CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

RESOLUTION NO. R5-2005-0005

AMENDING THE WATER QUALITY CONTROL PLAN
FOR
THE SACRAMENTO RIVER AND SAN JOAQUIN RIVER BASINS
FOR
THE CONTROL PROGRAM FOR FACTORS CONTRIBUTING TO THE DISSOLVED OXYGEN IMPAIRMENT IN THE STOCKTON DEEP WATER SHIP CHANNEL

WHEREAS, in 1975 the California Regional Water Quality Control Board, Central Valley Region (hereafter Regional Board) adopted the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins (hereafter Basin Plan), which has been amended occasionally; and

WHEREAS, the Basin Plan may be amended in accordance with California Water Code Section 13240, et seq.; and

WHEREAS, California Water Code Section 13242 requires the Regional Board to establish a program for implementation for achieving water quality objectives; and

WHEREAS, the Stockton Deep Water Ship Channel portion of the San Joaquin River (hereafter DWSC) has been identified under the federal Clean Water Act Section 303(d) as an impaired waterbody due to low dissolved oxygen; and

WHEREAS, the Regional Board recognizes that the Basin Plan does not include a plan to control factors that contribute to the dissolved oxygen impairment in the DWSC; therefore, a Basin Plan amendment is appropriate; and

WHEREAS, the proposed amendment modifies Basin Plan Chapter IV (Implementation) to establish a control program for factors contributing to the dissolved oxygen impairment in the DWSC, including the loading capacity and allocation requirements of a Total Maximum Daily Load (TMDL); and

WHEREAS, the proposed amendment requires entities responsible for the point and non-point sources of oxygen demanding substances and their precursors to conduct studies to identify and quantify: sources of oxygen demanding substances and their precursors; growth or degradation mechanisms of oxygen demanding substances in transit to the DWSC; and the impact of oxygen demanding substances on dissolved oxygen concentrations in the DWSC; and

WHEREAS, the Regional Board has considered the costs of implementing the proposed amendment, and finds these costs to be reasonable relative to the water quality benefits to be derived from implementing the proposed amendment; and

WHEREAS, Regional Board staff developed a draft staff report and draft Basin Plan Amendment for external scientific peer review in March 2004 in accordance with Health and Safety Code Section 57004 and the draft final staff report and amendment have been changed to conform to the recommendations of the peer reviewers or staff has provided an explanation of why no change was made; and

WHEREAS, the Regional Board has determined that the scientific portions of the Basin Plan Amendment are based on sound scientific knowledge, methods, and practices in accordance with Health and Safety Code Section 57004; and

WHEREAS, Regional Board staff held a public workshop and California Environmental Quality Act (CEQA) scoping meeting on 10 December 2003 to identify any significant issues that must be considered, and the Regional Board held a public workshop on 23 April 2004 to receive comments on the draft staff report and draft Basin Plan Amendment; and

WHEREAS, Regional Board staff has circulated a Notice of Public Hearing, Notice of Filing, a written staff report, an environmental checklist, and a draft proposed amendment to interested individuals and public agencies, including persons having special expertise with regard to the environmental effects involved with the proposed amendment, for review and comment in accordance with state and federal environmental regulations (23 CCR Section 3775, 40 CFR 25, and 40 CFR 131); and

WHEREAS, the Regional Board held public hearings on 8 and 9 July 2004 and 27 January 2005, for the purpose of receiving testimony on the proposed Basin Plan amendment. Notice of the public hearing was sent to all interested persons and published in accordance with California Water Code Section 13244; and

WHEREAS, the basin planning process has been certified as "functionally equivalent" to the CEQA requirements for preparing environmental documents and is, therefore, exempt from those requirements (Public Resources Code Section 21000 et seq.); and

WHEREAS, Regional Board staff completed an environmental checklist and functional equivalent document in compliance with the provisions of CEQA that concluded that the proposed amendment will have no potential for adverse effects, either individually or cumulatively, on wildlife or the environment; and

WHEREAS, the Regional Board concurs with staff's conclusion that the proposed amendment will have no potential for adverse effects, either individually or cumulatively, on wildlife or the environment; and

WHEREAS, a Basin Plan amendment must be approved by the State Water Resources Control Board, the Office of Administrative Law, and the U.S. Environmental Protection Agency before becoming effective; and

WHEREAS, the proposed amendment will not result in degradation of the San Joaquin River water quality and maintains the level of water quality necessary to protect existing and anticipated beneficial uses; and

WHEREAS, this regulatory action meets the "Necessity" standard of the Administrative Procedures Act, Government Code, section 11353, subdivision (b):

THEREFORE BE IT RESOLVED, that, pursuant to Sections 13240, et seq. of the California Water Code, the Regional Board, after considering the entire record, including oral testimony at the hearing, hereby adopts an amendment to the Basin Plan to establish a control program for factors contributing to the dissolved oxygen impairment in the DWSC, including the loading capacity and allocation requirements of a Total Maximum Daily Load, as set forth in Attachment 1; and be it further

RESOLVED, that the Executive Officer is directed to forward copies of the Basin Plan amendment to the State Water Resources Control Board in accordance with the requirements of Section 13245 of the California Water Code; and be it further

RESOLVED, that the Regional Board requests that the State Water Resources Control Board approve the Basin Plan amendment in accordance with the requirements of Sections 13245 and 13246 of the California Water Code and forward it to the Office of Administrative Law and the U.S. Environmental Protection Agency; and be it further

RESOLVED, that, if during its approval process the State Water Resources Control Board, or Office of Administrative Law, or U.S. Environmental Protection Agency determines that minor, non-substantive corrections to the language of the amendment are needed for clarity or consistency, the Executive Officer may make such changes, and shall inform the Regional Board of any such changes; and be it further

RESOLVED, the Executive Officer is authorized to sign a Certificate of Fee Exemption and following approval of the Basin Plan amendment by the U.S. Environmental Protection Agency submit this Certificate in lieu of payment of the Department of Fish and Game filing fee to the Secretary for Resources; and be it further

RESOLVED, following approval of the Basin Plan amendment by the U.S. Environmental Protection Agency, the Executive Officer shall file a Notice of Decision with the State Clearinghouse.

I, THOMAS R. PINKOS, Executive Officer, do hereby certify that the forgoing is a full, true, and correct copy of a Resolution adopted by the California Regional Water Quality Control Board, Central Valley Region, on 27 January 2005.

Thomas R Pinkos

THOMAS R. PINKOS, Executive Office

ATTACHMENT 1
RESOLUTION NO. R5-2005-0005
AMENDING THE WATER QUALITY CONTROL PLAN
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WITH EXECUTIVE OFFICER 20 SEPTEMBER 2005 MINOR REVISIONS

Following are excerpts from Basin Plan Chapter IV shown similar to how they will appear after the proposed amendment is adopted. Deletions are indicated as strike-through text (~~deleted text~~) and additions are shown as underlined text (added text). Italicized text (*Notation Text*) is included to locate where the modifications will be made in the Basin Plan. All other text changes are shown accurately, however, formatting and pagination will change.

Executive Officer 20 September 2005 minor revisions are shown with double underlined and gray shading for added text (added text) and double strike-through text for deleted text (~~deleted text~~).

Under the Chapter IV heading: "Control Action Considerations of the State Water Board" add the following two paragraphs to item #13 page IV-10

In December 1999 the State Water Board adopted, and in March 2000 per Order WR 2000-02 revised, Water Right Decisions 1641. This decision amended certain water rights by assigning responsibilities to water right holders to help meet flow objectives intended to implement certain water quality objectives contained in the 1995 Bay-Delta Plan.

Rather than taking any water right action to meet the dissolved oxygen objectives in the 1995 Bay-Delta Plan, the State Water Board directed the Regional Water Board to first prepare a TMDL to achieve the dissolved oxygen objectives and implement it.

Under the Chapter IV heading: "Control Action Considerations of the Central Valley Regional Water Board" and subheading "Regional Water Board Prohibitions", add new paragraph item #7 on page IV-26:

7. *Dissolved Oxygen in the Stockton Deep Water Ship Channel(DWSC)*

The discharge of oxygen demanding substances or their precursors into waters tributary to the DWSC portion of the San Joaquin River is prohibited after 31 December 2011 when net daily flow in the DWSC portion of the San Joaquin River in the vicinity of Stockton is less than 3,000 cubic feet per second, unless dissolved oxygen objectives in the DWSC are being met.

Any increase in the discharge of oxygen demanding substances or their precursors into waters tributary to the DWSC portion of the San Joaquin River is prohibited after [effective date of the amendment]~~28 January 2005~~.

These prohibitions do not apply if the discharge is regulated by a waiver of waste discharge requirements, or individual or general waste discharge requirements or NPDES permits, which implement the *Control Program for Factors Contributing to the Dissolved Oxygen Impairment in the Stockton Deep Water Ship Channel* or which include a finding that the discharge will have no reasonable potential to cause or contribute to a negative impact on the dissolved oxygen impairment in the DWSC.

These prohibitions will be reconsidered by the Regional Water Board by December 2009 based on:

a) the results of the oxygen demand and precursor studies required in the *Control Program for Factors Contributing to the Dissolved Oxygen Impairment in the Stockton Deep Water Ship Channel*

b) the prevailing dissolved oxygen conditions in the DWSC

Under the Chapter IV heading: "Recommended for Implementation by the State Water Board" add new sub-heading and items on page IV-28:

Dissolved Oxygen in the Stockton Deep Water Ship Channel (DWSC)

1. The State Water Board should consider amending water right permits for existing activities that reduce flow through the DWSC to require that the associated impacts on excess net oxygen demand conditions in the DWSC be evaluated and their impacts reduced in accordance with the *Control Program for Factors Contributing to the Dissolved Oxygen Impairment in the DWSC.*

2. The State Water Board should consider requiring evaluation and full mitigation of the potential impacts of future water right permits or water transfer applications on reduced flow and excess net oxygen demand conditions in the DWSC.

Under the Chapter IV heading: "Recommended for Implementation by Other Agencies" and subheading: "Water Resources Facilities" add new item #3 & #4 on page IV-29:

3. Agencies responsible for existing water resources facilities that reduce flow through the Stockton Deep Water Ship Channel (DWSC) should evaluate and reduce their impacts on excess net oxygen demand conditions in the DWSC in accordance with the *Control Program for Factors Contributing to the Dissolved Oxygen Impairment in the DWSC.*

4. Agencies responsible for future water resources facilities projects, which potentially reduce flow through the DWSC, should evaluate and fully mitigate the potential negative impacts on excess net oxygen demand conditions in the DWSC.

Under the Chapter IV heading: "Recommended for Implementation by Other Agencies" add sub-heading and paragraph item #1 on page IV-30:

Stockton Deep Water Ship Channel (DWSC)

1. The U.S. Army Corps of Engineers should reduce the impacts of the existing DWSC geometry on excess net oxygen demand conditions in accordance with the *Control Program for Factors Contributing to the Dissolved Oxygen Impairment in the DWSC.*

Under the Chapter IV heading: "Actions and Schedule to Achieve Water Quality Objectives" add a new sub- heading and the following paragraphs beginning on page IV-37:

Control Program for Factors Contributing to the Dissolved Oxygen Impairment in the Stockton Deep Water Ship Channel (DWSC) (Regional Water Board Resolution No. R5-2005-0005)

The purpose of this control program is to implement a dissolved oxygen TMDL to achieve compliance with the Basin Plan dissolved oxygen water quality objectives in the DWSC. The numeric targets for this TMDL are the existing dissolved oxygen water quality objectives.

The dissolved oxygen impairment in the DWSC is caused by the following three main contributing factors:

- Loads of oxygen demanding substances from upstream sources that react by numerous chemical, biological, and physical mechanisms to remove dissolved oxygen from the water column in the DWSC.
- Geometry of the DWSC that impacts various mechanisms that add or remove dissolved oxygen from the water column, such that net oxygen demand exerted in the DWSC is increased.
- Reduced flow through the DWSC impacts various mechanisms that add or remove dissolved oxygen from the water column, such that net oxygen demand exerted in the DWSC is increased.

For the purpose of this control program, net oxygen demand is defined as the combined impact of all chemical, biological, and physical mechanisms that add or remove dissolved oxygen from the water column. When the amount of oxygen removed from the water column is greater than the amount added there is a decrease in the dissolved oxygen concentration. When dissolved oxygen concentrations in the DWSC are below Basin Plan objectives, the assimilative capacity of the water column has been exceeded and the associated excess net oxygen demand (ENOD) is given by the equation:

$$ENOD = \{DO_{obj} - DO_{meas}\} \times \{Q_{DWSC} + 40\} \times 5.4$$

In the above equation DO_{obj} is the applicable Basin Plan dissolved oxygen objective in milligrams per liter, DO_{meas} is the measured dissolved oxygen concentration in the DWSC in milligrams per liter, Q_{DWSC} is the net daily flow rate through the DWSC in cubic feet per second (adjusted by 40 cfs to account for flow measurement error), and 5.4 is a unit conversion factor that provides ENOD in units of pounds of net oxygen demand per day in the DWSC.

To account for technical uncertainty a margin of safety (MOS) equal to 20% of ENOD is added to the overall required reduction of ENOD:

$$MOS = -0.2 \times ENOD$$

ENOD plus the MOS must be addressed by those collectively responsible for each of the three contributing factors:

$$ENOD - MOS = 1.2 \times ENOD = [\sum WLA + \sum LA] + R_{DWSC} + R_{Flow}$$

where $[\sum WLA + \sum LA]$ is the amount of ENOD and MOS for which sources of oxygen demanding substances are responsible, R_{DWSC} is the amount of ENOD and MOS for which DWSC geometry is responsible, and R_{Flow} is the amount of ENOD and MOS for which reduced DWSC flow is responsible.

This TMDL does not specify the relative responsibility among the three contributing factors. Each of the three contributing factors are considered to be 100% responsible for addressing ENOD and MOS. Those parties collectively responsible for each contributing factor must coordinate with those collectively responsible for the other factors to implement control measures address[ing] ENOD and MOS.

Those parties responsible for sources of oxygen demanding substances $[\sum WLA + \sum LA]$ are allocated relative responsibility for excess net oxygen demand as follows:

a) 30% as a waste load allocation for the City of Stockton Regional Wastewater Control Facility.

b) 60% as a load allocation to non-point sources of algae and/or precursors in the watershed.

c) 10% as a reserve for unknown sources and impacts, and known or new sources that have no reasonable potential to impact.

In measuring compliance with waste load and load allocations, credit will be given for control measures implemented after 12 July 2004.

For the purpose of this control program, non-point source discharges are discharges from irrigated lands. Irrigated lands are lands where water is applied for producing crops and, for the purpose of this control program, includes, but is not limited to, land planted to row, field, and tree crops, as well as commercial nurseries, nursery stock production, managed wetlands and rice production.

For the purpose of this control program, oxygen demanding substances and their precursors are any substance or substances that consume, have the potential to consume, or contribute to the growth or formation of substances that consume or have the potential to consume oxygen from the water column.

The source area for loads of oxygen demanding substances and their precursors being addressed by this TMDL includes the SJR watershed that drains downstream of Friant Dam and upstream of the confluence of the San Joaquin River and Disappointment Slough, with the exception of the western slope of the Sierra Nevada foothills above the major reservoirs of New Melones Lake on the Stanislaus, Don Pedro Reservoir on the Tuolumne, Lake McClure on the Merced, New Hogan Reservoir on the Calaveras, Comanche Reservoir on the Mokelumne, and those portions of the SJR watershed that fall within Mariposa, Tuolumne, Calaveras, and Amador Counties.

Measures will also need to be implemented to reduce the impact of both the DWSC geometry and reduced flow through the DWSC.

The Regional Water Board will take the following actions, as necessary and appropriate, to implement this TMDL:

1. The Regional Water Board will use its authority under California Water Code § 13267 (or alternately by Waste Discharge Requirements and NPDES permits) to require that entities responsible for point and non-point sources of oxygen demanding substances and their precursors within the TMDL source area perform the following studies by December 2008. These studies must identify and quantify:

   a) sources of oxygen demanding substances and their precursors in the dissolved oxygen TMDL source area

   b) growth or degradation mechanisms of these oxygen demanding substances in transit through the source area to the DWSC

   c) the impact of these oxygen demanding substances on dissolved oxygen concentrations in the DWSC under a range of environmental conditions and considering the effects of chemical, biological, and physical mechanisms that add or remove dissolved oxygen from the water column in the DWSC

   A study plan describing how ongoing studies and future studies will address these information needs must be submitted to Regional Water Board staff by [60 days after the effective date of the amendment]~~31 July 2005~~. The study plan and studies may be conducted by individual responsible entities or in collaboration with other entities.

2. The Regional Water Board establishes the following waste load allocations:

   a) The waste load allocations of oxygen demanding substances and their pre-cursors for all NPDES-permitted discharges are initially set at the corresponding effluent limitations applicable on 28 January 2005.

   b) Waste load allocations and permit conditions for new or expanded point source discharges in the SJR Basin upstream of the DWSC, including NPDES and stormwater, will be based on the discharger demonstrating that the discharge will have no reasonable potential to cause or contribute to a negative impact on the dissolved oxygen impairment in the DWSC.

3. The Regional Water Board will require any project that requires a Clean Water Act Section 401 Water Quality Certification from the Regional Water Board, and that has the potential to impact dissolved oxygen conditions in the DWSC, to evaluate and fully mitigate those impacts. This includes, but is not limited to:

a) Future projects that increase the cross-sectional area of the DWSC

b) Future water resources facilities projects that reduce flow through the DWSC

4. The Regional Water Board will require, pursuant to California Water Code § 13267, the United States Army Corps of Engineers to submit by 31 December 2006 a technical report identifying and quantifying:

   a) the chemical, biological, and physical mechanisms by which loads of substances into, or generated within the DWSC, are converted to oxygen demand

   b) the impact that the Stockton Deep Water Ship Channel has on re-aeration and other mechanisms that affect dissolved oxygen concentrations in the water column

5. The Regional Water Board may consider alternate measures, as opposed to direct control, of certain contributing factors if these measures adequately address the impact on the dissolved oxygen impairment and do not degrade water quality in any other way.

6. The Regional Water Board will review allocations and implementation provisions based on the results of the oxygen demand and precursor studies and the prevailing dissolved oxygen conditions in the DWSC by December 2009.

7. The Regional Water Board will require compliance with waste load allocations and load allocations for oxygen demanding substances and their precursors, and development of alternate measures to address non-load related factors by 31 December 2011.

8. The established allocations and implementation provisions represent a maximum allowable level for the purpose of addressing the dissolved oxygen impairment in the DWSC. Where more than one allocation may be applicable, the most stringent allocation applies. The Regional Water Board may take other, more restrictive, actions affecting the contributing factors to this impairment as needed to protect other beneficial uses or to implement other water quality objectives.

Under the Chapter IV heading: "Estimated Costs of Agricultural Water Quality Control Programs and Potential Sources of Financing" add new sub-heading and items on page IV-38:

San Joaquin River Dissolved Oxygen Control Program

The *Control Program for Factors Contributing to the Dissolved Oxygen Impairment in the Stockton Deep Water Ship Channel (DWSC)* requires agricultural and municipal dischargers to perform various studies. The total estimated cost of the studies to be performed as part of this control program is approximately $15.6 million. The preferred alternative also includes a prohibition of discharge if water quality objectives are not achieved by 31 December 2011. The estimated cost to cease discharge of water from irrigated lands ranges from $95 to $133 million per year. The estimated cost to provide minimum flows that would remove the need for the prohibition is approximately $37 million dollars per year to eliminate the impairment through provision of purchased water. The cost of construction of an aeration device of adequate capacity to eliminate the impairment, in conjunction with point source load reductions already required, is estimated to be $10 million, with yearly operation and maintenance costs of $200,000 per year.

Potential funding sources:

1. Proposition 13 includes $40 million in bond funds to address the dissolved oxygen impairment in the DWSC. Approximately $14.4 million of this $40 million has been identified to fund the oxygen demanding substance and precursor studies. An additional $1.2 million is being provided from various watershed stakeholders. Approximately $24 million of Proposition 13 funds are available to pay for projects such as the design and construction of an aeration device.

2. The State Water Contractors, Port of Stockton, San Luis and Delta Mendota Water Authority, San Joaquin Valley Drainage Authority, and the San Joaquin River Group Authority have proposed to develop an operating entity for an aeration device and have indicated their commitment to execute a funding agreement among themselves and other interested parties, (subject to ultimate approval of respective governing boards) that would provide the mechanism to support operation of a permanent aerator at a cost expected to be in the annual range of $250,000 to $400,000.