2009 Working Se TMDL Documents

Problem Statement

Regional Water Quality Control Board
Santa Ana Region

California Water Boards
State Water Resources Control Board
Regional Water Quality Control Boards

January 15, 2014
Workshop

Purpose

- Review impairment assessment methodology and findings used in 2009 TMDLs/SSOs
  - Understand selection of criteria and guidelines used
  - Understand how water bodies were assessed

2009 Problem Statement

Used 2000-2008 data:

- Water column: 2000-2008
- Freshwater fish tissue: 2002-2008
- Saltwater fish tissue: 2000-2007
- Bird eggs: 2003-2006

2009 Problem Statement

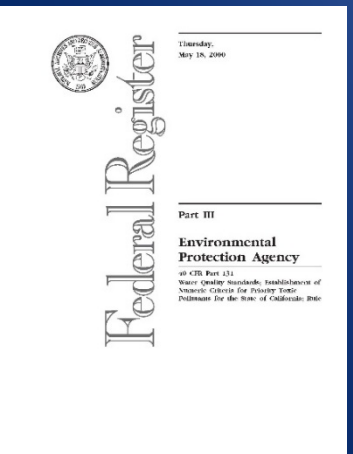
Data from all media types not available for each sampling location

- All QA'd data collected and evaluated
- Multiple lines of evidence considered, where feasible
- 2004 SWRCB Listing Policy assessment methods

2004 Listing Policy Methodology

Data comparisons: Water column

- Se concentrations compared to CTR chronic freshwater criterion (5 µg total recoverable Se/L)
  - Total recoverable/total dissolved data considered essentially equivalent
- In-bay concentrations well below CTR chronic saltwater criterion (71 µg Se/L)



2004 Listing Policy Methodology

Data comparisons: Tissue

- Selected appropriate guidelines to interpret Basin Plan narrative “no toxics in toxic amounts” objective
- Tissue-based guidelines most appropriate:
  - Se bioaccumulated primarily through diet

2004 Listing Policy Methodology

Tissue Guidelines:

- Whole fish and bird egg tissue: Se concentrations compared to middle range of marginal ecological risk guidelines for reproductive effects in fish/birds (Presser *et al.* 2004)
- Fish filets: Se concentrations compared to OEHHA 2008 Fish Contaminant Goals for human health protection

Presser *et al.* 2004 Guidelines

- Compiled by USGS & USFWS; updates USDOI 1998 guidelines
- Includes range of guidelines that define 3 ecological risk levels from Se:
  - No risk (<4 µg Se/g fish; <6 µg Se/g bird eggs)
  - Marginal (4-6 µg Se/g fish; 6-10 µg Se/g bird eggs)
  - Substantive (>6 µg Se/g fish; >10 µg Se/g bird eggs)

Presser *et al.* 2004 Guidelines

Marginal risk levels

- Lie between no effect concentrations and toxicity thresholds
- Provide reasonable protection of beneficial uses

➢ Middle of the marginal risk levels selected:

- Fish (whole): 5 µg Se/g dry wt.
- Bird eggs: 8 µg Se/g dry wt.

OEHHA Fish Contaminant Goals

Human health protection — fish consumption:

- Assume 8 oz. filet per week/32 grams/day
  - 7.4 µg/g wet wt.
  - 30 µg/g dry wt.

    [dry wt conversion assumes 75% moisture content]

2009 Problem Statement

Assessment results summarized for:

- Upper Peters Canyon Wash (upstream of Bryan Avenue)
- Lower Peters Canyon Wash (downstream of Bryan Avenue)
- San Diego Creek, Reach 1
- San Diego Creek, Reach 2
- IRWD treatment wetlands
- San Joaquin Freshwater Marsh Reserve
- Santa Ana Delhi Channel
- Big Canyon Wash
- Upper Newport Bay
- Lower Newport Bay

And tributaries…

Findings of Impairment

Water Bodies Impaired for Selenium:

- 12 of 20 Freshwater drainages/tributaries
- 3 freshwater wetlands
- Upper Newport Bay *

* this finding will be withdrawn

Findings of Impairment

Water column (5 µg Se/L):

- 12 of 20 freshwater drainages/tributaries/reaches (including BCW)
- IRWD wetlands

Fish tissue (5 µg Se/g dry wt):

- Lower Peters Canyon Wash
- Big Canyon Wash (BCNP and wetlands)
- Santa Ana-Santa Fe Channel
- San Diego Creek, Reach 1
- IRWD wetlands
- San Joaquin Freshwater Marsh Reserve (UCI)
- Upper Newport Bay*

* This finding will be withdrawn

Findings of Impairment

Bird eggs (8 µg Se/g dry wt):

- San Diego Creek, Reach 1
- IRWD wetlands
- San Joaquin Freshwater Marsh Reserve (UCI)

Findings of Impairment

- No impairment based on OEHHA FCGs
- Impaired freshwater bodies are within Swamp of the Frogs, except:
  - Santa Isabel Channel
  - Big Canyon Wash

Findings of Impairment

No Impairment Due to Selenium for:

- **8 Freshwater Creeks/Tributaries**
  - Upper Peters Canyon Wash
  - Agua Chinon
  - Hicks Canyon Wash
  - San Diego Creek Reach 2
  - San Joaquin Channel
  - Sand Canyon Channel
  - Bonita Canyon Channel
  - Costa Mesa Channel
- **1 Salt Water Body**
  - Lower Newport Bay

Table 5-8 Summary of Impairment Assessment

Watershed Subarea	Summary of Exceedance Frequencies Used to Determine Impairment				Impaired?[4]
	# of exceedances (total samples)				**Yes**/No
	Water	Fish Fillets[1]	Whole Body Fish Tissue[2]	Bird Egg Tissue[3]	
Freshwater Channels & Tributary Drainages					
Upper Peters Cyn Wash	2(37)	NA	NA	NA	No
Agua Chinon	0(14)	NA	NA	NA	No
Hicks Canyon Wash	2(48)	NA	NA	NA	No
Lower Peters Cyn Wash	155(191)	NA	6(6)	NA	**Yes**
Central Irvine Channel	10(15)	NA	NA	NA	**Yes**
El Modena-Irvine Channel	6(31)	NA	NA	NA	**Yes**
Como Storm Channel	19(21)	NA	NA	NA	**Yes**
Santa Ana-Santa Fe Ch.	18(19)	NA	1(1)	NA	**Yes**
Warner Channel	36(36)	NA	NA	NA	**Yes**
Barranca Channel	2(23)	NA	NA	NA	**Yes**
San Diego Creek Reach 2	3(49)	NA	NA	NA	No
San Diego Creek Reach 1	347(483)	0(13)	16(18)	4(18)	**Yes**
Lane Channel	46(59)	NA	NA	NA	**Yes**
San Joaquin Channel	2(53)	NA	NA	NA	No
Sand Canyon Channel	0(8)	NA	NA	NA	No
Bonita Channel	2(47)	NA	NA	NA	No
Santa Ana Delhi Channel	122(148)	NA	NA	NA	**Yes**
Big Canyon Wash	24(25)	NA	4(4)	NA	**Yes**
Santa Isabel Channel	2(24)	NA	NA	NA	**Yes**
Costa Mesa Channel	2(353)	NA	NA	NA	No
Freshwater Wetlands					
IRWD Treatment Wetlands	92(106)	NA	7(11)	3(15)	**Yes**
San Joaquin Freshwater Marsh	1(7)	NA	2(2)	2(19)	**Yes**
Saltwater Estuarine					
Upper Newport Bay	0(42)	0(15)	11(62)	4(62)	**Yes**
Lower Newport Bay	0(96)	0(35)	0(53)	NA	No

Assessment Alternatives Considered

- Use different guidelines to assess compliance with narrative objective (“no toxics in toxic amounts”)
- Use proposed tissue-based site-specific objectives
  - Different fish tissue objectives have been proposed
  - Numeric targets will be discussed in detail at second workshop