8-234

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WATER QUALITY CONTROL PLAN

SANTA ANA RIVER BASIN (8)

1995

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

SANTA ANA REGION

Adopted by Santa Ana Regional Water Quality Control Board, March 11, 1994 (Resolution No. 94-1)
Adopted by State Water Resources Control Board, July 21, 1994 (Resolution No. 94-60)
Approved by Office of Administrative Law, January 24, 1995

STATE OF CALIFORNIA

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California Regional Water Quality Control Board
Santa Ana Region

RESOLUTION NO. 94-1

Resolution Adopting the Updated Water Quality Control Plan for the Santa Ana River Basin (8)

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

1. The Water Quality Control Plan for the Santa Ana River Basin (Basin Plan) was adopted by the Regional Board on April 11, 1975 and approved by the State Water Resources Control Board (State Board) on April 17, 1975.

2. An amended Basin Plan was adopted by the Regional Board on May 13, 1983 and approved by the State Board on October 20, 1983. Since that time, specific amendments to the Basin Plan have been adopted by the Regional Board and approved by the State Board. These amendments include the following: revisions of compliance dates for certain waste discharge prohibitions; revisions of the beneficial use designations, in part to conform the Basin Plan to the State Board's Sources of Drinking Water Policy; revision of the total inorganic nitrogen wasteload allocation for discharges to the Santa Ana River system; and the incorporation of minimum lot size requirements and exemption criteria for the use of septic tank-subsurface disposal systems in the Region.

3. Section 303(c) of the Federal Clean Water Act requires that water quality standards be reviewed and revised, if appropriate, on a triennial basis, and Section 13240 of the California Water Code provides that basin plans must be periodically reviewed and may be revised.

4. In 1989, the State Board initiated a statewide program for comprehensive review and update of the basin plans by all regional boards.

5. With extensive public participation and input, the Regional Board has prepared an updated Basin Plan. This Basin Plan update process satisfies federal triennial review requirements under Section 303(c) of the Clean Water Act and the periodic review requirements of the California Water Code under Section 13240.

6. The Regional Board discussed the basin plan update process at its meeting on April 23, 1993. A first draft of the revised Basin Plan was released in June, 1993 and a public workshop to review that draft was conducted on July 16, 1993. The Regional Board released a second draft of the Basin Plan and the relevant staff report in September, 1993 and conducted a public workshop on October 22, 1993. The public workshops were conducted after notice was given to all interested persons in accordance with Section 13244 of the California Water Code. The testimony introduced at those workshops was considered in the preparation of the final revised Basin Plan.

7. Significant additions to the revised Basin Plan include the addition of a new beneficial use designation of "Limited Warm Freshwater Aquatic Habitat" (LWRM) specifically for concrete-lined channels, the creation of wetlands as a waterbody type, designation of RARE beneficial use for a number of waterbodies, revised un-ionized ammonia objectives and corresponding total ammonia effluent limits, water quality objectives for the Big Bear groundwater basin, revised total dissolved solids wasteload allocation and a discussion of water quality and water resource managment projects in the region.

8. In accordance with applicable guidance and regulations, the Regional Board has developed site-specific water quality objectives (SSOs) for cadmium, copper and lead in the Middle Santa Ana River system. The Regional Board reviewed and discussed the issues related to the development and adoption of these SSOs in public meetings and workshops on August 7, 1992, March 5, 1993 and June 4, 1993. The testimony introduced at these workshops was considered in the preparation of final recommendations for SSOs.

9. In accordance with the provisions of California Water Code, Section 13280 *et seq.*, the Regional Board developed a proposed Basin Plan amendment to incorporate the SSOs.

10. At a duly noticed Public Hearing on October 22, 1993, the Regional Board adopted Resolution No. 93-64, adopting the proposed Basin Plan amendment to incorporate the SSOs for cadmium, copper and lead for the middle Santa Ana River system. A staff report regarding this matter was prepared and distributed to all interested parties 30 days prior to the hearing. However, between the time of the transmittal of the staff report and the October 22, 1993 hearing, new information was presented that led to the modification of the SSOs which had been recommended in the staff report. To avoid procedural questions, it is appropriate to rescind Resolution No. 93-64 and to reconsider adoption of the SSOs as part of the final revised Basin Plan. A report concerning the SSOs considered and adopted by the Regional Board on October 22, 1993 is included in the staff report pertaining to the adoption of the revised Basin Plan.

11. Regional Board Resolution No. 92-10, adopted February 14, 1992, found that some of the national water quality criteria, including those for cadmium, copper and lead, are inappropriate for the Middle Santa Ana River because the flows are dominated by reclaimed water, which provides and supports beneficial uses which would not otherwise exist.

12. A Use-Attainability Analysis (UAA) has been conducted for the Santa Ana River. The UAA provided data and analyses which allow the Regional Board to make the following findings regarding the Santa Ana River:

    a. The Site-Specific Water Quality Objectives (SSOs) for cadmium, copper and lead proposed by Regional Board staff will protect the beneficial uses of the Santa Ana River.

    b. The proposed SSOs have been shown to be conservative.

c. The proposed SSOs, which represent higher water quality than presently exists, will not result in degradation of water quality.
d. Existing levels of cadmium, copper and lead in the SAR do not contribute to toxicity in the Santa Ana River.
e. Dischargers to the Santa Ana River are either in compliance with their NPDES permits or are meeting approved compliance schedules.

13. Adoption and implementation of the cadmium, copper and lead SSOs is consistent with the maximum benefit to the people of California, particularly because it encourages water reclamation and will support important social and economic development in the Santa Ana Region.

14. The findings of this Resolution with respect to metals SSOs are specific to the Santa Ana River and to cadmium, copper and lead These findings are not meant to establish precedent or be applicable to other metals or other water bodies.

15. The Regional Board has prepared and distributed a written report (Staff Report) on adoption of the revised Basin Plan, including site-specific objectives for metals, in compliance with applicable state and federal environmental regulations (California Code of Regulations, Section 3775, Title 23 and 40 CFR Parts 25 and 131).

16. The process of basin planning is exempt from the requirements of the California Environmental Quality Act (Public Resources Code Section 21000 *et seq*) to prepare an Environmental Impact Report or Negative Declaration. The updated Basin Plan includes a completed Environmental Checklist, an assessment of the environmental impacts of the adoption of the updated Basin Plan and a discussion of alternatives. The updated Basin Plan, Environmental Checklist, staff report and supporting documentation are functionally equivalent to an Environmental Impact Report or Negative Declaration.

17. Review of potential environmental impacts of adoption and implementation of the reviewed Basin Plan indicated that a substantial increase in energy consumption might be required and that there may be no feasible alternatives or mitigation measures for this impact. However, the only alternatives identified which would not require increase in energy consumption would not ensure protection of the beneficial uses of the waters of the Santa Ana Region and would therefore not comply with state and federal laws. Pursuant to CEQA regulations Section 15093a, Findings of Overriding Considerations, as attached to the Checklist, are therefore appropriate. The benefits of the Basin Plan amendments outweigh the unavoidable adverse environmental effects.

18. The Regional Board has considered federal and state antidegradation policies, the state Sources of Drinking Water Policy and other relevant water quality control policies and finds the updated Basin Plan consistent with those policies.

19. On January 28, 1994, the Regional Board held a Public Hearing to consider the revised Basin Plan, including site-specific objectives for metals. Notice of the Public Hearing was given to all interested persons and published in accordance with Water Code Section 13244.

20. This Basin Plan must be submitted for review and approval by the State Board, the Office of Administrative Law (OAL) and the US Environmental Protection Agency. Once approved by the State Board, the Basin Plan is to be submitted to the Office of Administrative Law. A Notice of Decision will be filed after the State Board and the Office of Administrative Law have acted on this matter. The Basin Plan must then be submitted for review by the U.S. Environmental Protection Agency.

21. The revised Basin Plan will become effective upon approval by the State Water Resources Control Board and the Office of Administrative Law

NOW THEREFORE BE IT RESOLVED THAT:

1. The California Regional Water Quality Control Board, Santa Ana Region, adopts the updated Water Quality Control Plan for the Santa Ana River Basin (8) as set forth in the attached document.

2. The Regional Board hereby adopts the Findings of Overriding Considerations attached to the Environmental Checklist prepared for the updated Water Quality Control Plan.

3. Resolution No. 93-64 adopting site-specific objectives for metals for the middle Santa Ana River system is hereby rescinded.

4. The Regional Board will implement the Inland Surface Waters Plan and Enclosed Bays and Estuaries Plan (Plans), where applicable, as long as they remain in effect. If the Plans are invalidated, the Regional Board will continue to issue National Pollutant Discharge Elimination System permits in compliance with the Porter-Cologne Act and applicable State and federal regulations, including but not limited to, 40 CFR 122.44(d).

5. Within three years after consultation with the Department of Fish and Game on specific waterbodies that support threatened or endangered species, and where scientific evidence indicates that certain existing water quality objectives for these water bodies do not adequately protect such species, the Regional Board will determine whether these objectives are adequately protective. In cases where such existing objectives do not provide adequate protection for threatened and endangered species, the Regional Board will develop and adopt adequately protective site-specific objectives for those constituents.

6. The Executive Officer is directed to forward copies of the updated Water Quality Control Plan for the Santa Ana River Basin (8) to the State Water Resources Control Board in accordance with the requirements of Section 13245 of the California Water Code.

7. The Regional Board requests that the State Water Resources Control Board approve the Water Quality Control Plan in accordance with the requirements of Sections 13245 and 13246 of the California Water Code and forward it to the Office of Administrative Law and the US Environmental Protection Agency-Region IX for approval.

I, Gerard J. Thibeault, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of a resolution adopted by the California Regional Water Quality Control Board, Santa Ana Region, on March 11, 1994.

Gerard J. Thibeault
Executive Officer

Table 3-1 BENEFICIAL USES

OCEAN WATERS	BENEFICIAL USE																			Hydrologic Unit	
	MUN	AGR	IND	PROC	GWR	NAV	POW	REC1	REC2	COMM	WARM	LWRM	COLD	BIOL	WILD	RARE	SPWN	MAR	SHEL	EST	Primary	Secondary
NEARSHORE ZONE																						
San Gabriel River to Poppy Street in Corona del Mar	+		X			X		X	X	X					X	X	X	X	X		801.11	
Poppy Street to Southeast Regional Boundary	+					X		X	X	X				X	X	X	X	X	X		801.11	
OFFSHORE ZONE																						
Waters Between Nearshore Zone and Limit of State Waters	+		X			X		X	X	X					X	X	X	X				

X Present or Potential Beneficial Use
I Intermittent Beneficial Use
+ Excepted from MUN (see text)

Defined by Ocean Plan Chapter II A.1.: "Within a zone bounded by shoreline and a distance of 1000 feet from shoreline or the 30-foot depth contour, whichever is further from shoreline..."

Table 3-1 BENEFICIAL USES

OCEAN WATERS	BENEFICIAL USE																			Hydrologic Unit	
	MUN	AGR	IND	PROC	GWR	NAV	POW	REC1	REC2	COMM	WARM	LWRM	COLD	BIOL	WILD	RARE	SPWN	MAR	SHEL	EST	Primary	Secondary
NEARSHORE ZONE																						
San Gabriel River to Poppy Street in Corona del Mar	+		X			X		X	X	X					X	X	X	X	X		801.11	
Poppy Street to Southeast Regional Boundary	+					X		X	X	X				X	X	X	X	X	X		801.11	
OFFSHORE ZONE																						
Waters Between Nearshore Zone and Limit of State Waters	+		X			X		X	X	X					X	X	X	X				

X Present or Potential Beneficial Use
I Intermittent Beneficial Use
\+ Excepted from MUN (see text)

Defined by Ocean Plan Chapter II A.1.: "Within a zone bounded by shoreline and a distance of 1000 feet from shoreline or the 30-foot depth contour, whichever is further from shoreline..."

Table 3-1 BENEFICIAL USES - Continued

BAYS, ESTUARIES, AND TIDAL PRISMS	BENEFICIAL USE																			Hydrologic Unit	
	MUN	AGR	IND	PROC	GWR	NAV	POW	REC1	REC2	COMM	WARM	LWRM	COLD	BIOL	WILD	RARE	SPWN	MAR	SHEL	EST	Primary	Secondary
Anaheim Bay - Outer Bay	+					X		X	X					X	X	X	X	X			801.11	
Anaheim Bay - Seal Beach National Wildlife Refuge	+							X[1]	X					X	X	X	X	X		X	801.11	
Sunset Bay - Huntington Harbour	+					X		X	X	X					X	X	X	X			801.11	
Bolsa Bay	+							X	X	X				X	X	X	X	X	X		801.11	
Bolsa Chica Ecological Reserve	+							X	X					X	X	X	X	X		X	801.11	
Lower Newport Bay	+					X		X	X	X					X	X	X	X	X		801.11	
Upper Newport Bay	+							X	X	X				X	X	X	X	X	X	X	801.11	
Santa Ana River Salt Marsh	+							X	X					X	X	X		X		X	801.11	
Tidal Prism of Santa Ana River (to within 1000' of Victoria Street) and Newport Slough	+							X	X	X					X	X		X			801.11	
Tidal Prism of San Gabriel River - River Mouth to Marina Drive	+		X					X	X	X					X	X		X	X	X	845.61	
Tidal Prisms of Flood Control Channels Discharging to Coastal or Bay Waters	+							X	X	X					X			X			801.11	

X Present or Potential Beneficial Use
I Intermittent Beneficial Use
\+ Excepted from MUN (see text)

[1] No access per agency with jurisdiction (U.S. Navy)

Table 3-1 BENEFICIAL USES - Continued

INLAND SURFACE STREAMS	BENEFICIAL USE																			Hydrologic Unit	
	MUN	AGR	IND	PROC	GWR	NAV	POW	REC1	REC2	COMM	WARM	LWRM	COLD	BIOL	WILD	RARE	SPWN	MAR	SHEL	EST	Primary	Secondary
LOWER SANTA ANA RIVER BASIN																						
Santa Ana River																						
Reach 1 - Tidal Prism to 17th Street in Santa Ana	+							X[2]	X		I				I						801.11	
Reach 2 - 17th Street in Santa Ana to Prado Dam	+	X			X			X	X		X				X	X					801.11	801.12
Aliso Creek	X				X			X	X		X				X	X					845.63	
Carbon Canyon Creek	X				X			X	X		X				X	X					845.63	
Santiago Creek Drainage																						
Santiago Creek																						
Reach 1 - below Irvine Lake	X				X			X[2]	X		X				X						801.12	801.11
Reach 2 - Irvine Lake (see Lakes, pg. 3-23)																						
Reach 3 - Irvine Lake to Modjeska Canyon	I				I			I	I		I				I						801.12	
Reach 4 - in Modjeska Canyon	X				X			X	X		X				X						801.12	
Silverado Creek	X				X			X	X		X				X						801.12	
Black Star Creek	I				I			I	I		I				I						801.12	
Ladd Creek	I				I			I	I		I				I	I					801.12	

X Present or Potential Beneficial Use
I Intermittent Beneficial Use
\+ Excepted from **MUN** (see text)

[2] Access prohibited in all or part by Orange County Environmental Managmeent Agency (OCEMA)

Table 3-1 BENEFICIAL USES - Continued

INLAND SURFACE STREAMS	BENEFICIAL USE																				Hydrologic Unit	
	MUN	AGR	IND	PROC	GWR	NAV	POW	REC1	REC2	COMM	WARM	LWRM	COLD	BIOL	WILD	RARE	SPWN	MAR	SHEL	EST	Primary	Secondary
San Diego Creek Drainage																						
San Diego Creek																						
Reach 1 - below Jeffrey Road	+							X[2]	X		X				X						801.11	
Reach 2 - above Jeffrey Road to Headwaters	+				I			I	I		I				I						801.11	
Other Tributaries: Bonita Creek, Serrano Creek, Peters Canyon Wash, Hicks Canyon Wash, Bee Canyon Wash, Borrego Canyon Wash, Agua Chinon Wash, Laguna Canyon Wash, Rattlesnake Canyon Wash, Sand Canyon Wash,* and other Tributaries to these Creeks	+				I			I	I		I				I						801.11	
San Gabriel River Drainage																						
Coyote Ck. (within Santa Ana Regional boundary)	X							X	X		X				X							

X Present or Potential Beneficial Use
I Intermittent Beneficial Use
\+ Excepted from **MUN** (see text)

* Sand Canyon Wash also has **RARE** Beneficial Use
[2] Access prohibited in all or part by Orange County Environmental Managmeent Agency (OCEMA)

Table 3-1 BENEFICIAL USES - Continued

INLAND SURFACE STREAMS	BENEFICIAL USE																				Hydrologic Unit	
	MUN	AGR	IND	PROC	GWR	NAV	POW	REC1	REC2	COMM	WARM	LWRM	COLD	BIOL	WILD	RARE	SPWN	MAR	SHEL	EST	Primary	Secondary
UPPER SANTA ANA RIVER BASIN																						
Santa Ana River																						
Reach 3 - Prado Dam to Mission Blvd. in Riverside	+	X			X			X	X		X				X	X					801.21	801.27, 801.25
Reach 4 - Mission Blvd. in Riverside to San Jacinto Fault in San Bernardino	+				X			X[3]	X		X				X						801.27	801.44
Reach 5 - San Jacinto Fault in San Bernardino to Seven Oaks Dam[1]	X	X			X			X[3]	X		X				X	X					801.52	801.57
Reach 6 - Seven Oaks Dam to Headwaters (see also Individual Tributary Streams)	X	X			X		X	X	X				X		X		X				801.72	
San Bernardino Mountain Streams																						
Mill Creek Drainage:																						
Mill Creek																						
Reach 1 - Confluence with Santa Ana River to Bridge Crossing Route 38 at Upper Powerhouse	I	I			I			I	I				I		I	I					801.58	
Reach 2 - Bridge Crossing Route 38 at Upper Powerhouse to Headwaters	X	X			X		X	X	X				X		X						801.58	

X Present or Potential Beneficial Use
I Intermittent Beneficial Use
\+ Excepted from **MUN** (see text)

MUN applies upstream of Orange Avenue (Redlands); downstream, water is excepted from **MUN**
[1] Reach 5 uses are intermittent upstream of Waterman Avenue
[3] Access prohibited in some portions by San Bernardino County Flood Control

Table 3-1 BENEFICIAL USES - Continued

INLAND SURFACE STREAMS	BENEFICIAL USE																			Hydrologic Unit	
	MUN	AGR	IND	PROC	GWR	NAV	POW	REC1	REC2	COMM	WARM	LWRM	COLD	BIOL	WILD	RARE	SPWN	MAR	SHEL	EST	Primary	Secondary
Mountain Home Creek	X				X		X	X	X				X		X						801.58	
Mountain Home Creek, East Fork	X				X		X	X	X				X		X		X				801.70	
Monkey Face Creek	X				X			X	X				X		X						801.70	
Alger Creek	X				X			X	X				X		X						801.70	
Falls Creek	X				X		X	X	X				X		X		X				801.70	
Vivian Creek	X				X			X	X				X		X						801.70	
High Creek	X				X			X	X				X		X						801.70	
Other Tributaries: Lost, Oak Cove, Green, Skinner, Momyer, Glen Martin, Camp, Hatchery, Rattlesnake, Slide, Snow, Bridal Veil, and Oak Creeks and other Tributaries to these Creeks	I				I			I	I				I		I						801.70	
Bear Creek Drainage:																						
Bear Creek	X	X			X		X	X	X				X		X		X				801.71	
Siberia Creek	X				X			X	X				X		X		X				801.71	
Slide Creek	I				I			I	I				I		I						801.71	
All other Tributaries to these Creeks	I				I			I	I				I		I						801.71	
Big Bear Lake (see Lakes, pg. 3-23)																						

X Present or Potential Beneficial Use
I Intermittent Beneficial Use
+ Excepted from **MUN** (see text)

Table 3-1 BENEFICIAL USES - Continued

INLAND SURFACE STREAMS	BENEFICIAL USE																			Hydrologic Unit	
	MUN	AGR	IND	PROC	GWR	NAV	POW	REC1	REC2	COMM	WARM	LWRM	COLD	BIOL	WILD	RARE	SPWN	MAR	SHEL	EST	Primary	Secondary
Big Bear Lake Tributaries:																						
North Creek	X				X			X	X				X		X		X				801.71	
Metcalf Creek	X				X			X	X				X		X		X				801.71	
Grout Creek	X				X			X	X				X		X		X				801.71	
Rathbone (Rathbun) Creek	X				X			X	X				X		X						801.71	
Meadow Creek	X				X			X	X				X		X						801.71	
Summit Creek	I				I			I	I				I		I						801.71	
Other Tributaries to Big Bear Lake: Knickerbocker, Johnson, Minnelusa, Polique, and Red Ant Creeks and other Tributaries to these Creeks	I				I			I	I				I		I						801.71	
Baldwin Lake (see Lakes, pg. 3-23)																						
Baldwin Lake Drainage:																						
Shay Creek	X				X			X	X				X		X	X					801.73	
Other Tributaries to Baldwin Lake: Sawmill, Green, and Caribou Canyons and other Tributaries to these Creeks	I				I			I	I				I		I						801.73	

X Present or Potential Beneficial Use
I Intermittent Beneficial Use
+ Excepted from **MUN** (see text)

Table 3-1 BENEFICIAL USES - Continued

INLAND SURFACE STREAMS	BENEFICIAL USE																				Hydrologic Unit	
	MUN	AGR	IND	PROC	GWR	NAV	POW	REC1	REC2	COMM	WARM	LWRM	COLD	BIOL	WILD	RARE	SPWN	MAR	SHEL	EST	Primary	Secondary
Other Streams Draining to Santa Ana River (Mountain Reaches[1])																						
Cajon Creek	X				X			X	X				X		X	X					801.52	801.51
City Creek	X	X			X			X	X				X		X	X	X				801.57	
Devil Canyon Creek	X				X			X	X				X		X						801.57	
East Twin and Strawberry Creeks	X	X			X			X	X				X		X		X				801.57	
Waterman Canyon Creek	X				X			X	X				X		X						801.57	
Fish Creek	X				X			X	X				X		X		X				801.57	
Forsee Creek	X				X			X	X				X		X		X				801.72	
Plunge Creek	X	X			X			X	X				X		X	X					801.72	
Barton Creek	X	X			X			X	X				X		X						801.72	
Bailey Canyon Creek	I				I			I	I				I		I						801.72	
Kimbark Canyon, East Fork Kimbark Canyon, Ames Canyon, and West Fork Cable Canyon Creeks	X				X			X	X		X		X		X						801.52	
Valley Reaches[1] of Above Streams	I				I			I	I		I				I						801.52	

X Present or Potential Beneficial Use
I Intermittent Beneficial Use
+ Excepted from **MUN** (see text)

[1] The division between Mountain and Valley reaches occurs at the base of the foothills of the San Bernardino or San Gabriel Mountains

Table 3-1 BENEFICIAL USES - Continued

INLAND SURFACE STREAMS	BENEFICIAL USE																				Hydrologic Unit	
	MUN	AGR	IND	PROC	GWR	NAV	POW	REC1	REC2	COMM	WARM	LWRM	COLD	BIOL	WILD	RARE	SPWN	MAR	SHEL	EST	Primary	Secondary
Other Tributaries (Mountain Reaches[U]): Alder, Badger Canyon, Bledsoe Gulch, Borea Canyon, Breakneck, Cable Canyon, Cienega Seca, Cold, Converse, Coon, Crystal, Deer, Elder, Fredalba, Frog, Government, Hamilton, Heart Bar, Hemlock, Keller, Kilpecker, Little Mill, Little Sand Canyon, Lost, Meyer Canyon, Mile, Monroe Canyon, Oak, Rattlesnake, Round Cienega, Sand, Schneider, Staircase, Warm Springs Canyon, and Wild Horse Creeks and other Tributaries to these Creeks	I				I			I	I				I		I						801.72	801.71, 801.57
San Gabriel Mountain Streams (Mountain Reaches[U])																						
San Antonio Creek	X	X	X	X	X		X	X	X				X		X						801.23	
Lytle Creek (South, Middle, and North Forks) and Coldwater Canyon Creek	X	X	X	X	X		X	X	X				X		X	X					801.41	801.42, 801.52, 801.59
Day Creek	X			X	X			X	X				X		X						801.21	
East Etiwanda Creek	X			X	X			X	X				X		X	X					801.21	
Valley Reaches[U] of Above Streams	I				I			I	I		I				I						801.21	

X Present or Potential Beneficial Use
I Intermittent Beneficial Use
+ Excepted from **MUN** (see text)

[U] The division between Mountain and Valley reaches occurs at the base of the foothills of the San Bernardino or San Gabriel Mountains

Table 3-1 BENEFICIAL USES - Continued

INLAND SURFACE STREAMS	BENEFICIAL USE																				Hydrologic Unit	
	MUN	AGR	IND	PROC	GWR	NAV	POW	REC1	REC2	COMM	WARM	LWRM	COLD	BIOL	WILD	RARE	SPWN	MAR	SHEL	EST	Primary	Secondary
Cucamonga Creek																						
Reach 1 - Confluence with Mill Creek to 23rd St. in Upland	+				X			X[3]	X			X			X						801.21	
Reach 2 (Mountain Reach[1]) -23rd St. in Upland to headwaters	X		X	X	X		X	X	X				X		X		X				801.24	
Mill Creek (Prado Area)	+							X	X		X				X	X					801.25	
Other Tributaries (Mountain Reaches[1]): Cajon Canyon, San Sevaine, Deer, Duncan Canyon, Henderson Canyon, Bull, Fan, Demens, Thorpe, Angalls, Telegraph Canyon, Stoddard Canyon, Icehouse Canyon, Cascade Canyon, Cedar, Falling Rock, Kerkhoff, and Cherry Creeks and other Tributaries to these Creeks	I				I			I	I				I		I						801.21	801.23
San Timoteo Area Streams																						
San Timoteo Creek																						
Reach 1 - Santa Ana River Confluence to Gage at San Timoteo Canyon Road	+	I			I			I[3]	I		I				I						801.52	801.53

X Present or Potential Beneficial Use
I Intermittent Beneficial Use
+ Excepted from **MUN** (see text)

[1] The division between Mountain and Valley reaches occurs at the base of the foothills of the San Bernardino or San Gabriel Mountains

[3] Access prohibited in some portions by San Bernardino County Flood Control

Table 3-1 BENEFICIAL USES - Continued

INLAND SURFACE STREAMS	BENEFICIAL USE																			Hydrologic Unit	
	MUN	AGR	IND	PROC	GWR	NAV	POW	REC1	REC2	COMM	WARM	LWRM	COLD	BIOL	WILD	RARE	SPWN	MAR	SHEL	EST	Primary	Secondary
Reach 2 - Gage at San Timoteo Canyon Road to Confluence with Yucaipa Creek	+				X			X	X		X				X						801.61	801.62
Reach 3 - Confluence with Yucaipa Creek to Bunker Hill II Groundwater Subbasin Boundary (T2S/R3W-24)	+				X			X	X		X				X						801.62	
Reach 4 - Bunker Hill II Groundwater Subbasin Boundary (T2S/R3W-24) to Confluence with Little San Gorgonio and Noble Creeks (Headwaters of San Timoteo Creek)	+				X			X	X		X				X						801.62	
Oak Glen, Potato Canyon, and Birch Creeks	X				X			X	X		X				X						801.67	
Little San Gorgonio Creek	X				X			X	X				X		X						801.69	801.62, 801.63
Yucaipa Creek	I				I			I	I		I				I						801.67	801.61, 801.62, 801.64
Other Tributaries to these Creeks - Valley Reaches[1]	I				I			I	I		I				I						801.62	801.52, 801.53
Other Tributaries to these Creeks - Mountain Reaches[1]	I				I			I	I				I		I						801.69	801.67
Anza Park Drain	X							X	X		X				X		X				801.27	

X Present or Potential Beneficial Use
I Intermittent Beneficial Use
\+ Excepted from **MUN** (see text)

[1] The division between Mountain and Valley reaches occurs at the base of the foothills of the San Bernardino or San Gabriel Mountains

Table 3-1 BENEFICIAL USES - Continued

INLAND SURFACE STREAMS	BENEFICIAL USE																				Hydrologic Unit	
	MUN	AGR	IND	PROC	GWR	NAV	POW	REC1	REC2	COMM	WARM	LWRM	COLD	BIOL	WILD	RARE	SPWN	MAR	SHEL	EST	Primary	Secondary
Sunnyslope Channel	X							X	X		X				X		X				801.27	
Tequesquite Arroyo (Sycamore Creek)	+				X			X	X		X				X		X				801.27	
Prado Area Streams																						
Chino Creek																						
Reach 1 - Santa Ana River confluence to beginning of concrete-lined channel south of Los Serranos Rd.	+							X	X		X				X	X					801.21	
Reach 2 - Beginning of concrete-lined channel south of Los Serranos Rd. to confluence with San Antonio Creek	+							X[3]	X			X			X						801.21	
Temescal Creek																						
Reach 1A - Santa Ana River Confluence to Lincoln Ave.	+	X	X		X			X[4]	X		X				X	X	X				801.25	
Reach 1B - Lincoln Ave. to Riverside Canal	+							X[4]	X			X			X						801.25	
Reach 2 - Riverside Canal to Lee Lake	+	I	I		I			I	I		I				I						801.32	801.25
Reach 3 - Lee Lake (see Lakes, pg. 3-23)																						

X Present or Potential Beneficial Use
I Intermittent Beneficial Use
\+ Excepted from MUN (see text)

[3] Access prohibited in some portions by San Bernardino County Flood Control
[4] Access prohibited in some portions by Riverside County Flood Control

Table 3-1 BENEFICIAL USES - Continued

INLAND SURFACE STREAMS	BENEFICIAL USE																			Hydrologic Unit	
	MUN	AGR	IND	PROC	GWR	NAV	POW	REC1	REC2	COMM	WARM	LWRM	COLD	BIOL	WILD	RARE	SPWN	MAR	SHEL	EST	Primary	Secondary
Reach 4 - Lee Lake to Mid-section line of Section 17 (downstream end of freeway cut)	+	I			I			I	I		I				I	X					801.34	
Reach 5 - Mid-section line of Section 17 (downstream end of freeway cut) to Elsinore Groundwater Subbasin Boundary	+	X			X			X	X		X				X	X					801.35	
Reach 6 - Elsinore Groundwater Subbasin Boundary to Lake Elsinore Outlet	+				I			I	I		I				I						801.35	
Coldwater Canyon Creek	X	X			X			X	X		X				X						801.32	
Bedford Canyon Creek	+				I			I	I		I				I						801.32	
Dawson Canyon Creek	I				I			I	I		I				I						801.32	
Other Tributaries to these Creeks	I				I			I	I		I				I						801.32	

X Present or Potential Beneficial Use
I Intermittent Beneficial Use
+ Excepted from **MUN** (see text)

Table 3-1 BENEFICIAL USES - Continued

INLAND SURFACE STREAMS	BENEFICIAL USE																				Hydrologic Unit	
	MUN	AGR	IND	PROC	GWR	NAV	POW	REC1	REC2	COMM	WARM	LWRM	COLD	BIOL	WILD	RARE	SPWN	MAR	SHEL	EST	Primary	Secondary
SAN JACINTO RIVER BASIN																						
San Jacinto River																						
Reach 1 - Lake Elsinore to Canyon Lake	I	I			I			I	I		I				I						802.32	802.31
Reach 2 - Canyon Lake (see Lakes, pg. 3-24)																						
Reach 3 - Canyon Lake to Nuevo Road	+	I			I			I	I		I				I						802.11	
Reach 4 - Nuevo Road to North-South Mid-Section Line, T4S/R1W-S8	+	I			I			I	I		I				I						802.14	802.21
Reach 5 - North-South Mid-Section Line, T4S/R1W-S8, to Confluence with Poppet Creek	+	I			I			I	I		I				I						802.21	
Reach 6 - Poppet Creek to Cranston Bridge	I	I			I			I	I		I				I						802.21	
Reach 7 - Cranston Bridge to Lake Hemet	X	X			X			X	X				X		X						802.21	
Bautista Creek - Headwaters to Debris Dam	X	X			X			X	X				X		X						802.21	802.23
Strawberry Creek and San Jacinto River, North Fork	X	X			X			X	X				X		X						802.21	

X Present or Potential Beneficial Use
I Intermittent Beneficial Use
+ Excepted from **MUN** (see text)

Table 3-1 BENEFICIAL USES - Continued

INLAND SURFACE STREAMS	BENEFICIAL USE																			Hydrologic Unit	
	MUN	AGR	IND	PROC	GWR	NAV	POW	REC1	REC2	COMM	WARM	LWRM	COLD	BIOL	WILD	RARE	SPWN	MAR	SHEL	EST	Primary	Secondary
Fuller Mill Creek	X	X			X			X	X				X		X						802.22	
Stone Creek	X	X			X			X	X				X		X						802.21	
Salt Creek	+							I	I		I				I						802.12	
Other Tributaries: Logan, Black Mountain, Juaro Canyon, Indian, Hurkey, Poppet, and Protrero Creeks and other Tributaries to these Creeks	I	I			I			I	I		I				I						802.21	802.22

X Present or Potential Beneficial Use
I Intermittent Beneficial Use
\+ Excepted from **MUN** (see text)

Table 3-1 BENEFICIAL USES - Continued

LAKES AND RESERVOIRS	BENEFICIAL USE																				Hydrologic Unit	
	MUN	AGR	IND	PROC	GWR	NAV	POW	REC1	REC2	COMM	WARM	LWRM	COLD	BIOL	WILD	RARE	SPWN	MAR	SHEL	EST	Primary	Secondary
UPPER SANTA ANA RIVER BASIN																						
Baldwin Lake	+							I	I		I		I	I	I	I					801.73	
Big Bear Lake	X	X			X			X	X		X		X		X	X					801.71	
Erwin Lake	X							X	X				X	X	X	X					801.73	
Evans, Lake	+							X	X		X		X		X						801.27	
Jenks Lake	X	X			X			X	X				X		X						801.72	
Lee Lake	+	X	X		X			X	X		X				X						801.34	
Mathews, Lake	X	X	X	X	X			X[5]	X		X				X	X					801.33	
Mockingbird Reservoir	+	X						X[6]	X		X				X						801.26	
Norconian, Lake	+							X	X		X				X						801.25	
LOWER SANTA ANA RIVER BASIN																						
Anaheim Lake	+				X			X	X		X				X						801.11	
Irvine Lake (Santiago Reservoir)	X	X						X	X		X		X		X						801.12	
Laguna, Lambert, Peters Canyon, Rattlesnake, Sand Canyon, and Siphon Reservoirs	+	X						X[7]	X		X				X						801.11	

X Present or Potential Beneficial Use
I Intermittent Beneficial Use
+ Excepted from **MUN** (see text)

[5] Access prohibited by the Metropolitan Water District
[6] Access prohibited by the Gage Canal Company (owner-operator)
[7] Access prohibited by Irvine Ranch Company

Table 3-1 BENEFICIAL USES - Continued

LAKES AND RESERVOIRS	BENEFICIAL USE																			Hydrologic Unit	
	MUN	AGR	IND	PROC	GWR	NAV	POW	REC1	REC2	COMM	WARM	LWRM	COLD	BIOL	WILD	RARE	SPWN	MAR	SHEL	EST	Primary	Secondary
SAN JACINTO RIVER BASIN																						
Canyon Lake (Railroad Canyon Reservoir)	X	X			X			X	X		X				X						802.11	802.12
Elsinore, Lake	+							X	X		X				X						802.31	
Fulmor, Lake	X	X						X	X		X		X		X						802.21	
Hemet, Lake	X	X			X		X	X	X		X		X		X		X				802.22	
Perris, Lake	X	X	X	X	X			X	X		X		X		X						802.11	

X Present or Potential Beneficial Use
I Intermittent Beneficial Use
+ Excepted from **MUN** (see text)

Table 3-1 BENEFICIAL USES - Continued

WETLANDS (INLAND)	BENEFICIAL USE																				Hydrologic Unit	
	MUN	AGR	IND	PROC	GWR	NAV	POW	REC1	REC2	COMM	WARM	LWRM	COLD	BIOL	WILD	RARE	SPWN	MAR	SHEL	EST	Primary	Secondary
San Joaquin Freshwater Marsh**	+							X	X		X			X	X	X					801.11	
Shay Meadows	I							I	I				I		I						801.73	
Stanfield Marsh**	X							X	X				X		X	X					801.71	
Prado Flood Control Basin**	+							X	X		X				X	X					801.25	
San Jacinto Wildlife Preserve**	+							X	X		X			X	X	X					802.15	
Glen Helen	X							X	X		X				X						801.59	

X Present or Potential Beneficial Use
I Intermittent Beneficial Use
+ Excepted from **MUN** (see text)

** This is a created wetland as defined in the wetlands discussion.

Table 3-1 BENEFICIAL USES - Continued

GROUNDWATER SUBBASINS	BENEFICIAL USE																				Hydrologic Unit	
	MUN	AGR	IND	PROC	GWR	NAV	POW	REC1	REC2	COMM	WARM	LWRM	COLD	BIOL	WILD	RARE	SPWN	MAR	SHEL	EST	Primary	Secondary
UPPER SANTA ANA RIVER BASIN																						
Big Bear Valley	X			X																	801.71	801.73
Cucamonga	X	X	X	X																	801.24	801.21
Chino I	X	X	X	X																	801.21	481.23, 481.22, 801.27
Chino II	X	X	X	X																	801.21	481.21, 801.23
Chino III	X	X	X	X																	801.21	481.21, 801.27, 801.26
San Timoteo	X	X	X	X																	801.60	801.63, 801.64, 801.66, 801.68
Bunker Hill I	X	X	X	X																	801.51	
Bunker Hill II	X	X	X	X																	801.52	
Bunker Hill Pressure	X	X	X	X																	801.52	
Lytle Creek	X	X	X	X																	801.41	801.42
Rialto	X	X	X	X																	801.43	801.44
Colton	X	X	X	X																	801.44	801.45, 801.27
Riverside I	X	X	X	X																	801.27	
Riverside II	X	X	X	X																	801.27	
Riverside III	X	X	X	X																	801.27	
Arlington	X	X	X	X																	801.26	801.25

X Present or Potential Beneficial Use
I Intermittent Beneficial Use
+ Excepted from **MUN** (see text)

Table 3-1 BENEFICIAL USES - Continued

GROUNDWATER SUBBASINS	BENEFICIAL USE																				Hydrologic Unit	
	MUN	AGR	IND	PROC	GWR	NAV	POW	REC1	REC2	COMM	WARM	LWRM	COLD	BIOL	WILD	RARE	SPWN	MAR	SHEL	EST	Primary	Secondary
Bedford (Upper Temescal I)	X	X	X	X																	801.32	
Lee Lake (Upper Temescal II)	X	X	X	X																	801.34	
Coldwater (Upper Temescal III)	X	X	X	X																	801.31	
Temescal	X	X	X	X																	801.25	
SAN JACINTO RIVER BASIN																						
Garner Valley	X	X																			802.22	
Idyllwild Area	X		X																		802.22	802.21
San Jacinto - Canyon	X	X	X	X																	802.21	
San Jacinto - Lower Pressure	X	X	X																		802.21	
San Jacinto - Intake	X	X	X	X																	802.21	
San Jacinto - Upper Pressure	X	X	X	X																	802.21	
Hemet	X	X	X	X																	802.15	802.21
Lakeview	X	X	X	X																	802.14	
Perris North	X	X	X	X																	802.11	
Perris South I	X	X																			802.11	
Perris South II	X	X																			802.11	
Perris South III	X	X																			802.11	
Winchester	X	X																			802.13	
Menifee I	X	X		X																	802.12	

X Present or Potential Beneficial Use
I Intermittent Beneficial Use
+ Excepted from **MUN** (see text)

Table 3-1 BENEFICIAL USES - Continued

GROUNDWATER SUBBASINS	BENEFICIAL USE																				Hydrologic Unit	
	MUN	AGR	IND	PROC	GWR	NAV	POW	REC1	REC2	COMM	WARM	LWRM	COLD	BIOL	WILD	RARE	SPWN	MAR	SHEL	EST	Primary	Secondary
Menifee II	X	X		X																	802.12	
Elsinore	X	X		X																	802.31	802.32
LOWER SANTA ANA RIVER BASIN																						
La Habra	X	X																			845.62	
Santiago	X	X	X																		801.12	
Santa Ana Forebay	X	X	X	X																	801.11	801.13, 845.61
Santa Ana Pressure	X	X	X	X																	801.11	845.61
Irvine Forebay I	X	X	X	X																	801.11	
Irvine Forebay II	X	X	X	X																	801.11	
Irvine Pressure	X	X	X	X																	801.11	

X Present or Potential Beneficial Use
I Intermittent Beneficial Use
+ Excepted from **MUN** (see text)

CHAPTER 4
WATER QUALITY OBJECTIVES

INTRODUCTION

The Porter-Cologne Act defines water quality objectives as "...the limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area" (§13050(h)). Further, the Act directs (§13241) that:

> "Each regional board shall establish such water quality objectives in water quality control plans as in its judgement will ensure the reasonable protection of beneficial uses and the prevention of nuisance: however, 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 the 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."

Two important additional factors which were also considered in setting the water quality objectives in this Plan are (1) historic and present water quality, and (2) the antidegradation policies cited in Chapter 2.

The water quality objectives in this plan supersede and replace those adopted in the 1983 Basin Plan. Perhaps the most significant difference between this and the prior Plan is the inclusion of new objectives for un-ionized ammonia and site-specific objectives for the middle Santa Ana River system for copper, cadmium, and lead.

Some of these water quality objectives refer to "controllable sources" or "controllable water quality factors." Controllable sources include both point and nonpoint source discharges, such as conventional discharges from pipes, as well as discharges from land areas or other diffuse sources. Controllable water quality factors are those characteristics of the discharge and/or the receiving water which can be controlled by treatment or management methods. Examples of other activities which may not involve waste discharges, but which also constitute controllable water quality factors, include the percolation of storm water, transport/delivery of water via natural stream channels, and stream diversions.

The water quality objectives in this Plan are specified according to waterbody type: ocean waters; enclosed bays and estuaries; inland surface waters; and groundwaters.

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 use to continue unimpaired. In other cases, an objective may prohibit the discharge of specific substances, may tolerate natural or "background" levels of certain substances or characteristics but no increases over those values, or may express a limit in terms of not impacting other beneficial uses. An adverse effect or impact on a beneficial use occurs where there is an actual or threatened loss or impairment of that beneficial use.

OCEAN WATERS

Water quality objectives specified in the "Water Quality Control Plan for Ocean Waters of California" (Ocean Plan) and the "Water Quality

Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California (Thermal Plan) are incorporated into this Basin Plan by reference. The provisions of the Ocean Plan and Thermal Plan apply to the ocean waters within this Region.

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ENCLOSED BAYS AND ESTUARIES

"Enclosed bays" means indentations along the coast which enclose an area of oceanic water within distinct headlands or harbor works. "Estuaries" means waters, including coastal lagoons, located at the mouths of streams which serve as areas of mixing for fresh and ocean waters. Enclosed bays and estuaries do not include ocean waters or inland surface waters (see definition in the Inland Surface Waters section).

The objectives which are included below apply to all enclosed bays and estuaries within the region. In addition to these parameter-specific objectives, the following narrative objective shall apply:

Enclosed bay and estuarine communities and populations, including vertebrate, invertebrate, and plant species, shall not be degraded as a result of the discharge of waste. Degradation is damage to an aquatic community or population with the result that a balanced community no longer exists. A balanced community is one that is (1) diverse, (2) has the ability to sustain itself through cyclic seasonal changes, (3) includes necessary food chain species, and (4) is not dominated by pollution-tolerant species, unless that domination is caused by physical habitat limitations. A balanced community also (5) may include historically introduced non-native species, but (6) does not include species present because best available technology has not been implemented, or (7) because site-specific objectives have been adopted, or (8) because of thermal discharges.

Algae

Excessive growth of algae and/or other aquatic plants can degrade water quality. Algal blooms sometimes occur naturally, but they are often the result of excess nutrients (*i.e.*, nitrogen, phosphorus) from waste discharges or nonpoint sources. These blooms can lead to problems with tastes, odors, color, and increased turbidity and can depress the dissolved oxygen content of the water, leading to fish kills. Floating algal scum and algal mats are also an aesthetically unpleasant nuisance.

Waste discharges shall not contribute to excessive algal growth in receiving waters.

Bacteria, Coliform

Fecal bacteria are part of the intestinal flora of warm- blooded animals. Their presence in bay and estuarine waters is an indicator of pollution. Total coliform is measured in terms of the number of coliform organisms per unit volume. Total coliform numbers can include non-fecal bacteria, so additional testing is often done to confirm the presence and numbers of fecal coliform bacteria.

Water quality objectives for numbers of total and fecal coliform vary with the uses of the water, as shown below.

Bays and Estuaries

REC-1 *Fecal coliform: log mean less than 200 organisms/100 mL based on five or more samples/30 day period, and not more than 10% of the samples exceed 400 organisms/100 mL for any 30-day period*

SHEL *Fecal coliform: median concentration not more than 14 MPN (most probable number)/100 mL and not more than 10% of samples exceed 43 MPN/100 mL*

Chlorine, Residual

Wastewater disinfection with chlorine usually produces a chlorine residual. Chlorine and its reaction products are toxic to aquatic life.

To protect aquatic life, the chlorine residual in wastewater discharged to enclosed bays and estuaries shall not exceed 0.1 mg/L.

Color

Color in water may arise naturally, such as from minerals, plant matter or algae, or may be caused by industrial pollutants. Color is primarily an aesthetic consideration.

Waste discharges shall not result in coloration of the receiving waters which causes a nuisance or adversely affects beneficial uses. The natural color of fish, shellfish or other bay and estuarine water resources used for human consumption shall not be impaired.

Floatables

Floatables are an aesthetic nuisance as well as a substrate for algae and insect vectors.

Waste discharges shall not contain floating materials, including solids, liquids, foam or scum, which cause a nuisance or adversely affect beneficial uses.

Oil and Grease

Oil and grease can be present in water as a result of the discharge of treated wastes and the accidental or intentional dumping of wastes into sinks and storm drains. Oils and related materials have a high surface tension and are not soluble in water, therefore forming a film on the water's surface. This film can result in nuisance conditions because of odors and visual impacts. Oil and grease can coat birds and aquatic organisms, adversely affecting respiration and/or thermoregulation.

Waste discharges shall not result in deposition of oil, grease, wax or other materials in concentrations which result in a visible film or in coating objects in the water, or which cause a nuisance or adversely affect beneficial uses.

Oxygen, Dissolved

Adequate dissolved oxygen (D.O.) is vital for aquatic life. Depression of D.O. levels can lead to fish kills and odors resulting from anaerobic decomposition. Dissolved oxygen content in water is a function of water temperature and salinity.

The dissolved oxygen content of enclosed bays and estuaries shall not be depressed to levels that adversely affect beneficial uses as a result of controllable water quality factors.

pH

pH is a measure of the hydrogen ion concentration of water. pH values generally range from 0 (most acidic) to 14 (most alkaline). Many pollutants can alter the pH, raising or lowering it excessively. These extremes in pH can have adverse effects on aquatic biota and can corrode pipes and concrete. Even small changes in pH can harm aquatic biota.

The pH of bay or estuary waters shall not be raised above 8.6 or depressed below 7.0 as a result of controllable water quality factors; ambient pH levels shall not be changed more than 0.2 units.

Radioactivity

Radioactive materials shall not be present in the bay or estuarine waters of the region in concentrations which are deleterious to human, plant or animal life.

Solids, Suspended and Settleable

Settleable solids are deleterious to benthic organisms and may cause anaerobic conditions to form. Suspended solids can clog fish gills and interfere with respiration in aquatic fauna. They also screen

out light, hindering photosynthesis and normal aquatic plant growth and development.

Enclosed bays and estuaries shall not contain suspended or settleable solids in amounts which cause a nuisance or adversely affect beneficial uses as a result of controllable water quality factors.

Sulfides

Sulfides are generated by many industries and from the anaerobic decomposition of organic matter. In water, sulfides can react to form hydrogen sulfide (H_2S), commonly known for its "rotten egg" odor. Sulfides in ionic form are also toxic to fish.

The dissolved sulfide content of enclosed bays and estuaries shall not be increased as a result of controllable water quality factors.

Surfactants (surface-active agents)

This group of materials includes detergents, wetting agents, and emulsifiers.

Waste discharges shall not contain concentrations of surfactants which result in foam in the course of flow or use of the receiving water, or which adversely affect aquatic life.

Taste and Odor

Undesirable tastes and odors in water may be a nuisance and may indicate the presence of a pollutant(s).

The enclosed bays and estuaries of the region shall not contain, as a result of controllable water quality factors, taste- or odor-producing substances at concentrations which cause a nuisance or adversely affect beneficial uses. The natural taste and odor of fish, shellfish or other enclosed bay and estuarine water resources used for human consumption shall not be impaired.

Temperature

Waste discharges can cause temperature changes in the receiving waters which adversely affect the aquatic biota. Discharges most likely to cause these temperature effects are cooling tower and heat exchanger blowdown.

All bay and estuary waters shall meet the objective specified in the Thermal Plan.

Toxic Substances

Toxic substances shall not be discharged at levels that will bioaccumulate in aquatic resources to levels which are harmful to human health.

The concentrations of toxic substances in the water column, sediments or biota shall not adversely affect beneficial uses.

Turbidity

Turbidity is a measure of light scattered due to particulates in water.

Increases in turbidity which result from controllable water quality factors shall comply with the following:

Natural Turbidity	*Maximum Increase*
0-50 NTU	*20%*
50-100 NTU	*10 NTU*
Greater than 100 NTU	*10%*

All enclosed bay and estuaries of the region shall be free of changes in turbidity which adversely affect beneficial uses.

INLAND SURFACE WATERS

Inland surface waters include streams, rivers, lakes, and wetlands in the Region. Ocean waters and enclosed bays and estuaries are not considered inland surface waters.

The narrative objectives which are included below apply to all inland surface waters within the region, including lakes, streams, and wetlands. In addition, specific numerical objectives are listed in Table 4-1. Where more than one objective is applicable, the stricter shall apply. In addition to these objectives, the following shall apply:

Inland surface water communities and populations, including vertebrate, invertebrate, and plant species, shall not be degraded as a result of the discharge of waste. Degradation is damage to an aquatic community or population with the result that a balanced community no longer exists. A balanced community is one that is (1) diverse, (2) has the ability to sustain itself through cyclic seasonal changes, (3) includes necessary food chain species, and (4) is not dominated by pollution-tolerant species, unless that domination is caused by physical habitat limitations. A balanced community also (5) may include historically introduced non-native species, but (6) does not include species present because best available technology has not been implemented, or (7) because site-specific objectives have been adopted, or (8) because of thermal discharges.

Algae

Excessive growth of algae and/or other aquatic plants can degrade water quality. Algal blooms sometimes occur naturally, but they are often the result of excess nutrients (*i.e.*, nitrogen, phosphorus) from waste discharges or nonpoint sources. These blooms can lead to problems with tastes, odors, color, and increased turbidity and can depress the dissolved oxygen content of the water, leading to fish kills. Floating algal scum and algal mats are also an aesthetically unpleasant nuisance.

Waste discharges shall not contribute to excessive algal growth in inland surface receiving waters.

Ammonia, Un-ionized

Un-ionized ammonia (NH_3 or UIA) is toxic to fish and other aquatic organisms. In water, UIA exists in equilibrium with ammonium (NH_4^+) and hydroxide (OH^-) ions. The proportions of each change as the temperature, pH, and salinity of the water change.

The 1983 Basin Plan specified an UIA objective of 0.8 mg/L for water bodies designated WARM. The SWRCB directed the Regional Board to review the 0.8 mg/L objective because of concerns that it is not stringent enough to protect aquatic wildlife. The US EPA concurred that this review was necessary.

The Regional Board contracted with California State University, Fullerton to conduct a study of un-ionized ammonia in the Santa Ana River and to develop recommendations regarding the UIA objective. This study, which was conducted in 1985-87, was complemented by additional Regional Board staff analysis. The additional staff analysis focused on adjusting EPA's national criteria for WARM waters (published in 1984 and amended in 1992), using the recalculation procedure. With this procedure, cold- and warmwater species not found in the Santa Ana Region's WARM designated waters were deleted from the database used to derive the national criteria, and new criteria were calculated.

Based on these analyses, this Plan specifies UIA objectives for WARM and COLD designated waterbodies in the Region. **Note:** site-specific objectives have been developed for the Santa Ana River and certain tributaries (see next page).

Acute (1-hour) UIA-N Objectives

For waterbodies designated COLD:

Objective=0.822[0.52/FT/FPH/2], where

$FT=10^{0.03(20-T)}$ $0 \le T \le 20$°C

$FT=1$ $20 \le T \le 30$°C

$FPH=\frac{1+10^{(7.4-pH)}}{1.25}$ $6.5 \le pH \le 8$

$FPH=1$ $8 \le pH \le 9$

For waterbodies designated WARM:

Objective=0.822[0.87/FT/FPH/2], where

$FT=10^{0.03(20-T)}$ $0 \le T \le 25$°C

$FT=0.7079$ $25 \le T \le 30$°C

$FPH=\frac{1+10^{(7.4-pH)}}{1.25}$ $6.5 \le pH \le 8$

$FPH=1$ $8 \le pH \le 9$

Chronic (4-day) UIA-N Objectives

For waterbodies designated COLD:

Objective=0.822[0.52/FT/FPH/RATIO], where

$FT=10^{0.03(20-T)}$ $0 \le T \le 15$°C

$FT=1.4125$ $15 \le T \le 30$°C

$FPH=\frac{1+10^{(7.4-pH)}}{1.25}$ $6.5 \le pH \le 8$

$FPH=1$ $8 \le pH \le 9$

$$RATIO=\frac{24[10^{(7.7-pH)}]}{1+10^{(7.4-pH)}} \quad 6.5 \leq pH \leq 7.7$$

$$RATIO=13.5 \quad 7.7 \leq pH \leq 9$$

For waterbodies designated WARM:
Objective=0.822[0.87/FT/FPH/RATIO], where

$$FT=10^{0.03(20-T)} \quad 0 \leq T \leq 20°C$$

$$FT=1 \quad 20 \leq T \leq 30°C$$

$$FPH=\frac{1+10^{(7.4-pH)}}{1.25} \quad 6.5 \leq pH \leq 8$$

$$FPH=1 \quad 8 \leq pH \leq 9$$

$$RATIO=\frac{24[10^{(7.7-pH)}]}{1+10^{(7.4-pH)}} \quad 6.5 \leq pH \leq 7.7$$

$$RATIO=13.5 \quad 7.7 \leq pH \leq 9$$

Calculated numerical UIA-N objectives as well as corresponding total ammonia nitrogen concentration for various pH and temperature conditions are shown in Tables 4-2 and 4-3. Table 4-4 lists the above equations in a form that can be entered into a computer or calculator program.

Site-specific Un-ionized Ammonia Objective for the Santa Ana River System

In addition to the un-ionized ammonia (UIA) objectives specified above, this Plan includes a chronic (4-day) site-specific UIA objective for the middle Santa Ana River, Chino Creek, Mill Creek (Prado Area), Temescal Creek, and San Timoteo Creek. This site-specific objective is based on carefully controlled chronic toxicity tests on Santa Ana River water conducted as part of the Santa Ana River Use-Attainability Analysis Study. The Santa Ana River water was spiked with UIA concentrations ranging from 0.0 (control) to 1.0 mg/L. The No Observed Effect Level (NOEL) was found to be at a UIA concentration of 0.24 mg/L (or 0.19 mg/L as UIA-nitrogen). Using a 50% safety factor, the UIA objective developed is 0.12 mg/L (or 0.098 mg/L UIA-nitrogen).

To prevent chronic toxicity to aquatic life in the Santa Ana River, Reaches 2,3, and 4, Chino Creek, Mill Creek (Prado Area), Temescal Creek and San Timoteo Creek, discharges to these waterbodies shall not cause the concentration of un-ionized ammonia (as nitrogen) to exceed 0.098 mg/L (NH_3-N) as a 4-day average.

Bacteria, Coliform

Fecal bacteria are part of the intestinal flora of warm- blooded animals. Their presence in surface waters is an indicator of pollution. Total coliform is measured in terms of the number of coliform organisms per unit volume. Total coliform numbers can include non-fecal bacteria, so additional testing is often done to confirm the presence and numbers of fecal coliform bacteria. Water quality objectives for numbers of total and fecal coliform vary with the uses of the water, as shown below.

Lakes and Streams

MUN *Total coliform: less than 100 organisms/100 mL*

REC-1 *Fecal coliform: log mean less than 200 organisms/100 mL based on five or more samples/30 day period, and not more than 10% of the samples exceed 400 organisms/100 mL for any 30-day period*

REC-2 *Fecal coliform: average less than 2000 organisms/100 mL and not more than 10% of samples exceed 4000 organisms/100 mL for any 30-day period*

Boron

Boron is not considered a problem in drinking water supplies until concentrations of 20-30 mg/L are reached. In irrigation, boron is an essential element. However, boron concentrations in excess of 0.75 mg/L may be deleterious to certain crops, particularly citrus. The maximum safe concentration of even the most tolerant plants is about 4.0 mg/L of boron.

Boron concentrations shall not exceed 0.75 mg/L in inland surface waters of the region as a result of controllable water quality factors.

Chemical Oxygen Demand (COD)

COD is a measure of the total amount of oxidizable material present in a sample, including stable organic materials which are not measured by the BOD test.

Waste discharges shall not result in increases in COD levels in inland surface waters which exceed the values shown in Table 4-1 or which adversely affect beneficial uses.

Chloride

Excess chloride concentrations lead primarily to economic damage rather than public health hazards. Chlorides are considered to be among the most troublesome anions in water used for industrial or irrigation purposes since they significantly affect the corrosion rate of steel and aluminum and can be toxic to plants. A safe value for irrigation is considered to be less than 175 mg/L of chloride. Excess chlorides affect the taste of potable water, so drinking water standards are generally based on potability rather than on health. The secondary drinking water standard for chloride is 500 mg/L.

The chloride objectives listed in Table 4-1 shall not be exceeded as a result of controllable water quality factors.

Chlorine, Residual

Wastewater disinfection with chlorine usually produces a chlorine residual. Chlorine and its reaction products are toxic to aquatic life.

To protect aquatic life, the chlorine residual in wastewater discharged to inland surface waters shall not exceed 0.1 mg/L.

Color

Color in water may arise naturally, such as from minerals, plant matter, or algae, or may be caused by industrial pollutants. Color is primarily an aesthetic consideration, although it can discolor clothes and food. The secondary drinking water standard for color is 15 color units.

Waste discharges shall not result in coloration of the receiving waters which causes a nuisance or adversely affect beneficial uses. The natural color of fish, shellfish or other inland surface water resources used for human consumption shall not be impaired.

Dissolved Solids, Total (Total Filtrable Residue)

The Department of Health Services recommends that the concentration of total dissolved solids (TDS) in drinking water be limited to 1000 mg/L (secondary drinking water standard) due to taste considerations. For most irrigation uses, water should have a TDS concentration under 700 mg/L. Quality-related consumer cost analyses have indicated that a benefit to consumers exists if water is supplied at or below 500 mg/L TDS.

The dissolved mineral content of the waters of the region, as measured by the total dissolved solids test (Standard Methods for the Examination of Water and Wastewater, 16th Ed., 1985: 209B (180°C), p.95), shall not exceed the specific objectives listed in Table 4-1 as a result of controllable water quality factors.

Filtrable Residue, Total

See Dissolved Solids, Total

Floatables

Floatables are an aesthetic nuisance as well as a substrate for algae and insect vectors.

Waste discharges shall not contain floating materials, including solids, liquids, foam or scum, which cause a nuisance or adversely affect beneficial uses.

Fluoride

Fluoride in water supply used for industrial or irrigation purposes has certain detrimental effects. Fluoride in optimum concentrations in water supply (concentration dependent upon the mean annual air temperature) is considered beneficial for preventing dental caries, but concentrations above approximately 1 mg/L, or its equivalent at a given temperature, are considered likely to increase the risk of occurrence of dental fluorosis.

Fluoride concentrations shall not exceed values specified in the table below in inland surface waters designated MUN as a result of controllable water quality factors.

Annual Average of Maximum Daily Air Temperature (°C)	Optimum Fluoride Concentration (mg/L)
12.0 and below	1.2
12.1 to 14.6	1.1
14.7 to 17.6	1.0
17.7 to 21.4	0.9
21.5 to 26.2	0.8
26.3 to 32.5	0.7

Hardness (as $CaCO_3$)
The major detrimental effect of hardness is economic. Any concentration (reported as mg/L $CaCO_3$) greater than 100 mg/L results in the increased use of soap, scale buildup in utensils in domestic uses, and in plumbing. Hardness in industrial cooling waters is generally objectionable above 50 mg/L.

The objectives listed in Table 4-1 shall not be exceeded as a result of controllable water quality factors. If no hardness objective is listed in Table 4-1, the hardness of receiving waters used for municipal supply (MUN) shall not be increased as a result of waste discharges to levels that adversely affect beneficial uses.

Inorganic Nitrogen, Total
see Nitrogen, Total Inorganic

Metals
Metals can be toxic to human and animal life.

In 1990, the Environmental Protection Agency (EPA) placed the Santa Ana River, reaches 2, 3, and 4, and Chino Creek on the 304(l) list of Waters Not Meeting Applicable Water Quality Standards based on its review of data on certain metals in POTW discharges to the River.

The Santa Ana River dischargers and the Regional Board disagreed with and objected to EPA's 304(l) designation. To demonstrate whether or not the 304(l) designation is correct and what effects, if any, heavy metal levels may have on aquatic life in the Region, the Santa Ana River Dischargers Association and the Santa Ana Watershed Project Authority agreed to conduct a Use-Attainability Analysis (UAA).

The purpose of a Use-Attainability Analysis is to evaluate the physical, biological, chemical, and hydrological conditions of a river to determine what specific beneficial uses the waterbody can support. If local conditions preclude full attainment of an aquatic life beneficial use for reasons unrelated to water quality, federal and state authorities may allow variances from the generic water quality criteria.

The UAA began in February 1991 and concluded in March 1992. It provided detailed information on chemical, biological, and hydrologic conditions in the middle Santa Ana River aquatic system. Conclusions and recommendations were presented to the Board in June 1992. The information presented is reflected in the Santa Ana River discussion in Chapter 1 and in the new LWRM Beneficial Use designation (Chapter 3). Data provided by the UAA was also used to support the adoption of site-specific objectives for three metals, cadmium (Cd), copper (Cu), and lead (Pb) for the Santa Ana River (Reaches 2, 3, and 4) and the perennial portions of some tributaries (including Chino Creek, Cucamonga/Mill Creek, Temescal Creek, and creeks in the Riverside Narrows area).

In adopting these SSOs, the Regional Board found (RWQCB Resolution No. 94-1) that:

a. The Site-Specific Water Quality Objectives (SSOs) will protect the beneficial uses of the Santa Ana River.

b. The SSOs are conservative.

c. The SSOs, which represent higher water quality than presently exists, will not result in degradation of water quality.

d. Existing levels of cadmium, copper, and lead in the Santa Ana River do not contribute to toxicity in the Santa Ana River.

The toxicity of these metals varies with water hardness. No fixed hardness value is assumed; objectives are calculated using the hardness of the collected sample.

The following equations represent the SSOs which apply to these waterbodies. These SSOs are expressed as the dissolved form of the metals.

SSO for Cadmium:

$$Cd\ SSO = 0.85[e^{[0.7852*ln(TH)-3.490]}]$$

SSO for Copper:

$$Cu\ SSO = 0.85[e^{[0.8545*ln(TH)-1.465]}]$$

SSO for Lead:

$$Pb\ SSO = 0.25[e^{[1.273*ln(TH)-3.958]}]$$

where TH is the total hardness (as $CaCO_3$) in mg/L.

The SSOs for cadmium and copper are simply the hardness-dependent formulas for calculating the objective (national criteria), corrected by the dissolved-to-total (metal) ratio. The SSO for lead is the recalculated* hardness-dependent formula, corrected by the dissolved-to-total ratio.

The table below shows the site-specific objectives for cadmium, copper, and lead that would apply to a water sample with 200 mg/L total hardness (as $CaCO_3$).

Metal	Calculated WQO	Recalculated Value	EPA Correction Factor	SSO
Cd	2.0	NA	0.85	1.7
Cu	21.4	NA	0.85	18.2
Pb	7.7	16.2	0.25	4.1

Toxicity testing performed as part of the Santa Ana River Use-Attainability Analysis (UAA) has demonstrated that the levels of dissolved metal shown below are safe and non-toxic in Santa Ana River water.

Cadmium	4 µg/L
Copper	37 µg/L
Lead	28 µg/L

There is also evidence that levels as much as 100% higher than those shown above do not result in chronic toxicity.

Methylene Blue-Activated Substances (MBAS)

The MBAS test is sensitive to the presence of detergents (see surfactants). Positive results may indicate the presence of wastewater. The secondary drinking water standard for MBAS is 0.05 mg/L.

MBAS concentrations shall not exceed 0.05 mg/L in inland surface waters designated MUN as a result of controllable water quality factors.

Nitrate

High nitrate concentrations in domestic water supplies can be toxic to human life. Infants are particularly susceptible and may develop methemoglobinemia (blue baby syndrome). The primary drinking water standard for nitrate (as NO_3) is 45 mg/L or 10 mg/L (as N).

Nitrate-nitrogen concentrations shall not exceed 45 mg/L (as NO_3) or 10 mg/L (as N) in inland surface waters designated MUN as a result of controllable water quality factors.

Nitrogen, Total Inorganic

The objectives listed in Table 4-1 shall not be exceeded as a result of controllable water quality factors.

Oil and Grease

Oil and grease can be present in water as a result of the discharge of treated wastes and the accidental or intentional dumping of wastes into sinks and storm drains. Oils and related materials have a high surface tension and are not soluble in water, therefore forming a film on the water's surface. This film can result in nuisance conditions because of odors and visual impacts. Oil and grease can coat birds and aquatic organisms, adversely affecting respiration and/or thermoregulation.

Waste discharges shall not result in deposition of oil, grease, wax or other materials in concentrations which result in a visible film or in coating objects in the water, or which cause a nuisance or adversely affect beneficial uses.

Oxygen, Dissolved

Adequate dissolved oxygen (D.O.) is vital for aquatic life. Depression of D.O. levels can lead to fish kills and odors resulting from anaerobic decomposition. Dissolved oxygen content in water is a function of water temperature and salinity.

* Recalculation for lead was carried out by EPA-Region IX, using the lowest genus mean acute value (GMAV) as the final acute value (FAV) and an acute-to chronic ratio (ACR) of 51.29, resulting in a final chronic value (FCV) of 2.78 and the SSO formula already shown.

The dissolved oxygen content of surface waters shall not be depressed below 5 mg/L for waters designated WARM, or 6 mg/L for waters designated COLD, as a result of controllable water quality factors. In addition, waste discharges shall not cause the median dissolved oxygen concentration to fall below 85% of saturation or the 95th percentile concentration to fall below 75% of saturation within a 30-day period.

pH

pH is a measure of the hydrogen ion concentration of water. pH values generally range from 0 (most acidic) to 14 (most alkaline). Many pollutants can alter the pH, raising or lowering it excessively. These extremes in pH can have adverse effects on aquatic biota and can corrode pipes and concrete. Even small changes in pH can harm aquatic biota.

The pH of inland surface waters shall not be raised above 8.5 or depressed below 6.5 as a result of controllable water quality factors.

Radioactivity

Radioactive materials shall not be present in the waters of the region in concentrations which are deleterious to human, plant or animal life. Waters designated MUN shall meet the limits specified in the California Code of Regulations, Title 22, and listed here:

Combined Radium-226 and Radium-228	*5*	*pCi/L*
Gross Alpha particle activity	*15*	*pCi/L*
Tritium	*20,000*	*pCi/L*
Strontium-90	*8*	*pCi/L*
Gross Beta particle activity	*50*	*pCi/L*
Uranium	*20*	*pCi/L*

Sodium

The presence of sodium in drinking water may be harmful to persons suffering from cardiac, renal, and circulatory diseases. It can contribute to taste effects, with the taste threshold depending on the specific sodium salt. Excess concentrations of sodium in irrigation water reduce soil permeability to water and air. The deterioration of soil quality because of the presence of sodium in irrigation water is cumulative and is accelerated by poor drainage.

The sodium objectives listed in Table 4-1 shall not be exceeded as a result of controllable water quality factors.

Solids, Suspended and Settleable

Settleable solids are deleterious to benthic organisms and may cause anaerobic conditions to form. Suspended solids can clog fish gills and interfere with respiration in aquatic fauna. They also screen out light, hindering photosynthesis and normal aquatic plant growth and development.

Inland surface waters shall not contain suspended or settleable solids in amounts which cause a nuisance or adversely affect beneficial uses as a result of controllable water quality factors.

Sulfate

Excessive sulfate, particularly magnesium sulfate ($MgSO_4$) in potable waters can lead to laxative effects, but this effect is temporary. There is some taste effect from magnesium sulfate in the range of 400-600 mg/L as $MgSO_4$. The secondary drinking water standard for sulfate is 500 mg/L. Sulfate concentrations in waters native to this region are normally low, less than 40 mg/L, but imported Colorado River water contains approximately 300 mg/L of sulfate.

The objectives listed in Table 4-1 shall not be exceeded as a result of controllable water quality factors.

Sulfides

Sulfides are generated by many industries and from the anaerobic decomposition of organic matter. In water, sulfides can react to form hydrogen sulfide (H_2S), commonly known for its "rotten egg" odor. Sulfides in ionic form are also toxic to fish in.

The dissolved sulfide content of inland surface waters shall not be increased as a result of controllable water quality factors.

Surfactants (surface-active agents)

This group of materials includes detergents, wetting agents, and emulsifiers. See also Methylene Blue-Activated Substances (MBAS).

Waste discharges shall not contain concentrations of surfactants which result in foam in the course of flow or use of the receiving water, or which adversely affect aquatic life.

Taste and Odor

Undesirable tastes and odors in water may be a nuisance and may indicate the presence of a pollutant(s). The secondary drinking water standard for odor (threshold) is 3 odor units.

The inland surface waters of the region shall not contain, as a result of controllable water quality factors, taste- or odor-producing substances at concentrations which cause a nuisance or adversely affect beneficial uses. The natural taste and odor of fish, shellfish or other regional inland surface water resources used for human consumption shall not be impaired.

Temperature

Waste discharges can cause temperature changes in the receiving waters which adversely affect the aquatic biota. Discharges most likely to cause these temperature effects are cooling tower and heat exchanger blowdown.

The natural receiving water temperature of inland surface waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Board that such alteration in temperature does not adversely affect beneficial uses. The temperature of waters designated COLD shall not be increased by more than 5°F as a result of controllable water quality factors. The temperature of waters designated WARM shall not be raised above 90°F June through October or above 78°F during the rest of the year as a result of controllable water quality factors. Lake temperatures shall not be raised more than 4°F above established normal values as a result of controllable water quality factors.

Total Dissolved Solids

See Dissolved Solids, Total

Total Filtrable Residue

See Dissolved Solids, Total

Total Inorganic Nitrogen

See Nitrogen, Total Inorganic

Toxic Substances

Toxic substances shall not be discharged at levels that will bioaccumulate in aquatic resources to levels which are harmful to human health.

The concentrations of contaminants in waters which are existing or potential sources of drinking water shall not occur at levels which are harmful to human health.

The concentrations of toxic pollutants in the water column, sediments or biota shall not adversely affect beneficial uses.

Turbidity

Turbidity is a measure of light scattered due to particulates in water. The secondary drinking water standard for turbidity is 5 NTU (nephelometric turbidity units).

Increases in turbidity which result from controllable water quality factors shall comply with the following:

Natural Turbidity	*Maximum Increase*
0-50 NTU	*20%*
50-100 NTU	*10 NTU*
Greater than 100 NTU	*10%*

All inland surface waters of the region shall be free of changes in turbidity which adversely affect beneficial uses.

GROUNDWATERS

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.

Arsenic

Arsenic concentrations shall not exceed 0.05 mg/L in groundwaters designated MUN as a result of controllable water quality factors.

Bacteria, Coliform
Fecal bacteria are part of the intestinal flora of warm- blooded animals. Their presence in groundwater is an indicator of pollution. Total coliform is measured in terms of the number of coliform organisms per unit volume. Total coliform numbers can include non-fecal bacteria, so additional testing is often done to confirm the presence and numbers of fecal coliform bacteria. Water quality objectives for numbers of total and fecal coliform vary with the uses of the water, as shown below.

Total coliform numbers shall not exceed 2.2 organisms/100 mL median over any seven-day period in groundwaters designated MUN as a result of controllable water quality factors.

Barium
Barium concentrations shall not exceed 1.0 mg/L in groundwaters designated MUN as a result of controllable water quality factors.

Boron
Boron is not considered a problem in drinking water supplies until concentrations of 20-30 mg/L are reached. In irrigation, boron is an essential element. However, boron concentrations in excess of 0.75 mg/L may be deleterious to certain crops, particularly citrus. The maximum safe concentration of even the most tolerant plants is about 4.0 mg/L of boron.

Boron concentrations shall not exceed 0.75 mg/L in groundwaters of the region as a result of controllable water quality factors.

Chloride
Excess chloride concentrations lead primarily to economic damage rather than public health hazards. Chlorides are considered to be among the most troublesome anions in water used for industrial or irrigation purposes since they significantly affect the corrosion rate of steel and aluminum and can be toxic to plants. A safe value for irrigation is considered to be less than 175 mg/L of chloride. Excess chlorides affect the taste of potable water, so drinking water standards are generally based on potability rather than on health. The secondary drinking water standard for chloride is 500 mg/L.

The chloride objectives listed in Table 4-1 shall not be exceeded as a result of controllable water quality factors.

Color
Color in water may arise naturally, such as from minerals, plant matter or algae, or may be caused by industrial pollutants. Color is primarily an aesthetic consideration, although it can discolor clothes and food. The secondary drinking water standard for color is 15 color units.

Waste discharges shall not result in coloration of the receiving waters which causes a nuisance or adversely affects beneficial uses.

Cyanide
Cyanide concentrations shall not exceed 0.2 mg/L in groundwaters designated MUN as a result of controllable water quality factors.

Dissolved Solids, Total (Total Filtrable Residue)
The Department of Health Services recommends that the concentration of total dissolved solids (TDS) in drinking water be limited to 1000 mg/L (secondary drinking water standard) due to taste considerations. For most irrigation uses, water should have a TDS concentration under 700 mg/L. Quality-related consumer cost analyses have indicated that a benefit to consumers exists if water is supplied at or below 500 mg/L TDS.

The dissolved mineral content of the waters of the region, as measured by the total dissolved solids test (Standard Methods for the Examination of Water and Wastewater, 16th Ed., 1985: 209B (180°C), p.95), shall not exceed the specific objectives listed in Table 4-1 as a result of controllable water quality factors.

Filtrable Residue, Total
See Dissolved Solids, Total

Fluoride
Fluoride in water supply used for industrial or irrigation purposes has certain detrimental effects. Fluoride in optimum concentrations in water supply (concentration dependent upon the mean annual air temperature) is considered beneficial for preventing dental caries, but concentrations above

approximately 1 mg/L, or its equivalent at a given temperature, are considered likely to increase the risk of occurrence of dental fluorosis.

Fluoride concentrations shall not exceed 1.0 mg/L in groundwaters designated MUN as a result of controllable water quality factors.

Hardness (as $CaCO_3$)
The major detrimental effect of hardness is economic. Any concentration (reported as mg/L $CaCO_3$) greater than 100 mg/L results in the increased use of soap, scale buildup in utensils in domestic uses, and in plumbing. Hardness in industrial cooling waters is generally objectionable above 50 mg/L.

The objectives listed in Table 4-1 shall not be exceeded as a result of controllable water quality factors. If no hardness objective is listed in Table 4-1, the hardness of receiving waters used for municipal supply (MUN) shall not be increased as a result of waste discharges to levels that adversely affect beneficial uses.

Metals
Metals can be toxic to human and animal life.

Metals concentrations shall not exceed the values listed below in groundwaters designated MUN as a result of controllable water quality factors.

Metal	*Concentration (mg/L)*
Cadmium	*0.01*
Chromium	*0.05*
Cobalt	*0.2*
Copper	*1.0*
Iron	*0.3*
Lead	*0.05*
Manganese	*0.05*
Mercury	*0.002*
Selenium	*0.01*
Silver	*0.05*

Methylene Blue-Activated Substances (MBAS)
The MBAS test is sensitive to the presence of detergents (see surfactants in inland surface waters discussion). Positive results may indicate the presence of wastewater. The secondary drinking water standard for MBAS is 0.05 mg/L.

MBAS concentrations shall not exceed 0.05 mg/L in groundwaters designated MUN as a result of controllable water quality factors.

Nitrate
High nitrate concentrations in domestic water supplies can be toxic to human life. Infants are particularly susceptible and may develop methemoglobinemia (blue baby syndrome). The primary drinking water standard for nitrate (as NO_3) is 45 mg/L or 10 mg/L (as N).

Nitrate-nitrogen concentrations listed in Table 4-1 shall not be exceeded as a result of controllable water quality factors.

Oil and Grease
Oil and grease can be present in water as a result of the discharge of treated wastes and the accidental or intentional dumping of wastes into sinks and storm drains. Oils and related materials have a high surface tension and are not soluble in water, therefore forming a film on the water's surface. This film can result in nuisance conditions because of odors and visual impacts.

Waste discharges shall not result in deposition of oil, grease, wax or other materials in concentrations which cause a nuisance or adversely affect beneficial uses.

pH
pH is a measure of the hydrogen ion concentration of water. pH values generally range from 0 (most acidic) to 14 (most alkaline). Many pollutants can alter the pH, raising or lowering it excessively. These extremes in pH can corrode pipes and concrete.

The pH of groundwater shall not be raised above 9 or depressed below 6 as a result of controllable water quality factors.

Radioactivity

Radioactive materials shall not be present in the waters of the region in concentrations which are deleterious to human, plant or animal life. Groundwaters designated MUN shall meet the limits specified in the California Code of Regulations, Title 22, and listed here:

Combined Radium-226 and Radium-228	*5*	*pCi/L*
Gross Alpha particle activity	*15*	*pCi/L*
Tritium	*20.000*	*pCi/L*
Strontium-90	*8*	*pCi/L*
Gross Beta particle activity	*50*	*pCi/L*
Uranium	*20*	*pCi/L*

Sodium
The presence of sodium in drinking water may be harmful to persons suffering from cardiac, renal, and circulatory diseases. It can contribute to taste effects, with the taste threshold depending on the specific sodium salt. Excess concentrations of sodium in irrigation water reduce soil permeability to water and air. The deterioration of soil quality because of the presence of sodium in irrigation water is cumulative and is accelerated by poor drainage.

The sodium objectives listed in Table 4-1 shall not be exceeded as a result of controllable water quality factors.

Sulfate
Excessive sulfate, particularly magnesium sulfate ($MgSO_4$) in potable waters can lead to laxative effects, but this effect is temporary. There is some taste effect from magnesium sulfate in the range of 400-600 mg/L as $MgSO_4$. The secondary drinking water standard for sulfate is 500 mg/L. Sulfate concentrations in waters native to this region are normally low, less than 40 mg/L, but imported Colorado River water contains approximately 300 mg/L of sulfate.

The objectives listed in Table 4-1 shall not be exceeded as a result of controllable water quality factors.

Taste and Odor
Undesirable tastes and odors in water may be a nuisance and may indicate the presence of a pollutant(s). The secondary drinking water standard for odor (threshold) is 3 odor units.

The groundwaters of the region shall not contain, as a result of controllable water quality factors, taste- or odor-producing substances at concentrations which cause a nuisance or adversely affect beneficial uses.

Total Dissolved Solids
See Dissolved Solids, Total

Total Filtrable Residue
See Dissolved Solids, Total

Total Inorganic Nitrogen
See Nitrogen, Total Inorganic

Toxic Substances
All waters of the region shall be maintained free of substances in concentrations which are toxic, or that produce detrimental physiological responses in human, plant, animal or aquatic life.

THE SANTA ANA RIVER

Setting objectives for the flowing portions of the Santa Ana River is a significant feature of this Basin Plan. The River provides water for recreation and for aquatic and wildlife habitat. River flows are a significant source of groundwater recharge in the lower basin, which provides domestic supplies for more than two million people. These flows account for about 70% of the total recharge.

The dividing line between reaches 2 and 3 of the River, and between the upper and lower Santa Ana Basins, is Prado Dam, a flood control facility built and operated by the U.S. Army Corps of Engineers. The dam includes a subsurface groundwater barrier, and as a result all ground and surface waters from the upper basin are forced to pass through the dam (or over the spillway). For this reason, it is an ideal place to measure flows and monitor water quality.

The Prado Settlement, a stipulated court judgement (Orange County Water District vs. City of Chino, *et al.*), which requires that a certain minimum amount of water be released each year from the upper basin, is overseen by the Santa Ana River Watermaster. The U.S. Geologic Survey (USGS) operates a permanent continuous monitoring station immediately below Prado Dam, and the data collected there are utilized by the Watermaster. Orange County Water District (OCWD) samples the river monthly at the USGS gage and determines the water quality. Compliance with the objectives for reaches 2 and 3 is monitored by the Regional Board,

using the data and information available from the USGS gage and these sources, plus the data from its own specific sampling programs (see Chapter 6).

The quality of the Santa Ana River is a function of the quantity and quality of the various components of the flows. The two major components of total flow are storm flow and base flow. Storm flow is the water which results directly from rainfall (surface runoff) in the upper basin; it also includes the stormwater runoff from the San Jacinto Basin which may reach the River via Temescal Creek. Most storms occur during the winter rainy season (December through April). Base flow is composed of wastewater discharges, rising groundwater, and nonpoint source discharges. Wastewater discharges are the treated sewage effluents discharged by municipalities to the river and its tributaries. Rising groundwater occurs at a number of locations along the River, including the San Jacinto Fault, Riverside Narrows, and in or near the Prado Flood Control Basin. Nonpoint source discharges include uncontrolled runoff from agricultural and urban areas which is not related to storm flows.

Nontributary flow is a third element of total flow. It is generally imported water released in the upper basin, for recharge in the lower basin (Santa Ana Forebay).

The Santa Ana River Watermaster calculates the amount and quality of total flow for each water year (October 1 to September 30). The Watermaster's Annual Report is used to determine compliance with the stipulated judgement referred to earlier, which set quality and quantity limits on the river. The Watermaster's report presents summary data compiled from the continuous monitoring of flow in cfs (cubic feet per second) and salinity as E.C. (electrical conductivity) at the USGS Prado Gaging Station. The Watermaster's annual determination of total flow quality will be used to determine compliance with the total flow objectives in this Plan. In years of normal rainfall, most of the total flow of the river is percolated in the Santa Ana Forebay, and directly affects the quality of that groundwater. For that reason, compliance with the total dissolved solids (TDS) water quality objective for Reach 2 will be based on the five- year moving average of the annual TDS content of total flow. Use of this moving average allows the effects of wet and dry years to be smoothed out over the five-year period.

As was noted earlier, the three components of base flow in the river are wastewater, rising water, and nonpoint source discharges. These three components are present in varying amounts throughout the year, and the contributions and quality of each can be affected by the regulatory activities of the Regional Board. The quantity of storm flow is obviously highly variable; programs to control its quality are in their nascent stages. For these reasons, water quality objectives for controllable constituents are set based on the base flow of the river, rather than on total flow.

The regulatory activities of the Regional Board include setting waste discharge requirements on point source discharges. Waste discharge requirements are developed on the basis of the limited assimilative capacity of the river (see TDS and Nitrogen Wasteload Allocation, Chapter Five). Nonpoint source discharges, generally urban runoff (nuisance water) and agricultural tailwater, will be regulated by requiring compliance with Best Management Practices (BMPs), where appropriate. The rising water component of base flow will be affected by the extraction of brackish groundwater in several subbasins (a Basin Plan implementation action), by regulation of wastewater discharges, and other activities.

The quantity and quality of base flow is most consistent during the month of August. At that time of year the influence of storm flows and nontributary flows is at a minimum. There is usually no water impounded behind Prado Dam. The volumes of rising water and nonpoint source discharges tend to be low during that time. The major component of base flow in August, therefore, is municipal wastewater. For these reasons, this period has been selected as the time when base flow will be measured and its quality determined. This information will subsequently allow the evaluation of available assimilative capacity, which serves to verify the accuracy of the wasteload allocation. In order to determine whether the water quality and quantity objectives for base flow in Reach 3 are being met, the Regional Board will collect a series of grab and composite samples during August of each year. The results will also be compared with the continuous monitoring data collected by USGS and data from

other sources. Additional sampling in Reach 3 will help evaluate the effects of the various constituents of base flow.

Future river flows and quality (TDS and TIN) were projected by computer models. The results indicate that the objectives for TDS and total nitrogen will be met. The objectives for individual mineral constituents are expected to be met if the TDS objective is met.

REFERENCES

The "Federal Clean Water Act," 33 USC 466 *et seq.*

California Water Code, Section 13000 "Water Quality," *et seq.*

California State Water Resources Control Board, "Water Quality Criteria, Second Edition," 1963.

US EPA, "Ambient Water Quality Criteria for Ammonia," 1984.

US EPA Memorandum, "Revised Tables for Determining Average Freshwater Ammonia Concentrations." 1992.

California State University, Fullerton, "Investigation of Un-ionized Ammonia in the Santa Ana River, Final Project Report," February 1988.

California Regional Water Quality Control Board, "Public Workshop - Review of the Un-ionized Ammonia Objective - Summary of Findings & Recommendation," Staff Report, December 1988.

Santa Ana Watershed Project Authority, "Final Report, Santa Ana River Use-Attainability Analysis," June 1992.

California Regional Water Quality Control Board, Resolution No. 93-64, "Resolution Amending the Water Quality Control Plan to Set Site-Specific Water Quality Objectives for Cadmium, Copper, and Lead in the Middle Santa Ana River," October 1993.

ENSR Consulting and Engineering, "Short-Term Chronic Toxicity of Un-ionized Ammonia to Fathead Minnows (*Pimephales promelas*) in a Site Water," September 1993.

FIGURE 4-1
SANTA ANA REGION
GROUNDWATER BASINS

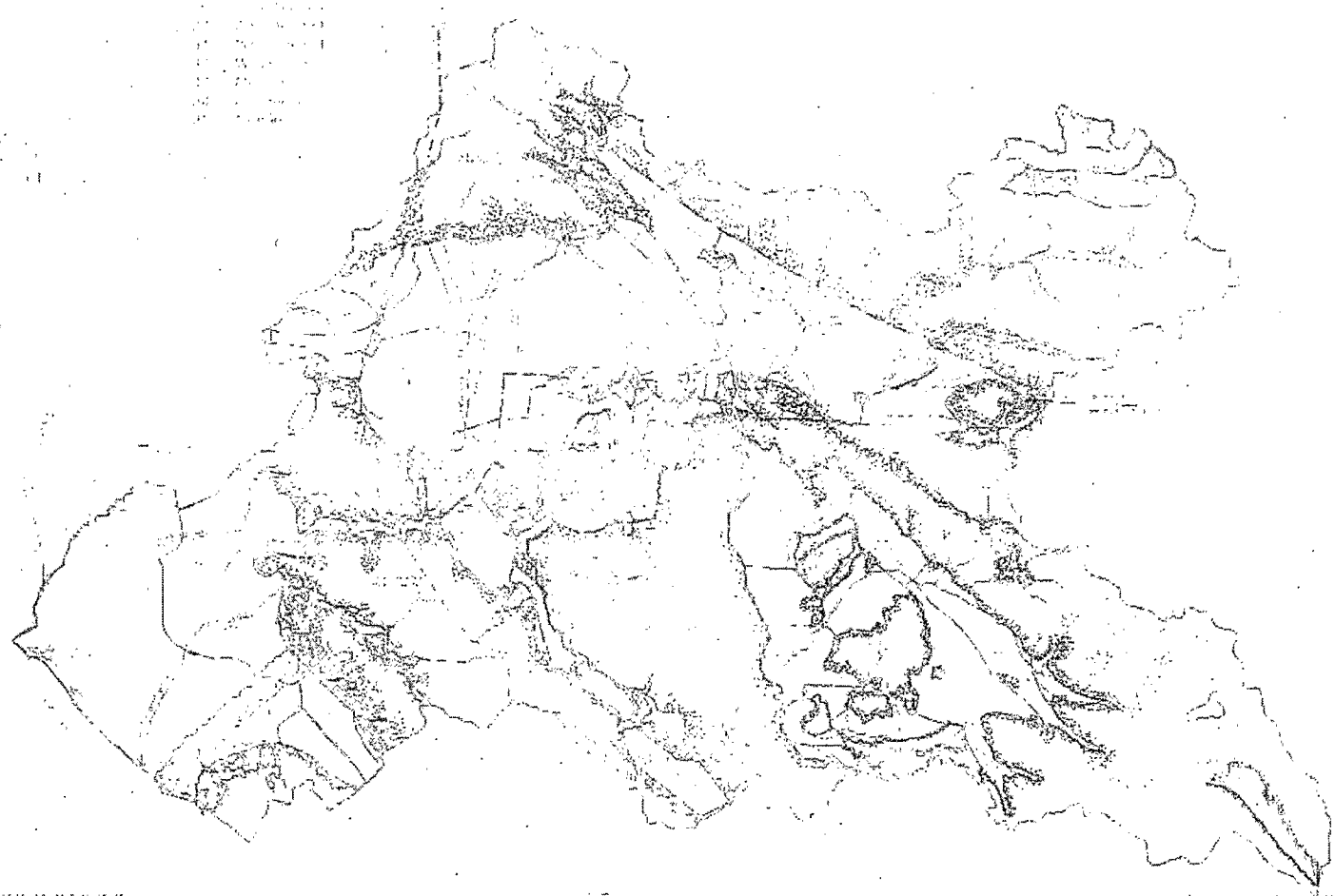

FIGURE 4-2
SANTA ANA REGION
GROUNDWATER BASINS
(TDS, mg/L)

Upper Santa Ana Watershed

1 Big Bear Valley (300mg/L)
2 Cucamonga(220 mg/L)
3 Chino I (220 mg/L)
4 Chino II 1330 mg/L)
5 Chino III (740 mg/L)
6 San Timoteo (240 mg/L)
7 Bunker Hill I (260 mg/L)
9 Bunker Hill II (290 mg/L)
9 Bunker Hill Pressure (300 mg/L)
10 LytleCreek (225 mg/L).
11 Rialto(200 mg/L)
12 Colton(400 mg/L)
13 Riverside I (490 mg/L)
14 Riverside II (650 mg/L)
15 Riverside III (990 mg/L)
16 Arlington (1050 mg/L)
17 Bedford (Upper Temescal I) (640 mg/L)
16 Lee Lake (Upper Temescal II) 1600 mg/L)
19 Coldwater (Upper Tamescal III) (350 mg/L)
20 Temescal(640 mg/L)

Lower Santa Ana Watershed

36 Santa Ana Forebay(600 mg/L)
37 Santa Ana Pressure (500 mgA)
39 Irvine Forebay I(1000 mg/L)
39 Irvine Forebay II(720 mg/L)
40 Irvine Forebay Pressure (720 mg/L)
41 La Habra (1000 mg/L)
42 Santiago (None)

In tha Los Angeles Region, but within the Santa Ana River drainage area

43 Claremont Heights
44 Pomona

San Jacinto Watershed

21 Gamer Valley (300)
22 Idyllwild Area (None)
23 San Jacinto Canyon (250 mg/L)
24 San Jacinto - Intake and Upper Pressure (350 mg/L)
25 San Jacinto - Lower Pressure (900 mg/L)
26 Hemet (600 mg/L)
27 Lakeview (500 mg/L)
28 Perris North (300 mg/L)
29 Perris South I (1000 mg/L)
30 Perris South II (2000 mg/L)
31 Perris South III (1500 mg/L)
32 Winchester (1200 mg/L)
33 Menifee I (2000 mg/L)
34 Menifee II (1500 mg/L)
35 Elsinore (450 mg/L)

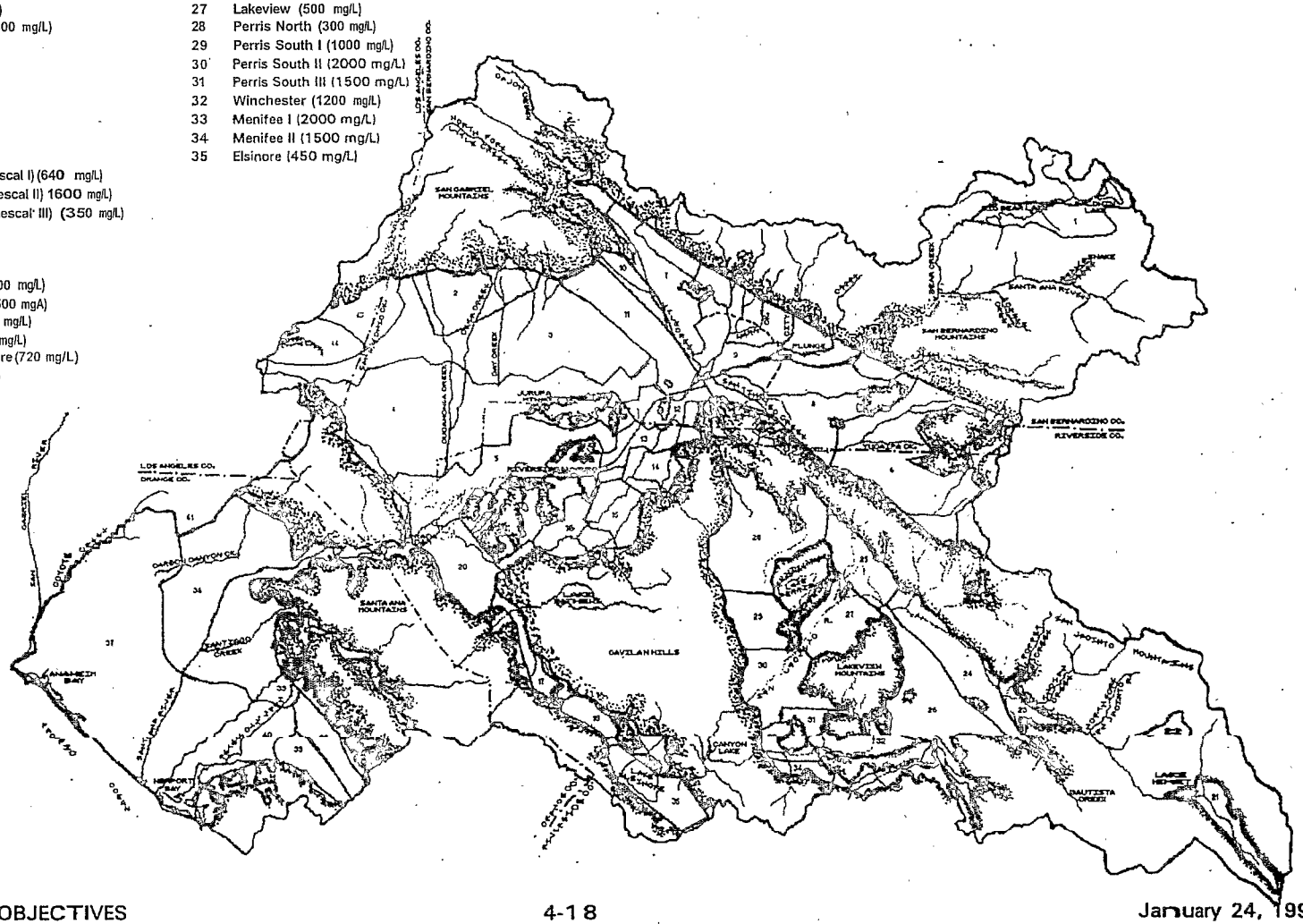

FIGURE 4-3
SANTA ANA REGION
GROUNDWATER BASINS
(NO_3-N, mg/L)

Upper Santa Ana Watershed

1 Big Bear Valley (5 mg/L)
2 Cucamonga (5 mg/L)
3 Chino I (5 mg/L)
4 Chino II (6 mg/L)
5 Chino III (11 mg/L)
6 San Timoteo (6 mg/L)
7 Bunker Hill I (1 mg/L)
8 Bunker Hill II (5 mg/L)
9 Bunker Hill Pressure (1 mg/L)
10 Lytle Creek (1 mg/L)
11 Rialto (2 mg/L)
12 Colton (3 mg/L)
13 Riverside I (4 mg/L)
14 Riverside II (10 mg/L)
15 Riverside III (20 mg/L)
16 Arlington (20 mg/L)
17 Bedford (Upper Temescal I mg/L) (9 mg/L)
18 Lee Lake (Upper Temescal II mg/L) (6 mg/L)
19 Coldwater (Upper Temescal III mg/L) (2 mg/L)
20 Temescal (9 mg/L)

Lower Santa Ana Watershed

36 Santa Ana Forebay (3 mg/L)
37 Santa Ana Pressure (3 mg/L)
38 Irvine Forebay I (8 mg/L)
39 Irvine Forebay II (6 mg/L)
40 Irvine Forebay Pressure (6 mg/L)
41 La Habra (None)
42 Santiago (None)

San Jacinto Watershed

21 Garner Valley (2 mg/L)
22 Idyllwild Area (None)
23 San Jacinto Canyon (1 mg/L)
24 San Jacinto - Intake and Upper Pressure (5 mg/L)
25 San Jacinto - Lower Pressure (3 mg/L)
26 Hemet (4 mg/L)
27 Lakeview (2 mg/L)
28 Perris North (3 mg/L)
29 Perris South I (None)
30 Perris South II (None)
31 Perris South III (None)
32 Winchester (None)
33 Menifee I (None)
34 Menifee II (None)
35 Elsinore (4 mg/L)

In the Los Angeles Region, but within the Santa Ana River drainage area
43 Claremont Heights
44 Pomona

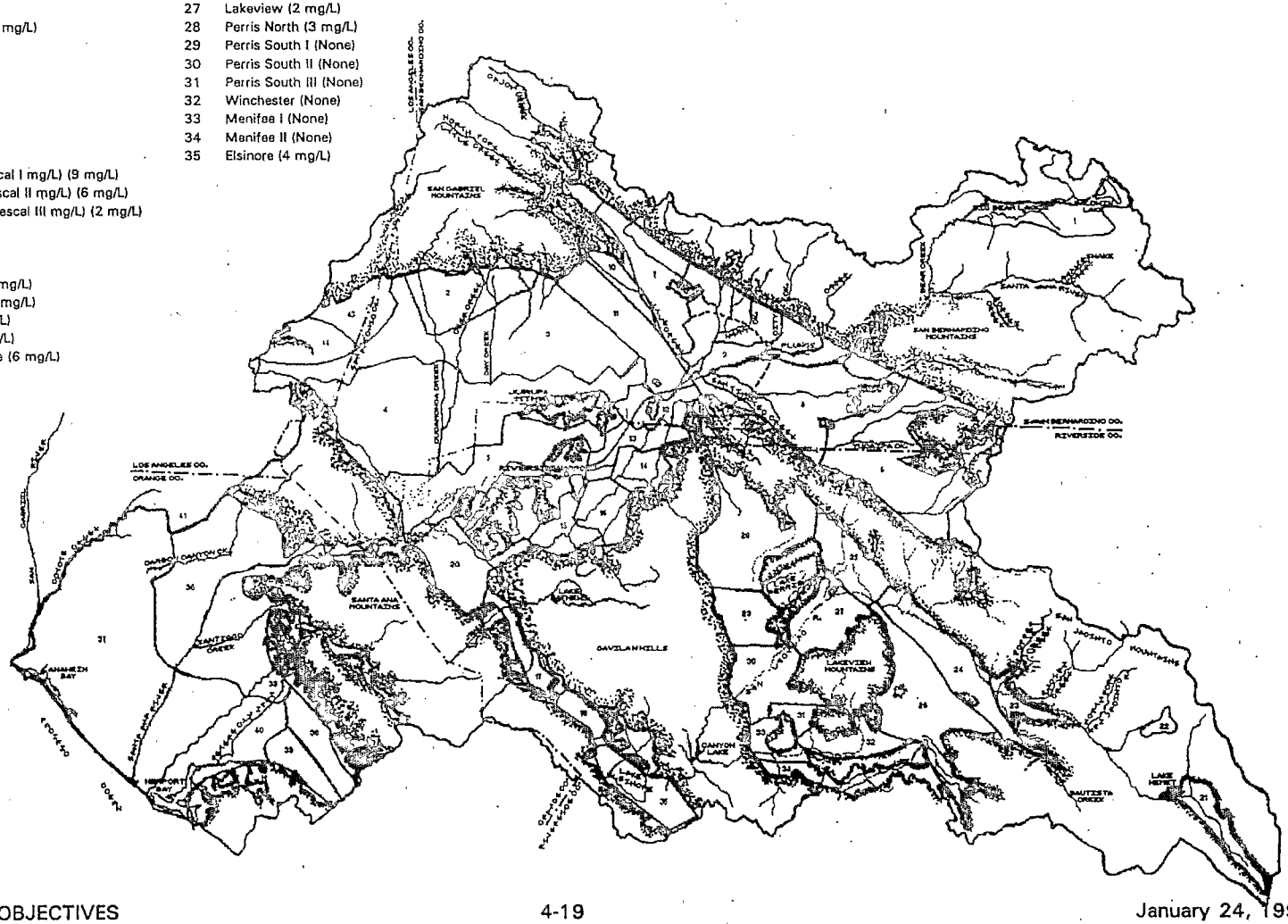

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Table 4-1 WATER QUALITY OBJECTIVES

OCEAN WATERS	WATER QUALITY OBJECTIVES (mg/L)							Hydrologic Unit	
	TDS	Hard.	Na	Cl	TIN	SO_4	COD	Primary	Secondary
NEARSHORE ZONE*									
San Gabriel River to Poppy Street in Corona del Mar+	---	---	---	---	---	---	---	801.11	
Poppy Street to Southeast Regional Boundary+	---	---	---	---	---	---	---	801.11	
OFFSHORE ZONE									
Waters Between Nearshore Zone and Limit of State Waters+	---	---	---	---	---	---	---		

* Defined by Ocean Plan Chapter II A.1.: "Within a zone bounded by shoreline and a distance of 1000 feet from shoreline or the 30-foot depth contour, whichever is further from shoreline..."

\+ Numeric ojectives have not been established; narrative objectives apply.

Table 4-1 WATER QUALITY OBJECTIVES - Continued

BAYS, ESTUARIES, AND TIDAL PRISMS	WATER QUALITY OBJECTIVES (mg/L)							Hydrologic Unit	
	TDS	Hard.	Na	Cl	TIN	SO_4	COD	Primary	Secondary
Anaheim Bay - Outer Bay[+]	---	---	---	---	---	---	---	801.11	
Anaheim Bay - Seal Beach National Wildlife Refuge[+]	---	---	---	---	---	---	---	801.11	
Sunset Bay - Huntington Harbour[+]	---	---	---	---	---	---	---	801.11	
Bolsa Bay[+]	---	---	---	---	---	---	---	801.11	
Bolsa Chica Ecological Reserve[+]	---	---	---	---	---	---	---	801.11	
Lower Newport Bay[+]	---	---	---	---	---	---	---	801.11	
Upper Newport Bay[+]	---	---	---	---	---	---	---	801.11	
Santa Ana River Salt Marsh[+]	---	---	---	---	---	---	---	801.11	
Tidal Prism of Santa Ana River (to within 1000' of Victoria Street) and Newport Slough[+]	---	---	---	---	---	---	---	801.11	
Tidal Prism of San Gabriel River - River Mouth to Marina Drive[+]	---	---	---	---	---	---	---	845.61	
Tidal Prisms of Flood Control Channels Discharging to Coastal or Bay Waters[+]	---	---	---	---	---	---	---	801.11	

[+] Numeric objectives have not been established; narrative objectives apply.

Table 4-1 WATER QUALITY OBJECTIVES - Continued

INLAND SURFACE STREAMS	WATER QUALITY OBJECTIVES (mg/L)							Hydrologic Unit	
	TDS	Hard.	Na	Cl	TIN	SO_4	COD	Primary	Secondary
LOWER SANTA ANA RIVER BASIN									
Santa Ana River									
Reach 1 - Tidal Prism to 17th Street in Santa Ana+	(Flood Flows Only)							801.11	
Reach 2 - 17th Street in Santa Ana to Prado Dam	650[1]	---	---	---	---	---	---	801.11	801.12
Aliso Creek+	---	---	---	---	---	---	---	845.63	
Carbon Canyon Creek+	---	---	---	---	---	---	---	845.63	
Santiago Creek Drainage									
Santiago Creek									
Reach 1 - below Irvine Lake	600	---	---	---	---	---	---	801.12	801.11
Reach 2 - Irvine Lake (see Lakes, pg. 4-36)									
Reach 3 - Irvine Lake to Modjeska Canyon	350	260	20	12	2	80	---	801.12	
Reach 4 - in Modjeska Canyon	350	260	20	12	2	80	---	801.12	
Silverado Creek	650	450	30	20	1	275	---	801.12	
Black Star Creek+	---	---	---	---	---	---	---	801.12	
Ladd Creek+	---	---	---	---	---	---	---	801.12	

[1] Five-year moving average

+ Numeric objectives have not been established; narrative objectives apply.

Table 4-1 WATER QUALITY OBJECTIVES - Continued

INLAND SURFACE STREAMS	WATER QUALITY OBJECTIVES (mg/L)							Hydrologic Unit	
	TDS	Hard.	Na	Cl	TIN	SO_4	COD	Primary	Secondary
San Diego Creek Drainage									
San Diego Creek									
Reach 1 - below Jeffrey Road	1500	---	---	---	13	---	90	801.11	
Reach 2 - above Jeffrey Road to Headwaters	720	---	---	---	5	---	---	801.11	
Other Tributaries: Bonita Creek, Serrano Creek, Peters Canyon Wash, Hicks Canyon Wash, Bee Canyon Wash, Borrego Canyon Wash, Agua Chinon Wash, Laguna Canyon Wash, Rattlesnake Canyon Wash, Sand Canyon Wash and other Tributaries to these Creeks[+]	---	---	---	---	---	---	---	801.11	
San Gabriel River Drainage									
Coyote Ck. (within Santa Ana Regional Boundary)[+]	---	---	---	---	---	---	---		

[1] Five-year moving average
[+] Numeric objectives have not been established; narrative objectives apply.

Table 4-1 WATER QUALITY OBJECTIVES - Continued

INLAND SURFACE STREAMS	WATER QUALITY OBJECTIVES (mg/L)							Hydrologic Unit	
	TDS	Hard.	Na	Cl	TIN	SO_4	COD	Primary	Secondary
UPPER SANTA ANA RIVER BASIN									
Santa Ana River									
Reach 3 - Prado Dam to Mission Blvd. in Riverside – Base Flow[2]	700	350	110	140	10[3]	150	30	801.21	801.27, 801.25
Reach 4 - Mission Blvd. in Riverside to San Jacinto Fault in San Bernardino	550	---	---	---	10	---	30	801.27	801.44
Reach 5 - San Jacinto Fault in San Bernardino to Seven Oaks Dam	300	190	30	20	5	60	25	801.52	801.57
Reach 6 - Seven Oaks Dam to Headwaters (see also Individual Tributary Streams)	200	100	30	10	1	20	5	801.72	
San Bernardino Mountain Streams									
Mill Creek Drainage:									
Mill Creek									
Reach 1 - Confluence with Santa Ana River to Bridge Crossing Route 38 at Upper Powerhouse	200	100	30	10	1	20	5	801.58	
Reach 2 - Bridge Crossing Route 38 at Upper Powerhouse to Headwaters	110	100	25	5	1	15	5	801.58	

[2] Additional Objectives: Boron: 0.75 mg/L
[3] Total nitrogen, filtered sample

Table 4-1 WATER QUALITY OBJECTIVES - Continued

INLAND SURFACE STREAMS	WATER QUALITY OBJECTIVES (mg/L)							Hydrologic Unit	
	TDS	Hard.	Na	Cl	TIN	SO_4	COD	Primary	Secondary
Mountain Home Creek	200	100	30	10	1	20	5	801.58	
Mountain Home Creek, East Fork	200	---	---	---	---	---	---	801.70	
Monkey Face Creek	200	100	30	10	1	20	5	801.70	
Alger Creek	200	---	---	---	---	---	---	801.70	
Falls Creek	200	100	30	10	1	20	5	801.70	
Vivian Creek	200	---	---	---	---	---	---	801.70	
High Creek	200	---	---	---	---	---	---	801.70	
Other Tributaries: Lost, Oak Cove, Green, Skinner, Momyer, Glen Martin, Camp, Hatchery, Rattlesnake, Slide, Snow, Bridal Veil, and Oak Creeks, and other Tributaries to these Creeks	200	---	---	---	---	---	---	801 70	
Bear Creek Drainage:									
Bear Creek	175	115	10	10	1	4	5	801.71	
Siberia Creek	200	---	---	---	---	---	---	801.71	
Slide Creek	175	---	---	---	---	---	---	801.71	
All other Tributaries to these Creeks[+]	---	---	---	---	---	---	---	801.71	
Big Bear Lake (see Lakes, pg. 4-36)									

[+] Numeric objectives have not been established; narrative objectives apply.

Table 4-1 WATER QUALITY OBJECTIVES - Continued

INLAND SURFACE STREAMS	WATER QUALITY OBJECTIVES (mg/L)							Hydrologic Unit	
	TDS	Hard.	Na	Cl	TIN	SO_4	COD	Primary	Secondary
Big Bear Lake Tributaries:									
North Creek	175	---	---	---	---	---	---	801.71	
Metcalf Creek	175	---	---	---	---	---	---	801.71	
Grout Creek	150	---	---	---	---	---	---	801.71	
Rathbone (Rathbun) Creek	300	---	---	---	---	---	---	801.71	
Meadow Creek[+]	---	---	---	---	---	---	---	801.71	
Summit Creek[+]	---	---	---	---	---	---	---	801.71	
Other Tributaries to Big Bear Lake: Knickerbocker, Johnson, Minnelusa, Polique, and Red Ant Creeks, and other Tributaries to these Creeks	175	---	---	---	---	---	---	801.71	
Baldwin Lake (see Lakes, pg. 4-36)									
Baldwin Lake Drainage:									
Shay Creek[+]	---	---	---	---	---	---	---	801.73	
Other Tributaries to Baldwin Lake: Sawmill, Green, and Caribou Canyons and other Tributaries to these Creeks[+]	---	---	---	---	---	---	---	801.73	

[+] Numeric objectives have not been established; narrative objectives apply.

Table 4-1 WATER QUALITY OBJECTIVES - Continued

INLAND SURFACE STREAMS	WATER QUALITY OBJECTIVES (mg/L)							Hydrologic Unit	
	TDS	Hard.	Na	Cl	TIN	SO_4	COD	Primary	Secondary
Other Streams Draining to Santa Ana River (Mountain Reaches[1])									
Cajon Creek	200	100	30	10	1	20	5	801.51	
City Creek	200	115	30	10	1	20	5	801.57	
Devil Canyon Creek	275	125	35	20	1	25	5	801.57	
East Twin and Strawberry Creeks	475	---	---	---	---	---	---	801.57	
Waterman Canyon Creek	250	---	---	---	---	---	---	801.57	
Fish Creek	200	100	30	10	1	20	5	801.57	
Forsee Creek	200	100	30	10	1	20	5	801.72	
Plunge Creek	200	100	30	10	1	20	5	801.72	
Barton Creek	200	100	30	10	1	20	5	801.72	
Bailey Canyon Creek	200	---	---	---	---	---	---	801.72	
Kimbark Canyon, East Fork Kimbark Canyon, Ames Canyon and West Fork Cable Canyon Creeks	325	---	---	---	---	---	---	801.52	
Valley Reaches[1] of Above Streams	(Water Quality Objectives Correspond to Underlying GW Basin Objectives)							801.52	

[1] The division between Mountain and Valley reaches occurs at the base of the foothills of the San Bernardino or San Gabriel Mountains.

Table 4-1 WATER QUALITY OBJECTIVES - Continued

INLAND SURFACE STREAMS	WATER QUALITY OBJECTIVES (mg/L)							Hydrologic Unit	
	TDS	Hard.	Na	Cl	TIN	SO_4	COD	Primary	Secondary
Other Tributaries (Mountain Reaches[1]): Alder, Badger Canyon, Bledsoe Gulch, Borea Canyon, Breakneck, Cable Canyon, Cienega Seca, Cold, Converse, Coon, Crystal, Deer, Elder, Fredalba, Frog, Government, Hamilton, Heart Bar, Hemlock, Keller, Kilpecker, Little Mill, Little Sand Canyon, Lost, Meyer Canyon, Mile, Monroe Canyon, Oak, Rattlesnake, Round Cienega, Sand, Schneider, Staircase, Warm Springs Canyon and Wild Horse Creeks, and other Tributaries to these Creeks	200	100	30	10	1	20	5	801.72	801.71, 801.57
San Gabriel Mountain Streams (Mountain Reaches[1])									
San Antonio Creek	225	150	20	6	4	25	5	801.23	
Lytle Creek (South, Middle and North Forks) and Coldwater Canyon Creek	200	100	15	4	4	25	5	801.41	801.42, 801.52, 801.59
Day Creek	200	100	15	4	4	25	5	801.21	
East Etiwanda Creek	200	100	15	4	4	25	5	801.21	
Valley Reaches[1] of Above Streams	(Water Quality Objectives Correspond to Underlying GW Basin Objectives)							801.21	

[1] The division between Mountain and Valley reaches occurs at the base of the foothills of the San Bernardino or San Gabriel Mountains.

Table 4-1 WATER QUALITY OBJECTIVES - Continued

INLAND SURFACE STREAMS	WATER QUALITY OBJECTIVES (mg/L)							Hydrologic Unit	
	TDS	Hard.	Na	Cl	TIN	SO_4	COD	Primary	Secondary
Cucamonga Creek									
Reach 1 - Confluence with Mill Creek to 23rd St. in Upland[+]	---	---	---	---	---	---	---	801.21	
Reach 2 (Mountain Reach[1]) - 23rd St. in Upland to headwaters	200	100	15	4	4	25	5	801.24	
Mill Creek[+]	---	---	---	---	---	---	---	801.25	
Other Tributaries (Mountain Reaches[1]): Cajon Canyon, San Sevaine, Deer, Duncan Canyon, Henderson Canyon, Bull, Fan, Demens, Thorpe, Angalls, Telegraph Canyon, Stoddard Canyon, Icehouse Canyon, Cascade Canyon, Cedar, Falling Rock, Kerkhoff and Cherry Creeks, and other Tributaries to these Creeks	200	---	---	---	---	---	---	801.21	801.23
San Timoteo Area Streams									
San Timoteo Creek									
Reach 1 - Santa Ana River Confluence to Gage at San Timoteo Canyon Road	290	175	60	60	6	45	15	801.52	801.53

[+] Numeric objectives have not been established; narrative objectives apply.
[1] The division between Mountain and Valley reaches occurs at the base of the foothills of the San Bernardino or San Gabriel Mountains.

Table 4-1 WATER QUALITY OBJECTIVES - Continued

INLAND SURFACE STREAMS	WATER QUALITY OBJECTIVES (mg/L)							Hydrologic Unit	
	TDS	Hard.	Na	Cl	TIN	SO_4	COD	Primary	Secondary
Reach 2 - Gage at San Timoteo Canyon Road to Confluence with Yucaipa Creek	290	175	60	60	6	45	15	801.61	801.62
Reach 3 - Confluence with Yucaipa Creek to Bunker Hill II Groundwater Subbasin Boundary (T2S/R3W-24)	290	175	60	60	6	45	15	801.62	
Reach 4 - Bunker Hill II Groundwater Subbasin Boundary (T2S/R3W-24) to Confluence with Little San Gorgonio and Noble Creeks (Headwaters of San Timoteo Creek)	290	175	60	60	6	45	15	801.62	
Oak Glen, Potato Canyon and Birch Creeks	230	125	50	40	3	45	5	801.67	
Little San Gorgonio Creek	230	125	50	40	3	45	5	801.69	801.62, 801.63
Yucaipa Creek	290	175	60	60	6	45	15	801.67	801.61, 801.62, 801.64
Other Tributaries to these Creeks - Valley Reaches[+][‖]	---	---	---	---	---	---	---	801.62	801.52, 801.53
Other Tributaries to these Creeks - Mountain Reaches[‖]	290	---	---	---	---	---	---	801.69	801.67
Anza Park Drain[+]	---	---	---	---	---	---	---	801.27	

[+] Numeric objectives have not been established; narrative objectives apply.
[‖] The division between Mountain and Valley reaches occurs at the base of the foothills of the San Bernardino or San Gabriel Mountains.

Table 4-1 WATER QUALITY OBJECTIVES - Continued

INLAND SURFACE STREAMS	WATER QUALITY OBJECTIVES (mg/L)							Hydrologic Unit	
	TDS	Hard.	Na	Cl	TIN	SO_4	COD	Primary	Secondary
Sunnyslope Channel[+]	---	---	---	---	---	---	---	801.27	
Tequesquite Arroyo (Sycamore Creek)[+]	---	---	---	---	---	---	---	801.27	
Prado Area Streams									
Chino Creek									
Reach 1 - Santa Ana River confluence to beginning of concrete-lined channel south of Los Serranos Rd.	550	240	75	75	8	60	15	801.21	
Reach 2 - Beginning of concrete-lined channel south of Los Serranos Rd. to confluence with San Antonio Creek[+]	---	---	---	---	---	---	---	801.21	
Temescal Creek									
Reach 1A - Santa Ana River Confluence to Lincoln Ave.	800	400	100	200	6	70	---	801.25	
Reach 1B - LIncoln Ave. to Riverside Canal[+]	---	---	---	---	---	---	---	801.25	
Reach 2 - Riverside Canal to Lee Lake[+]	---	---	---	---	---	---	---	801.32	801.25
Reach 3 - Lee Lake (see Lakes, pg. 4-36)									

[+] Numeric objectives have not been established; narrative objectives apply.

Table 4-1 WATER QUALITY OBJECTIVES - Continued

INLAND SURFACE STREAMS	WATER QUALITY OBJECTIVES (mg/L)							Hydrologic Unit	
	TDS	Hard.	Na	Cl	TIN	SO_4	COD	Primary	Secondary
Reach 4 - Lee Lake to Mid-section line of Section 17 (downstream end of freeway cut)[+]	---	---	---	---	---	---	---	801.34	
Reach 5 - Mid-section line of Section 17 (downstream end of freeway cut) to Elsinore Groundwater Subbasin Boundary[+]	---	---	---	---	---	---	---	801.35	
Reach 6 - Elsinore Groundwater Subbasin Boundary to Lake Elsinore Outlet[+]	---	---	---	---	---	---	---	801.35	
Coldwater Canyon Creek	250	---	---	---	---	---	---	801.32	
Bedford Canyon Creek[+]	---	---	---	---	---	---	---	801.32	
Dawson Canyon Creek[+]	---	---	---	---	---	---	---	801.32	
Other Tributaries to these Creeks	250	---	---	---	---	---	---	801.32	

[+] Numeric objectives have not been established; narrative objectives apply.

Table 4-1 WATER QUALITY OBJECTIVES - Continued

INLAND SURFACE STREAMS	WATER QUALITY OBJECTIVES (mg/L)							Hydrologic Unit	
	TDS	Hard.	Na	Cl	TIN	SO_4	COD	Primary	Secondary
SAN JACINTO RIVER BASIN									
San Jacinto River									
Reach 1 - Lake Elsinore to Canyon Lake	450	260	50	65	3	60	15	802.32	802.31
Reach 2 - Canyon Lake (see Lakes, pg. 4-37)									
Reach 3 - Canyon Lake to Nuevo Road	820	400	---	250	6	---	15	802.11	
Reach 4 - Nuevo Road to North-South Mid-Section Line, T4S/R1W-S8	500	220	75	125	5	65	---	802.14	802.21
Reach 5 - North-South Mid-Section Line, T4S/R1W-S8, to Confluence with Poppet Creek	300	140	30	25	3	40	12	802.21	
Reach 6 - Poppet Creek to Cranston Bridge	250	130	25	20	1	30	12	802.21	
Reach 7 - Cranston Bridge to Lake Hemet	150	100	10	15	1	20	5	802.21	
Bautista Creek - Headwaters to Debris Dam	250	130	25	20	1	30	5	802.21	802.23
Strawberry Creek and San Jacinto River, North Fork	150	100	10	15	1	20	5	802.21	

[+] *Numeric objectives have not been established; narrative objectives apply.*

Table 4-1 WATER QUALITY OBJECTIVES - Continued

INLAND SURFACE STREAMS	WATER QUALITY OBJECTIVES (mg/L)							Hydrologic Unit	
	TDS	Hard.	Na	Cl	TIN	SO_4	COD	Primary	Secondary
Fuller Mill Creek	150	100	10	15	1	20	5	802.22	
Stone Creek	150	100	10	15	1	20	5	802.21	
Salt Creek[+]	---	---	---	---	---	---	---	802.12	
Other Tributaries: Logan, Black Mountain, Juaro Canyon, Indian, Hurkey, Poppet and Protrero Creeks, and other Tributaries to these Creeks	150	70	10	12	1	15	5	802.21	802.22

[+] Note the quality objective for Reach 4 is not intended to preclude transport of water supplies or delivery to Canyon Lake

Table 4-1 WATER QUALITY OBJECTIVES - Continued

LAKES AND RESERVOIRS	WATER QUALITY OBJECTIVES (mg/L)							Hydrologic Unit	
	TDS	Hard.	Na	Cl	TIN	SO_4	COD	Primary	Secondary
UPPER SANTA ANA RIVER BASIN									
Baldwin Lake*+	---	---	---	---	---	---	---	801.73	
Big Bear Lake**	175	125	20	10	0.15	10	---	801.71	
Erwin Lake+	---	---	---	---	---	---	---	801.73	
Evans, Lake	490	---	---	---	---	---	---	801.27	
Jenks Lake	200	100	30	10	1	20	---	801.72	
Lee Lake+	---	---	---	---	---	---	---	801.34	
Mathews, Lake	700	325	100	90	---	290	---	801.33	
Mockingbird Reservoir	650	---	---	---	---	---	---	801.26	
Norconian, Lake	1050	---	---	---	---	---	---	801.25	
LOWER SANTA ANA RIVER BASIN									
Anaheim Lake	600	---	---	---	---	---	---	801.11	
Irvine Lake (Santiago Reservoir)	730	360	110	130	6	310	---	801.12	
Laguna, Lambert, Peters Canyon, Rattlesnake, Sand Canyon, and Siphon Reservoirs	720	---	---	---	---	---	---	801.11	

* Fills occasionally with storm flows; may evaporate completely
** Additional Objective: 0.15 mg/L Phosphorus
+ Numeric objectives have not been established; narrative objectives apply.

Table 4-1 WATER QUALITY OBJECTIVES - Continued

LAKES AND RESERVOIRS	WATER QUALITY OBJECTIVES (mg/L)							Hydrologic Unit	
	TDS	Hard.	Na	Cl	TIN	SO_4	COD	Primary	Secondary
SAN JACINTO RIVER BASIN									
Canyon Lake (Railroad Canyon Reservoir)***	700	325	100	90	8	290	---	802.11	802.12
Elsinore, Lake****	2000	---	---	---	1.5	---	---	802.31	
Fulmor, Lake	150	70	10	12	1	15	---	802.21	
Hemet, Lake	135	---	25	20	1	10	---	802.22	
Perris, Lake	220	110	50	55	1	45	---	802.11	

*** Note : The quality objectives for Canyon Lake is not intended to proclude transport of water supplies or delvery to the Lake.
**** Lake volume and quality highly variable.

Table 4-1 WATER QUALITY OBJECTIVES - Continued

WETLANDS (INLAND)	WATER QUALITY OBJECTIVES (mg/L)							Hydrologic Unit	
	TDS	Hard.	Na	Cl	TIN	SO_4	COD	Primary	Secondary
San Joaquin Freshwater Marsh[**]	2000	---	---	---	13	---	90	801.11	
Shay Meadows[+]	---	---	---	---	---	---	---	801.73	
Stanfield Marsh[+**]	---	---	---	---	---	---	---	801.71	
Prado Flood Control Basin[+**]	---	---	---	---	---	---	---	801.25	
San Jacinto Wildlife Preserve[+**]	---	---	---	---	---	---	---	802.15	
Glen Helen[+]	---	---	---	---	---	---	---	801.59	

[+] Numeric objectives have not been established; narrative objectives apply.

[**] This is a created wetland as defined in the wetlands discussion (see Chapter 3).

Table 4-1 WATER QUALITY OBJECTIVES - Continued

GROUNDWATER SUBBASINS	WATER QUALITY OBJECTIVES (mg/L)						Hydrologic Unit	
	TDS	Hard.	Na	Cl	NO_3-N	SO_4	Primary	Secondary
UPPER SANTA ANA RIVER BASIN								
Big Bear Valley	300	225	20	10	5	20	801.71	801.73
Cucamonga	220	170	15	15	5	20	801.24	801.21
Chino I	220	170	15	15	5	20	801.21	481.23, 418.22, 801.27
Chino II	330	185	18	18	6	20	801.21	418.21, 801.23
Chino III	740	425	100	50	11	110	801.21	481.21, 801.27, 801.26
San Timoteo	240	170	45	25	6	35	801.60	801.63, 801.64, 801.66, 801.68
Bunker Hill I	260	190	15	10	1	45	801.51	
Bunker Hill II	290	190	30	20	5	62	801.52	
Bunker Hill Pressure	300	160	30	20	1	62	801.52	
Lytle Creek	225	175	15	10	1	30	801.41	801.42
Rialto	200	95	35	35	2	40	801.43	801.44
Colton	400	240	35	35	3	64	801.44	801.45, 801.27
Riverside I	490	270	50	50	4	85	801.27	
Riverside II	650	360	70	85	10	100	801.27	
Riverside III	990	500	125	170	20	135	801.27	
Arlington	1050	500	125	180	20	160	801.26	801.25

Table 4-1 WATER QUALITY OBJECTIVES - Continued

GROUNDWATER SUBBASINS	WATER QUALITY OBJECTIVES (mg/L)						Hydrologic Unit	
	TDS	Hard.	Na	Cl	NO_3-N	SO_4	Primary	Secondary
Bedford (Upper Temescal I)	840	440	80	100	9	200	801.32	
Lee Lake (Upper Temescal II)	600	300	100	100	6	140	801.34	
Coldwater (Upper Temescal III)	350	175	45	25	2	125	801.31	
Temescal	840	440	120	180	9	160	801.25	
SAN JACINTO RIVER BASIN								
Garner Valley	300	100	65	30	2	40	802.22	
Idyllwild Area[+]	---	---	---	---	---	---	802.22	802.21
San Jacinto - Canyon	250	130	25	20	1	30	802.21	
San Jacinto - Lower Pressure	800	380	120	100	3	330	802.21	
San Jacinto - Intake	350	145	50	35	5	40	802.21	
San Jacinto - Upper Pressure	350	145	50	35	5	40	802.21	
Hemet	600	300	80	80	4	215	802.15	802.21
Lakeview	500	190	80	160	2	25	802.14	
Perris North	300	100	70	90	3	15	802.11	
Perris South I	1000	---	---	---	---	---	802.11	
Perris South II	2000	---	---	---	---	---	802.11	
Perris South III	1500	---	---	---	---	---	802.11	
Winchester	1200	---	---	---	---	---	802.13	
Menifee I	2000	---	---	---	---	---	802.12	

[+] Numeric objectives have not been established; narratve objectives apply.

Table 4-1 WATER QUALITY OBJECTIVES - Continued

GROUNDWATER SUBBASINS	WATER QUALITY OBJECTIVES (mg/L)						Hydrologic Unit	
	TDS	Hard.	Na	Cl	NO_3-N	SO_4	Primary	Secondary
Menifee II	1500	---	---	---	---	---	802.12	
Elsinore	450	260	50	60	4	60	802.31	802.32
LOWER SANTA ANA RIVER BASIN								
La Habra[+**]	1000	---	---	250	---	250	845.62	
Santiago[+]	---	---	---	---	---	---	801.12	
Santa Ana Forebay	600	290	60	65	3	120	801.11	801.13, 845.61
Santa Ana Pressure	500	240	45	55	3	100	801.11	845.61
Irvine Forebay I	1000	450	180	180	8	340	801.11	
Irvine Forebay II	720	380	100	150	6	240	801.11	
Irvine Pressure	720	380	100	150	6	240	801.11	

[+] Numeric objectives have not been established; narratve objectives apply.

[**] Water quality objectives apply to upper unconfined La Habra subbasin. Additional objective, Boron; 1.0 mg/L. Lower confined La Habra subbasin objectives are consistent with the Santa Ana Pressure water quality objectives.

Table 4-2

4-Day Average Concentration for Ammonia
Salmonids or Other Sensitive Coldwater Species Present
(COLD)

Un-ionized Ammonia (mg/liter N)		Temperature, °C						
		0	5	10	15	20	25	30
pH	6.50	0.0004	0.0005	0.0007	0.0010	0.0010	0.0010	0.0010
	6.75	0.0006	0.0009	0.0013	0.0018	0.0018	0.0018	0.0018
	7.00	0.0011	0.0016	0.0022	0.0031	0.0031	0.0031	0.0031
	7.25	0.0020	0.0028	0.0040	0.0056	0.0056	0.0056	0.0056
	7.50	0.0035	0.0050	0.0070	0.0099	0.0099	0.0099	0.0099
	7.75	0.0069	0.0097	0.0137	0.0194	0.0194	0.0194	0.0194
	8.00	0.0080	0.0112	0.0159	0.0224	0.0224	0.0224	0.0224
	8.25	0.0080	0.0112	0.0159	0.0224	0.0224	0.0224	0.0224
	8.50	0.0080	0.0112	0.0159	0.0224	0.0224	0.0224	0.0224
	8.75	0.0080	0.0112	0.0159	0.0224	0.0224	0.0224	0.0224
	9.00	0.0080	0.0112	0.0159	0.0224	0.0224	0.0224	0.0224

Total Ammonia (mg/liter N)		Temperature, °C						
		0	5	10	15	20	25	30
pH	6.50	1.36	1.27	1.20	1.15	0.796	0.556	0.393
	6.75	1.36	1.27	1.20	1.15	0.796	0.556	0.393
	7.00	1.36	1.27	1.20	1.16	0.798	0.558	0.395
	7.25	1.36	1.27	1.20	1.16	0.800	0.560	0.397
	7.50	1.36	1.27	1.21	1.16	0.804	0.565	0.402
	7.75	1.49	1.40	1.33	1.28	0.890	0.627	0.448
	8.00	0.974	0.913	0.871	0.844	0.589	0.418	0.302
	8.25	0.551	0.519	0.497	0.484	0.341	0.245	0.179
	8.50	0.313	0.297	0.286	0.282	0.202	0.147	0.111
	8.75	0.180	0.172	0.168	0.169	0.123	0.093	0.072

Table 4-3

4-Day Average Concentration for Ammonia Salmonids or Other Sensitive Coldwater Species Absent[1] (WARM)

Un-ionized Ammonia (mg/liter N)		Temperature, °C						
		0	5	10	15	20	25	30
pH	6.50	0.0006	0.0008	0.0012	0.0017	0.0024	0.0024	0.0024
	6.75	0.0010	0.0015	0.0021	0.0030	0.0042	0.0042	0.0042
	7.00	0.0019	0.0026	0.0037	0.0053	0.0074	0.0074	0.0074
	7.25	0.0033	0.0047	0.0066	0.0094	0.0132	0.0132	0.0132
	7.50	0.0059	0.0083	0.0118	0.0166	0.0235	0.0235	0.0235
	7.75	0.0115	0.0162	0.0229	0.0324	0.0458	0.0458	0.0458
	8.00	0.0133	0.0188	0.0265	0.0375	0.0530	0.0530	0.0530
	8.25	0.0133	0.0188	0.0265	0.0375	0.0530	0.0530	0.0530
	8.50	0.0133	0.0188	0.0265	0.0375	0.0530	0.0530	0.0530
	8.75	0.0133	0.0188	0.0265	0.0375	0.0530	0.0530	0.0530
	9.00	0.0133	0.0188	0.0265	0.0375	0.0530	0.0530	0.0530

Total Ammonia (mg/liter N)		Temperature, °C						
		0	5	10	15	20	25	30
pH	6.50	2.27	2.12	2.01	1.93	1.88	1.31	0.928
	6.75	2.27	2.12	2.01	1.93	1.88	1.31	0.930
	7.00	2.27	2.12	2.01	1.93	1.89	1.32	0.933
	7.25	2.27	2.12	2.01	1.94	1.89	1.32	0.939
	7.50	2.27	2.13	2.02	1.95	1.90	1.33	0.949
	7.75	2.49	2.34	2.22	2.14	2.10	1.48	1.06
	8.00	1.63	1.53	1.46	1.41	1.39	0.987	0.713
	8.25	0.922	0.868	0.831	0.811	0.806	0.578	0.424
	8.50	0.524	0.496	0.479	0.472	0.476	0.348	0.262
	8.75	0.301	0.287	0.281	0.282	0.291	0.219	0.170
	9.00	0.175	0.170	0.170	0.175	0.187	0.146	0.119

[1] These values may be conservative, however. If a more refined criterion is desired, EPA recommends a site-specific criteria modification.

Table 4-4

Equations Used to Calculate UIA-N and Total Ammonia-N

Water Quality Objectives for COLD and WARM Waterbodies

COLD Chronic UIA-N	$0 \le T \le 15$	$15 \le T \le 30$
$6.5 \le pH \le 7.7$	$\frac{0.0223}{10^{(8.3-.03T-pH)}}$	$\frac{0.0158}{10^{(7.7-pH)}}$
$7.7 \le pH \le 8$	$\frac{0.0396}{10^{(0.6-0.03T)}+10^{(8.0-0.03T-pH)}}$	$\frac{0.0280}{1+10^{(7.4-pH)}}$
$8 \le pH \le 9$	$\frac{0.0317}{10^{(0.6-0.03T)}}$	0.0224

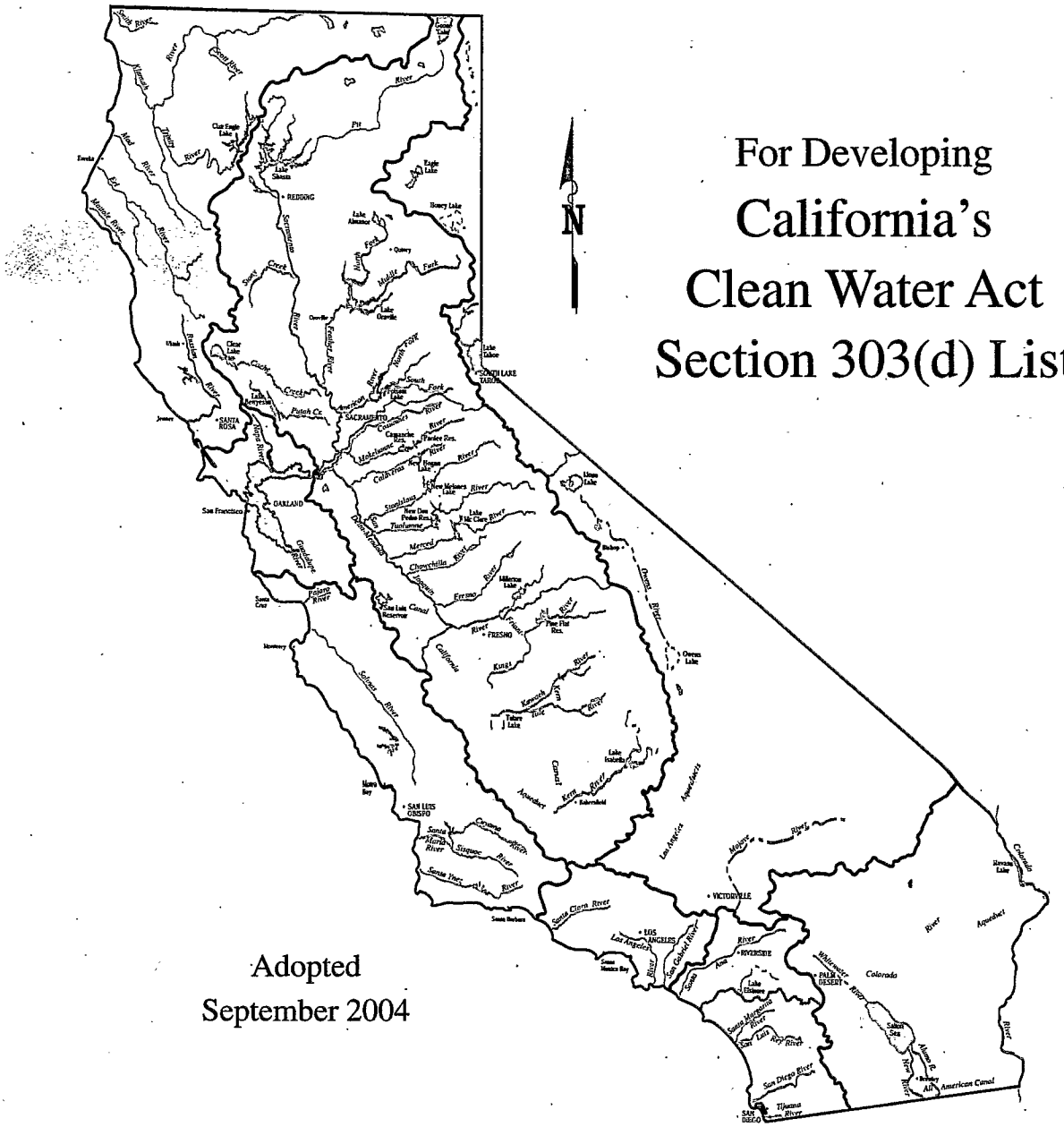
WARM Chronic UIA-N	$0 \le T \le 15$	$15 \le T \le 30$
$6.5 \le pH \le 7.7$	$\frac{0.0372}{10^{(8.3-.03T-pH)}}$	$\frac{0.0372}{10^{(7.7-pH)}}$
$7.7 \le pH \le 8$	$\frac{0.0662}{10^{(0.6-0.03T)}+10^{(8.0-0.03T-pH)}}$	$\frac{0.0662}{1+10^{(7.4-pH)}}$
$8 \le pH \le 9$	$\frac{0.0530}{10^{(0.6-0.03T)}}$	0.0530

Total Ammonia-N Objectives

$$NH_3\text{-}N = UIA\text{-}N * [1 + 10^{(0.09018 + \frac{2729.92}{T+273.15} - pH)}]$$

Note: For all equations, T is the temperature in °C

Water Quality Control Policy



For Developing
California's
Clean Water Act
Section 303(d) List

Adopted
September 2004

CALIFORNIA
Water Boards
STATE WATER RESOURCES CONTROL BOARD
REGIONAL WATER QUALITY CONTROL BOARDS
CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

STATE OF CALIFORNIA
Arnold Schwarzenegger, Governor

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
Terry Tamminen, Secretary

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11/03

State of California

STATE WATER RESOURCES CONTROL BOARD

WATER QUALITY CONTROL POLICY

FOR DEVELOPING

CALIFORNIA'S CLEAN WATER ACT SECTION 303(d) LIST

Adopted September 30, 2004

STATE WATER RESOURCES CONTROL BOARD
RESOLUTION NO. 2004-0063

ADOPTION OF THE WATER QUALITY CONTROL POLICY (POLICY) FOR DEVELOPING CALIFORNIA'S CLEAN WATER ACT SECTION 303(d) LIST

WHEREAS:

1. Section 303(d)(1) of the federal Clean Water Act (CWA) requires states to identify waters that do not meet applicable water quality standards with technology-based controls alone and prioritize such waters for the purposes of developing Total Maximum Daily Loads (TMDLs) [40 Code of Federal Regulations (CFR) 130.7(b)].

2. Section 13191.3(a) of the California Water Code (CWC) requires the State Water Resources Control Board (SWRCB) to prepare guidelines to be used by SWRCB and the Regional Water Quality Control Boards (RWQCBs) in listing, delisting, developing, and implementing TMDLs pursuant to section 303(d) of the federal CWA [33 United States Code (USC) section 1313(d)].

3. California Assembly Bill (AB) 982 Public Advisory Group (PAG) was established in 2000 to assist in the evaluation of SWRCB's water quality programs' structure and effectiveness as it relates to the implementation of section 303(d) of CWA [33 USC section 1313(d)] and applicable federal regulation.

4. CWC section 13191.3(b) also requires the SWRCB to consider the consensus recommendations on the guidelines adopted by PAG.

5. The 2001 Budget Act Supplemental Report required the use of a "weight of evidence" approach in developing the Policy for listing and delisting waters and to include criterion to ensure that data and information used are accurate and verifiable.

6. SWRCB, in compliance with CWC section 13147, held public hearings in Sacramento, California, on January 28, 2004 and in Torrance, California, on February 5, 2004 on the Water Quality Control Policy and carefully considered all testimony and comments received.

7. SWRCB has completed a scientific peer review by University of California scientists of the draft Functional Equivalent Document as required by section 57004 of the Health and Safety Code.

8. SWRCB has determined that the adoption of this Policy will not have a significant adverse effect on the environment.

9. The regulatory provisions of the Policy do not become effective until the regulatory provisions are approved by the Office of Administrative Law (OAL).

THEREFORE BE IT RESOLVED THAT:

The SWRCB:

1. Approves the final FED: Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List.

2. Adopts the Policy for Developing California's Clean Water Act Section 303(d) List (Attachment).

3. Authorizes the Executive Director or designee to submit the Policy to the Office of Administrative Law for approval.

4. Shall hold a public workshop after the approval of the 2004 section 303(d) list to assess implementation of the Policy.

CERTIFICATION

The undersigned, Clerk to the Board, does hereby certify that the foregoing is a full, true, and correct copy of a resolution duly and regularly adopted at a meeting of the State Water Resources Control Board held on September 30, 2004.

Debbie Irvin
Clerk to the Board

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September 30, 2004

WATER QUALITY CONTROL POLICY FOR DEVELOPING CALIFORNIA'S CLEAN WATER ACT SECTION 303(d) LIST

1 Introduction

Pursuant to California Water Code section 13191.3(a), this State policy for water quality control (Policy) describes the process by which the State Water Resources Control Board (SWRCB) and Regional Water Quality Control Boards (RWQCBs) will comply with the listing requirements of section 303(d) of the federal Clean Water Act (CWA). The objective of this Policy is to establish a standardized approach for developing California's section 303(d) list in order to achieve the overall goal of achieving water quality standards and maintaining beneficial uses in all of California's surface waters.

CWA section 303(d) requires states to identify waters that do not meet, or are not expected to meet by the next listing cycle, applicable water quality standards after the application of certain technology-based controls and schedule such waters for development of Total Maximum Daily Loads (TMDLs) [40 Code of Federal Regulations (CFR) 130.7(c) and (d)]. The states are required to assemble and evaluate all existing and readily available water quality-related data and information to develop the list [40 CFR 130.7(b)(5)] and to provide documentation for listing or not listing a state's waters [40 CFR 130.7(b)(6)]. The methodology to be used to develop the section 303(d) list [40 CFR 130.7(b)(6)(i)] is established by this Policy and includes:

- California Listing Factors and Delisting Factors;
- The process for gathering and evaluating of readily available data and information; and
- Total Maximum Daily Load (TMDL) scheduling.

This Policy applies only to the listing process methodology used to comply with CWA section 303(d). In order to make decisions regarding standards attainment, this Policy provides guidance for interpreting data and information as they are compared to beneficial uses, existing numeric and narrative water quality objectives, and antidegradation considerations. The Policy shall not be used to:

- determine compliance with any permit or waste discharge requirement provision;
- establish, revise, or refine any water quality objective or beneficial use; or
- translate narrative water quality objectives for the purposes of regulating point sources.

Data and information from water bodies shall be analyzed under the provisions of this Policy using a weight-of-evidence approach. The weight-of-evidence approach shall be used to

evaluate whether the evidence is in favor of or against placing waters on or removing waters from the section 303(d) list (section 2). The following steps describe the weight-of-evidence approach:

1. Data and Information Preprocessing: All data and information for existing listings shall be solicited and assembled, as appropriate (sections 6.1.1 and 6.1.2.1). Water body fact sheets (section 6.1.2.2) describing the assessments shall be prepared. Evaluation guidelines (section 6.1.3), if needed, shall be selected and the quality of the data (section 6.1.4) and quantity of data (section 6.1.5) shall be assessed.

2. Data and Information Processing: All data and information shall be evaluated using the decision rules listed in sections 3 or 4, as appropriate, and using applicable implementation factors (including, but not limited to, sections 6.1.2.2 and 6.1.5.1 through 6.1.5.9). RWQCBs shall also develop a schedule for completion of TMDLs (section 5). All other information not addressed under sections 3, 4, 5, or 6, shall be evaluated and presented in fact sheets.

3. Data Assessment: An assessment in favor of or against a list action for a water body-pollutant combination shall be presented in fact sheets. The assessment shall identify and discuss relationships between all available lines of evidence for water bodies and pollutants. This assessment shall be made on a pollutant-by-pollutant (including toxicity) basis. RWQCBs shall approve all decisions to list or delist a water segment (section 6.2).

2 Structure of the CWA Section 303(d) List

This section describes the categories of waters that shall be included in the section 303(d) list. Sections 3 and 4 contain the factors that shall be used to add and remove waters from the list. At a minimum, the California section 303(d) list shall identify waters where standards are not met, pollutants or toxicity contributing to standards exceedance, and the TMDL completion schedule. The section 303(d) list shall contain the following categories:

2.1 Water Quality Limited Segments

Waters shall be placed in this category of the section 303(d) list if it is determined, in accordance with the California Listing Factors, that the water quality standard is not attained; the standards nonattainment is due to toxicity, a pollutant, or pollutants; and remediation of the standards attainment problem requires one or more TMDLs.

The water segment shall remain in this category of the section 303(d) list until TMDLs for all pollutants have been completed, U.S. Environmental Protection Agency (USEPA) has approved the TMDLs, and implementation plans have been adopted.

2.2 Water Quality Limited Segments Being Addressed

Water segments shall be placed in this category if the conditions for placement in the water quality limited segments category (section 3) are met and either of the following conditions is met:

1. A TMDL has been developed and approved by USEPA and the approved implementation plan is expected to result in full attainment of the standard within a specified time frame; or

2. The RWQCB has determined in fact sheets that an existing regulatory program is reasonably expected to result in the attainment of the water quality standard within a reasonable, specified time frame.

Waters shall only be removed from this category if it is demonstrated in accordance with section 4 that water quality standards are attained.

3 California Listing Factors

RWQCBs and SWRCB shall use the following factors to develop the California section 303(d) list. Waters meeting the conditions in section 3 exceed water quality standards.

In developing the list, the state shall evaluate all existing readily available water quality-related data and information. Data and information, collected during a known spill or violation of an effluent limit in a permit or waste discharge requirement (WDR), may be used in conjunction with other data to demonstrate that there is an exceedance of a water quality standard in the water body. Visual assessments or other semi-quantitative assessments shall also be considered as ancillary lines of evidence to support a section 303(d) listing.

Water segments shall be placed on the section 303(d) list if any of the following conditions are met.

3.1 Numeric Water Quality Objectives and Criteria for Toxicants in Water

Numeric water quality objectives for toxic pollutants, including maximum contaminant levels where applicable, or California/National Toxics Rule water quality criteria are exceeded as follows:

- Using the binomial distribution, waters shall be placed on the section 303(d) list if the number of measured exceedances supports rejection of the null hypothesis as presented in Table 3.1.

3.2 Numeric Water Quality Objectives for Conventional or Other Pollutants in Water

Numeric water quality objectives for conventional pollutants are exceeded as follows:

- Using the binomial distribution, waters shall be placed on the section 303(d) list if the number of measured exceedances supports rejection of the null hypothesis as presented in Table 3.2.

For depressed dissolved oxygen, if measurements of dissolved oxygen taken over the day (diel) show low concentrations in the morning and sufficient concentrations in the afternoon, then it shall be assumed that nutrients are responsible for the observed dissolved oxygen concentrations if riparian cover, substrate composition or other pertinent factors can be ruled out as controlling dissolved oxygen fluctuations. When continuous monitoring data are available, the seven-day average of daily minimum measurements shall be assessed. In the absence of diel measurements, concurrently collected measurements of nutrient concentration shall be assessed using applicable water quality objectives or acceptable evaluation guidelines (section 6.1.3) and using the binomial distribution as described in section 3.1.

3.3 Numerical Water Quality Objectives or Standards for Bacteria Where Recreational Uses Apply

In the absence of a site-specific exceedance frequency, a water segment shall be placed on the section 303(d) list if bacteria water quality standards in California Code of Regulations, Basin Plans, or statewide plans are exceeded using the binomial distribution as described in section 3.2.

If a site-specific exceedance frequency is available, it may be used instead of the ten percent exceedance frequency as described in Table 3.2 or four percent as described in the following paragraph. The site-specific exceedance frequency shall be the number of water quality standard exceedances in a relatively unimpacted watershed (i.e., a reference water segment). To the extent possible and allowed by water quality objectives, RWQCBs shall identify one or more reference beaches or water segments to compare the measurements.

For bacterial measurements from coastal beaches, if water quality monitoring was conducted April 1 through October 31 only, a four percent exceedance percentage shall be used. For bacterial measurements from inland waters, if water quality monitoring data were collected April 1 through October 31 only, a four percent exceedance percentage shall be used if (1) bacterial measurements are indicative of human fecal matter, and (2) there is substantial human contact in the water body. If the exceedance is due to a closure related to a sewage spill, the water segment shall not be placed on the section 303(d) list. Postings that are not backed by water quality data shall not be used to support placement of a water segment on the section 303(d) list.

3.4 Health Advisories

A water segment shall be placed on the section 303(d) list if a health advisory against the consumption of edible resident organisms, or a shellfish harvesting ban has been issued by the Office of Environmental Health Hazard Assessment (OEHHA), or Department of Health Services and there is a designated or existing fish consumption beneficial use for the segment. In addition, water segment-specific data must be available indicating the evaluation guideline for tissue is exceeded.

3.5 Bioaccumulation of Pollutants in Aquatic Life Tissue

A water segment shall be placed on the section 303(d) list if the tissue pollutant levels in organisms exceed a pollutant-specific evaluation guideline (satisfying the requirements of section 6.1.3) using the binomial distribution as described in section 3.1.

Acceptable tissue concentrations may be based on composite samples measured either as muscle tissue or whole body residues. Residues in liver tissue alone are not considered a suitable measure. Samples can be collected either from transplanted animals or from resident populations.

3.6 Water/Sediment Toxicity

A water segment shall be placed on the section 303(d) list if the water segment exhibits statistically significant water or sediment toxicity using the binomial distribution as described in section 3.1. The segment shall be listed if the observed toxicity is associated with a pollutant or pollutants. Waters may also be placed on the section 303(d) list for toxicity alone. If the pollutant causing or contributing to the toxicity is identified, the pollutant shall be included on the section 303(d) list as soon as possible (i.e., during the next listing cycle).

Reference conditions may include laboratory controls (using a t-test or other applicable statistical test), the lower confidence interval of the reference envelope, or, for sediments, response less than 90 percent of the minimum significant difference for each specific test organism.

Appropriate reference and control measures must be included in the toxicity testing. Acceptable methods include, but are not limited to, those listed in water quality control plans, the methods used by Surface Water Ambient Monitoring Program (SWAMP), the Southern California Bight Projects of the Southern California Coastal Water Research Project, American Society for Testing and Materials (ASTM), USEPA, the Regional Monitoring Program of the San Francisco Estuary Institute, and the Bay Protection and Toxic Cleanup Program (BPTCP).

Association of pollutant concentrations with toxic or other biological effects should be determined by any one of the following:

A. Sediment quality guidelines (satisfying the requirements of section 6.1.3) are exceeded using the binomial distribution as described in section 3.1. In addition, using rank correlation, the observed effects are correlated with measurements of chemical concentration in sediments. If these conditions are met, the pollutant shall be identified as "sediment pollutant(s)."

B. For sediments, an evaluation of equilibrium partitioning or other type of toxicological response that identifies the pollutant that may cause the observed impact. Comparison to reference conditions within a watershed or ecoregion may be used to establish sediment impacts.

C. Development of an evaluation (such as a toxicity identification evaluation) that identifies the pollutant that contributes to or caused the observed impact.

3.7 Nuisance

A water segment shall be placed on the section 303(d) list if qualitative assessments of the water segment for nuisance water odor, taste, excessive algae growth, foam, turbidity, oil, trash, and color are associated with numerical water quality data that meets any one of the following:

3.7.1 Nutrient-related

An acceptable nutrient-related evaluation guideline is exceeded using the binomial distribution as described in section 3.1 for excessive algae growth, unnatural foam, odor, and taste. Waters may also be placed on the section 303(d) list when a significant nuisance condition exists as compared to reference conditions, or when nutrient concentrations cause or contribute to excessive algae growth. If listing for nitrogen or phosphorus specifically, RWQCBs should consider whether the ratio of these two nutrients indicates which is the limiting agent.

3.7.2 Other Types

An acceptable evaluation guideline is exceeded using the binomial distribution as described in section 3.1 for taste, color, oil sheen, turbidity, litter, trash, and odor not related to nutrients. Water segments may also be placed on the section 303(d) list when there is significant nuisance condition compared to reference conditions.

3.8 Adverse Biological Response

A water segment shall be placed on the section 303(d) list if the water segment exhibits adverse biological response measured in resident individuals as compared to reference conditions and these impacts are associated with water or sediment concentrations of pollutants as described in

section 3.6. Endpoints for this factor include reduction in growth, reduction in reproductive capacity, abnormal development, histopathological abnormalities, and other adverse conditions.

Qualitative visual assessments or other semi-qualitative assessments may be used as secondary lines of evidence to support placement on the section 303(d) list. These types of assessments include fish kills or bird kills related to water quality conditions.

For adverse biological response related to sedimentation, the water segment shall be placed on the section 303(d) list if adverse biological response is identified and effects are associated with clean sediment loads in water or with loads stored in the channel. Waters shall be placed on the section 303(d) list if evaluation guidelines (satisfying the conditions of section 6.1.3) are exceeded using the binomial distribution as described in section 3.1.

3.9 Degradation of Biological Populations and Communities

A water segment shall be placed on the section 303(d) list if the water segment exhibits significant degradation in biological populations and/or communities as compared to reference site(s) and is associated with water or sediment concentrations of pollutants including but not limited to chemical concentrations, temperature, dissolved oxygen, and trash. This condition requires diminished numbers of species or individuals of a single species or other metrics when compared to reference site(s). The analysis should rely on measurements from at least two stations. Comparisons to reference site conditions shall be made during similar season and/or hydrologic conditions.

Association of chemical concentrations, temperature, dissolved oxygen, trash, and other pollutants shall be determined using sections 3.1, 3.2, 3.6, 3.7, 6.1.5.9, or other applicable sections.

For population or community degradation related to sedimentation, the water segment shall be placed on the section 303(d) list if degraded populations or communities are identified and effects are associated with clean sediment loads in water or with loads stored in the channel when compared to evaluation guidelines (satisfying the conditions of section 6.1.3) using the binomial distribution as described in section 3.1 or as compared to reference sites.

Bioassessment data used for listing decisions shall be consistent with section 6.1.5.8. For bioassessment, measurements at one stream reach may be sufficient to warrant listing provided that the impairment is associated with a pollutant(s) as described in this section.

3.10 Trends in Water Quality

A water segment shall be placed on the section 303(d) list if the water segment exhibits concentrations of pollutants or water body conditions for any listing factor that shows a trend of declining water quality standards attainment. This section is focused on addressing the antidegradation component of water quality standards and threatened waters as defined in 40 CFR 130.2(j) by identifying trends of declining water quality. Numeric, pollutant-specific water quality objectives need not be exceeded to satisfy this listing factor. In assessing trends in water quality RWQCBs shall:

1. Use data collected for at least three years;

2. Establish specific baseline conditions;
3. Specify statistical approaches used to evaluate the declining trend in water quality measurements;
4. Specify the influence of seasonal effects, interannual effects, changes in monitoring methods, changes in analysis of samples, and other factors deemed appropriate;
5. Determine the occurrence of adverse biological response (section 3.8), degradation of biological populations and communities (section 3.9), or toxicity (section 3.6); and
6. Assess whether the declining trend in water quality is expected to not meet water quality standards by the next listing cycle.

Waters shall be placed on the section 303(d) list if the declining trend in water quality is substantiated (steps 1 through 4 above) and impacts are observed (step 5).

3.11 Situation-Specific Weight of Evidence Listing Factor

When all other Listing Factors do not result in the listing of a water segment but information indicates non-attainment of standards, a water segment shall be evaluated to determine whether the weight of evidence demonstrates that a water quality standard is not attained. If the weight of evidence indicates non-attainment, the water segment shall be placed on the section 303(d) list.

When making a listing decision based on the situation-specific weight of evidence, the RWQCB must justify its recommendation by:

- Providing any data or information including current conditions supporting the decision;
- Describing in fact sheets how the data or information affords a substantial basis in fact from which the decision can be reasonably inferred;
- Demonstrating that the weight of evidence of the data and information indicate that the water quality standard is not attained; and
- Demonstrating that the approach used is scientifically defensible and reproducible.

TABLE 3.1: MINIMUM NUMBER OF MEASURED EXCEEDANCES NEEDED TO PLACE A WATER SEGMENT ON THE SECTION 303(D) LIST FOR TOXICANTS.

Null Hypothesis: Actual exceedance proportion ≤ 3 percent.
Alternate Hypothesis: Actual exceedance proportion > 18 percent.
The minimum effect size is 15 percent.

Sample Size	List if the number of exceedances equal or is greater than
2 – 24	2*
25 – 36	3
37 – 47	4
48 – 59	5
60 – 71	6
72 – 82	7
83 – 94	8
95 – 106	9
107 – 117	10
118 – 129	11

*Application of the binomial test requires a minimum sample size of 16. The number of exceedances required using the binomial test at a sample size of 16 is extended to smaller sample sizes.

For sample sizes greater than 129, the minimum number of measured exceedances is established where α and $\beta \leq 0.2$ and where $|\alpha - \beta|$ is minimized.

α = Excel® Function BINOMDIST(n-k, n, 1 – 0.03, TRUE)
β = Excel® Function BINOMDIST(k-1, n, 0.18, TRUE)
where n = the number of samples,
k = minimum number of measured exceedances to place a water on the section 303(d) list,
0.03 = acceptable exceedance proportion, and
0.18 = unacceptable exceedance proportion.

TABLE 3.2: MINIMUM NUMBER OF MEASURED EXCEEDANCES NEEDED TO PLACE A WATER SEGMENT ON THE SECTION 303(D) LIST FOR CONVENTIONAL OR OTHER POLLUTANTS.

Null Hypothesis: Actual exceedance proportion ≤ 10 percent.
Alternate Hypothesis: Actual proportion > 25 percent.
The minimum effect size is 15 percent.

Sample Size	List if the number of exceedances equal or is greater than
5 – 30	5*
31 – 36	6
37 – 42	7
43 – 48	8
49 – 54	9
55 – 60	10
61 – 66	11
67 – 72	12
73 – 78	13
79 – 84	14
85 – 91	15
92 – 97	16
98 – 103	17
104 – 109	18
110 – 115	19
116 – 121	20

*Application of the binomial test requires a minimum sample size of 26. The number of exceedances required using the binomial test at a sample size of 26 is extended to smaller sample sizes.

For sample sizes greater than 121, the minimum number of measured exceedances is established where α and $\beta \leq 0.2$ and where $|\alpha - \beta|$ is minimized.

α = Excel® Function BINOMDIST(n-k, n, 1 – 0.10, TRUE)
β = Excel® Function BINOMDIST(k-1, n, 0.25, TRUE)
where n = the number of samples,
k = minimum number of measured exceedances to place a water segment on section 303(d) list,
0.10 = acceptable exceedance proportion, and
0.25 = unacceptable exceedance proportion.

4 California Delisting Factors

This section provides the methodology for removing waters from the section 303(d) list (including the Water Quality Limited Segments category and Water Quality Limited Segments Being Addressed category).

All listings of water segments shall be removed from the section 303(d) list if the listing was based on faulty data, and it is demonstrated that the listing would not have occurred in the absence of such faulty data. Faulty data include, but are not limited to, typographical errors, improper quality assurance/quality control procedures, or limitations related to the analytical methods that would lead to improper conclusions regarding the water quality status of the segment.

If objectives or standards have been revised and the site or water meets water quality standards, the water segment shall be removed from the section 303(d) list. The listing of a segment shall be reevaluated if the water quality standard has been changed.

Any interested party may request an existing listing be reassessed under the delisting factors of this Policy. In requesting the reevaluation, the interested party must, using the delisting factors: state the reason(s) the listing is inappropriate and the Policy would lead to a different outcome; and provide the data and information necessary to enable the RWQCB and SWRCB to conduct the review.

Water segments or pollutants shall be removed from the section 303(d) list if any of the following conditions are met.

4.1 Numeric Water Quality Objectives, Criteria, or Standards for Toxicants in Water

Numeric water quality objectives for toxic pollutants, including maximum contaminant levels where applicable, or California/National Toxics Rule water quality criteria are not exceeded as follows:

- Using the binomial distribution, waters shall be removed from the section 303(d) list if the number of measured exceedances supports rejection of the null hypothesis as presented in Table 4.1.
- The binomial distribution cannot be used to support a delisting with sample sizes less than 28.

4.2 Numeric Water Quality Objectives for Conventional or Other Pollutants in Water

Numeric water quality objectives for conventional pollutants are not exceeded as follows:

- Using the binomial distribution, waters shall be removed from the section 303(d) list if the number of measured exceedances supports rejection of the null hypothesis as presented in Table 4.2.
- The binomial distribution cannot be used to support a delisting with sample sizes less than 26.

4.3 Numeric Water Quality Objectives for Bacteria in Water

Numeric water quality objectives or standards for bacteria are not exceeded using the binomial distribution as described in section 4.2. If a site-specific exceedance frequency was used to place the water on the section 303(d) list, then the same exceedance frequency shall be used in the assessment to remove waters from the section 303(d) list. To the extent possible and allowed by water quality objectives, RWQCBs shall identify one or more reference beaches or water segments in a relatively unimpacted watershed to compare the measurements.

4.4 Health Advisories

The health advisory used to list the water segment has been removed or the chemical or biological contaminant-specific evaluation guideline for tissue is no longer exceeded.

4.5 Bioaccumulation of Pollutants in Aquatic Life Tissue

Numeric pollutant-specific evaluation guidelines are not exceeded using the binomial distribution as described in section 4.1.

4.6 Water/Sediment Toxicity

Water/Sediment Toxicity or associated water or sediment quality guidelines are not exceeded using the binomial distribution as described in section 4.1.

4.7 Nuisance

The water segment no longer satisfies the conditions for a nuisance listing or associated numerical water or sediment data meets any one of the following:

4.7.1 Nutrient-related

For excessive algae growth, unnatural foam, odor, taste, applicable numerical nutrient-related evaluation guidelines are not exceeded using the binomial distribution as described in section 4.1.

4.7.2 Other Types

Acceptable numerical evaluation guidelines are not exceeded using the binomial distribution as described in sections 4.1 and 4.2 for color, oil sheen, turbidity, trash, taste, or odor not related to nutrients. These types of nuisance shall also be removed from the list when there is no significant nuisance condition when compared to reference conditions.

4.8 Adverse Biological Response

Adverse biological response is no longer evident or associated water or sediment numeric pollutant-specific evaluation guidelines are not exceeded using the binomial distribution as described in section 4.1.

4.9 Degradation of Biological Populations and Communities

Biological populations and communities degradation in the water segment is no longer evident as compared to reference site(s) or associated water or sediment numeric pollutant-specific evaluation guidelines are not exceeded using the binomial distribution as described in section 4.1.

4.10 Trends in Water Quality

The factors for assessing trends in water quality (section 3.10) are not substantiated (steps 1 through 4) or impacts are no longer observed (step 5).

4.11 Situation-Specific Weight of Evidence Delisting Factor

When all other Delisting Factors do not result in the delisting of a water segment but information indicates attainment of standards, a water segment shall be evaluated to determine whether the weight of evidence demonstrates that a water quality standard is attained. If the weight of evidence indicates attainment, the water segment shall be removed from the section 303(d) list. If warranted, a listing may be maintained if the weight of evidence indicates a water quality standard is not attained.

When making a delisting decision based on the situation-specific weight of evidence, the RWQCB must justify its recommendation by:

- Providing any data or information including current conditions supporting the decision;
- Describing in fact sheets how the data or information affords a substantial basis in fact from which the decision can be reasonably inferred;
- Demonstrating that the weight of evidence of the data and information indicates that the water quality standard is attained; and
- Demonstrating that the approach used is scientifically defensible and reproducible.

TABLE 4.1: MAXIMUM NUMBER OF MEASURED EXCEEDANCES ALLOWED TO REMOVE A WATER SEGMENT FROM THE SECTION 303(D) LIST FOR TOXICANTS.

Null Hypothesis: Actual exceedance proportion ≥ 18 percent.
Alternate Hypothesis: Actual proportion < 3 percent of the samples
The minimum effect size is 15 percent.

Sample Size	Delist if the number of exceedances equal or is less than
28 – 36	2
37 – 47	3
48 – 59	4
60 – 71	5
72 – 82	6
83 – 94	7
95 – 106	8
107 – 117	9
118 – 129	10

For sample sizes greater than 129, the maximum number of measured exceedances allowed is established where α and $\beta \leq 0.10$ and where $|\alpha - \beta|$ is minimized.

α = Excel® Function BINOMDIST(k, n, 0.18, TRUE)
β = Excel® Function BINOMDIST(n-k-1, n, 1 – 0.03, TRUE)
where n = the number of samples,
k = maximum number of measured exceedances allowed,
0.03 = acceptable exceedance proportion, and
0.18 = unacceptable exceedance proportion.

TABLE 4.2: MAXIMUM NUMBER OF MEASURED EXCEEDANCES ALLOWED TO REMOVE A WATER SEGMENT FROM THE SECTION 303(D) LIST FOR CONVENTIONAL OR OTHER POLLUTANTS.

Null Hypothesis: Actual exceedance proportion ≥ 25 percent.
Alternate Hypothesis: Actual exceedance proportion < 10 percent.
The minimum effect size is 15 percent.

Sample Size	Delist if the number of exceedances equal or is less than
26 – 30	4
31 – 36	5
37 – 42	6
43 – 48	7
49 – 54	8
55 – 60	9
61 – 66	10
67 – 72	11
73 – 78	12
79 – 84	13
85 – 91	14
92 – 97	15
98 – 103	16
104 – 109	17
110 – 115	18
116 – 121	19

For sample sizes greater than 121, the maximum number of exceedances allowed is established at α and $\beta \leq 0.2$ and where $|\alpha - \beta|$ is minimized.

α = Excel® Function BINOMDIST(k, n, 0.25, TRUE)
β = Excel® Function BINOMDIST(n-k-1, n, 1 – 0.1, TRUE)
where n = the number of samples,
k = maximum number of measured exceedances allowed,
0.10 = acceptable exceedance proportion, and
0.25 = unacceptable exceedance proportion.

5 TMDL Scheduling

A schedule shall be established by the RWQCBs and SWRCB for waters on the section 303(d) list that identifies the TMDLs that will be established within the current listing cycle and the number of TMDLs scheduled to be developed thereafter.

For water quality limited segments needing a TMDL, RWQCBs shall develop a completion schedule in compliance with federal law and regulation based on, but not limited to, the following criteria:

- Water body significance (such as importance and extent of beneficial uses, threatened and endangered species concerns, and size of water body);
- Degree that water quality objectives are not met or beneficial uses are not attained or threatened (such as the severity of the pollution or number of pollutants/stressors of concern) [40 CFR 130.7(b)(4)];
- Degree of impairment;
- Potential threat to human health and the environment;
- Water quality benefits of activities ongoing in the watershed;
- Potential for beneficial use protection and recovery;
- Degree of public concern;
- Availability of funding; and
- Availability of data and information to address the water quality problem.

All water body-pollutant combinations on the section 303(d) list shall be assigned a TMDL schedule date.

6 Policy Implementation

This section provides SWRCB guidance on implementation of this Policy. The most recently completed section 303(d) list shall form the basis for any subsequent lists.

6.1 Process for Evaluation of Readily Available Data and Information

All readily available data and information shall be evaluated. To develop the section 303(d) list the RWQCBs and SWRCB shall use the following process.

6.1.1 Definition of Readily Available Data and Information

RWQCBs and SWRCB shall actively solicit, assemble, and consider all readily available data and information. Data and information that shall be reviewed include, but are not limited to: submittals resulting from the solicitation, selected data possessed by the RWQCBs, and other sources. At a minimum, readily available data and information includes paper and electronic copies of:

- The most recent section 303(d) list, and the most recent section 305(b) report;
- Drinking water source assessments;
- Municipal Separate Storm Sewer System (MS4) reports;
- Information on water quality problems in documents prepared to satisfy Superfund and Resource Conservation and Recovery Act requirements;
- Fish and shellfish advisories, beach postings and closures, or other water quality-based restrictions;
- Reports of fish kills, cancers, lesions or tumors;
- Dilution calculations, trend analyses, or predictive models for assessing the physical, chemical, or biological condition of streams, rivers, lakes, reservoirs, estuaries, coastal lagoons, or the ocean;
- Applicable water quality data and information from SWAMP, USEPA's Storage and Retrieval Database Access (STORET) or other USEPA databases and information sources, the Bay-Delta Tributaries Database, Southern California Coastal Water Research Project, and the San Francisco Estuary Regional Monitoring Program; and
- Water quality problems and existing and readily available water quality data and information reported by local, state and federal agencies (including receiving water monitoring data from discharger monitoring reports), citizen monitoring groups, academic institutions, and the public. The Federal agencies that shall be actively solicited for data and information include but are not limited to: U.S. Department of Agriculture, National Oceanic and Atmospheric Administration, U.S. Geological Survey, and U.S. Fish and Wildlife Service.

6.1.2 Administration of the Listing Process

6.1.2.1 Solicitation of All Readily Available Data and Information

SWRCB and RWQCBs shall seek all readily available data and information on the quality of surface waters of the State. Readily available data and information shall be solicited from any interested party, including but not limited to, private citizens, public agencies, state and federal

governmental agencies, non-profit organizations, and businesses possessing data and information regarding the quality of the Region's waters.

Though the SWRCB and RWQCBs must specifically solicit all readily available data and assessment information, SWRCB and RWQCB may place emphasis in the solicitation on the data and information generated since the last listing cycle. For the purposes of this solicitation, information means any documentation describing the water quality condition of a surface water body. Data are considered a subset of information that consists of reports detailing measurements of specific environmental characteristics. The data and information may pertain to physical, chemical, and/or biological conditions of the State's waters or watersheds.

Information solicited should contain the following:

- The name of the person or organization providing the information;
- The name of the person certifying the completeness and accuracy of the data and information and a statement describing the standards exceedance;
- Mailing address, telephone numbers, and email address of a contact person for the information provided;
- A copy of all information provided. The submittal must specify the software used to format the information and provide definitions for any codes or abbreviations used;
- Bibliographic citations for all information provided; and
- If computer model outputs are included in the information, provide bibliographic citations and specify any calibration and quality assurance information available for the model(s) used.

Data solicited should contain the following:

- Data in electronic form, spreadsheet, database, or ASCII formats. The submittal should use the SWAMP data format and should define any codes or abbreviations used in the database.
- Metadata for the field data, i.e., when measurements were taken, locations, number of samples, detection limits, and other relevant factors.
- Metadata for any Geographical Information System data must be included. The metadata must detail all the parameters of the projection, including datum.
- A copy of the quality assurance procedures.
- A copy of the data.
- Data from citizen volunteer water quality monitoring efforts require the name of the group and indication of any training in water quality assessment completed by members of the group. Data submitted by citizen monitoring groups should meet the data quality assurance procedures as detailed in section 6.1.4.
- For photographic documentation, adhere to the guidelines detailed in section 6.1.4.

Data and information previously submitted to RWQCBs, such as Discharge Monitoring Reports, need not be solicited if the data and information are remain available to RWQCBs.

6.1.2.2 RWQCB Fact Sheet Preparation

When data and information are available, each RWQCB shall prepare a standardized fact sheet for each water and pollutant combination that is proposed for inclusion in or deletion from the section 303(d) list. Fact sheets shall present a description of the line(s) of evidence used to support each component of the weight of evidence approach. Fact sheets shall be prepared for all data and information solicited. If the data and information reviewed indicate standards are attained, a single fact sheet may address multiple water and pollutant combinations.

The fact sheets shall contain the following:

A. Region
B. Type of water body (Bay and Harbors, Coastal Shoreline, Estuary, Lake/Reservoir, Ocean, Rivers/Stream, Saline Lake, Tidal Wetlands, Freshwater Wetland)
C. Name of water body segment (including Calwater watershed)
D. Pollutant or type of pollution that appears to be responsible for standards exceedance
E. Medium (water, sediment, tissue, habitat, etc.)
F. Water quality standards (copy applicable water quality standard, objective, or criterion from appropriate plan or regulation) including:
    1. Beneficial use affected
    2. Numeric water quality objective/water quality criteria plus metric (single value threshold, mean, median, etc.) or narrative water quality objective plus guideline(s) used to interpret attainment or non-attainment
    3. Antidegradation considerations (if applicable to situation)
    4. Any other provision of the standard used
G. Brief Watershed Description (e.g., land use, precipitation patterns, or other factors considered in the assessment)
H. Summary of data and/or information
    1. Spatial representation, area that beneficial use is affected or determined to be supported, including a map, any site specific information, and reference condition
    2. Temporal representation
    3. Age of data and/or information
    4. Effect of seasonality and events/conditions that might influence data and/or information evaluation (e.g., storms, flow conditions, laboratory data qualifiers, etc.)
    5. Number of samples or observations
    6. Number of samples or observations exceeding guideline or standard
    7. Source of or reference for data and/or information
I. For numeric data include:
    1. Quality assurance assessment
J. For non-numeric data include:
    1. Types of observations
    2. Perspective on magnitude of problem
    3. Numeric indices derived from qualitative data
K. Potential source of pollutant (the source category should be identified as specifically as possible)
L. Program(s) addressing the problem, if known

M. Data evaluation as required by sections 3 or 4 of this Policy
N. Recommendation
O. TMDL schedule (developed only for the section 303(d) list as required by section 5 of this Policy).

6.1.3 Evaluation Guideline Selection Process

Narrative water quality objectives shall be evaluated using evaluation guidelines. When evaluating narrative water quality objectives or beneficial use protection, RWQCBs and SWRCB shall identify evaluation guidelines that represent standards attainment or beneficial use protection. The guidelines are not water quality objectives and shall only be used for the purpose of developing the section 303(d) list.

To select an evaluation guideline, the RWQCB or SWRCB shall:

- Identify the water body, pollutants, and beneficial uses;
- Identify the narrative water quality objectives or applicable water quality criteria;
- Identify the appropriate interpretive evaluation guideline that potentially represents water quality objective attainment or protection of beneficial uses. If this Policy requires evaluation values to be used as one line of evidence, the evaluation value selected shall be used in concert with the other required line(s) of evidence to support the listing or delisting decision. Depending on the beneficial use and narrative standard, the following considerations shall be used in the selection of evaluation guidelines:

1. Sediment Quality Guidelines for Marine, Estuarine, and Freshwater Sediments: RWQCBs may select sediment quality guidelines that have been published in the peer-reviewed literature or by state or federal agencies. Acceptable guidelines include selected values (e.g., effects range-median, probable effects level, probable effects concentration), and other sediment quality guidelines. Only those sediment guidelines that are predictive of sediment toxicity shall be used (i.e., those guidelines that have been shown in published studies to be predictive of sediment toxicity in 50 percent or more of the samples analyzed).

2. Evaluation Guidelines for Protection from the Consumption of Fish and Shellfish: RWQCBs may select evaluation guidelines published by USEPA or OEHHA. Maximum Tissue Residue Levels (MTRLs) and Elevated Data Levels (EDLs) shall not be used to evaluate fish or shellfish tissue data.

3. Evaluation Guidelines for Protection of Aquatic Life from Bioaccumulation of Toxic Substances: RWQCBs may select the evaluation values for the protection of aquatic life published by the National Academy of Science.

For other parameters, evaluation guidelines may be used if it can be demonstrated that the evaluation guideline is:

- Applicable to the beneficial use
- Protective of the beneficial use

- Linked to the pollutant under consideration
- Scientifically-based and peer reviewed
- Well described
- Identifies a range above which impacts occur and below which no or few impacts are predicted. For non-threshold chemicals, risk levels shall be consistent with comparable water quality objectives or water quality criteria.

RWQCBs shall assess the appropriateness of the guideline in the hydrographic unit. Justification for the alternate evaluation guidelines shall be referenced in the water body fact sheet.

6.1.4 Data Quality Assessment Process

Even though all data and information must be used, the quality of the data used in the development of the section 303(d) list shall be of sufficient high quality to make determinations of water quality standards attainment. Data supported by a Quality Assurance Project Plan (QAPP) pursuant to the requirements of 40 CFR 31.45 are acceptable for use in developing the section 303(d) list.

The data from major monitoring programs in California and published U.S. Geological Survey (USGS) reports are considered of adequate quality. The major programs include SWAMP, the Southern California Bight Projects of the Southern California Coastal Water Research Project, USEPA's Environmental Monitoring and Assessment Program, the Regional Monitoring Program of the San Francisco Estuary Institute, and the BPTCP.

Numeric data are considered credible and relevant for listing purposes if the data set submitted meets the minimum quality assurance/quality control requirements outlined below. A QAPP or equivalent documentation must be available containing, at a minimum, the following elements:

- Objectives of the study, project, or monitoring program;
- Methods used for sample collection and handling;
- Field and laboratory measurement and analysis;
- Data management, validation, and recordkeeping (including proper chain of custody) procedures;
- Quality assurance and quality control requirements;
- A statement certifying the adequacy of the QAPP (plus name of person certifying the document); and
- A description of personnel training.

A site-specific or project-specific sampling and analysis plan for numeric data should also be available containing:

- Data quality objectives or requirements of the project;
- A statement that data quality objectives or requirements were achieved;
- Rationale for the selection of sampling sites, water quality parameters, sampling frequency and methods that assure the samples are spatially and temporally representative of the surface water and representative of conditions within the targeted sampling timeframe; and

- Documentation to support the conclusion that results are reproducible.

The RWQCBs shall make a finding in the fact sheets on the availability of the QAPP (or equivalent), adequacy of data collection, analysis practices, and adequacy of the data verification process (including the chain of custody, detection limits, holding times, statistical treatment of data, precision and bias, etc). If any data quality objectives or requirements in the QAPP are not met, the reason for not meeting them and the potential impact on the overall assessment shall be documented.

Data without rigorous quality control can be used in combination with high quality data and information. If the data collection and analysis is not supported by a QAPP (or equivalent) or if it is not possible to tell if the data collection and analysis were supported by a QAPP (or equivalent), then the data and information should not be used by itself to support listing or delisting of a water segment. All data of whatever quality can be used as part of a weight of evidence determination (sections 3.11 or 4.11).

For narrative and qualitative submittals, the submission must:

- describe events or conditions that indicate impacts on water quality;
- provide linkage between the measurement endpoint (e.g., a study that may have been performed for some other purpose) and the water quality standard of interest;
- be scientifically defensible;
- provide analyst's credentials and training; and
- be verifiable by SWRCB or RWQCB.

For photographic documentation, the submission must:

- identify the date;
- identify location on a general area map;
- either mark location on a USGS 7.5 minute quad map along with quad sheet name or provide location latitude/longitude;
- provide a thorough description of photograph(s);
- describe the spatial and temporal representation of the photographs;
- provide linkage between photograph-represented condition and condition that indicates impacts on water quality;
- provide photographer's rationale for area photographed and camera settings used; and
- be verifiable by SWRCB and RWQCB.

6.1.5 Data Quantity Assessment Process

Before determining if water quality standards are exceeded, RWQCBs have wide discretion establishing how data and information are to be evaluated, including the flexibility to establish water segmentation, as well as the scale of spatial and temporal data and information that are to be reviewed. The following considerations shall be documented in each water body fact sheet.

6.1.5.1 Water Body Specific Information

Data used to assess water quality standards attainment should be actual data that can be quantified and qualified. Information that is descriptive, estimated, modeled, or projected may be used as ancillary lines of evidence for listing or delisting decisions. In order to be used in developing the lists:

- Data must be measured at one or more sites in the water segment;
- If applicable and available, environmental conditions in a water body or at a site must be taken into consideration (e.g., effects of seasonality, events such as storms, the occurrence of wildfires, land use practices, etc.); and
- The fact sheet shall contain a description of readily available pertinent factors such as the depth of water quality measurements, flow, hardness, pH, the extent of tidal influence, and other relevant sample- and water body-specific factors.

6.1.5.2 Spatial Representation

Samples should be representative of the water body segment. To the extent possible, samples should represent statistically or in a consistent targeted manner the segment of the water body.

Samples collected within 200 meters of each other should be considered samples from the same station or location. However, samples less than 200 meters apart may be considered to be spatially independent samples if justified in the water body fact sheet.

6.1.5.3 Temporal Representation

Samples should be representative of the critical timing that the pollutant is expected to impact the water body. Samples used in the assessment must be temporally independent. If the majority of samples were collected on a single day or during a single short-term natural event (e.g., a storm, flood, or wildfire), the data shall not be used as the primary data set supporting the listing decision.

Documentation should include the time of day in which the sample was taken, and, to the extent possible, the critical season for the pollutant and applicable water quality standard. In general, samples should be available from two or more seasons or from two or more events when effects or water quality objective exceedances would be expected to be clearly manifested.

Sampling ephemeral waters, during a specific season, or during human-caused events (except spills) should be used to assess significant pollutant-related exceedances of water quality standards. Timing of the sampling should include the critical season for the pollutant and applicable water quality standard. If the implementation of a management practice(s) has resulted in a change in the water body segment, only recently collected data [since the implementation of the management measure(s)] should be considered. The water quality fact sheet should describe the significance of the sample timing.

6.1.5.4 Aggregation of Data by Reach/Area

At a minimum, data shall be aggregated by the water body segments as defined in the Basin Plans. In the absence of a Basin Plan segmentation system, the RWQCBs should define distinct reaches based on hydrology and relatively homogeneous land use.

If available data suggest that a pollutant may cause an excursion above a water quality objective, the RWQCB should, to the extent information is readily available, identify land uses, subwatersheds, tributaries, or dischargers that could be contributing the pollutant to the water body. The RWQCBs should identify stream reaches or lake/estuary areas that may have different pollutant levels based on significant differences in land use, tributary inflow, or discharge input. Based on these evaluations of the water body setting, RWQCBs should aggregate the data by appropriate reach or area.

Data must be measured at one or more sites in the water segment in order to place a water segment on the section 303(d) list.

6.1.5.5 Quantitation of Chemical Concentrations

When available data are less than or equal to the quantitation limit and the quantitation limit is less than or equal to the water quality standard, the value will be considered as meeting the water quality standard, objective, criterion, or evaluation guideline.

When the sample value is less than the quantitation limit and the quantitation limit is greater than the water quality standard, objective, criterion, or evaluation guideline, the result shall not be used in the analysis.

The quantitation limit includes the minimum level, practical quantitation level, or reporting limit.

6.1.5.6 Evaluation of Data Consistent with the Expression of Numeric Water Quality Objectives, Water Quality Criteria, or Evaluation Guidelines

If the water quality objectives, criteria, or guidelines state a specific averaging period and/or mathematical transformation, the data should be evaluated in a consistent manner prior to conducting any statistical analysis for placement of the water on the section 303(d) list. If sufficient data are not available for the stated averaging period, the available data shall be used to represent the averaging period.

To be considered temporally independent, samples collected during the averaging period shall be combined and considered one sampling event. For data that is not temporally independent (e.g., when multiple samples are collected at a single location on the same day), the measurements shall be combined and represented by a single resultant value. For dissolved oxygen measurements, the minimum value shall be used to determine compliance with the water quality objective. For pH measurements, the minimum or maximum values of the data set shall be used to determine compliance with the water quality objective.

If the averaging period is not stated for the standard, objective, criterion, or evaluation guideline, then the samples collected less than 7 days apart shall be averaged.

6.1.5.7 Binomial Model Statistical Evaluation

Once data have been summarized, RWQCBs shall determine if standards are exceeded. The RWQCBs shall determine for each averaging period which data points exceed water quality standards. The number of measurements that exceed standards shall be reported in the water body fact sheet.

When numerical data are evaluated, all of the following steps shall be completed:

A. For each data point representing the averaging period, the RWQCB shall answer the question: Are water quality standards met?

B. If the measurement is greater than the water quality standard, objective, criterion, or evaluation guideline, then the standard is exceeded.

C. Sum the number of samples exceeding the standard, objective, criterion, or evaluation guideline.

D. Sum the total number of measurements (sample population).

E. Compare the result to the appropriate table (i.e., Tables 3.1, 3.2, 4.1, or 4.2).

F. Report the result of this comparison in the water body fact sheet.

6.1.5.8 Evaluation of Bioassessment Data

When evaluating biological data and information, RWQCBs shall evaluate all readily available data and information and shall:

- Identify appropriate reference sites within water segments, watersheds, or ecoregions. Document methods for selection of reference sites.
- Evaluate bioassessment data at reference sites using water segment-appropriate method(s) and index period(s). Document sampling methods, index periods, and Quality Assurance/Quality Control procedures for the habitat being sampled and question(s) being asked.
- Evaluate bioassessment data from other sites, and compare to reference conditions. Evaluate physical habitat data and other water quality data, when available, to support conclusions about the status of the water segment.
- Calculate biological metrics for reference sites and develop Index of Biological Integrity if possible.

6.1.5.9 Evaluation of Temperature Data

Temperature water quality objectives shall be evaluated as described in sections 6.1.5.1 through 6.1.5.7. When "historic" or "natural" temperature data are not available, alternative approaches shall be employed to assess temperature impacts.

In the absence of necessary data to interpret numeric water quality objectives, recent temperature monitoring data shall be compared to the temperature requirements of aquatic life in the water segment. In many cases, fisheries, particularly salmonids, represent the beneficial uses most sensitive to temperature. Information on current and historic conditions and distribution of

sensitive beneficial uses (e.g., fishery resources) in the water segment is necessary, as well as recent temperature data reflective of conditions experienced by the most sensitive life stage of the aquatic life species. If temperature data from past (historic) periods corresponding to times when the beneficial use was fully supported are not available, information about presence/absence or abundance of sensitive aquatic life species shall be used to infer past (historic) temperature conditions if loss of habitat, diversions, toxic spills, and other factors are also considered.

Determination of life stage temperature requirements of sensitive aquatic life species shall be based on peer-reviewed literature. Similarly, evaluation of temperature data shall be based on temperature metrics reflective of the temperature requirements for the sensitive aquatic life species, including but not limited to, the maximum weekly average temperature and upper lethal limit.

6.2 RWQCB Approval

At a public hearing, the RWQCB shall consider and approve each proposed list change as documented in water body fact sheet. Advance notice and opportunity for public comment shall be provided. RWQCB shall develop written responses to all comments. After consideration of all testimony, RWQCBs shall approve a resolution in support of their recommendations for the section 303(d) list. RWQCBs shall submit to SWRCB the water body fact sheets, responses to comments, documentation of the hearing process, and a copy of all data and information considered. For the 2004 section 303(d) list, RWQCB approval of list changes is not required.

6.3 SWRCB Approval

During the development of the 2004 section 303(d) list, SWRCB shall perform all tasks required by this Policy.

Subsequent to the 2004 listing cycle, SWRCB shall evaluate RWQCB-developed water body fact sheets for completeness, consistency with this Policy, and consistency with applicable law. The SWRCB shall assemble the fact sheets and consolidate all the RWQCB lists into the statewide section 303(d) list.

Before the adoption of the section 303(d) list, the SWRCB shall hold a public workshop. Advance notice and opportunity for public comment shall be provided. Requests for review of specific listing decisions must be submitted to the SWRCB within 30 days of the RWQCB's decision. The SWRCB shall consider changes only to waters that are requested for review unless the SWRCB, on its own motion, decides to consider recommendations on other waters. Subsequent to the workshop, the SWRCB shall approve the section 303(d) list at a Board Meeting. The approved section 303(d) list and the supporting fact sheets shall be submitted to USEPA for approval as required by the Clean Water Act.

7 Definitions

α (Alpha) is the statistical error of rejecting a null hypothesis that is true. This type of error is also called Type I error.

ALTERNATE HYPOTHESIS is a statement or claim that a statistical test is set up to establish.

β (Beta) is the statistical error of failing to reject a null hypothesis that is not true. This type of error is also called Type II error.

BINOMDIST is an Excel® function that is used to calculate the cumulative binomial distribution.

BINOMIAL DISTRIBUTION is a mathematical distribution that describes the probabilities associated with the possible number of times particular outcomes will occur in series of observations (i.e., samples). Each observation may have only one of two possible results (e.g., standard exceeded or standard not exceeded).

BIOACCUMULATION is the process by which a chemical is taken up by an organism from its surrounding medium through gill membranes, epithelial tissue, or from food and subsequently concentrated and retained in the body of the organism.

BIOASSESSMENT is an assessment of biological community information along with measures of the physical/habitat quality to determine, in the case of water quality, the integrity of a water body of interest.

CONVENTIONAL POLLUTANTS include dissolved oxygen, pH, and temperature.

DIEL measurements pertain to measurements taken over a 24-hour period of time.

EFFECT SIZE is maximum magnitude of exceedance frequency that is tolerated.

NULL HYPOTHESIS is a statement used in statistical testing that has been put forward either because it is believed to be true or because it is to be used as a basis for argument, but has not been proved.

RANK CORRELATION is the association between paired values of two variables that have been replaced by their ranks within their respective samples (e.g., chemical measurements and response in a toxicity test).

REFERENCE CONDITION refers to the characteristics of water body segments least impaired by human activities. As such, reference conditions can be used to describe attainable biological or habitat conditions for water body segments with common watershed/catchment characteristics within defined geographical regions.

STATISTICAL SIGNIFICANCE occurs when it can be demonstrated that the probability of obtaining a difference by chance only is relatively low.

TOXICANTS include priority pollutants, metals, chlorine, and nutrients.

TOXICITY IDENTIFICATION EVALUATION (TIE) is a technique to identify the unexplained cause(s) of toxic events. TIE involves selectively removing classes of chemicals through a series of sample manipulations, effectively reducing complex mixtures of chemicals in natural waters to simple components for analysis. Following each manipulation the toxicity of the sample is assessed to see whether the toxicant class removed was responsible for the toxicity.

WATER QUALITY LIMITED SEGMENT is any segment of a water body where it is known that water quality does not meet applicable water quality standards, and/or is not expected to meet applicable water quality standards, even after application of technology-based effluent limitations required by CWA sections 301(d) or 306.

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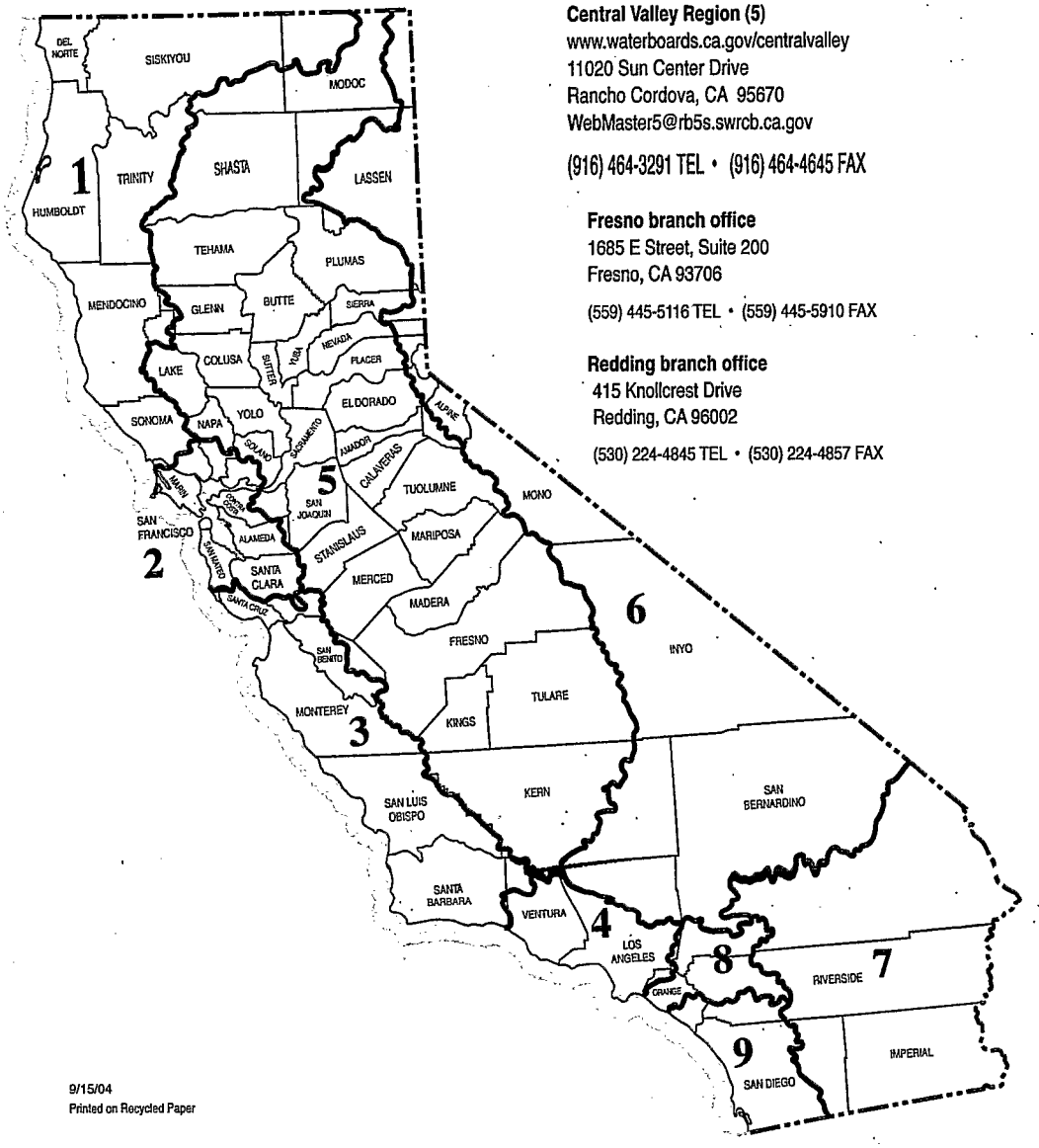

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