituent exists as an independent listing

AND,

Option 1B.

California Toxic Rule (CTR):

In 2000, US EPA established numeric water column criteria for priority toxic pollutants for the State of California (40 CFR 131; CTR) (US EPA, 2000a). The CTR criteria are intended to protect aquatic organisms, predator species and humans. The human health criteria pertaining to consumption of water and organisms has a risk level of 10^{-6} while aquatic life is protected through the Criterion Continuous Concentration (CCC). The CCC is an estimate of the highest concentration of a pollutant in surface water to which an aquatic community can be exposed for an extended period of time (4 days) without deleterious effects (chronic).

To see the CTR criteria, please refer to the Preliminary Draft BPA Text (June 2010), Table XX.1, pg. 2.

Where more than one objective (target) may be applicable, as shown above, the most stringent water quality objective applies.

6.2. Potential Fish Tissue Targets

The Basin Plan does not have numeric objectives for fish tissue but has a narrative toxicity objective that could serve as the basis for potential TMDL targets.

(Basin Plan III-8.01):

All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.

Option 1:

Fish Contaminant Goals

With the exception of Orestimba Creek, the waterbodies in the proposed Amendment were listed as impaired based on fish tissue data that exceeded the 1999 screening values recommended by the state Office of Environmental Health Hazard Assessment (OEHHA). The OEHHA 1999 SVs were calculated based on a study of some California Lakes considering a 70 kg adult using a cancer risk of $1x10^{-5}$ with a fish consumption value of 21 g/day.

The OEHHA 1999 fish tissue Screening Values (SVs) were recently revised for some OC pesticide constituents in June 2008. The OEHHA 2008 threshold values are termed as Fish Contaminant Goals (FCGs) which are based on a 10^{-6} cancer risk, and assume consumption of 32 grams per day of fish by a 70 kilogram adult who frequently consumes fish. This consumption represents the average amount of fish consumed daily, distributed over a 7-day period, using an 8-ounce serving size, prior to cooking. FCGs trigger consumption advice and indicate public health risk.

However, the OEHHA 2008 FCGs were updates for only a portion of the OCs namely chlordane (total), DDT (total), dieldrin and toxaphene. As a result, the OEHHA 1999 Screening Values (SVs) for fish tissue serve as the most currently available known science for the OC constituents not addressed in the revised OEHHA 2008 guidelines. Numeric targets for endrin, heptachlor epoxide, gamma-BHC (Lindane), alpha-BHC and endosulfan (total) will be selected from the OEHHA 1999 SVs. The 1999 OEHHA SVs are presented as a separate column in Table XX.2 of the preliminary BPA text.

To see the OEHHA 2008 FCGs and OEHHA 1999 SVs, please refer to the Preliminary Draft BPA Text (June 2010), Table XX.2, pg. 2.

Option 2:

Tissue Threshold Residue Levels
Fish tissue endpoints could be back-calculated from CTR human health criteria using bio-concentration factors (BCF) obtained from scientific literature. The proposed targets, Threshold Tissue Residue Levels (TTRLs), are derived from CTR human health criteria for consumption of water and organisms. (*See Table XX.1, pg. 2, in Preliminary BPA Text, June, 2010*).

Tissue Threshold Residue Levels (TTRL) assume the following relationship:
TTRL = Cw * BCF
Where: TTRL = Threshold Tissue Residue Level (µg/kg wet weight)
Cw = CTR Human Health Water Criterion (µg/L)
BCF = Applicable bio-concentration factors derived from literature (L/kg).
To see the TTRLs, please refer to the Preliminary Draft BPA Text (June 2010), Table XX.3, pg. 3.

Option 3:
Advisory Tissue Levels:
In 2008, OEHHA developed Advisory Tissue Levels (ATLs) as a guideline for setting fish consumption advisories. ATLs are used by OEHHA as part of a process to develop traditional health advisories (that focus on fish whose consumption should be restricted or avoided altogether). These advisories inform consumers which fish with low contaminant levels are considered safe to eat frequently and provides associated benefits of fish consumption.
To see the ATLs, please refer to the Preliminary Draft BPA Text (June 2010), Table XX.4, pg. 3.

6.3. Potential Sediment Targets

The Basin Plan does not have numeric objectives for sediment but has narrative toxicity objectives that could serve as the basis for potential TMDL targets.

Narrative sediment water quality objectives:
(Basin Plan III-6.0)
Discharges shall not result in pesticide concentrations in bottom sediments or aquatic life that adversely affect beneficial uses.

(Basin Plan III-7.0)
The suspended sediment load and suspended sediment discharge rate of

Option 1A:
Delta Waterways: State Water Board SQOs
For applicable waterbodies listed in Table XX.0 (of the Preliminary BPA text, June 2010) as delta waterways, sediment quality objectives (SQOs) in the Water Quality Control Plan for Enclosed Bays and Estuaries of California will be used as sediment targets for aquatic life-benthic community protection.

In relation to the eight portions of Delta waterways in the Sacramento-San Joaquin Delta, Phase I Sediment Quality Objectives (SQOs) for enclosed bays and estuaries were approved by the US EPA in August 2009 and are in effect (State Water Board, 2008). Staff continues to track on-going Phase II State Water Board's efforts to address indirect effects related to bioaccumulation of pollutants and how the approved Sediment Quality Objectives may be applied and implemented in the Delta waterways in the project area. The Phase II SQOs may/may not be in effect prior to adoption of this proposed Amendment. Staff still needs to

analyze how/if SQOs (Phase I and possibly Phase II) can be implemented to develop targets for the proposed Amendment.

Waterbodies outside the legal Delta (Fresh waterbodies)

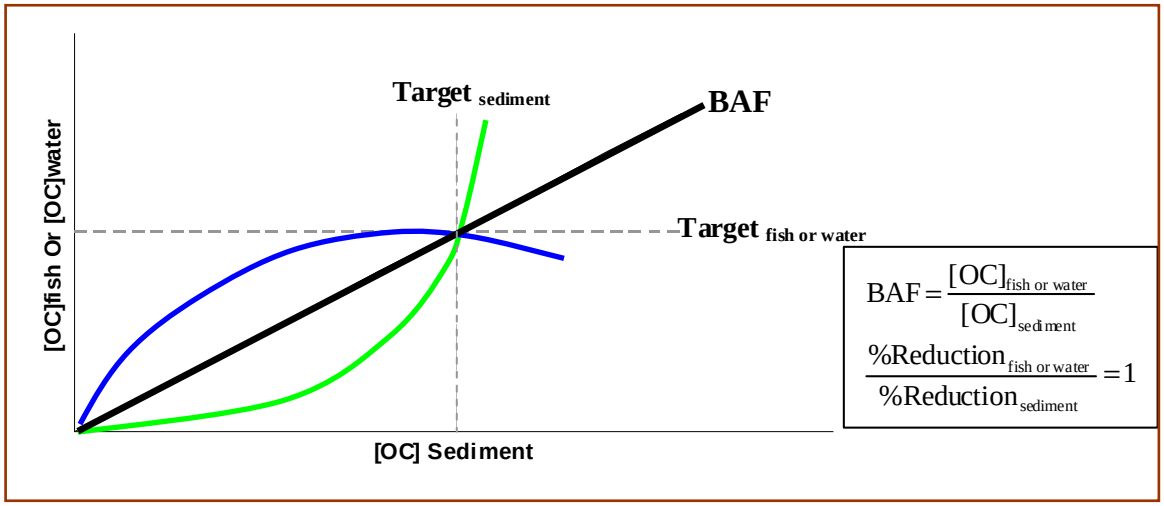
Option 1B:

Linkage to Fish Tissue and Water Column

Sediment targets may be developed through a linkage analysis with percent reduction in pollutant concentrations in fish tissue and water column. The percent reduction approach uses numerical criteria and guidelines for toxic substances such as the OEHHA FCGs for fish tissue and the CTR criteria for the water column.

Targets may be developed as a reduction in sediment concentration, which is based upon fish tissue and water concentrations. In order to translate required reductions in fish tissue and water column concentrations into sediment concentration reductions, it is assumed that the overall sediment–organism bioaccumulation factor (BAFs) for fish tissue to sediment and water to sediment are linear, and that a given percent reduction in fish tissue or water concentration results in an equal percent reduction in sediment concentration (Figure 1). The slope of the line in Figure 1 is the overall sediment–organism bioaccumulation factor (BAF). It is possible that the relationship for fish tissue to sediment and water to sediment may not be linear as shown by the two curves in Figure 1.

Figure 1. Assumptions for translation of reduction in concentration of fish tissue and water to sediment reductions



The basic premise underlying this linkage is that OCs in sediments are taken up directly by benthic feeders. Organisms taking up dissolved OCs are still affected by OCs in sediment, because of adsorption-desorption equilibria. When the OC concentration of sediment in streams approaches zero, the OC concentration in the water column, interstitial waters and the food chain also approaches zero.

Further discussion on this approach will be covered in Module 2: "Linkage Analysis and Allocations (Load Allocations and Waste Load Allocations)"

Option 2:

Calculation of Sediment Targets using Biota-Sediment Accumulation Factor (BSAFs)

BSAFs are based on the relationship between lipid normalized tissue and total organic carbon normalized sediment. BSAFs are used by the US EPA in evaluations of the suitability of dredged sediments for disposal at open water sites according to procedures given in the implementation manuals (EPA/USACE, 1998) for regulating dredging. When a significant relationship is established between pollutant concentrations in a target organism and in sediment, a "safe" sediment concentration can be calculated by dividing an appropriate tissue endpoint or guideline by the BSAF value. This empirical model accounts for pollutant bioavailability, since concentrations are normalized to organic carbon content in sediments and lipid content in tissue.
The biota-sediment accumulation factor (BSAF) is defined as:

$$BSAF = \frac{C_t}{f_t} \div \frac{C_s}{f_{oc}}$$

where, C_t = organism tissue concentration (μg/kg wet weight)
f_t = the lipid fraction in the organism
C_s = pollutant concentration in sediment (μg/kg dry weight)
f_{oc} = organic carbon fraction of sediment

For the BSAF approach, please refer to the Preliminary Draft BPA Text (June 2010), pg. 4.

Option 3:
Using Toxic Effects Level (TEL) NOAA Guidelines
Toxic Effects Levels (TELs) are sediment quality guidelines from the National Oceanographic and Atmospheric Administration (NOAA) and are presented as Screening Quick Reference Tables by NOAA (SQuiRT, Buchman, 1999).

The derivation of TELs is based upon a database of synoptic contaminant concentrations and sediment toxicity bioassays or benthic community metrics. Freshwater TEL calculations make use of the non-toxic samples hence benchmarks are calculated as a geometric mean using the full suite of information from a given database.

For the TELs, please refer to the Preliminary Draft BPA Text (June 2010), Table XX.5, pg. 4.

7.0 Summary

As stated previously, the purpose of this supplemental information is to provide more detail on the partial preliminary draft BPA Text (June 2010) that will be discussed at the 17 June Stakeholder meeting. It is intended to give opportunity for public discussion about potential alternatives and approaches and no policy or regulation is either expressed or intended. As mentioned previously, the proposed stakeholder meetings are to encourage early involvement and will be followed by the formal BPA process, for example formal comment periods on the Public Review Draft and revised Final Draft Staff Report (including draft BPA Text) prior to Regional Board adoption hearing (August 2011). Staff encourages comments on additional options or any other relevant information that should be considered during the BPA process. Any comments or concerns should be raised at the stakeholder meeting or may be presented as written comments by 1 July 2010 (2 weeks following the 17 June meeting).

Please bring this supplemental information to the attention of anyone you know who would be interested in this matter. If you have any questions, please contact me by email at fkizito@waterboards.ca.gov or at (916) 464-4633.

Fred Kizito

Attached: References

8.0 References

Water Quality Control Plan for the Sacramento River and San Joaquin River Basins, Fourth Edition, revised September 2009.

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US EPA. 2000a. California Toxics Rule, Volume 65, No. 97 (Thursday, 18 May 2000), pp. 31682-31719; and Federal Register, Volume 66, No. 30 (Tuesday, 13 February 2001), pp. 9960-9962 [California Toxics Rule Correction] http://www.gpoaccess.gov/fr/browse.html. Accessed: April, 2010.

ADDENDUM : 06/15/2010

As an example, typical current detection limits for OCs analyzed using EPA method 608 for organochlorine pesticides in water samples (municipal and waste water), are presented in the Table below (http://www.epa.gov/waterscience/methods/method/organics/608.pdf). Detection limits will vary with the medium of extraction and method of analysis used. Detection limits likely will change over time.

Constituent	Method Detection Limits using EPA Method 608 (µg/L)
DDT and its isomers	
DDTs (total)*	-
p,p'-DDD	0.011
p,p'-DDT	0.012
p,p'-DDE	0.004
Group A Pesticides	
Aldrin	0.004
Dieldrin	0.002
Endrin	0.006
Heptachlor	0.003
Heptachlor epoxide	0.083
Chlordane (total)**	0.014
Hexachlorocyclohexane	
gamma-BHC (Lindane)	0.004
alpha-BHC	0.003
beta-BHC	0.006
delta-BHC	0.009
Endosulfan (total)	
alpha-Endosulfan	0.014
beta-Endosulfan	0.004
Endosulfan Sulfate	0.066
Toxaphene	0.240

* Sum of ortho and para DDTs, DDDs and DDEs
** Sum of alpha and gamma chlordane, cis- and trans-nonachlor and oxychlordane
------ Constituent exists as an independent listing