STATE OF CALIFORNIA

STATE WATER RESOURCES CONTROL BOARD

ORDER WQ 2009-0012

In the Matter of the Petitions of

CITY OF STOCKTON, CALIFORNIA SPORTFISHING PROTECTION ALLIANCE, SAN LUIS & DELTA-MENDOTA WATER AUTHORITY AND WESTLANDS WATER DISTRICT

For Review of Waste Discharge Requirements Order No. R5-2008-0154
[NPDES No. CA0079138] for the City of Stockton Regional
Wastewater Control Facility, San Joaquin County
Issued by the
California Regional Water Quality Control Board,
Central Valley Region

SWRCB/OCC FILES A-1971, A-1971(a), and A-1971(b)

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. The City of Stockton (City), California Sportfishing Protection Alliance (CALSPA), and San Luis & Delta-Mendota Water Authority and Westlands Water District (Water Agencies) have raised a number of objections to the Permit issued by the Central Valley Water Board for the wastewater treatment plant owned and operated by the City. The contentions addressed in this order deal with effluent limitations and control measures for electrical conductivity (EC), permit provisions related to tertiary treatment facilities, dissolved oxygen and ammonia limitations, monitoring for emerging contaminants, and creation of a mixing zone for human health criteria.[1]

Based on the record before the Central Valley Water Board and our technical review, we conclude that (1) the provisions of the Permit limiting the application of the EC water quality-based limitations and (2) the mixing zone for human health criteria should be remanded

[1] 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).)

to the Central Valley Water Board, and that in all other respects discussed in this Order the Permit is appropriate and proper.[2]

I. BACKGROUND

The City owns and operates a Regional Wastewater Control Facility (Facility) that provides tertiary wastewater treatment. The Permit involves discharges into the San Joaquin River, within the Sacramento-San Joaquin River Delta (Delta). The discharge point is in the southern portion of the Delta, just upstream of the Stockton Deep Water Ship Channel (Channel). The discharge is subject to the Central Valley Water Board's Water Quality Control Plan, Fourth Edition, for the Sacramento and San Joaquin River Basins (Basin Plan). The discharge is also subject to the State Water Board's Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan; December 2006). Both the Delta area and the Channel where the discharge occurs have water quality impairments. The impairing pollutants are chloropyrifos, DDT, diazinon, dioxin, EC, exotic species, furan compounds, group A pesticides, mercury, pathogens, PCBs, and unknown toxicity. The Central Valley Water Board adopted a total maximum daily load (TMDL) for oxygen demanding substances in the Channel, which was approved by the State Water Board and by the United States Environmental Protection Agency (U.S. EPA). The TMDL established wasteload allocations for oxygen demanding substances, including ammonia, carbonaceous biochemical oxygen demand (CBOD), and dissolved oxygen (DO).

A. The Treatment Plant

The City owns and operates the Facility, which serves the City and discharges intermittently up to 55 million gallons per day (MGD). The average daily flow rate is approximately 31.7 MGD, and the maximum annual average effluent discharge is 36.37 MGD. The Facility provides primary treatment, consisting of screening, grit removal, and primary sedimentation, and secondary treatment consisting of high rate trickling filters and secondary clarifiers. The secondary treated effluent is then piped under the San Joaquin River to a tertiary treatment facility, which consist of facultative ponds, engineered wetlands, nitrifying biotowers, dissolved air flotation, mixed-media filters, and chlorination and dechlorination facilities. Treated wastewater discharges to the San Joaquin River at Discharge Point 001.

[2] The deadline for resolution of these petitions has passed. This order is issued on the State Water Board's own motion, pursuant to Water Code section 13320.

B. The Receiving Waters

The San Joaquin River is a water of the United States, and the discharge occurs in the lower Delta, just upstream of the Channel. The beneficial uses of the receiving waters include municipal and domestic supply; agricultural supply; industrial process supply; industrial service supply; water contact recreation; non-contact water recreation; migration of aquatic organisms; cold and warm freshwater aquatic habitat; spawning, reproduction, and early development; wildlife habitat; and navigation. The receiving waters—the Delta where the discharge occurs and the Channel—are water quality limited segments, impaired by numerous constituents. The Central Valley Water Board has adopted TMDLs for some of these constituents.

C. Applicable Plans, Policies, and Regulations

There are several water quality control plans and policies applicable to the discharge, including the Basin Plan; U.S. EPA National Toxics Rule (NTR) and California Toxics Rule (CTR)[3]; State Water Board's Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP); 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 Bay-Delta Plan.

D. The Petitions

In October 2008, the Central Valley Water Board adopted waste discharge requirements for the Facility in Order No. R5-2008-0154 [NPDES No. CA0079138]. In November 2008, the State Water Board received three timely petitions challenging the Permit. The City challenged provisions regarding EC and salinity reduction. CALSPA challenged numerous provisions in the Permit, including provisions regarding EC and provisions related to tertiary treatment. The Water Agencies challenged provisions regarding EC and ammonia, and monitoring requirements. In this Order, we address various contentions concerning EC and salinity, the provisions relevant to tertiary treatment, and the need to address new or emerging contaminants.

[3] 40 C.F.R. §§ 131.36 & 131.38.

II. CONTENTIONS AND FINDINGS

A. Electrical Conductivity

Contentions: All of the petitioners assert various claims regarding EC. Some of these claims we addressed recently in Order WQ 2009-0003 (*Tracy*), concerning a petition filed by CALSPA challenging the NPDES permit for the Tracy sewage treatment plant. Because the City raises somewhat different contentions, we shall discuss those in more detail. CALSPA contends, as it did in its Tracy petition, that the Permit fails to establish an effluent limitation for EC that is protective of applicable water quality objectives and that the Permit instead contains a "conditional" final limit that imposes no numeric requirements as long as the City submits a salinity reduction plan for approval by the Central Valley Water Board and carries out the plan once it is approved. The Water Agencies generally make similar contentions as CALSPA, pointing out that the salinity plan requirements are vague and undermine the numeric effluent limitations. The City, on the other hand, challenges the numeric effluent limitation for EC, claims that the State Water Board's Bay-Delta Plan does not apply to the City, objects to the salinity plan, and challenges inclusion of a salinity reduction goal and monitoring to show progress toward that goal.

Discussion: In our recent *Tracy* order, we found that our Bay-Delta Plan did apply to the discharge from that city's treatment plant. We further concluded that the numeric effluent limitations, which incorporated the water quality objectives from that Plan but were contingent on submittal of and compliance with a salinity reduction plan, were inappropriate and improper. The substance of our finding was included in the following statement:

> 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.[4]

We need not discuss this issue thoroughly, as our discussion and conclusions there are applicable here. We do note, though, that in the case of Stockton, the performance-based requirement is 1,300 µmhos. Thus, unlike Tracy, Stockton may be able to achieve compliance with the winter effluent limitations without significant modifications. The Central Valley Water Board should consider this factor in developing the appropriate EC requirements for the City.

[4] *Tracy* at p. 7.

As discussed below, we conclude here that the Central Valley Water Board appropriately applied the EC objectives in the Bay-Delta Plan as numeric effluent limitations, but that, as we held in the *Tracy* order, these should not have been made contingent on submittal and compliance with a salt reduction plan. In answer to the City's contentions, we clarify that the requirements for the plan and the associated monitoring requirements are appropriate.

The Facility discharges directly into the San Joaquin River, just upstream of the Channel, within the Sacramento-San Joaquin Delta. The Central Valley Water Board's Basin Plan requires protection of the receiving waters for domestic and municipal supply and for agricultural use, among other beneficial uses. The Bay-Delta Plan established 30-day running average salinity objectives for the protection of agricultural uses at 700 µmhos/cm from September through March and at 1000 µmhos/cm from April through August in the southern Delta. The compliance locations include: (1) in the San Joaquin River at Brandt Bridge; (2) in Old River near Middle River; and (3) in Old River at Tracy Road Bridge.

We have already concluded, in the *Tracy* order, that it was inappropriate for the Central Valley Water Board to include conditional effluent limitations, based on submission and implementation of a salinity plan. While we did not specifically address the claim that Stockton makes, that the Permit should not contain effluent limitations for EC, it is clear from our precedential order that we believe that it is appropriate to establish effluent limitations to ensure compliance with the water quality objectives in the Bay-Delta Plan.

The City contends that the water quality objectives in the Bay-Delta Plan apply only at the compliance points specified in the plan. This is incorrect. The water quality objectives in the Bay-Delta Plan apply to waters throughout the legal boundaries of the Sacramento-San Joaquin Delta. As pointed out by the Central Valley Water Board, the plan on its face applies to the general area of the southern Delta; it is not limited to the specific points where compliance will be monitored.[5] We do acknowledge that the border between the Southern Delta and Middle Delta is not clearly delineated in our plan. While the Stockton discharge occurs between the compliance locations described as interior Delta and southern Delta, it is physically much closer to the latter locations. The Central Valley Water Board considered river morphology, river flows (including major diversions and tributaries), and in-stream and diverted uses of the water at the southern Delta (Brandt Bridge) compliance location

[5] "The water quality objectives in this plan apply to waters of the San Francisco Bay system and the legal Sacramento-San Joaquin Delta, as specified in the objectives. Unless otherwise indicated, water quality objectives cited for a general area, such as for the southern Delta, are applicable for all locations in that general area and compliance locations will be used to determine compliance with the cited objectives." (Bay-Delta Plan, at p. 10.)

and concluded that the river conditions that exist at the Facility discharge point are similar. We find that the Central Valley Water Board has properly applied the objectives for the southern Delta. Both the Bay-Delta Plan and the Central Valley Water Board's Basin Plan protect agricultural and domestic uses throughout the Delta. We find that the EC effluent limitations are appropriate for protection of those uses.

The City also contends that the Permit inappropriately required a salinity reduction plan, required implementation of an approved plan, and required monitoring of salinity reduction. In the *Tracy* order, we concluded that salinity reduction requirements alone were not sufficient—an effluent limitation or other legally sufficient controls were required. On the other hand, we took note of the difficulties of salinity reduction in the Delta and suggested various methods. The City, on the other hand, makes the radical claim that the City should be under no requirements whatsoever to reduce salinity—it challenges the need for a plan, the need to implement salinity reduction measures, and the need to monitor salinity reduction. The San Joaquin River and the Delta are impaired by salinity. The Facility discharges salinity into these waters. Of course it is appropriate, and indeed necessary, for the Permit to require the City to participate in the steps that will be required to reduce salinity and protect this valuable resource.

B. Tertiary Treatment

Contentions: Several of the contentions by CALSPA and the Water Agencies concern the appropriate effluent limitations for the Facility in light of its tertiary treatment.

Discussion: CALSPA contends that the Permit should have contained effluent limitations for oil and grease. It also contends that, because of the technological capabilities of tertiary treatment, the Permit should have included a more stringent effluent limitation for CBOD. CALSPA challenges the decision to move the turbidity limitations from the effluent limitations section of the Permit to the Special Provisions section. As we will explain, in each of these cases, the Permit contains appropriate requirements for publicly owned treatment works (POTWs) that employ tertiary treatment.

As discussed previously, the Facility provides tertiary treatment to sanitary sewage. After the wastewater leaves the main facility, where it receives primary and secondary treatment and sludge is removed, the effluent is piped under the River to the tertiary treatment facilities. Those facilities consist of unlined facultative oxidation ponds, engineered wetlands, two nitrifying biotowers, dissolved air flotation, mixed-media filters, and chlorination/ dechlorination facilities. Some of the ponds are operated as necessary, to achieve improved

effluent quality by decreasing solids loading and by maintaining stable ammonia loading to the nitrifying biotowers.

The federal Clean Water Act[6] contains a technology based requirement that publicly owned treatment works must attain secondary treatment.[7] In addition, permits must include more stringent limitations necessary to meet water quality standards, treatment standards, or schedules of compliance.[8] Tertiary treatment is not specifically required for POTWs by federal law, but it may be a reasonable requirement where the treatment is necessary to achieve compliance with water quality standards. It is appropriate to include provisions that require tertiary treatment where necessary to protect water quality.[9] The exercise of discretion in adopting appropriate permit requirements includes requiring tertiary treatment and including requirements to ensure that the Facility is operated properly.[10]

In establishing the specific requirements for a tertiary treatment plant, the permit must, of course, include water quality-based effluent limitations as necessary to protect water quality. The regional water board also has discretion to include other requirements to ensure that the facility is operating properly. But there is no legal requirement to adopt technology-based effluent limitations for tertiary treatment.

Turning to the specific contentions of CALSPA, we first address the contention that every POTW must have effluent limitations for oil and grease. Oil and grease are not part of the federal technology-based requirements for POTWs.[11] An alternative basis for including an effluent limitation for oil and grease would be if there was reasonable potential for oil or grease to cause or contribute to an excursion above a water quality standard.[12] It is true that, in the prior permit, the Central Valley Water Board had included such effluent limitations. The record reveals that Stockton made upgrades to its tertiary train that resulted in improved effluent quality. Based on existing monitoring data, there is not a reasonable potential for the effluent from the Facility to cause or contribute to an excursion above applicable water quality standards for oil and grease. It was appropriate in this situation to remove effluent limitations for oil and

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[6] Federal Water Pollution Control Act, 33 U.S.C. § 1251 and following.

[7] 33 U.S.C. § 1311(b)(1)(B). This requirement applies to publicly owned treatment works that discharge to surface water pursuant to an NPDES permit.

[8] 33 U.S.C. § 1311(b)(1)(C).

[9] State Water Board Order WQO 2004-0010 (*Woodland*).

[10] *Id.*

[11] Cf. 33 U.S.C. § 1311(b)(1)(B) and 40 C.F.R. Part 133.

[12] 33 U.S.C. § 1311(b)(1)(C); 40 C.F.R. § 122.44(d).

grease in the Permit upon finding that there was no reasonable potential for these constituents to cause or contribute to exceedance of water quality objectives.

We also reject CALSPA's contention that, because of the technological capabilities of tertiary treatment, the Permit was required to include a more stringent effluent limitation for CBOD. In fact, the CBOD effluent limitations in the Permit are far more stringent than the required technology-based requirements for POTWs. They reflect treatment plant performance following installation of upgraded nitrifying treatment, which is indeed beyond treatment that was attained by a lower level of secondary treatment. The turbidity limitations in this Permit are not water quality-based effluent limitations. Instead, the provisions are intended as a check to ensure that the tertiary treatment is operating properly. The Central Valley Water Board properly exercised its discretion in labeling these requirements as "Special Provisions" rather than effluent limitations.

C. Dissolved Oxygen and Ammonia Effluent Limitations

Contention: The Water Agencies contend that the effluent limitations for dissolved oxygen and ammonia should have been strengthened over those of the prior permit in light of new scientific information about the declining health of the Delta and a salmon fish kill in 2007.

Discussion: As we stated in our *Tracy* order, ammonia is known to cause chronic toxicity to aquatic organisms in surface waters. The Central Valley Water Board has also concluded that dissolved oxygen threatens aquatic life. The Central Valley Water Board included effluent limitations for both ammonia and dissolved oxygen, and these limitations were unchanged from the prior permit. The Water Agencies contend that our Strategic Workplan for Activities in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Strategic Workplan), adopted July 16, 2008, points to potential impacts to delta smelt from ammonia, including from POTWs. The Water Agencies also argue that there was a significant fish kill of salmon in May 2007 near the City's discharge point, at a time when the facility was in compliance with its prior permit. They conclude that the prior permit was not sufficiently stringent.

The Central Valley Water Board included a thorough discussion in the Fact Sheet to the Permit justifying the calculation of the ammonia and dissolved oxygen effluent limitations. The Board also discussed current studies on ammonia in the Delta and effects of algal blooms associated with lowered dissolved oxygen. The Central Valley Water Board concluded that no definite conclusions could be drawn from the studies and stated its intention

to modify permits in the future as more definitive information is available. Our Strategic Workplan also pointed to the need for further studies to clarify the need for further controls on ammonia. Our review of the existing studies and documents in the record indicate that the Central Valley Water Board did consider new scientific information, and acted properly in retaining the existing effluent limitations and including a reopener provision. As to the fish kill cited by the Water Agencies, there was never a final determination as to the cause of the kill and there is no established link between the Facility's discharge, or the permit terms, and the event.

D. Emerging Contaminants of Concern

Contention: The Water Agencies contend that recent scientific investigations have found detectable levels of pharmaceuticals in drinking water supplies across the country. They conclude that the City should be required to monitor and test for such substances in its discharge. They also point to language in the Strategic Workplan concerning the need for improved monitoring and (separately) the concern for emerging contaminants.

Discussion: The issue of pharmaceuticals and other emerging contaminants is of concern to this Board. In September 2008, we held a workshop to discuss and encourage reduction of pharmaceutical waste discharges to POTWs. At this point in time, however, the science is too uncertain to require each POTW to monitor for a host of materials that have the potential to be found in its discharge. The Central Valley Water Board acted appropriately by including a reopener provision to allow for coordinated monitoring of emerging constituents under a regional program.

E. Mixing Zone

Contention: CALSPA contends that the Permit inappropriately grants a mixing zone for certain constituents.

Discussion: In an order on the City's prior permit, the State Water Board stated that it is the discharger that bears the burden to justify a mixing zone.[13] In the Fact Sheet, the Central Valley Water Board states that the City did not submit studies to justify dilution credits for acute and chronic aquatic life criteria. But for human health criteria, the Central Valley Water Board concluded that "critical environmental impacts are expected to occur far downstream from

[13] In the prior permit, the Central Valley Water Board had denied Stockton's requests for a mixing zone and dilution credit. In an order reviewing that permit (WQO 2003-0002), the State Water Board upheld that action, noting that the burden was on the City to prove the existence of dilution.

the source such that complete mixing is a valid assumption."[14] The Central Valley Water Board makes a similar assumption regarding available dilution for agricultural water quality objectives. The Permit grants mixing zones for human health criteria for chlorodibromomethane, dichlorobromomethane, manganese, and nitrate plus nitrite. A mixing zone for protection of irrigated agriculture is granted for molybdenum.[15]

Concerning the mixing zone for human health criteria, the Permit increases the dilution credit from 10:1 in the prior permit to 13:1 in this Permit. As we have stated in other orders, dilution credit can be granted for a completely-mixed discharge, but if the discharge is not completely-mixed, the discharger must conduct a study to support the dilution credit.[16] The SIP states: "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." In applying this definition, it is important that there be confirmation that the discharge is completely-mixed across the river transect at the downstream mixing zone boundary. Our prior order concerning this Facility's discharge discusses that the Central Valley Water Board found numerous flaws and areas of uncertainty regarding the reliability of dilution studies and adequacy of existing models at that time to support a mixing zone and dilution credits.[17] In this case, the record does not include any more recent field study or modeling to confirm that the discharge is completely-mixed. Instead, upon granting a mixing zone that extends into the Channel, the Central Valley Water Board simply assumed that there would be complete mixing at some location "far downstream". It is quite possible that there is complete mixing, in light of the size of mixing zone granted, the turbulence within the river, and the river bends and channel configuration. But there is no diffuser from the Facility and it is certainly possible that the discharge would not completely mix, even after a lengthy river transport. The issue should be remanded to the Central Valley Water Board for confirmation. The boundaries of the mixing zone are also not clearly defined.[18] This should also be corrected in the remand.

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[14] Fact Sheet, at F-19.

[15] The mixing zone information for molybdenum appears to be in error, because the Fact Sheet states that there is only one agricultural intake "in the vicinity." (Fact Sheet, at p. F-21.) In fact, there are numerous diversions for crop irrigation in the area. The "performance-based" effluent limitation is, however, much more stringent than an effluent limitation based on 13:1 dilution credit. There is initial mixing at the discharge and assimilative capacity for molybdenum. Therefore, granting the mixing zone for molybdenum appears to be harmless error.

[16] See, e.g., *Tracy*, at pp. 10-13.

[17] Order WQO 2003-002, pp. 3-4.

[18] The mixing zone also does not correspond to data the City submitted in a study. (See "Human Carcinogenic Mixing Zone Evaluation Program for the Stockton Regional Wastewater Control Facility Waste Discharge *(Continued)*

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.

1. The Central Valley Water Board must revise the effluent limitation for electrical conductivity so that they are not contingent on submission of and compliance with a salinity plan.

2. The Central Valley Water Board must clarify whether there is a basis for a mixing zone for human health criteria and, if so, to specify the boundaries of the mixing zone. If necessary, the effluent limitations for chlorodibromomethane, dichlorobromomethane, manganese, and nitrate plus nitrite should be revised.

CERTIFICATION

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 Resources Control Board held on October 6, 2009.

AYE:	Chairman Charles R. Hoppin Vice Chair Frances Spivy-Weber Board Member Arthur G. Baggett, Jr. Board Member Tam M. Doduc
NAY:	None
ABSENT:	None
ABSTAIN:	None

Jeanine Townsend
Clerk to the Board

Requirement Order No. R5-2002-0083, May 17, 2005," at pp. 9-10.) This document states that the downstream tidal movement extends 1.5 miles to the Channel and then about 0.75 miles into the Channel. Accordingly, the downstream mixing zone boundary corresponding with this extent of tidal movement would be located 2.25 miles downstream, or mile 39 of the San Joaquin River.