Organochlorine Compounds TMDLs
Upper and Lower Newport Bay
Rhine Channel
San Diego Creek

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SARWQCB
June 22, 2005
Context of these TMDLs

• TMDLs for Toxic Pollutants – San Diego Creek and Newport Bay, CA
  – Promulgated by USEPA in June 2002
  – Included the following constituents:
    • OP Pesticides – Diazinon, chlorpyrifos
      – BPA adopted by RB 2003 (R8-2003-0039)
    • Organochlorine Compounds
    • Selenium
    • Metals
    • Chromium and mercury in Rhine Channel
Outline

• CEQA Scoping
• History of the TMDLs
• Technical TMDLs (with staff’s proposed revisions) and Allocations
• Proposed Implementation Plan
California Environmental Quality Act (CEQA)

- Basin planning process is subject to CEQA requirements
- State Board’s water quality planning process has been certified as “functionally equivalent” to the requirements of CEQA
  - Exempt from requirement to prepare an Environmental Impact Report or Negative Declaration and Initial Study (CCR Title 14, §15251(g))
CEQA (cont’d)

• Environmental documents required for basin planning actions are:
  – A written report
  – A draft of the Basin Plan Amendment
  – A completed Environmental Checklist
CEQA (cont’d)

- Economic Considerations
  - Must be evaluated when rules are adopted that require the installation of pollution control equipment or establish a performance standard or treatment requirement
  - Must be evaluated prior to implementation of any agricultural water quality control program
    - Total cost of program
    - Identification of potential sources of financing
Watershed Characteristics

- 154 square miles
- Cities include Orange, Tustin, Santa Ana, Irvine, Lake Forest, Laguna Hills, Costa Mesa, and Newport Beach
- Average rainfall ≈ 13 inches per year
- Hydrology has been greatly altered compared to historic conditions
- San Diego Creek is main freshwater drainage
- Upper Newport Bay estuary contains an important state ecological reserve
Figure 1-1
Newport Bay Watershed
# Land Use Data Provided by Orange County, March 2002

<table>
<thead>
<tr>
<th>Land Use</th>
<th>San Diego Creek Watershed</th>
<th>Newport Bay Watershed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Acres  Percent</td>
<td>Acres     Percent</td>
</tr>
<tr>
<td>Vacant</td>
<td>21,910  28.5</td>
<td>23,462    23.9</td>
</tr>
<tr>
<td>Residential</td>
<td>11,668  15.2</td>
<td>19,420    19.7</td>
</tr>
<tr>
<td>Education/Religion/Recreation</td>
<td>15,811  20.6</td>
<td>17,393    17.7</td>
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<tr>
<td>Roads</td>
<td>10,295  13.4</td>
<td>15,774    16.0</td>
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<tr>
<td>Commercial</td>
<td>6,381   8.3</td>
<td>9,641     9.8</td>
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<tr>
<td>Industrial</td>
<td>3,965   5.2</td>
<td>5,263     5.4</td>
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<tr>
<td>Agriculture</td>
<td>5,092   6.6</td>
<td>5,147     5.2</td>
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<tr>
<td>Transportation</td>
<td>1,177   1.5</td>
<td>1,326     1.3</td>
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<tr>
<td>No code</td>
<td>440     0.6</td>
<td>936       0.9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>76,739</strong>  <strong>100</strong></td>
<td><strong>98,362</strong>  <strong>99.9</strong></td>
</tr>
</tbody>
</table>
Background

• San Diego Creek and Newport Bay listed as impaired in early 1990s

• Pollutants of concern were:
  – Pesticides, metals, sediments, nutrients, toxicity for San Diego Creek
  – Nutrients, pathogens, sediments, pesticides for Upper Newport Bay
  – Metals and PCBs for Rhine Channel
  – Chlordane, DDT, chlorpyrifos, endosulfan, other pesticides, nutrients, algae, pathogens for Lower Bay
Background (cont’d)

• Regional Board (RB) staff began TMDL development for sediments, nutrients, and pathogens
  – Sediment TMDLs for SD Creek and Newport Bay
    • BPA adopted 1998, Order 98-101
  – Nutrient TMDLs for SD Creek and Newport Bay
    • Order 98-9 as amended by Resolution 98-100
  – Fecal Coliform TMDL for Newport Bay
    • BPA adopted 1999, Order 99-10
Background (cont’d)

• Consent decree entered into between USEPA and Defend the Bay, October 1997
  – Defend the Bay, Inc. v. Marcus (N.D. Cal. No. C97-3997 MMC)
  – Defined a schedule of completion for TMDLs; schedule based on RB staff’s projected timeline for TMDL development
Background (cont’d)

- 303(d) listings for “toxics” and “pesticides,” for the most part, did not identify specific toxicants – needed further evaluation

- RB Staff completed Final Problem Statement for Toxic Substances - December 2000
• Consent Decree deadline for USEPA’s completion of Toxics TMDLs was January 2002; extended to June 2002

• Technical TMDLs for Toxic Substances promulgated by USEPA June 2002
  – Technical TMDLs do not include implementation plan
## TMDL Constituent Comparison

<table>
<thead>
<tr>
<th>Waterbody</th>
<th>Regional Board Staff</th>
<th>Consent Decree</th>
<th>USEPA*</th>
</tr>
</thead>
<tbody>
<tr>
<td>San Diego Creek</td>
<td>PCBs, DDT, Toxaphene</td>
<td>Endosulfan, DDT, PCBs, Toxaphene</td>
<td>Chlordane, Dieldrin, DDT, PCBs, Toxaphene</td>
</tr>
<tr>
<td>Upper Newport Bay</td>
<td>PCBs, DDT</td>
<td>Endosulfan, DDT</td>
<td>Chlordane, DDT, PCBs</td>
</tr>
<tr>
<td>Lower Newport Bay</td>
<td>PCBs, DDT</td>
<td>Chlorbenside, Chlordane, Dieldrin, Endosulfan, DDT, PCBs, Toxaphene</td>
<td>Chlordane, Dieldrin, DDT, PCBs</td>
</tr>
<tr>
<td>Rhine Channel</td>
<td>PCBs, DDT</td>
<td></td>
<td>Chlordane, Dieldrin, DDT, PCBs</td>
</tr>
</tbody>
</table>

* Technical TMDLs include 16 waterbody-pollutant combinations.
Where We are Now

- RWQCB must incorporate TMDLs for Toxic Substances, with implementation plans, into the Basin Plan, including:
  - USEPA Technical TMDLs with some revisions proposed by RB staff
  - Implementation Plan developed by RB Staff
Anticipated Schedule for Completion

- Public meeting/CEQA scoping 6/22/05
- Presentation to the Regional Board – 6/24/05
- Peer Review 9/1/05
- 1st Public Workshop 9/30/05
- Regional Board consideration of adoption of Basin Plan Amendment 1/06
## Identification of TMDLs

<table>
<thead>
<tr>
<th>Water Bodies</th>
<th>TMDL Constituents</th>
</tr>
</thead>
<tbody>
<tr>
<td>San Diego Creek</td>
<td>Chlordane, Dieldrin, DDT, PCBs, Toxaphene</td>
</tr>
<tr>
<td>Upper Newport Bay</td>
<td>Chlordane, DDT, PCBs</td>
</tr>
<tr>
<td>Lower Newport Bay</td>
<td>Chlordane, Dieldrin, DDT, PCBs</td>
</tr>
<tr>
<td>Rhine Channel</td>
<td>Chlordane, Dieldrin, DDT, PCBs</td>
</tr>
</tbody>
</table>
Pollutant Properties

- Legacy pesticides historically used on agricultural crops and in urban areas
- PCBs used in transformers and as lubricants
- Uses banned in the U.S. for one or more decades
- Strongly persistent in the environment; associated with the organic fraction of fine sediments
- Low solubility in water
Biomagnification

All OCs pollutants bioaccumulate in plants and fatty tissues of fish, birds, and mammals. DDT linked to reproductive failure in bald eagle; also adverse effects to peregrine falcon, brown pelican and osprey.
System Complexity
What is a TMDL?

• **Total Maximum Daily Load**: The maximum amount of a pollutant that can a waterbody can receive and still attain water quality standards (i.e., meet applicable water quality objectives and support all beneficial uses)

• TMDL development triggered by placement on CWA 303(d) list of impaired waterbodies; development of OCs TMDLs considered a high priority

• TMDL = WLA + LA + MOS
TMDL Elements

• Problem Statement
• Numeric Targets
• Source Analysis
• Loading Capacity/Linkage Analysis
• TMDL and Allocations
• Seasonal Variation/Critical Conditions
• Margin of Safety
• Implementation Plan
Problem Statement

• In the early 1990s, Newport Bay and San Diego Creek were placed on the CWA Section 303(d) list due to violations, or threatened violations, of Basin Plan narrative water quality objectives for toxic substances.

• Note that there were no numeric water quality objectives for toxic pollutants until CTR criteria were promulgated in 2000.
Water Quality Objectives for Toxic Substances

(1) Toxic substances shall not be discharged at levels that will bioaccumulate in aquatic resources to levels which are harmful to human health; and

(2) The concentration of toxic substances in the water column, sediment, or biota shall not adversely affect beneficial uses.
| Water Body       | MUN | AGR | IND | PROC | GWWR | NAV | POW | REC 1 | REC 2 | COMM | WARM | LWRM | COLD | BIOL | WILD | RARE | SPWN | MAR | SHEL | EST |
|------------------|-----|-----|-----|------|------|-----|-----|-------|-------|------|------|------|------|------|------|------|-----|------|-----|
| Lower Bay        | +   |     | X   |      | X    | X   | X   | X     | X     | X    | X    | X    | X    | X    | X    | X    | X    |     |      |     |
| Upper Bay        | +   |     |     |      | X    | X   | X   |       |       | X    | X    | X    | X    | X    | X    | X    | X    | X    |     |      |     |
| San Diego Creek  | +   |     |     |      | X    | X   | X   |       |       |     |     |     |     |     |     |     |     |     |     |     |     |
| Reach 1          |     |     |     |      |      |     |     |       |       |     |     |     |     |     |     |     |     |     |     |     |     |
| San Diego Creek  | +   |     |     |      | X    | X   | X   |       |       |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Reach 2          |     |     |     |      |      |     |     |       |       |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Other tributaries| +   |     |     |      | X    | X   | X   |       |       |     |     |     |     |     |     |     |     |     |     |     |     |     |

Key:
- X: Present
- I: Indicated

Beneficial Uses:
- MUN: Municipal
- AGR: Agricultural
- IND: Industrial
- PROC: Process
- GWWR: General Water-related Use
- NAV: Navigation
- POW: Power
- REC 1: Recreational 1
- REC 2: Recreational 2
- COMM: Commercial
- WARM: Warm
- LWRM: Low Reaches Management
- COLD: Cold
- BIOL: Biodiversity
- WILD: Wildlife
- RARE: Rare
- SPWN: Spawning
- MAR: Marine
- SHEL: Shellfish
Data Sources

- State Mussel Watch Program (SMW)
- Toxic Substances Monitoring Program (TSMP)
- Bay Protection & Toxic Cleanup Program (BPTCP)
- Orange County RDMD
- Irvine Ranch Water District (IRWD)
- SCCWRP Sediment Toxicity Study (preliminary data 2001)
- Resource Management Associates (RMA) modeling reports
Impairment Assessment

• USEPA used a weight of evidence approach to determine which toxic substances required TMDLs
  – Water Column Concentrations
  – Sediment Concentrations
  – Tissue Concentrations
Toxic Substances Monitoring Program
San Diego Creek

Total DDT  (µg/kg wet wt)

Chlordane  (µg/kg wet wt)

*Fish sampled were primarily red shiner.
OEHHA Fish Tissue Screening Values

- OEHHA = California Office of Environmental Health Hazard Assessment
- Intended to identify chemical concentrations that may be of human health concern for frequent consumers of sport fish.
- Not a trigger for consumption advisories; identify where more investigation needed
- Calculated for the 1:100,000 cancer risk for a 70 kg adult who eats 21 grams per day of fish
Toxic Substances Monitoring Program
San Diego Creek

- **Dieldrin** (µg/kg wet wt): Target = 2.0 ppb
- **Toxaphene** (µg/kg wet wt): Target = 30 ppb
Target = 20 ppb

PCBs
(µg/kg wet wt)
BIGHT '98
Lower Bay

Total DDT
Target = 3.89 ng/g dw

Chlordane
Target = 2.26 ng/g dw

Total PCBs
Target = 21.5 ng/g dw
NOAA Threshold Effects Levels (TELs)

- NOAA = National Oceanic & Atmospheric Administration
- Sediment Quality Guidelines (SQGs) are preliminary screening values used to identify substances that could adversely affect coastal resources
  - Not intended as regulatory criteria or clean-up levels
  - Based on toxicity to benthic organisms
  - TELs apply statistics to a nationwide data set, and represent the concentration below which adverse effects are expected to occur only rarely
SCCWRP Sediment Toxicity Study (2004)

September 2000

Target = 3.89 \mu g/kg dw

May 2001

Target = 3.89 \mu g/kg dw
Total DDT Tissue Residues in Fish Filets, Lower Newport Bay

Recreational Fish Species (Common Name)
SCCWRP Fish Bioaccumulation Study

Total DDT Residues in Whole Fish Tissue Composites, Newport Bay

Forage Fish Species (Common Name)

Concentration (ppb wet weight)

Environment Canada Wildlife Target = 14 ppb
Total DDT Tissue Residues in Bivalve and Fish Tissue from San Diego Creek Basin No. 2, June 2003

Bivalve Tissue (Corbicula fluminea) and Whole Fish Tissue Composites

Muscle tissue (filet)
Liver tissue

Target = 100 ppb
Numeric Targets

• TMDL must identify endpoints in sediment, water column or tissue that equate to attainment of water quality standards
• Set to be protective of most sensitive beneficial use
• Newport Bay supports 7 federally listed bird species; two endangered plant species; 78 species of fish, some of which are caught and consumed by people
Numeric Targets (cont’d)

- USEPA identified sediment targets as the primary targets in developing the TMDLs because:
  - OC pollutants directly associated with fine sediment
  - OC pollutants primarily transported via adherence to particulates
  - Limited water column data are available
  - Attainment of sediment targets will result in attainment of water column criteria (CTR) and tissue screening values (OEHHA)
Discharges of organochlorine pollutants are associated with discharges of contaminated sediments.
## TMDL Targets

<table>
<thead>
<tr>
<th>Waterbody</th>
<th>Pollutant</th>
<th>Sediment (µg/kg dw)</th>
<th>Fish Tissue (µg/kg ww)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SD Creek and tributaries</td>
<td>Total DDT</td>
<td>6.98</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Chlordane</td>
<td>4.5</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Dieldrin</td>
<td>2.85</td>
<td>2.0</td>
</tr>
<tr>
<td></td>
<td>Toxaphene</td>
<td>0.1</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Total PCBs</td>
<td>34.1</td>
<td>20</td>
</tr>
<tr>
<td>Upper and Lower Newport Bay and Rhine Channel</td>
<td>Total DDT</td>
<td>3.89</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Chlordane</td>
<td>2.26</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Dieldrin</td>
<td>0.72</td>
<td>2.0</td>
</tr>
<tr>
<td></td>
<td>Total PCBs</td>
<td>21.5</td>
<td>20</td>
</tr>
</tbody>
</table>

Sediment targets are equivalent to threshold effect levels (TEL) from Buchman 1999, except toxaphene is from NY Dept. of Environmental Conservation. Fish tissue targets are OEHHA screening values; may not represent values that would be protective of wildlife.
USEPA TMDL Development

- Used sediment targets to calculate loading capacities (assimilative capacity; usually equal to the TMDL)
- Used measured sediment or fish tissue concentrations to estimate existing loads
- Set the TMDL to the lower of either the loading capacity or existing load
- Applied an explicit 10% MOS
- Identified WLAs and LAs
USEPA’s Approach to Calculating Existing Load – San Diego Creek

Fish Tissue (µg/kg) \times BCF \rightarrow Dissolved Concentration (µg/L) \rightarrow Partition Coefficient (K_d) \rightarrow Particulate Concentration (µg/kg) \rightarrow Total Water Column Concentration (µg/L) \times Flow (cfs) = Load (g/year)
Staff’s Proposed Revisions to Technical TMDL

- TMDLs for San Diego Creek calculated using “short ton” conversion instead of “metric ton”
- Revised $K_d$ for total DDT to reflect a weighted average of log $K_d$ values for DDT, DDE, and DDD (USEPA used arithmetic average)
- For consistency between the OCs TMDLs and the sediment TMDLs, staff calculated loading capacities based on allowable sediment loads
**USEPA vs. Revised TMDL**

### San Diego Creek

<table>
<thead>
<tr>
<th>Constituent</th>
<th>2002 Loading Capacity</th>
<th>2002 Existing Load</th>
<th>Revised Loading Capacity</th>
<th>Revised Existing Load</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total DDT</td>
<td>432.6</td>
<td>3733.8</td>
<td>327.2</td>
<td>5220.3</td>
</tr>
<tr>
<td>Chlordane</td>
<td>314.7</td>
<td>615.7</td>
<td>248.0</td>
<td>552.5</td>
</tr>
<tr>
<td>Dieldrin</td>
<td>261.5</td>
<td>381.8</td>
<td>208.4</td>
<td>353.2</td>
</tr>
<tr>
<td>Toxaphene</td>
<td>8.9</td>
<td>582.1</td>
<td>7.3</td>
<td>536.0</td>
</tr>
<tr>
<td>Total PCBs</td>
<td>2226</td>
<td>282.1</td>
<td>1721.1</td>
<td>256.7</td>
</tr>
</tbody>
</table>

Units are grams per year. Numbers are very low in both cases; revisions will not result in changes in TMDL implementation.
## USEPA vs. Revised TMDL

### Upper Newport Bay

<table>
<thead>
<tr>
<th>Constituent</th>
<th>2002 Loading Capacity</th>
<th>2002 Existing Load</th>
<th>Revised Loading Capacity</th>
<th>Revised Existing Load</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total DDT</td>
<td>276.5</td>
<td>1080.2</td>
<td>160.0</td>
<td>1080.2</td>
</tr>
<tr>
<td>Chlordane</td>
<td>160.6</td>
<td>290.7</td>
<td>93.0</td>
<td>290.7</td>
</tr>
<tr>
<td>Total PCBs</td>
<td>1528.2</td>
<td>858.7</td>
<td>884.0</td>
<td>858.7</td>
</tr>
</tbody>
</table>

Units are grams per year
## USEPA vs. Revised TMDL

### Lower Newport Bay

<table>
<thead>
<tr>
<th>Constituent</th>
<th>2002 Loading Capacity</th>
<th>2002 Existing Load</th>
<th>Revised Loading Capacity</th>
<th>Revised Existing Load</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total DDT</td>
<td>101.85</td>
<td>438.4</td>
<td>59.0</td>
<td>438.4</td>
</tr>
<tr>
<td>Chlordane</td>
<td>59.2</td>
<td>50.2</td>
<td>34.0</td>
<td>50.2</td>
</tr>
<tr>
<td>Dieldrin</td>
<td>18.6</td>
<td>5.9</td>
<td>11.0</td>
<td>5.9</td>
</tr>
<tr>
<td>Total PCBs</td>
<td>562.95</td>
<td>409.8</td>
<td>326.0</td>
<td>409.8</td>
</tr>
</tbody>
</table>

Units are grams per year
## USEPA vs. Revised TMDL

### Rhine Channel

<table>
<thead>
<tr>
<th>Constituent</th>
<th>2002 Loading Capacity</th>
<th>2002 Existing Load</th>
<th>Revised Loading Capacity</th>
<th>Revised Existing Load</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total DDT</td>
<td>2.92</td>
<td>5.6</td>
<td>1.7</td>
<td>5.6</td>
</tr>
<tr>
<td>Chlordane</td>
<td>1.7</td>
<td>0.33</td>
<td>1.0</td>
<td>0.33</td>
</tr>
<tr>
<td>Dieldrin</td>
<td>0.53</td>
<td>3.76</td>
<td>0.3</td>
<td>3.76</td>
</tr>
<tr>
<td>Total PCBs</td>
<td>16.2</td>
<td>70.0</td>
<td>9.4</td>
<td>70.0</td>
</tr>
</tbody>
</table>

Units are grams per year
## Needed Load Reductions

### San Diego Creek

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Loading Capacity</th>
<th>Existing Load</th>
<th>Needed Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total DDT</td>
<td>327.2</td>
<td>5220.3</td>
<td>4893.1</td>
</tr>
<tr>
<td>Chlordane</td>
<td>248</td>
<td>552.5</td>
<td>304.5</td>
</tr>
<tr>
<td>Dieldrin</td>
<td>208.4</td>
<td>353.2</td>
<td>144.8</td>
</tr>
<tr>
<td>Toxaphene</td>
<td>7.3</td>
<td>536</td>
<td>528.7</td>
</tr>
<tr>
<td>Total PCBs</td>
<td>1721.1</td>
<td>256.7</td>
<td>0</td>
</tr>
</tbody>
</table>

Units are g/year
# Needed Load Reductions

## Upper Newport Bay

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Loading Capacity</th>
<th>Existing Load</th>
<th>Needed Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total DDT</td>
<td>160</td>
<td>1080.2</td>
<td>920.2</td>
</tr>
<tr>
<td>Chlordane</td>
<td>93</td>
<td>290.7</td>
<td>197.7</td>
</tr>
<tr>
<td>Total PCBs</td>
<td>884</td>
<td>858.7</td>
<td>0</td>
</tr>
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</table>

Units are g/year
## Needed Load Reductions

### Lower Newport Bay

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Loading Capacity</th>
<th>Existing Load</th>
<th>Needed Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total DDT</td>
<td>59</td>
<td>438.4</td>
<td>379.4</td>
</tr>
<tr>
<td>Chlordane</td>
<td>34</td>
<td>50.2</td>
<td>16.2</td>
</tr>
<tr>
<td>Dieldrin</td>
<td>11</td>
<td>5.9</td>
<td>0</td>
</tr>
<tr>
<td>Total PCBs</td>
<td>326</td>
<td>409.8</td>
<td>83.8</td>
</tr>
</tbody>
</table>

Units are g/year
## Needed Load Reductions

### Rhine Channel

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Loading Capacity</th>
<th>Existing Load</th>
<th>Needed Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total DDT</td>
<td>1.7</td>
<td>5.6</td>
<td>3.9</td>
</tr>
<tr>
<td>Chlordane</td>
<td>1</td>
<td>0.33</td>
<td>0</td>
</tr>
<tr>
<td>Dieldrin</td>
<td>0.3</td>
<td>3.76</td>
<td>3.46</td>
</tr>
<tr>
<td>Total PCBs</td>
<td>9.4</td>
<td>70</td>
<td>60.6</td>
</tr>
</tbody>
</table>

Units are g/year
TMDL Allocations

- USEPA (2002) allocations modified by RB staff after:
  - Loading capacities were revised
  - Sediment TMDL allocations and current land use estimates were considered
TMDLs and Allocations

- TMDL = WLA + LA + MOS
  - MOS – Explicit 10%
  - WLA = Point Source Allocations
    - Urban (MS4) (40%)
    - Caltrans (5%)
    - Other NPDES (5%)
  - LA = Non-point Source Allocations
    - Agriculture (20%)
    - Open Space (20%)
    - Undefined (10%)
TMDL Allocations

- Urban Runoff: 40%
- Caltrans: 5%
- Other NPDES: 5%
- Agriculture: 20%
- Open Space: 10%
- Agriculture: 20%
- WLA’s: 5%
- LA’s: 5%
- Undefined: 0%
## Allocations – San Diego Creek

<table>
<thead>
<tr>
<th>Category</th>
<th>Type</th>
<th>Total DDT</th>
<th>Chlordane</th>
<th>Dieldrin</th>
<th>Toxaphene</th>
<th>Total PCBs</th>
</tr>
</thead>
<tbody>
<tr>
<td>WLA</td>
<td>Urban</td>
<td>117.8</td>
<td>89.3</td>
<td>75.0</td>
<td>2.62</td>
<td>92.4</td>
</tr>
<tr>
<td></td>
<td>Caltrans</td>
<td>14.7</td>
<td>11.2</td>
<td>9.4</td>
<td>0.33</td>
<td>11.6</td>
</tr>
<tr>
<td></td>
<td>Other NPDES</td>
<td>14.7</td>
<td>11.2</td>
<td>9.4</td>
<td>0.33</td>
<td>11.6</td>
</tr>
<tr>
<td></td>
<td>Subtotal</td>
<td>147.2</td>
<td>111.6</td>
<td>93.79</td>
<td>3.27</td>
<td>115.5</td>
</tr>
<tr>
<td>LA</td>
<td>Agriculture</td>
<td>58.9</td>
<td>44.6</td>
<td>37.5</td>
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</tr>
<tr>
<td></td>
<td>Open Space</td>
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<td>44.6</td>
<td>37.5</td>
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</tr>
<tr>
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<td>18.8</td>
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<td>23.1</td>
</tr>
<tr>
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<td>Subtotal</td>
<td>147.2</td>
<td>111.6</td>
<td>93.79</td>
<td>3.27</td>
<td>115.5</td>
</tr>
<tr>
<td>MOS 10%</td>
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<td>32.7</td>
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</table>

Units are grams per year.
## Allocations – Upper Bay

<table>
<thead>
<tr>
<th>Category</th>
<th>Type</th>
<th>Total DDT</th>
<th>Chlordane</th>
<th>Total PCBs</th>
</tr>
</thead>
<tbody>
<tr>
<td>WLA</td>
<td>Urban</td>
<td>57.6</td>
<td>33.48</td>
<td>309.1</td>
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<tr>
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<td>Caltrans</td>
<td>7.2</td>
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</tr>
<tr>
<td></td>
<td>Other NPDES</td>
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<td>4.19</td>
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</tr>
<tr>
<td></td>
<td>Subtotal</td>
<td>72</td>
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<td>386.4</td>
</tr>
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<td>LA</td>
<td>Agriculture</td>
<td>28.8</td>
<td>16.74</td>
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</tr>
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<td>Open Space</td>
<td>28.8</td>
<td>16.74</td>
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<tr>
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<tr>
<td></td>
<td>Subtotal</td>
<td>72</td>
<td>41.85</td>
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<tr>
<td>MOS 10%</td>
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<td>TMDL</td>
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<td>160.0</td>
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</table>

Units are grams per year.
### Allocations – Lower Bay

<table>
<thead>
<tr>
<th>Category</th>
<th>Type</th>
<th>Total DDT</th>
<th>Chlordane</th>
<th>Dieldrin</th>
<th>Total PCBs</th>
</tr>
</thead>
<tbody>
<tr>
<td>WLA</td>
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</tr>
<tr>
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<td>Other NPDES</td>
<td>2.66</td>
<td>1.53</td>
<td>0.266</td>
<td>14.67</td>
</tr>
<tr>
<td></td>
<td>Subtotal</td>
<td>26.55</td>
<td>15.3</td>
<td>2.66</td>
<td>146.7</td>
</tr>
<tr>
<td>LA</td>
<td>Agriculture</td>
<td>10.62</td>
<td>6.12</td>
<td>1.06</td>
<td>58.68</td>
</tr>
<tr>
<td></td>
<td>Open Space</td>
<td>10.62</td>
<td>6.12</td>
<td>1.06</td>
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</tr>
<tr>
<td></td>
<td>Undefined</td>
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<td>3.06</td>
<td>0.531</td>
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</tr>
<tr>
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<td>Subtotal</td>
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<td>15.3</td>
<td>2.66</td>
<td>146.7</td>
</tr>
<tr>
<td>MOS 10%</td>
<td></td>
<td>5.9</td>
<td>3.4</td>
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<tr>
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<td>59</td>
<td>34</td>
<td>5.9</td>
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</table>

Units are grams per year.
## Allocations – Rhine Channel

<table>
<thead>
<tr>
<th>Category</th>
<th>Type</th>
<th>Total DDT</th>
<th>Chlordane</th>
<th>Dieldrin</th>
<th>Total PCBs</th>
</tr>
</thead>
<tbody>
<tr>
<td>WLA</td>
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<td>0.612</td>
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<td>Other NPDES</td>
<td>0.076</td>
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<td>Subtotal</td>
<td>0.765</td>
<td>0.1485</td>
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</tr>
<tr>
<td>LA</td>
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<td>0.0594</td>
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</tr>
<tr>
<td></td>
<td>Open Space</td>
<td>0.306</td>
<td>0.0594</td>
<td>0.054</td>
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<tr>
<td></td>
<td>Subtotal</td>
<td>0.765</td>
<td>0.1485</td>
<td>0.135</td>
<td>4.23</td>
</tr>
<tr>
<td>MOS 10%</td>
<td></td>
<td>0.17</td>
<td>0.033</td>
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<td>0.94</td>
</tr>
<tr>
<td>TMDL</td>
<td></td>
<td>1.7</td>
<td>0.33</td>
<td>0.3</td>
<td>9.4</td>
</tr>
</tbody>
</table>

Units are grams per year.
• Implementation & compliance tied to sediment TMDLs
  – Revisions to the sediment TMDLs will trigger revisions to the OCs TMDLs
  – Staff is developing recommended revisions to the sediment TMDLs; these revisions may be substantial
RB Staff’s Proposed Implementation Plan

- Compliance schedule
  - Tied to sediment TMDLs compliance
    - 10-year running average (1999-2009)
    - Evaluate in 2009
      - Phase 1 of the OCs TMDLs therefore has a 3-4 year schedule for re-evaluation
RB Staff’s Proposed Implementation Plan

- **MS4 – Urban WLA**
  - Permit will be modified to incorporate WLA’s upon renewal
  - Encompasses developed areas as well as construction activities that can potentially discharge to the MS4
  - Latest revision to MS4 permit resulted in greater local oversight of new development and redevelopment; permit required the County to:
    - Review/revise local plans, policies and ordinances
    - Conduct inspections of construction sites
    - Conduct study of erosion control BMPs and formulate a “county-preferred” list
RB Staff’s Proposed Implementation Plan

• MS4 Requirements (continued)
  – Evaluate whether current strategies are adequate to meet WLA for urban runoff
  • Identify Construction BMPs and associated pollutant control effectiveness that demonstrate the WLAs will be attained
  • Submit a WLA compliance plan and schedule that demonstrate how the WLA will be implemented
MS4 Requirements (continued)

• Ensure developers made aware of TMDL compliance issues early in planning process (e.g., Conditions of Approval). Notification to developers to include:
  – Where applicable, the need to sample for nonvisible pollutants in construction site discharges (i.e., OCs in storm water runoff from sites previously in agricultural land use) per requirements of existing storm water permit for construction activities.
RB Staff’s Proposed Implementation Plan

• MS4 Requirements (cont’d)
  – Requirement for SWPPP to provide discussion of how selected BMPs and their implementation will ensure the MS4 will achieve WLAs for the OCs TMDLs

• Recommendations
  – Consider restricting large mass grading projects to the dry season
  – Identify a financial mechanism to defray the cost of dredging
MS4 Requirements (continued)

- Monitoring
  - Develop and implement toxics RMP (may be incorporated into NPDES monitoring)
  - Coordinate with implementation of sediment TMDLs
  - Document trends (especially fish tissue concentrations), potential hot spots in the creek and/or bay to be remediated, areas/sources that need additional control measures
RB Staff’s Proposed Implementation Plan

- **Caltrans MS4**
  - Implementation similar to County MS4
- **Other NPDES/WDRs**
  - Evaluate existing permits, and Incorporate discharge limits consistent with WLAs
- **Agriculture LAs**
  - Regulate through appropriate implementation of State’s Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program (Nonpoint Source Policy)
RB Staff’s Proposed Implementation Plan

- Nonpoint Source Policy provides options for regulation:
  - Conditional waivers, WDRs, or prohibitions
  - Any individual WDRs will be modified upon renewal to incorporate discharge limits consistent with LAs.
  - Monitoring will be required.

- UCCE actively involved in assisting with development and implementation of BMPs
RB Staff’s Proposed Implementation Plan

- Staff currently developing nonpoint source regulatory approach
- Plan to make specific recommendations to the Regional Board in September
RB Staff’s Proposed Implementation Plan

• Open Space LAs
  – Evaluate open space land use as a potential source of OCs
  – Regulate through appropriate implementation of the State’s Non-point Source Policy
RB Staff’s

Proposed Implementation Plan

• Rhine Channel
  – Will recommend a separate TMDL
  – Implementation to consist of remediation activities (to be determined)

• Re-run RMA model to estimate:
  – Deposition amounts and locations within the Bay that reflect current conditions (especially fine particulates)
RB Staff’s Proposed Implementation Plan

• Monitoring/research studies
  – County of Orange, PRISM grant ($188,254)
    • Measure existing loads of OCs
  – SCCWRP, PRISM grant ($185,155)
    • Source analysis
    • Measurement of air deposition
  – SFEI, Food Web model and BSAFs
    • Part of work of Sediment Quality Objectives Task Force
  – SCCWRP, Fish Food Web Analysis ($253,532)
    • Predator/prey evaluation
RB Staff’s Proposed Implementation Plan

- Study results may lead to development of site-specific sediment quality objectives and refinement of TMDL targets
  - Identify most sensitive species
  - Evaluate food web structure for that species
  - Determine BSAFs/BAFs that will lead to identification of protective sediment target
  - Performed in whole or in part through contract or TAC
  - Monitoring results may lead to TMDL revisions and/or de-listing for certain of the OCs constituents in the next phase of the TMDL
Contact

• We encourage your input and items to consider with respect to CEQA
• Send comments no later than July 6, 2005, to:

Kathy Rose  
Santa Ana Regional Water Quality Control Board  
3737 Main Street, Suite 500  
Riverside, CA 92507  
krose@waterboards.ca.gov  
(951) 321-4585