

STATE OF CALIFORNIA
STATE WATER RESOURCES CONTROL BOARD

In the Matter of the Petition of)
CHINO BASIN MUNICIPAL WATER)
DISTRICT for Review of Orders)
Nos. 81-27 and 81-28, NPDES Permits)
Nos. CA0105279 and CA0105287),)
California Regional Water Quality)
Control Board, Santa Ana Region.)
Our File No. A-287.)

Order No. WQ 82-5

BY THE BOARD:

On January 9, 1981, the California Regional Water Quality Control Board, Santa Ana Region (Regional Board) adopted waste discharge requirements in Order Nos. 81-27 and 81-28 (NPDES Permit Nos. CA0105279 and CA0105287) for the Chino Basin Municipal Water District, Regional Plants Nos. 1 and 2, respectively. The waste discharge requirements establish effluent limitations for petitioner's two regional wastewater treatment facilities. Chino Basin Municipal Water District (petitioner) submitted a petition, dated February 4, 1981, requesting review of these requirements and seeking a stay. The petition did not meet the regulatory requirements for a stay.

I. BACKGROUND

The Santa Ana River Basin has a severe water quality problem caused by an adverse salt balance. More salts enter the Basin than leave the Basin. The net result is a long-term general degradation of mineral quality in both surface and groundwater

supplies due to the recycled use of water supplies. Very little salt is removed through discharge to the ocean. In a previous order (WQ 79-14)^{1/} we noted that in 1970 the rate of buildup of dissolved salts was estimated to be 523,000 tons per year in the entire basin. Importation of Colorado River water accounts for over 30 percent of the total salt buildup. Domestic and agricultural sources account for approximately one half of the total salt input,

The petitioner currently operates two regional wastewater treatment facilities. Regional Plant One (RPI) discharges approximately 24.5 mgd of treated municipal waste into Mill Creek, a tributary of the Santa Ana River, Reach 3. The revised requirements allow an increase in volume of discharge to 32 mgd.

Regional Plant Two (RP2) discharges approximately 5 mgd into Chino Creek, also a tributary of the Santa Ana River, Reach 3. As revised, the waste discharge requirements allow the volume to increase to 10.5 mgd.

The petitioner makes three separate contentions:

1. Mineral concentration limitations should be set at the same concentration levels as the water quality objectives for the receiving stream.
2. The Regional Board did not allow petitioner to participate in the Metropolitan Water District's In-Lieu Program.
3. The ammonia removal requirement should not be implemented until it has been shown to be cost-effective or economically justifiable.

These issues will be addressed separately below.

-
1. In the Matter of the Petition of Pacific Water Conditioning Association, Inc.

II. DISCUSSION

A. Mineral Limits.

Because the issues raised herein deal with limitations to prevent salt loading problems, it is appropriate to review the general principles previously established (State Board Order Nos. 73-4, WQ 79-14 and WQ 81-5).

To apply these principles, one must first determine how the constituent in the receiving water relates to the objective set forth in the Basin Plan.

As set forth in the Order WQ 81-5^{2/}

"Where the constituent in a groundwater basin is already at or exceeding the water quality objective, the Regional Board must set limitations no higher than the objectives set forth in the Basin Plan.*

1. Exceptions to this rule may be granted where it can be shown that a higher discharge limitation is appropriate due to system mixing or removal of the constituent through percolation through the ground to the aquifer.
2. The Regional Board should set limitations more stringent than the Basin Plan objectives if it can be shown that these limitations can be met by using 'best efforts.' The 'best efforts' approach involves (a) making a showing that the constituent is in need of control and (b) establishing limitations which the discharger can be expected to achieve using reasonable control efforts. Factors which should be included in the

*Where compliance with the limitations cannot be achieved by reasonable efforts, review of the appropriateness of the water quality objectives may be required.

-
2. In the Matter of the Petition of the City of Lompoc at page 6.

'best efforts' analysis include (a) the water supply available to the discharger; (b) the past effluent quality of the discharger; (c) the effluent quality achieved by other similarly situated dischargers; (d) the good faith efforts of the discharger to limit the discharge of the constituent, and (e) the measures necessary to achieve compliance.

Where the receiving water is of better quality than the Basin Plan objective, the Regional Board may set limitations which are more or less stringent than the objective.**

1. The Regional Board may set limitations less stringent than the water quality objective by adding an increment to the objective to reflect reasonable use of the remaining assimilative capacity. The increment should consider use of the capacity by the discharger and other dischargers. Of greatest importance, however, is that the Regional Board should ensure that the cumulative impact of all discharge does not result in a situation where the water quality objective set for the basin are exceeded.
2. After establishing the increment providing for reasonable use, the Regional Board should then apply the 'best efforts' analysis to determine if a more stringent limitation is appropriate."

**Adoption of limitations in this situation must be consistent with the State Board's nondegradation policy, which states circumstances under which receiving waters should remain of higher quality than water quality objectives.

The petitioner contends that the mineral quality requirements should be established at the same concentration levels as the water quality objectives for receiving stream. The Regional Board adopted more stringent limits based on the "best efforts" approach. Petitioner sets forth several arguments in support of its contention:

(a) That the Regional Board erred in concluding there was no assimilative capacity in the receiving water. This error was allegedly caused through the Regional Board's use of out-of-date data; the fact that the Regional Board used one or two specific instances where receiving water quality exceeded objectives to conclude that certain water quality objectives are threatened, ignoring the 12- or 60-month averages which define the objectives; and the fact that it has not been shown that petitioner's discharges have caused objectives to be exceeded.

(b) That the Regional Board improperly applied the "best efforts" approach;

(c) That, in view of the effluent limitations established for Total Filterable Residue, it should not be necessary to also set separate requirements for the mineral constituents which are a part of the Total Filterable Residue.

The Regional Board and the petitioner disagree over whether there is assimilative capacity in the receiving water for minerals. However, with the exception of the boron limitation, we need not resolve the question of assimilative capacity in order to dispose of the issue as to whether the mineral concentration limitations were appropriately established. Regardless of whether there is or is not assimilative capacity, the Regional Board may employ best efforts to adopt effluent limitations at a more stringent level than the water quality objectives for the Santa Ana River.

Water Code Section 13263(b) provides that "A Regional Board, in prescribing requirements, need not authorize the utilization of the full waste assimilation capacities of the receiving waters." Such an approach is also consistent with the principles set forth earlier in this Order. The issue is whether this approach was properly employed.

We further note, in response to the petitioner's contention that although it is not necessary to set requirements for both Total Filterable Residue and individual mineral constituents, that the Regional Board may do so. In this situation, the mineral constituent objectives established for the receiving water are approached on an average basis and have been exceeded at particular times. Accordingly, we feel that if the individual mineral constituent requirements for petitioner's effluent were deleted, it would be possible for petitioner to comply with a Total Filterable Residue limitation, but still contribute to violations of a particular mineral receiving water objective. In this regard, the Regional Board need not show that petitioner has caused or threatens to cause violations of receiving water objectives. It need only show that the waste discharge requirements will help ensure that objectives are met. However, as is discussed in Section C below, we feel that these mineral objective limitations should be expressed in terms of a 12-month average when Colorado River water is being used.

We will now examine whether the Regional Board's actions are in accord with our previous orders regarding best efforts.

1. Regional Plant One.

The Regional Board revised waste discharge requirements for Regional Plant One in response to objections from the discharger to requirements in the previous Regional Board order and to allow the discharger to increase the volume from 24.5 mgd to 32 mgd. Table 1 illustrates the relationship of the effluent limits for the mineral constituents to the receiving water objectives and to actual receiving water quality (in milligrams per liter).

Petitioners are not challenging the Total Filtrable Residue (TFR) limitation as it has been developed in accordance with the wasteload allocation of the Basin Plan. (We will discuss the method of measuring compliance with the TFR limitation in response to petitioner's second contention.)

With respect to the mineral constituents of Sodium, Sulfate, Chloride and Total Hardness, the Regional Board properly applied the best efforts test to establish limitations stricter than the objectives. The Regional Board demonstrated that they were in need of control. The Regional Board determined that the objectives were close to being violated and then properly developed the effluent limitations based on the approach outlined in our earlier orders and based on the fact that all the assimilative capacity need not be utilized. In the case of Fluoride, the Regional Board set the requirements at the level of the Basin Plan objectives.

However, we do not feel that the 0.5 mg/l effluent limitation for Boron was based on the best efforts approach. The

TABLE 1

REGIONAL PLANT ONE

MINERAL CONSTITUENTS IN MILLIGRAMS PER LITER

	<u>TFR</u>	<u>Chloride</u>	<u>Sodium</u>	<u>Sulfate</u>	<u>Boron</u>	<u>Fluoride</u>	<u>Total Hardness</u>
<u>Surface Water</u> (2-year receiving range)	348-821	48-139	42-114	54-158	0.2-0.5	0.4-0.8	174-403
<u>Order 81-27</u> (4-month average)	510	140	100	110	0.5	1.0	200
<u>*Water Quality Objective</u> (12-month average)	700	160	110	150	0.5	1.0	350
<u>Plant Effluent</u> (4-month average)	420-554	66-99	68-96	57-129	0.5-1.0	0.6-1.1	113-183
<u>Water Supply</u> 1 year (1978) individual source, flow weighted average	265	17	25	52	(Not available)	(Not available)	165

*From Basin Plan -- Flow weighted base flow.

record shows that while Boron levels in Reach 3 of the Santa Ana River have reached 0.5 mg/l on specific occasions, this has not occurred on an annual or 5-year average as specified in the Basin Plan. Therefore, it appears there is some assimilative capacity in the river. The record also shows that the discharger is not meeting the effluent limitation and that the Regional Board states it is not enforcing the limitation "pending the completion of a study of the incidence of Boron in wastewaters and its impact upon beneficial uses." Based on these factors, we feel that the Regional Board should make use of the assimilative capacity and relax the effluent limitation for Boron pending the result of this study.

2. Regional Plant Two.

The Regional Board revised waste discharge requirements for Regional Plant Two in response to objections by the discharger to requirements in the previous Regional Board order and to allow the discharger to increase the volume from 5 mgd to 10.5 mgd. Table 2 illustrates the relationship of the effluent limits for the mineral constituents to the receiving water objectives and to actual receiving water quality (in milligrams per liter).

The petitioner makes the same contentions concerning Order No. 81-28 for Regional Plant Two as previously discussed for Regional Plant One.

We note that the problems are very different for the two plants, as the water supply of the area served by Regional Plant Two is of an inferior quality. Because of this, Regional Plant Two has had regular difficulty meeting its effluent limitations.

TABLE 2

REGIONAL PLANT TWO
MINERAL CONSTITUENTS IN MILLIGRAMS PER LITER

<u>TFR</u>	<u>Chloride</u>	<u>Sodium</u>	<u>Sulfate</u>	<u>Boron</u>	<u>Fluoride</u>	<u>Total Hardness</u>	<u>Ammonia</u>
Receiving Water (2-year range)	48-139	42-114	54-158	0.2-0.5	0.4-0.8	174-403	
Order 81-28 (4-month average)	140	100	130	0.5	1.0	200	14**
Water Quality Objective (12-month average)	160	110	150	0.5	1.0	350	0.8***
Effluent (4-month average)	72-108	78-120	93-174	0.5-0.7	0.5-0.9	164-260	
Supply 1 year (1978) individual source, flow weighted average	8-95	22-105	13-298	(Not available)	(Not available)	30-327	
Average range	236-408						

*From Basin Plan -- Flow weighted base flow.

**Measured as Ammonia-Nitrogen.

***Unionized ammonia.

The same receiving stream water quality objectives apply to Regional Plant Two as Regional Plant One. The mineral quality limitations were established through the same "best efforts" analysis as for Regional Plant One. Fluoride and Boron limitations were set at the water quality objective level; other constituents were set at a more stringent level.

As discussed previously, regardless of whether there is assimilative capacity in the receiving water for the mineral constituents of Total Hardness, Sodium, and Sulfate, limitations may be set at more stringent levels than the Basin Plan objective. This is permissible if they can be met by using "best efforts" approach.

The record shows that the effluent from Regional Plant Two has been in violation of the Total Hardness and Sulfate limitations a number of times. The Regional Board believes this to be attributable to regular use of large quantities of Colorado River water in service area.

One component of the "best efforts" approach shows that limitations should be set which the discharger can achieve using "reasonable" control methods. Two possible remedies which would prevent the petitioner from exceeding effluent limitations would be a change in the water supply or demineralization. While both options may be expensive, the petitioner is currently participating in a joint powers agency to develop a plan for better quality water supply for communities in western San Bernardino County, which includes the service area of Regional

Plant Two. The Regional Board believes that implementing such a plan together with a source control program will lead to compliance with the requirements of Order No. 81-28.

While these are admirable goals, we are concerned whether they constitute "reasonable" control methods in light of our recommended change to a 12-month averaging period (discussed in Part C following). We believe that the Total Hardness and Sulfate limitations should remain at the current level for the present, but that the Regional Board should subsequently review these limitations taking into consideration the changed averaging period and the completion of the joint powers study.

The Boron limitation has also been consistently violated by Regional Plant Two. As discussed previously, we feel that there is assimilative capacity for Boron and an appropriate effluent limitation should be established.

The limits established for the remaining individual constituents (Chloride, Sodium and Fluoride) were properly adopted.

B. Ammonia Removal

The petitioner believes that implementation of the ammonia removal requirements should be deferred until justification is documented.

Ammonia effluent limitations are generally expressed in terms of the total ammonia nitrogen level as was done here by the Regional Board. However, it is the unionized portion of the total ammonia which is of concern because of its toxicity. The Basin Plan has an unionized ammonia objective of 0.8 mg/l for Reach 3 of the Santa Ana River. The Regional Board set the

ammonia effluent limitation at 14 mg/l for both regional plants. The Regional Board felt this limitation would not cause violations of the unionized objective of 0.8 mg/l for Reach 3 of the Santa Ana River and as such would be sufficient to protect the fishery.

We have two concerns with the Regional Board's action. First, we do not agree with the method used to calculate the ammonia effluent limitation of 14 mg/l.

A review of the calculations used to determine this limitation shows that the Regional Board did not fully consider the receiving water concentration and temperature and the comparatively high salinity. If the TDS of the Santa Ana River were considered in calculating the unionized ammonia, up to 25 mg/l ammonia-nitrogen could be present in the river during certain periods without violating the unionized objective of 0.8 mg/l.

Secondly, and more importantly, we have concerns about whether the objective of 0.8 mg/l is adequate to protect aquatic species. Chronic toxicity effects of unionized ammonia are observed at 0.025 mg/l and lethal levels between 0.2 and 2.0 mg/l.^{3/} We direct the Regional Board to review the unionized ammonia objective in light of this concern for the concentrations at which chronic toxic and/or lethal effects are observed.

In regard to the cost effectiveness and economics justification issues raised by the petitioner, the Regional Board has responded that a need to protect the beneficial use of the river

3. See "Water Quality Criteria for European Freshwater Fish-- Report on Ammonia and Inland Fisheries" European Inland Fisheries Advisory.

was demonstrated and the costs of protection should be commensurate with that need. The Regional Board further stated that there was no convincing evidence that a less costly method would assure equal protection. Additionally, the Regional Board noted that the cost-effectiveness of providing this protection was evaluated as part of the Clean Water Grant for facilities at both regional plants.

Since we do have concerns about the appropriate figures for both the unionized ammonia objective itself and the effluent limitation necessary to meet that objective, we cannot resolve the issue of cost-effectiveness at this time. Accordingly, we direct the Regional Board to review the ammonia-nitrogen limitation and the unionized ammonia objective. In this review, the Regional Board should include economic considerations, as set forth in Water Code Section 13241.

In the interim, we feel that the 14 mg/l limit is appropriate. As discussed before, we are not required to use the full assimilative capacity of the receiving water. In light of this and our direction to the Regional Board to evaluate the appropriateness of an unionized ammonia objective of 0.8 mg/l, we do not feel it would be prudent to allow either the unionized ammonia objective or the effluent limitation to be increased. The effluent limitation should thus remain at 14 mg/l pending the results of the Regional Board review of the objective and limitation.

C. In-Lieu Program

The petitioner contends that the Regional Board has denied it from participating in the Metropolitan Water District's (MWD) In-Lieu Program. This is a program wherein MWD will supply Colorado River water to their customers "in-lieu" of the customers using their regular water supply. The petitioner is able to use surplus Colorado River water instead of groundwater pumping.

The Regional Board has not directly denied Chino Basin Municipal Water District participation in the in-lieu program. However, the Regional Board did adopt TFR limits in such a way that may preclude the petitioner from participation in the program. The TFR limitations and the individual mineral constituent limitations contained in the waste discharge requirements are established on a 4-month average. The Basin Plan objectives are based on 12 or 60 month averages. Petitioner argues that the limitations should be based on the same time period as the objective. Since Colorado River water is higher in TFR than the current water supply, a 12-month averaging period would allow the petitioner to use more Colorado River water in certain months than could be used if a 4-month averaging period is used.

The petitioner is not contesting the TFR limits themselves, as these were developed in accordance with the wasteload allocation, but rather is challenging the manner in which compliance is computed. Similarly, the same question also arises with regard to the individual mineral limitations.

Our review of the record indicates that there have been violations of the TFR limit at Regional Plant One for a 4-month average when Colorado River water is used. The discharger is usually able to meet the 4-month limit when in-lieu water is not used.

The Regional Board did not feel that a 12-month averaging period is appropriate. The Regional Board is concerned both that there will be negative impacts on water quality and that there will be too much of an administrative enforcement lag time using a 12-month averaging period.^{4/}

As a general rule, the time period for measuring compliance with effluent limitations should be left to the sound discretion of Regional Boards. Only in limited situations should we review such determinations. We feel that this petition presents such a situation. For the following reasons we conclude that the 4-month average compliance requirement should be modified when Colorado River water is being used.

1. It appears that the 4-month compliance requirement would hinder petitioner's ability to participate in the Colorado River water in-lieu program. Generally, there is a need to balance the advantages of short term averaging against the effort needed to comply. (See e.g. In the Matter of the Petition of Ramona Municipal Water District, Order No. 81-16.)

4. We note, however, that a Regional Board may use past records to compute a 12-month running average. Additionally, an enforcement action in this type of situation could require immediate compliance.

Ordinarily a short term compliance requirement is appropriate where there are significant seasonal variations in effluent quality. Where seasonal variations do not cause a detrimental effect on beneficial uses or objective violations, short term limitations should be avoided. However, use of short term requirements must be closely scrutinized when that use conflicts with statewide policies. In fact, Water Code Section 13225(h) requires a Regional Board consider the effect of its actions upon plans which develop, utilize and conserve state water resources. In this regard the State Board has adopted a strong policy in favor of conjunctive use of the State's water resources (Department of Water Resources/SWRCB Bulletin 4, pages 3 and 5). The benefits of allowing petitioner to participate in the in-lieu program include decreased costs of water and the reduction of demand on other supplies (groundwater and northern California). Where a conjunctive use program will not cause water quality objectives to be violated, such programs should be encouraged.

2. Water quality degradation that would result from modification of the four-month compliance requirement would be minimal. While such modification may allow a slight increase in the mass emission of TFR, such levels would be within the Basin Plan's wasteload allocation. Petitioner's monitoring data shows that the average TFR level of petitioner's effluent has approached its allocation. Thus petitioner will still be constrained in the amount of high TFR water that could be used.

3. Petitioner appears to be the only public entity in the upper Santa Ana River watershed with the capability of participating in the Colorado River water in-lieu program. Other dischargers who experience seasonal peaks of mineral concentrations could continue to be required to meet short-term compliance averages where necessary to protect beneficial uses and meet water quality objectives.

4. The in-lieu program will apparently be temporary. At such time as it ends the Regional Board may reevaluate the compliance requirements. If there are still seasonal fluctuations in mineral concentrations of the effluent with no concomittant benefits, the balance of the benefits may weigh in favor of a return to a shorter compliance requirement.

Based on unique circumstances presented in this case, we conclude that use of a 12-month running average to compute compliance with mineral limitations is appropriate when Colorado River water is being used. A 12-month requirement is consistent with the Basin Plan, where receiving water objectives for both TFR and industrial mineral constituents are expressed in terms of 12- and 60-month averages. Use of the longer compliance period will smooth out peaks caused by seasonal effluent quality variations and thus give petitioner the flexibility to participate in the in-lieu program.

We also note that present mineral constituent limits may unduly restrict the use of Colorado River water in the future. A by weight comparison of the mineral constituents (Sodium, Chloride and Sulfate) in Colorado River water and the present

water supply show that Colorado River water has a greater percentage of those constituents in the makeup of the Total Filterable Residue than the current water supply. We feel that at Regional Plant One, the ability of the petitioner to control the individual constituents should be considered when Colorado River water is used, as well as when it is not used. If higher concentrations of constituents cause the discharger to be unable to meet the limitations while making "best efforts," the effluent limitations for Sodium, Chloride and Sulfate should be reevaluated. However, such reevaluation should keep in mind that if water quality objectives are threatened or exceeded, there is no assimilative capacity. In such a case, effluent limitations could not exceed the objectives.

III. CONCLUSIONS AND RECOMMENDATIONS

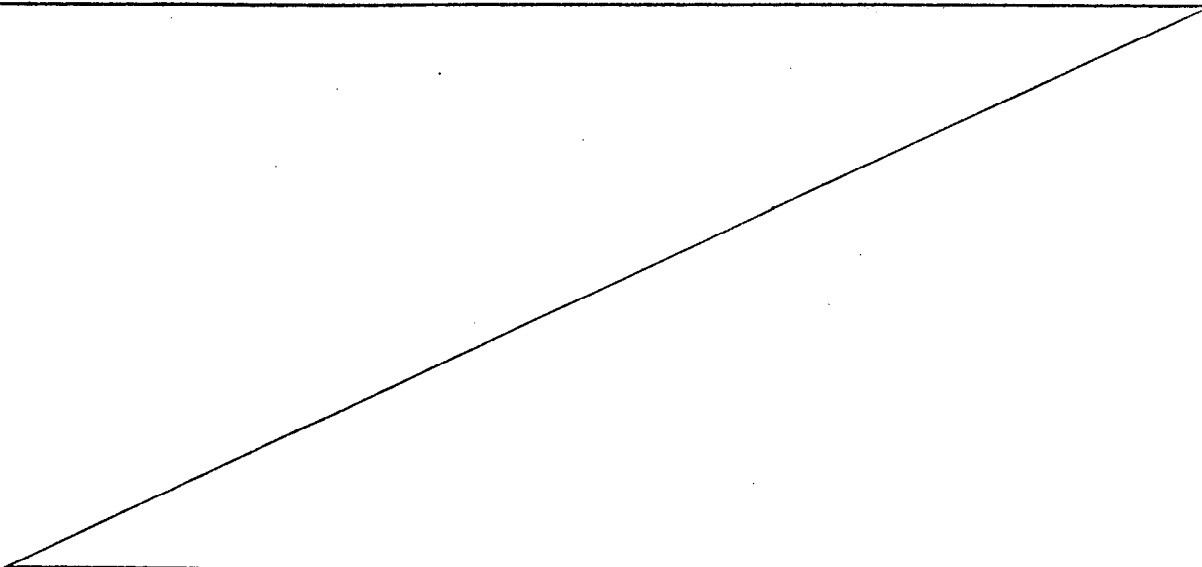
1. The contested mineral concentration limitations (excluding Boron) for Regional Plant One have been properly developed in accordance with the best efforts approach.

2. The contested mineral concentration limitations (excluding Boron, Total Hardness and Sulfate) for Regional Plant Two have been properly developed in accordance with the best efforts approach. These two limitations should be reviewed upon the completion of the joint powers study in which the petitioner is currently participating.

3. The Boron limitation for both Regional Plants One and Two is inappropriate and should be revised to make use of the assimilative capacity which appears to be available in the river pending results of study.

4. The 4-month averaging period for Total Filterable Residue and the individual mineral constituents for both Regional Plants One and Two should not be enforced when the discharger is participating in a program which substitutes Colorado River water for other supplies. At such times a 12-month running average should be used.

un-ionized
5. Pending the completion of a study reviewing the appropriateness of the 0.8 mg/l unionized ammonia objective, the ammonia effluent limitation should remain at 14 mg/l for both Regional Plants One and Two. Upon the completion of the study, the limitation should be revised in accordance with conclusions in the study.



IV. ORDER

IT IS HEREBY ORDERED that Regional Board reconsider the petitioner's waste discharge requirements in a manner consistent with this Order.

DATED: May 20, 1982

/s/ Carla M. Bard

Carla M. Bard, Chairwoman

/s/ L. L. Mitchell

L. L. Mitchell, Member

/s/ Jill B. Dunlap

Jill B. Dunlap, Member

ABSENT

F. K. Aljibury, Member

0. 1. 2. 3. 4. 5. 6. 7. 8. 9. 10.

