

STATE WATER RESOURCES CONTROL BOARD  
RESOLUTION NO. 92-15

APPROVAL OF AN AMENDMENT TO THE WATER QUALITY  
CONTROL PLAN FOR THE SANTA ANA RIVER BASIN INCORPORATING  
A REVISED WASTELOAD ALLOCATION FOR TOTAL INORGANIC NITROGEN  
IN PUBLICLY OWNED TREATMENT WORKS EFFLUENT DISCHARGES TO THE  
SANTA ANA RIVER AND ITS TRIBUTARIES AND TO  
GROUND WATER IN THE UPPER SANTA ANA RIVER BASIN

WHEREAS:

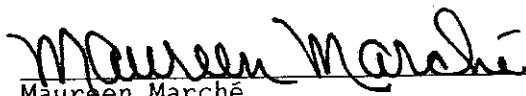
1. The California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Regional Board) adopted its Water Quality Control Plan for the Santa Ana River Basin (Basin Plan) in April 1975.
2. The Basin Plan was amended in November 1983 to incorporate a wasteload allocation (WLA) for total inorganic nitrogen (TIN) discharged to the Santa Ana River and tributaries.
3. On November 15, 1991, the Santa Ana Regional Board adopted Resolution No. 91-125 at their regular meeting, to revise the TIN-WLA in the Implementation Chapter of the Basin Plan.
4. The adoption of this revised WLA for TIN is consistent with Section 303(d)(1)(C) of the Federal Clean Water Act regarding establishing total maximum daily loads for discharges of selected pollutants to surface waters. The revised WLA is concentration-based and does not impose a cap on mass loads of TIN.
5. Santa Ana Regional Board staff prepared documents and followed procedures satisfying environmental documentation requirements in accordance with the California Environmental Quality Act (Public Resources Code Section 21000 et seq.).
6. Sections 13245 and 13246 of the California Water Code specify that Basin Plan amendments adopted by a Regional Board do not become effective until approved by the State Water Resources Control Board (State Board).
7. Santa Ana Regional Board Resolution No. 91-125 was adopted in accordance with State laws and regulations.

THEREFORE BE IT RESOLVED:

That the State Board approves Santa Ana Regional Board's Basin Plan amendment which was adopted by Resolution No. 91-125 and which incorporates revised wasteload allocations (WLA) for total inorganic nitrogen (TIN) in the Implementation Chapter of the Basin Plan.

CERTIFICATION

The undersigned, Administrative Assistant to the Board, does hereby certify that the foregoing is a full, true, and correct copy of a resolution duly and regularly adopted at a meeting of the State Water Resources Control Board held on February 20, 1992.



Maureen Marché  
Administrative Assistant to the Board

California Regional Water Quality Control Board  
Santa Ana Region

RESOLUTION No. 91-125

Amending the Water Quality Control Plan for the Santa Ana River Basin to Amend the Waste Load Allocation for Total Inorganic Nitrogen (TIN) in Discharges to the Santa Ana River

WHEREAS, the California Regional Water Quality Control Board, Santa Ana Region (hereinafter Regional Board), finds that:


1. On April 11, 1975, the Regional Board adopted a Water Quality Control Plan (Basin Plan) for the Santa Ana River Basin. The State Water Resources Control Board (State Board) approved the Basin Plan on April 17, 1975.
2. On May 13, 1983, the Regional Board adopted an amended Basin Plan for the Santa Ana River Basin (Resolution No. 83-88). The State Board approved the amended Basin Plan on October 20, 1983 (Resolution No. 83-82).
3. On April 25, 1984, the Environmental Protection Agency (EPA) approved the amended Basin Plan, with conditions.
4. The Basin Plan identifies the beneficial uses of the waters of the Santa Ana River Basin and establishes water quality objectives necessary to protect those beneficial uses. The Basin Plan objectives include nitrogen objectives for the Santa Ana River and the groundwater subbasins of the Upper Santa Ana River Basin. The objectives are intended to protect the uses of these waters for groundwater recharge (GWR), municipal and domestic supply (MUN) and aquatic habitat (WARM).
5. To facilitate and assure compliance with the TIN objectives in the river, the Implementation chapter of the Basin Plan includes a TIN waste load allocation (WLA) for publicly owned treatment plants (POTWs).
6. Sampling of the Santa Ana River (1986-1991) has shown that the nitrogen objective for the river at Prado Dam is being consistently exceeded. This indicates that the TIN WLA is no longer adequate and that revision is necessary.
7. Sampling of the groundwater subbasins of the Upper Santa Ana Basin and projections of future quality conditions indicate that these groundwaters exceed or will exceed water quality objectives for nitrate. This necessitates control of nitrogen discharges to land, as well as to the Santa Ana River.

8. The Regional Board and dischargers have conducted extensive, comprehensive nitrogen and TDS management planning. A revised TIN WLA was produced as part of the evaluation of alternatives.
9. The results of the comprehensive nitrogen and TDS management planning were discussed in detail at two Regional Board workshops, on April 19 and June 19, 1991. The recommended TIN WLA is that specified in Alternative 5C-10, which is described in the attached Basin Plan amendment. The recommended WLA specifies limits for POTW discharges to the Santa Ana River and its tributaries and, in addition, for discharges to percolation ponds in the Upper Santa Ana Basin.
10. On November 15, 1991, the Regional Board conducted a public hearing to receive testimony regarding adoption of the revised TIN waste load allocation.
11. In compliance with Public Resources Code Section 21000 et seq. (CEQA), the Regional Board staff prepared an environmental assessment evaluating the environmental impacts of adopting the proposed Basin Plan amendment, finding that no significant adverse impacts would result.
12. A Basin Plan amendment must be approved by the State Board before it becomes effective (Public Resources Code Sections 13245 and 13246).

THEREFORE, BE IT RESOLVED THAT the California Regional Water Quality Control Board, Santa Ana Region:

1. Adopts the Basin Plan Amendment incorporating a revised TIN WLA, which appears in Table 4-1-TIN and accompanying text, together with the Environmental Checklist and the Findings of Overriding Considerations.
2. Directs the Executive Officer to transmit a copy of this resolution and supporting documentation to the State Water Resources Control Board, requesting approval.

I, Gerard J. Thibeault, Executive Officer, do hereby certify that the foregoing is a full, true and correct copy of a resolution adopted by the California Regional Water Quality Control Board, Santa Ana Region, on November 15, 1991.

  
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Gerard J. Thibeault  
Executive Officer

Resolution No. 91-125  
Adopted November 15, 1991

AMENDMENT TO CHAPTER 4: IMPLEMENTATION

Waste Load Allocation for Discharges of Inorganic Nitrogen  
to the Santa Ana River and its tributaries and to the  
Groundwater in the Upper Santa Ana Basin

On April 19, 1991 and July 19, 1991, the Regional Board held workshops to review the results of comprehensive investigations of nitrogen and total dissolved solids (TDS) problems in the ground and surface waters of the Upper Santa Ana River Basin. These investigations were conducted under the auspices of the Nitrogen (or Basin Plan Upgrade) Task Force, composed of representatives of the Regional Board, the Santa Ana Watershed Project Authority, the Santa Ana River Dischargers Association and the Metropolitan Water District of Southern California. The objectives of these studies were to evaluate alternative nitrogen and TDS management plans, including revised nitrogen and TDS waste load allocations, and to make recommendations regarding the selection of a plan for incorporation in the Basin Plan. The results of these studies are presented and discussed in a set of reports prepared by the Task Force's consultants<sup>1,2</sup>, and in staff reports prepared by Regional Board staff<sup>3,4</sup>.

Based on the discussion at the workshops and input from the affected dischargers, the Board selected the TIN allocation specified in one of the alternative management plans (Alternative 5C-10) for incorporation in the Basin Plan. Under Alternative 5C-10, wastewater discharges to Reaches 4 and 5 of the River and tributaries thereto are limited to 10 mg/l TIN; for discharges to

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<sup>1</sup> James M. Montgomery, Consulting Engineers, Inc., Final Report and Appendices (two volumes). "Nitrogen and TDS Studies, Upper Santa Ana Watershed". February, 1991.

<sup>2</sup> Mark J. Wildermuth, Consulting Water Resources Engineer. "Final Summary Report, TDS and Nitrogen Studies, Santa Ana River Watershed". February, 1991.

<sup>3</sup> Regional Water Quality Control Board, Santa Ana Region. "Nitrogen and TDS Studies - Upper Santa Ana Watershed". Staff report for April 19, 1991 workshop.

<sup>4</sup> Regional Water Quality Control Board, Santa Ana Region. "Workshop II - Nitrogen and TDS Studies, Upper Santa Ana Watershed". Staff report for July 19, 1991 workshop.

Reach 3, existing<sup>5</sup> POTW flows are limited to 13 mg/l TIN, while new<sup>6</sup> flows are limited to 10 mg/l. Alternative 5C-10 also specifies that all wastewater discharges to percolation ponds (existing and new) be limited to 10 mg/l TIN. This waste load allocation is shown in Table 4-1-TIN. The salient features of this table are:

- Present and projected wastewater discharges to the middle Santa Ana River and its tributaries are listed in the left column. The TIN waste load allocation to be used to establish effluent limitations for these discharges is the set of TIN concentrations shown for the year 1995 discharges. This waste load allocation replaces the TIN allocation (only) specified in Table 4-1 of the 1983 Basin Plan.
- The Cities of Redlands and Corona currently discharge to percolation ponds. Corona's discharge is considered as a direct discharge to the Santa Ana River. In the future, portions of the flow from both communities will receive tertiary treatment with discharge to the Santa Ana River.
- Present (1990) and projected (years 1995 and 2000) wastewater flows for each of the discharges are listed. Present wastewater flows (and TIN concentrations) are shown for information only. The years 1995 and 2000 flow values are not intended as limits on POTW flows. Rather, these flows were derived from population assumptions and are used in the models for quality projections. Wastewater flows significantly in excess of those projected will necessitate additional model analysis to confirm the propriety of the allocation.
- Year 2000 wastewater flows and TIN concentrations are listed in Table 4-1-TIN, but it is expected that the wasteload

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<sup>5</sup> For the purposes of this allocation, "existing" POTW flows are defined as the wastewater flows projected in the model up to the year 2000. Projected wastewater flows are shown in Table 4-1-TIN.

<sup>6</sup> For the purposes of this allocation, "new" flows are defined as flows from new treatment facilities projected to come on-line during the planning period (1990-2000) (e.g., Chino Basin MWD RP2A and RP4), flows from existing wastewater treatment plants not previously discharged to the Santa Ana River system (e.g., Eastern Municipal Water District), and any flows from operating POTWs which are in excess of existing flows, as defined (see footnote 5).

allocation will be revisited prior to that time to update population assumptions and associated wastewater flows and to review the appropriate TIN concentrations.

In contrast to the waste load allocation in Table 4-1 of the 1983 Basin Plan, Table 4-1-TIN does not include specific ammonia limits for each of the POTWs. Reconsideration of the un-ionized ammonia objectives for the River is in progress and recommendations for site-specific objectives are expected in mid-1992. Adoption of the ammonia component of the TIN wasteload allocation has been deferred pending the completion of this study.

The comprehensive studies conducted under the auspices of the Nitrogen Task Force included consideration of a revised TDS waste load allocation for POTW discharges to the River. A revised TDS allocation was developed, however, formal consideration of this allocation for incorporation in the Basin Plan has been deferred pending additional workshop discussion of its features and of the remaining components of the comprehensive TDS management plan. Consideration of this TDS management plan is expected in early 1992.

In contrast to its predecessor in the 1983 Basin Plan, this revised allocation is intended to address compliance with nitrogen objectives throughout the River system and not only at Prado Dam. In addition, the revised TIN allocation addresses the severe groundwater nitrate problems identified in the Task Force's studies. The total nitrogen objectives for the various reaches of the River were established to protect the use of the River for groundwater recharge (GWR) and, by extension, the quality of underlying groundwater. The groundwater quality results produced by the improved BPP showed that most of the groundwater subbasins in the Upper Santa Ana Basin, including those affected by Santa Ana River flows, exceed their respective nitrate objectives. This requires that the Board impose limits on wastewater discharges which are sufficient to ensure compliance with water quality objectives throughout the River system. The historic focus on objective compliance at Prado is no longer adequate. This finding is reflected in the revised TIN allocation's treatment of discharges to Reach 4 and its tributaries: in order to achieve compliance with the Reach 4 nitrogen objective (10 mg/l), the Task Force studies found that waste discharges to that Reach and its tributaries must be limited to 10 mg/l TIN. This 10 mg/l TIN limit is incorporated in the new TIN waste load allocation, as shown in Table 4-1-TIN. In addition, the revised TIN waste load allocation addresses the groundwater nitrate problems directly by specifying that wastewater discharges to percolation ponds not exceed 10 mg/l TIN. The groundwater subbasins of the Upper Santa Ana Basin are designated for use for municipal and domestic supply (MUN). The

10 mg/l TIN concentration is essentially comparable to the nitrate drinking water standard which protects the MUN use. By holding wastewater discharges to percolation ponds to 10 mg/l TIN, the Board ensures that the MUN use will not be adversely affected by those discharges, and that cleanup of currently unuseable groundwater will not be encumbered by percolation of wastewater with nitrogen in excess of potable standards.

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Table 4-1-TIN  
(11/15/91)

WASTE LOAD ALLOCATION FOR DISCHARGES OF TOTAL INORGANIC NITROGEN (TIN) TO THE SANTA ANA RIVER AND ITS TRIBUTARIES

DISCHARGER	DISCHARGE TO	HISTORIC DATA		WASTE LOAD ALLOCATION		FUTURE PROJECTION	
		1990 FLOW (MGD)	1990 TIN (MG/L)	1995 FLOW (MGD)	1995 TIN (MG/L)	2000 FLOW (MGD)	2000 TIN (MG/L)
BEAUMONT	STC	0 (8)	0	2.0	10	2.2	10
YUCAIPA VALLEY CWD	STC	0 (8)	0	5.5	10	6.0	10
REDLANDS TO PONDS (1)	R 5	6.8	23	5.1	10	5.1	10
REDLANDS TERTIARY	R 5	0	0	2.7	10	3.6	10
SAN BERNARDINO	EWC	27.6	22	17.7	10	17.7	10
COLTON	R 4	5.1	16	0	0	0	0
SAN BERNARDINO TERTIARY (2)	R 3	0	0	15.7	13	17.7	13
COLTON TERTIARY (2)	R 3	0	0	6.0	13	6.8	13
RIALTO TERTIARY	R 4	6.3	20	2.8	10	11.6	10
RIVERSIDE REGIONAL	R 3	34.2	16	35.9	13	38.0	13
JURUPA CSD INDIAN HILLS	R 3	0.1	10	0.7	10	0.7	10
CHINO BASIN MWD RP3	R 3	0	0	8.0	10	11.8	10
WESTERN RIVERSIDE REGIONAL	R 3	0	0	6.8	10	8.4	10
CORONA TERTIARY	TMS	0	0	1.0	10	4.6	10
CORONA TO PONDS (1)	R 3	7.4	18	10.2	13	9.0	13
LEE LAKE WD	TMS	0.3	10	1.3	13	1.7	13
ELSINORE VALLEY MWD	TMS	2.0	10	7.2	13	8.8	13
EASTERN MWD (3)	TMS	0 (9)	0	16.8	10	27.9	10
CHINO BASIN MWD RP2A (4)	CHN	0	0	6.4	10	9.6	10
CHINO BASIN MWD RP2	CHN	6.6	17	6.8	13	6.7	13
CHINO BASIN MWD RP1 (5)	CHN	17.8	19	17.3	13	17.0	13
CHINO BASIN MWD RP1 (6)	CUC	19.8	19	17.5	13	17.4	13
CHINO BASIN MWD RP4 (7)	CUC	0	0	3.1	10	6.3	10
TOTAL		134.2		202.2		238.3	

NOTES

- TOTAL INORGANIC NITROGEN (TIN) IS THE SUM OF THE NITRATE, NITRITE, NITRITEN AND AMMONIUM IN A FILTERED SAMPLE OF WATER.
- (1) INDIRECT LOAD
  - (2) DIVERTED DOWNSTREAM TO R 3
  - (3) SAN JACINTO RIVER BASIN
  - (4) CARBON CANYON PLANT
  - (5) NEAR HWY 60 XING
  - (6) PRADO PARK LAKE
  - (7) VIA DEER CREEK
- (8) FLOWS FROM BEAUMONT AND YUCAIPA ARE SHOWN AS ZERO SINCE THEY ARE NOT YET CONTINUOUS WITH THE RIVER. ACTUAL 1990 DISCHARGES: BEAUMONT 1.0 MGD; YUCAIPA, 2.5 MGD.
- (9) EMWD'S PRESENT DISCHARGES ARE RECLAIMED OR PERCOLATED, A SURFACEDISCHARGE MAY BE MADE IN THE FUTURE.

California Regional Water Quality Control Board  
Santa Ana Region

November 15, 1991

ITEM: 5

SUBJECT: Basin Plan Amendment - Revised Waste Load Allocation For Total Inorganic Nitrogen In POTW Effluent Discharges to the Santa Ana River And Its Tributaries and to Groundwater in the Upper Santa Ana River Basin: Resolution No. 91-125

DISCUSSION:

At Regional Board workshops held on April 19 and July 19, 1991, the results of intensive investigations of TDS and nitrogen quality problems in the ground and surface waters of the Upper Santa Ana River Basin were discussed in detail. Alternative TDS and nitrogen management plans evaluated in the course of these studies were described, and recommendations were made regarding the selection of a management plan for incorporation in the Basin Plan. The rationale for these investigations, their scope of work, the results of alternative analyses, and conclusions and recommendations are presented in staff reports prepared for the workshops<sup>1,2</sup> and in the study reports.

At the July 19, 1991 workshop, Regional Board staff recommended that the Board select between two alternatives, 5C-8 and 5C-10. While resultant nitrogen levels are similar, these alternatives differ in the total inorganic nitrogen (TIN) waste load allocation for POTWs which discharge to Reach 3 of the Santa Ana River. In Alternative 5C-8, Reach 3 POTWs are assumed to be held to 12 mg/l TIN, while in Alternative 5C-10 the POTWs are held to 13 mg/l for existing capacity and 10 mg/l for new flows. In both alternatives, POTW discharges to Reaches 4 and 5 of the River, and to percolation ponds in the Upper Basin, are held to 10 mg/l TIN.

Board staff indicated that 5C-8 and 5C-10 provide essentially equivalent water quality protection and recommended that the Board select between the two alternatives based on input from the dischargers regarding the relative economic and operational impacts of the alternatives.

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<sup>1</sup> Regional Water Quality Control Board, Santa Ana Region. "Nitrogen and TDS Studies - Upper Santa Ana Watershed". Staff report for April 19, 1991 workshop.

<sup>2</sup> Regional Water Quality Control Board, Santa Ana Region. "Workshop II - Nitrogen and TDS Studies, Upper Santa Ana Watershed". Staff report for the July 19, 1991 workshop.

In oral and written comments (Attachment 3) presented at the July 19, 1991 workshop, Chino Basin Municipal Water District (CBMWD) representatives indicated the District's preference for Alternative 5C-10. However, the District indicated that its concurrence with 5C-10 is for nitrogen only; the District requested that the Board defer action on the ammonia and TDS aspects of 5C-10 pending the completion of additional studies. This request was echoed by representatives of the Santa Ana River Dischargers Association and the City of San Bernardino.

At the close of the July 19, 1991 workshop, the Board directed staff to prepare a Basin Plan amendment based on economic and operational information obtained from the POTW dischargers. Further, the Board directed that the Basin Plan amendment reflect staff's responses and recommendations with respect to the issues raised by the dischargers, i.e., the deferral of the ammonia and/or TDS aspects of the recommended alternatives. Staff's recommendations for the disposition of these matters follow.

(1) POTW Economic/Operational Data

During the course of the nitrogen/TDS studies, Board staff repeatedly solicited information from the POTW dischargers concerning the economic and operational impacts of the various nitrogen management alternatives under consideration. However, no substantive, documented information was provided.

By letter dated July 31, 1991 (Attachment 4), Board staff reiterated the request for input from the dischargers, specifically regarding the relative impacts on their facilities of Alternatives 5C-8 and 5C-10. Responses to this request were provided by three dischargers, CBMWD (Attachment 5), the City of Riverside (Attachment 6) and the City of San Bernardino (Attachments 7 and 8).

The preference for Alternative 5C-10, relative to TIN only, was reiterated in CBMWD's comments. The District estimates that the new nitrogen regulations will cost up to \$75 million initially and that these costs will approach \$100 million by the turn of the century. The District estimates that these costs will translate to a \$3 to \$4 increase over the current monthly user rate of \$6.38 per EDU. Detailed documentation of these estimates was not included in CBMWD's letter.

The City of Riverside indicates that about 20% of treatment plant capacity could be lost to meet the proposed TIN standards. Total construction costs for facilities to treat 40 mgd (the City's present capacity is 32 mgd) to meet the TIN standards are estimated at \$24 million. Additional operations and maintenance costs would be approximately \$300,000 per year. The City did not translate

these costs into impacts on monthly user rates. Finally, the City indicates that there would be no substantive difference in costs between Alternatives 5C-8 and 5C-10.

The City of San Bernardino, like the City of Riverside, indicated that approximately 20% of the treatment plant capacity would be lost in order to provide treatment to meet the proposed TIN and ammonia standards. Construction costs are estimated at \$37.7 million. Estimates of operations and maintenance cost increases were based solely on power costs; for 28.1 mgd, these costs would be about \$450,000 per year. These costs translate into an increase from \$12.47 to \$16.26 per month per single family dwelling (about 30% increase). Finally, the City indicates no preference between the alternatives. The City's consultants have indicated that 5C-10 would be preferable if discharge of a portion of the City's effluent to Reach 3 of the River is implemented.

It should be emphasized that the cost estimates provided by the dischargers were based on an assumed ammonia limitation of 2 mg/l (this assumption is incorporated in both alternatives 5C-8 and 5C-10). Less restrictive ammonia limits would result in lower capital and operations and maintenance costs. The issue of ammonia limitations is addressed further below.

In summary, cost estimates to achieve compliance with the TIN standards proposed in Alternatives 5C-8 or 5C-10 were provided by three of the dischargers. The types of cost estimates provided were variable and their range considerable: from \$24 million (capital) + \$300,000 (O&M) to treat 40 mgd, to \$75 million (presumably capital + O&M; flow not specified). Two dischargers provided estimates of the impacts on costs to individual households. In each case, the increase in monthly user rate was estimated at \$3 - \$4. One discharger expressed a distinct preference for Alternative 5C-10; 5C-10 was preferred by a second discharger under certain discharge conditions. The third discharger indicated that there would be no substantive difference between the two alternatives with respect to treatment plant construction and operations.

Staff believes that the information provided by the dischargers justifies the selection of Alternative 5C-10, rather than 5C-8, as the management plan of choice. Accordingly, the Basin Plan amendment proposed herein (Attachment 1) is formulated based on Alternative 5C-10.

## (2) Ammonia Component of the Waste Load Allocation

As stated above, several dischargers commented at the July 19, 1991 workshop that the Board should defer action to adopt the 2 mg/l ammonia limit as part of the TIN waste load allocation pending