**STATE WATER RESOURCES CONTROL BOARD**
**BOARD WORKSHOP SESSION – OFFICE OF CHIEF COUNSEL**
**APRIL 21, 2009**

**ITEM 8**

## SUBJECT

WORKSHOP TO SOLICIT PUBLIC COMMENTS ON A PROPOSED ORDER REMANDING A PERMIT TO THE CENTRAL VALLEY WATER BOARD IN THE MATTER OF OWN MOTION REVIEW OF WASTE DISCHARGE REQUIREMENTS (ORDER R5-2007-0037 [NPDES No. CA0079154]) FOR THE CITY OF TRACY, CENTRAL VALLEY REGION.
SWRCB/OCC FILE A-1846(a) and A-1846(b)

## DISCUSSION

In May 2007, the Central Valley Regional Water Quality Control Board (Central Valley Water Board) reissued a National Pollutant Discharge Elimination System (NPDES) permit (Permit) to the City of Tracy (City). The requirements regulate discharges to Old River from the Tracy Wastewater Treatment Plant (Facility). The California Sportfishing Protection Alliance (CALSPA) and the Environmental Law Foundation filed timely petitions for the State Water Resources Control Board's (State Water Board) review. In January 2009, the State Water Board decided to review the requirements on its own motion.

In this draft order, the State Water Board remands the NPDES Permit to the Central Valley Water Board for revisions. The contentions addressed in this order deal with final effluent limitations for electrical conductivity (EC) and bis(2-ethylhexyl)phthalate, dilution and the application of mixing zones, chronic ammonia toxicity, and chronic toxicity.

The draft order remands the Permit to include a final effluent limitation for EC. The Permit as written includes an effluent limit for EC, which is intended to effectuate the numeric objectives in the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan) designed to protect agricultural uses. However, the numeric limits in the Permit are applicable only if the discharger fails to submit and implement a salt-reduction plan. If the discharger submits & implements a plan, there is no final effluent limit in the Permit. This order would remand the Permit for a final effluent limit consistent with the Bay-Delta plan.

The draft order remands the Permit to re-evaluate the dilution credit for effluent limitations implementing human health objectives for priority pollutants. The Permit allows a dilution credit; the draft order remands the Permit for deletion of the credit or an analysis justifying its application. The draft order remands the Permit to explain the use of the median pH value in calculating its effluent limit for chronic ammonia. The Central Valley Water Board calculated the effluent limit for chronic ammonia using a median value for pH (instead of the average value) without adequate justification. On remand, the draft order also states that the Permit should contain a final effluent limit for chronic toxicity, and for bis(2-ethylhexyl)phthalate, if indicated by the applicable data.

## POLICY ISSUE

Should the State Water Board adopt the draft order remanding the City's waste discharge requirements to the Central Valley Water Board?

## FISCAL IMPACT

Central Valley Water Board work resulting from the proposed remand will be addressed with current and future budgeted resources.

## REGIONAL BOARD IMPACT

Yes, Central Valley Water Board.

## STAFF RECOMMENDATION

This is a workshop item only. The purpose of this workshop is to solicit suggestions from stakeholders and the public regarding the proposed order. The State water Board will take no action on the order at this meeting.

State Water Board action on this item will assist the Water Boards in reaching Goals 1 and 6 of the Strategic Plan Update: 2008-2012 to fully support the beneficial uses for all 2006-listed water bodies and to enhance consistency across the water boards.

# D R A F T

February 2, 2009

STATE OF CALIFORNIA

STATE WATER RESOURCES CONTROL BOARD

**ORDER WQ 2009-**

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In the Matter of the Petition of

**ENVIRONMENTAL LAW FOUNDATION**
**AND**
**CALIFORNIA SPORTFISHING PROTECTION ALLIANCE**

For Review of Waste Discharge Requirements Order No. R5-2007-0136 and Time Schedule Order No. R5-2007-0037 [NPDES No. CA0079154] for the City of Tracy Wastewater Treatment Plant, San Joaquin County
Issued by the
California Regional Water Quality Control Board,
Central Valley Region

***SWRCB/OCC FILE A-1846(a) and A-1846(b)***

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BY THE BOARD:

In this order, the State Water Resources Control Board (State Water Board) remands a National Pollutant Discharge Elimination System (NPDES) permit (Permit) to the Central Valley Regional Water Quality Control Board (Central Valley Water Board) for revisions. California Sportfishing Protection Alliance (CALSPA)[1] has raised a series of objections to the Permit issued by the Central Valley Water Board for the wastewater treatment plant owned and operated by the City of Tracy (City). The contentions addressed in this order deal with Permit provisions related to final effluent limitations for electrical conductivity (EC) and bis(2-ethylhexyl)phthalate, dilution and the application of mixing zones, chronic ammonia toxicity, and chronic toxicity.[2]

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[1] Environmental Law Foundation also filed a petition challenging this permit. It bases its challenge upon the contention that the Central Valley Water Board failed to comply with State Water Board Resolution 68-16, Statement of Policy for Maintaining High Quality of Waters in the State of California. The State Water Board has initiated a review of the application of this policy. (See Notice of Staff Workshop -- Periodic Review of The "Statement of Policy With Respect To Maintaining High Quality Of Waters In California" (Anti-Degradation Policy) State Water Resources Control Board Resolution 68-16, November 17, 2008.) These issues will not be covered by this order, and are hereby dismissed. (See, *post,* fn. 2.)

[2] To the extent petitioners raised issues that are not discussed in this order, such issues are hereby dismissed as not substantial or appropriate for review by the State Water Board. (See *People v. Barry* (1987) 194 Cal.App.3d 158, 175-177, *Johnson v. State Water Resources Control Board* (2004) 123 Cal.App.4th 1107, Cal. Code Regs., tit. 23, § 2052, subd. (a)(1).) This order does not address any groundwater issues raised by CALSPA, as those issues are governed by a separate permit that is not at issue in this petition.

Based on the record before the Central Valley Water Board and our technical review, we conclude that the Permit should be remanded to the Central Valley Water Board for reconsideration and revisions consistent with this order.

## I. BACKGROUND

The Permit involves discharges into Old River, which is part of the Lower Sacramento-San Joaquin River Delta. The hydrology and water quality of this area are extremely complicated, and the Water Boards protect water quality in this area through individual waste discharge requirements, water quality control plans, and water rights decisions. Many of the issues addressed in the Permit are the subject of protracted and ongoing adjudications, litigation, studies, and planning processes. The flow in Old River is also subject to mechanical modifications that are applied at different places on the river and in different times of the year, which complicate the flow regime.

### A. The Treatment Plant

The City owns and operates the Tracy Wastewater Treatment Plant (Plant), which currently provides secondary level wastewater treatment before it discharges to Old River (Discharge Point 001). Old River is a part of the lower Sacramento-San Joaquin River Delta, and is a water of the United States. Most of the waste treated by the Plant is domestic wastewater from the City's wastewater collection system. The Plant also accepts industrial wastewater, the bulk of which is food-processing wastewater from a local cheese manufacturer, Leprino Food Company (Leprino). Leprino manufactures cheese year-round, and the process results in highly-saline wastewater. Leprino discharges its waste through a segregated industrial wastewater pipeline into the Plant. Before it is discharged to the Plant, the effluent is treated for solids and other constituents, but remains high in salts.

The Plant was originally constructed in 1930 and has undergone three major expansions. The last expansion was completed in 1987, expanding the treatment capacity from 5.5 million gallons per day (mgd) to 9.0 mgd design average dry weather flow (ADWF). The City is currently upgrading the Plant to improve treatment and to expand capacity to 16 mgd through a four-phase expansion; the City plans to complete the final phase by the end of 2016. The Phase 1 upgrade includes: 1) the addition of nitrification/de-nitrification and tertiary filtration systems; and 2) an increase in capacity to an ADWF of 10.8 mgd. The expected completion

date of the Phase 1 upgrade was August 1, 2008. Only Phase 1 of the proposed expansion will be completed during the five-year term of the Permit.

The Plant is composed of a main treatment facility and an industrial facility. The main treatment facility consists of raw influent bar screening, primary sedimentation, bio-filtration, conventional activated sludge, and secondary sedimentation. Secondary effluent is disinfected by chlorination and is de-chlorinated prior to discharge. Biosolids are thickened by dissolved air flotation, anaerobically digested, and dewatered in unlined sand drying beds. The dried biosolids are hauled off-site for land application or disposal in a landfill. The industrial facility consists of four unlined industrial ponds (Ponds 1, 3, 4, and 5) of approximately 52 acres. In addition, Leprino leases two lined aerated lagoons and one 8-acre unlined oxidation pond (Pond 2) from the City for preliminary treatment of its industrial food processing wastewater. Leprino discharges to the Plant under an industrial pretreatment permit issued by the City. Leprino employees operate and maintain the industrial wastewater pipeline and leased pretreatment units. Leprino's industrial pretreatment program permit allows for a discharge of up to 850,000 gallons per day of industrial food-processing wastewater. The wastewater from Leprino Foods has an average EC of 3,113 µmhos/cm.

The industrial ponds were originally constructed to provide storage of peak industrial wastewater flows during the summer canning season to prevent overloading of the main treatment facility. Since canneries no longer operate in the Tracy area, the industrial ponds are currently used to store food processing wastewater from Leprino, water from construction dewatering, and wastewater from the main treatment facility (e.g. digester supernatant, pump seal water, boiler cooling water, etc.).

Leprino's effluent first enters the leased aerated lagoons and Pond 2, the oxidation pond, and then continues to Pond 1, Pond 5, Pond 4 and finally to Pond 3. Effluent from Pond 3 then discharges into the primary sedimentation basins and clarifiers at the main treatment facility, where it mixes with the domestic wastewater.

B. <u>Development of the Draft Permit</u>

The Central Valley Water Board staff first circulated a tentative permit to interested persons on December 8, 2005. Due to significant comments, the Central Valley Water Board redrafted and reissued the tentative permit on May 26, 2006. A public hearing was held on August 4, 2006, with salinity issues being the major topic of testimony and discussion.

The Central Valley Water Board continued the hearing pending a better assessment of the impacts of the discharge on Delta salinity and development of alternative means of regulating salinity. The Central Valley Water Board sought an analysis of the impact that the City's discharge had on the overall salt loading to Old River. Staff organized a stakeholder group that included representatives from the City, Mountain House Community Services District, South Delta Water Agency, CALSPA, and the Department of Water Resources (DWR). The stakeholder group was asked to develop appropriate scenarios for running DWR's Delta Simulation Model II (DSM2), in order to evaluate the salinity impacts of the City's discharge on the overall salinity of Old River. The Central Valley Water Board found that the impact of the City's discharge is relatively minor, compared to the total salt load in the river.[3]

The Central Valley Water Board issued a revised tentative permit for public comment on March 6, 2007, and a second public hearing was held on May 4, 2007. The Central Valley Water Board provided responses for all comments it received on both the May 2006 and March 2007 tentative permits.

The Central Valley Water Board adopted the Permit and Time Schedule Order (TSO) No. R5-2007-0037 on May 4, 2007.

C. Applicable Plans, Policies, and Regulations

The beneficial uses of Old River include municipal and domestic supply (MUN), agricultural supply and stock watering (AGR), industrial process water supply (PROC), industrial service supply (IND), water contact recreation (REC-1), other non-contact water recreation (REC-2), warm freshwater aquatic habitat (WARM), cold freshwater aquatic habitat (COLD), warm and cold fish migration habitat (MIGR), warm spawning habitat (SPAWN), wildlife habitat (WILD), and navigation (NAV).

There are several water quality control plans and policies applicable to the discharge, including the Water Quality Control Plan for the Sacramento and San Joaquin River Basins (Basin Plan); U.S. Environmental Protection Agency's (U.S. EPA) National Toxics Rule (NTR) and California Toxics Rule (CTR);[4] State Water Board's Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP);

[3] See Fact Sheet at F-46.

[4] 40 C.F.R. §§ 131.36 & 131.38.

Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California (Thermal Plan); and the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan).

D. CALSPA's Petition

In June 2007, CALSPA petitioned the State Water Board to review the Central Valley Water Board's action to adopt the Permit and TSO. The petition includes numerous challenges to the Permit. Both the Central Valley Water Board and the City submitted responses to the petition in support of the Permit as adopted.[5]

## II. CONTENTIONS AND FINDINGS

A. Electrical Conductivity

**Contention:** CALSPA contends that the Permit fails to establish an effluent limitation for EC that is protective of applicable water quality objectives. CALSPA further contends that the Permit instead contains a "conditional" final limit that imposes no numeric requirements as long as the City submits a salt reduction plan for approval by the Central Valley Water Board and carries out the plan once it is approved.

**Discussion:** CALSPA's contention has merit. The record reflects that the discharge of the City's wastewater with high levels of EC has the reasonable potential to contribute to an excursion above water quality standards in Old River. The challenges associated with salinity management in the Central Valley are significant, and the record reflects that the Central Valley Water Board attempted to craft a creative solution. However, the approach taken is inconsistent with federal requirements to establish a final effluent limitation in an NPDES permit when a pollutant will be discharged at a level that will cause or contribute to an excursion above a water quality standard. Thus, the Permit must be remanded to the Central Valley Water Board for the inclusion of final effluent limitations for EC consistent with water quality objectives applicable to Old River.

The following table lists the applicable salinity-related water quality objectives for EC in comparison to effluent and receiving water samples.

[5] The City filed a petition challenging several issues in the permit. It has requested that its petition remain in abeyance, even though the two other petitions challenging the Permit are resolved by this Order.

**Table 1 – Salinity Water Quality Criteria/Objectives**[6]

| Parameter | Agricultural WQ Goal | Secondary MCL | Basin Plan (Bay-Delta Plan) | Effluent | | Receiving Water | |
|---|---|---|---|---|---|---|---|
| | | | | Avg. | Max | Avg. | Max |
| C (µmhos/cm) | 700 or higher | 900<br>1,600<br>2,200 | 700<br>(Apr 1 – Aug 31)<br>1,000<br>(Sep 1 – Mar 31) | 1,753 | 2,410 | 640<br>(277 samples) | 1420 |

Importantly, the State Water Board's Bay-Delta Plan includes specific EC objectives that cover Old River: 700 µmhos/cm between April 1 and August 31, and 1,000 µmhos/cm for September 1 through March 31. Old River does not have a history of consistently meeting the EC objectives.[7] Additionally, Old River is included on the 2006 List of Impaired Water Bodies under Clean Water Act section 303(d) as impaired for EC.[8]

To implement adopted water quality control plans, permits must include effluent limitations for discharge of all pollutants that have a reasonable potential to cause or contribute to an excursion above water quality standards.[9] The City's permit and the accompanying Fact Sheet (Attachment F to the Permit) cite to evidence in the record and reach the conclusion that the City's discharge has a reasonable potential to cause or contribute to an in-stream excursion above the water quality objectives for EC in the Bay-Delta Plan. See Fact Sheet at F-28 3b. No one disputes this fact.

The Permit, however, in Section IV.A.1.i contains the following "final limit" for EC:

> **Electrical Conductivity.** The electrical conductivity in the discharge shall not exceed a monthly average of 700 µmhos/cm (April 1 to August 31) and a monthly average of 1000 µmhos/cm (September 1 to March 31), if: (1) the Discharger fails to submit a Salinity Plan to reduce its salinity impacts to the Southern Delta, including a schedule, to comply with conditions (1) – (3) below to the Regional Water Board within six months of the effective date of this permit, or (2) the

[6] Compiled from information in the Fact Sheet to the Permit.

[7] It appears that historically, the receiving water did not comply with the Bay-Delta Plan's southern Delta seasonal objectives (700 µmhos/cm between April 1 and August 31 and 1,000 µmhos/cm between September 1 and March 31) in 2001, 2002, 2003, and 2004, or with the recommended maximum contaminant level (MCL) level of 900 µmhos/cm in 2002, 2003, and 2004.

[8] California's 2006 Clean Water Act Section 303(d) List of Water Quality Limited Segments, p. 8, (identifying Delta Waterways (southern portion, which include Old River) as listed for EC (among other things).)

[9] The term "reasonable potential" is based on 40 Code of Federal Regulations, section 122.44(d)(1)(i), which requires that permit issuers include effluent limitations for all pollutants that "are or may be discharged at a level that will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality." If a pollutant does not require a limit under this test, the pollutant is said not to have "reasonable potential."

> Discharger fails to timely implement the Salinity Plan upon the Regional Water Board's approval. The proposed Salinity Plan will be circulated for no less than 30 days of public comment prior to the Regional Water Board's consideration of the Salinity Plan, and the Regional Water Board may revise the Salinity Plan prior to approving it.
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> 1) The Discharger implements all reasonable steps to obtain alternative, lower salinity water supply sources; and
>
> 2) The Discharger develops and implements a salinity source control program that will identify and implement measures to reduce salinity in discharges from residential, commercial, industrial and infiltration sources in an effort to meet the interim salinity goal of a maximum 500 umhos/cm electrical conductivity increase over the weighted average electrical conductivity of the City of Tracy's water supply; and
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> 3) The Discharger participates financially in the development of the Central Valley Salinity Management Plan at a level commensurate with its contributions of salinity to the Southern Delta.
>
> Upon determination by the Regional Water Board that the Discharger has materially failed to comply with the approved Salinity Plan due to circumstances within its control, the final effluent limitations for electrical conductivity shall become effective immediately.

Thus, if the City timely submits a plan, and, if the City implements the plan (after the Central Valley Water Board approves it), the 700/1,000 µmhos/cm will not be the final effluent limitation. If the plan is approved and implemented, there is neither a final numeric effluent limitation nor even a final effluent limitation for EC.

The City maintains that the Permit provision constitutes a final, water quality-based effluent limit. While it is possible to have effluent limitations other than numeric effluent limitations (see State Water Board Order WQO 2003-0012 [*Los Coyotes/Long Beach*]), the effluent limitation must nonetheless be enforceable and designed to implement the water quality objective. The Permit simply requires, however, the discharger to develop and comply with its own plan to reduce salinity in its discharge. If the City does so, there is no applicable numeric effluent limitation. Further, there is no requirement that the plan be designed to implement the water quality objective. Such a permit provision does not meet the requirement of 40 Code of Federal Regulations, section 122.44(d)(1)(i).[10]

[10] Our conclusion in this respect is similar to the one U.S. EPA reached in disapproving an approach proposed by the State Water Board in the original SIP. (See, Letter from Alexis Straus, U.S. EPA, to Celeste Cantú (Oct. 23, 2006), at p. 4 [observing that permits must include provisions to implement water quality standards and concluding that studies and commitments to studies that do not actually implement the standards do not satisfy federal regulations]. We take administrative notice of this letter pursuant to California Code of Regulations, title 23, section 648.2.)

In the Fact Sheet, the Central Valley Water Board appears to acknowledge that the Permit provision does not constitute a final water quality-based effluent limitation. The Central Valley Water Board determined that meeting the objective was "not a reasonable approach," because it would require the application of reverse osmosis.[11] The Central Valley Water Board implicitly relied upon the determination made by the State Water Board in Order 2005-005 (*City of Manteca*).

In adopting the Manteca order in 2005, this Board made clear that the order's conclusions with respect to EC were not precedential. "Our conclusion is based on the unique background and facts of this case, and this order shall not be regarded as precedential with respect to other proceedings. . . ." (State Water Board Order WQ 2005-005.) In other words, it was not to be used with respect to future proceedings, such as this Permit.

Moreover, in adopting the Manteca order, we pointed to several facts that are different now and in reference to Tracy. It is true that in adopting the Manteca order in 2005, we determined that Manteca's discharge of EC did not need to meet the summer salinity standard for the Lower San Joaquin River, the same standard that applies to Old River. We pointed out that Manteca's discharge met the 1,000 µmhos/cm winter standard, but could not at that time meet the 700 µmhos/cm standard for summer discharges. We considered the cost of reverse-osmosis treatment, and the need to dispose of high-saline brine waste from reverse osmosis. We also considered potential changes to these standards.[12] We determined that imposition of the 700 µmhos/cm standard was unreasonable under those circumstances. We concluded that a numeric year-round limit of 1,000 µmhos/cm was appropriate in those circumstances. Even if the Manteca order had been precedential, the Permit does not comply with the requirements this Board established for Manteca. In Tracy's permit, there is no final numeric effluent limit; only a

[11] "Final effluent limitations based on the MCL, Bay-Delta Plan, or the agricultural water quality goal would likely require construction and operation of a reverse-osmosis Treatment plant." (Fact Sheet at F-45 vii.) The Fact Sheet contains several pages of discussion about the EC limits, including a discussion of the results of modeling to determine the impact of the City's discharge on the overall salinity in the Old River. (*Id.*, at F-45 to F-49.)

[12] We also discussed the fact that in repeated iterations of Water Rights Decision 1641, the solution to the salt problems in the San Joaquin River were generally assigned to diverters and agricultural discharges, that the increment that would be removed by enforcing the 700 µmhos/cm standard would have little impact on the overall salt loading of the San Joaquin River, and that the Water Boards were embarking on a study and planning process to address salinity in the watershed. All of these factors are the same for Tracy as they were for Manteca. However, in 2006, we revisited the Bay-Delta Plan, and re-adopted the salinity objectives for Old River without change. Further, the 2006 update to the Bay-Delta Plan removed any ambiguity that the EC objectives applied throughout the southern Delta water bodies.

requirement to submit and implement a plan to reduce salts, with no back stop to implement the numeric water quality objectives.[13]

We also note that there is almost no discussion in the Fact Sheet or Permit about the conclusion that reverse osmosis is the only treatment methodology that the City could use to meet the numeric limits, or whether there are any other feasible alternatives that the City could use to meet the numeric water quality objectives in the Bay-Delta Plan. Because of the high-salt industrial influent from Leprino, which appears to contribute to the higher EC in Tracy's effluent, it is likely that there are other methods by which limitations could be met. In fact, the Permit required the City to perform a salt-reduction study to avoid imposition of the final numeric effluent limitations for EC. While the salt-reduction study is not part of the record, the Central Valley Water Board should have received that study last fall. That study may indicate ways in which the City could comply with the applicable requirements without incorporating reverse osmosis into its treatment train.[14] Importantly, there are no findings or discussion in the Permit or the Fact Sheet about alternatives to reverse osmosis or even the feasibility or cost of reverse osmosis for all or part of the waste-train treated by the City.[15]

On remand, the Central Valley Water Board should consider the salt reduction study and other reasonable ways in which the City could reduce the EC in its discharge to meet the applicable effluent limitation. If it appears that there are no feasible ways to reduce the level of EC to meet the water quality objective, the Central Valley Water Board could then consider various planning options: a total maximum daily load (TMDL) for Old River[16]; site-specific water quality objectives; a basin plan amendment; or, if the timing allows, the results of the State and Central Valley Water Boards' joint study and planning process regarding management of salt in the watershed. Issues pertaining to salts and salt management can be very complex, and

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[13] It should also be noted that the City's discharge does not meet the 1,000 µmhos/cm limit imposed in *Manteca*. The City's interim limit is 1,350 µmhos/cm, which represents current performance.

[14] The record reflects that the Central Valley Water Board delayed its decision on permit approval to run a salt-increment model for Old River. Modeling demonstrated that the amount of salt added by the City's discharge was a relatively small increment of the total salt loading in Old River. While this does not exempt the City from meeting the Clean Water Act's NPDES requirements, it may argue in favor of a TMDL, where, after the City incorporates all feasible salt-reduction techniques, the City's allocation for salt could be adjusted appropriately.

[15] As alternatives to reverse-osmosis treatment, the Central Valley Water Board could consider options such as: 1) reviewing the results of the City's study to reduce EC in its influent and its effluent; 2) feasibility and effectiveness of pre-treatment for salt removal in Leprino's wastewater; or 3) possibility of multiple treatment options other than reverse-osmosis.

[16] Adoption of a TMDL for Old River could include appropriate allocations for all of the dischargers of salt to Old River.

planning processes may provide the optimum vehicle for addressing salts. In the meantime, though, the Water Boards must follow the requirements of federal law.

It was inappropriate for the Central Valley Water Board to rely upon the Manteca order, which was not precedential. Since we adopted the Manteca order, we have re-affirmed the salinity objectives applicable to the southern Delta, without changing the objectives applicable to the discharge at issue here.[17] We remand the permit for the inclusion of the final water quality based effluent limits designed to implement the numeric water quality objectives contained in the Bay-Delta Plan, and, if appropriate, a planning process. This does not mean that the City must immediately comply with these limits. The Central Valley Water Board may adopt a time schedule for compliance, as it did in the permit at issue.

B. Dilution Credits

**Contention**: The Permit allows one hundred percent use of the assimilative capacity of the receiving stream without an adequate analysis of actual receiving water flow rates.

**Discussion**: To the extent CALSPA objects to the allowance of a maximum dilution credit for calculating effluent limitations to protect human health from priority pollutants, the contention has merit. The Central Valley Water Board failed to justify its use of a completely-mixed discharge scenario when it granted a 20:1 dilution credit – the maximum allowable. The record indicates that the discharge into Old River is incompletely mixed. When a discharge is not completely-mixed, then mixing zones and dilution credits may only be granted based on site-specific data and special studies. These are not in the record. As a result, we will remand the Permit for calculation of appropriate effluent limitations for the human health criteria for dichlorobromomethane and chlorodibromomethane, to be based on either no dilution credit or the results of an appropriate study.

According to the Permit[18], the Central Valley water Board granted the maximum dilution credit for priority pollutant human health criteria: 20:1. In doing so it used an estimated harmonic mean flow. In order to ensure that the estimate was conservative, it excluded wet years and used the maximum effluent flow of 16 mgd, which will be the maximum flow after the

[17] State Water Board Resolution 2006-0098 (approving the 2006 update to the Bay-Delta Plan).

[18] Fact Sheet at p. F-24. The Fact Sheet discusses Dilution and Mixing Zones generally at pp. F14 - F25.

entire plant expansion is complete. The result may be a conservative estimate, given that the effluent flow will not reach the 16 mgd until after the current permit cycle. Nevertheless, it is not the correct method for calculating the dilution credit in this case. The Central Valley Water Board's approach would be permissible if the discharge were "completely-mixed," in accordance with SIP section 1.4.2.1. [19] The record, however, does not support the conclusion that the discharge is completely-mixed. The record indicates that the flow regime of Old River is extremely complex, due to tidal influences, hydro-modifications, and management requirements. [20] The evidence and description in the Fact Sheet indicate that the discharge is incompletely-mixed.

For discharges to water bodies with complex, site-specific dynamics, the SIP states that "the mixing zone and dilution credit shall be determined using site-specific information and procedures for incompletely-mixed discharges."[21] Calculating a mixing zone and dilution credits for incompletely-mixed discharges is more complex and requires an independent mixing zone study.[22] For Old River, there are no reliable actual-flow data. In the Fact Sheet, the Central Valley Water Board pointed out flaws in several models presented by the City to justify various dilution credits, generally because none reflected actual flow conditions.[23] In the Permit, however, the Central Valley Water Board adopted a 20:1 dilution

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[19] "Completely-mixed discharge condition means not more than a 5 percent difference, accounting for analytical variability, in the concentration of a pollutant exists across a transect of the water body at a point within two stream/river widths from the discharge point." (SIP, Appendix 1-1.)

[20] "Multiple dosing of the receiving water with effluent occurs as the tide moves the water column upstream and downstream past the point of discharge. The complex dynamics of the stream flow, the tidal flows, the barrier operations, and the state and federal pumping operations must be considered in an evaluation of the available dilution for the discharge….[¶] ….The flow of diluting water at the point of discharge varies with the tidal cycle. Typically, as net river flow drops, at some point in the tidal cycle the incoming tide balances against the downstream river flow resulting in river flow stagnation and very little dilution of effluent. Below this net river flow, the direction of the river flow reverses with incoming tides resulting in short periods of time with zero net river flows. Additionally, with flow reversals, some volume of river water is multiple dosed with the effluent as the river flows downstream past the discharge, reverses, moves upstream past the discharge a second time, then again reverses direction and passes the discharge point a third time as it moves down the river. A particular volume of river water may move back and forth, past the discharge point many times due to tidal action, each time receiving an additional load of wastewater. This is exacerbated with the barriers installed in the South Delta. The barriers minimize inflow from the San Joaquin River and restrict downstream flows. Therefore, flows while the barriers are in place are primarily tidal, since the [Head of Old River] barrier directs the majority of San Joaquin River flows north towards Stockton. In addition, the agricultural barriers allow flood tides through but the ebb tides are restricted. This maintains water levels for irrigation, but reduces downstream flow in Old River." (Fact Sheet at p. F-17.)

[21] SIP, p. 16, § 1.4.2.1.

[22] SIP, p. 17, § 1.4.2.1.

[23] See Fact Sheet at pp. F18- F20.

credit for priority pollutant human health criteria, based upon DWR's DSM2 model.[24] The record does not demonstrate that an independent mixing-zone study was conducted to establish this dilution credit/mixing zone for the priority pollutant human health criteria. Instead, it appears that the dilution credit was established using SIP Table 3 parameters for completely-mixed discharges.[25]

The SIP establishes a number of explicit conditions for mixing zones. Among the conditions, the SIP requires that a "mixing zone shall be as small as practicable."[26] Further, "[a] mixing zone shall not: [¶]. . . dominate the receiving water body."[27] We have also previously discussed that the SIP requires a permit to identify the mixing zone boundaries.[28] The Permit does not indicate whether the dilution credit is limited in this manner.

The Central Valley Water Board's approach to the difficult issues associated with establishing a mixing zone is inconsistent with the SIP. The SIP only allows the granting of the maximum dilution credit using Table 3 parameters when the discharger demonstrates that the discharge is completely-mixed. For an incompletely-mixed discharge, any dilution credit must be determined based on an appropriate mixing zone study using site-specific data, and the credit can provide only the necessary assimilative capacity and not all the available assimilative capacity. The boundaries of the mixing zone must also be defined. Until such information is provided, no dilution credit may be granted.

The Central Valley Water Board inappropriately considered the discharge to be a "completely-mixed discharge" without adequate demonstration and verification that the discharge completely mixes. On remand, an appropriate dilution credit should be determined using procedures detailed for incompletely-mixed discharges, which requires site-specific data and an independent mixing zone study, and should contain the appropriate parameters. Until the study results are complete and acceptable to the Central Valley Water Board, the discharge should be granted no dilution credit for priority pollutant human health criteria.

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[24] See Fact Sheet at pp. F-23-24. DSM2 is basically a river, estuary, and land modeling system that was developed by DWR that can calculate stages, flows, velocities and many mass transport processes, including salts, multiple non-conservative constituents, temperature, trihalomethane formation, and potential and individual particles. The model is copyrighted by the State of California, Department of Water Resources.

[25] Fact Sheet, at pp. F-23-24.

[26] SIP, p. 17, § 1.4.2.2.

[27] *Id.*, at § 1.4.2.2.A (emphasis in original).

[28] Order WQ 2008-0010 (*Yuba City*) (discussing SIP, p. 17, § 1.4.2.2.B).

C. Chronic Ammonia Effluent Limit

**Contention**: CALSPA contends that the Central Valley Water Board's use of the median pH value (over five and one-half years of data) and the 30-day average temperature for the calculation of an ammonia effluent limitation to protect against chronic toxicity does not produce a limitation that will be protective in all events over the life of the Permit. CALSPA contends that the Permit does not present a technical explanation or statistical analysis to justify the use of median values, and, as such, does not implement the narrative toxicity water quality objective in the Basin Plan. CALSPA contends that the ammonia effluent limitation in the City's permit will allow toxic discharges to Old River, which has no assimilative capacity.

**Discussion**: We agree that the Permit lacks an adequate rationale for using a median pH value instead of an average pH. On remand, the Central Valley Water Board can either explain its basis for using a median or recalculate the effluent limitation based on an average pH.

Ammonia is known to cause chronic toxicity to aquatic organisms in surface waters. The Basin Plan contains a narrative water quality objective that applies to toxic substances in Old River: "all waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life."[29] Since the Fact Sheet indicates that the discharge of ammonia has the reasonable potential to cause or contribute to an excursion above the narrative objective,[30] the Central Valley Water Board was required to establish an effluent limit for ammonia using one of the methods specified in 40 Code of Federal Regulations, section 122.44(b)(1)(vi). One method specified by the federal regulation would allow the Central Valley Water Board to establish an effluent limit using U.S. EPA's 304(a) criteria guidance, supplemented where necessary by other relevant information.[31] The Central Valley Water Board could have supplemented the 304(a) criteria guidance with other information, but it must include evidence in the record and a scientific rationale that its effluent limitation, with the supporting information, adequately protects the beneficial use.[32]

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[29] Basin Plan at III-8.00.

[30] Fact Sheet at p. F-30.

[31] 40 C.F.R. § 122.44(b)(1)(vi)(B).

[32] The Basin Plan states that material and relevant information, including numeric criteria, and recommendations from other agencies and scientific literature will be considered in evaluating compliance with the narrative toxicity objective.

U.S. EPA has developed 304(a) criteria guidance for ammonia to protect freshwater aquatic life. The guidance document [33] recommends the use of "criteria continuous concentration" (CCC) which is dependent on pH, temperature, and life stage of receptor organisms (aquatic life in this case).

In Old River there are salmonids and aquatic life in all stages year-round.[34] In order to comply with the Basin Plan's narrative toxicity objective, the Central Valley Water Board established effluent limits in the Permit designed to protect aquatic life from chronic exposure to ammonia, using U.S. EPA's criteria guidance. The CCC developed by U.S. EPA varies, depending upon temperature and pH. Thus, any effluent limitation established in the Permit must account for all temperature and pH variations in order to protect all stages of aquatic life in all circumstances. U.S. EPA, in its 1999 update, recommends 30 days as the averaging period for the ammonia chronic criterion. [35] Therefore, it would be appropriate to use the pH and temperature values expressed as 30-day averages.

The Central Valley Water Board, while mostly following the guidance, chose instead to use a *median* pH for over 5 years of data and a 30-day average temperature in its calculation, instead of using 30-day averages for both temperature and pH. It does not explain its choice, other than to state:

> [T]he median was chosen for chronic toxicity, because over a period of time receptors would be exposed to a more or less average ammonia concentration. Using this approach, the chronic design pH was calculated as 7.8. This exceeds the median effluent pH, which was calculated as 7.4, based on 2,372

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[33] 1999 Aquatic Life Ambient Water Quality Criteria for Ammonia Update, the 304(a) criteria guidance document for ammonia, is posted at http://www.epa.gov/waterscience/criteria/ammonia/technical.html.

[34] The most stringent acute ammonia criteria are applied when salmonids are present within the water column. Old River at Tracy is a migratory path for salmonids, and they are likely to be present in the river at any time of the year. The chronic ammonia criteria are most stringent when early life stages (ELS) of aquatic species are present. A Department of Fish and Game memorandum dated February 27, 2001, states that ELS of multiple fish and invertebrates species are present in the Delta year-round. Therefore, both acute and chronic ammonia toxicity are based on the assumption that both salmonids and ELS of fishes are present in Old River near the Facility's outfall year-round. (Fact Sheet at p. F-30.)

[35] "EPA recommends the 30B3 (the lowest thirty-day average flow based on a 3-year return interval when flow records are analyzed using EPA's 1986 DFLOW procedure), the 30Q10 (the lowest thirty-day average flow based on a ten-year return interval when flow records are analyzed using extreme-value statistics), or the 30Q5 as the appropriate design flows associated with the 30-day averaging period of the ammonia chronic criterion. In addition, EPA recommends that within the 30-day averaging period, no 4-day average concentration should exceed 2.5 times the chronic criterion, or Criterion Continuous Concentration (CCC). Consequently, the design flow should also be protective of any 4-day average at 2.5 times the CCC." (Technical Fact Sheet, 1999 Aquatic Life Ambient Water Quality Criteria for Ammonia Update, http://www.epa.gov/waterscience/criteria/ammonia/technical.html.)

> measurements from July 1, 1998 to December 31, 2004. Therefore, the critical pH for calculation of the chronic criterion is 7.8.

This does not explain nor scientifically justify the choice of the median for pH, in lieu of the average. These are not equivalent. Comparing the average and median pH values available for this discharge, the State Water Board's technical evaluation concludes that the average provides a more protective chronic criterion.[36] While the U.S. EPA guidance is not binding, the Central Valley Water Board must provide some justification for its selection of median values and must explain why the median values will result in compliance with the narrative water quality objective which requires that aquatic life be protected from chronic exposure to ammonia.

Using the average values results in a more stringent, and therefore more protective, value for chronic ammonia exposure. U.S. EPA has demonstrated the validity of using average values as a way to demonstrate compliance. The Central Valley Water Board instead used the median pH value, and failed to provide a technical justification. On remand, the Central Valley Water Board must either use the average values or justify use of the median values. The Central Valley Water Board has discretion in calculating the chronic ammonia toxicity requirement. In this case, it abused that discretion by picking a method that was not the most protective while providing no justification.

D. Chronic Toxicity Effluent Limit

**Contention**: CALSPA contends that the Permit does not contain a final effluent limit for chronic toxicity.

**Discussion**: The Permit does not contain an appropriate final effluent limitation for chronic toxicity. We have addressed this issue in detail in recent orders, and we will require a similar change to the Permit to address the short-coming.

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[36] The State Water Board's technical review of the record shows that more protective scenarios existed. For instance the July 2004, 30-day average receiving water value for pH was reported as 8.99. This value was the highest monthly average presented in the record based on weekly receiving water samples. The Central Valley Water Board's median value is 7.8, which was calculated from evaluating 280 weekly receiving water samples obtained from July 1998 through November 2003. Use of the average value would thus result in a more stringent and protective effluent limitation. When the Central Valley Water Board revisits the data to make its determination as to what is the most protective scenario, it should use caution when averaging pH values. Since pH is based on a logarithmic scale, the use of arithmetic or geometric means is not appropriate. For example, the record as stated above reports the July 2004, 30-day average pH as 8.99, however this calculated average is incorrect and should be 8.92 based on the four samples taken during that month.

As stated above, the Basin Plan contains a narrative toxicity objective that states, "all waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life." (Basin Plan at III-8.00) In addition, SIP section 4 states, "a chronic toxicity effluent limitation is required for all discharges that will cause, have reasonable potential to cause, or contribute to chronic toxicity in receiving waters."

In the Fact Sheet on Page F-57, the Central Valley Water Board found that there was reasonable potential to cause or contribute to chronic toxicity:

> Based on quarterly whole effluent chronic toxicity testing performed by the Discharger from March 2, 2001 through October 15, 2004, the discharge has reasonable potential to cause or contribute to an in-stream excursion above of the Basin Plan's narrative toxicity objective. No dilution has been granted for the chronic condition. Therefore, chronic toxicity testing results exceeding 1 chronic toxic unit (TUc)[37] demonstrates the discharge has a reasonable potential to cause or contribute to an in-stream excursion of the Basin Plan's narrative toxicity objective. As shown in Table F-11, below, the discharge regularly exceeds 1 TUc with all three test species.

However, even though the discharge has a reasonable potential to cause or contribute to chronic toxicity in receiving waters, the Permit does not have chronic toxicity effluent limitations. The Central Valley Water Board references the State Water Board's Order WQO 2003-012 (*Los Coyotes/Long Beach*) and provides the following rationale:

1. The process to revise the SIP to provide implementation procedures for whole effluent toxicity is currently underway;
2. Proposed changes include clarifying the appropriate form of effluent toxicity limits in NPDES permits and general expansion and standardization of toxicity control implementation related to the NPDES permitting process; and
3. Since the toxicity control provisions in the SIP are under revision, it is infeasible to develop numeric effluent limitations for chronic toxicity.

In State Water Board Order WQ 2008-0008 (*City of Davis*), this Board pointed out that, while our 2003 order stated that no numeric effluent limitation was appropriate, permits must contain a narrative effluent limitation. We determined that the permit in question lacked a

[37] TUc – Chronic toxic unit. The reciprocal of the effluent concentration that causes no observable effect on the test organism in a chronic toxicity test (TUc = 100/NOEC).

narrative effluent limitation for chronic toxicity. We remanded the permit for inclusion of a narrative effluent limitation for chronic toxicity, and required the permit to contain a re-opener for an appropriate numeric limitation once an applicable limitation is available.[38] This Permit must also include a similar narrative effluent limitation.

On remand, the Central Valley Water Board must include a narrative chronic toxicity limitation in the City's permit, with an appropriate re-opener for a numeric limitation when one is available.

E. Bis(2-ethylhexyl)phthalate

**Contention**: CALSPA contends that the Permit needs an effluent limitation for bis(2-ethylhexyl)phthalate.

**Discussion**: Based on the limited data, the SIP procedures require a finding of reasonable potential for bis(2-ethylhexyl)phthalate. As a result, the Permit should have included an effluent limitation for bis(2-ethylhexyl)phthalate. Bis(2-ethylhexyl)phthalate is a manufactured chemical that is commonly added to plastics to make them flexible, and its occurrence is widespread.

The record indicates that there were numerous samples that showed the presence of bis(2-ethylhexyl)phthalate. Prior to 2002, the samples were composite samples. There have been recorded sample contaminations from composite samples, because composite samples are normally collected by automatic sampler over 24-hour period using plastic tubing and bottles. Composite samples have longer contact time with plastic sampling apparatus during sample collection. Thus, they are more likely to be contaminated. In contrast, grab samples have minimum contact with plastic tubing and bottles. Chances for sample contamination in grab samples are minimal.

The record indicates that the Central Valley Water Board used four of the City's samples that were taken after 2002 to determine reasonable potential. These four were grab samples, analyzed by Caltest Analytical Laboratory. Of the four laboratory samples taken after 2002, three detected bis(2-ethylhexyl)phthalate. The laboratory J-flagged[39] the three samples,

[38] See WQ 2008-0008 at p. 5.

[39] Caltest Analytical Laboratory defines "J" flagged result as an estimated concentration above the method detection limit (MDL) and below the RL/ML (Reporting Limit/Minimum Level). "J" flag is equivalent to the detected but not quantified (DNQ) estimated concentration flag.

so all results are estimated. One of the J-flagged samples had a value of 2 µg/L, which exceeds the lowest water quality objective of 1.8 µg/L.

It thus appears from the record that at least one sample contained bis(2-ethylhexyl)phthalate at a level above 1.8 µg/L, which would be enough to create a "reasonable potential." On remand, the Central Valley Water Board must analyze existing and additional samples to determine whether the presence of bis(2-ethylhexyl)phthalate creates a reasonable potential, and thus whether an effluent limit is required.[40]

## III. ORDER

IT IS HEREBY ORDERED THAT, this matter be remanded to the Central Valley Water Board to make revisions to the Permit that are consistent with this order. Specifically, the Central Valley Water Board must do the following:

1. Amend the Permit to include a final effluent limitation for Electrical Conductivity in compliance with the objectives in the Bay-Delta Plan, and, if appropriate, initiate a water quality planning process;
2. Amend the Permit to remove a dilution credit for the water quality-based effluent limitations based on human health criteria for dichlorobromomethane and chlorodibromomethane unless an independent mixing zone study with site-specific data supports a credit;
3. Amend the Permit to ensure that it contains an effluent limit for chronic ammonia toxicity that implements the narrative standard in the Basin Plan;
4. Amend the Permit to ensure that it contains a narrative chronic toxicity objective, with an appropriate re-opener for a numeric limit when one is available;
5. Amend the Permit to include an effluent limitation for bis(2-ethylhexyl)phthalate.

## CERTIFICATION

[40] If repeated sampling demonstrates that there is no reasonable potential for bis(2-ethylhexyl)phthalate to cause an excursion above the water quality objective, the Central Valley Water Board can leave an effluent limitation out of the permit or remove it from a future iteration of the permit. (See WQ-2003-0012 (*Los Coyotes/Long Beach*) at pp. 15-16.)

The undersigned, Clerk to the Board, does hereby certify that the foregoing is a full, true, and correct copy of an order duly and regularly adopted at a meeting of the State Water Board held (TBD).

_____
Jeanine Townsend
Clerk to the Board