California Regional Water Quality Control Board
Santa Ana Region

November 21, 2003

ITEM: **12**

SUBJECT: **Public Workshop: Proposed Basin Plan Amendments Related to Nitrogen and Total Dissolved Solids Management in the Santa Ana Region**

EXECUTIVE SUMMARY

Federal law requires states to establish water quality standards (beneficial uses, water quality criteria, and an antidegradation policy) for all water bodies within the state's jurisdiction, and to review those standards at least once every three years. The Porter - Cologne Water Quality Control Act (Division 7, "Water Quality", of the California Water Code) establishes similar requirements in state law. For the Santa Ana Region, these standards are established in the 1995 Water Quality Control Plan, Santa Ana River Basin (Basin Plan).

Regional Board staff recommends amendment of the Basin Plan to:

1. Incorporate revised boundaries for groundwater subbasins (to be designated as groundwater "management zones") throughout the Santa Ana Region, and identify existing and potential beneficial use designations for these new management zones, as appropriate.

2. Incorporate water quality objectives for nitrate-nitrogen and total dissolved solids (TDS) for the new groundwater management zones. In certain areas, two sets of objectives would be specified. One set is based on historical quality (the "antidegradation" objectives), while the other, less stringent set of objectives is based on the finding that antidegradation requirements have been satisfied, including the demonstration that water quality consistent with "maximum benefit to the people of the State" would be maintained (the "maximum benefit" objectives). The "maximum benefit" objectives would apply unless the Regional Board finds that the maximum benefit demonstration has not been made. In that case, the "antidegradation" objectives would apply.

3. Revise the narrative objectives for chloride, TDS, hardness, sodium and sulfate applicable to groundwater. These narrative objectives would govern regulation of chloride, hardness, sodium and sulfate in the groundwater management zones in lieu of numeric objectives for these constituents.

4. Delineate a new "Prado Basin Management Zone", given the unique hydraulic characteristics of the area. The Prado Basin Management Zone would be treated as a surface water body for regulatory purposes. Beneficial uses and surface water quality objectives already established for the major tributary streams in the Prado Basin Management Zone would apply.

5. Subdivide Reach 1 of San Timoteo Creek into two reaches (1A and 1B) and redefine the upstream boundary of Reach 3 of the Creek so that it includes what is now designated as Reach 4. No changes to the beneficial uses designated for the Creek in the current Basin Plan are proposed, except that the groundwater recharge beneficial use (GWR) would not be specified for Reach 1A (this Reach is concrete-lined). Rather than specifying numeric objectives for TDS, nitrogen, chloride, hardness, sodium, sulfate and chemical oxygen demand (COD) specific to each Reach (as in the current Basin Plan), the objectives (numeric and narrative) proposed for the underlying groundwater management zone (San Timoteo Management Zone), would apply.

6. Subdivide Reach 1 of Chino Creek into two reaches (1A and 1B). The nitrogen, TDS and mineral constituents objectives specified in the current Basin Plan for Reach 1

would apply to the proposed Reach 1B; new nitrogen, TDS and mineral constituents objectives for Reach 1A that are the same as those established for the Santa Ana River, Reach 3 would be incorporated.

7. Delete Temescal Creek, Reach 1A from the Basin Plan and rename Reach 1B as "Reach 1". Removal of Reach 1A would result in the removal of the Reach 1A water quality objectives.

8. Incorporate revised wasteload allocations for discharges of nitrogen and TDS to the Santa Ana River.

9. Revise Chapter 4, "Water Quality Objectives" to include: (a) narrative regarding the reevaluation of nitrogen and TDS quality objectives for groundwater; (b) revisions of the narrative objectives for chloride, TDS, hardness, sodium, and sulfate applicable to groundwater; (c) discussion of the objectives applicable to the Prado Basin Management Zone; and (d) discussion of the "maximum benefit" objectives for certain groundwater management zones.

10. Revise Chapter 5, "Implementation" to incorporate (a) updated narrative concerning nitrogen and TDS studies and management strategies; (b) revised nitrogen and TDS management strategies, including the new wasteload allocations; (c) findings regarding nitrogen and TDS assimilative capacity in the new groundwater management zones; (d) findings regarding nitrogen loss coefficients and their implementation; (e) special considerations for salt management of subsurface disposal system discharges ; and (f) implementation of "maximum benefit" objectives for specific groundwater management zones.

The proposed amendments are the culmination of a multi-year, multi-million dollar effort by the Nitrogen-TDS Task Force, with extensive participation from and close coordination with Regional Board staff, to conduct studies pertaining to nitrogen and TDS management. These studies were motivated by concerns expressed by a number of wastewater and water supply agencies during the 1995 revisions to the Basin Plan. These agencies indicated that the total dissolved solids (TDS)/Nitrogen Management Plan specified in the Basin Plan places serious constraints on available wastewater reclamation opportunities in this area of rapidly increasing water demand. Preliminary findings and recommendations of the Task Force studies were presented to the Regional Board at a series of public workshops held during the Board's regularly scheduled meetings. The comprehensive set of proposed changes to the Basin Plan, developed by the Task Force/Regional Board staff and identified above, will be presented at this workshop. Formal Regional Board action to consider adoption of the proposed amendments will take place at a subsequent public hearing.

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1.0 Introduction

Federal law requires states to establish water quality standards for all water bodies within the state's jurisdiction. A water quality standard is comprised of three parts: 1) the beneficial uses that apply to the waterbody; 2) the water quality criteria needed to protect those uses; and 3) an antidegradation policy to protect water quality that is already better than the applicable criteria.[1] The Porter -Cologne Water Quality Control Act (Division 7, "Water Quality", of the California Water Code, aka "Porter- Cologne Act") establishes similar requirements in state law.

In California, Regional Water Quality Control Boards enact water quality standards through a formal basin planning process. Each Regional Board publishes a Basin Plan that identifies individual water bodies within its jurisdiction, designates the beneficial uses that apply to each waterbody and specifies the water quality criteria (aka "objectives") for those water bodies. Although the federal Clean Water Act applies only to surface waters, the Porter-Cologne Act applies to both the ground and surface waters of California.

Federal law requires that the Regional Board review and update the Basin Plan water quality standards at least once every three years. The Porter-Cologne Act also requires periodic review of Basin Plans. This review is done to ensure that water quality standards, and the Basin Plan as a whole, are based on the best available science and the most current data. The proposed amendments to the Basin Plan were developed as part of the triennial review process.

Background

<u>1971-1995</u>
The Santa Ana Regional Board adopted interim Water Quality Control Plans (Basin Plans) in 1971 and 1973. These Plans included preliminary water quality objectives and beneficial uses for ground and surface waters in the Region. Special emphases of these planning efforts were the Santa Ana River and the build-up of salts (Total Dissolved Solids (TDS)) and nitrogen in groundwater that occurs as water is used and re-used. These Plans were designated as interim since it was recognized that additional refinement would be necessary once more relevant data were collected and modeling tools then under development were completed.

The 1975 Basin Plan was the culmination of an intensive effort to review and update the 1973 Interim Plan. The focus of the effort was on groundwater and the application of a groundwater model to project TDS quality under different wastewater and water supply management scenarios. The 1975 Plan included significantly revised nitrogen and TDS objectives for an expanded set of identified groundwater subbasins, and a detailed water supply and wastewater management plan intended to meet those objectives. This management plan included wasteload allocations for total inorganic nitrogen (TIN) and TDS discharges to the Santa Ana River, implemented via effluent limitations in waste discharge requirements[2]. The wasteload

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[1] 40 Code of Federal Regulations (CFR) 131

[2] The River recharges a number of groundwater basins, so its quality materially affects groundwater quality and the use of the groundwater for drinking water supply. Total inorganic nitrogen is used for regulatory purposes in wasteload allocations and surface water discharge limits. It is the sum of nitrate, nitrite and ammonia. Nitrite and ammonia can be oxidized to nitrate during flow in the stream or during recharge to the groundwater basin. Therefore, nitrogen concentration in groundwater is expressed as nitrate-nitrogen. The primary drinking water standard (10 mg/L) is also expressed as nitrate-nitrogen. The nitrogen concentration can be reduced to some extent in the stream or during infiltration to groundwater due to macrophyte uptake and other processes.

allocations were developed to achieve compliance with the nitrogen and TDS water quality objectives for the River, and, thereby, to assure protection of the quality of groundwater subbasins recharged by the River.

The Basin Plan was thoroughly rewritten in 1983. The 1983 Plan included significant revisions to the TIN and TDS wasteload allocations, and to the nitrogen/TDS management plan as a whole.

After the 1983 Basin Plan was adopted, a number of agencies in the Santa Ana River watershed expressed concern that the nitrogen/TDS management plan would severely limit opportunities for wastewater reclamation, and that the wasteload allocations were not equitable. In addition, monitoring data showed that the nitrogen and TDS water quality objectives for the Santa Ana River were being violated, despite the implementation of the 1983 wasteload allocations. In response to all of these concerns, a consortium of agencies agreed to undertake studies with the Regional Board to update the nitrogen and TDS management plan, including the wasteload allocations, for the upper Santa Ana River Basin (upstream of Prado Dam). As a result of this work, the Regional Board adopted a Basin Plan amendment to incorporate a revised TIN allocation in 1991. A revised nitrogen and TDS management plan, including a new TDS wasteload allocation, was included in the 1995 update of the Basin Plan.

The studies conducted to update the TDS/nitrogen management plans in the 1983 and 1995 Basin Plans were not designed to validate or revise the TDS or nitrogen water quality objectives specified in the 1975 Plan. Rather, the focus of the studies was to determine how best to meet those established objectives. During public hearings to consider adoption of the 1995 Basin Plan, a number of water supply and wastewater agencies in the region commented that, considering the probable cost of compliance (then estimated at several billion dollars), the objectives themselves should also be reviewed to ensure that they are based on the best available data and scientific analysis. The Regional Board agreed to make the review of objectives a high priority in the next triennial review. Stakeholders throughout the Region agreed to provide sufficient resources to perform the necessary studies.

<u>1995-2003</u>
In 1995, the Santa Ana Watershed Project Authority (SAWPA) convened a Scoping Committee charged with preparing a work plan to guide the proposed nitrogen and TDS objective studies. Senior staff members from the Regional Board actively participated throughout the development effort.

One key question was how to implement the state antidegradation policy, as specified in State Water Resources Control Board Resolution No. 68-16, “Policy with Respect to Maintaining High Quality Waters in California”. Resolution No. 68-16 prohibits high quality waters (i.e., those with quality better than established water quality objectives) from being degraded unless doing so would be consistent with maximum benefit to the people of California, and provided that beneficial uses would be protected.

To determine whether water quality is high (better than objectives), or put another way, whether “assimilative capacity” exists, one must first decide how ambient quality should be calculated. The Scoping Committee reviewed the approach used in 1975. First, the Committee recognized that more powerful computer hardware and software provided new tools for calculating ambient groundwater quality more accurately than was possible when the 1975 Basin Plan was developed. Second, the Committee concluded that there were probably additional water quality data available to characterize historical ambient quality (the historical baseline condition). The

historical baseline condition was used to establish the nitrogen and TDS objectives in the 1975 Plan.

In light of these findings, the Committee recommended a review of the objectives to assure their technical and scientific validity. The Committee also recommended a review of the established groundwater subbasin boundaries. This recommendation was in response to questions concerning the technical validity of the boundaries identified in the Basin Plan, particularly in view of the new information and analytical tools available. The Regional Board concurred with the Scoping Committee's recommendations. A Nitrogen-TDS Task Force was established to perform the analyses and make recommendations, where appropriate, to revise the Basin Plan. All parties recognized that the Task Force effort could result in significant changes to the Plan and the regulation and management of nitrogen and TDS in the Region. The Task Force work began in 1996 and the results are being presented herein as proposed amendments to the Basin Plan.

The Nitrogen-TDS Task Force is comprised of 22 water supply and wastewater agencies in the region.[3] Invitations were extended to stakeholders throughout San Bernardino, Riverside and Orange counties. Any agency, group or person with an interest in water quality was encouraged to participate. All Task Force meetings were open to the public and no one was excluded from the process. Regional Board staff, including the senior planning staff and the Executive Officer, actively participated in nearly 100 Task Force meetings in preparation for the proposed Basin Plan update.

<u>The Purpose of the Task Force</u>

The Task Force was charged with answering several important questions:

1. Do the groundwater subbasin boundaries depicted in the 1995 Basin Plan accurately represent the true hydrogeologic structure of existing groundwater subbasins? If not, how should the boundaries be realigned?

2. What was the ambient concentration of TDS and nitrate-nitrogen in each groundwater subbasin at the time the historical baseline conditions, and thus the objectives, were established for the 1975 Basin Plan?

3. What is the current ambient concentration of TDS and nitrate-nitrogen in each groundwater subbasin and how does it compare to the historical baseline?

4. Given our current understanding of how groundwater recharge occurs, what concentration of nitrate-nitrogen or TDS may be discharged into surface waters without degrading water quality in the underlying groundwater subbasins?

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[3] Orange County Water District, City of Riverside, City of Colton, City of Rialto, Elsinore Valley Municipal Water District, Riverside-Highland Water Company, Inland Empire Utilities Agency, City of San Bernardino Water Dept., Eastern Municipal Water District, Yucaipa Valley Water District, West San Bernardino County Water District, Chino Basin Watermaster, Chino Basin Water Conservation District, City of Redlands, San Bernardino Valley Water Conservation District, California Institute for Men, San Bernardino Valley Municipal Water District, Jurupa Community Services District, City of Corona, Western Municipal Water District, Santa Ana Watershed Project Authority, US Geological Survey, Metropolitan Water District and Sanitation Districts of Orange County

5. How does consideration of the factors specified in Section 13241 of the California Water Code, or other factors, affect the determination of water quality objectives for nitrate-nitrogen or TDS?

6. What comprehensive monitoring program is necessary to assess continuing compliance with water quality objectives in the Basin Plan?

7. What does it mean to "lower water quality?" To what degree must pollutant concentrations change in order to require a formal antidegradation review?

The scope of Task Force activities was limited to determining how best to comply with current law and regulation. The Task Force enjoined itself from considering any approach that would require a change in state or federal laws. It was assumed throughout the process that there was sufficient flexibility in existing regulatory guidance to accommodate and even encourage increased reclamation, while continuing to protect beneficial uses and minimize water quality degradation.

The Task Force contracted with two consulting firms to guide the study process. Wildermuth Environmental, Inc. (WEI) was responsible for performing the technical analyses and preparing the water quality reports. Risk Sciences was responsible for facilitating the regulatory review and developing consensus among the Task Force participants.

The consultants prepared several reports that form the scientific foundation supporting the proposed Basin Plan amendments, including: a comprehensive database of groundwater quality data from 1954 to 1997; an analysis identifying relative pollutant loads contributed by point vs. non-point sources; detailed descriptions of the geohydrology of each major groundwater basin in the watershed; accurate estimates of average ambient water quality used to establish groundwater objectives and determine the availability of assimilative capacity; analyses to validate the probable nitrogen loss that occurs as surface water percolates through the soil interface to become groundwater; wasteload allocations and monitoring requirements to assure compliance with proposed water quality objectives; and a draft guidance document to facilitate water resource planning and the increased use of reclaimed water. All of these documents, and other Task Force materials, are included in the formal administrative record supporting the proposed Basin Plan amendments[4]. Each of the key technical documents is being carefully reviewed by University of California system experts, identified through the peer review process established by the State Water Resources Control Board staff. The proposed Basin Plan amendments will be revised, if and as appropriate, based on the peer review comments.

Altogether, the Task Force devoted several thousand hours and expended more than $2 million to complete the study. The level of professional effort and financial resources was, by far, the largest ever committed to a Triennial Review or basin plan amendment process in the Santa Ana River watershed. The extraordinary extent of apparent scientific and political consensus developed during the project speaks to the validity and objectivity of the Task Force process.

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[4] While the draft reclamation guidance document is included in the administrative record for these amendments to the Basin Plan, it is not now proposed for Regional Board adoption. It is anticipated that the document will be refined and presented to the Regional Board for formal consideration at a later date.

2.0 Proposed Groundwater Subbasin (Management Zone) Boundaries

As previously stated, the availability of new information and analytical tools made it advisable to validate the historical delineations of groundwater subbasins included in the Basin Plan (Figure 1). Using an extensive database of groundwater level data and other hydrogeologic studies performed during the last 50 years, WEI mapped the groundwater subbasins underlying the Santa Ana River watershed[5].

The Task Force identified three specific criteria for distinguishing one groundwater subbasin (proposed to be identified as "management zones") from another. Boundaries were drawn where:

1. impermeable rock formations prevent subsurface flow from one area to another;

2. natural gradients caused groundwater to flow in one direction but not another; and

3. significant differences in TDS or nitrate-nitrogen concentrations made it useful to differentiate two or more distinct management zones in order to protect areas with high groundwater quality.

Results of the hydrogeologic mapping effort are presented in Figures 2 through 6. As shown in these maps, and in the proposed amendments to the table of beneficial uses (see Attachment to tentative Resolution No. R8-2004-0001: Table 3-1 Beneficial Uses, p. 3-26 through 3-28*)*, revised names as well as boundaries for many of the subbasins are proposed. Electronic files suitable for locating the groundwater subbasin boundaries using the GIS format are available in the Regional Board's library and on the Regional Board's website.[6] Maps rendered in PDF format my also be downloaded from the website. Detailed explanations of the technical rationale for each boundary location are provided in the Final Technical Memorandum for Phase 2A of the Nitrogen-TDS Study prepared by WEI and submitted to the Task Force in July 2000. Minor revisions were requested by the Task Force and submitted by WEI in October 2002. Both documents are included in the administrative record located in the Regional Board's library and can be downloaded from the Regional Board's website.

In addition to this technical reevaluation, the Chino Basin Watermaster and its member agencies recommended a further redefinition of the boundaries of the proposed Chino 1, 2 and 3 management zones (see Figure 4) and revised TDS and nitrate nitrogen water quality objectives for these management zones to reflect water management practices in these areas that would provide maximum benefit to the people of the state. The Watermaster "maximum benefit" proposal combines these three management zones into a larger management zone, termed "Chino North" (see Figure 8). In conjunction with this change, the Watermaster also proposed that the Chino 4 and 5 management zones proposed by the Task Force be renamed to Chino East and Chino South, respectively. (The Task Force agreed with this proposal to

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[5] The review of groundwater subbasin boundaries did not include Big Bear Valley, Garner Valley or the Idyllwild area, which are within the Santa Ana Region but outside the study area. No changes to the boundaries or beneficial uses of these subbasins (to be designated also as management zones), are proposed.

[6] http://www.swrcb.ca.gov/rwqcb8/

Figure 1 Current Sub-basin Boundaries in the Basin Plan

Figure 2 Proposed Management Zone Boundaries – San Bernardino Valley and Yucaipa/Beaumont Plains

Figure 3 Proposed Management Zone Boundaries – San Jacinto Basins

Figure 4 Proposed Management Zone Boundaries – Chino (Antidegradation), Rialto-Colton and Riverside Basins

Figure 5 Proposed Management Zone Boundaries – Elsinore/Temescal Valleys

Figure 6 Proposed Management Zone Boundaries – Orange County Basins

rename Chino 4 and 5, as reflected in Figure 4 (and reported in WEI, October 2002).) The Watermaster proposal is described later in this report (see Section 6.1). In brief, if the Regional Board finds that the Watermaster has demonstrated maximum benefit to the people of the state by means of implementation of a specific program of projects and requirements, then the proposed Chino North groundwater management zone would apply for regulatory purposes. However, if the Regional Board does not find that maximum benefit has been demonstrated, then the Chino 1, 2, and 3 management zone boundaries would govern.

Accurate understanding and mapping of the hydrogeology of the groundwater resources in the Region is necessary to develop an effective strategy to manage nitrogen, TDS and other pollutants in the subsurface. Board staff believes that the revised boundaries depicted in the maps developed by WEI and shown in Figures 2 through 6 better delineate the hydrogeology of the groundwater subbasins (management zones) and should be used for future regulatory and planning activities in the Region. Staff also believes that the Chino Basin Watermaster maximum benefit proposal is conducive to and consistent with responsible water and wastewater management in that area. We believe that maximum benefit can be demonstrated by the implementation of the program proposed by the Watermaster. However, if for some reason maximum benefit is not demonstrated, then the proposed Chino 1, 2 and 3 groundwater management zones should be employed.

Accordingly, staff recommends that the Basin Plan be amended to incorporate the revised groundwater subbasin (management zone) maps (see Attachment to Resolution No. R8-2004-0001, Figures 3-2 through 3-7). These include two maps for the Chino Basin: one that delineates Chino North, East and South consistent with the maximum benefit approach; the second delineates Chino 1, 2 and 3, and East and South as the historical, antidegradation boundaries. Staff also recommends that the Table of Beneficial Uses in the Plan be amended as shown in Attachment to Resolution No. R8-2004-0001, Table 3-1 Beneficial Uses, Page 3-26 through 28, to reflect the revised nomenclature of the new groundwater management zones. As shown in the excerpted Table 3-1, beneficial use designations are recommended for the new management zones. These include the same beneficial uses generally designated in the 1995 Basin Plan for the existing list of groundwater subbasins. Most management zones are proposed to be designated to protect:

MUN - Municipal and domestic water supply
AGR - Agricultural water supply
IND - Industrial service water supply
PROC - Industrial process water supply

Finally, staff recommends that Chapter 3 be amended, as reflected in the Attachment to draft Resolution No. R8-2004-0001, to incorporate a narrative description of the process used to define the new groundwater management zone boundaries, and the Chino Basin Watermaster maximum benefit proposal.

3.0 Prado Basin Management Zone

The flood plain behind Prado Dam has unique hydraulic characteristics that justify special consideration. Chino Creek, Mill-Cucamonga Creek and Temescal Creek join the Santa Ana River behind the dam. Flood control operations at the dam, coupled with an extremely shallow groundwater table and unusually thin aquifer, significantly affect these surface flows, as well as

subsurface flows in the area. Depending on how the dam is operated, surface waters may or may not percolate behind the dam. There is little or no groundwater storage in the flood plain behind the dam. Any groundwater in storage is forced to the surface because the foot of Prado Dam extends to bedrock and subsurface flows cannot pass through the impermeable barrier created by the dam and the surrounding hills. Given these characteristics, the Task Force recommended that this area be designated as a surface water management zone, rather than a groundwater management zone.

The proposed Prado Basin Management Zone (PBMZ), shown in Figure 7, is generally defined by the 566-foot elevation above mean sea level. This area encompasses the expected flood plain after the Army Corps of Engineers completes the planned projects to raise Prado Dam to provide additional downstream flood protection. The proposed PBMZ extends from Prado Dam up the channel of Chino Creek to the concrete lining near the road crossing at Old Central Avenue[7], up the channel of Mill Creek (Prado Area) to Cucamonga Creek at the concrete lining near the crossing at Hellman Road, up the channel of Temescal Creek to the crossing at Lincoln Avenue[8], and up the Santa Ana River to the 566 foot elevation (just south of River Road)[9]. The proposed PBMZ encompasses the Prado Flood Control Basin identified in the 1995 Basin Plan. This Basin is recognized in the Plan as a created wetlands, resulting from the construction of Prado Dam. Within the Prado Flood Control Basin, Orange County Water District operates constructed wetlands for the removal of nitrogen in diverted Santa Ana River flows.

The beneficial uses of the proposed PBMZ would include all of the beneficial uses currently designated for the surface waters identified above, including the Prado Flood Control Basin (see Attachment to Resolution No. R8-2003-0018, Table 3-1, Beneficial Uses, page 3-25).

The 1995 Basin Plan specifies nitrogen and TDS water quality objectives for these surface waters that flow within the proposed PBMZ, with the exception of Mill Creek (Prado Area) and Cucamonga Creek and the Prado Flood Control Basin. Board staff and the Task Force recommend that these objectives continue to apply for regulatory purposes for discharges that would affect the PBMZ and downstream waters. It is infeasible to establish groundwater quality objectives for the PBMZ in view of the lack of relevant data; in any case, given the hydraulic characteristics described previously, groundwater quality objectives would be inappropriate. The application of the existing surface water objectives would assure continued water quality and beneficial use protection for waters within and downstream of the PBMZ.

The detailed discussion of the basis for formation of the Prado Basin Management Zone is found in the report prepared by Risk Sciences, “Final Description of Prado Basin Management Zone”, September, 2002.

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[7] This part of Chino Creek is identified in the 1995 Basin Plan as “Chino Creek, Reach 1”

[8] This part of Temescal Creek is identified in the 1995 Basin Plan as “Temescal Creek, Reach 1A”; see Section 5.3 for recommended revisions to this Reach.

[9] This is part of Reach 3 of the Santa Ana River.

Figure 7 Proposed Management Zone Boundaries – Prado Basin Management Zone

These Prado Basin Management Zone recommended changes are shown in the Attachment to Resolution No. R8-2004-0001, Chapter 3, Table 3-1, Beneficial Uses, p. 3-25, and Chapter 4, Table 4-1, Water Quality Objectives, p. 4-38. Brief narrative discussion of the PBMZ would also be added to Chapter 3 and 4.

4.0 Proposed Water Quality Objectives

The Task Force recognized that if the groundwater subbasin (management zone) boundaries are realigned as proposed to better represent the true hydrogeology of the region, then it would also be necessary to calculate and apply new water quality objectives for each groundwater management zone. In developing recommendations for proposed nitrogen and TDS objectives, the Task Force made extensive use of new computer tools to evaluate groundwater quality conditions. The recommendations derived from this technical review were then considered in light of established water quality control law and policy. In particular, the Task Force considered State Board Resolution No. 68-16 and the factors specified in Section 13241 of the California Water Code. Water Code Section 13241 stipulates the following:

> *"It is recognized that it may be possible for the quality of water to be changed to some degree without unreasonably affecting beneficial uses. Factors to be considered by a regional board in establishing water quality objectives shall include, but not necessarily be limited to, all of the following:*
>
> *a) Past, present, and probable future beneficial uses of water.*
>
> *b) Environmental characteristics of the hydrographic unit under consideration, including quality of water available thereto.*
>
> *c) Water quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area.*
>
> *d) Economic considerations.*
>
> *e) The need for developing housing within the region*
>
> *f) The need to develop and use recycled water."*

4.1 Management Zone TDS and Nitrate-Nitrogen Water Quality Objectives

As indicated previously (see Section 1.0 – Introduction), the nitrogen and TDS objectives for groundwater were established in the 1975 Basin Plan based on consideration of historic water quality. Historic water quality was considered the “baseline” condition against which the potential water quality effects of discharges and other activities would be judged, pursuant to the State’s antidegradation policy (Resolution No. 68-16).

The Task Force devoted considerable effort to characterizing both historical and existing water quality throughout the region (as required by Water Code Section 13241 (b)). Working collaboratively, the Task Force spent two years developing a detailed methodology to estimate the volume-weighted concentration of nitrate-nitrogen and TDS in each groundwater subbasin (proposed management zone). It is important to note that the Task Force developed consensus on the most appropriate method for estimating groundwater quality *prior to* analyzing any of the available data. This helped ensure that the tools would be rigorous and objective. It is also important to note that the Task Force identified several Data Quality Objectives that were used to establish whether specific monitoring data were

suitable for accurately estimating concentrations of nitrate-nitrogen and TDS. The level of Quality Control and Quality Assurance review applied to the data used by the Task Force was very high and was consistent with the U.S. Environmental Protection Agency's (USEPA) most recent guidance, despite being performed years before the guidance was available (USEPA, December 2002 and USEPA, November 2002). A comprehensive description of the final methodology is published in the Final Technical Memorandum for Phase 2A of the Nitrogen-TDS Study prepared by WEI and submitted to the Task Force in July 2000.

As required to address Water Code Section 13241(a) (past present and probable future beneficial uses), the Task Force conducted an extensive review of available scientific literature to identify the concentrations of nitrate-nitrogen and total dissolved solids that are likely to impair beneficial uses. Special emphasis was placed on the standards and water quality criteria for drinking water recommended by the U.S. Environmental Protection Agency (EPA) and the California Department of Health Services (DHS). This focus was based on the recognition that the MUN beneficial use was the most sensitive use; objectives established to protect the MUN use would assure protection of the other beneficial uses of groundwaters in the Santa Ana Region.

In general, beneficial uses are deemed to be protected when TDS concentrations are less than 500 mg/L and nitrate-nitrogen concentrations are less than 10 mg/L (see Table 1 and Table 2). These are the concentrations recommended by the U.S. Environmental Protection Agency and the California Department of Health Services. The Task Force also found that lower concentrations of nitrate-nitrogen provided a useful safety factor and that lower concentrations of TDS increased consumer acceptance of municipal water supplies. Therefore, the Task Force recommended that where water quality was better than the threshold concentrations recommended by EPA and DHS, Basin Plan objectives should be set so as to preserve that higher level of water quality. This approach is consistent with the antidegradation principles identified in State Board Resolution No. 68-16, which require the maintenance of high quality waters, unless specific demonstrations to support the lowering of water quality are made.

As described in the introduction section of this report, the Task Force effort to review groundwater quality objectives was motivated to a significant degree by the concern that the established objectives would place serious limitations on opportunities to use recycled water. Increasing use of recycled water is expected to be essential to meet the growing demands of the rapidly growing population seeking housing and employment in the Santa Ana Region. The costs of meeting TDS and nitrogen objectives, and of the measures that would have to be implemented to achieve compliance while assuring a reliable water supply at reasonable cost, were of paramount concern. Thus, in recommending nitrogen and TDS objectives for the proposed groundwater management zones, the factors cited in Water Code Section 13241 c-f were carefully considered. Indeed, consideration of these factors led certain members of the Task Force to propose alternative, less stringent water quality objectives for specific management zones. These proposals are founded on demonstrations that the objectives would continue to protect beneficial uses and would maintain water quality consistent with maximum benefit to the people of the State. Both demonstrations are required by the State's antidegradation policy, State Board Resolution No. 68-16. These "maximum benefit" objective recommendations are described in Section 6.0.

The proposed management zone water quality objectives for TDS and nitrate-nitrogen are presented in Table 3 and are presented in the Attachment to Resolution No. R8-2004-0001, Chapter 4, Table 4-1 WATER QUALITY OBJECTIVES, pp. 4-39 through 4-41. Note that in some instances, there were not sufficient data to estimate the historical baseline condition. Where that occurred, the Task Force recommended that water quality objectives be established on a case-by-case basis when it becomes necessary to do so. Staff endorses that recommendation. It is important to note also that the recommended groundwater management zone objectives are for nitrate-nitrogen and TDS only. While the Basin Plan currently specifies objectives for individual minerals (hardness, sodium, chloride, sulfate) as well as for nitrate-nitrogen and TDS for each groundwater subbasin, no such objectives are recommended for the new groundwater management zones (see the next section of this report).

Table 1

Total Dissolved Solids (TDS) – Use Protection Thresholds

	Basis	Use Protection
3000 mg/L	SWRCB	Basins less than 3000 mg/L must be designated MUN.
1500 mg/L	DHS Temporary Maximum	Temporary Maximum Acceptable for short term where there are no practical alternatives for higher quality sources of supply.
1000 mg/L	DHS Long-Term Maximum	Acceptable for drinking water supply, MUN beneficial use is protected. Some crops (avocados) are adversely affected at TDS 750 mg/L.
750 mg/L	Last Practical Use	Highest concentration that allows for an additional increment of use (250 mg/L) before exceeding long-term maximum of 1000 mg/L
500 mg/L	Recommended EPA/DHS Criteria	Recommended EPA/DHS Criteria Preferable for drinking water supply

Risk Sciences, September 2002.

Table 2

Nitrate Nitrogen (NO_3-N) – Use Protection Thresholds

	Basis	Use Protection
10 mg/L	No Observed Effect Concentration; EPA Primary Drinking Water Standard; DHS Drinking Water Standard	Nitrate-nitrogen concentrations less than 10 mg/L have no known adverse effects on human health (including infants).
8 mg/L	The increment between 8 mg/L and 10 mg/L is intended to provide an operational safety factor in order to minimize the possibility that the EPA/DHS criteria will be exceeded, even temporarily, thereby triggering significant reporting requirements and undermining pubic confidence in water supplies.	Initial groundwater objectives will not be set greater than 8 mg/L unless the higher concentration represents the best water quality achieved since 1968. Public health risk increases in proportion to the rising concentration of nitrate-nitrogen.
5 mg/L	Preferred by the water agencies for managing drinking water supplies because it provides maximum resource flexibility with minimal need for blending.	All beneficial uses are presumed to be fully protected at concentrations less than 5 mg/L.

Risk Sciences, September 2002.

Table 3

Proposed Groundwater Management Zone
TDS and Nitrate-Nitrogen Water Quality Objectives

Groundwater Management Zones	Water Quality Objective (mg/L)	
	TDS	NO_3-N
UPPER SANTA ANA RIVER BASIN		
Beaumont "maximum benefit"++	330	5.0
Beaumont "antidegradation" ++	230	1.5
Bunker Hill – A	310	2.7
Bunker Hill – B	330	7.3
Colton	410	2.7
Chino – North "maximum benefit" ++	420	5.0
Chino 1– "antidegradation" ++	280	5.0
Chino 2 – "antidegradation" ++	250	2.9
Chino 3 – "antidegradation" ++	260	3.5
Chino – East	730	10.0
Chino – South	680	4.2
Cucamonga "maximum benefit" ++	380	5.0
Cucamonga "antidegradation" ++	210	2.4
Lytle	260	1.5
Rialto	230	2.0
San Timoteo "maximum benefit" ++	400	5.0
San Timoteo "antidegradation" ++	300	2.7
Yucaipa "maximum benefit" ++	370	5.0
Yucaipa "antidegradation" ++	320	4.2

++ "maximum benefit" objectives apply unless Regional Board determines that lowering of water quality is not consistent with maximum benefit to the people of the state; "antidegradation" objectives then would apply (see discussion in Section 6.0).

Table 3 (cont.)

Proposed Groundwater Management Zone
TDS and Nitrate-Nitrogen Water Quality Objectives

Groundwater Management Zones	Water Quality Objective (mg/L)	
	TDS	NO_3-N
MIDDLE SANTA ANA RIVER BASIN		
Arlington	980	10
Bedford **	--	--
Coldwater	380	1.5
Elsinore	480	1.0
Lee Lake**	--	--
Riverside – A	560	6.2
Riverside – B	290	7.6
Riverside – C	680	8.3
Riverside – D	810	10.0
Riverside – E	720	10.0
Riverside – F	660	9.5
Temescal	770	10.0
SAN JACINTO RIVER BASIN		
Canyon	230	2.5
Hemet - South	730	4.1
Lakeview – Hemet North	520	1.8
Menifee	1020	2.8
Perris North	570	5.2
Perris South	1260	2.5
San Jacinto – Lower	520	1.0
San Jacinto – Upper	320	1.4
LOWER SANTA ANA RIVER BASIN		
La Habra**	--	--
Santiago **	--	--
Orange	580	3.4
Irvine	910	5.9

** Numeric objectives not established; narrative objectives apply

4.2 Narrative Mineral Water Quality Objectives

For groundwaters, the current Basin Plan specifies both narrative and subbasin- specific numeric water quality objectives for sodium, hardness, chloride and sulfate, in addition to TDS. These minerals, along with other minerals (calcium, magnesium and nitrate) are the principal components of TDS. The narrative objectives specify that the numeric objectives for each groundwater subbasin shall not be exceeded as a result of controllable water quality factors.

As part of the N/TDS Task Force effort, determination and calculation of new numeric water quality objectives for these mineral constituents for the proposed management zones was not conducted. Rather, the focus was on determining appropriate TDS objectives. The Task Force believes, and Board staff agrees, that regulation of TDS will ensure that these individual minerals do not increase unreasonably. If the proposed groundwater management zones are approved, the existing numeric objectives for these individual minerals would be obsolete and would need to be deleted from the Basin Plan.

Staff reviewed the Basin Plan narrative water quality objectives for sodium, hardness, chloride and sulfate specified for groundwaters to ensure that they are appropriate and protective. The narrative objective for TDS was evaluated as well. Proposed changes to the narrative objectives are as follows:

- Chloride – delete reference to the groundwater subbasin specific numeric chloride objectives listed in the Basin Plan, Table 4-1 (these objectives are now proposed to be deleted; see Section 4.1); specify the secondary drinking water standard of 500 mg/L as the narrative objective.

- Sulfate – delete reference to the groundwater subbasin specific numeric sulfate objectives listed in the Basin Plan, Table 4-1 (these objectives are now proposed to be deleted; see Section 4.1); specify the secondary drinking water standard of 500 mg/L as the narrative objective.

- Hardness – delete reference to the groundwater subbasin specific numeric objectives listed in the Basin Plan, Table 4-1 (these objectives are now proposed to be deleted; see Section 4.1). The Basin Plan would continue to specify that waste discharges shall not result in increases in the hardness of receiving waters used for municipal supply (MUN) that adversely affect that beneficial use. There is no secondary drinking water standard for hardness.

- Sodium – delete reference to the groundwater subbasin specific numeric objectives listed in the Basin Plan, Table 4-1(these objectives are now now proposed to be deleted; see Section 4.1). The California Department of Health Services does not list sodium in their Drinking Water Standards; the US EPA lists sodium only as an advisory for people on retricted sodium diets. Based on best professional judgement, staff recommends that the narrative water quality objective specify that sodium concentrations shall not exceed 180 mg/L in groundwaters designated MUN as a result of controllable water quality factors.

In addition, for protection of the AGR beneficial use, staff recommends that the narrative objective specify a Sodium Absorption Ratio not to exceed 9[10]. This is based on guidance contained in "Irrigation with Reclaimed Municipal Wastewater, A Guidance Manual," State Water Resources Control Board, Report Number 84-1, July 1984.

- Total dissolved solids – The narrative objective would continue to make reference to the specific management zone numeric objectives listed in Table 4-1. As discussed in the preceding section of this report, this Table would be revised to specify the TDS (and nitrate-nitrogen) objectives for the new groundwater management zones. The narrative TDS objective also refers to a secondary drinking water standard of 1000 mg/L. This needs to be corrected to 500 mg/L.

These recommended changes are shown in the proposed Basin Plan amendment, Attachment to Resolution No. R8-2004-0001, Chapter 4.

5.0 Proposed Changes to Creek Reach Designations and Water Quality Standards

The N/TDS Task Force agreed at the outset that the focus of the study was to review groundwater subbasin boundaries and TDS and nitrate-nitrogen water quality objectives, and not to review any surface water boundaries or surface water TDS and nitrogen water quality objectives. However, once the proposed groundwater management zone boundaries were developed and their respective TDS and nitrate-nitrogen water quality objectives calculated, it became apparent that it would be appropriate to make adjustments to the reach boundaries and TDS and nitrogen objectives of several surface waters. Changes in reach boundaries and water quality objectives are proposed for San Timoteo Creek, Chino Creek, and Temescal Creek, as discussed below. Removal of the groundwater recharge (GWR) beneficial use for part of San Timoteo Creek is also recommended, in response to flood control modifications implemented by the U.S. Army Corps of Engineers.

5.1 San Timoteo Creek

San Timoteo Creek, which joins the Santa Ana River in Reach 5, drains San Timoteo Canyon from its headwaters near the City of Beaumont. Treated municipal wastewater from the cities of Beaumont and Yucaipa is discharged to San Timoteo Creek[11] and comprises most or all of the flow in the Creek for most of the year. As defined in the current Basin Plan, San Timoteo Creek overlies and recharges the Bunker Hill II groundwater subbasin.

The current Basin Plan divides San Timoteo Creek into 4 reaches. These reaches were established in 1989 updates to the Basin Plan in order to provide a sufficient level of detail to ensure adequate identification and protection of appropriate beneficial uses. Since 1989, the US Army Corps of Engineers has significantly altered San Timoteo Creek; the Creek has been completely concrete-lined from the confluence with the Santa Ana River to just upstream of Barton Road. Additional flood control work by the Corps is underway. This

[10] The Sodium Absorption Ratio (SAR) measures the relative proportion of sodium ions in a water sample to those f calcium and magnesium. The SAR is used to predict the potential for sodium to accumulate in the soil. The accumulation of sodium in the soil is detrimental to plants.

[11] The City of Beaumont discharges to Coopers Creek, a tributary of San Timoteo Creek, Reach 4.

entails the construction of a concrete-line transition from Barton Road to a new soft-bottomed channel that will terminate a short distance downstream of Alessandro Road. The area affected includes Reach 1 and a part of Reach 2 of the Creek, as now defined in the Basin Plan.

Staff recommends that Reach 1 be subdivided into Reach 1A and Reach 1B, with Barton Road as the dividing point, in order to reflect the modifications of this area by the Corps. The Basin Plan identifies groundwater recharge (GWR) as a beneficial use of Reach 1 of the Creek. That use has been removed in the lower part of the Reach (proposed Reach 1A) as the result of the concrete lining by the Corps. Therefore, Board staff recommends that the GWR use not be designated for the proposed Reach 1A. (THE GWR use would be deleted from the lower part of what is now identified as Reach 1.) No other changes to the beneficial uses of San Timoteo Creek are recommended.

Reaches 3 and 4 of the Creek, as now identified in the Basin Plan, are subdivided by the Bunker Hill II groundwater subbasin boundary. If the new groundwater management zones are adopted as recommended, this boundary will cease to exist. Staff recommends that the two Reaches be combined into a single reach, Reach 3, to reflect this change.

Numeric TDS, TIN and other mineral constituent water quality objectives for San Timoteo Creek were established in the 1975 Basin Plan. These objectives were established at levels intended to ensure that the quality of TDS, TIN and other mineral constituents recharged from San Timoteo Creek to the underlying Bunker Hill II groundwater subbasin would comply with the Bunker Hill II TDS, nitrate-nitrogen and mineral objectives. This was to ensure that the groundwater recharge (GWR) beneficial use of the Creek would be protected.

If, as proposed, new groundwater management zones and new TDS and nitrate-nitrogen water quality objectives for these zones are approved, then the numeric water objectives now specified for the Creek would become obsolete. With the approval of the new management zones, San Timoteo Creek would overlie the San Timoteo and Bunker Hill B management zones. The Creek would recharge the San Timoteo management zone and to a negligible extent, the Bunker Hill B management zone. The proposed Bunker Hill B management zone would not be recharged significantly by Creek flows because of the concrete-lining at the downstream end of the Creek (proposed Reach 1A).

Staff recommends that the Basin Plan be amended to delete the numeric objectives for all reaches of San Timoteo Creek that are specified in Table 4-1 of the Plan. Rather than identifying new numeric objectives for the Creek, staff recommends that the TDS and nitrate-nitrogen objectives of the proposed groundwater management zones recharged by the Creek be used for regulatory purposes. This would complement and conform to the regulatory approach for existing POTW discharges to the Creek by the City of Beaumont and the Yucaipa Valley Water District. As they have been in the past, these POTW discharges would be regulated pursuant to the recommended wasteload allocations (see discussion below). Then, as now, the wasteload allocations were developed to assure consistency with groundwater quality objectives. (As noted above, the existing groundwater subbasin objectives also serve in the current Basin Plan as the surface water objectives for San Timoteo Creek).

These proposed changes to San Timoteo Creek are shown in the proposed Basin Plan amendment, Attachment to Resolution No.R8-2004-0001, Chapter 3, Table 3-1, pp 3-17, 3-18 and Chapter 4, Table 4-1, pp 4-30, 4-31.

5.2 Chino Creek

Chino Creek is tributary to the Santa Ana River, Reach 3 in the Prado Basin (proposed Prado Basin Management Zone). In the 1995 Basin Plan, Chino Creek is divided into 2 reaches. Reach 1 extends from the confluence with the Santa Ana River to the start of the concrete-lined section of Chino Creek at Los Serranos Road; Reach 2 extends from Los Serranos Road to the confluence with San Antonio Creek.

Staff proposes that Reach 1 be divided into Reach 1A and Reach 1B. Reach 1A would extend from the confluence with the Santa Ana River to just downstream of the confluence with the Mill Creek (Prado Area); Reach 1B would extend from downstream of the confluence with the Mill Creek (Prado Area) to the confluence with San Antonio Creek. Proposed TDS and nitrogen water quality objectives for Reach 1A are the same as the Santa Ana River, Reach 3 objectives; Reach 1B proposed objectives are the same as currently specified in the Basin Plan for Chino Creek.

As a reminder, Orange County Water District (OCWD) diverts approximately 50% of the Santa Ana River flows at River Road to their wetland ponds in the Prado Basin. Flows from the ponds re-enter the River via Chino Creek, downstream of the confluence with Mill Creek (in the proposed Reach 1A of Chino Creek). OCWD's ponds provide additional nitrogen removal and help to assure compliance with the Santa Ana River, Reach 3 total nitrogen objective. However, at the same time, there are slight increases in the TDS of the return flows. While the TDS quality of the return flows meets the Santa Ana River, Reach 3 objective, it is likely that they would exceed the 550 mg/L TDS water quality objective that is currently specified for Chino Creek. Because the routing of the Santa Ana River through the wetlands provides an overall water quality benefit, staff believes that it is appropriate to assure that the return flows can be allowed pursuant to established Basin Plan objectives. Thus, staff recommends the subdivision of Reach 1 of Chino Creek as described above, and the establishment of TDS and nitrogen water quality objectives for Reach 1A that are equivalent to those for the Santa Ana River, Reach 3 (i.e., 700 mg/L TDS and 10 mg/L total nitrogen). The water quality objectives now specified in the Basin Plan for Chino Creek, Reach 1(550 mg/L TDS and 8 mg/L total inorganic nitrogen) would apply to the proposed Reach 1B of Chino Creek.

There is no economic impact associated with the proposed changes in reach boundaries and water quality objectives. Any lowering of water quality that results from the specification of less stringent objectives for part of Chino Creek (the proposed Reach 1A) would be consistent with antidegradation requirements. First, beneficial uses would continue to be protected. Second, water quality consistent with maximum benefit to the people of the state would be maintained. Establishing these revised Reach boundaries and revising the applicable water quality objectives is in the best interest of both upstream and downstream users. The upstream users benefit by not incurring additional costs for nitrogen removal at their respective wastewater facilities. OCWD, the downstream user, benefits by ensuring that water delivered to their recharge ponds in Anaheim is of enhanced quality, protecting a critical groundwater resource upon which several million Orange County residents rely. Finally, with any wetlands systems, there is the added wildlife enhancement benefit.

These proposed changes to Chino Creek are shown in the proposed Basin Plan amendment, Attachment to Resolution No.R8-2004-0001, Chapter 3, Table 3-1, pp 3-19 and Chapter 4, Table 4-1, pp 4-32.

5.3 Temescal Creek

Temescal Creek is a tributary of the Santa Ana River, Reach 3. It flows from the outlet of Lake Elsinore to join the Santa Ana River less than a mile east of Prado Dam. Currently, Lee Lake Water District, and Elsinore Valley Municipal Water District (EVMWD) discharge to Temescal Creek downstream of Lake Elsinore. In periods of normal to low rainfall, these discharges do not flow beyond Lee Lake (Reach 3 of the Creek). Discharges to Temescal Creek from Eastern Municipal Water District (EMWD) are seasonal and occur only during periods of prolonged rainfall when there is insufficient demand for EMWD's recycled water for agricultural/landscape irrigation in the San Jacinto Watershed. During storm events, effluent from these three POTWs may overflow Lee Lake into the lower reaches of Temescal Creek. The lower reaches of Temescal Creek are typically dry, except for minor urban nuisance flows, and generally contain substantial flows only during storm events.

The current Basin Plan divides Temescal Creek into six reaches. In the 1995 updates to the Basin Plan, Temescal Creek, Reach 1 was subdivided into Reach 1A and Reach 1B in order to distinguish the natural segment (confluence with the Santa Ana River to Lincoln Avenue – Reach 1A) from the channelized and concrete-lined segment (Lincoln Avenue to the Riverside Canal – Reach 1B). The Basin Plan specifies numeric TDS, nitrogen and other mineral water quality objectives only for Reach 1A . These objectives were established in the 1975 Basin Plan. While the derivation of these objectives is not clear, they were evidently based on existing quality at that time.

As discussed previously in the section describing the proposed Prado Basin Management Zone (Section 3.0), the U.S. Army Corps of Engineers has begun implementing plans to raise Prado Dam and the associated spillway to provide additional downstream flood protection. When the project is complete, the proposed Prado Basin Management Zone (flood control reservoir) will extend to an elevation of 566 feet above mean sea level, essentially allowing inundation of Temescal Creek up to Lincoln Avenue (all of Reach 1A). Thus, Reach 1A would be included as part of the proposed Prado Basin Management Zone.

It is now difficult to discern parts of Reach 1A because of the spreading of outflows from the Creek into the shifting topography of the Prado Basin. Further, the Basin Plan identification of Reach 1A does not appear to fulfill any meaningful regulatory purpose. At present, there are no direct POTW or other non-stormwater wastewater discharges to Reach 1A of the Creek. The City of Corona discharges to the Butterfield Drain, which converges with the Santa Ana River west (downstream) of the river's confluence with Temescal Creek. These discharges, and those by the upstream POTWs (Lee Lake Water District, EVMWD and EMWD) are regulated pursuant to Santa Ana River, Reach 3 objectives, as reflected in the established wasteload allocations. (The proposed wasteload allocations (see Section 8.0) also implement this regulatory approach.)

Taking these circumstances into consideration, staff recommends that Temescal Creek, Reach 1A be deleted from the Basin Plan. This area would be considered part of the proposed Prado Basin Management Zone. Reach 1B of Temescal Creek would be renamed "Reach 1." No other boundary changes are recommended for the remaining

reaches of Temescal Creek. Removal of Reach 1A would also result in the removal of the Reach 1A water quality objectives.

These proposed changes to Temescal Creek are shown in the Attachment to Resolution No. R8-2004-0001, Chapter 3, Table 3-1, p. 3-19 and Chapter 4, Table 4-1, p. 4-32.

6.0 Maximum Benefit Proposals/Demonstrations

As stated above, several agencies and parties who were members of the Task Force submitted documentation to request, and justify, changes to the Basin Plan beyond those recommended by the Task Force on the basis of the scientific review. These proposals include recommendations for the adoption of less stringent nitrogen and TDS objectives for certain ground and surface waters. Since the implementation of less stringent water quality objectives would allow the lowering of water quality, the requirements of the state's antidegradation policy, Resolution No. 68-16, must be satisfied before the objectives can be considered for adoption. Specifically, there must be demonstrations that beneficial uses will continue to be protected and that water quality consistent with maximum benefit to the people of the state will be maintained. Each of these "maximum benefit" proposals is detailed below.

6.1 Chino Basin Watermaster and Inland Empire Utilities Agency Maximum Benefit Proposal

The Chino Basin Watermaster (CBW) is responsible for administering adjudicated water rights and managing groundwater resources within the Chino Groundwater Basin by managing the replenishment of water supplies in the Basin. The CBW acquires and spreads replenishment water as needed, determines the amount of groundwater that each producer is entitled to extract without incurring a replenishment obligation, and approves and facilitates the storage of supplemental water in the Basin. The Inland Empire Utilities Agency (IEUA) provides most of the water supply and wastewater treatment and disposal needs in the Chino Basin. IEUA operates four Publicly Owned Treatment Works (POTWs) that discharge to Chino Creek or its tributaries. These POTWs provide very high quality treated wastewater that is suitable for all water recycling purposes.

CBW, working in concert with IEUA and other Watermaster member agencies, requested two significant revisions to the proposed Basin Plan amendments (Chino Basin Watermaster, December 2002). First, as discussed in Section 2.0, these agencies requested that the proposed Chino 1, Chino 2 and Chino 3 management zones be combined into a Chino North management zone (and that the proposed Chino 4 and 5 management zones be renamed as Chino "East" and "South", respectively[12]) (see Figure 8). Second, CBW and IEUA requested that the water quality objectives for nitrate-nitrogen and TDS in this Chino North management zone be increased significantly above the "antidegradation" water quality objectives proposed for Chino 1, 2 and 3. CBW and IEUA manage water resources within the Cucamonga MZ and also requested increases in the proposed "antidegradation" TDS and nitrate-nitrogen objectives for this proposed Management Zone These proposed "maximum benefit "objectives are compared to the "antidegradation objectives" in Table 4. Both sets of objectives would assure the protection of beneficial uses (see Tables 1 and 2).

[12] As previously indicated, the Task Force agreed with this proposal.

Table 4

Comparison of Proposed Antidegradation and Maximum Benefit
TDS and Nitrate-nitrogen Water Quality Objectives and Current Quality in Chino and Cucamonga Management Zones

Management Zone	"Antidegradation" WQO		Current Ambient Quality		Management Zone	"Maximum Benefit" WQO		Current Ambient Quality[1]	
	TDS mg/L	NO_3-N mg/L	TDS mg/L	NO_3-N mg/L		TDS mg/L	NO_3-N mg/L	TDS mg/L	NO_3-N mg/L
Chino 1	290	4.9	310	8.4	Chino North	420	5.0	300	7.4
Chino 2	260	2.9	300	7.2					
Chino 3	260	3.5	280	6.3					
Cucamonga	210	2.4	260	4.4	Cucamonga	380	5.0	260	4.4

[1] See Section 7.0 for ambient quality and assimilative capacity discussion

The intent of this maximum benefit proposal is to enable and facilitate the implementation of a program of projects and requirements for overall basin management (Chino Basin Watermaster, December 2002). This program is an integral part of the Chino Basin Optimum Basin Management Program (OBMP), developed by the CBW under the supervision of the San Bernardino County Superior Court. The OBMP is a comprehensive, long-range water management plan for the Chino Basin as a whole, including the proposed Chino North Management Zone. The OBMP maps a strategy that will provide for enhanced yield for the Chino Basin, remove groundwater contaminants, reduce reliance on imported water (particularly at critical periods), and provide reliable water supplies. While the OBMP does not explicitly address the proposed Cucamonga Management Zone, the CBW agencies pump from this area and therefore, requirements and plans pursuant to the OBMP indirectly affect the proposed Cucamonga Management Zone.

Central to the OBMP is the extensive use of recycled water produced by IEUA for direct use and groundwater recharge. To improve the quality of the recycled water and to mitigate the water quality effects of recycled water use/recharge on nitrogen and TDS quality in the Basin, the OBMP includes the capture of increased quantities of high quality storm water runoff, recharge of imported water when TDS concentrations are low, improvement of water supply by the desalting of poor quality groundwater, and enhanced wastewater pollutant source control programs.

The "maximum benefit" objectives are necessary for the OBMP to proceed. As shown in Table 4, the proposed TDS and nitrate-nitrogen antidegradation (historical quality) objectives for Chino 1,2 and 3 and Cucamonga Management Zones are very low, and current ambient quality in these Zones exceeds them. This means that there is no assimilative capacity for TDS or nitrate-nitrogen inputs at levels above the objectives (see Section 7.0 for additional discussion of assimilative capacity). Recycled water recharge and other discharges would

Figure 8 -- Proposed Chino Basin "Maximum Benefit" Management Zone Boundaries

have to be limited to these objectives (if adopted). IEUA's average agency-wide effluent TDS and nitrate-nitrogen concentrations are approximately 500 mg/L and 7-9 mg/L, respectively. Treatment of this recycled water would be necessary to achieve the proposed antidegradation objectives, hindering recycling and reuse opportunities[13]. The "maximum benefit" objectives recommended by IEUA would create assimilative capacity that would accommodate maximized recycled water recharge and reuse, while protecting beneficial uses[14].

To support their maximum benefit proposal, CBW/IEUA provided evidence to demonstrate that for the proposed Chino North Management Zone, the long-term trend in TDS quality is an increase in the average concentration from the current quality of 320 mg/L to 420 mg/L by 2025. For the Cucamonga Management Zone, TDS would increase from the current ambient quality of 260 mg/L to 372 mg/L by 2025. These increases in TDS are expected primarily as a result of legacy contamination from past large-scale agricultural practices and typical domestic irrigation practices (watering of lawns, etc.). It must be emphasized that TDS is expected to continue to degrade to 420 mg/L in Chino North and 372 mg/L in the Cucamonga Management Zone with or without recycled water use. (see Figures 9 and 10).

In order to assure that water quality consistent with the maximum benefit to the people of the state will be maintained despite the lowering of water quality that would be allowed by the implementation of the "maximum benefit" objectives, CBW/IEUA are committed to the projects and requirements summarized below. These projects and requirements are also described as part of the proposed amendments to the implementation chapter of the Basin Plan (Chapter 5), presented in the Attachment to tentative Resolution No. R8-2004-0001 (see "VI. Maximum Benefit Implementation Plans for Salt Management", p. 39):

1. Surface and Ground Water Monitoring

The Chino Basin Watermaster will conduct surface and groundwater quality monitoring designed to evaluate the water quality effects of implementation of the maximum benefit proposal, including the "maximum benefit" nitrate-nitrogen and TDS objectives. Annual reports will be submitted, and every three years a determination of ambient nitrate-nitrogen and TDS quality in the Chino North and Cucamonga Management Zones will be made. Based on these assessments, the demonstration of maximum benefit may be revisited and the need for changes to the TDS and nitrogen management strategy in the area can be identified.

[13] Even if for some reason the proposed "antidegradation" objectives are not adopted, the existing TDS and nitrate-nitrogen objectives for groundwater in the Chino Basin and findings that no assimilative capacity exists in much of the Basin would prevent or significantly impede implementation of the OBMP.

[14] Implementation of the CBW/IEUA "maximum benefit" proposal would create TDS assimilative capacity in the proposed Chino North and Cucamonga Management Zones and nitrate-nitrogen assimilative capacity in the proposed Cucamonga Management Zone. However, this created assimilative capacity would be used solely by CBW and IEUA to accommodate the recharge of recycled water. This assimilative capacity would not be allocated to other waste discharges, such as those from dairies.

Figure 9 -- Comparison of TDS Concentration Time Histories for Selected Water Resources Management Cases in the Chino North Management Zone

Figure 10 Comparison of TDS Concentration Time Histories for the Cucamonga Management Zone

The monitoring will also address whether or not "Hydraulic Control" of the Chino Basin is achieved and maintained (see below for discussion of hydraulic control).

(See Attachment to Resolution No. R8-2004-0001, Table 5-8a, # 1,2, 9.)

2. Desalters

Prior to the discharge of recycled water in the Chino Basin, the Chino 1 desalter will be expanded and in operation at a capacity of 10 million gallons per day (MGD)[15]. Contracts for the construction of the Chino 2 desalter will be awarded and a notice to proceed with the construction will be given prior to recharge of recycled water[16]. In addition, by October 2005, the Watermaster will develop plans for implementation of additional desalter capacity (20 MGD). IEUA and CBW will initiate the building of the next desalter when the TDS in IEUA's effluent reaches 545 mg/L TDS. The proposed Basin Plan amendments require the submittal of a plan and schedule for construction of additional desalters.

(See Attachment to Resolution No. R8-2004-0001, Table 5-8a, #3,4,6.)

3. Recharge Facilities/Conjunctive Use Program

One of the key elements of the OBMP is the plan to develop conjunctive use storage and recovery in the Chino groundwater basins. Implementation of this plan would enable CBW/IEUA to offset the recharge of poorer quality recycled water and to ensure that the TDS and nitrate-nitrogen "maximum benefit" objectives for the proposed management zones would be met (see also "Recycled Water Management", below). Importantly, it would also provide increased protection against water shortages due to drought conditions. CBW has committed to increase the number of recharge basins from the 2 currently in place to 19 to allow recharge of significant amounts of water from all sources, including State Project Water, stormwater, and recycled water. These facilities would be in place by June 30, 2004.

The increased number of recharge basins would significantly increase the CBW's effort to harvest and recharge high quality storm water runoff in the area. Specifically, CBW's capacity to retain and recharge storm water would be increased from 5,600 acre-feet/year to 25,000 acre-feet/year – a 350% increase. As noted, these recharge facilities would also be used for the recharge of State Project Water. The absence of large-scale storage projects in southern California tends to increase demand for State Project Water precisely when the supply of such water is lowest - during periods of drought. The conjunctive use program commitment requires the CBW to import and recharge State Project Water when it is plentiful, thus reducing the adverse environmental impacts that may occur when State Project Water supplies in the Bay-Delta are low. This will result in reduced stress on the Bay-Delta aquatic and marine ecosystems. IEUA/CBW are also committed to the recharge of State Project water into the Chino Basin when the TDS concentration is the lowest.

(See Attachment to Resolution No. R8-2004-0001, Table 5-8a, # 6.)

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[15] It is expected that the expanded desalter will be operational by January 2004 (CBW, December 2002).

[16] It is expected that this desalter (10 MGD) will be operational by June 2004 (CBW, December 2002).

4. Recycled Water Management

Recycled water recharged in the Chino Basin will be blended with other recharge sources so that the 5-year running average TDS and nitrogen concentrations are equal to or less that the proposed "maximum benefit" objectives for the Chino North and Cucamonga Management Zones. This requires that CBW/IEUA document the amount and TDS and nitrate-nitrogen quality of all sources of recharge, including stormwater[17], imported water and recycled water, and the recharge location.

IEUA has committed to achieve agency-wide compliance with 12-month TDS and total Inorganic nitrogen (TIN) effluent limits of 550 mg/L and 8 mg/L, respectively (see further discussion of the basis for these limitations in the wasteload allocation section of this report (Section 8.0). The TDS in IEUA's effluent is expected to reach 550 mg/L before the groundwater in the proposed Chino North and Cucamonga Management Zones reaches 420 mg/L. As such, IEUA's effluent will be the controlling point for water quality management. As stated above, IEUA and CBW will initiate the building of the next desalter when the TDS in IEUA's effluent reaches 545 mg/L. The proposed amendments require IEUA to submit a wastewater quality improvement plan and schedule if the 12-month running average effluent quality equals or exceeds 545 mg/L TDS for 3 consecutive months or exceeds 8 mg/L total inorganic nitrogen in any month. IEUA would be required to implement that plan upon Regional Board approval.

IEUA has committed to implement immediately a salt management program that will reduce the salts entering IEUA's POTWs and improve recycled water quality. This program consists of: 1) connecting new industries that have a wastewater stream greater than 550 mg/L TDS to existing brine lines (the Santa Ana Regional Interceptor or IEUA Non-reclaimable Line); 2) providing incentives for the removal of on-site regenerative water softeners and replacement with off-site regenerative systems; and, 3) connect existing domestic system industries with high TDS to the brine lines.

(See Attachment to Resolution No. R8-2004-0001, Table 5-8a, #6, 7.)

5. Hydraulic Control

"Hydraulic Control" is defined as the elimination of groundwater discharge from the Chino Basin to the Santa Ana River, or controlling the discharge to *de minimis* levels. An estimated 5,000 acre-feet per year or more of groundwater in the Chino Basin now rises into the Santa Ana River and becomes part of the surface flows recharged in the Orange County groundwater basin (proposed Orange County Management Zone). (See further discussion of Santa Ana River recharge in the wasteload allocation section of this report (Section 8.0)). This rising groundwater is typically poor in nitrate-nitrogen and TDS quality. Implementation of the CBW/IEUA maximum benefit proposal, including the "maximum benefit" TDS and nitrate-nitrogen objectives, would allow a lowering of water quality that could further adversely affect the quality of groundwater discharge to the River, and thus the quality of Orange County

[17] The proposed amendments reflect that a certain amount of stormwater recharge will occur naturally and require CBW/IEUA to determine the recharge that occurs as a direct result of their enhanced recharge facilities (see Attachment to tentative Resolution No. R8-2004-0001, Table 5-8a, # 7).

groundwater. The maximum benefit proposal by CBW/IEUA calls for the use of desalters at the southern portion of the proposed Chino North Management Zone and recharge management programs to control groundwater discharge to the River. Eliminating or at least substantially reducing the discharge of poor quality groundwater to the River should improve the quality of the River. This is a benefit recognized by the Orange County Water District, which operates extensive River recharge facilities and is the principal water purveyor in the Orange County area of the Region.

CBW will conduct monitoring to demonstrate that hydraulic control is maintained. The proposed amendments require the submittal of a plan and schedule to correct the loss of hydraulic control, if such loss is demonstrated by the monitoring. Hydraulic control would have to be achieved no later than 180 days after the loss of control is identified. CBW has also committed to implement measures to assure that the effects of temporary losses of hydraulic control are mitigated.

(See Attachment to Resolution No. R8-2004-0001, Table 5-8a, # 8.)

The development of the CBW/IEUA maximum benefit proposal was discussed extensively at the TDS/N Task Force meetings as well as in individual meetings with OCWD, the primary, potentially affected downstream agency. Task Force members and OCWD have expressed support of the CBW/IEUA maximum benefit proposal. Board staff also supports the proposal. As previously stated, implementation of the "maximum benefit" objectives would assure the protection of beneficial uses. Further, provided that the commitments identified above are met, water quality that is consistent with maximum benefit to the people of the state will be maintained. It would promote water recycling and reuse, which the California legislature has declared is a primary interest of the people of California (California Water Code (CWC) Sections 13510-13512). Implementation of the proposal would also increase the quantity and reliability of local water supplies, reduce demand for imported water, particularly during critical low flow periods, and result in the removal of groundwater contaminants via desalters.

However, if these commitments are not implemented, it would be inappropriate to make this maximum benefit finding. In that case, the proposed "antidegradation" objectives should be applied to the management zones proposed by the Task Force on the basis of the technical review, i.e., Chino 1, 2,and 3 (rather than Chino North), and the Cucamonga Management Zone (see Sections 2.0 and 4.0 of this report)).

The proposed Basin Plan amendments shown in the Attachment to Resolution No. R8-2004-0001 incorporate both scenarios. That is, both the "antidegradation" and "maximum benefit" objectives are proposed to be included in the Basin Plan, with explicit language that governs their application (see Attachment to Resolution No. R8-2004-0001, Chapter 4, "Maximum Benefit Objectives"). The "maximum benefit" objectives apply only provided that there is timely implementation of the CBW/IEUA commitments described above and in the proposed amendments to Chapter 5, Implementation, of the Basin Plan (see Attachment to Resolution No. R8-2004-0001, "VI. Maximum Benefit Implementation Plans for Salt Management, A. Salt Management – Chino Basin and Cucamonga Basin"). If the Regional Board finds that "maximum benefit" is not being demonstrated, then the antidegradation objectives would apply and the Regional Board would require mitigation of the effects of any discharges of recycled and imported water that took place in conformance with the

”maximum benefit” objectives. Mitigation would be required such that the TDS and nitrogen loads to the Chino Basin from imported water, storm water capture as the result of the CBW/IEUA enhanced stormwater interception program and recycled recharge activities are equivalent to the TDS and nitrogen loads that would have been allowed in conformance with the “antidegradation” objectives. This mitigation requirement is also delineated explicitly in the proposed amendments to Chapter 5, “VI. Maximum Benefit Implementation Plans for Salt Management, A. Salt Management – Chino Basin and Cucamonga Basin”.

In addition, pursuant to the proposed amendment language, the Board will require mitigation of any adverse impacts to downstream surface or groundwater quality, as indicated by the annual sampling of the Santa Ana River at Prado Dam prescribed in the Basin Plan, that are attributable to the implementation of the CBW/IEUA maximum benefit proposal.

The proposed amendments also describe the tools that the Regional Board will use to require and encourage the implementation of the maximum benefit commitments. These include appropriate revisions to IEUA waste discharge requirements, and use of the authority provided by Water Code Section 13267 to require the collection and submittal of technical information. (See Attachment to Resolution No. R8-2004-0001, “VI. Maximum Benefit Implementation Plans for Salt Management, A. Salt Management – Chino Basin and Cucamonga Basin”.)

In summary, Board staff recommends the adoption of the “maximum benefit” objectives for the groundwater management zones proposed by CBW/IEUA, as well as the “antidegradation objectives” and management zones recommended by the Task Force. These amendments are reflected in the proposed changes to Chapters 3 and 4 of the Basin Plan (See Attachment to Resolution No. R8-2004-0001). Staff also recommends the adoption of the changes to Chapter 5, Implementation, shown in the Attachment to the Resolution, “VI. Maximum Benefit Implementation Plans for Salt Management, A. Salt Management – Chino Basin and Cucamonga Basin”. These changes are necessary to address appropriate implementation of the “maximum benefit” proposal by CBW/IEUA.

6.2 Yucaipa Valley Water District Maximum Benefit Proposal

The Yucaipa Valley Water District (YVWD) provides the water supply and sewer services to most of the Yucaipa Valley, including most of the City of Yucaipa, a portion of the City of Calimesa and unincorporated areas in Riverside and San Bernardino Counties. Groundwater pumped from the proposed Yucaipa Management Zone is currently the predominant source of supply for YVWD and other water purveyors (South Mesa Water Company, Western Heights Water Company) serving the Yucaipa Valley. The combined production of YVWD and the South Mesa and Western Heights water companies exceeds the yield of the proposed Yucaipa Management Zone, and groundwater levels are decreasing. YVWD operates one wastewater treatment facility, which currently discharges tertiary treated wastewater to San Timoteo Creek, Reach 3. This unlined reach of the Creek overlies and recharges the proposed San Timoteo groundwater management zone.

To assure reliable supplies to meet present and anticipated demands, YVWD, with other members of the San Timoteo Watershed Management Authority (STWMA; see Section 6.3), has developed and is in the process of implementing a watershed-scale water resources

management plan. This plan includes enhanced recharge of stormwater and recycled water, optimizing direct use of recycled and imported water, and conjunctive use.

To enable implementation of this plan, YVWD has requested revisions to the proposed Basin Plan amendments (Yucaipa Valley Water District, January 2003). YVWD requested that the water quality objectives for nitrate-nitrogen and TDS in the proposed San Timoteo and Yucaipa management zones be set at levels higher than the "antidegradation" water quality objectives proposed for these management zones. These proposed "maximum benefit "objectives are compared to the "antidegradation objectives" in Table 5[18]. Both sets of objectives would assure the protection of beneficial uses.

As discussed in Section 6.3, the City of Beaumont and STWMA made the same recommendation for "maximum benefit" objectives for the proposed San Timoteo Management Zone. The City discharges to Coopers Creek, a tributary of San Timoteo Creek[19]. These agencies also recommended "maximum benefit" objectives for the proposed Beaumont Management Zone. This proposal is discussed in the next section of this report.

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[18] YVWD's January 2003 "maximum benefit" proposal requests that an interim objective of 8 mg/L total inorganic nitrogen (which is largely nitrate-nitrogen) for the proposed San Timoteo and Yucaipa Management Zones be approved for a three year period to accommodate continued YVWD discharges while new denitrification facilities are installed. The new facilities would enable YVWD to meet the effluent limitation (6 mg/L TIN; see wasteload allocation discussion in Section 8.0) that would be necessary to comply with their recommended long-term "maximum benefit" objective of 5 mg/L. However, staff believes that the interim "maximum benefit" objective of 8 mg/L is unnecessary. Pursuant to the explicit NPDES permit compliance schedule authorization language in the Basin Plan, YVWD could be granted an appropriate schedule in its NPDES permit for compliance with 6 mg/L TIN to assure conformance with the 5 mg/L "maximum benefit" objective, if that objective is approved.

[19] The Beaumont discharge is to Coopers Creek in a subunit of the proposed Beaumont Management Zone that is called the Beaumont South Storage Unit. It is a *de facto* discharge to the proposed San Timoteo Management Zone since it enters that Management Zone essentially immediately (WEI, personal communication, November 8, 2003).

Table 5

Comparison of Proposed Antidegradation and Maximum Benefit
TDS and Nitrate-nitrogen Water Quality Objectives and Current Ambient Quality
in the San Timoteo and Yucaipa Management Zones

Management Zone	"Antidegradation" WQOs		"Maximum Benefit" WQOs		Current Ambient Quality[1]	
	TDS mg/L	NO_3-N mg/L	TDS mg/L	NO_3-N mg/L	TDS mg/L	NO_3-N mg/L
San Timoteo	300	2.7	400	5.0	300	2.9
Yucaipa	320	4.2	370	5.0	330	5.2

[1] See Section 7.0 for ambient quality and assimilative capacity discussion

Yucaipa Management Zone. One of the key elements in YVWD's water supply plan is the implementation of a conjunctive use program in the proposed Yucaipa Management Zone area that will provide drought reliability in the form of dry-year yields. The conjunctive use program is critical to meet the existing and future water supply needs of the San Timoteo Watershed area. The success of conjunctive use depends on YVWD's ability to recharge significant amounts of water from all sources, including State Project water, other imported water, storm water, and recycled water. However, the proposed "antidegradation" water quality objectives could prevent State Project water, other imported water, and recycled water from being recharged or reused without necessitating significant mitigation or offset. As shown in Table 5, the proposed TDS and nitrate-nitrogen "antidegradation" (historical quality) objectives for the Yucaipa Management Zone are very low. Since current ambient quality in this proposed management zone exceeds the "antidegradation" objectives, this management zone lacks assimilative capacity for TDS and nitrate-nitrogen inputs at levels above the objectives. Recycled water recharge and other discharges would have to be limited to these objectives (if adopted). YVWD's effluent TDS and nitrate-nitrogen discharge limits are 540 mg/L and 10 mg/L, respectively, as specified in the existing Basin Plan wasteload allocations. Expensive treatment of this recycled water would be necessary to achieve the proposed "antidegradation" objectives, which would severely hinder recycling and reuse opportunities[20]. The "maximum benefit" objectives recommended by YVWD would create TDS assimilative capacity that would accommodate maximized recycled water recharge and reuse, while protecting beneficial uses[21].

[20] Even if for some reason the proposed "antidegradation" objectives are not adopted, the existing (1995 Basin Plan) TDS and nitrate-nitrogen objectives for groundwater in the area of the proposed Yucaipa and San Timoteo management zones, and findings that no assimilative capacity exists in much of the Basin, would prevent or significantly impede implementation of many of the water resources plans and projects proposed by YVWD, including wastewater recycling.

[21] This created assimilative capacity would be used solely by YVWD to accommodate the reuse and recharge of recycled water and would not be allocated to other waste discharges, such as those from agriculture.

To support their maximum benefit proposal, YVWD provided evidence to demonstrate that in the proposed Yucaipa Management Zone, the TDS concentration is projected to increase indefinitely, even without recycled water use. YVWD evaluated the TDS effects of several alternative scenarios of the use of State Project water and recycled water (assumed to be limited to 540 mg/L) for the replenishment of the Yucaipa Management Zone and for non-potable supply. YVWD determined that to assure a reliable water supply, it must pursue alternatives that entail the use of a 50/50 mix of State Project water and recycled water for non-potable use, and the possible replenishment of the Yucaipa Management Zone with the same blend of waters. These alternatives provide the best balance between reliability (reduced dependence on imported water) and the groundwater quality effects of the use of recycled water. The projected TDS concentration for the proposed Yucaipa Management Zone is 370 mg/L by 2030, as shown in Figure 11. Maintenance of TDS water quality at this level (370 mg/L) and at 5 mg/L nitrate-nitrogen would be consistent with maximum benefit to the people of the state since it would accommodate recycling for subsequent beneficial use and would reduce dependence on precious imported water supplies, which could be used to meet water demands elsewhere in the state.

San Timoteo Management Zone. Like the proposed Yucaipa Management Zone, the recommended "antidegradation" objectives for TDS and nitrate-nitrogen for the proposed San Timoteo Management Zone are very low, and the current quality exceeds these objectives (Table 5). Since no TDS and nitrate-nitrogen assimilative capacity exists, limits for recycled water discharges that affect this zone would have to be set to meet the "antidegradation" objectives, if approved. This includes the limits for YVWD's (and the City of Beaumont's) discharges to San Timoteo Creek. These objectives are very restrictive and would require significant wastewater treatment plant upgrades[22]. The expenditure of significant funds to complete these upgrades is not commensurate with any benefit to beneficial uses, or to the reliability of water supplies for the area. The proposed management zone is hydraulically closed (subsurface outflows from the San Timoteo Management Zone to the downgradient, proposed Bunker Hill B management zone have been found to be negligible), and therefore the quality of the San Timoteo Management Zone would not affect downgradient groundwaters. YVWD (and the City of Beaumont) plan to reduce or eliminate their recycled water discharges to San Timoteo Creek (see below). These reduced discharges would not result in any sustained dry weather flow in the Santa Ana River, to which the Creek is tributary. The recharge of these discharges in the proposed Bunker Hill B Management Zone will be insignificant, and within the assimilative capacity of the proposed management zone. Similarly, there is not expected to be recharge of these discharges in downgradient proposed management zones (e.g. Colton MZ). The quality of these discharges would not adversely affect the quality of downstream waters or their beneficial uses[23].

In short, the adoption and implementation of the recommended "maximum benefit" objectives would assure the protection of the water quality and beneficial uses of all affected receiving

[22]Based on model analysis, limits of 320 mg/L TDS and 4.1 mg/L TIN would be necessary for discharges to San Timoteo Creek by both YVWD and Beaumont to achieve the proposed "antidegradation" objectives for the proposed San Timoteo Management Zone. (See Section 8.0 Wasteload Allocations).

[23]Pursuant to the proposed "maximum benefit" wasteload allocations, YVWD would be held to 540 mg/L TDS and 6 mg/L TIN; the City of Beaumont would be held to 490 mg/L TDS and 6 mg/L TIN. Both dischargers will implement facilities/operational changes necessary to meet the TIN limit. See further discussion in this section and Section 8.0, Wasteload Allocations.

waters. Further, these objectives would be in the best interest of the people of the state since they would accommodate wastewater recycling and reduce dependence on imported water supplies. In contrast, reliance on the "antidegradation" objectives would necessitate significant commitments of resources, without enhancement of beneficial uses or the reliability of water supplies.

To develop a set of proposed "maximum benefit" objectives, quality projections similar to those provided for the proposed Yucaipa Management Zone were not made for the proposed San Timoteo Management Zone. This is because data are limited for this management zone and its hydrology and geology are less understood. However, it is estimated that the TDS concentration in the proposed San Timoteo Management Zone would approach the volume weighted average of all inflows to the management zone (storm water, wastewater discharges, subsurface inflow, etc.) of about 385 mg/L (WEI, November 5, 2003).). This assumes that YVWD's recycled water is limited to 540 mg/L TDS, and that the City of Beaumont is limited to 490 mg/l TDS. YVWD and the City of Beaumont intend to discontinue all or part of their wastewater discharges to the unlined parts of San Timoteo Creek that overlie the proposed San Timoteo Management Zone. When this occurs, the TDS quality of the volume weighted average inflow to the Zone is expected to decrease to about 260 mg/L (WEI, November 5, 2003). The recommended "maximum benefit" TDS objective (400 mg/L) is based on consideration of existing recycled water quality and the immediate need to continue to discharge that recycled water to San Timoteo Creek in the absence of a currently available discharge alternative. Further, staff believes that consideration must be given to the potential, if not the likelihood, that the long-term discharge of at least some recycled water to the unlined part of the Creek will be necessary to maintain established habitat.

There is considerable riparian habitat in San Timoteo Creek downstream of YVWD's point of discharge that is supported, in part, by the YVWD recycled water discharge. The "maximum benefit" proposal by YVWD indicates that YVWD expects to completely eliminate its discharge to the unlined reach of San Timoteo Creek by 2008. The District is planning the construction of a pipeline to convey recycled water downstream to the lined reach of the Creek (the proposed Reach 1A). A second pipeline may be constructed to convey the recycled water to the San Jacinto watershed for reuse. YVWD indicates that the plan of discharge would have the following priorities: first, direct reuse and limited recharge in the YVWD service area (principally the area overlying the proposed Yucaipa Management Zone); second, discharge to the San Jacinto watershed for direct and environmental uses; and third, discharge to the lined reach of San Timoteo Creek downstream of the current point of discharge[24]. YVWD recognizes the obligation to maintain flows in the Creek to maintain the riparian habitat (State Board Order Change of Use Permit No. WW-26) and is considering other sources of supply, including imported State Project water or groundwater.

[24]The discharge to the lined reach of San Timoteo Creek could result in added flows to the Santa Ana River, Reach 4, with the potential for recharge to the underlying groundwater, including the proposed Colton Management Zone. Recharge of wastewater in this Zone is not expected to be signficant , although this has not been confirmed by model analysis. Analyses by WEI (June 2003) show that the volume-weighted average recharge in Reach 4, including discharges by YVWD at 540 mg/L TDS, would comply with the TDS objective proposed for the Colton Management Zone. However, there is no analysis currently available that demonstrates that discharges by YVWD at 6 mg/L TIN would assure compliance with the nitrate-nitrogen objective proposed for the Colton Management Zone. Unless this demonstration is made, or the expectation that recharge of YVWD discharges in the proposed Colton Management Zone is insignificant is demonstrate, the third option would not be viable.

Figure 11 – Comparison of TDS Concentration Time Histories for Selected Water Resources Management Cases in the Yucaipa Management Zone

The "maximum benefit" TDS and nitrogen objectives recommended by YVWD (and STWMA/City of Beaumont; see discussion below) would provide a limited amount of assimilative capacity that would allow the agencies to continue their discharges of wastewater to unlined reaches of San Timoteo Creek until they can construct the facilities necessary to divert the recycled water and implement their recycled water programs. Discharges by YVWD at 540 mg/L or less TDS (and by the City of Beaumont at 490 mg/L or less TDS) would be consistent with compliance with the "maximum benefit" TDS objective (WEI, personal communication, October 2003; WEI, letter dated November 5, 2003 (via e-mail)). Facility improvements by both YVWD and the City of Beaumont will be necessary to achieve compliance with the 6 mg/L nitrogen limit needed to implement the recommended "maximum benefit" objective (5 mg/L). In accordance with the explicit NPDES permit compliance schedule language in the Basin Plan, compliance schedules can be included in the NPDES permits for these dischargers to provide the time necessary to meet those limits. The TDS and nitrogen assimilative capacity created by these "maximum benefit" objectives would be used solely by YVWD (and the City of Beaumont) to accommodate the recycled water discharges and would not be allocated to other waste discharges, such as those from agriculture.

It may appear that in light of the expected removal of the recycled water discharges from San Timoteo Creek, the need and justification for the "maximum benefit" objectives for the proposed San Timoteo management zone is limited to the period of time required to implement alternative discharge plans. However, there are as yet no definitive plans for the relocation/reuse of the wastewater discharges. Nor is there a clear demonstration that an alternative water source(s) to maintain the riparian habitat in San Timoteo Creek can be provided. Board staff believes that it is likely that some amount of recycled water will need to be discharged to the Creek over the long term. Moreover, the "maximum benefit" objectives would accommodate recycled water use and recharge in this management zone, if implemented by YVWD. Given these circumstances, staff recommends the approval of the requested "maximum benefit" objectives. These objectives are subject to review and revision if the circumstances justifying their adoption no longer pertain.

In order to assure that water quality consistent with the maximum benefit to the people of the state will be maintained despite the lowering of water quality that would be allowed by the implementation of the "maximum benefit" objectives, YVWD is committed to the projects and requirements summarized below. These projects and requirements are also described as part of the proposed amendments to the implementation chapter of the Basin Plan (Chapter 5) presented in the Attachment to tentative Resolution No. R8-2004-0001 (see "VI. Maximum Benefit Implementation Plans for Salt Management", p. 39):

1. Surface and Ground Water Monitoring

YVWD will conduct surface and groundwater quality monitoring designed to evaluate the water quality effects of implementation of the maximum benefit proposal, including the "maximum benefit" nitrate-nitrogen and TDS objectives. Annual reports will be submitted, and every three years a determination of ambient nitrate-nitrogen and TDS quality in the Yucaipa and San Timoteo Management Zones will be made. Based on these assessments, the demonstration of maximum benefit may be revisited and the need for changes to the TDS and nitrogen management strategy in the area can be identified.

(See Attachment to Resolution No. R8-2004-0001, Table 5-9a, # 1,2, 6.)

2. Desalters (Yucaipa Management Zone) and Brine Disposal Facilities

YVWD will initiate the building of a desalter when the 5 year average TDS in YVWD's effluent reaches 530 mg/L TDS or when TDS quality in the Yucaipa Management Zone reaches 360 mg/L. The proposed Basin Plan amendments require the submittal of a plan and schedule for construction of a desalter(s) and requisite brine disposal facilities, and the implementation of that plan upon Regional Board approval. The proposed amendments specify that the schedule must assure that these facilities are operational no later than 7 years from the date of Regional Board approval.

(See Attachment to Resolution No. R8-2004-0001, Table 5-9a, #3.)

3. Recycled Water Use/Recharge

The projected water demands for the Yucaipa area for year 2030 require approximately an additional 16,000 AF/Y of supplemental water from State Water Project water, water imported from local sources, recharged storm water, and/or recycled water. As discussed previously, the use and possible recharge of recycled water is a critical component of the YVWD/STWMA water resources management plan.

In order to meet these increased demands and to offset the impacts from the use/recharge of recycled water, YVWD will significantly increase their efforts to harvest and recharge low TDS and low nitrate-nitrogen storm water runoff. YVWD will construct or facilitate construction of recharge projects that will capture and recharge new urban stormwater. This has the added benefit of improving water quality in surface water by diverting urban runoff from the existing natural streams (note that the depth to groundwater is generally very deep in the proposed Yucaipa Management Zone and urban related contaminants will be either filtered out or removed by bio-chemical processes in the unsaturated zone). YVWD will also establish a fund to purchase imported water from local sources and/or the State Water Project and recharge water with a TDS concentration less than 290 mg/L (the long-term historical average of water delivered from the State Project.)

YVWD is constructing a non-potable water system to serve water for irrigation purposes. The non-potable water will be a blend of State Project and recycled waters. The intent of blending these sources is to minimize the impact of recycled water use on the proposed Yucaipa and San Timoteo Management Zones. YVWD has committed to produce a non-potable supply with a running ten-year average TDS concentration less than their recommended "maximum benefit" TDS objective for the proposed Yucaipa Management Zone (370 mg/L). To implement this provision, the proposed Basin Plan amendments require YVWD to submit a plan and schedule for the implementation of the non-potable supply system, to be completed as soon as possible but no later than 10 years from the effective date of the proposed amendments.

The demonstration of "maximum benefit" and the continued application of the "maximum benefit" objectives depends on the combined recharge (storm water, imported water, recycled water) to the Yucaipa Management Zone of a 5-year annual average (running average) TDS concentration of 370 mg/L and nitrate-nitrogen concentration of 5 mg/L. If

recycled water use or recharge in the proposed San Timoteo Management Zone is pursued, then the continued application of the "maximum benefit" objectives for that Zone will depend on the combined recharge of a 5-year running average TDS concentration of 400 mg/L or less TDS, and 5 mg/L nitrate-nitrogen. The proposed Basin Plan amendments reflect these requirements. No specific requirements pertaining to storm water or imported water recharge are included. Implementation of these facilities will be driven by the combined recharge quality requirements described above, and by the desire to avoid, or at least minimize, the construction of desalters that could become necessary in the absence of recharge of higher quality waters.

(See Attachment to Resolution No. R8-2004-0001, Table 5-9a, #4, 5)

4. Recycled Water Quality Management

In addition to the projects discussed above, YVWD's maximum benefit proposal commits the District to a number of projects intended to improve recycled water quality and to mitigate impacts from the discharge of recycled water.

First, YVWD will replace existing denitrification facilities to enable the District to produce effluent nitrogen quality that complies with the recommended "maximum benefit" objective of 5 mg/L (for both the proposed San Timoteo and Yucaipa Management Zones). As noted previously, the wasteload allocation analyses conducted as part of this 2003 update of the N/TDS Management Plan indicate that effluent quality of 6 mg/L TIN would assure compliance with this objective (see Section 8.0).

Second, YVWD will limit the TDS concentration in its effluent to less than or equal to 540 mg/L by using a low TDS source water supply for potable uses, selective desalting of either source water and/or recycled waters, and minimizing the TDS waste increment. YVWD is currently constructing a 12-MGD treatment plant to treat and serve State Project Water. The plant will also be able to treat low TDS Mill Creek and Santa Ana River water. When necessary, YVWD will construct desalters to reduce either the TDS concentration in water supplied to customers or the TDS concentration in the effluent. YVWD will also use best efforts to enact ordinances and other requirements to minimize the TDS use increment.

Third, as discussed earlier, YVWD plans to remove some or all of its effluent discharge from the unlined part of San Timoteo Creek. As noted previously, this would improve the quality of inflows to the proposed San Timoteo Management Zone. Relocation of the discharge downstream to the lined reach of San Timoteo Creek (the proposed Reach 1A) would be expected to enhance quality in the Santa Ana River and groundwater recharged by the River.

The proposed amendments require YVWD to replace their existing denitrification facilities within 3 years of the effective date of the Basin Plan amendment. YVWD would also be required to submit a plan and schedule for improvement of wastewater quality when the 12 month running average TDS concentration equals or exceeds 530 mg/L, or the 12 month running average total inorganic nitrogen concentration equals or exceeds 6 mg/L in any month (once the new denitrification facilities are operational). Finally, the proposed amendments require YVWD to submit a plan and schedule to reduce or eliminate the existing wastewater discharge to the unlined reach of San Timoteo Creek. YVWD would be required to implement that plan upon Regional Board approval.

(See Attachment to Resolution No. R8-2004-0001, Table 5-9a, #7, 8, 9)

5. Western Regional Interceptor

YVWD will construct the Western Regional Interceptor to provide wastewater collection and treatment services to Dunlap Acres in order to mitigate what has been identified as a poor quality groundwater area due to prior agricultural use and existing septic systems. The interceptor includes the construction of a major wastewater interceptor pipeline, a force main and pump station. These facilities will be constructed prior to 2010. The Dunlap Acres area was inadvertently omitted from the Yucaipa-Calimesa septic tank subsurface disposal system prohibition established by the Regional Board in 1973. Staff believes that sewering of this area is a high priority and commends the District for its actions to provide this service. Regional Board action may be necessary to require connection of properties to the wastewater collection system, when it is completed.

YVWD will also require newly constructed parcels of one acre or less to connect to the YVWD wastewater collection system, unless exempted by the Regional Board. The District will also continue to pursue the development and expansion of the wastewater collection system to include as many parcels as possible to minimize the TDS impacts on the groundwater basins.

The proposed amendments require YVWD to submit a plan and schedule for construction of the Interceptor, and to implement that plan upon Regional Board approval. The Interceptor would be required to be in place no later than January 1, 2010, as proposed by YVWD. (See Attachment to Resolution No. R8-2004-0001, Table 5-9a, #10)

Like the CBW/IEUA proposal, the YVWD maximum benefit proposal was discussed extensively at the TDS/N Task Force meetings and both the Task Force members and Regional Board staff support it. Again, implementation of the “maximum benefit” objectives would assure the protection of beneficial uses. Further, provided that the commitments identified above are met, water quality that is consistent with maximum benefit to the people of the state will be maintained. It would promote water recycling and reuse, which the California legislature has declared is a primary interest of the people of California (California Water Code (CWC) Sections 13510-13512). Implementation of the proposal would also increase the quantity and reliability of local water supplies and reduce demand for imported water, particularly during critical low flow periods.

However, if YVWD fails to fulfill these commitments, this maximum benefit finding would be inappropriate and the “antidegradation” objectives developed by the Task Force on the basis of the technical review should be applied to the proposed Yucaipa and San Timoteo Management Zones.

As for the CBW/IEUA maximum benefit proposal, the proposed Basin Plan amendments shown in the Attachment to Resolution No. R8-2004-0001 incorporate both scenarios. That is, both the “antidegradation” and “maximum benefit” objectives are proposed to be included in the Basin Plan, with explicit language that governs their application (see Attachment to Resolution No. R8-2004-0001, Chapter 4, “Maximum Benefit Objectives”). The “maximum benefit” objectives apply only provided that there is timely implementation of the YVWD commitments described above and in the proposed amendments to Chapter 5, Implementation, of the Basin Plan (see Attachment to Resolution No. R8-2004-0001, “VI. Maximum Benefit Implementation Plans for Salt Management, B. Salt Management – San

Timoteo and Yucaipa Management Zones (Yucaipa Valley Water District")). If the Regional Board finds that "maximum benefit" is not being demonstrated, then the "antidegradation" objectives would apply and the Regional Board would require mitigation of the surface and groundwater effects of any discharges of recycled and imported water that took place in excess of those objectives. This mitigation requirement is explicitly identified in the proposed amendments to Chapter 5, "VI. Maximum Benefit Implementation Plans for Salt Management, B. Salt Management – San Timoteo and Yucaipa Management Zones (Yucaipa Valley Water District)". Implementation steps by the Regional Board are also delineated in the proposed amendments.

In summary, Board staff recommends the adoption of the "maximum benefit" TDS and nitrate-nitrogen objectives recommended by YVWD for the proposed San Timoteo and Yucaipa groundwater management zones, as well as the "antidegradation objectives" for those zones recommended by the Task Force. These amendments are reflected in the proposed changes to Chapters 3 and 4 of the Basin Plan (See Attachment to Resolution No. R8-2004-0001). Staff also recommends that adoption of the changes to Chapter 5, Implementation, shown in the Attachment to the Resolution, "VI. Maximum Benefit Implementation Plans for Salt Management, B. Salt Management – San Timoteo and Yucaipa Management Zones (Yucaipa Valley Water District)". These changes are necessary to address appropriate implementation of the "maximum benefit" proposal by YVWD.

6.3 San Timoteo Watershed Management Agency/City of Beaumont Maximum Benefit Proposal

STWMA was formed in January 2001 by the Beaumont-Cherry Valley Water District (BCVWD), the City of Beaumont, the South Mesa Water Company and YVWD. STWMA formed a stakeholder group to develop a watershed-scale water resources management program that, among other goals, would provide a safe and reliable water supply for all water users in the watershed. The STWMA service area (which includes Beaumont and Yucaipa) is one of the fastest growing regions in the State. Currently, the proven local water supplies for the STWMA area are about 32,000 acre-ft/yr, while ultimate demand is estimated at 99,000 acre-ft/yr.

The San Timoteo Watershed Management Program (STWMP) was completed in March 2002 and was documented in the *San Timoteo Watershed Management Program, Phase 1 Report*. As described in the preceding discussion of the YVWD maximum benefit proposal, this program entails enhanced recharge of native and recycled water, maximizing the direct use of recycled water, optimizing the direct use of imported water, recharge, and conjunctive use. STWMA, acting for all its member agencies, will conduct the regional planning and monitoring activities necessary to implement this program and the "maximum benefit" commitments described below. Currently, STWMA is assisting its member agencies in developing and implementing regional recycled water management and reuse programs. STWMA is also completing investigations and developing agreements that will enable construction of the facilities necessary to implement the program.

The City of Beaumont operates a municipal wastewater treatment plant and discharges tertiary treated wastewater to Coopers Creek, a tributary of San Timoteo Creek, Reach 4 (as discussed earlier (Section 5.1), Reach 4 is proposed to become part of a redefined Reach 3 of San Timoteo Creek). This unlined reach of San Timoteo Creek overlies and

recharges the proposed San Timoteo groundwater management zone[25]. Coopers Creek overlies and recharges the proposed Beaumont Management Zone. Like the YVWD proposal, the "maximum benefit" request by the City of Beaumont/STWMA indicates that Beaumont expects to completely stop the recycled water discharge to the unlined reach of San Timoteo Creek overlying the proposed San Timoteo Management Zone by 2008. The STWMP anticipates that Beaumont's recycled water will be almost completely reused within the Beaumont area for landscape irrigation, habitat enhancement, and potentially for groundwater recharge. Like YVWD, Beaumont and STWMA are also considering the export of a portion of Beaumont's surplus recycled water to the San Jacinto basin, where the proposed TDS objectives are higher than those proposed for the Beaumont Management Zone and recycled water demands are greater than supplies. Some limited recycled water discharge to Coopers Creek/San Timoteo Creek may need to be continued to support existing riparian habitat.

Implementation of the STWMP relies on revisions to the proposed Basin Plan amendments. The City of Beaumont and STWMA have requested the same "maximum benefit" TDS and nitrate-nitrogen objectives for the proposed San Timoteo Management Zone as recommended by YVWD (STWMA, June 26, 2002, as revised on November 6, 2002, December 19, 2002 and November 11, 2003). (STWMA coordinated these requests to assure consistency with the STWMP). In addition, Beaumont/STWMA requested that "maximum benefit" TDS and nitrate-nitrogen objectives be established for the proposed Beaumont Management Zone. These proposed "maximum benefit "objectives are compared to the "antidegradation objectives" in Table 6. Both sets of objectives would assure the protection of beneficial uses (see Tables 1 and 2).

Table 6

Comparison of Proposed Antidegradation, Maximum Benefit
TDS and Nitrate-nitrogen Water Quality Objectives and Current Ambient Quality
in the San Timoteo and Beaumont Management Zones

Management Zone	"Antidegradation" WQOs		"Maximum Benefit" WQOs		Current Ambient Quality[1]	
	TDS mg/L	NO_3-N mg/L	TDS mg/L	NO_3-N mg/L	TDS mg/L	NO_3-N mg/L
San Timoteo	300	2.7	400	5.0	300	2.9
Beaumont	230	1.5	330	5.0	290	2.4

[1] See Section 7.0 for ambient quality and assimilative capacity discussion

[25] As noted above, though the Beaumont discharge is to Coopers Creek, overlying a part of the proposed Beaumont Management Zone, it is considered a *de facto* discharge to the proposed San Timoteo Management Zone since it enters that Zone essentially immediately.

Beaumont Management Zone. One of the key elements of the STWMP is the plan to implement a conjunctive use program in the proposed Beaumont Management Zone. STWMA is coordinating a stipulated agreement among the groundwater producers in the area that will establish the institutional infrastructure to enable conjunctive use to occur. Conjunctive use in the Beaumont Management Zone would provide drought reliability in the form of dry-year yields and is critical to meet the existing and future water supply needs of the San Timoteo Watershed and the State. The program proposed by STWMA/Beaumont will encourage more efficient transfers of State Project water and other waters of the State and reduce the adverse environmental impacts that may occur as a result of such transfers.

The success of conjunctive use depends on the agencies' ability to recharge significant amounts of water from all sources, including state project water, other imported water, storm water and recycled water. However, the "antidegradation" TDS and nitrate-nitrogen objectives recommended for the proposed Beaumont Management Zone would prevent recycled water, and likely State Project water, from being recharged without significant treatment, mitigation and/or offset. As shown in Table 6, the proposed TDS and nitrate-nitrogen "antidegradation" (historical quality) objectives for the Beaumont Management Zone are very low. Since current ambient quality in this proposed management zone exceeds the "antidegradation" objectives, this management zone lacks assimilative capacity for TDS and nitrate-nitrogen inputs at levels above the objectives. Recycled water recharge and other discharges would have to be limited to these objectives (if adopted). The wasteload allocation now specified in the Basin Plan for Beaumont's effluent TDS and nitrate-nitrogen discharges are 540 mg/L and 10 mg/L, respectively. Expensive treatment of this recycled water would be necessary to achieve the proposed "antidegradation" objectives, which would severely hinder recycling and reuse opportunities[26]. The "maximum benefit" objectives recommended by Beaumont/STWMA would create TDS assimilative capacity that would accommodate maximized recycled water recharge and reuse, while protecting beneficial uses[27]. The agencies point out that this is consistent with established State policy encouraging increased recycled water use.

In their "maximum benefit" request, Beaumont/STMWA argue that it would make no sense to require that State Project water be desalted prior to being recharged into the proposed Beaumont Management Zone. Such a requirement would discourage conjunctive use projects. In addition, the agencies point out that the absence of large-scale storage projects in southern California increases the demand for State Project water precisely when the supply of such water is lowest – during droughts. Conjunctive use offers the opportunity to reduce stress on the aquatic and marine ecosystems in the Bay Delta, particularly at critical, low flow periods.

To support their maximum benefit proposal, STWMA provided evidence to demonstrate that in the proposed Beaumont Management Zone, the TDS concentration is projected to increase

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[26] Even if for some reason the proposed "antidegradation" objectives are not adopted, the existing (1995 Basin Plan) TDS and nitrate-nitrogen objectives for groundwater in the area of the proposed Beaumont management zone, and findings that no assimilative capacity exists in much of the basin, would prevent or significantly impede implementation of many of the water resources plans and projects proposed by Beaumont/STWMA, including wastewater recycling.

[27] This created assimilative capacity would be used solely by Beaumont/STWMA to accommodate the reuse and recharge of recycled water and would not be allocated to other waste discharges, such as those from agriculture.

indefinitely, even without recycled water use. STWMA evaluated the TDS effects of several alternative scenarios of the use of State Project water and recycled water for the replenishment of the Beaumont Management Zone and for non-potable supply. These alternatives assumed that recycled water quality was held to 490 mg/L. STWMA determined that to assure a reliable water supply, it must pursue alternatives that entail the use of a 50/50 mix of State Project water and recycled water for non-potable use, and the possible replenishment of the Beaumont Management Zone with the same blend of waters. These alternatives provide the best balance between reliability (reduced dependence on imported water) and the groundwater quality effects of the use of recycled water. The projected TDS concentration for the proposed Beaumont Management Zone is 330 mg/L by 2030, as shown in Figure 12. Maintenance of TDS water quality at this level (330 mg/L) and at 5 mg/L nitrate-nitrogen would be consistent with maximum benefit to the people of the state since it would accommodate recycling for subsequent beneficial use and would reduce dependence on precious imported water supplies, which could be used to meet water demands elsewhere in the state.

San Timoteo Management Zone. As previously stated, Beaumont/STWMA recommended the same "maximum benefit" TDS and nitrate-nitrogen objectives for this proposed San Timoteo Management Zone as those proposed by YVWD. The discussion of the YVWD "maximum benefit" proposal describes the rationale and justification for these objectives. In brief, the "maximum benefit" objectives would provide assimilative capacity for recycled water discharges by YVWD and Beaumont, which are likely to continue in the future, at least intermittently and at reduced levels, to support riparian habitat. The "maximum benefit" objectives would obviate the need for the expensive treatment of these discharges that would be otherwise required to meet the "antidegradation" TDS and nitrate-nitrogen objectives, without commensurate beneficial use benefits. The "maximum benefit" objectives proposed would support beneficial uses of this and downstream waters, while enabling the agencies to implement their recycled water programs.

In order to assure that water quality consistent with the maximum benefit to the people of the state will be maintained despite the lowering of water quality that would be allowed by the implementation of the "maximum benefit" objectives, Beaumont/STWMA is committed to the projects and requirements summarized below. These projects and requirements are also described as part of the proposed amendments to the implementation chapter of the Basin Plan (Chapter 5) presented in the Attachment to tentative Resolution No. R8-2004-0001 (see "VI. Maximum Benefit Implementation Plans for Salt Management", San Timoteo and Beaumont Management Zones):

1. Surface and Ground Water Monitoring

Beaumont/STWMA will conduct surface and groundwater quality monitoring designed to evaluate the water quality effects of implementation of the maximum benefit proposal, including the "maximum benefit" nitrate-nitrogen and TDS objectives. Annual reports will be submitted, and every three years a determination of ambient nitrate-nitrogen and TDS quality in the Beaumont and San Timoteo Management Zones will be made. Based on these assessments, the demonstration of maximum benefit may be revisited and the need for changes to the TDS and nitrogen management strategy in the area can be identified.

(See Attachment to Resolution No. R8-2004-0001, Table 5-10a, # 1,2, 6.)

Figure 12 -- Comparison of TDS Concentration Time Histories for Selected Water Resources Management Cases in the Beaumont Management Zone Desalters (Beaumont MZ)

Beaumont/STWMA will initiate the construction of a desalter when the 5 year average TDS in Beaumont's effluent reaches 480 mg/L and/or when the TIN exceeds 6 mg/L. This requirement would also be triggered when the Beaumont Management Zone TDS quality exceeds 320 mg/L and/or the nitrate nitrogen exceeds 5 mg/L. The proposed Basin Plan amendments require the submittal of a plan and schedule for construction of a desalter(s) and any requisite brine disposal facilities, and the implementation of that plan upon Regional Board approval. The proposed amendments specify that the schedule must assure that these facilities are operational no later than 7 years from the date of Regional Board approval.

(See Attachment to Resolution No. R8-2004-0001, Table 5-10a, #3.)

2. Recycled Water Use/Recharge

As indicated above, substantial additional water supplies (approximately 67,000 acre-ft./year) are expected to be required to meet ultimate demand in the area served by the STWMA member agencies. To meet these demands, the STWMP includes supplemental water from State Water Project water, water imported from local sources, recharged storm water, and recycled water. As discussed previously, the use and possible recharge of recycled water is a critical component of the STWMA water resources management plan.

In order to meet these increased demands and to provide regional drought protection, STWMA and its member agencies are developing plans to recharge and store State Project water in the proposed Beaumont Management Zone. The Beaumont-Cherry Valley Water District (BCVWD) is developing a new 80-acre groundwater recharge project that will increase storm water recharge in the Beaumont Basin by 4100 acre-ft/yr. The City of Beaumont is also developing storm water recharge in facilities in newly developing areas, which is expected to result in the recharge of an additional 2400 acre-ft/yr of stormwater runoff.

Like YVWD, the City of Beaumont is developing a non-potable water system that will convey untreated State Project water and recycled water for irrigation within its service area. The intent of blending these sources is to minimize the impact of recycled water use on groundwater quality in the proposed Beaumont and San Timoteo Management Zones.

The demonstration of "maximum benefit" and the continued application of the "maximum benefit" objectives depends on the combined recharge (storm water, imported water, recycled water) to the Beaumont Management Zone of a 5-year annual average (running average) TDS concentration of 330 mg/L and nitrate-nitrogen concentration of 5 mg/L. If recycled water use or recharge in the proposed San Timoteo Management Zone is pursued, then the continued application of the "maximum benefit" objectives for that Zone will depend on the combined recharge of a 5-year running average TDS concentration of 400 mg/L or less TDS, and 5 mg/L nitrate-nitrogen. This requires that Beaumont/STWMA document the amount and TDS and nitrate-nitrogen quality of all sources of recharge, including

stormwater[28], imported water and recycled water, and the recharge location. The proposed Basin Plan amendments reflect these requirements.

The proposed Basin Plan amendments also require Beaumont/STWMA to submit a plan and schedule for the implementation of the non-potable supply system, to be completed as soon as possible but no later than 10 years from the effective date of the proposed amendments. No specific requirements pertaining to storm water or imported water recharge are included. Implementation of these facilities will be driven by the combined recharge quality requirements described above, and by the desire to avoid, or at least minimize, the construction of desalters that could become necessary in the absence of recharge of higher quality waters.

(See Attachment to Resolution No. R8-2004-0001, Table 5-10a, #4, 5)

4. Recycled Water Management

In addition to the projects discussed above, Beaumont/STWMA's maximum benefit proposal commits the agencies to a number of projects intended to improve recycled water quality and to mitigate impacts from the discharge of recycled water.

First, Beaumont has committed to produce recycled water with a 12-month average TIN concentration of 6 mg/L or less by 2008. This may be accomplished via operational changes, or may require the installation/modification of facilities. This TIN effluent quality is necessary to assure compliance with the proposed "maximum benefit" nitrate-nitrogen objective for the Beaumont and San Timoteo Management Zones (5 mg/L)

Second, Beaumont will limit the TDS concentration in its effluent to less than or equal to 490 mg/L by using a low TDS source water supply for potable uses, selective desalting of either source water and/or recycled waters, and minimizing the TDS waste increment. Beaumont, through BCVWD, will always attempt to serve the lowest TDS supply available for its potable supply. Beaumont will also use best efforts to enact ordinances and other requirements to minimize the TDS use increment.

Third, as discussed earlier, Beaumont plans to remove some or all of its effluent discharge from the unlined part of San Timoteo Creek. As noted previously, this would improve the quality of inflows to the proposed San Timoteo Management Zone. Relocation of the discharge downstream to the lined reach of San Timoteo Creek (the proposed Reach 1A) would be expected to enhance quality in the Santa Ana River and groundwater recharged by the River.

The proposed amendments require Beaumont to take the steps necessary to assure compliance with the TIN wasteload allocation (6 mg/L) within 3 years of the effective date of this Basin Plan amendment. Beaumont would also be required to submit a plan and schedule for improvement of wastewater quality when the 12 month running average TDS concentration equals or exceeds 480 mg/L, or the 12 month running average total inorganic nitrogen concentration equals or exceeds 6 mg/L in any month (once any new/modified denitrification facilities or operational changes are in place). Finally, the proposed amendments require

[28] The proposed amendments reflect that a certain amount of stormwater recharge will occur naturally and require Beaumont/STWMA to determine the recharge that occurs as a direct result of their enhanced recharge facilities (See Attachment to tentative Resolution No. R8-2004-0001, Table 5-10a, #5)

Beaumont to submit a plan and schedule to reduce or eliminate the existing wastewater discharge to the unlined reach of San Timoteo Creek. Beaumont would be required to implement that plan upon Regional Board approval.

(See Attachment to Resolution No. R8-2004-0001, Table 5-10a, #7, 8, 9)

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Like the CBW/IEUA and YVWD proposals, the Beaumont/STWMA maximum benefit proposal was discussed extensively at the TDS/N Task Force meetings and both the Task Force members and Regional Board staff support it. Again, implementation of the "maximum benefit" objectives would assure the protection of beneficial uses. Further, provided that the commitments identified above are met, water quality that is consistent with maximum benefit to the people of the state will be maintained. It would promote water recycling and reuse, which the California legislature has declared is a primary interest of the people of California (California Water Code (CWC) Sections 13510-13512). Implementation of the proposal would also increase the quantity and reliability of local water supplies and reduce demand for imported water, particularly during critical low flow periods.

However, if Beaumont/STWMA fail to fulfill these commitments, this maximum benefit finding would be inappropriate and the "antidegradation" objectives developed by the Task Force on the basis of the technical review should be applied to the proposed Beaumont (and San Timoteo) Management Zones.

As for the CBW/IEUA and YVWD maximum benefit proposals, the proposed Basin Plan amendments shown in the Attachment to Resolution No. R8-2004-0001 incorporate both scenarios. That is, both the "antidegradation" and "maximum benefit" objectives are proposed to be included in the Basin Plan, with explicit language that governs their application (see Attachment to Resolution No. R8-2004-0001, Chapter 4, "Maximum Benefit Objectives"). The "maximum benefit" objectives apply only provided that there is timely implementation of the Beaumont/STWMA commitments described above and in the proposed amendments to Chapter 5, Implementation, of the Basin Plan (see Attachment to Resolution No. R8-2004-0001, "VI. Maximum Benefit Implementation Plans for Salt Management, B. Salt Management – San Timoteo and Beaumont Management Zones (Beaumont/STWMA")). If the Regional Board finds that "maximum benefit" is not being demonstrated, then the "antidegradation" objectives would apply and the Regional Board would require mitigation of the surface and groundwater effects of any discharges of recycled and imported water that took place in excess of those objectives. This mitigation requirement is explicitly identified in the proposed amendments to Chapter 5, "VI. Maximum Benefit Implementation Plans for Salt Management, B. Salt Management – San Timoteo and Beaumont Management Zones (Beaumont/STWMA)". Implementation steps by the Regional Board are also delineated in the proposed amendments.

In summary, Board staff recommends the adoption of the "maximum benefit" TDS and nitrate-nitrogen objectives recommended by Beaumont/STWMA for the proposed San Timoteo and Beaumont groundwater management zones, as well as the "antidegradation objectives" for those zones recommended by the Task Force. These amendments are reflected in the proposed changes to Chapters 3 and 4 of the Basin Plan (See Attachment to Resolution No. R8-2004-0001). Staff also recommends that adoption of the changes to Chapter 5, Implementation, shown in the Attachment to the Resolution, "VI. Maximum Benefit

Implementation Plans for Salt Management, B. Salt Management – San Timoteo and Beaumont Management Zones (Beaumont/STWMA)". These changes are necessary to address appropriate implementation of the "maximum benefit" proposal by Beaumont/STWMA.

7.0 Assimilative Capacity Findings

Some groundwaters in the Region have assimilative capacity for TDS and/or nitrogen; that is, inputs with higher nitrogen/TDS concentrations than the receiving waters are diluted sufficiently by natural processes, including rainfall and recharge, such that the TDS and nitrogen water quality objectives of the receiving waters are not violated. The amount of assimilative capacity varies widely, depending on the individual characteristics of the groundwater subbasin (management zone) in question.

To determine whether assimilative capacity for TDS and nitrate-nitrogen exists in the proposed management zones, current ambient TDS and nitrate-nitrogen water quality was calculated using the same methods and protocols that were used in the calculation of historical ambient water quality (see Section 4.0). For current ambient water quality, the analysis focused on representing water quality as a 20-year average for the period from 1978 through 1997 (WEI, July 2000). For each proposed management zone, current TDS and nitrate-nitrogen water quality were compared to historical water quality. If the current water quality of a proposed management zone is the same as or poorer than its historic water quality, then that management zone does not have assimilative capacity. If the current water quality of a management zone is better than historic water quality, then that management zone has assimilative capacity. The difference between the historic and current quality is the amount of assimilative capacity available.

Tables 7 and 8show the historic ambient quality and the current ambient quality for TDS and nitrate-nitrogen for each proposed management zone. These tables also list the TDS and nitrate-nitrogen assimilative capacity of the management zones, if any. Of the thirty-seven (37) proposed management zones, twenty-seven (27) lack assimilative capacity for TDS, and thirty (30) lack assimilative capacity for nitrate-nitrogen[29]. There are five (5) management zones for which there were insufficient data to calculate TDS and/or nitrate-nitrogen objectives. These 5 management zones are identified as not having assimilative capacity.

The Task Force agreed that the 20 mg/L of assimilative capacity for the Orange County Management Zone should be allocated to Orange County Water District to facilitate remediation projects and/or to address legacy contamination and that no assimilative capacity should be assumed to be available to increase discharge limits upstream. Regional Board staff recommends the adoption of this approach.

Assimilative capacity findings have significant regulatory repercussions. Water Code Section 13263 requires that waste discharge requirements must implement the Basin Plan. If there is assimilative capacity in the receiving waters for TDS or nitrate-nitrogen, waste discharge

[29] These assimilative capacity findings assume the maximum benefit TDS and nitrate-nitrogen objectives for Chino North, Yucaipa, San Timoteo and Beaumont Management Zones are in effect. If maximum benefit objectives are not in effect, thirty-one (31) Management Zones lack assimilative capacity for TDS and thirty-two (32) Management Zones lack assimilative capacity for nitrate nitrogen (see Tables 7 and 8).

requirements may allow a discharge quality in excess of the objectives for those constituents, as long as the discharge does not cause violation of the objectives. However, if there is no assimilative capacity in the receiving waters, the discharge limits cannot exceed the receiving water objectives or the degradation process would be accelerated. This rule was expressed clearly by the State Water Resources Control Board in a decision regarding the appropriate TDS discharge limitations for the Rancho Caballero Mobile home park, located in the Santa Ana Region (Order No. 73-4, the “Rancho Caballero decision”).

These assimilative capacity findings were taken into account when developing and evaluating the wasteload allocations for POTW discharges to the Santa Ana River system. The wasteload allocations are discussed in the next section of this report.

Table 7

Total Dissolved Solids (TDS) Assimilative Capacity Findings

Management Zone	Water Quality Objective (mg/L)	Current Ambient (mg/L)	Assimilative Capacity (mg/L)
UPPER SANTA ANA RIVER BASIN			
Beaumont – "max benefit"	330	290	40[1]
Beaumont – "antideg"	230	290	None
Bunker Hill A	310	350	None
Bunker Hill B	330	260	70
Colton	410	430	None
Chino North – "max benefit"	420	300	120[1]
Chino 1 – "antideg"	280	310	None
Chino 2 – "antideg"	250	300	None
Chino 3 – "antideg"	260	280	None
Chino South	680	720	None
Chino East	730	760	None
Cucamonga – "max benefit"	380	260	160[1]
Cucamonga – "antideg"	210	260	None
Lytle	260	240	20
Rialto	230	230	None
San Timoteo – "max benefit"	370	300	70[1]
San Timoteo – "antideg"	210	300	None
Yucaipa – "max benefit"	370	330	40[1]
Yucaipa – "antideg"	320	330	None

[1] Assimilative capacity created by "maximum benefit" objectives is allocated solely to the agency(-ies) responsible for "maximum benefit" implementation (see Section 6.0)

Table 7 (cont.)

Total Dissolved Solids (TDS) Assimilative Capacity Findings

Management Zone	Water Quality Objective (mg/L)	Current Ambient (mg/L)	Assimilative Capacity (mg/L)
MIDDLE SANTA ANA RIVER BASIN			
Arlington	980	--[2]	None
Bedford	--[2]	--[2]	None
Coldwater	380	380	None
Elsinore	480	480	None
Lee Lake	--[2]	--[2]	None
Riverside A	560	440	120
Riverside B	290	320	None
Riverside C	680	760	None
Riverside D	810	--[2]	None
Riverside E	720	720	None
Riverside F	660	580	80
Temescal	770	780	None
Warm Springs	--[2]	--[2]	None
SAN JACINTO RIVER BASINS			
Canyon	230	220	10
Hemet South	730	1030	None
Lakeview – Hemet North	520	830	None
Menifee	1020	3360	None
Perris North	570	750	None
Perris South	1260	3190	None
San Jacinto Lower	520	730	None
San Jacinto Upper	320	370	None
LOWER SANTA ANA RIVER BASINS			
Irvine	910	910	None
La Habra	--[2]	--[2]	None
Orange County	580	560	None[3]
Santiago	--[2]	--[2]	None

[2] Not enough data to estimate TDS concentrations

[3] The Task Force agreed that the 20 mg/L of assimilative capacity should be allocated to OCWD to facilitate remediation projects and/or to address legacy contamination. No additional assimilative capacity would be available. Regional Board staff recommends the adoption of this approach.

Table 8

Nitrate Nitrogen (NO_3-N) Assimilative Capacity Findings

Management Zone	Water Quality Objective (mg/L)	Current Ambient (mg/L)	Assimilative Capacity (mg/L)
UPPER SANTA ANA RIVER BASINS			
Beaumont – "max benefit"	5.0	2.6	2.4[1]
Beaumont – "antideg"	1.5	2.6	None
Bunker Hill A	2.7	4.5	None
Bunker Hill B	7.3	5.5	1.8
Colton	2.7	2.9	None
Chino North – "max benefit"	5.0	7.4	None
Chino 1 – "antideg"	5.0	8.4	None
Chino 2 – "antideg"	2.9	7.2	None
Chino 3 – "antideg"	3.5	6.3	None
Chino South	4.2	8.8	None
Chino East	10	29.1	None
Cucamonga – "max benefit"	5.0	4.4	0.6[1]
Cucamonga – "antideg"	2.4	4.4	None
Lytle	1.5	2.8	None
Rialto	2.0	2.7	None
San Timoteo – "max benefit"	5.0	2.9	2.1[1]
San Timoteo – "antideg"	2.7	2.9	None
Yucaipa – "max benefit"	5.0	5.2	None
Yucaipa – "antideg"	4.2	5.2	None

[1] Assimilative capacity created by "maximum benefit" objectives is allocated solely to the agency(-ies) responsible for "maximum benefit" implementation (see Section 6.0)

Table 8 (cont.)

Nitrate Nitrogen (NO_3-N) Assimilative Capacity Findings

Management Zone	Water Quality Objective (mg/L)	Current Ambient (mg/L)	Assimilative Capacity (mg/L)
MIDDLE SANTA ANA RIVER BASINS			
Arlington	10.0	--[2]	None
Bedford	--[2]	--[2]	None
Coldwater	1.5	2.6	None
Elsinore	1.0	2.6	None
Lee Lake	--[2]	--[2]	None
Riverside A	6.2	4.4	1.8
Riverside B	7.6	8.0	None
Riverside C	8.3	15.5	None
Riverside D	10.0	--[2]	None
Riverside E	10.0	14.8	None
Riverside F	9.5	9.5	None
Temescal	10.0	13.2	None
Warm Springs	--[2]	--[2]	None
SAN JACINTO RIVER BASINS			
Canyon	2.5	1.6	0.9
Hemet South	4.1	5.2	None
Lakeview – Hemet North	1.8	2.7	None
Menifee	2.8	5.4	None
Perris North	5.2	4.7	0.5
Perris South	2.5	4.9	None
San Jacinto Lower	1.0	1.9	None
San Jacinto Upper	1.4	1.9	None
LOWER SANTA ANA RIVER BASINS			
Irvine	5.9	7.4	None
La Habra	--[2]	--[2]	None
Orange County	3.4	3.4	None
Santiago	--[2]	--[2]	None

[2] Not enough data to estimate nitrate nitrogen concentrations

8.0 Proposed Wasteload Allocations

8.1 Purpose and Need for Wasteload Allocations

During dry weather, most of the flows in the Santa Ana River and its tributaries (apart from mountain reaches) are composed of highly treated municipal wastewater. Management of the quality of this wastewater and other wastewater discharges that ultimately affect the quality of the River[30] is a high Regional Board priority. In addition to providing significant in-stream beneficial uses such as recreation and wildlife habitat, the River and its tributaries are a significant source of groundwater recharge. In some areas, particularly in Orange County, groundwater recharged by the River is the predominant source of water supply.

The Basin Plan specifies TDS and nitrogen objectives for the River and most of its tributaries[31] that are intended to protect the use of these surface waters for groundwater recharge, and by extension, the quality of affected groundwater. These include objectives for baseflow in the Santa Ana River, Reach 3. Baseflow is composed of wastewater discharges, non-point source discharges and rising groundwater. Baseflow does not include stormwater, which is typically low in TDS and nitrogen and improves the quality of receiving waters, including the River and groundwater recharged by the River. Historically, sampling and modeling analyses demonstrated that the TDS and nitrogen water quality objectives for the Santa Ana River, Reach 3 (1995 Basin Plan, page 4-25) were either being violated or were in danger of being violated. Pursuant to the Clean Water Act (Section 303(d)(1)(c); 33 USC 466 *et seq.*), violations of surface water quality objectives must be addressed by the calculation of the maximum wasteloads that can be discharged to achieve and maintain compliance (the total maximum daily load, or TMDL process). Accordingly, TDS and nitrogen (expressed as total inorganic nitrogen (TIN)) wasteload allocations for municipal wastewater discharges to the River and its tributaries were developed and included in the 1975 and 1983 Basin Plans. The nitrogen allocation was updated in 1991; a revised TDS wasteload allocation was incorporated in the 1995 Basin Plan. These allocations are shown in Table 5-4 and Table 5-5 of the 1995 Basin Plan (pages 5-17 and 5-20, respectively). The wasteload allocations distribute a share of the total TDS and nitrogen wasteloads to the River system to each Publicly Owned Treatment Works (POTW) that discharges to the River, either directly or indirectly[32]. The allocations are implemented principally through TDS and nitrogen (TIN) limits specified in waste discharge requirements (NPDES permits) issued to the POTWs.

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[30] Apart from some areas where groundwater pumping practices typically preclude all but minor amounts of groundwater outflow, it, the ground and surface waters of the upper Santa Ana Basin (upstream of Prado Dam) eventually enter the Santa Ana River and flow through Prado Dam. Discharges to these waters will eventually affect the quality of the River and must be regulated so as to protect both the immediate receiving waters and other affected waters, including the River.

[31] The 1995 Basin Plan does not include TDS or nitrogen objectives for Cucamonga Creek, Reach 1 or Mill Creek, both of which lie within the proposed Prado Basin Management Zone. Wastewater discharges from the Inland Empire Utilities Agencies' Regional Plants No. 1 and 4 are to Cucamonga/Mill Creek, and thence to Chino Creek. IEUA discharges would be regulated on an agency-wide basis a whole using Chino Creek water quality objectives (see Discussion, Section 6.1).

[32] Indirect discharges include those to percolation ponds. The current nitrogen wasteload allocation includes a 10 mg/L total inorganic nitrogen limit for such discharges (see 1995 Basin Plan, page 5-18,19).

In the 2003 update of the Clean Water Act Section 303(d) list, the Santa Ana River, Reach 3 listing for nitrogen and TDS was removed since the objectives are now being achieved. As a result, nitrogen and TDS TMDLs are no longer legally required. However, review, revision and implementation of the wasteload allocations are necessary to ensure continued compliance with applicable water quality standards.

As part of the Task Force studies to update the Nitrogen/TDS management plan for the Santa Ana River Basin, a review of the wasteload allocations was conducted. The Task Force recognized that with the proposed revision of subbasin (management zone) boundaries and calculation of new TDS and nitrate-nitrogen water quality objectives, it would be necessary to review the wasteload allocation as well. This review was necessary to ensure that the wasteload allocations would be adequate to achieve compliance with the proposed objectives for downstream and underlying management zones, as well as to assure compliance with existing and proposed surface water quality objectives. Furthermore, as previously discussed, adoption of revised TDS and nitrate-nitrogen water quality objectives for the proposed groundwater management zones requires economic consideration (Water Code 13241(d)). An evaluation of the wasteload allocations was needed to determine the dischargers' costs to comply with the proposed revised TDS and nitrate-nitrogen water quality objectives.

The Task Force review of the wasteload allocations included the evaluation of nitrogen loss coefficients and the use of a calibrated model to assess the surface and groundwater quality effects of alternative wastewater discharge scenarios. Each of these efforts is described below.

8.2 Nitrogen Loss Coefficients

An initial step in the review of the wasteload allocations was work by WEI to quantify the extent of nitrogen[33] reduction in the Santa Ana River system through subsurface transformation losses. Historically, nitrate-nitrogen was considered a conservative constituent, not subject to significant subsurface transformation or loss, and such losses were not identified or assumed for regulatory purposes[34]. One goal of WEI's nitrogen loss quantification effort was to determine whether dischargers might be required to incur costs for additional treatment to meet the proposed groundwater management zone objectives, or whether natural, subsurface nitrogen losses could achieve any requisite reductions. The second objective was to develop a nitrogen loss coefficient that could be used with certainty to develop limits for nitrogen discharges throughout the Region that would protect the quality of affected groundwater.

To develop the nitrogen loss coefficient, WEI evaluated specific recharge operations in the Santa Ana watershed. For example, WEI evaluated the Orange County Water District recharge basins overlying the Orange County Forebay, the Hidden Valley Wildlife Area

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[33] Nitrogen refers to nitrate-nitrogen in groundwaters and total inorganic nitrogen in surface waters. (Note one exception: the Basin Plan objective for the Santa Ana River, Reach 3 is based on total nitrogen.)

[34] As discussed in greater detail in the next section of this report, nitrogen losses in the surface flows in Reach 3 of the Santa Ana River were recognized, though not specifically identified, in the development of the 1991 TIN wasteload allocation. Nitrogen losses due to plant uptake when recycled water is applied for irrigation purposes have also been recognized in waste discharge requirements. Again, <u>subsurface</u> losses have not been recognized in permits or other regulatory strategies.

wastewater treatment wetlands, and Santa Ana River recharge losses (comparison of water quality in reaches of the Santa Ana River where recharge is occurring ("losing" reaches) and local well data). In each case, WEI evaluated long term (1954 to 1997) nitrogen surface water quality data and compared those values to long term nitrogen data for adjacent wells. Based on this evaluation, WEI concluded the following:

- "With relatively few exceptions, nitrate in groundwater samples collected from wells influenced by the Santa Ana River was significantly lower than nitrate concentrations at the respective upstream control point (either MWD Crossing[35] or Prado Dam);

- Nitrate in groundwater could not be consistently correlated with climatic trends (ADFM)[36] or with fluctuations of concentrations of nitrate in the Santa Ana River; and,

- Nitrate concentrations decreased by approximately 25 to 75 percent" (WEI, July, 2000).

Based on the study findings, WEI identified the nitrogen loss coefficients for the Santa Ana Watershed listed in Table 9. As shown in this Table, the coefficients are variable, depending on the nature of the processes involved (e.g., active management of wetlands for nitrogen removal versus passive surface water infiltration). In light of this variability, the Task Force recommended that a conservative approach be taken to identify a nitrogen loss coefficient for regulatory purposes. Note from Table 9 that WEI found that there were insufficient data to justify a range of nitrogen losses for groundwater recharge basins. However, the data do support a minimum loss of 25%, the minimum observed at treatment wetlands, RIX and the Santa Ana River. The Task Force recommended that a default nitrogen loss of 25% be considered for all discharges that affect groundwater in the Santa Ana River watershed, including discharges that percolate to ground but are not discharged directly to the River system.

[35] This is the location on the Santa Ana River where a Metropolitan Water District pipeline crosses the River.

[36] ADFM = Accumulated Departure from the Mean is a representation of climate/precipitation over time. When plotted with a groundwater elevation time history, ADFM aids in understanding groundwater elevation level fluctuations (WEI, July 2000).

Table 9

Nitrogen Loss Coefficients for Various Conditions in the Santa Ana River Watershed

Facility Type Evaluated	**Nitrogen Loss Coefficient (%)**
Constructed Wetlands – Hidden Valley Wildlife Area	50% to 90%
OCWD Anaheim Lakes Recharge Basin	Insufficient data
Rapid Infiltration and Extraction Facility (RIX)*	25 % to 75%
Surface water/groundwater losses -- losing reaches of the River, Orange County Forebay	25 % to 75%

Source: WEI, July 2000

* RIX is a wastewater treatment facility that relies on infiltration of the wastewater through basin soils to achieve requisite reductions of pathogens and nitrogen to assure compliance with waste discharge requirements.

Santa Ana River, Reach 3 downstream segment

The City of Riverside presented additional data and information to support a nitrogen loss coefficient of 50%, rather than 25%, for the lower portions of Reach 3 of the Santa Ana River that overlie the proposed Chino South Management Zone (see Figure 8). The City discharges treated wastewater to this area of the River. The City based its findings on an analysis of data from the Hidden Valley Wildlife Area (see Table 9) and additional data from the Prado Wetlands maintained and operated by Orange County Water District (OCWD) (City of Riverside, April 2002).

The Hidden Valley Wildlife Area receives wastewater discharged from the City of Riverside, as well as incidental overflows from Hole Lake. The City analyzed wastewater influent data from 1996 to 2001, and compared those data to 24 subsurface measurements (lysimeter data). To evaluate deep percolation losses, the City evaluated data from 18 adjacent monitoring wells for the period 1996 through 1998. Based on these findings, the City determined that subsurface nitrogen losses averaged 65.9% and deep percolation nitrogen losses averaged 90%.

As previously mentioned, the City also evaluated nitrogen losses occurring at the OCWD Prado Wetlands. These wetlands, located behind Prado Dam, were built and are maintained by OCWD to provide additional treatment of Santa Ana River flows before they reach the OCWD recharge facilities downstream of Prado Dam. Based on limited data taken during November 1992 through January 1993 at two shallow wells that showed similar ionic water quality characteristics as surface water, the City of Riverside determined that nitrogen losses averaged 97.6%. This high percentage appears to be consistent with the Hidden Valley Wildlife Area results.

The data presented to the Task Force by the City of Riverside indicates nitrogen losses from wetlands in this portion of Reach 3 of the Santa Ana River can be greater than 90%. However, the Task Force again recognized that it is necessary to be conservative with this

nitrogen loss assumption, given the lack of an extensive database. The Task Force agreed that confirmatory, follow-up monitoring would be needed when a nitrogen loss coefficient greater than the proposed regionwide default of 25% was requested and approved. This monitoring program is discussed in Section 9.0.

Based on the nitrogen loss studies, the Task Force recommended that language be added to the Basin Plan to recognize explicitly the 25% and 50% nitrogen loss coefficients and to authorize their use in developing nitrogen discharge limits. These loss coefficients would be applied to discharges that affect groundwater management zones with and without nitrate assimilative capacity.

For management zones with assimilative capacity, the TIN discharge limitation would be calculated as follows:

$$\text{TIN Discharge Limit (mg/L)} = \frac{\text{MZ nitrate-nitrogen current ambient water quality}}{\text{(1-nitrogen loss coefficient)}}$$

For management zones without assimilative capacity, the TIN discharge limitation would be calculated as follows:

$$\text{TIN Discharge Limit (mg/L)} = \frac{\text{MZ nitrate-nitrogen water quality objective}}{\text{(1-nitrogen loss coefficient)}}$$

The Regional Board will employ its discretion in specifying a higher TIN limit that would allocate some of the available assimilative capacity.

Board staff believes that this approach is appropriate and justified and recommends that the Basin Plan be amended as shown in the Attachment to draft Resolution No. R8-2004-0001, Chapter 5 – Implementation (Section III.B.4.). It should be noted that the nitrogen loss coefficients would be applied to discharges not specifically addressed by the TIN wasteload allocations, described next. The 25 and 50% nitrogen loss coefficients were already considered in developing these allocations.

In some cases, such as with POTW discharges from the City of Riverside, Western Riverside Regional and Yucaipa Valley, there remained questions about the need for nitrogen removal to achieve the proposed management zone objectives, even when the 25 or 50% loss coefficient was applied. Given these uncertainties, the Task Force decided to proceed with model analyses to evaluate the wasteload allocations. These analyses are described next.

8.3 Model Analysis

8.3.1 Methodology

WEI also performed the model wasteload allocation analysis for both TDS and nitrogen (WEI, October 2002; June 2003). POTW discharges to the Santa Ana River or its tributaries were considered (see Table 10). Note that the list of POTWs identified in this Table for wasteload allocation purposes has been updated from that shown in the 1995 Basin Plan (Tables 5-4 and 5-5) to reflect current facility status. Specific POTW changes for the 2003 wasteload allocation analysis include the following:

- The City of Redlands and Jurupa Community Services District (JCSD) no longer are included in the wasteload allocation table. The City's discharge is to percolation ponds and JCSD reuses most of it's recycled water for irrigation. Discharges from both of these facilities will be regulated accordingly as discharges to land.

- The Cities of San Bernardino and Colton employ the Rapid Infiltration and Extraction Facility (RIX) to provide tertiary-equivalent treatment of wastewater treated at the Cities' secondary treatment plants. Discharges from RIX are to Reach 4 of the Santa Ana River. Discharges of secondary treated wastewater from the Cities individual secondary treatment plants are authorized only under exceptional circumstances (when natural flow in the River provides at least 20:1 dilution of the wastewater). Only the RIX discharge is addressed by the proposed wasteload allocations

Table 10

Summary of Santa Ana Watershed POTWs and Wasteload Allocation Flow, TDS and TIN Discharge Quality Assumptions
(adapted from WEI, October 2002; WEI, June 2003)

Publicly Owned Treatment Works (POTW)	Surface Water Discharge Location	Proposed Management Zone(s) Affected	Baseline			Alternative 2010-A			Alternative 2010-B		
			Flow (MGD)	TDS (mg/L)	TIN (mg/L)	Flow (MGD)	TDS (mg/L)	TIN (mg/L)	Flow (MGD)	TDS (mg/L)	TIN (mg/L)
Considered in Wasteload Allocation Analysis											
City of Beaumont[1]	Coopers Creek (tributary of San Timoteo Cr., Reach 3[2])	San Timoteo	1.2	540	10.0	2.3	540	10.0	1.0	540	10.0
Yucaipa Valley Water District - Wochholz	San Timoteo Cr., Reach 3[2]	San Timoteo	2.9	540	10.0	5.7	540	10.0	0.0	540	10.0
City of Rialto	Santa Ana River, Reach 4	Riverside A, Chino South, Orange County	6.6	490	10.0	12.0	490	10.0	10.0	490	10.0
Rapid Infiltration and Extraction Facility (RIX)[3]	Santa Ana River, Reach 4	Riverside A, Chino South, Orange County	40.2	550	10.0	49.4	550	10.0	28.2	550	10.0
City of Riverside Regional WQCP	Santa Ana River, Reach 3	Chino South, Orange County	31.5	650	13.0	35.0	650	13.0	26.1	650	13.0
Western Riverside Co. WWTP	Santa Ana River, Reach 3	Chino South, Orange County	2.1	625	10.0	4.4	625	10.0	3.3	625	10.0
Eastern Municipal Water District	Temescal Creek, Reach 6	Elsinore, Lee Lake, Bedford, Temescal, Orange County	0	na	na	43.4	650	10	6.0	650	10
Elsinore Valley Municipal Water District	Temescal Creek, Reach 6	Elsinore, Lee Lake, Bedford, Temescal, Orange County	3.8	700	13.0	7.2	700	13.0	2.0	700	13.0
Lee Lake Water District	Temescal Creek, Reach 6	Elsinore, Lee Lake, Bedford, Temescal, Orange County	0.4	650	13.0	1.6	650	13.0	1.6	650	13.0
Corona WWTP #1	Prado Basin MZ	Orange County	3.4	700	10.0	3.6	700	10.0	2.0	700	10.0

Publicly Owned Treatment Works (POTW)	Surface Water Discharge Location	Proposed Management Zone(s) Affected	Baseline			Alternative 2010-A			Alternative 2010-B		
			Flow (MGD)	TDS (mg/L)	TIN (mg/L)	Flow (MGD)	TDS (mg/L)	TIN (mg/L)	Flow (MGD)	TDS (mg/L)	TIN (mg/L)
Corona WWTP #2	Temescal Creek, Reach 2	Temescal, Orange County	0	na	na	0.2	700	10.0	0.5	700	10.0
Corona WWTP #3	Temescal Creek, Reach 2	Temescal, Orange County	0	na	na	2.0	700	10.0	0.5	700	10.0
IEUA Carbon Canyon WRP	Chino Creek, Reach 2	Chino North, Orange County	8.1	555	10.0	8.0	555	10.0	4.4	555	10.0
IEUA RP #1, RP#4	Cucamonga Creek, Reach 1	Chino North, Orange County	36.3	515	12.7	64.0	515	11.4	27.8	515	11.6
IEUA RP #5[4]	Chino Creek, Reach 2	Chino North, Orange County	0	na	na	8.0	560	10.0	5.3	560	10.0

na = not applicable

1 While 540 mg/L was assumed in the WEI analyses, Beaumont has since committed to meet 490 mg/L TDS as part of the Beaumont/STWMA "maximum benefit" commitments (see Section 6.3).

2 The Reach 3 designation is part of the proposed re-alignment of the Reaches of San Timoteo Creek (see Section 5.1).

3 The October 2002 WEI analyses assumed TDS quality for RIX of 510 mg/L. A revised limit of 550 mg/L was assumed in the June 2003 analysis. The 1995 Basin Plan TDS and TIN wasteload allocation (Tables 5-4 and 5-5, respectively) do not list RP5. This facility replaces RP2

- The Chino Basin Municipal Water District is now known as Inland Empire Utilities Agency. IEUA discharges or will discharge wastewater from its treatment plants (Regional Plant No. 1, Carbon Canyon, No. 4 and No. 5 (RP-5 will shortly replace Regional Plant No. 2) directly or indirectly (via Cucamonga Creek) to Chino Creek. In light of this, it is recommended that the facilities be regulated on an agency-wide basis (as discussed below, individual wasteload allocations for each of the treatment plant discharges are no longer proposed (see Table 13)).

POTW discharges to ponds (e.g., City of Redlands) are direct discharges to groundwater and were not considered in the model analysis. The proposed management zone objectives, findings of assimilative capacity, and nitrogen loss coefficients described in preceding sections of this report will be used to regulate these direct groundwater discharges.

As shown in Table 11-A, the proposed management zones and respective proposed TDS and nitrate-nitrogen water quality objectives that might be affected by the wasteload allocations as the result of streambed recharge are San Timoteo, Bunker Hill B (San Timoteo Creek Reaches 2 and 3, Santa Ana River, Reach 5), Colton (Santa Ana River Reach 4) Riverside A (Santa Ana River Reach 4), Chino South (Cucamonga Creek, Reach 1, Mill Creek (Prado Area), Chino Creek, Reaches 1and 2, Santa Ana River Reach 3), Elsinore, Lee Lake, Bedford and Temescal (Temescal Creek, Reaches 1 through 6) and Orange County (Santa Ana River Reach 3 at Prado and Reach 2). Table 11-B shows the existing and proposed TDS and nitrogen objectives for the surface waters to which these POTW discharges occur.

Table 11-A

Proposed Basin Plan Objectives for TDS and Nitrate Nitrogen
for Management Zones That May Be Affected by Wasteload Allocations

Management Zone	**TDS (mg/L)**	**NO_3-N (mg/L)**
Bunker Hill B[1]	330	7.3
Colton[1]	410	2.7
San Timoteo – "max benefit"	370	5.0
San Timoteo "antidegradation"	210	2.7
Riverside A	560	6.2
Chino South	680	4.2
Elsinore[2]	480	1.0
Lee Lake[2]	--[3]	--[3]
Bedford[2]	--[3]	--[3]
Temescal[2]	770	10.0
Orange County	580	3.4

[1] Recharge of recycled water in these management zones is expected to be insignificant. Technical evaluation is required to document this for the Colton MZ.
[2] These management zones were not evaluated as part of the wasteload allocation process due to insufficient data.
[3] Not enough data to calculate objectives (see Section 4.1)

Table 11-B

Proposed and Existing Basin Plan Objectives for TDS and TIN
for Surface Waters Evaluated in Wasteload Allocation

Surface Water	Description	TDS (mg/L)	TIN (mg/L)
Santa Ana River, Reach 2	17th Street in Santa Ana to Prado Dam	650[1]	--
Santa Ana River, Reach 3	Mission Blvd. To Prado Dam	700[2]	10[2]
Santa Ana River, Reach 4	San Jacinto Fault to Mission Blvd.	550	10
Chino Creek, Reach 1A[3]	Santa Ana River confluence to downstream of confluence with Mill Creek	700[2, 4]	10[2, 4]
Chino Creek, Reach 1B[3]	Upstream of confluence with Mill Creek (Prado Area) to beginning of concrete-lined channel south of Los Serranos Rd.	550	8
San Timoteo Creek, all Reaches	--	--[5]	--[5]
Temescal Creek, Reach 1[6]	Lincoln Ave. to Riverside Canal	--	--

[1] Five-year moving average
[2] Base Flow objectives; total nitrogen objective is based on a filtered sample
[3] Proposed change to waterbody reach delineation (see Section 5.2)
[4] Proposed change to TDS and TIN water quality objectives (see Section 5.2)
[5] Proposed change to TDS and TIN water quality objectives (see Section 5.1)
[6] Proposed change to waterbody reach delineation (see Section 5.3)

WEI developed a wasteload allocation model that was calibrated using surface water flow, TDS and nitrogen data from a number of stations in the watershed. In order to ensure that all hydrological regimes were considered, data from 1950 through 1999 were used in the calibration process. The model took into account the TDS and nitrogen quality of wastewater discharges, overland runoff (based on 1993 land use data[37]), in-stream flows, and groundwater. Precipitation data from 43 rain gauge stations and daily stream flow data from 20 United States Geological Service (USGS) stations across the upper Santa Ana watershed were collected and put into the model. These data and soil characteristics were used to evaluate the amount of impervious surface, off-stream and in-stream percolation rates, and rising groundwater quality and quantity. The modeling work did not

[37] The 1993 land use data were the most recent and complete available at the time the study was conducted.

include simulation of the interaction of surface and groundwater and its effects on nitrogen and TDS quality. Rather, the volume-weighted average of the surface water TDS and nitrogen inputs described above were compared to ground and surface water quality (Table 11-A,11-B). The 25 and 50% nitrogen loss coefficients recommended by the Task Force were factored into this analysis.

WEI performed three model evaluations in order to assess wasteload allocation proposals for the year 2010. Model evaluations included a year 2001 Baseline Plan and 2 year 2010 wastewater recycling alternatives that were developed by the Task Force[38]. For these scenarios, Table 10 shows the flows and the TDS and nitrogen concentrations assumed for discharges by each of the POTWs discharging to the Santa Ana River or its tributaries.

Baseline Plan

The Baseline Plan generally assumed the TDS and TIN limits and design flows for POTWs specified in waste discharge requirements as of 2001 (these limits implement the 1995 Basin Plan wasteload allocations). The Baseline Plan also assumed reclamation activities at the level specified in the 1995 Basin Plan (see Table 5-7, page 5-24). The purpose of the Baseline Plan assessment was to provide an accurate basis of comparison for the results of evaluations of the other alternatives. Actual wastewater quality in 2001 was generally better than discharge limits (no dischargers were violating these limits), and surface and ground water quality measurements reflect that performance. To provide common ground for evaluation of the other alternatives, which also rely largely on year 2001 discharge limitations (but projected flows), it was necessary to evaluate 2001 permitted conditions.

The approach utilized for discharges from the RIX facility was slightly different. The initial Baseline Plan analysis (October 2002) assumed that the TDS effluent quality was 510 mg/L, based on the Basin Plan wasteload allocation. However, in light of the substantive proposed change to the groundwater management zone immediately affected by this discharge (Riverside A) and its proposed TDS objective (560 mg/L), subsequent analysis conducted in June 2003 assumed a revised TDS limit for RIX of 550 mg/L. The WEI analysis demonstrates that the difference in resultant TDS quality of water recharge to affected proposed groundwater management zones would be less than 20 mg/L, which is within the range of variation in TDS analyses, and is therefore considered insignificant.

Also, the Baseline Plan assumed TDS quality for the City of Beaumont discharge based on the established wasteload allocation (540 mg/L), although the current permit limits are more restrictive (490 mg/L). The assumption of 540 mg/L TDS quality is not considered significant. As discussed in Section 6.3 and noted in Table 10, the City has committed to continue to meet 490 mg/l as part of its “maximum benefit” proposal.

Alternative 2010-A

For this alternative, it was assumed that year 2001 discharge effluent limits for TDS and nitrogen apply to the projected surface water discharge flows. Again, a TDS limit of 550 mg/L was assumed for RIX in the supplemental June 2003 wasteload allocation analysis

[38] The October 2002 WEI report describes all three plans evaluated as “Baseline” wasteload runs to indicate that all three assumed the existing 2001 (“baseline”) wasteload allocations remained in effect. For simplification purposes, this report uses the term “baseline” to apply only to the model run that evaluates the 2001 wasteload allocation and discharge flows.

and the analysis assumed a 540 mg/L TDS limit for Beaumont. Limited reclamation and reuse, as identified in Table 5-7 of the 1995 Basin Plan, was included.

Alternative 2010-B
For alternative 2010-B, dischargers were again limited to the 2001 effluent limits for TDS and nitrogen. Once again, the June 2003 supplemental analysis assumed a TDS limit of 550 mg/L for RIX and 540 mg/L TDS limit for Beaumont. This alternative differs from Alternative 2010-A in that dischargers and water supply agencies identified large increases in reclamation and reuse. This is reflected in the reduced projected surface water discharge flows shown in Table 10.

The results of model evaluations, described in the next section, were compared with the proposed management zone objectives and established and proposed surface water objectives. Assimilative capacity findings (Section 7.0) were taken into account in determining whether there would be any impacts to water quality and wastewater dischargers as a result of the assumed wasteload allocations.

8.3.2. Model Results

The results of model evaluation of Alternatives 2010-A and 2010-B are shown in Table 12. This Table shows the projected volume-weighted average TDS and TIN quality of stormwater and wastewater recharge in the Santa Ana River, Reaches 2, 3, and 4 and San Timoteo Creek, Reaches 2 through 4. The proposed TDS and TIN objectives of the groundwater management zones that would be affected by POTW discharges to these surface waters, and therefore, by the wasteload allocations, are also identified (except Orange County; see discussion of results for Santa Ana Reach 2, below). These results are discussed briefly below.

Santa Ana River, Reach 4 extends from Mission Boulevard in Riverside upstream to the San Jacinto Fault in San Bernardino. The proposed Riverside A Management Zone underlies that part of Reach 4 that is affected by direct wastewater discharges. As shown in Table 11-A, the proposed TDS and nitrate-nitrogen objectives for this Management Zone are 560 mg/L and 6.2 mg/L, respectively.

Direct discharges to this Reach of the River are those from the City of Rialto and the Cities of San Bernardino and Colton (Rapid Infiltration and Extraction facility, or RIX). Both Alternatives 2010-A and 2010-B assume discharge limits, based on the current Basin Plan wasteload allocations, of 490 mg/L TDS and 10 mg/L TIN for the City of Rialto (see Table 10). As previously noted, discharge limitations of 550 mg/L and 10 mg/LTIN for the RIX facility were assumed in the June 2003 analyses, upon which the proposed wasteload allocations rely.

For both Rialto and RIX, the assumed TDS wasteload allocations are less than or equal to the surface water objective for Reach 4 (550 mg/L), and less than the proposed management zone objective (560 mg/L). Therefore, with respect to TDS, the existing wasteload allocation is clearly adequate to assure compliance with the proposed groundwater objective, as well as the established surface water objective. Moreover, the model results shown in Table 12, indicate that the 5 year volume-weighted average TDS quality of stormwater and wastewater recharge to this Reach would be on the order of 333 - 341 mg/L, well below the proposed Management Zone and surface water objectives.

The 10 mg/L nitrogen wasteload allocation for both dischargers is the same as the surface water objective for Reach 4, and would thus assure surface water compliance. However, as noted above, the proposed Riverside A Management Zone objective for nitrate-nitrogen is 6.2 mg/L. Riverside A has 1.8 mg/L of assimilative capacity for nitrate-nitrogen (Table 8), but even if this assimilative capacity was applied, the TIN limits (wasteload allocations) assigned to the dischargers do not appear adequate to assure compliance with the proposed Management Zone objective. However, the WEI model results (Table 12) for both alternatives show that the 5 year volume-weighted average nitrogen concentration of stormwater and wastewater recharge to Reach 4 is on the order of 4.1 – 4.2 mg/L, substantially less than the proposed water quality objective for Riverside A. As noted on Table 12 (footnote 2), the volume weighted average recharge values include appropriate adjustments for nitrogen loss during percolation (see preceding discussion of nitrogen loss coefficients).

Therefore, the existing TDS and TIN wasteload allocations specified for the Santa Ana River, Reach 4 dischargers are adequate to protect the proposed Riverside A groundwater Management Zone, as well as Reach 4.

Table 12

Estimated Metrics and Corresponding TDS and TIN Objectives
for Management Zones Impacted by Streambed Recharge – RIX discharge TDS 550 mg/L

Point Where Metric is Evaluated	Management Zone Protected	TDS		TIN		---------- Compliance Metric ----------						
		Proposed Objective	Current Ambient	Proposed Objective	Current Ambient	Averaging Period	--------- TDS ---------			--------- TIN ---------		
							2001	2010A	2010B	2001	2010A	2010B
		(mg/L)	(mg/L)	(mg/L-N)	(mg/L-N)		(mg/L)	(mg/L)	(mg/L)	(mg/L-N)	(mg/L-N)	(mg/L-N)
						Average for Surface Water						
Santa Ana River at Prado[1]	Reach 3	700	615	10.0	10.3	August	624	601	635	9.6	9.4	9.1
	Reach 2	650	615	na	5.8	5-year	585	570	594	8.5	8.5	8.1
						Volume-Weighted Average Recharge[2]						
Santa Ana River Reach 3 Recharge	Chino South	680	716	4.2	8.8	1-year	555	545	560	4.0	4.0	3.9
						5-year	550	540	554	4.0	4.0	3.9
Santa Ana River Reach 4 Recharge	Riverside A	560	443	6.2	4.4	1 year	356	358	350	4.6	4.5	4.4
						5 year	339	341	333	4.3	4.2	4.1
San Timoteo Creek Reach 2 Recharge	San Timoteo	300	304	2.7	2.9	1 year	458	492	151	6.0	6.6	1.0
						5 year	451	489	160	5.9	6.5	1.0
San Timoteo Creek Reach 3 and 4 Recharge	San Timoteo and	300	304	2.7	2.9	1 year	450	484	438	5.8	6.4	5.6
	Beaumont	230	293	1.5	2.6	5 year	441	479	427	5.6	6.3	5.4

Source: WEI, July 2003

1 – TDS and TIN objectives based on current wasteload allocation;, no changes are proposed. Reach 3 is an August-only value and Reach 2 is a five year, volume-weighted average.

2 – Volume-weighted average recharge values include appropriated adjustments for nitrogen loss during percolation.

Santa Ana River, Reach 3 extends from Prado Dam to Mission Boulevard in Riverside. Discharges affecting this Reach of the River include both direct and tributary discharges of treated wastewater (see Table 10). Direct discharges include all of the upstream Reach 4 discharges, as well as the City of Riverside and Western Riverside Regional Facility[39]. Tributary discharges include those from Inland Empire Utilities Agency (IEUA) facilities, the City of Corona and any discharges from Elsinore Valley Municipal Water District, Lee Lake Water District and Eastern Municipal Water District that overflow from Lee Lake to Temescal Creek[40]

Proposed groundwater management zones that underlie Reach 3 are Riverside A and Chino South. The lower part of Reach 3 flows through the proposed Prado Basin Management Zone (PBMZ) to Prado Dam. Chino Creek, Cucamonga Creek, Mill Creek (Prado Area) and Temescal Creek join Reach 3 of the River within the proposed PBMZ, near the Dam.

POTW discharges that affect the part of Reach 3 that overlies Riverside A Management Zone are those from RIX and the City of Rialto, discussed above. As explained above, the wasteload allocations for these facilities are adequate to protect Riverside A. Further, in both cases, the TDS and TIN limits for these discharges are at or below the surface water objectives established for Reach 3 (700 mg/L TDS and 10 mg/L total nitrogen[41]). Again, the TDS and TIN allocations for these dischargers are adequate to meet existing surface water objectives and proposed groundwater objectives for Riverside A.

The proposed Chino South Management Zone does not have assimilative capacity for TDS or nitrate (Tables 7 and 8). If the TDS and nitrate-nitrogen objectives and findings of assimilative capacity are adopted as proposed, then absent any further consideration or analyses, discharges affecting the Chino South Management Zone (Rialto, RIX and the City of Riverside) would have to be held to the new objectives (680 mg/L TDS and 4.2 mg/L TIN) to implement the Basin Plan. TDS is not an issue, since the wasteload allocations for these dischargers are below 680 mg/L. TIN wasteload allocations, on the other hand, are all higher than 4.2 mg/L (in some cases, such as the City of Riverside,

[39] The Western Riverside Regional Wastewater Facility effluent discharges to a Santa Ana River diversion channel downstream of River Road. The effluent is then conveyed to OCWD's wetland ponds, flows through the ponds and is discharged to Chino Creek in proposed Reach 1A.

[40] Discharges from Elsinore Valley MWD, Lee Lake WD and Eastern MWD are to Temescal Creek, downstream of Lake Elsinore. In periods of normal rainfall, these discharges terminate at Lee Lake. During periods of heavy rainfall, Lee Lake overflows to the Santa Ana River via Temescal Creek. Therefore, the discharge limits for these discharges must ensure the protection of the Santa Ana River as well as Temescal Creek and underlying management zones.

[41] As noted previously (Table 11-B), the Santa Ana River, Reach 3 objective is 10 mg/L total nitrogen (in a filtered sample) for baseflow. Total nitrogen in a filtered sample includes total inorganic nitrogen and dissolved organic nitrogen. POTW discharges to the Santa Ana River system contain minimal concentrations of dissolved organic nitrogen; thus compliance with TIN limits assures compliance with the total nitrogen objective.

these allocations even exceed the Reach 3 surface water objective (Table 10))[42]. However, the WEI model results provide relevant additional evidence. The WEI model results for alternatives 2010-A and 2010-B indicate that the volume-weighted average nitrogen (and TDS) quality of stormwater and wastewater recharge to the proposed Chino South Management Zone would be better than the objectives proposed for the Chino South Management Zone (Table 11). Projected TIN quality is 3.9 – 4.0 mg/L. Again, these TIN values take into account the 50% nitrogen loss coefficient recommended by the Task Force for discharges affecting this Zone. Therefore, it appears that both TDS and TIN wasteload allocations for Rialto, RIX and the City of Riverside are adequate to protect the proposed Chino South Management Zone.

Since the existing TDS limits for discharges that affect the Santa Ana River, Reach 3, assumed in both Alternatives 2010-A and 2010-B, are at or below the surface water objective (700 mg/L), the wasteload allocations will clearly assure compliance with the Santa Ana River @ Prado objective.

As shown in Table 12, the WEI analysis demonstrates that the existing TIN wasteload allocation will assure compliance with the nitrogen objective at Prado Dam. Projected baseflow nitrogen quality for the River at Prado is 9.1 – 9.4 mg/L. As indicated above, the Santa Ana River, Reach 3 receives wastewater discharges from POTWs that discharge to Chino Creek, Cucamonga/Mill Creek(tributary to Chino Creek) (IEUA), and Temescal Creek (City of Corona WWTP #2 and #3, Lee Lake Water District, Elsinore Valley Municipal Water District, Eastern Municipal Water District). These surface waters terminate within the proposed Prado Basin Management Zone. As discussed previously, the Task Force made no effort to identify surface or groundwater quality objectives for this proposed zone. Hence, discharges to the proposed Prado Basin Management Zone would be required to comply with surface water objectives for the Santa Ana River, Reach 3 and the tributaries within the Zone to which the discharges occur. For the IEUA facilities, this means effluent limits of 550 mg/L TDS and 8 mg/L TIN. These limits are more stringent than those assumed in the WEI wasteload allocation analysis. As discussed in Section 5.3, staff recommends that Temescal Reach 1A be deleted from the Basin Plan (together with the water quality objectives now specified for that Reach). No water quality objectives for other Reaches of Temescal Creek are established in the Basin Plan or proposed. Therefore, discharges to Temescal Creek by the City of Corona, Lee Lake Water District,

[42] These TIN limits implement the established nitrogen wasteload allocation in the Basin Plan. When this wasteload allocation was developed in 1991, the apparent inconsistencies between the surface water objective for the River and TIN limits above the objective for certain dischargers were recognized. However, the higher TIN limits were approved based on two considerations. The first was the finding that despite limits higher than the objective for certain dischargers, compliance with the surface water nitrogen objective was still achieved at Prado Dam. This was due to unidentified but clearly real nitrogen losses as the surface flows moved downstream. The Dam is the crucial compliance point for protecting downstream groundwater quality. Second, it was believed at that time that the flows in Reach 3 do not enter or affect Chino III, the groundwater subbasin identified in the 1995 Basin Plan underlying and adjacent to the area of the River where these higher-than-objective discharges take place. It appeared, therefore, that the higher-than-objective limits would protect affected groundwater. As previously discussed, the protection of groundwater (and groundwater recharge beneficial uses) is the fundamental purpose of the surface water objective. Taking economic considerations into account as required by Water Code Section 13241, specifically, the fact that compliance with a more stringent TIN limit would necessitate additional treatment and cost, in 1991, the Regional Board approved the higher TIN limits.

Elsinore Valley Municipal Water District and Eastern Municipal Water District would be governed by the Santa Ana River, Reach 3 objectives.

Santa Ana River, Reach 2, extends from 17th Street in Santa Ana to Prado Dam. Upstream of 17th Street, Orange County Water District (OCWD) diverts the River into spreading basins for recharge of the Orange County groundwater basin. There are no direct wastewater discharges into Reach 2; all wastewater discharges affecting Reach 2 result from discharges in the upper Santa Ana Watershed.

The current TDS and nitrogen wasteload allocations specified in the Basin Plan are based, in part, on meeting the Santa Ana River, Reach 3 baseflow TDS and nitrogen objectives. As previously discussed, the purpose of these objectives is to protect groundwater quality in Orange County.

With respect to TDS, the WEI determined that if the discharges continue to comply with the existing wasteload allocation and thereby continue to assure compliance with the Santa Ana River, Reach 3 objective (see results for Santa Ana River at Prado, Table 12), the proposed TDS objective for the Orange County Management Zone (560 mg/L) will also be achieved (WEI, July 2000; WEI, October 2002). This determination was based on empirical, rather than model evidence. The Task Force recognized that despite long-term recharge of the Orange County groundwater basin with Santa Ana River TDS quality above the 700 mg/L objective (violation of this objective necessitated the development of the wasteload allocation), the current ambient quality of the Basin is slightly better (560 mg/L) than the proposed objective (580 mg/L). Thus, the TDS allocation assumed in the model Alternatives, which results in projected Reach 2 TDS quality of 570 - 594 mg/L (five-year average), should result in protection of Orange County groundwater.

For nitrogen, while WEI determined that there were insufficient data to make the demonstration that meeting the baseflow nitrogen objective at Prado ensures compliance with the proposed Orange County nitrate-nitrogen objective. Empirical evidence indicates that the existing TIN wasteload allocation is adequate to protect the proposed Orange County Management Zone. As shown in Table 8, the historical quality and current ambient quality in the proposed Orange County Management Zone are the same (3.4 mg/L), indicating that recharge by the River even when the nitrogen quality exceeded the Reach 3 surface water objective has not had a deleterious effect.

San Timoteo Creek (all reaches), extends upstream from the confluence of Reach 5 of the Santa Ana River to the confluence with Little San Gorgonio and Noble Creeks (headwaters of San Timoteo Creek). The proposed Bunker Hill-B and San Timoteo management zones underlie these Reaches of San Timoteo Creek[43]. Wastewater discharges affecting San Timoteo Creek and the proposed San Timoteo Management

[43] Bunker Hill-B MZ was not considered in the wasteload allocation analysis because the recharge of wastewater effluent to this MZ was considered insignificant, in light of planned reduction/elimination of these discharges to San Timoteo Creek, **and because of concrete-lining of a significant part of the Creek (proposed Reach 1A that overlies the proposed Bunker Hill B MZ.**

Zone include discharges from the Yucaipa Valley Water District (YVWD) and City of Beaumont[44].

Both Alternatives 2010-A and 2010-B assume discharge limits, based on the current Basin Plan wasteload allocations, of 540 mg/L TDS and 10 mg/L TIN for both YVWD and Beaumont (Table 10). As shown in Table 12 the projected volume-weighted average TDS quality of stormwater and wastewater recharge in San Timoteo Creek is in the range of 427 – 492 mg/L (except for recharge in Reach 2 under Alternative 2010-B, where improved TDS quality (151-160 mg/L) reflects higher amounts of wastewater recycling by Yucaipa Valley Water District and the City of Beaumont or removal of these effluents from San Timoteo Creek (see Section 6.2, 6.3)). The 427- 492 mg/L projected TDS quality exceeds the antidegradation objective proposed for the San Timoteo Management Zone (300 mg/L). Similarly, projected TIN recharge quality (5.6 - 6.6 mg/L) exceeds the antidegradation proposed nitrate-nitrogen objective for the San Timoteo Management Zone (2.7 mg/L) (Table 10).

WEI conducted additional analyses of the TDS and TIN limits needed to assure compliance with the proposed San Timoteo Management Zone antidegradation objectives and found that limits of 320 mg/L TDS and 4.1 mg/L TIN would be necessary for both dischargers to meet these proposed objectives. Since compliance with these limits would have significant facility and cost implications, the dischargers elected to explore revision of the proposed antidegradation objectives. This “maximum benefit” proposal has been described in detail in Section 6.2 and 6.3. As discussed in these Sections two sets of objectives for the proposed San Timoteo Management Zone have been identified. One set (the “antidegradation” objectives) would apply if the Board finds that “maximum benefit” has not been demonstrated. The second set (the “maximum benefit” objectives) would apply if maximum benefit is demonstrated. The wasteload allocations that would apply to discharges by the City of Beaumont and Yucaipa Valley Water District depend on which set of objectives is in effect. Both YVWD and the City of Beaumont have committed to meet effluent TIN limits of 6 mg/L as part of their “maximum benefit proposals. Beaumont has also committed to meet a TDS limit of 490 mg/L. Under the “maximum benefit” scenario, YVWD would continue to be held to 540 mg/l, as specified in the existing wasteload allocations. These limits are the proposed “maximum benefit” wasteload allocations. Additional analysis by WEI (November 5, 2003) demonstrates that the proposed “maximum benefit” wasteload allocations would be adequate to assure compliance with the proposed “maximum benefit” objectives.

8.4 Proposed Total Dissolved Solids (TDS) and Total Inorganic Nitrogen (TIN) Wasteload Allocations

The recommended TDS and TIN wasteload allocations are shown in Tables 13. The allocations assume the recycled water reuse proposed by the dischargers. For the most part, the allocations are the same as those specified in 2001 discharge limitations, based on the established Basin Plan wasteload allocations. The exceptions are as follows:

[44] The Beaumont discharge is to Coopers Creek, which overlies a part of the proposed Beaumont Management Zone (the Beaumont South Storage Unit) and is tributary to San Timoteo Creek. It is a *de facto* discharge to the proposed San Timoteo Management Zone (see Section 6.3).

- As noted above, two alternative TDS and TIN wasteload allocations for the City of Beaumont and YVWD facilities are identified. The "maximum benefit" allocations implement the "maximum benefit" objectives and will be implemented provided that YVWD and the City of Beaumont/STWMA continue to demonstrate "maximum benefit" (see Sections 6.2 and 6.3). If the Board finds that YVWD and/or the City of Beaumont is not fulfilling their "maximum benefit" commitments, then the wasteload allocations based on the "antidegradation" objectives would apply.

- Two alternative TDS and TIN wasteload allocations for the City of Beaumont and YVWD facilities are identified. Under maximum benefit" findings by the Regional Board, these facilities would be limited to TDS and TIN as show on Table 13. The sets of objectives that apply is also contingent on the Board's maximum benefit determination. If the Board finds "maximum benefit" is not being realized, the TDS and TIN wasteload allocation specified as "antidegradation" allocations would be specified as shown in Table 13;

- A single wasteload allocation for TDS and TIN that would be applied on a flow-weighted average basis to all of the treatment plants operated by the Inland Empire Utilities Agency (IEUA) as a whole is proposed. This is in contrast to the existing Basin Plan approach, in which individual allocations for each of the plants are specified. The proposed TDS and TIN allocations are based on the water quality objectives for Chino Creek, Reach 1 (550 mg/L TDS and 8 mg/L TIN). (This reach is proposed to be subdivided into Reach 1A and 1B (Section 5.2); the 550 mg/L TDS and 8 mg/L TIN objectives would be applied to Reach 1B, to which the IEUA discharges occur.)

- The TDS wasteload allocation proposed for the RIX facility is less stringent (550 mg/L) than the existing wasteload allocation. This revision is proposed in light of the substantive proposed change to the groundwater management zone immediately affected by this discharge (Riverside A) and its proposed TDS objective (560 mg/L). As already discussed, analysis by WEI demonstrates that the less stringent TDS limitation will not result in significant lowering of water quality and will continue to assure that the beneficial uses of the affected receiving waters will be protected. Staff believes that a comprehensive antidegradation analysis is thus not required. Given this, the less stringent effluent limitation can be specified pursuant to the exception to the prohibition against antibacksliding established in the Clean Water Act, Section 303(d)(4)(a).

Based on this analysis, staff proposes that the Basin Plan amendment specify a TDS and TIN wasteload allocations as shown in the Attachment to Resolution No. R8-2004-0001, Chapter 5, Table 5-5.

Table 13

Proposed Alternative Wasteload Allocations through 2010
based on "Maximum Benefit" or "Antidegradation" Water Quality Objectives[1]

Publicly Owned Treatment Works (POTW)	Alternative 2010A – Reclamation in 1995 Basin Plan			Alternative 2010B – Reclamation Plans Advocated by POTWs/others		
	Surface Water Discharge (MGD)	TDS (mg/L)	TIN (mg/L)	Surface Water Discharge (MGD)	TDS (mg/L)	TIN (mg/L)
Beaumont – "max benefit" [2]	2.3	490	6.0	1.0	490	6.0
Beaumont – "antideg" [2, 3]	2.3	320[3]	4.1[3]	1.0	320[3]	4.1[3]
YVWD – Wochholz – "max benefit"	5.7	540	6.0	0.0	540	6.0
YVWD – Wochholz – "antideg" [3]	5.7	320[3]	4.1[3]	0.0	320[3]	4.1[3]
Rialto	12.0	490	10.0	10.0	490	10.0
RIX	49.4	550	10.0	28.2	550	10.0
Riverside Regional WQCP	35.0	650	13.0	26.1	650	13.0
Western Riverside Co. WWTP	4.4	625	10.0	3.3	625	10.0
EMWD[4]	43	650	10.0	6.0	650	10.0
EVMWD – Lake Elsinore Regional	7.2	700	13.0	2.0	700	13.0
Lee Lake WRF	1.6	650	13.0	1.6	650	13.0
Corona WWTP # 1	3.6	700	10.0	2.0	700	10.0
Corona WWTP # 2	0.2	700	10.0	0.5	700	10.0
Corona WWTP # 3	2.0	700	10.0	0.5	700	10.0
IEUA Facilities [5]	80.0	550	8.0	37.4	550	8.0

1. "Antidegradation" wasteload allocations are the default allocation if the Regional Board determines that "maximum benefit" commitments are not being met.
2. Beaumont discharges to Coopers Creek, a tributary of San Timoteo Creek, Reach 4 (proposed to be redefined to be included in Reach 3). It is *de facto* discharge to San Timoteo Creek/San Timoteo MZ
3. "Antidegradation" wasteload allocations for City of Beaumont and YVWD based on additional model analysis performed by WEI (WEI, October 2002).
4. EMWD discharges are expected to occur only during periods of wet weather.
5. IEUA facilities include RP#1, Carbon Canyon WRP, RP#4 and RP#5; These facilities are to be regulated as a bubble (see text). WLAs ensure compliance with both "maximum benefit" objectives and "antidegradation" objectives.

9.0 Monitoring and Reporting Program

Section 13242 of the California Water Code specifies that Basin Plan implementation plans must contain a description of the monitoring and surveillance programs to be undertaken to determine compliance with water quality objectives. As part of this proposed revision to the TDS and nitrogen water quality objectives and update of the TDS and nitrogen management plan, staff proposed changes to the Basin Plan to require the implementation of a watershed-wide Nitrogen/TDS monitoring program.

In addition to the Water Code requirement, the need to develop and implement this monitoring program was triggered by Task Force agreement, with Board staff support, that future decisions regarding TDS and nitrogen management would not be based on model projections. This is in contrast to the development of previous Nitrogen/TDS management plans, in which watershed models were used extensively. Rather, key future findings regarding assimilative capacity, compliance with TDS and nitrogen water quality objectives, the efficacy of the wasteload allocations, evaluation of recycled water project impacts, etc., would be based on real-time data obtained through a rigorous monitoring program. The Task Force acknowledged the need to develop and implement a comprehensive monitoring program to collect these data, and has initiated efforts to do so.

Some parts of the comprehensive monitoring program are already in place and are being implemented, including the annual sampling of the Santa Ana River, Reach 3 at Prado Dam by Board staff. Board staff expects to continue to implement this program. Certain agencies have committed to conduct monitoring of specific water bodies as part of their “maximum benefit” proposals (see Section 6.0). The proposed amendment to the Basin Plan includes the requirement that the Task Force agencies propose a comprehensive monitoring program that would integrate these existing commitments with other monitoring recommendations. The Task Force would be required to implement this program upon approval by the Regional Board. This and other proposed changes are described further below.

9.1 Surface Water Monitoring Program for TDS and Nitrogen

Implementation of a surface water monitoring program is needed to determine compliance with the nitrogen and TDS objectives of the Santa Ana River, and thereby, to determine the efficacy of the wasteload allocations. It is also needed to evaluate the validity of the 50% nitrogen loss coefficient proposed to be applied in assessing the effects of discharges to that part of Reach 3 that overlies the proposed Chino South groundwater management zone (see nitrogen loss coefficient discussion in Section 8.2).

As previously discussed, the Basin Plan specifies baseflow TDS and total nitrogen objectives for Reach 3. For Reach 2, a TDS objective based on a five year moving average of the annual TDS concentration is specified. Use of this moving average allows the effects of wet and dry years to be integrated over the five-year period and reflects the actual long-term quality of water recharged by OCWD downstream of Prado Dam. No nitrogen objective has been established for Reach 2.

The Basin Plan specifies a monitoring program to determine compliance with the Reach 3 objectives (1995 Basin Plan, p. 4-15, 4-16). Because the quantity and quality of base flow appeared to be most consistent during the month of August, when storm flows and non-tributary flows were expected to be minimal, the program requires measurement of baseflow

quality during August, on an annual basis. Board staff have conducted this baseflow sampling program since 1983, when the program was first incorporated in the Basin Plan. Sampling is conducted at Prado Dam, the downstream terminus of Reach 3 [45]. The Basin Plan does not specify a monitoring program to assess compliance with the Reach 2 TDS objective. Data collected by the United States Geological Survey and others, including Orange County Water District, can be used to assess compliance. To date, the Regional Board has relied on measurement of baseflow quality in Reach 3 as an indicator of the effects of recharge of Santa Ana River flows on Orange County groundwater.

As part of the Nitrogen/TDS study, WEI was charged with the evaluation of the baseflow monitoring program to determine whether it is adequate and appropriate to assess the effects of Santa Ana River recharge in Orange County. WEI was also tasked with recommending an alternative compliance metric, if appropriate.

To conduct this evaluation, WEI attempted to correlate long term TDS and nitrogen concentrations measured at Prado Dam with comparable long term TDS and nitrogen data from wells under the influence of Santa Ana River recharge in the vicinity of the OCWD recharge operations.

WEI concluded that there were insufficient data to develop a correlation due to a number of factors, including, but not limited to, limited groundwater data or influence of other sources of water (*e.g.,* Colorado River water). For TDS, WEI concluded that the existing baseflow monitoring programs "…seem to have protected the Orange County Management Zone as delineated in Phase 2A effort with a proposed TDS objective of 585 mg/L." With regard to nitrogen, WEI concluded that wells in the proposed Orange County Management Zone are "… frequently lower than the TIN concentrations in the Santa Ana River, suggesting the influence of other sources of recharge and nitrogen loss." (WEI, July 2000). This finding indicates that reliance on the Reach 3 baseflow objectives to protect Orange County groundwater, and the existing monitoring program designed to measure compliance, are adequate. Reliance on baseflow quality does not take into account the added level of nitrogen reduction observed downstream of Prado, and thus is a conservative management approach.

Staff recommends that the Basin Plan continue to specify an annual water quality sampling program to determine compliance with the Reach 3 TDS and total nitrogen baseflow objectives. Board staff experience in implementing this program indicates that sample collection in August only may be inappropriate, given the sometime presence of waters other than baseflow. To address this, staff recommends that the annual monitoring requirement be modified to specify that sample collection shall occur when the influence of storm flows and non-tributary flows is at a minimum (typically, August and September). The results of this sampling can be compared to data collected by United States Geological Survey (USGS), Orange County Water District, and others, to make findings regarding compliance with the baseflow objectives

Staff believes that compliance with the Santa Ana River, Reach 2 TDS objective can be determined by evaluation of data collected by the Santa Ana River Watermaster, Orange

[45] Because of unexpected non-tributary flows (e.g., the release of imported water for transport to Orange County via the River system) and/or storm flows during August, baseflow sampling has at times included sample collection during September. This was necessary to assure that these "non-baseflows" did not complicate the determination of compliance with baseflow objectives.

County Water District, USGS and others. If necessary, the Board can implement or require the collection of additional data.

As already noted, implementation of additional surface water monitoring in Reach 3 is necessary to verify the applicability of the 50% nitrogen loss coefficient considered in the wasteload allocation process for discharges to that area of the River that overlies and recharges the proposed Chino South Management Zone.

When and where other special data needs arise, the Board can specify additional surface water monitoring programs.

9.2 Groundwater Monitoring Program for TDS and Nitrogen

Implementation of a watershed-wide Nitrogen/TDS groundwater monitoring program is necessary to update findings of current ambient water quality and assimilative capacity. Focused groundwater monitoring will be necessary, in conjunction with surface water monitoring, to confirm the propriety of the 50% nitrogen loss coefficient proposed to be considered in setting waste discharge requirements for discharges to the Santa Ana River, Reach 3 in the area overlying the proposed Chino South Management Zone.

Review current water quality and assimilative capacity findings
For the purposes of determining current ambient TDS and nitrate-nitrogen water quality, the Task Force determined that it would be appropriate to consider data from a 20-year period to assure that variations in hydrologic regime (e.g., unusually wet and dry years) would be taken into account. The Nitrogen/TDS study and data collection effectively began in 1996 and so the Task Force considered data for 1978 to 1997 to determine current water quality. Current water quality was compared with historical water quality (the proposed management zone objectives) to determine assimilative capacity (see Section 7.0 of this report).

As stated above, the Task Force agreed that future Nitrogen and TDS management decisions would be based on actual data, rather than model projections. This data must be collected and analyzed. According to the method adopted by the Task Force, as new data are collected, current ambient quality is to be re-evaluated using the new data and data for the preceding 19 years, i.e., a 20-year average. This will enable the Regional Board and dischargers to determine whether water quality objectives are being achieved, whether findings of assimilative capacity must be revised, and whether some change in nitrogen and/or TDS management strategy is necessary. Staff recommends that this re-evaluation occur at least once every three years. The results could then be considered in the development of the Basin Plan triennial review list. For example, if the re-evaluation indicates that revised assimilative capacity findings are necessary or that the wasteload allocations should be revisited, these tasks could be identified as part of the Board's Basin Plan update priorities.

As shown in Tables 7 and 8, there were insufficient data to determine current ambient TDS and nitrate-nitrogen quality in 7 of the proposed management zones. For all but two of these zones, data with which to determine proposed water quality objectives (historical water quality) were similarly deficient. To be conservative, it is recommended that no assimilative capacity be assumed for these management zones. If waste discharge requirements for wastewater reclamation activities or other discharges in these proposed zones need to be considered, then the prospective discharger will be required to collect additional data so that the effects of proposed discharges can be evaluated.

Confirm nitrogen loss coefficient for Santa Ana River, Reach 3

As previously discussed, site-specific monitoring is needed to confirm the 50% nitrogen loss coefficient allowed for the lower Santa Ana River, Reach 3 (overlying the Chino South Management Zone). The data used to justify the 50% nitrogen loss coefficient were limited in both time and spatial extent. Therefore, it is proposed that the Basin Plan amendment specify additional and ongoing confirmatory monitoring of the nitrogen loss coefficient for discharges to the River that affect the proposed Chino South Management Zone. This would entail both surface and groundwater monitoring.

To address these monitoring requirements, staff recommends that the Basin Plan be amended as shown in the Attachment to draft Resolution No. R8-2004-0001 and summarized as follows:

1. Revise the language in Chapter 4,"Water Quality Objectives", page 4-15, regarding the annual sampling of Santa Ana River, Reach 3 baseflow quality to specify that sampling shall occur when the influence of storm flows and non-tributary flows is at a minimum, typically August and September. (See Attachment to Resolution No. R8-2004-0001, Chapter 4, p. 19)

2. Revise Chapter 5 "Implementation" to incorporate a new section that specifies monitoring program requirements related to salt (nitrogen and TDS) management. The Task Force agencies would be required to submit a proposed plan or plans, either collectively or individually, to conduct comprehensive nitrogen and TDS monitoring in the Region. The monitoring program would be designed to:

    - provide data necessary to review current ambient water quality
    - determine compliance with nitrogen and TDS objectives for ground and surface waters
    - re-evaluate assimilative capacity findings
    - validate the 50% nitrogen loss coefficient proposed to be applied to discharges to the Santa Ana River that affect the Chino South Management Zone
    - assess the effectiveness of the nitrogen and TDS wasteload allocations.

    Staff recommends that the program proposed by the agencies address:

    - Monitoring program goals
    - responsible agencies
    - groundwater water sampling locations
    - surface water sampling locations
    - water quality parameters
    - sampling frequency
    - quality assurance/quality control
    - database management
    - reporting requirements

    Analyses and reporting of the data to update findings regarding compliance with TDS and nitrogen surface and groundwater objectives, assimilative capacity, the efficacy of the wasteload allocations and the validity of the 50% nitrogen loss coefficient would be

required. Re-evaluation of current ambient nitrogen and TDS quality and assimilative capacity would be required at least once every three years, beginning from the date of approval of this proposed Basin Plan amendment.

Task Force agencies, either collectively or individually, would be required to implement this plan upon Regional Board approval. (See Attachment to Resolution No. R8-2004-0001, Chapter 5, "V. Salt Management Plan – Monitoring Program Requirements", p. 39 through 41).

10.0 Additional Recommended Basin Plan Changes

Staff recommends the revision of explanatory language in Chapters 3 and 4 of the Basin Plan to clarify and/or correct that language. Staff also recommends the addition of language in Chapter 5 pertaining to TDS regulation of subsurface disposal systems in waste discharge requirements.

Chapter 3 – Beneficial Uses

The Basin Plan states (p.3-3):

> "More than one beneficial use may be identified for a given waterbody. Water quality objectives are established (Chapter 4) which are sufficiently stringent to protect the most demanding use. The Regional Board reserves the right to resolve any conflicts among beneficial uses based on the facts in a given case."

The second sentence of this statement needs to be clarified to express the intent, which is that where more than one beneficial use is identified for a specific waterbody, the most sensitive use must be protected.

As now written, the second sentence suggests that the water quality objectives established in Chapter 4 necessarily comply with this requirement. Rather, while the water quality objectives specified in Chapter 4 generally represent the levels needed to protect beneficial uses, more stringent levels may need to be specified in waste discharge requirements depending on the specific circumstances of the discharge. The Regional Board's dual obligation to implement the Basin Plan and to separately consider the protection of beneficial uses in prescribing waste discharge requirements is well established (Water Code Sections 13263, 13263(a), 13372, 13377; *PUD No. 1 of Jefferson County v. Washington Department of Ecology, fn. 17, 511 U.S. at 714-715;* 33 U.S.C. section 1311(b)(2)(C)).

A good example of this is the coliform limitations imposed on wastewater discharges to the Santa Ana River. To protect public health and the water contact recreation beneficial use (REC-1) of the River, the Board requires compliance with coliform limitations that are more stringent than the Basin Plan coliform objectives established to protect REC-1 waters. In specifying the more stringent limitations, the Board has considered: the exceptional circumstances of the POTW discharges (wastewater is the sole or predominant component of the flow in the River in dry weather); the nature of the discharges and the potential for exposure to pathogens; the recommendations of the Department of Health Services for the discharge limitations necessary to assure pathogen removal and the protection of public health; and the nature of the Basin Plan objectives, which were based on studies in which the recreational sites investigated were outside the direct influence of sewage discharges.

Staff recommends that this paragraph be revised to read as follows (language added is underlined; deleted language is shown in strike-out type):

> "More than one beneficial use may be identified for a given waterbody. The most sensitive use must be protected. ~~Water quality objectives are established (Chapter 4) which are sufficiently stringent to protect the most demanding use.~~ The Regional Board reserves the right to resolve any conflicts among beneficial uses based on the facts in a given case."

This recommended change is shown in the proposed Basin Plan amendment, Attachment to tentative Resolution No. R8- 2004-0001, Chapter 3.

<u>Chapter 4 – Water Quality Objectives</u>

The Basin Plan states (p. 4-1):

> "The narrative water quality objectives below are arranged alphabetically. They vary in applicability and scope, reflecting the variety of beneficial uses of water which have been identified (Chapter 3). Where numerical limits are specified they represent the maximum levels that will allow the beneficial uses to continue unimpaired."

Changes to this language are necessary for several reasons. First, in many cases, such as the majority of the TDS and nitrate-nitrogen water quality objectives now specified in the Basin Plan and proposed for the new groundwater management zones, the objectives are based on historical quality ("antidegradation" objectives). These objectives cannot be said to represent the "maximum" quality that will assure beneficial use protection. Second, as discussed above, change is necessary to reflect the Regional Board's dual obligation to implement the objectives in the Plan, and to separately consider more stringent discharge limitations where necessitated by the specific circumstances of the discharge. Finally, changes are needed for grammatical reasons.

Accordingly, staff recommends that the language be revised as follows (language added is underlined; deleted language is shown in strike-out type):

> "The narrative water quality objectives below are arranged alphabetically. They vary in applicability and scope, reflecting the variety of beneficial uses of water ~~which~~ <u>that</u> have been identified (Chapter 3). Where numerical ~~limits~~ <u>objectives</u> are specified, they generally represent the ~~maximum~~ levels that will <u>protect</u> ~~allow~~ ~~the~~ beneficial uses. ~~to continued unimpaired.~~ <u>However, in establishing waste discharge requirements for specific discharges, the Regional Board may find that more stringent levels are necessary to protect beneficial uses</u>."

The Basin Plan states (p. 4-11):

> "The narrative objectives which are included below apply to all groundwaters as noted. In addition, specific numerical objectives are listed in Table 4-1. Where more than one objective is applicable, the stricter shall apply."

As discussed previously in this staff report, staff recommends that the Basin Plan be amended to incorporate two new sets of TDS and nitrate-nitrogen objectives for specific groundwater management zones: "antidegradation objectives" based on historical water quality, and less

stringent "maximum benefit" objectives. The "maximum benefit" objectives would apply as long as the agencies that proposed them fulfilled specific commitments needed to demonstrate "maximum benefit". The "antidegradation" objectives would apply if these commitments are not met and "maximum benefit" is not demonstrated.

The paragraph shown above needs to be revised to clearly reflect this regulatory approach. Staff recommends that the paragraph be revised as follows (language added is underlined; deleted language is shown in strike-out type):

> "The narrative objectives ~~which~~ that are included below apply to all groundwaters as noted. In addition, specific numerical objectives are listed in Table 4-1. With the exception of the "maximum benefit" objectives identified in this Table (see further discussion below and in Chapter 5), ~~W~~where more than one objective is applicable, the stricter shall apply."

These recommended changes to the Basin Plan are shown in the proposed Basin Plan amendment, Attachment to tentative Resolution No. R8-2004-0001, Chapter 4.

Chapter 5 – Implementation

To prevent adverse water quality and public health impacts that may result from the use of subsurface disposal systems, the Regional Board has adopted prohibitions on the use of such systems in certain areas, and minimum lot size requirements (Basin Plan, pp. 5-6 and p. 5-36 through 5-39). The Board has also issued waste discharge requirements for subsurface disposal system use at mobile home parks, RV parks and truck washing operations, where the volume of waste is high and/or there is the potential for the discharge of wastes other than domestic sewage. Waste discharge requirements for individual residential systems and low volume (less than 500 gallons per day) domestic waste discharges from industrial and commercial facilities have been largely waived, pursuant to the waiver provisions of the Water Code.

Where waste discharge requirements have been issued for subsurface disposal system use, TDS limits have been specified to assure consistency with the TDS objectives of affected groundwater. These limits have been set as both a maximum value that is based on the TDS objective of the receiving water, and a value that allows a reasonable use increment of 250 mg/L above water supply quality. The more restrictive of the two limits is controlling.

In many cases, compliance with the maximum TDS limit based on the objective is difficult if not impossible, and the commercial and industrial facilities have no practicable means to achieve it or to provide suitable offsets. Unlike POTWs, these facilities have little or no control over the quality of water supplied to them. Sewering of the discharges is typically not an option, at least at the present time, though this is expected to change as rapid development in the Region drives sewer system expansion.

The TDS and nitrogen contributions from domestic waste discharges from existing residential, industrial and commercial subsurface disposal systems are factored into the determinations of TDS and nitrate-nitrogen ambient quality and assimilative capacity by the N/TDS Task Force (Section 7.0). In light of this, and in view of the impracticality of alternative compliance options, it appears unnecessary and inappropriate to require that these existing discharges comply with the TDS objective of the affected receiving water or to provide an offset. It remains appropriate,

however, to assure that the discharges do not add an unreasonable salt increment to the water supply quality.

Accordingly, staff recommends that Chapter 5, Implementation, be amended to include language that identifies this regulatory approach and the rationale for it. The proposed language is shown in the Attachment to Resolution No. R8-2004-0001, Chapter 5, Section III. B. 6.

11.0 Economic Analysis

The California Water Code (Section 13241) and CEQA regulations (Public Resources Code Section 21159) require that economics be considered, both when adopting water quality objectives and when evaluating methods of compliance with the proposed Basin Plan amendment.

Clearly, the proposed Basin Plan amendment, in particular the proposed identification of new groundwater management zone boundaries, the adoption of new nitrate-nitrogen and TDS water quality objectives for the new management zones, and the revised wasteload allocations, has the potential to affect materially the limitations and costs of compliance that would be imposed on discharges to surface and groundwaters, including water recycling activities. While developing recommendations based first and foremost on sound and objective science, the Task Force was clearly cognizant of the potential economic impacts. Consideration of these impacts, and of the constraints that the revised Basin Plan might place on optimal management of wastewater and water supplies, some agencies have proposed alternative objectives and regulatory strategies (the “maximum benefit” proposals discussed in Section 6.0). These strategies include a commitment by IEUA to meet more stringent discharge limitations commensurate with the existing or proposed objectives for the surface waters to which IEUA discharges (Chino Creek, Reach 1A (proposed redefinition of Reach designation).

As discussed in Section 8.0, the revised TDS and TIN wasteload allocations propose discharge limitations for most POTWs (except IEUA , discussed above) that are no more stringent than those in the 1995 Basin Plan. Hence, they should not result in any economic impact.

Additional potential costs to comply with the proposed Basin Plan amendment are costs associated with implementing an ongoing data collection and reporting program. WEI was asked to develop a proposal and a cost estimate for a maintaining the data management system (Wildermuth Environmental, October 2001). WEI estimates that costs to solicit, process, upload and enter necessary data could be spread over a three year period at a total cost of approximately $760,000. After the 3rd year, annual costs, which include database management, were estimated to be approximately $160,000. It is important to emphasize that the implementation of the entire Task Force effort depends on developing and implementing a comprehensive surface and groundwater monitoring program, and that the Task Force itself recommended this approach.

It should be noted that these costs do not cover other specific proposed monitoring costs, such as confirmation of the 50% nitrogen loss coefficient for discharges to the Santa Ana River affecting the proposed Chino South Management Zone. Staff believe that costs associated with this program would be more than offset by the regulatory relief provided by applying the 50% nitrogen loss coefficient in POTW discharge limits (see Section 8.2 for discussion of the application of the coefficient in developing the proposed TIN wasteload allocation).

Finally, there are monitoring program costs associated with the "maximum benefit" proposals for the Chino Basin and San Timoteo Watershed (see Section 6.0). Again, these monitoring costs are more than offset by the benefits derived from meeting less stringent water quality objectives. The implementation of appropriate monitoring programs is a key commitment by IEUA, YVWD, the City of Beaumont and STWMA that is requisite to the application of the "maximum benefit" objectives

12.0 California Environmental Quality Act

The Secretary of Resources has certified the Basin Planning process as functionally equivalent to the preparation of an Environmental Impact Report (EIR) or a Negative Declaration pursuant to the California Environmental Quality Act (CEQA). However, in lieu of these documents, the Regional Board is required to prepare the following: the Basin Plan amendment; an Environmental Checklist that identifies potentially significant adverse environmental impacts of the Basin Plan amendment; and, a staff report that describes the proposed amendment, reasonable alternatives, and mitigation measures to minimize any significant adverse environmental impacts identified in the Checklist. The Basin Plan amendment, Environmental Checklist, and staff report together are functionally equivalent to an EIR or Negative Declaration.

The proposed Basin Plan amendment is shown in the Attachment to draft Resolution No. R8-2004-0001.

An Environmental Checklist is being prepared and will be distributed in advance of the Regional Board's hearing to consider adoption of the proposed Basin Plan amendment.

This staff report will be followed by another report that includes comments received on the proposed amendment, staff responses to those comments, and a discussion of any changes made to the proposed amendment as the result of the comments or further deliberation by the Board, Board staff and/or the Task Force. This follow-up report would address any additional CEQA considerations, including economics, that might arise as the result of any changes to the proposed amendment.

Alternative Analysis

1. No Project Alternative

   Under the "No Project" Alternative, no action would be taken to amend the Basin Plan to incorporate changes related to the management of Nitrogen and TDS in the Santa Ana Region. Water quality objectives, subbasin boundaries, etc. would remain unchanged, and "maximum benefit" proposals would not be considered.

   Clearly, this is not a preferred alternative since it would ignore the findings of technically sound, intensive and objective studies that indicate that modification of the Basin Plan is appropriate. Moreover, it would reject proposals to provide maximum benefit to the people of the state by optimizing wastewater disposal and water supply strategies. Such strategies are particularly necessary in some areas of the Region where the existing (and otherwise proposed) Basin Plan nitrogen/TDS regulatory framework would likely preclude efficient and wise use of water and wastewater, and necessitate extensive expenditure without obvious environmental or public benefit.

2. Other Alternatives

A plethora of alternatives could be developed based on different combinations of the Basin Plan amendment components described in this staff report. For example, revisions to some but not all groundwater subbasin boundaries and water quality objectives could be considered. Some but not all of the "maximum benefit" proposals could be part of an amendment alternative. However, given the nature of the studies conducted by the Task Force (extensive studies based on sound and objective science), and the consensus of the Task Force members regarding the validity of the scientific/technical findings, it is now hard to imagine how an argument opposing Task Force recommendations based on the science could be supported. The Regional Board must be the arbiter of the extent to which the "maximum benefit" proposals and all that they entail (including adjustments to proposed groundwater management zone and surface water quality objectives) satisfy the requirements of the state antidegradation requirements. The Board may elect to accept or reject them. However, Board staff is persuaded of the value and validity of these proposals and their consistency with antidegradation requirements. Accordingly, we recommend that they be a part of the recommended Basin Plan amendment alternative.

Task Force study, consideration and debate about potential alternatives since 1997 have resulted in the recommended Basin Plan alternative. No argument, compelling or otherwise, for an alternative set of Basin Plan changes has been proposed to date.

3. Recommended Alternative

The set of changes to the Basin Plan identified in the Attachment to tentative Resolution No. R8-2004-0001 and discussed in this staff report is the recommended Basin Plan amendment alternative. It reflects a comprehensive and scientifically defensible review of the Region's nitrogen and TDS management strategy. It recognizes the interrelationships between nitrogen and TDS discharges in upstream and downstream waters and was deliberately designed to assure that water quality and beneficial uses in all parts of the Region will be protected. It also incorporates a number of "maximum benefit" proposals, whereby affected agencies seek nitrogen and TDS-related Basin Plan changes beyond those justified by the science. The intent of these proposals is to optimize wastewater management and water supply strategies in the public interest. The recommended Basin Plan amendment includes safeguards should these "maximum benefit" proposals not be implemented or not prove efficacious. Specifically, alternative nitrogen and TDS objectives (and, in the case of the Chino Basin, alternative management zone configuration) are identified that would apply in the event that the Board finds that "maximum benefit" has not been demonstrated. The proposed amendment also includes requirements for the implementation of a comprehensive monitoring program that will provide data necessary to evaluate and update the Board's Nitrogen and TDS regulatory program in the future.

13.0 Staff Recommendation

Direct staff to revise the proposed Basin Plan amendment, shown in the Attachment to tentative Resolution No. R8-2004-0001, based on comments received, and to prepare other documentation necessary for Regional Board consideration of adoption of the amendment at a future public hearing.

14.0 References

California State Water Resources Control Board, "Policy with Respect to Maintaining High Quality Waters, Resolution No. 68-16," October 1968.

Risk Sciences, "Final Description of Prado Basin Management Zone," September 2002.

U. S. Environmental Protection Agency, "Guidance for Choosing a Sampling Design for Environmental Data Collection (EPA/240/R-02/005)," December 2002.

U. S. Environmental Protection Agency, "Guidance on Environmental Data Verification and Data Validation (EPA/2240/R-02/004)," November 2000.

Wildermuth Environmental, Inc., "TIN/TDS Study – Phase 2A, Development of Groundwater Management Zones, Estimation of Historical and Current TDS and Nitrogen Concentrations in Groundwater, Final Technical Memorandum," July 2000.

Risk Science, "Reclamation Guidance Document" Prepared for TIN/TDS Task Force, Draft, September 2002.

Chino Basin Watermaster, Letter to Gerard Thibeault, "Chino Basin Watermaster Proposal for New Total Dissolved Solids (TDS) and Total Inorganic Nitrogen Water Quality Objectives for the Chino and Cucamonga Basins Based on Maximum Benefit," December 2002.

Yucaipa Valley Water District, Letter to Gerard Thibeault, "Yucaipa Valley Water District Proposal for New Total Dissolved Solids (TDS) and Total Inorganic Nitrogen Water Quality Objectives for the San Timoteo and Yucaipa Management Zones Based on Maximum Beneficial Use," January 10, 2002.

San Timoteo Watershed Management Agency, Letter to Gerard Thibeault, "Revised San Timoteo Watershed Management Agency Proposal for New Total Dissolved Solids (TDS) and Total Inorganic Nitrogen Water Quality Objectives for the Beaumont, San Timoteo and Yucaipa Management Zones Based on Maximum Benefit Use," November 2003.

City of Riverside, Memo from Rod Cruze to TIN/TDS Task Force, "Nitrogen Loss Assumptions for Reach 3 of the Santa Ana River, April 16, 2002.

Wildermuth Environmental, Inc., "TIN/TDS Study – Phase 2B, Wasteload Allocation Investigation, Final Technical Memorandum," October 2002.

Wildermuth Environmental, Inc., "June 2003 Addendum TIN/TDS Study – Phase 2B of the Santa Ana Watershed Wasteload Allocation Investigation". July 31, 2003. Report to SAWPA.

Wildermuth Environmental, Inc., Memo to TIN/TDS Task Force, "Transmittal of Final Tables, Figures and CD in Support of Basin Plan Amendments – TIN/TDS Study", October 3, 2002.

Wildermuth Environmental, Inc., "Santa Ana Watershed Data Collection and Management Program, Final Technical Memorandum," October 2001.

Wildermuth Environmental, Inc., personal communications, October 19, 2003.

Wildermuth Environmental, Inc., Letter to Regional Board , November 5, 2003.

Wildermuth Environmental, Inc., personal communications, November 8, 2003.

Risk Sciences, “Wasteload Allocation for RIX” October 3, 2003, Letter to California Regional Water Quality Control Board.