

**DRAFT FOR PEER REVIEW AND PUBLIC COMMENTS**

**March 29, 2019**

**California Regional Water Quality Control Board  
Santa Ana Region**

**ATTACHMENT A TO DRAFT TENTATIVE RESOLUTION NO. R8-2019-0041**

**A Resolution Amending the Water Quality Control Plan for the Santa Ana River Basin to Revise  
the Nutrient Total Maximum Daily Loads (TMDLs)  
for Lake Elsinore and Canyon Lake, in the San Jacinto River Watershed,  
Riverside County California**

**ATTACHMENT A TO RESOLUTION NO. R8-2019-0041**

**Chapter ~~5-6~~ Implementation Plan: Total Maximum Daily Loads**

*(NOTE: The following language is proposed to be inserted into Chapter ~~5~~ 6 of the Basin Plan. If the amendments are approved, corresponding changes will be made to the Table of Contents, the List of Tables, page numbers, and page headers in the plan. Due to the two-column page layout of the Basin Plan, the location of tables in relation to text may change during final formatting of the amendments. For formatting purposes, the maps may be redrawn for inclusion in the Basin Plan, and the final layout may differ from that of the draft. Changes and additions to the current Basin Plan are underlined and deletions are struck out.)*

**Chapter 6. Total Maximum Daily Loads (TMDLs)**

**6.X Lake Elsinore/Canyon Lake Watershed TMDLs**

**6.1.XX: Nutrients TMDLs for Lake Elsinore/Canyon Lake**

These TMDLs were first adopted by the Regional Water Quality Control Board, Santa Ana Region, (Regional Board) on December 20, 2004 (2004 TMDLs).

The 2004 TMDLs were approved by:

- The State Water Resources Control Board on May 19, 2005.
- The Office of Administrative Law on July 26, 2005.
- The U.S. Environmental Protection Agency on September 30, 2005.

The 2004 TMDLs were revised by the Regional Board on **(Insert Date and Resolution No.)**

These 2019 Revisions to the 2004 TMDLs were approved by:

- The State Water Resources Control Board on **(Insert Date)**.
- The Office of Administrative Law on **(Insert Date)**.
- The U.S. Environmental Protection Agency on **(Insert Date)**.

**Lake Elsinore/San Jacinto River Watershed**

The San Jacinto River Watershed is located in Riverside County and includes the following major waterbodies: Lake Hemet, San Jacinto River, Salt Creek, Canyon Lake and Lake Elsinore. The total drainage area of the San Jacinto River watershed is approximately 782 square miles, or almost 450,000

acres. Over 90 percent of the watershed (735 square miles) drains into Canyon Lake (~500 acres). Lake Elsinore is the terminus of the San Jacinto River watershed. The local tributary area to Lake Elsinore, consisting of drainage from the Santa Ana Mountains and the City of Lake Elsinore, is 47 square miles.

Land use in the watershed includes open/forested, agricultural (including concentrated animal feeding operations such as dairies and chicken ranches, and irrigated cropland), and urban uses, including residential, industrial and commercial. Vacant/open space is being converted to residential uses as the population in the area expands. The municipalities, and other stakeholders affected by the TMDL, in the watershed include the cities of ~~San Jacinto, Hemet, Perris, Canyon Lake, Lake Elsinore and portions of Moreno Valley and Beaumont.~~ the cities of Beaumont, Canyon Lake, Hemet, Lake Elsinore, Moreno Valley, Murrieta, Menifee, Perris, Riverside, San Jacinto, and Wildomar, Elsinore Valley MWD, San Jacinto Agricultural Operators (WRCAC and non-WRCAC members), San Jacinto Dairy and CAFO Operators (WRCAC), CALTRANS, CA Department of Fish and Wildlife, Eastern MWD, March ARB, and the US Air Force. The forest lands managed by the US Forest Service, Tribal Reservations, and other Federal Lands, are also assigned Load Allocations and are part of the TMDLs.

## **1. Lake Elsinore and Canyon Lake Nutrient Total Maximum Daily Load (TMDLs)**

### **A. Problem Statement**

Lake Elsinore was formed in a geologically active graben area and has been in existence for thousands of years. Due to the Mediterranean climate and watershed hydrology, fluctuations in the level of Lake Elsinore have been extreme, with alternate periods of a dry lake bed and extreme flooding. These drought/flood cycles have a great impact on lake water quality. Fish kills and excessive algae blooms have been reported in Lake Elsinore since ~~the late 1800's~~ early 20th century. The Regional Board's first Basin Plan from 1975, as well as the 2004 TMDL, acknowledged that Lake Elsinore periodically dries up completely due to high rates of evaporation (~4 feet/year) and recurring droughts. Over the past 100 years the Lake has been dry about 9% of the time. In addition, as the Lake evaporates, residual salt concentrations slowly increase and, at times, exceed the salinity of ocean water. The excess salinity is toxic to most freshwater organisms. Without water, all beneficial uses in Lake Elsinore, including aquatic habitat and recreational resources, simply cease to exist. ~~Lake Elsinore and Canyon Lake are~~ is not attaining water quality standards due to excessive nutrients (nitrogen and phosphorus) and algae. As a result, in 1994 and subsequent years, the Regional Board recommended that the State Water Resources Control Board place Lake Elsinore on the 303(d) list of impaired waters due to excessive levels of nutrients and organic enrichment/low dissolved oxygen.

Canyon Lake, located approximately 5 miles upstream of Lake Elsinore, was formed by the construction of Railroad Canyon Dam in 1928. Approximately 735 square miles of the 782 square mile San Jacinto River watershed drain to Canyon Lake. During most years, runoff from the watershed terminates at Canyon Lake without reaching Lake Elsinore, resulting in the buildup of nutrients in Canyon Lake. While Canyon Lake does not have as severe as eutrophication problem as Lake Elsinore, there have been periods of algal blooms and anecdotal reports of occasional fish kills. In 2018, monitoring data shows that Canyon Lake has less excessive algae but still had a Lake wide bloom of brown algae and Harmful Alga Blooms (HABs) that produce cyanotoxins that may pose a risk to public health, and is also included in these TMDLs because it is an integral part of the Lake Elsinore and San Jacinto Watershed hydrologic system and contributes to water quality conditions in Lake Elsinore. Accordingly, in 1998 and subsequent years, the Regional Board recommended that the State Water Resources Control Board added Canyon Lake to the 303(d) list of impaired waters due to excessive levels of nutrients. Reports prepared by LESJWA, the TMDL Task Force and Regional Board staff describe the impact nutrient discharges have on the beneficial uses of Lake Elsinore and Canyon Lake.

A Revised TMDL Technical Report, “Draft for Public Review and Peer Review TMDL Technical Report: Revision to the Lake Elsinore and Canyon Lake Nutrient TMDLs”, December 1, 2018, CDM Smith et.al.”, (Revised TMDL Technical Report) prepared by The TMDL Task Force and Regional Board staff describes the past and current nutrient related problems in Canyon Lake and Lake Elsinore in greater detail and discusses the technical basis for updating and revising the 2004 TMDLs, that follow [Ref. # 1].

### **B. Demonstrating Compliance**

This section is not a State or Federal requirement of TMDLs, but is provided to assist TMDL stakeholders, and the Board Staff, in determining compliance with the TMDLs. The following five alternative approaches for demonstrating compliance with these TMDLs may need modifications based on whether a stakeholder chooses to demonstrate compliance for all their discharges, or as part of a watershed level stakeholder group compliance and monitoring program, or other reasons, at the discretion of the Regional Board. For example, a discharger may be required to have individual discharge location monitoring, receiving water monitoring, modeling, and/or be required to submit an application for, and obtain from the Regional Board waste discharge requirements or NPDES permit. Any discharger or group of dischargers may propose, through the revised watershed based CNRP and AgNMP, or as part of an individual compliance demonstration, for the Regional Board’s approval, an alternative approach to demonstrating compliance with these TMDLs. In addition to annual monitoring reports, demonstrations of progress towards compliance with these TMDLs shall be submitted every 5 years by all TMDL dischargers with load allocations. All dischargers shall also demonstrate that all feasible best management practices have been implemented to reduce nutrient discharges, before proposing to use in-lake treatment options for meeting the load allocations for these TMDLs. Additionally, if the Numeric Targets for the Lake are not met, additional nutrient load reductions may be required of all dischargers subject to these TMDLs.

The following provides 5 possible approaches to demonstrating compliance with these TMDL, and each watershed stakeholder with a Load Allocation may require equivalent and modified monitoring requirements, depending on whether pursuing compliance with the TMDLs individually or as part of a coalition/group and which compliance demonstration method is chosen. The following 5 approaches to demonstrating compliance with these TMDLs are explained in greater detail in the TMDL Technical Report and summarized below.

Approach 1 - Numeric Target: CDFs of in-lake water quality monitoring data are equal to or better than numeric target CDFs for chlorophyll-a, DO, and total ammonia.

Approach 2 – Reference Condition Model: CDFs of in-lake water quality monitoring data are equal to or better than validated model results for the reference scenario over the same hydrologic period for chlorophyll-a, DO, and total ammonia.

Approach 3 - External Load Reduction: Allocations are developed for nutrients in watershed runoff with concentrations of nutrients, TN and TP, representative of the validated model reference watershed. One way to demonstrate compliance involves collection of monitoring data that shows nutrients in watershed loads have been reduced to the required allocations, applicable to one or multiple jurisdictions.

Approach 4 – In-lake Offsets: Meet WLA/LAs by offsetting watershed nutrient loads in excess of reference conditions over the same hydrologic period and offsetting watershed nutrient loads from the

sediments in both lakes. If only one nutrient is found to meet the LA/WLA, then data needed to demonstrate compliance with in-lake numeric target CDFs must be developed.

Approach 5 – Retention: Prevent nutrient loads from a drainage area by retaining all runoff on-site for all rainfall events.

### **C. Lake Elsinore and Canyon Lake Nutrient TMDL Numeric Targets**

Numeric targets for Lake Elsinore and Canyon Lake are based on the beneficial uses and water quality objectives in the Basin Plan, reference conditions, and the asymmetric periods of flooding and a dry Lake bed in Lake Elsinore, when beneficial uses in the lakes were not significantly impacted by nutrients from anthropogenic sources and requires a return to the reference conditions.

The 2004 TMDLs used average conditions for wet, moderate, and dry hydrologic conditions for estimating reference conditions, whereas the revisions to the TMDL approved in 2019 use a 100-year hydrologic record for the watershed, and cumulative distribution frequencies (CDFs) for the Numeric Targets. The original TMDLs also used general land use maps, while the 2019 TMDLs revision depends on the use of a recent aerial survey (down to one-acre scale) of more accurate and current land uses and for the source analysis. This current land use data was also used to model the reference watershed nutrient loads, by taking each acre back to its natural condition, before anthropogenic inputs of nutrients. The development of these Numeric Targets also used dynamic models instead of static models to determine the Numeric Targets for the reference conditions. Table 5-9n shows both “causal” and “response” interim and final numeric targets for both lakes. Causal targets are those for phosphorus and nitrogen. Phosphorus and nitrogen are the primary limiting nutrients in Lake Elsinore and Canyon Lake, respectively. However, under certain conditions, nitrogen may be limiting in Lake Elsinore and phosphorus may be limiting in Canyon Lake. Targets for both nutrients are therefore necessary. Reduction in nitrogen inputs will be necessary over the long term and only final targets are specified.

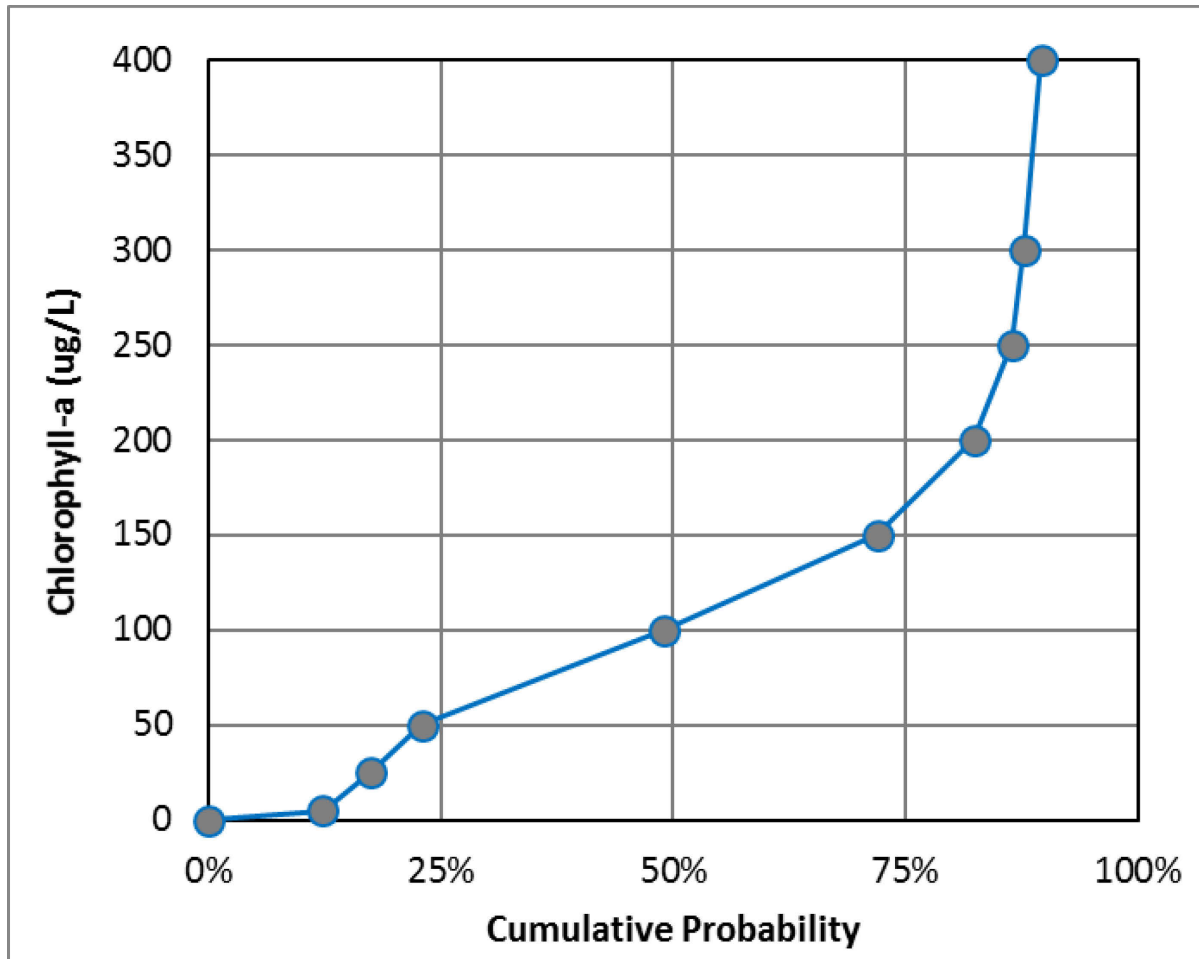
Figures 6-X-1 through 6-X-9, show Numeric Targets for Chlorophyll-a, Dissolved Oxygen, and Ammonia, expressed as CDFs that recognize the extreme spatial and temporal variability in water quantity and quality that can be expected in Lake Elsinore, Canyon Lake Main Body, Canyon Lake East Bay, and for discharges from Canyon Lake to Lake Elsinore, under a reference watershed condition. These R-response targets include chlorophyll *a* and dissolved oxygen as the primary measures of how well the lakes are responding to nutrient source reductions required by the TMDLs. These targets are also specified to assess water quality improvements in the lakes. Finally, ammonia targets are specified to prevent un-ionized ammonia toxicity to aquatic life, under the reference condition.

Numeric Targets for Total Nitrogen and Phosphorous, that were part of the 2004 TMDL, are no longer included, because the specific load reductions required for these two nutrients, below in the load allocation section, provide a detailed method for controlling all the sources of nitrogen and phosphorous to a level that returns the nutrient loadings to the Lakes to the natural reference conditions. The Numeric Targets for chlorophyll-a, dissolved oxygen, and ammonia provide the most direct measure of water quality and excess algae.

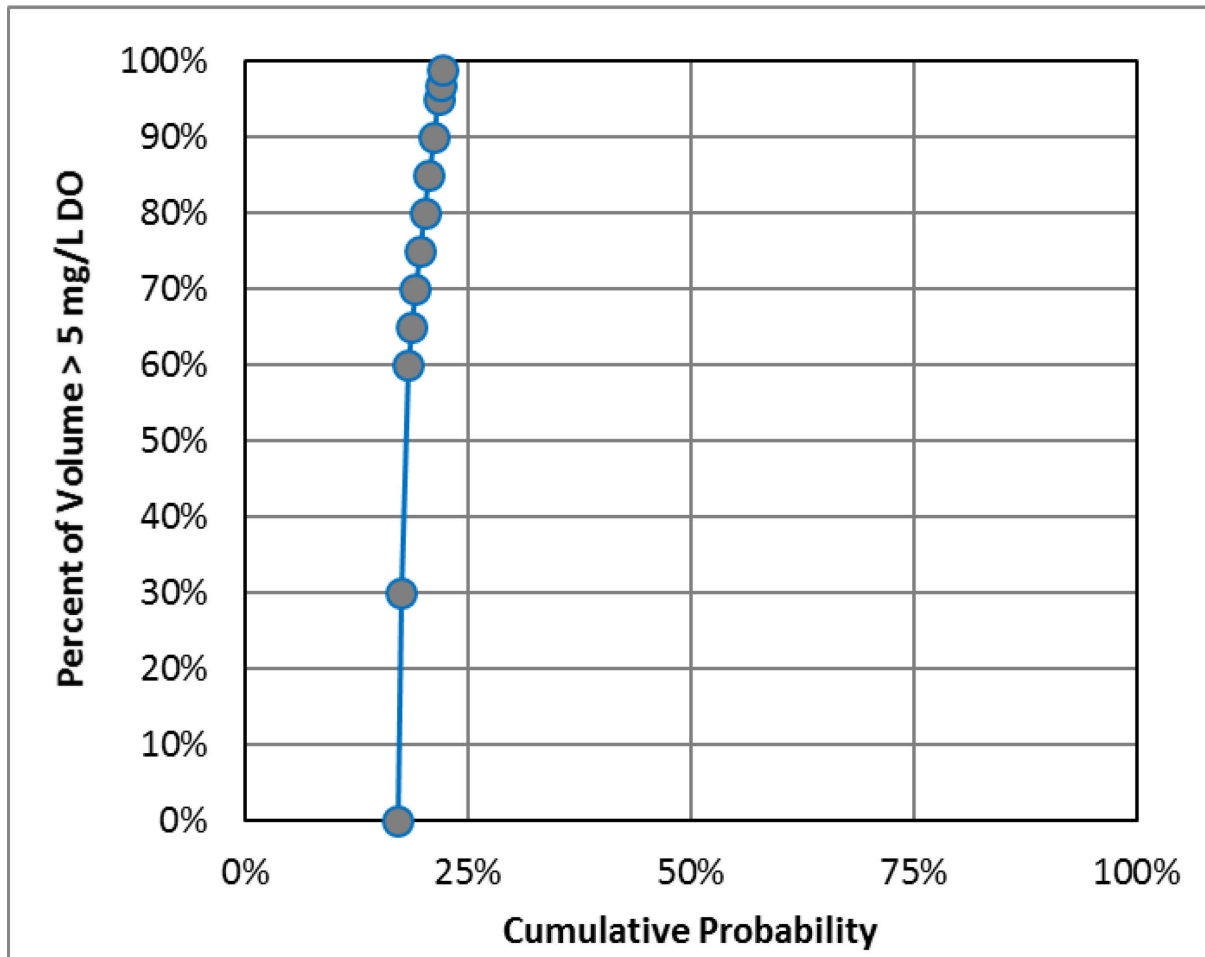
Table 5-9n  
Lake Elsinore and Canyon Lake Nutrient TMDL Numeric Targets\*

Indicator	Lake Elsinore	Canyon Lake
Total P concentration (Final)	Annual average no greater than 0.1 mg/L; to be attained no later than 2020	Annual average no greater than 0.1 mg/L; to be attained no later than 2020
Total N concentration (Final)	Annual average no greater than 0.75 mg/L; to be attained no later than 2020	Annual average no greater than 0.75 mg/L; to be attained no later than 2020
Ammonia-nitrogen concentration (Final) [Ref. #4]	<p>Calculated concentrations to be attained no later than 2020</p> <p>Acute: 1-hour average concentration of total ammonia nitrogen (mg/L) not to exceed, more than once every three years on the average, the CMC (acute criteria), where</p> $CMC = 0.411 / (1 + 10^{7.204 - pH}) + 58.4 / (1 + 10^{pH - 7.204})$ <p>Chronic: thirty-day average concentration of total ammonia nitrogen (mg/L) not to exceed, more than once every three years on the average, the CCC (chronic criteria)</p> $CCC = (0.0577 / (1 + 10^{7.688 - pH}) + 2.487 / (1 + 10^{pH - 7.688})) * \min(2.85, 1.45 * 10^{0.028(25 - T)})$	<p>Calculated concentrations to be attained no later than 2020</p> <p>Acute: 1-hour average concentration of total ammonia nitrogen (mg/L) not to exceed, more than once every three years on the average, the CMC (acute criteria), where</p> $CMC = 0.411 / (1 + 10^{7.204 - pH}) + 58.4 / (1 + 10^{pH - 7.204})$ <p>Chronic: thirty-day average concentration of total ammonia nitrogen (mg/L) not to exceed, more than once every three years on the average, the CCC (chronic criteria)</p> $CCC = (0.0577 / (1 + 10^{7.688 - pH}) + 2.487 / (1 + 10^{pH - 7.688})) * \min(2.85, 1.45 * 10^{0.028(25 - T)})$
Chlorophyll <i>a</i> concentration (Interim)	Summer average no greater than 40 ug/L; to be attained no later than 2015	Annual average no greater than 40 ug/L; to be attained no later than 2015
Chlorophyll <i>a</i> concentration (Final)	Summer average no greater than 25 ug/L; to be attained no later than 2020	Annual average no greater than 25 ug/L; to be attained no later than 2020
Dissolved oxygen concentration (Interim)	Depth average no less than 5 mg/L; to be attained no later than 2015	Minimum of 5 mg/L above thermocline; to be attained no later than 2015
Dissolved oxygen concentration (Final)	No less than 5 mg/L 1 meter above lake bottom; to be attained no later than 2020	Daily average in hypolimnion no less than 5 mg/L; to be attained no later than 2020.

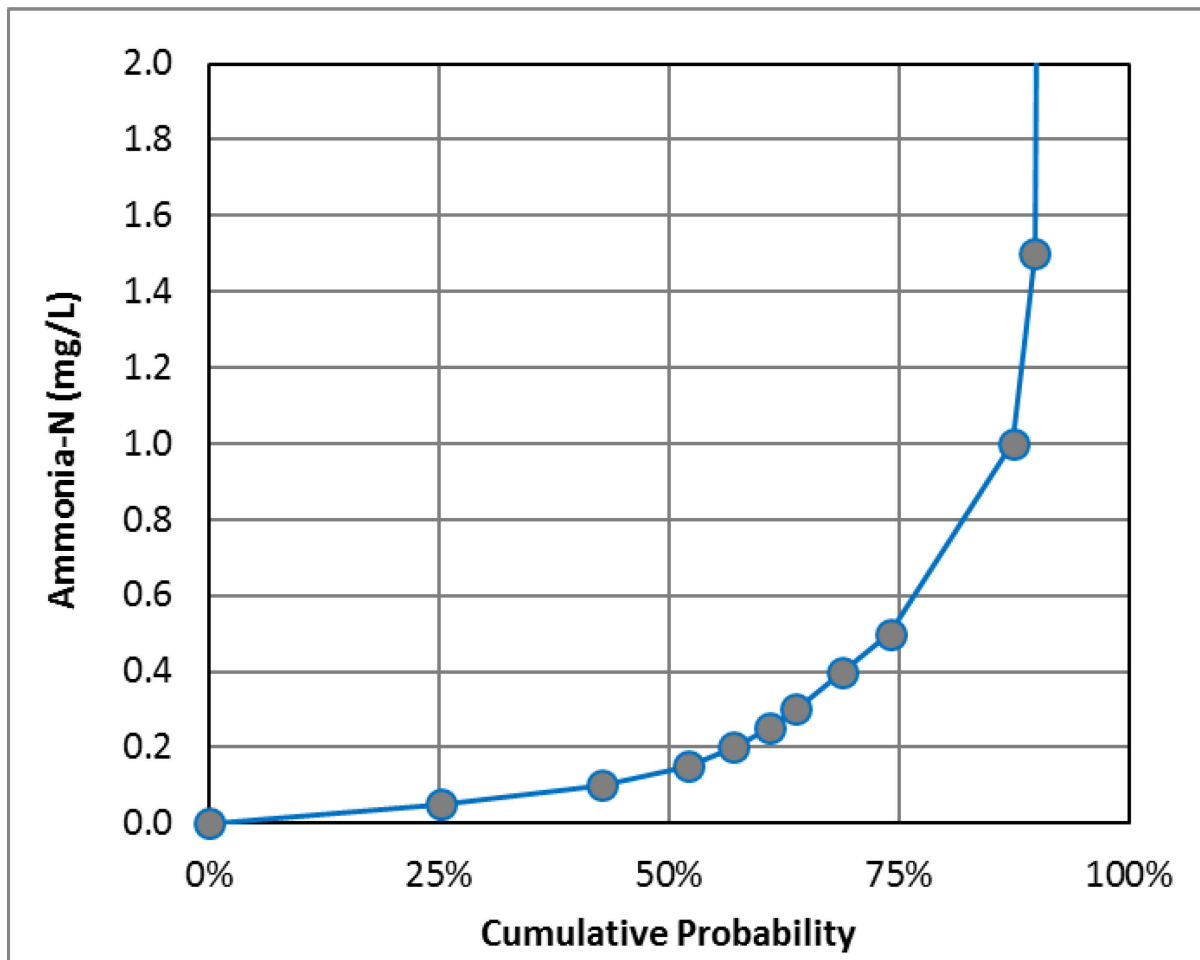
\* compliance with targets to be achieved as soon as possible, but no later than the date specified



**Figure 6-X-1. Numeric Target CDF for top 1-meter chlorophyll-a in Lake Elsinore**

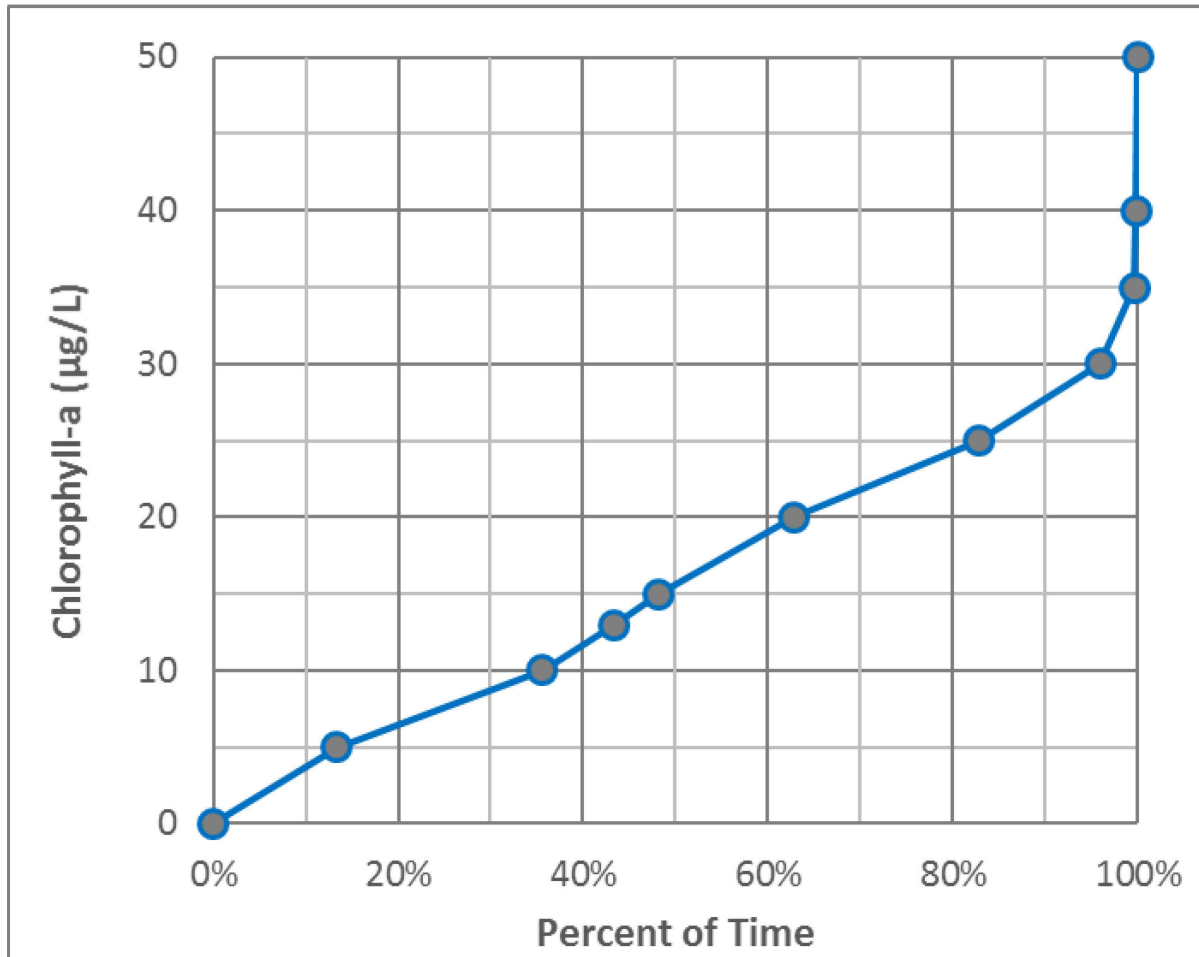


**Figure 6-X-2. Numeric Target CDF for Fraction of the Lake Volume >5 mg/L Dissolved Oxygen in Lake Elsinore**

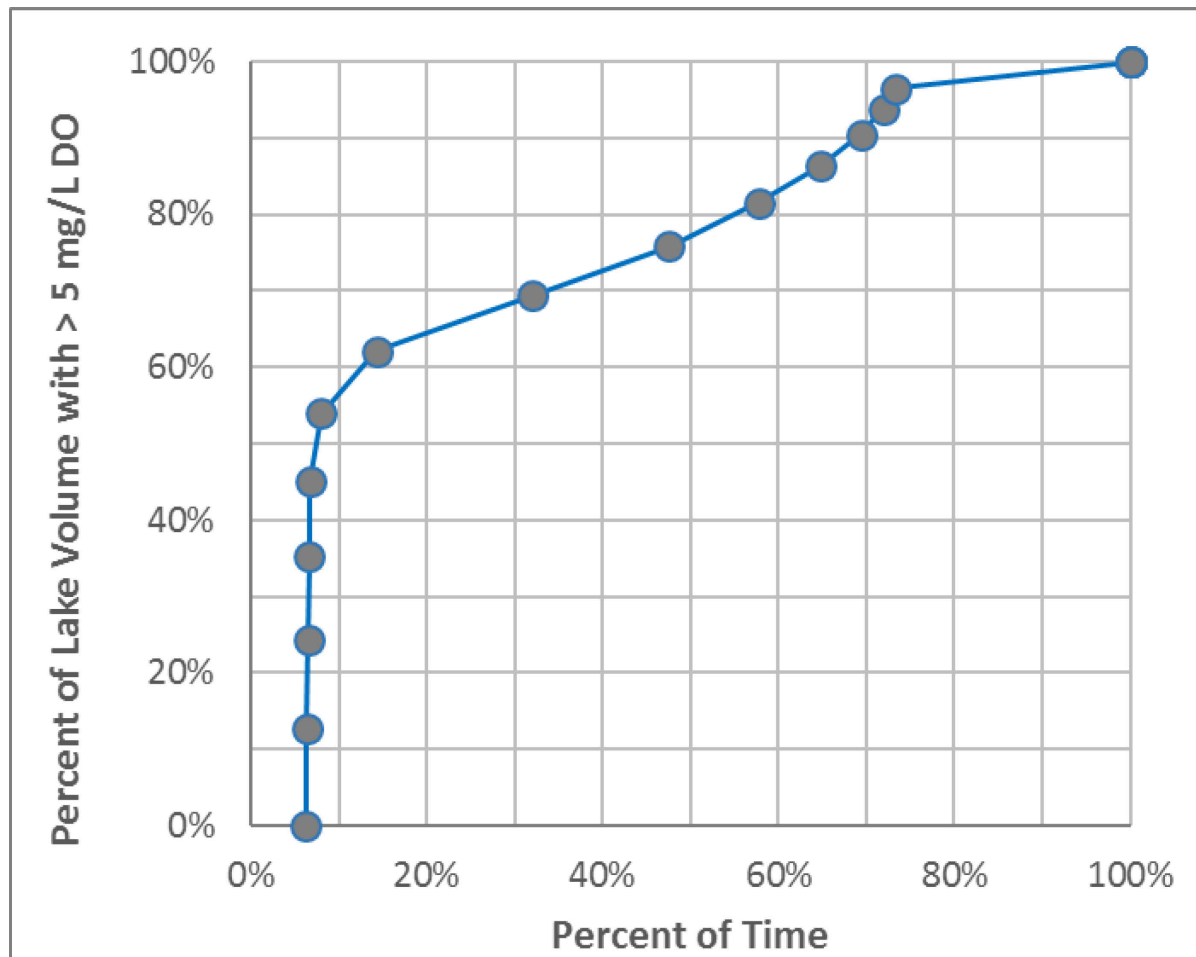


**Figure 6-X-3. Numeric Target CDF for Depth Average Ammonia Concentrations in Lake Elsinore**

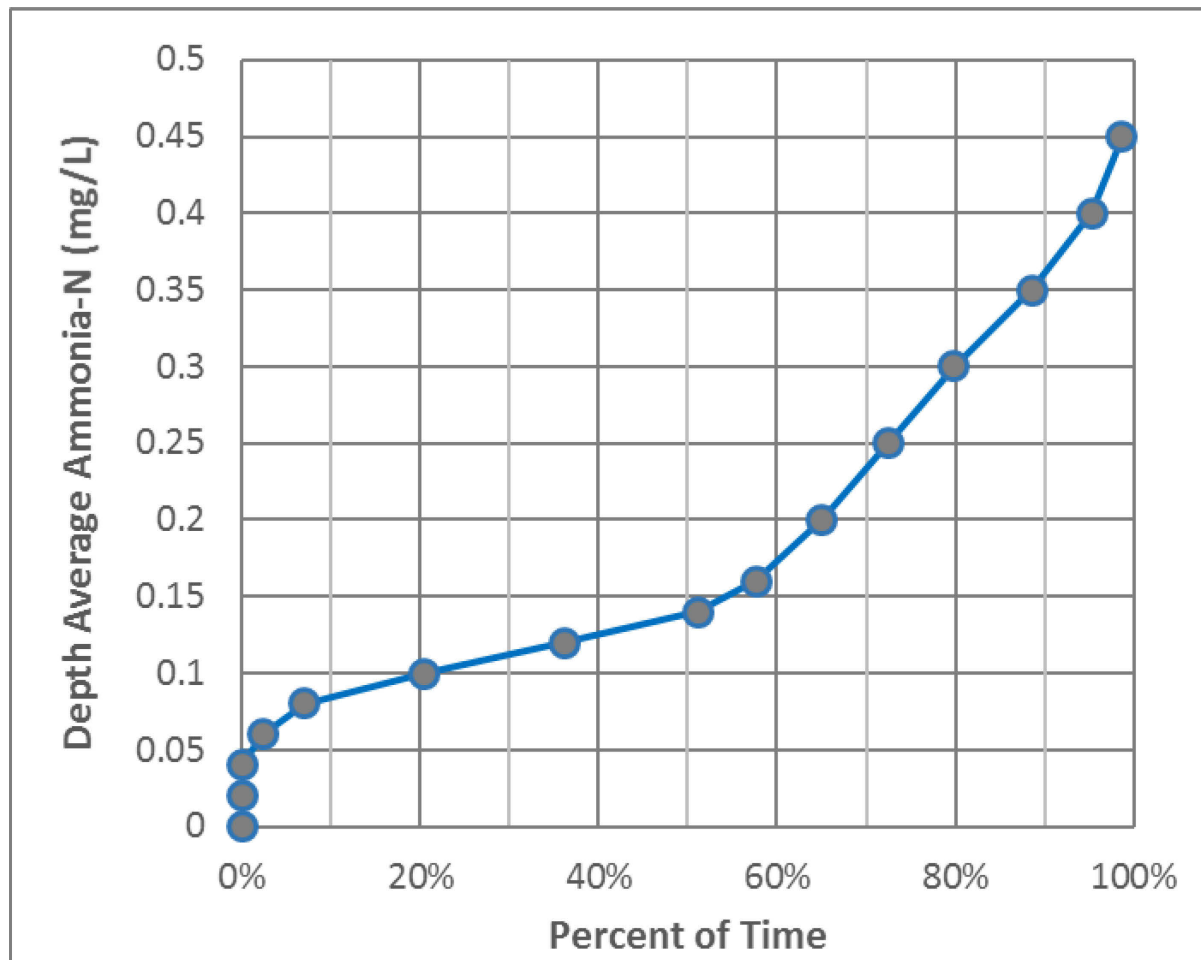




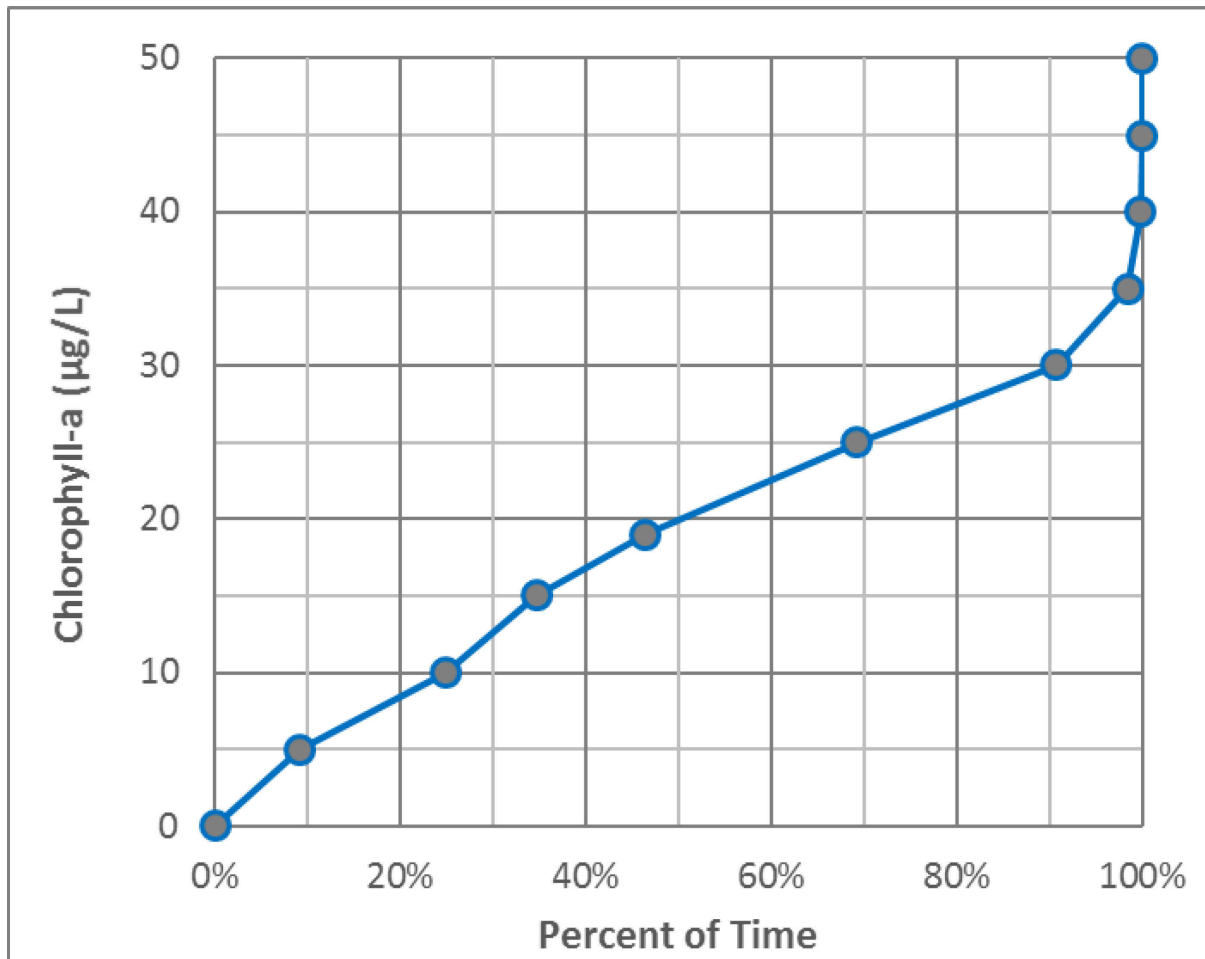
**Figure 6-X-4. Numeric Target CDF for top 1-meter chlorophyll-a in Canyon Lake Main Lake**



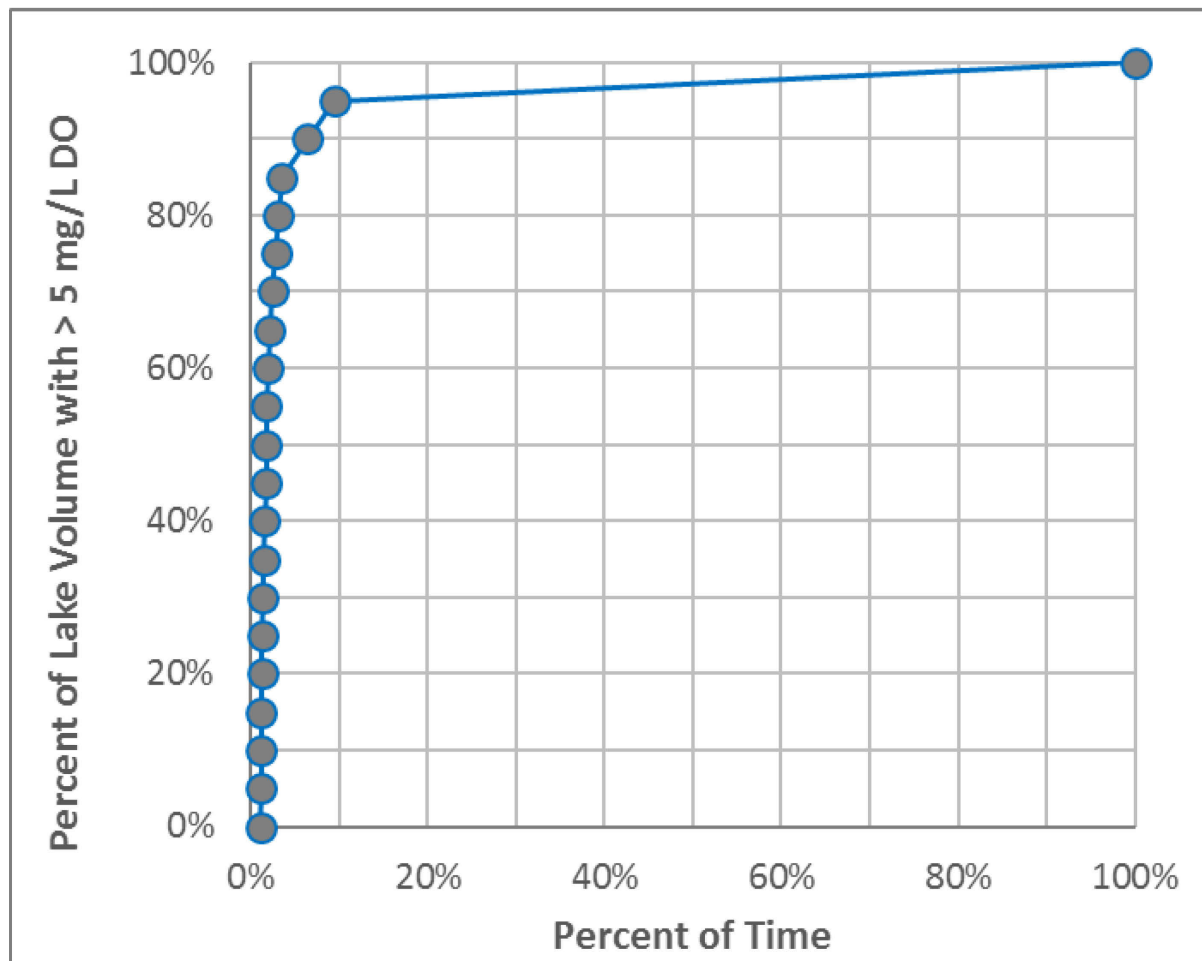
**Figure 6-X-5. Numeric Target CDF for Fraction of the Lake Volume >5 mg/L Dissolved Oxygen in Canyon Lake Main Lake**



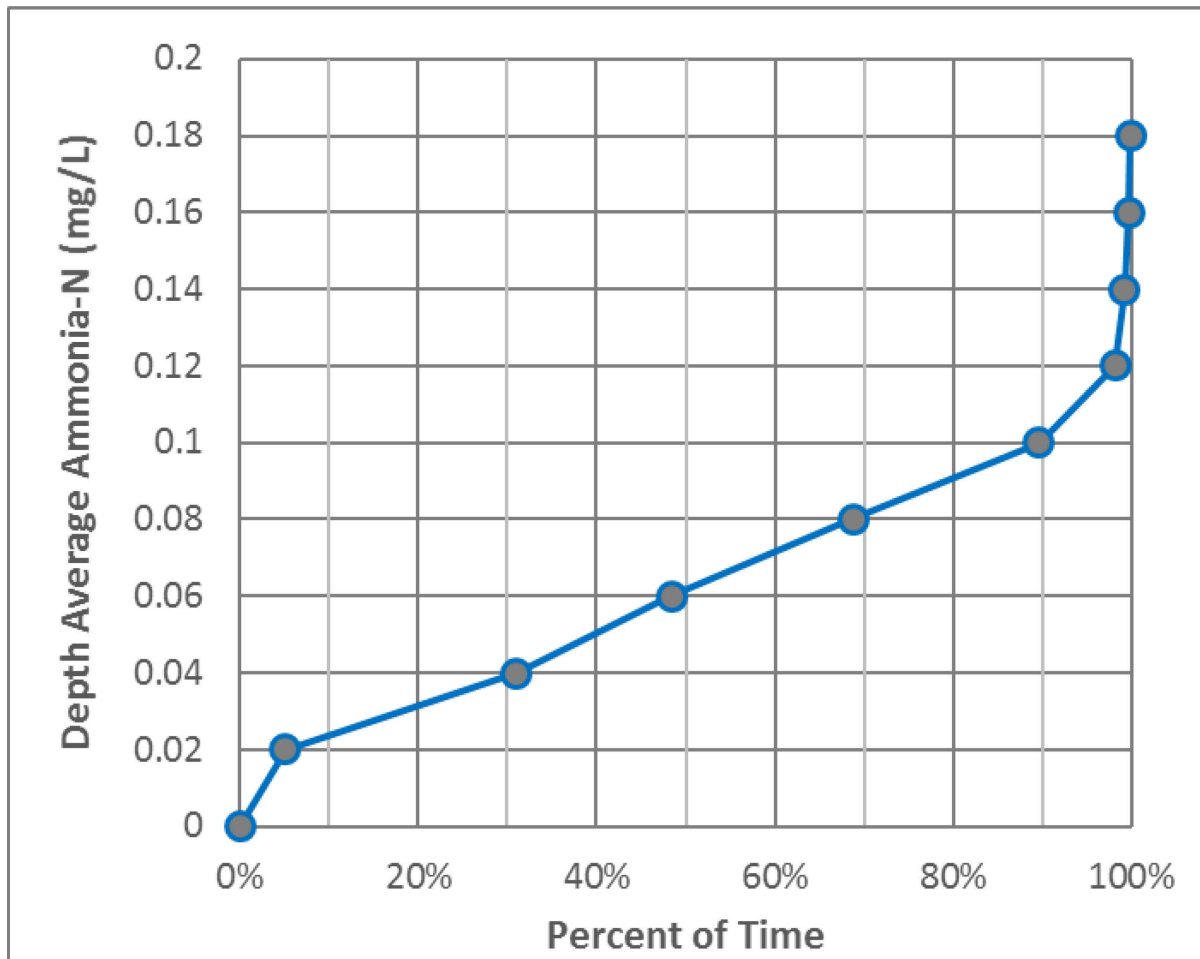
**Figure 6-X-6. Numeric Target CDF for Depth Average Ammonia Concentrations in Canyon Lake Main Lake**



**Figure 6-X-7. Numeric Target CDF for top 1-meter chlorophyll-a in Canyon Lake East Bay**



**Figure 6-X-8. Numeric Target CDF for Fraction of the Lake Volume >5 mg/L Dissolved Oxygen in Canyon Lake East Bay**



**Figure 6-X-9. Numeric Target CDF for Depth Average Ammonia Concentrations in Canyon Lake East Bay**

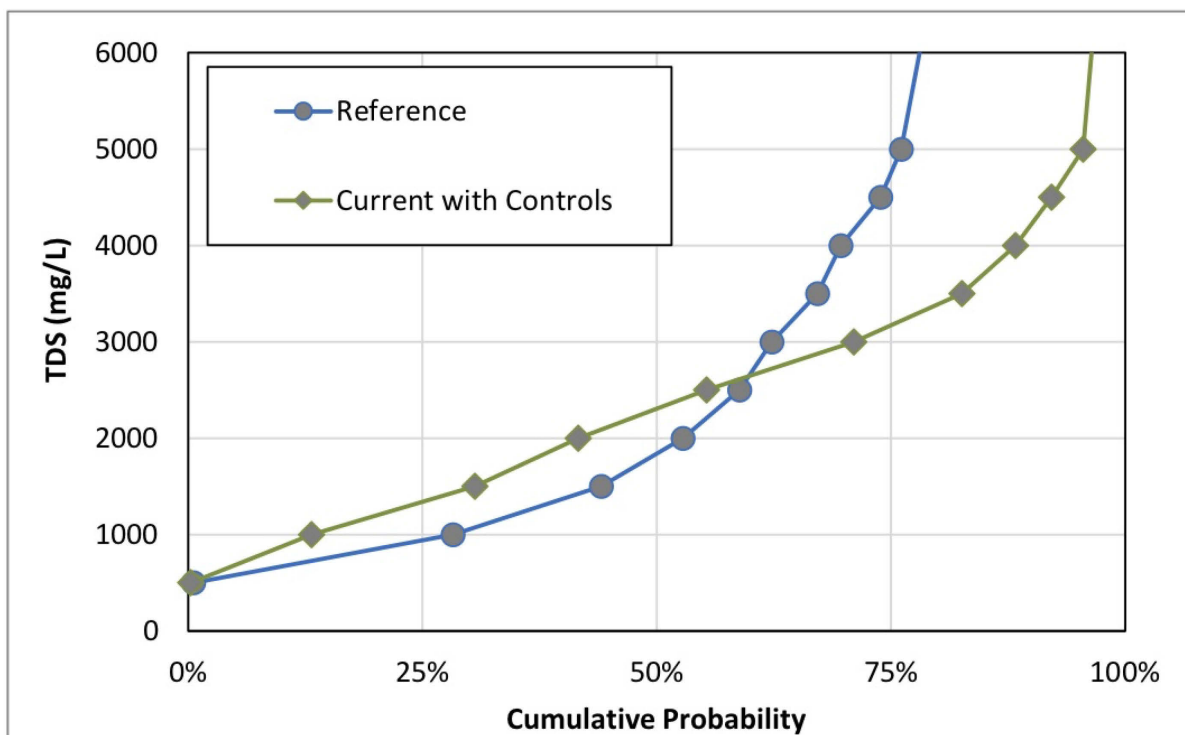
#### **D. CDF Goal for Total Dissolved Solids (TDS) in Lake Elsinore**

Stakeholders in the region have implemented several projects designed to limit or mitigate the negative effects of evaporation, on Lake Elsinore. In 1996, a levee was constructed within Lake Elsinore to reduce its total surface area from 6,000 acres down to 3,000 acres. And, in 2003, the City of Lake Elsinore and the Elsinore Valley Municipal Water District (EVMWD) settled a long-standing dispute over water rights by agreeing to work cooperatively and apply their best efforts toward a goal of maintaining the lake elevation above 1240' msl. To help meet that goal, EVMWD subsequently submitted an application for a permit to discharge large volumes (up to 8 Million Gallons per Day (MGD) of highly treated recycled water to Lake Elsinore in order to offset natural evaporation. EVMWD discharges up to 7.5 MGD to the Lake, with 0.5 MGD discharged to the Gunnerson Pond Wetland area adjacent to Temescal Creek, and a discharge of 7.5 MGD to the lake was assumed for the development of the 2019 revisions to these TMDLs.

The Regional Board strongly supports this effort and approved a wasteload allocation in the 2004 TMDL and issued a permit consistent with that wasteload allocation to authorize EVMWD's discharge of recycled water to the lake. Since 2007 EVMWD has added approximately 17 billion gallons of recycled water to the lake, enough to raise the lake elevation by about 20 feet. There is no question that, without this supplemental water supply and the installation of the levee, Lake Elsinore would have dried up completely in mid-2015 and remained that way for several years just as it did 60 years ago. Offsetting evaporation with supplemental water has also helped avoid the hyper-saline conditions which plagued the lake during previous prolonged droughts.

Recent experience has demonstrated the importance of using supplemental water to maintain the elevation of Lake Elsinore and protect all of its designated beneficial uses. Monitoring data indicates that water quality begins to rapidly deteriorate as the lake elevation falls below 1240' msl. When drought and evaporation cause the lake to be less than half full it is virtually impossible to comply with the 2,000 mg/L TDS objective that was established for Lake Elsinore in the Basin Plan. Modeling analysis, undertaken as part of the revised TMDLs, shows that approximately 7.5 million-gallons-per-day of supplemental water is needed to maintain the lake level above 1240' even during occasional drought conditions. Seeking to build on the previous success of using recycled water to help meet the lake management goals described in the aforementioned Settlement Agreement, the proposed TMDL includes an updated wasteload allocation and offset program that allows the Regional Board to reauthorize EVMWD's NPDES permit so that such discharges can continue in the future.

The following CDF, for TDS in Lake Elsinore, represents the reference watershed TDS concentrations for the past 100 years, and shows TDS concentrations for adding up to 7.5 MGD of reclaimed water, or other water of similar or better water quality. This CDF is not a Numeric Target for TDS in these TMDLs, but reflects the goal of these TMDLs to maintain lake level elevations between 1240' and 1250' above mean sea level, and TDS concentrations in the lake below 2000 mg/L. The CDF goal shows that Lake Elsinore may be dry as much as 9.2% of the time in the reference condition, and the relationship between different hydrologic conditions in the watershed and subsequent lake elevations and TDS concentrations. No one can predict the future hydrologic conditions in the watershed, so the CDF is a Goal for TDS to keep the lake below the water quality objective for TDS, and as a major component for compliance with these TMDLs and is not a regulatory control of TDS in Lake Elsinore. The Regional Board will also not require any party to remove TDS or nutrients from any source water/reclaimed water, that is lower in TDS and nutrient concentrations than EVMWD's reclaimed water, used to maintain the elevation of Lake Elsinore above the 1240' elevation needed to meet this CDF Goal for TDS and water quality objectives.



**Figure 6-X-XX: CDF Goal for TDS in Lake Elsinore**

### **E. Source Analysis**

The Revised TMDLs Technical Report includes a different watershed and in-lake analysis, than the 2004 TMDLs, to estimate sources of nutrients causing the impairments in Lake Elsinore and Canyon Lake due to excess nutrients. Current based on 2014 aerial mapping) land use maps, down to one-acre scale, were used in modeling nutrient wash-off rates from the various land use types (i.e. Residential Sewered, Residential Un-sewered, Commercial, Irrigated Agriculture, etc.) for each acre of that land use type within each jurisdiction (i.e. City, County, etc.) subject to these TMDLs. The nutrient loading rates to the Lakes were developed using USEPA's P-Load model. New lake water quality models used in the Linkage Analysis provided a daily simulation of internal loads to support the source analysis.

The source analysis found that the main sources of nutrients to the Lakes are from sediment nutrient flux, watershed runoff, and supplemental water in Lake Elsinore, and watershed runoff and sediment nutrient flux in Canyon Lake. Over 70% of the nutrient loads (TN and TP) to Lake Elsinore are from sediment nutrient flux, with 22% TP and 12% TN coming from watershed runoff. Lake Elsinore also has 7% TP and 8% TN of the nutrient load coming from the discharge of reclaimed water to the Lake. However, in Canyon Lake, the total nutrient load is roughly evenly divided between watershed runoff and sediment nutrient flux. Both Lakes also have a small amount of atmospheric deposition, 1-6%, of the total load of nutrients.



The sediment nutrient flux in both Lakes is a function of settled particulate nutrients from the watershed and decaying algae from within the lakes. The source analysis also found that the predominant sources of nutrients in watershed runoff come from the Cities, and County, with the most land area.

#### ***F. Linkage Analysis***

The linkage analysis performed for these revised TMDLs was critical in developing the reference watershed approach that was used, which differs from the traditional stressor response TMDL approach used in 2004. In the 2004 TMDLs, the numeric targets were developed for the lakes based on the water quality conditions expected for a typical reference year (2001), and then calculated the total load of nutrients needed to meet those targets, as a frequency-weighted average of “Dry, Normal, and Wet” hydrologic years.

The watershed approach used for the 2019 TMDL revisions modeled the reference water quality conditions for both lakes, and the reference nutrient loads from the watershed and internal sediment flux, and then calculated the external nutrient load reductions needed to return the Lakes to the natural reference conditions. The linkage analysis evaluated and estimated water quality response variables (chlorophyll-a, DO, and Ammonia) in the Lakes for different nutrient loading levels representing both the reference watershed conditions and existing conditions, with and without the current nutrient control measures being in place. The linkage analysis was then used to develop the CDF numeric targets based on the reference watershed conditions. The watershed model run for an undeveloped, natural land use condition determined the TMDLs, WLA, and LAs needed to meet the reference nutrient CDFs in the Lakes, and the nutrient load reductions still needed to return the Lakes to the reference water quality conditions.

#### ***G. Lake Elsinore and Canyon Lake Nutrient TMDLs, Wasteload Allocations, Load Allocations and Compliance Dates***

As discussed in the Revised Technical TMDL report, nutrient loading to Canyon Lake and Lake Elsinore varies depending on the hydrologic conditions that occur in the San Jacinto watershed. As part of the TMDL analysis and development, three hydrologic scenarios and the relative frequency of each of these conditions (based upon an 87 year record of flow data at the USGS Gauging station downstream of Canyon Lake), were identified as shown in Table 5-9o. The resulting TMDLs, wasteload allocations and load allocations are based on 10-year running flow-weighted average nutrient loads, taking into account the frequency of the three hydrologic conditions and the nutrient loads associated with each of them. The Technical Report provides a detailed collection of available watershed and lake monitoring data, descriptions of the hydrologic and hydrodynamic analyses and modeling, and numerous other factors that were used in the development of the TMDL, Waste Load Allocations for point sources of nutrients, and Load Allocations for non-points sources of nutrients. Phosphorus and nitrogen TMDLs for Canyon Lake Main Lake, Canyon Lake East Bay, Overflows from Canyon Lake to Lake Elsinore and Lake Elsinore are shown in Table 6-9p. The TMDLs, expressed as 10-year running averages, will implement the numeric targets and thereby return nutrient loads to the reference watershed condition and attain water quality standards. Phosphorus and nitrogen wasteload allocations for point source discharges and load allocations for nonpoint source discharges, also expressed as 10-year running averages, are shown in Tables 6-9q and 6-9r. No TMDLs, wasteload allocations or load allocations are specified for chlorophyll a, dissolved oxygen or ammonia. Chlorophyll a and dissolved oxygen targets are intended to serve as measures of the effectiveness of phosphorus and nitrogen reductions implemented to meet TMDL

requirements. Until ammonia transformations, and nitrogen dynamics in general, are better understood, no ammonia TMDLs, wasteload allocations or load allocations are specified.

Table 6-9q2 shows the Nutrient Load Reductions required for each jurisdiction to meet the allocations specified in Table 6-9q. The required load reductions are the amount of nutrients each source still needs to be reduced by to return to the reference watershed condition, and accounts for load reductions already achieved by current controls, and the continuation of this level of controls with additional nutrient controls to meet the load allocations.

Table 5-9o  
 San Jacinto River Hydrologic Conditions with Relative Flow Frequency at the USGS Gauging Station  
 Downstream of Canyon Lake (Station No. 1170500)

Hydrologic Condition	Representative Water Year	Years of Hydrologic Condition	Relative Frequency (%)	Description
Wet	1998	14	16	Both Canyon Lake and Mystic Lake overflow; flow at the USGS gauging station 11070500 17,000 AF or greater
Moderate	1994	36	41	No Mystic Lake overflow; Canyon Lake overflowed; flow at the USGS gauging station 11070500 less than 17,000 AF and greater than 2,485 AF
Dry	2000	37	43	No overflows from Mystic Lake or Canyon Lake; flow at the USGS gauging station 11070500 371 AF or less

Table 6 5-9p  
 Nutrient TMDLs and Compliance Dates for Lake Elsinore and Canyon Lake

<b>TMDL</b>	<b>Final Total Phosphorus TMDL (kg/yr)<sup>a, b</sup></b>	<b>Final Total Nitrogen TMDL (kg/yr)<sup>a, b</sup></b>
Canyon Lake	<del>8,691</del> <u>2,515</u>	<del>37,735</del> <u>9,144</u>
<u>Main Lake</u>	<u>1,817</u>	<u>6,688</u>
<u>East Bay</u>	<u>698</u>	<u>2,456</u>
<u>Overflow to Lake Elsinore</u>	<u>2,620</u>	<u>7,533</u>
Lake Elsinore	<del>28,584</del> <u>13,705</u>	<del>239,025</del> <u>142,340</u>

<sup>a</sup> Final compliance to be achieved as soon as possible, but no later than 20 years after TMDL effective date.~~2020~~.

<sup>b</sup> TMDLs specified as 10-year running average.

Table 5-9q  
 Canyon Lake  
 Nitrogen and Phosphorus Wasteload and Load Allocations<sup>a</sup>

Canyon Lake Nutrient TMDL	Final Total Phosphorus Load Allocation (kg/yr) <sup>b,e</sup>	Final Total Nitrogen Load Allocation (kg/yr) <sup>b,e</sup>
<b>TMDL</b>	<b>8,691</b>	<b>37,735</b>
<b>WLA</b>	486	-6,248
Supplemental water	48	-366
Urban	306	3,974
CAFO	-132	1,908
<b>LA</b>	<b>8,205</b>	<b>-31,487</b>
Internal Sediment	4,625	13,549
Atmospheric Deposition	221	1,918
Agriculture	-1,183	-7,583
Open/Forest	-2,037	-3,587
Septic systems	-139	-4,850

<sup>a</sup> The TMDL allocations for Canyon Lake apply to those land uses located upstream of Canyon Lake.

<sup>b</sup> Final allocation compliance to be achieved as soon as possible, but no later than December 31, 2020.

<sup>c</sup> TMDL and allocations specified as 10-year running average.

Table 6-9q1

Lake Elsinore and Canyon Lake  
Nitrogen and Phosphorus Waste Load and Load Allocations<sup>a,b,c</sup>

<u>Lake Segment</u>	<u>Wasteload Allocation (kg/yr)</u>		<u>Load Allocation (kg/yr)</u>	
	<u>TP</u>	<u>TN</u>	<u>TP</u>	<u>TN</u>
<u>Canyon Lake (Main Lake)</u>				
<u>Watershed Runoff</u>	<u>753</u>	<u>2,165</u>	<u>218</u>	<u>627</u>
<u>Supplemental Water</u>	<u>As needed</u>		<u>n/a</u>	
<u>Atmospheric Deposition</u>	<u>n/a</u>		<u>17</u>	<u>1,077</u>
<u>Sediment Nutrient Flux</u>	<u>n/a</u>		<u>829</u>	<u>2,820</u>
<u>Canyon Lake (East Bay)</u>				
<u>Watershed Runoff</u>	<u>368</u>	<u>1,059</u>	<u>68</u>	<u>196</u>
<u>Supplemental Water</u>	<u>As needed</u>		<u>n/a</u>	
<u>Atmospheric Deposition</u>	<u>n/a</u>		<u>5</u>	<u>331</u>
<u>Sediment Nutrient Flux</u>	<u>n/a</u>		<u>256</u>	<u>870</u>
<u>Lake Elsinore</u>				
<u>Watershed Runoff (Canyon Lake overflows)</u>	<u>1,833</u>	<u>5,270</u>	<u>787</u>	<u>2,263</u>
<u>Watershed Runoff (local)</u>	<u>611</u>	<u>1,756</u>	<u>127</u>	<u>364</u>
<u>Supplemental Water</u>	<u>4,067</u>	<u>12,463</u>	<u>n/a</u>	
<u>Atmospheric Deposition</u>	<u>n/a</u>		<u>156</u>	<u>9,682</u>
<u>Sediment Nutrient Flux</u>	<u>n/a</u>		<u>8,744</u>	<u>118,074</u>

<sup>a</sup> The TMDL allocations for Canyon Lake apply to those land uses located upstream of Canyon Lake.

<sup>b</sup> Final allocation compliance to be achieved as soon as possible, but no later than 10 years after TMDL effective date.

<sup>c</sup> TMDL and allocations specified as 10-year running average.

**Table 6-9q2. WLAs for EVMWD Reclaimed Water Additions to Lake Elsinore**

<u>EVMWD Reclaimed Water Additions</u>	<u>Flow<sup>a</sup></u>		<u>Concentration Limit</u>		<u>Mass Limit<sup>c</sup></u>	
	<u>mgd</u>	<u>AFY</u>	<u>TP (mg/L)</u>	<u>TN (mg/L)</u>	<u>TP (kg/yr)</u>	<u>TN (kg/yr)</u>
<u>Current Permit</u>	<u>5.4</u>	<u>6,037</u>	<u>0.50</u>	<u>1.00<sup>b</sup></u>	<u>3,721</u>	<u>7,442</u>
<u>After TMDL Revision<sup>d</sup></u>	<u>7.5</u>	<u>8,401</u>	<u>0.32</u>	<u>0.92</u>	<u>3,315</u>	<u>9,528</u>

- a) Discharge volume used to calculate the mass-based effluent limit. This does not serve as an effluent limit on the volume of flow allowed. The treatment plant presently has a permitted capacity of 8 mgd., and EVMWD is permitted to discharge all the permitted 8 mgd flow from the Regional Plant to either the Lake or Temescal Creek, due to flood control requirements and/or for the operational and maintenance needs of the treatment plant. Currently, EVMWD discharge all but 0.5 mgd of the flow from the Regional Plant to the lake, approximately 5-6 mgd, and plans to discharge up to 7.5 mgd to the Lake and 0.5 mgd discharged to the Gunnerson Pond wetland area. The analysis and modeling done for these TMDLs shows that an average of 7.5 mgd of makeup water will need to be discharged to Lake Elsinore in order to offset evaporation and ensure compliance with these TMDLs.
- b) TN limit in current permit was based on Interim target value that applies until 12/31/2020. Beginning in 1/1/2021, the Final TN target of 0.75 mg/L would be used to set effluent limits in EVMWD's permit if the proposed TMDL revisions are not approved.
- c) TMDL expresses waste load allocations as 10-year running flow-weighted averages. 40 CFR 122.44-d-vii-B requires effluent limits to be "consistent with the assumptions and requirements of any available Wasteload Allocation for the discharge." In addition, for POTWs, 40 CFR 122.45-f requires effluent limits be expressed as mass and 40 CFR 122.45-d-2 requires that effluent limits be expressed as weekly or monthly averages unless impracticable. Therefore, to be consistent with all of these federal requirements, the mass-based effluent limits should be expressed as a 120-month running flow-weighted average and EVMWD must certify compliance on each monthly DMR.
- d) As before, EVMWD may be allowed to rely on an approved offset program to achieve compliance with the new effluent limitations; the treatment plant must first meet certain minimum performance requirements based on Best Available Technology before relying on offsets to make up any difference between actual effluent concentrations and the specified effluent limit. The BAT-based performance limits will be 3 mg/L as a flow-weighted annual average for TN and 0.5 mg/L as a flow-weighted annual average for TP.

Table 5-9r

Lake Elsinore  
Nitrogen and Phosphorus Wasteload and Load Allocations<sup>a</sup>

Lake Elsinore Nutrient TMDL	Final Total Phosphorus Load Allocation (kg/yr) <sup>b, e</sup>	Final Total Nitrogen Load Allocation (kg/yr) <sup>c, d</sup>
<del>TMDL</del>	<del>28,584</del>	<del>239,025</del>
<del>WLA</del>	<del>3,845</del>	<del>-7,791</del>
Supplemental water <sup>d</sup>	3,721	7,442
Urban	124	349
CAFO	0	0
<del>LA</del>	<del>21,969</del>	<del>210,461</del>
Internal Sediment	21,554	197,370
Atmospheric Deposition	108	11,702
Agriculture	60	213
Open/Forest	178	567
Septic systems	69	608
CL Watershed <sup>e</sup>	2,770	20,774

<sup>a</sup> The Lake Elsinore TMDL allocations for urban, agriculture open/forest, septic systems and CAFOs only apply to those land uses located downstream of Canyon Lake.

<sup>b</sup> Final allocation compliance to be achieved as soon as possible, but no later than December 31, 2020.

<sup>c</sup> TMDL and allocations specified as 10-year running average.

<sup>d</sup> WLA for supplemental water should met as soon as possible as a 5-year running average.

<sup>e</sup> Allocation for Canyon Lake overflows

**Table 6-9q3. Allocations for Watershed Runoff in Lake Elsinore and Canyon Lake Nutrient TMDLs <sup>a</sup>**

Responsible Entity	Canyon Lake Main Lake		Canyon Lake East Bay		Local Lake Elsinore <sup>1</sup>		Canyon Lake Overflow to Lake Elsinore <sup>b</sup>	
	TP (kg/yr)	TN (kg/yr)	TP (kg/yr)	TN (kg/yr)	TP (kg/yr)	TN (kg/yr)	TP (kg/yr)	TN (kg/yr)
<b>Wasteload Allocations</b>								
<u>Banning</u>	=	=	=	=	=	=	<u>1</u>	<u>2</u>
<u>Beaumont</u>	=	=	=	=	=	=	<u>6</u>	<u>18</u>
<u>CAFO</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>	<u>0</u>	<u>0</u>	<u>15</u>	<u>25</u>
<u>Caltrans</u>	<u>12</u>	<u>36</u>	<u>4</u>	<u>13</u>	<u>9</u>	<u>27</u>	<u>28</u>	<u>81</u>
<u>Canyon Lake</u>	<u>13</u>	<u>39</u>	<u>17</u>	<u>49</u>	<u>11</u>	<u>32</u>	<u>46</u>	<u>132</u>
<u>Federal – Dept. of Defense</u>	<u>23</u>	<u>66</u>	=	=	=	=	<u>35</u>	<u>99</u>
<u>Hemet</u>	=	=	<u>64</u>	<u>184</u>	=	=	<u>106</u>	<u>304</u>
<u>Lake Elsinore</u>	<u>15</u>	<u>43</u>	<u>4</u>	<u>10</u>	<u>381</u>	<u>1,095</u>	<u>28</u>	<u>80</u>
<u>March Joint Powers Authority</u>	<u>19</u>	<u>55</u>	=	=	=	=	<u>29</u>	<u>82</u>
<u>Menifee</u>	<u>56</u>	<u>162</u>	<u>240</u>	<u>691</u>	<u>9</u>	<u>25</u>	<u>445</u>	<u>1,280</u>
<u>Moreno Valley</u>	<u>281</u>	<u>807</u>	=	=	=	=	<u>422</u>	<u>1,213</u>
<u>Murrieta</u>	=	=	<u>6</u>	<u>18</u>	=	=	<u>9</u>	<u>27</u>
<u>Perris</u>	<u>165</u>	<u>473</u>	<u>0</u>	<u>1</u>	=	=	<u>248</u>	<u>712</u>
<u>Riverside</u>	<u>9</u>	<u>25</u>	=	=	=	=	<u>13</u>	<u>38</u>
<u>Riverside County</u>	<u>360</u>	<u>1,036</u>	<u>158</u>	<u>454</u>	<u>149</u>	<u>428</u>	<u>885</u>	<u>2,545</u>
<u>San Jacinto</u>	<u>0</u>	<u>1</u>	<u>1</u>	<u>2</u>	=	=	<u>22</u>	<u>64</u>
<u>Wildomar</u>	=	=	<u>0</u>	<u>0</u>	<u>128</u>	<u>367</u>	<u>0</u>	<u>0</u>
<b>Load Allocations</b>								
<u>Agriculture-CWAD: Irrigated</u>	<u>66</u>	<u>190</u>	<u>22</u>	<u>63</u>	=	=	<u>145</u>	<u>416</u>
<u>Agriculture-CWAD: Non-irrigated</u>	<u>40</u>	<u>114</u>	<u>28</u>	<u>80</u>	<u>0</u>	<u>1</u>	<u>106</u>	<u>304</u>
<u>Agriculture (Small)</u>	<u>16</u>	<u>46</u>	<u>9</u>	<u>25</u>	<u>1</u>	<u>4</u>	<u>38</u>	<u>110</u>
<u>CA Dept. of Fish and Wildlife</u>	<u>28</u>	<u>80</u>	=	=	=	=	<u>60</u>	<u>173</u>
<u>Federal - National Forest</u>	=	=	<u>1</u>	<u>4</u>	<u>106</u>	<u>304</u>	<u>198</u>	<u>568</u>
<u>Federal – Other</u>	<u>19</u>	<u>55</u>	<u>5</u>	<u>14</u>	=	=	<u>55</u>	<u>158</u>
<u>Federal – Wilderness</u>	=	=	=	=	=	=	<u>38</u>	<u>110</u>
<u>State Land</u>	<u>22</u>	<u>64</u>	=	=	=	=	<u>49</u>	<u>141</u>
<u>Tribal Reservations</u>	=	=	=	=	=	=	<u>11</u>	<u>31</u>
<u>Western Riverside County Regional Conservation Authority</u>	<u>5</u>	<u>13</u>	<u>3</u>	<u>9</u>	=	=	<u>13</u>	<u>39</u>
<b>Total Allowable Watershed Load (WLAs and LAs)</b>	<b><u>1,149</u></b>	<b><u>3,304</u></b>	<b><u>562</u></b>	<b><u>1,617</u></b>	<b><u>794</u></b>	<b><u>2,283</u></b>	<b><u>3,050</u></b>	<b><u>8,753</u></b>

<sup>a</sup> Final allocation compliance to be achieved as soon as possible, but no later than 10 years after TMDL effective date.

<sup>b</sup> Allocations for Local Lake Elsinore and Canyon Lake Overflow to Lake Elsinore are combined into a single Lake Elsinore TMDL. However, the allocations are reported separately here since source controls in the Canyon Lake watershed can be used to estimate credits toward reducing loads in Overflows from Canyon Lake to Lake Elsinore.



**Table 6-9q4. Nutrient Load Reduction Required for Watershed Jurisdictions to Comply with Lake Elsinore and Canyon Lake Nutrient TMDLs<sup>a,b,c</sup>**

<u>Responsible Entity</u>	<u>Canyon Lake Main Lake</u>		<u>Canyon Lake East Bay</u>		<u>Local Lake Elsinore</u>		<u>Canyon Lake Overflow to Lake Elsinore</u>	
	<u>TP (kg/vr)</u>	<u>TN (kg/vr)</u>	<u>TP (kg/vr)</u>	<u>TN (kg/vr)</u>	<u>TP (kg/vr)</u>	<u>TN (kg/vr)</u>	<u>TP (kg/vr)</u>	<u>TN (kg/vr)</u>
<b><u>Point Sources with NPDES Permits</u></b>								
<u>Banning</u>	=	=	=	=	=	=	<u>1</u>	<u>9</u>
<u>Beaumont</u>	=	=	=	=	=	=	<u>8</u>	<u>55</u>
<u>CAFO</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>	<u>0</u>	<u>(0)</u>	<u>27</u>	<u>35</u>
<u>Caltrans</u>	<u>1</u>	<u>130</u>	<u>0</u>	<u>45</u>	<u>1</u>	<u>81</u>	=	<u>286</u>
<u>Canyon Lake</u>	<u>5</u>	<u>55</u>	<u>6</u>	<u>90</u>	<u>3</u>	<u>48</u>	<u>16</u>	<u>217</u>
<u>Federal – Dept. of Defense</u>	<u>4</u>	<u>158</u>	=	=	=	=	<u>7</u>	<u>237</u>
<u>Hemet</u>	=	=	<u>37</u>	<u>332</u>	=	=	<u>74</u>	<u>622</u>
<u>Lake Elsinore</u>	<u>4</u>	<u>49</u>	<u>1</u>	<u>15</u>	<u>26</u>	<u>1,038</u>	<u>8</u>	<u>96</u>
<u>March Joint Powers Authority</u>	<u>4</u>	<u>54</u>	=	=	=	=	<u>6</u>	<u>81</u>
<u>Menifee</u>	<u>45</u>	<u>297</u>	<u>146</u>	<u>1,204</u>	<u>4</u>	<u>24</u>	<u>286</u>	<u>2,252</u>
<u>Moreno Valley</u>	<u>125</u>	<u>1,604</u>	=	=	=	=	<u>188</u>	<u>2,408</u>
<u>Murrieta</u>	=	=	<u>3</u>	<u>37</u>	=	=	<u>4</u>	<u>56</u>
<u>Perris</u>	<u>59</u>	<u>809</u>	<u>0</u>	=	=	=	<u>89</u>	<u>1,213</u>
<u>Riverside</u>	<u>4</u>	<u>55</u>	=	=	=	=	<u>6</u>	<u>82</u>
<u>Riverside County</u>	<u>210</u>	<u>1,093</u>	<u>162</u>	<u>402</u>	<u>50</u>	<u>466</u>	<u>739</u>	<u>2,828</u>
<u>San Jacinto</u>	=	=	<u>0</u>	<u>2</u>	=	=	<u>35</u>	<u>206</u>
<u>Wildomar</u>	=	=	=	=	<u>40</u>	<u>525</u>	=	=
<b><u>Nonpoint Sources</u></b>								
<u>Agriculture (CWAD)</u>	<u>30</u>	=	<u>10</u>	=	=	=	<u>75</u>	=
<u>Agriculture (Non-irrigated)</u>	<u>237</u>	<u>285</u>	<u>155</u>	<u>176</u>	<u>1</u>	<u>1</u>	<u>668</u>	<u>810</u>
<u>Agriculture (Small)</u>	<u>37</u>	<u>24</u>	<u>27</u>	<u>24</u>	<u>0</u>	=	<u>99</u>	<u>72</u>
<u>CA Dept. of Fish and Wildlife</u>	<u>0</u>	<u>0</u>	=	=	=	=	<u>13</u>	<u>36</u>
<u>Federal - National Forest</u>	=	=	=	=	<u>1</u>	<u>2</u>	<u>132</u>	<u>381</u>
<u>Federal – Other</u>	=	=	<u>1</u>	<u>1</u>	=	=	<u>13</u>	<u>36</u>
<u>Federal – Wilderness</u>	=	=	=	=	=	=	<u>26</u>	<u>73</u>
<u>State Land</u>	<u>2</u>	<u>5</u>	=	=	=	=	<u>13</u>	<u>38</u>
<u>Tribal Reservations</u>	=	=	=	=	=	=	<u>8</u>	<u>27</u>
<u>Western Riverside County Regional Conservation Authority</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	=	=	<u>3</u>	<u>5</u>
<b><u>Total Watershed Load Reduction Required</u></b>	<u>767</u>	<u>4,516</u>	<u>548</u>	<u>2,293</u>	<u>127</u>	<u>2,186</u>	<u>2,527</u>	<u>11,951</u>

<sup>a</sup> The required load reductions for Canyon Lake apply to those land uses located upstream of Canyon Lake.

<sup>b</sup> Final allocation compliance to be achieved as soon as possible, but no later than 10 years after TMDL effective date.

<sup>c</sup> Required load reductions specified as 10-year running average.

The TMDL distributes the portions of the waterbody's assimilative capacity to various pollution sources so that the waterbody achieves the goal to return the watershed and lakes to the reference condition and meet water quality standards. The Regional Board supports the trading of pollutant allocations among sources, where appropriate. Trading can take place between point/point, point/nonpoint, and nonpoint/nonpoint pollutant sources. Optimizing alternative point and nonpoint control strategies through allocation tradeoffs may be a cost-effective way to achieve pollution reduction benefits. The Regional Board also supports the use of in-lake projects to control internal nutrient sources and offset watershed nutrient loading. Each jurisdiction subject to the requirements of this TMDL, and the WLAs and LAs, shall, as part of the update to the CNRP and AgNMPs, inform the Board of its plans and schedules to comply with the required load reductions. (See Section E. TMDL Implementation, Task ??, below).

#### **H. Margin of Safety**

The Canyon Lake and Lake Elsinore Nutrient TMDLs include an implicit margin of safety (MOS) as follows:

- the derivation of numeric targets based on median concentrations of nutrients in watershed runoff under a reference watershed condition before anthropogenic impacts, instead of the mean, which provide a margin of safety for TP of over 600%, and for TN of over 180%. the 25<sup>th</sup> percentile of These data provide the reference watershed data for the CDF Numeric Targets, and TMDLs, for Lake Elsinore; Canyon Lake numeric targets to be consistent with the Lake Elsinore targets;
- the use of multiple numeric targets to measure attainment of beneficial uses and thereby assure TMDL efficacy;
- the use of conservative literature and site-specific values in the absence of site-specific data for source loading rates in the watershed nutrient model;
- the use of conservative assumptions in dynamic modeling the response of Lake Elsinore and Canyon Lake to nutrient loads; and
- requiring load reductions to be accomplished during hydrological conditions when model results indicate, in some instances, that theoretical loads could be higher.

#### **I. Seasonal Variations/Critical Conditions (i.e. such as severe drought)**

The Canyon Lake and Lake Elsinore Nutrient TMDLs account for seasonal and annual variations in external and internal nutrient loading and associated impacts on beneficial uses by the use of a 10-year running average allocation approach. This 10-year running average approach addresses variation in hydrologic conditions (wet, moderate and dry) that can dramatically affect both nutrient loading and lake response.

Compliance with numeric targets will ensure water quality improvements that prevent excessive algae blooms and fish kills, particularly during the critical summer period when these problems are most likely to occur.

#### **J. TMDL Implementation**

Typically, under dry and moderate conditions, the internal nutrient loading drives the nutrient dynamics in both Canyon Lake and Lake Elsinore. However, it is the extreme (albeit infrequent) loading that occurs during wet conditions that provides the nutrients to the lakes that remain in the lakes as internal nutrient sources in subsequent years. Given the complexity of the San Jacinto River watershed hydrology, control

of nutrients input to the lakes is needed for all hydrologic conditions. Collection of additional monitoring data is critical to developing long-term solutions for nutrient control. With that in mind, the submittal of plans and schedules to implement the TMDLs should take into consideration the need to develop and implement effective short-term solutions, as well as allow for the development of long-term solutions once additional data have been generated.

Implementation of tasks and schedules as specified in Table 5-9s is expected to return the lakes to a reference condition and achieve compliance with water quality standards. Each of these tasks is described below. This Phase 2 TMDL Implementation Plan replaces the Implementation Plan for the 2004 TMDL. The TMDL Stakeholders have satisfactorily completed the Phase 1 Implementation Plan, or some tasks have been determined to no longer be necessary. Table 5-9s provides a summary of Phases 1 and 2, and Table 5-9t provides the updated Implementation Plan for Phase 2. The Monitoring Plan required for thee TMDLs is the current Monitoring Plan approved by the Board and being implemented by the TMDL Task Force on behalf of all stakeholders. This monitoring plan shall be revised to address these TMDLs according to the schedule and is a part of these TMDLs.

The Regional Board does not specify the methods of compliance with the Basin Plan or Orders issued by the Regional Board to implement the TMDL, such as the MS4 permits, the CAFO permit, and the CWAD. Therefore, each watershed stakeholder affected by these TMDLs is required to ensure they meet all the requirements of the TMDLs. Watershed stakeholders with nutrient load allocations shall comply with these TMDLs either individually, or as part of a Regional Board approved coalition or group, and each TMDL affected stakeholder shall provide documentation proving to the Regional Board that they are a current member of a TMDL Compliance coalition or group. And that they are current with the payment of all dues to that group. As well as, document, on an annual basis, that any nutrient offset credits used to comply with these TMDLs are properly accounted for and paid for, in full. However, the Regional Board does encourage all TMDL stakeholders to continue to work together as part of LESJWA and the TMDL Task Force to implement the TMDLs in the most cost-effective manner. Especially for a joint TMDL monitoring program and submittal or coordinated nutrient management plan revisions. The Regional Board will continue to conduct compliance inspections and monitoring of individual TMDL stakeholders, as needed and appropriate, and enforce Orders that implement these TMDLs.

Table 6-9(s), below, provides an outline of Phases 1 and 2 for the Implementation of the 2004 Nutrient TMDL and these TMDLs, respectively. Table 6-9(t) below provides a more detailed outline of Phase 2, the Implementation Plan for these Revised TMDLs.

**Table 6-9s**

**Lake Elsinore and Canyon Lake Nutrient TMDL Implementation  
 Plan/Schedule Report Due Dates**

Table 6-9s. Phased Implementation Plans for Lake Elsinore and Canyon Lake TMDLs

<u>Phase</u>	<u>Time Period</u>	<u>Completed or Anticipated Key Activities</u>	<u>Existing or Anticipated Outcomes</u>
<u>Phase 1</u>	<u>Effective date of original TMDLs to effective date of revised TMDLs (2005 - ~2020)</u>	<ul style="list-style-type: none"> <li>• <u>LECL Task Force Management</u></li> <li>• <u>Alum applications</u></li> <li>• <u>LEAMS implementation</u></li> <li>• <u>Fishery management</u></li> <li>• <u>Watershed BMPs (CNRP, AgNMP)</u></li> <li>• <u>Supplemental water additions</u></li> <li>• <u>Special studies to support TMDL revisions</u></li> <li>• <u>Monitoring and reporting activities</u></li> </ul>	<ul style="list-style-type: none"> <li>• <u>Implementation of watershed-based and in-lake BMPs to reduce nutrient loads to the lakes and mitigate nutrient impacts</u></li> <li>• <u>Development of new data to support revision of nutrient TMDLs</u></li> </ul>
<u>Phase 2</u>	<u>15-20 year period after effective date of revised TMDLs</u>	<ul style="list-style-type: none"> <li>• <u>Revised permits and management plans (e.g., CNRP and AgNMP)</u></li> <li>• <u>Continued/enhanced implementation of existing water quality control programs</u></li> <li>• <u>Supplemental project implementation, as identified through revision of management plans</u></li> <li>• <u>Additional research/studies, as needed</u></li> <li>• <u>Annual monitoring and reporting according to a plan approved by the Regional Board</u></li> <li>• <u>Periodic assessment to evaluate progress towards compliance with TMDLs and attainment of water quality objectives</u></li> </ul>	<ul style="list-style-type: none"> <li>• <u>Return the lakes to the reference condition, compliance with TMDL numeric targets and attainment of water quality standards</u></li> <li>• <u>Compliance Evaluations after 5, 10, 15, and 20 years, and evaluate and revise TMDLs, at discretion of the Santa Ana Water Board</u></li> </ul>

Table 6-9t. Summary of TMDL Implementation Activities (See Table 6-9q3 for identification of responsible entities with WLAs or LAs)

<u>Implementation Element</u>	<u>Activity</u>	<u>Responsible Entity (ies)</u>	<u>Complete by</u>
<u>Task 1: Stakeholder Coordination</u>	<u>LECL Task Force collaborate at least quarterly on TMDL implementation activities</u>	<u>All entities with a WLA or LA, Table 6-9q3, and Regional Board</u>	<u>Throughout Phase 2</u>
<u>Task 2: Revision to Existing Permits and Other Regulatory Actions</u>	<u>Riverside County MS4 Permit</u>	<u>Regional Board</u>	<u>In a timely manner, and as needed; at the discretion of the regulatory agency.</u>
	<u>March Air Reserve Base MS4 Permit (industrials storm water permit)</u>		
	<u>Conditional Waiver for Agricultural Operations</u>		
	<u>EVMWD Waste Discharge Requirements (WDR)</u>		
	<u>Dairy General Order</u>		
	<u>Caltrans MS4 Permit</u>	<u>State Water Board</u>	
	<u>Small MS4 General Permit</u>		
	<u>USFS Nutrient Management Plans</u>	<u>Regional Board, SWRCB, and USEPA</u>	<u>Revised Management Plans within two years of TMDL effective date</u>
<u>Task 3: Revise Existing Watershed Implementation Plans</u>	<u>Comprehensive Nutrient Reduction Plan: Revise existing CNRP to: (a) identify supplemental projects for implementation, where needed; (b) be consistent with revised TMDLs; and (c) satisfy MS4 permit requirements, as applicable</u>	<u>Phase I MS4 Permittees</u>	<u>Revised CNRP shall be submitted for Regional Board approval within two years of the revised TMDLs effective date or as required by reauthorized MS4 permits, whichever is sooner</u>
	<u>Agricultural Nutrient Management Plan: Revise existing AgNMP to: (a) identify supplemental projects for implementation, where needed; (b) be consistent with revised TMDLs; and (c) satisfy CWAD requirements, as applicable</u>	<u>Agricultural Operators</u>	<u>Revised AgNMP(s) shall be submitted for Regional Board approval within 3 months of the Regional Board ‘s adoption of the revised TMDL, or as required by a reauthorized CWAD , whichever is sooner</u>
<u>Task 4: Implementation and/or Revision of Existing Water Quality Controls</u>	<u>Canyon Lake Alum Project</u>	<u>Entities with a WLA or LA applicable to Canyon Lake</u>	<u>As needed application, as determined through revision to the CNRP and AgNMP</u>
	<u>LEAMS</u>	<u>Entities with a WLA or LA applicable to Lake Elsinore</u>	<u>Continued implementation as per LEAMS operational agreements</u>

Table 6-9t. Summary of TMDL Implementation Activities (See Table 6-9q3 for identification of responsible entities with WLAs or LAs)

<u>Implementation Element</u>	<u>Activity</u>	<u>Responsible Entity (ies)</u>	<u>Complete by</u>
	<u>Fishery Management</u>	<u>Entities with a WLA or LA applicable to Lake Elsinore</u>	<u>As needed carp removal or implementation of additional fishery management activities as determined through revision of CNRP and AgNMP</u>
	<u>Supplemental Reclaimed Water</u>	<u>EVMWD</u>	<u>Assumed continuance of the discharge of supplemental water to Lake Elsinore, and additional flows up to 7.5 MGD</u>
<u>Task 5: Special Studies</u>	<u>Nutrient Loads from Reference Watershed</u>	<u>All entities with a WLA or LA</u>	<u>Complete study within three years of TMDL effective date</u>
	<u>Other Research Activities</u>	<u>All entities with a WLA or LA</u>	<u>As needed, milestones determined by specific study</u>
<u>Task 6: Revised Monitoring Program</u>	<u>Revised Monitoring and Reporting Program, to include watershed aerial surveys of land use every 5 years, HAB, and cyanotoxin monitoring program for both lakes</u>	<u>All entities with a WLA or LA</u>	<u>Submitted within 90 days of TMDL effective date; implemented within 90 days of Regional Board approval</u>
	<u>Annual Water Quality Reports</u>	<u>All entities with a WLA or LA</u>	<u>By August 15 each year</u>
	<u>Evaluate Status of TMDL Compliance, and possible revisions to the TMDLs</u>	<u>All entities with a WLA or LA</u>	<u>By August 15 of every fifth year, and after 15-20 years for possible revisions to the TMDLs, after TMDL effective date</u>

#### **K. Monitoring Program**

On March 3, 2006, the Regional Board adopted Resolution No. R8-2006-003, “Approving the Lake Elsinore and San Jacinto Watersheds Authority Monitoring Program Proposal Submitted Pursuant to the Lake Elsinore and Canyon Lake Nutrient Total Maximum Daily Loads Specified in the Water Quality Control Plan for the Santa Ana River Basin”. This 2006 Monitoring Program for the TMDLs has been implemented since approval in 2006, by LESJWA and the TMDL Task Force, except for minor approved revisions over the years and during the period from June 2012 through April 2015 when the Regional Board allowed the re-allocation of the in-lake monitoring program costs towards nutrient reduction projects in the Lakes and Watershed. The current version of the Lake Elsinore and Canyon Lake Nutrient TMDLs Comprehensive Monitoring Work Plan, Haley & Aldrich, July 27, 2016, provides the current TMDL Compliance Monitoring Plan for the 2004 TMDLs, that will continue to be implemented until

replaced by a Revised TMDL Compliance Monitoring Plan required by these new TMDLs (2019), which is required to be submitted within 90 days after the effective date for these TMDLs.

Table 6-9u, below, outlines elements that will be included in the Revised TMDL Monitoring Program, in addition to watershed aerial land use surveys for comparing and documenting rapidly changing land use patterns, and a monitoring program for Harmful Algae Blooms and Cyanotoxins in both lakes. More detailed descriptions of monitoring plan details are included in the Revised TMDL Technical Report in Section 8.

**Table 6-9u. Summary of Elements for Inclusion in Revised TMDL Monitoring Program**

<u>Waterbody</u>	<u>Elements Recommended for Inclusion in Revised TMDL Monitoring Program</u>
<u>San Jacinto River Watershed</u>	<ul style="list-style-type: none"> <li>• <u>Re-inclusion of the Cranston Guard Station</u></li> <li>• <u>Add two new monitoring stations below reference sub-watersheds</u></li> <li>• <u>Reduce the storm mobilization criteria for the October 1 to December 31 period from a 1.0-inch to a 0.5-inch forecast within 24-hours. The January 1 through April 30 mobilization criteria remains the same.</u></li> </ul>
<u>Lake Elsinore</u>	<ul style="list-style-type: none"> <li>• <u>Discontinue the afternoon water column profile at each existing monitoring station. Analysis of water column profiles will continue to be performed once in mid to late morning during each monitoring event.</u></li> <li>• <u>Utilize the two EVMWD multi-depth in-lake water quality sondes in combination with fixed depth DO sondes mounted just under the surface at both EVMWD sondes. These data will supplement the single point-in-time water column profiles recorded during each field monitoring event.</u></li> <li>• <u>Incorporate Sentinel-2 satellite imagery (10-m resolution) for chlorophyll-<i>a</i> and turbidity measurements during months in which it is available (September through May), and LandSat 8 satellite imagery (30-m resolution) during all other months (June through August).</u></li> </ul>
<u>Canyon Lake</u>	<ul style="list-style-type: none"> <li>• <u>Discontinue the afternoon water column profile at each existing monitoring station. Analysis of water column profiles will continue to be performed once in mid to late morning during each monitoring event.</u></li> <li>• <u>Utilize a combination of fixed depth in-lake DO and temperature sondes to supplement single point-in-time water column profiles recorded during each field monitoring event.</u></li> <li>• <u>Add Station CL09 to sites being monitored for full analyte list during each event.</u></li> <li>• <u>Add total and dissolved aluminum to the analyte list for all sites to assess any influences from alum treatments in Canyon Lake.</u></li> <li>• <u>Incorporate Sentinel-2 satellite imagery (10-m resolution) for chlorophyll-<i>a</i> and turbidity measurements during months in which it is available (September through May), and LandSat 8 satellite imagery (30-m resolution) during all other months (June through August).</u></li> </ul>

## References

1. CDM Smith, Draft for Public Review and Peer Review TMDL Technical Report: Revision to the Lake Elsinore and Canyon Lake Nutrient TMDLs”, December 1, 2018.



Task	Description	Compliance Date-As soon As Possible but No Later Than
<b><i>TMDL Phase 1</i></b>		
Task 1	Establish New Waste Discharge Requirements	March 31, 2006
Task 2	Revise Existing Waste Discharge Permits	March 31, 2006
Task 3	Identify Agricultural Operators	October 31, 2005
Task 4	Nutrient Water Quality Monitoring Program 4.1 Watershed-wide Nutrient Monitoring Plan(s) 4.2 Lake Elsinore Nutrient Monitoring Plan(s) 4.3 Canyon Lake Nutrient Monitoring Plan(s)	<ul style="list-style-type: none"> <li>Initial plan/schedule due December 31, 2005</li> <li>Annual reports due August 15</li> <li>Revised plan/schedule due December 31, 2006</li> </ul>
Task 5	Agricultural Discharges—Nutrient Management Plan	Plan/schedule due September 30, 2007
Task 6	On-site Disposal Systems (Septic Systems) Management Plan	Dependent on State Board approval of relevant regulations (see text).
Task 7	Urban Discharges 7.1 Revision of Drainage Area Management Plan (DAMP) 7.2 Revision of the Water Quality Management Plan (WQMP) 7.3 Update of the Caltrans Stormwater Management Plan and Regional Plan 7.4 Update of US Air Force, March Air Reserve Base SWPPP	Plan/schedule due: 7.1 August 1, 2006 7.2 August 1, 2006 7.3 April 1, 2006 7.4 Dependent on Task 3 results. See text.
Task 8	Forest Area—Review/Revision of Forest Service Management Plans	Plan/schedule due September 30, 2007
Task 9	Lake Elsinore In-Lake Sediment Nutrient Reduction Plan	Plan/schedule due March 31, 2007
Task 10	Canyon Lake In-Lake Sediment Treatment Evaluation	Plan/schedule due March 31, 2007
Task 11	Watershed and Canyon Lake and Lake Elsinore In-Lake Model Updates	Plan/schedule due March 31, 2007

Task	Description	Compliance Date As soon As Possible but No Later Than
Task 12	Pollutant Trading Plan	Plan/schedule due September 30, 2007
Task 13	Review and Revise Nutrient Water Quality Objectives	December 31, 2009
Task 14	Review of TMDL/WLA/LA	Once every 3 years to coincide with the Regional Board's triennial review

### **Task 1: — Establish New Waste Discharge Requirements**

On or before March 31, 2006, the Regional Board shall issue new waste discharge requirements (NPDES permit) to Elsinore Valley Municipal Water District for supplemental water discharges to Canyon Lake that incorporate the appropriate interim and final wasteload allocations, compliance schedule and monitoring program requirements.

Other proposed nutrient discharges will be addressed and permitted as appropriate.

### **Task 2: — Review and/or Revise Existing Waste Discharge Requirements**

There are five Waste Discharge Requirements (WDRs) issued by the Regional Board regulating discharge of various types of wastes in the San Jacinto watershed. On or before March 31, 2006, each of these WDRs shall be reviewed and revised as necessary to implement the Lake Elsinore and Canyon Lake Nutrient TMDLs, including the appropriate nitrogen and phosphorus interim and final wasteload allocations, compliance schedules and/or monitoring program requirements.

2.1 Waste Discharge Requirements for the Riverside County Flood Control and Water Conservation District, the County of Riverside and the Incorporated Cities of Riverside County within the Santa Ana Region, Areawide Urban Runoff, NPDES No. CAS 618033 (Regional Board Order No. R8-2002-0011). The current Order has provisions to address TMDL issues (see Task 7.1, below). In light of these provisions, revision of the Order may not be necessary to address TMDL requirements.

2.2 Watershed Wide Waste Discharge Requirements for Discharges of Storm Water Runoff Associated with New Developments in the San Jacinto Watershed, Order No. 01-34, NPDES No. CAG 618005. It is expected that this Order will be rescinded once the Regional Board/Executive Officer approves a Water Quality Management WQMP) under Order No. R8-2002-0011 (see 2.1, above and Task 7.2, below)

2.3 General Waste Discharge Requirements for Concentrated Animal Feeding Operations (Dairies and Related Facilities) within the Santa Ana Region, NPDES No. CAG018001 (Regional Board Order No. 99-11).

2.4 Waste Discharge and Producer/User Reclamation Requirements for the Elsinore Valley Municipal Water District, Regional Water Reclamation Facility Riverside County, Order No. 00-1, NPDES No. CA8000027. Revised permit specifications will take into consideration the Lake Elsinore Recycled Water Pilot Project findings.

~~2.5 Waste Discharge Requirements for Eastern Municipal Water District, Regional Water Reclamation System, Riverside County, Order No. 99-5, NPDES No. CA8000188<sup>1</sup>. Revised permit specifications will take into consideration the Lake Elsinore Recycled Water Pilot Project findings.~~

~~2.6 Waste Discharge Requirements for US Air Force, March Air Reserve Base, Storm Water Runoff, Riverside County, Order No. R8-2004-0033, NPDES CA 0011100~~

### ~~2.7 Task 3: Identify Agricultural Operators~~

~~On or before October 31, 2005, the Regional Board shall develop a list of all known agricultural operators in the San Jacinto watershed that will be responsible for implementing requirements of this TMDL. The Regional Board will send a notice to these operators informing them of their TMDL responsibility and alerting them to potential regulatory consequences of failure to comply.~~

### ~~Task 4: Monitoring~~

~~No later than December 31, 2005, the US Forest Service, the US Air Force (March Air Reserve Base), March Joint Powers Authority, California Department of Transportation (Caltrans), California Department of Fish and Game, the County of Riverside, the cities of Lake Elsinore, Canyon Lake, Hemet, San Jacinto, Perris, Moreno Valley, Murrieta, Riverside and Beaumont, Eastern Municipal Water District<sup>1</sup>, Elsinore Valley Municipal Water District, concentrated animal feeding operators and other agricultural operators within the San Jacinto watershed shall, as a group, submit to the Regional Board for approval monitoring program as required by Tasks 4.1, 4.2 and 4.3.~~

~~If modifications to the monitoring program are warranted, no later than December 31, 2006, the US Forest Service, the US Air Force (March Air Reserve Base), March Joint Powers Authority, California Department of Transportation (Caltrans), California Department of Fish and Game, the County of Riverside, the cities of Lake Elsinore, Canyon Lake, Hemet, San Jacinto, Perris, Moreno Valley, Murrieta, Riverside and Beaumont, Eastern Municipal Water District<sup>1</sup>, Elsinore Valley Municipal Water District, concentrated animal feeding operators and other agricultural operators within the San Jacinto watershed shall, as a group, submit to the Regional Board for approval a revised proposed Watershed nutrient monitoring program (Task 4.1), Lake Elsinore monitoring program (Task 4.2) and Canyon Lake nutrient monitoring program (Task 4.3).~~

~~In lieu of this coordinated monitoring plan, one or more of the parties identified above may submit a proposed individual or group monitoring plan for Regional Board approval for the monitoring program specified in tasks 4.1, 4.2 and 4.3. Any such individual or group monitoring plan is due no later than December 31, 2005. If needed, any individual or group revised monitoring plan is due no later than December 31, 2006.~~

### ~~4.1 Watershed-wide Nutrient Water Quality Monitoring Program~~

~~The US Forest Service, the US Air Force (March Air Reserve Base), March Joint Powers Authority, California Department of Transportation (Caltrans), California Department of Fish and Game, the County of Riverside, the cities of Lake Elsinore, Canyon Lake, Hemet, San Jacinto, Perris, Moreno Valley, Murrieta, Riverside and Beaumont, Eastern Municipal Water District<sup>1</sup>, Elsinore Valley Municipal Water District, concentrated animal feeding operators and other agricultural operators within the San Jacinto watershed shall, as a group, submit to the Regional Board for approval a proposed watershed-wide~~

---

<sup>1</sup> Contingent on Eastern Municipal Water District discharge of recycled water to Lake Elsinore.

nutrient monitoring program that will provide data necessary to review and update the Lake Elsinore and Canyon Lake Nutrient TMDL. Data to be collected and analyzed shall address, at a minimum: (1) determination of compliance with interim and/or final nitrogen and phosphorus allocations; and (2) determination of compliance with the nitrogen and phosphorus TMDL, including the WLAs and LAs.

At a minimum, the stations specified in Table 5-9t and shown in Figure 5-3, at the frequency specified in Table 5-9t, shall be considered for inclusion in the proposed monitoring plan. If one or more of these monitoring stations are not included, rationale shall be provided and proposed alternative monitoring locations shall be identified in the proposed monitoring plan. In addition to water quality samples, at a minimum, daily discharge (stream flow) determinations shall be made at all stations shown in Table 5-9t.

At a minimum, samples shall be analyzed for the following constituents:

- organic nitrogen
- nitrite nitrogen
- total phosphorus
- total hardness
- total suspended solids (TSS)
- biological oxygen demand (BOD)
- ammonia nitrogen
- nitrate nitrogen
- ortho-phosphate (SRP)
- total dissolved solids (TDS)
- turbidity
- chemical oxygen demand (COD)
- pH
- water temperature

The proposed monitoring plan shall be implemented upon Regional Board approval at a duly noticed public meeting. An annual report summarizing the data collected for the year and evaluating compliance with the WLAs/LAs shall be submitted by August 15 of each year.

In lieu of this coordinated monitoring plan, one or more of the parties identified above may submit a proposed individual or group monitoring plan for Regional Board approval. This individual monitoring plan shall be implemented upon Regional Board approval at a duly noticed public meeting. An annual report of data collected pursuant to approved individual/group plan(s) shall be submitted by August 15 of each year. The report shall summarize the data and evaluate compliance with the WLAs/LAs.

It may be that implementation of these monitoring requirements will be required through the issuance of Water Code Section 13267 letters to the affected parties. The monitoring plan(s) will be considered by the Regional Board and implemented upon the Regional Board's approval.

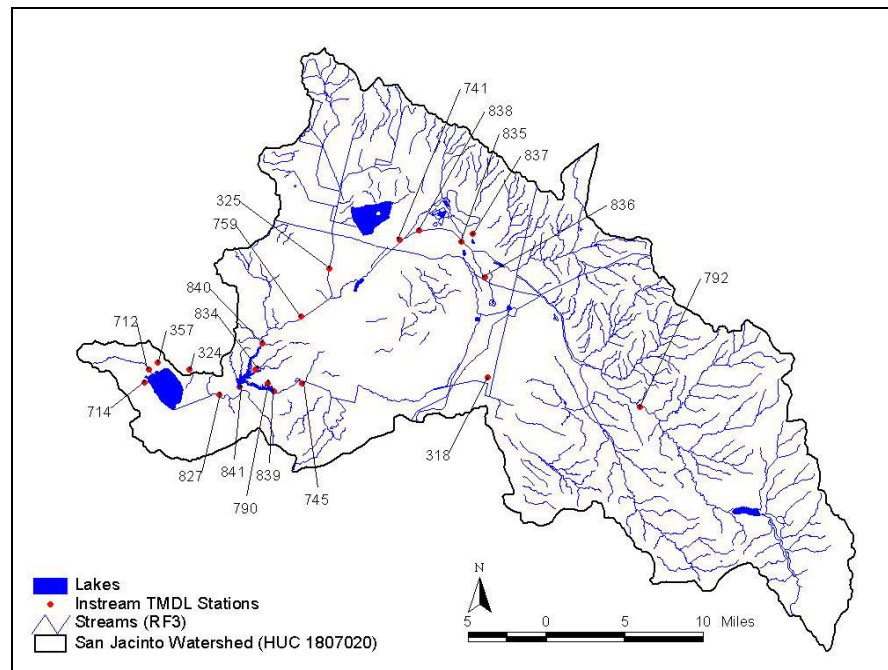


Figure 5-3 San Jacinto River Watershed Nutrient TMDL Water Quality Stations Locations

Table 5-9t  
Lake Elsinore and Canyon Lake Watershed  
Minimum Required Sampling Station Locations

Station Number	Station Description
792	San Jacinto River @ Cranston Guard Station
318	Hemet Channel at Sanderson Ave.
745	Salt Creek @ Murrieta Road
759	San Jacinto River @ Goetz Rd
325	Perris Valley Storm Drain @ Nuevo Rd.
741	San Jacinto River @ Ramona Expressway
827	San Jacinto River upstream of Lake Elsinore
790	Fair Weather Dr. Storm Drain in Canyon Lake
357	4 Corners Storm Drain in Elsinore
714	Ortega Flood Channel in Elsinore
324	Lake Elsinore Outlet Channel
712	Leach Canyon Channel in Elsinore

834	Sierra Park Drain in Canyon Lake
835	Bridge Street and San Jacinto River
836	North Side of Ramona Expressway near Warren Road
837	Mystic Lake inflows
838	Mystic Lake outflows
841	Canyon Lake spillway

Frequency of sampling at all stations: dry season—none; wet season; minimum of 3 storms/year whenever possible and 8 samples across each storm hydrograph

#### **4.2 Lake Elsinore: In-Lake Nutrient Monitoring Program**

The US Forest Service, the US Air Force (March Air Reserve Base), March Joint Powers Authority, California Department of Transportation (Caltrans), California Department of Fish and Game, the County of Riverside, the cities of Lake Elsinore, Canyon Lake, Hemet, San Jacinto, Perris, Moreno Valley, Murrieta, Riverside and Beaumont, Eastern Municipal Water District<sup>1</sup>, Elsinore Valley Municipal Water District, concentrated animal feeding operators and other agricultural operators within the San Jacinto watershed shall, as a group, submit to the Regional Board for approval a proposed Lake Elsinore nutrient monitoring program that will provide data necessary to review and update the Lake Elsinore Nutrient TMDL. Data to be collected and analyzed shall address, at a minimum: determination of compliance with interim and final nitrogen, phosphorus, chlorophyll *a*, and dissolved oxygen numeric targets. In addition, the monitoring program shall evaluate and determine the relationship between ammonia toxicity and the total nitrogen allocation to ensure that the total nitrogen allocation will prevent ammonia toxicity in Lake Elsinore.

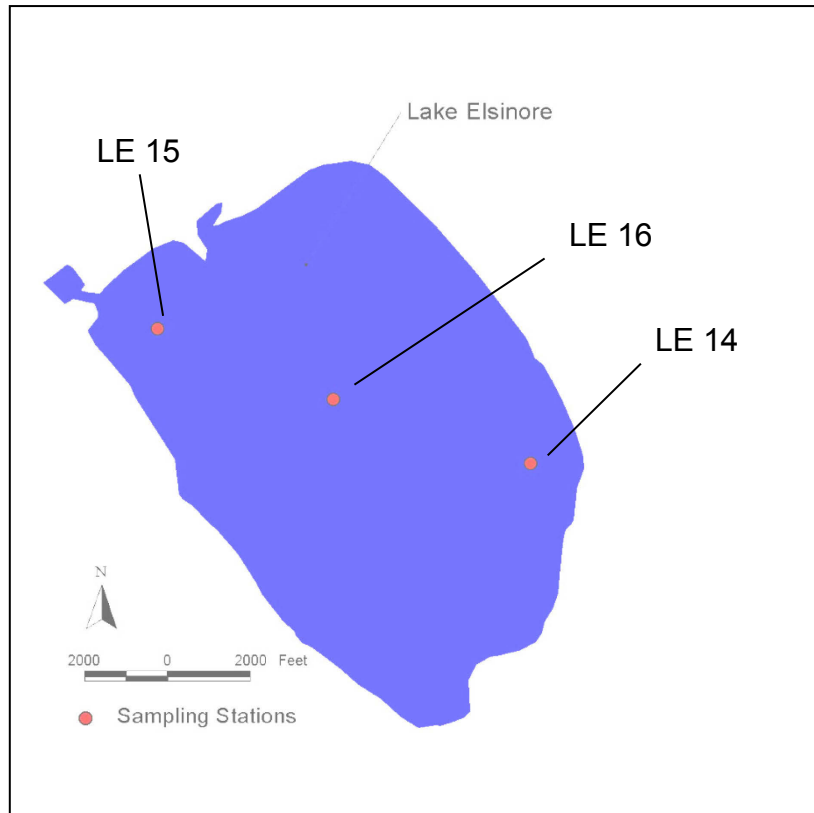
At a minimum, the proposed plan shall include the collection of samples at the stations specified in Table 5-9u and shown in Figure 5-4, at the specified frequency indicated in Table 5-9u. With the exception of dissolved oxygen and water temperature, all samples to be analyzed shall be depth integrated.

The monitoring plan shall be implemented upon Regional Board approval at a duly noticed public meeting. An annual report summarizing the data collected for the year and evaluating compliance with the TMDL shall be submitted by August 15 of each year.

Table 5-9u  
Lake Elsinore Minimum Required Sampling Station Locations

Station Number	Station Description
LE-14	Lake Elsinore—inlet
LE-15	Lake Elsinore—four corners
LE-16	Lake Elsinore—mid-lake

Frequency of sampling at all stations: monthly October through May; bi-weekly June through September.



~~Figure 5-4 Lake Elsinore TMDL monitoring Stations~~

~~At a minimum, in-lake samples must be analyzed for the following constituents:~~

- |  |   |
|--|---|
| ● <del>specific conductance</del>            | ● <del>chemical oxygen demand (COD)</del>   |
| ● <del>water temperature</del>               | ● <del>dissolved oxygen</del>               |
| ● <del>pH</del>                              | ● <del>water clarity (secchi depth)</del>   |
| ● <del>chlorophyll <math>\alpha</math></del> | ● <del>ammonia nitrogen</del>               |
| ● <del>organic nitrogen</del>                | ● <del>nitrate nitrogen</del>               |
| ● <del>nitrite nitrogen</del>                | ● <del>turbidity</del>                      |
| ● <del>organic phosphorus</del>              | ● <del>ortho-phosphate (SRP)</del>          |
| ● <del>total hardness</del>                  | ● <del>total suspended solids (TSS)</del>   |
| ● <del>total dissolved solids (TDS)</del>    | ● <del>biological oxygen demand (BOD)</del> |

~~In lieu of this coordinated monitoring plan, one or more of the parties identified above may submit a proposed individual or group monitoring plan for Regional Board approval. This individual monitoring plan shall be implemented upon Regional Board approval at a duly noticed public meeting. An annual report of data collected pursuant to approved individual/group plan(s), shall be submitted by August 15 of each year. The report shall summarize the data and evaluate compliance with the numeric targets.~~

~~It may be that implementation of these requirements will be required through the issuance of Water Code Section 13267 letters to the affected parties. The monitoring plan(s) will be considered by the Regional Board and implemented upon the Regional Board's approval.~~

#### **4.3 Canyon Lake Nutrient Monitoring Program**

~~The US Forest Service, the US Air Force (March Air Reserve Base), March Joint Powers Authority, California Department of Transportation (Caltrans), California Department of Fish and Game, the County of Riverside, the cities of Canyon Lake, Hemet, San Jacinto, Perris, Moreno Valley, Murrieta, Riverside and Beaumont, Elsinore Valley Municipal Water District, concentrated animal feeding operators and other agricultural operators within the San Jacinto watershed shall, as a group, submit to the Regional Board for approval a proposed Canyon Lake nutrient monitoring program that will provide data necessary to review and update the Canyon Lake Nutrient TMDL. Data to be collected and analyzed shall address, at a minimum: determination of compliance with interim and final nitrogen, phosphorus, chlorophyll  $\alpha$ , and dissolved oxygen numeric targets. In addition, the monitoring program shall evaluate and determine the relationship between ammonia toxicity and the total nitrogen allocation to ensure that the total nitrogen allocation will prevent ammonia toxicity in Canyon Lake.~~

~~At a minimum, the proposed plan shall include the collection of samples at the stations specified in Table 5-9v and shown in Figure 5-5, at the specified frequency indicated in Table 5-9v. Discrete samples in Canyon Lake are to be collected in the epilimnion, hypolimnion and thermocline when and where appropriate.~~

~~The monitoring plan shall be implemented upon Regional Board approval at a duly noticed public meeting. An annual report summarizing the data collected for the year and evaluating compliance with the TMDL shall be submitted by August 15 of each year.~~



Table 5-9v

Canyon Lake Minimum Required Sampling Station Locations

Station Number	Station Description
CL 07	Canyon Lake — At the Dam
CL 08	Canyon Lake — North Channel
CL 09	Canyon Lake — Canyon Bay
CL 10	Canyon Lake — East Bay

Frequency of sampling at all stations: monthly October through May; bi-weekly June through September.

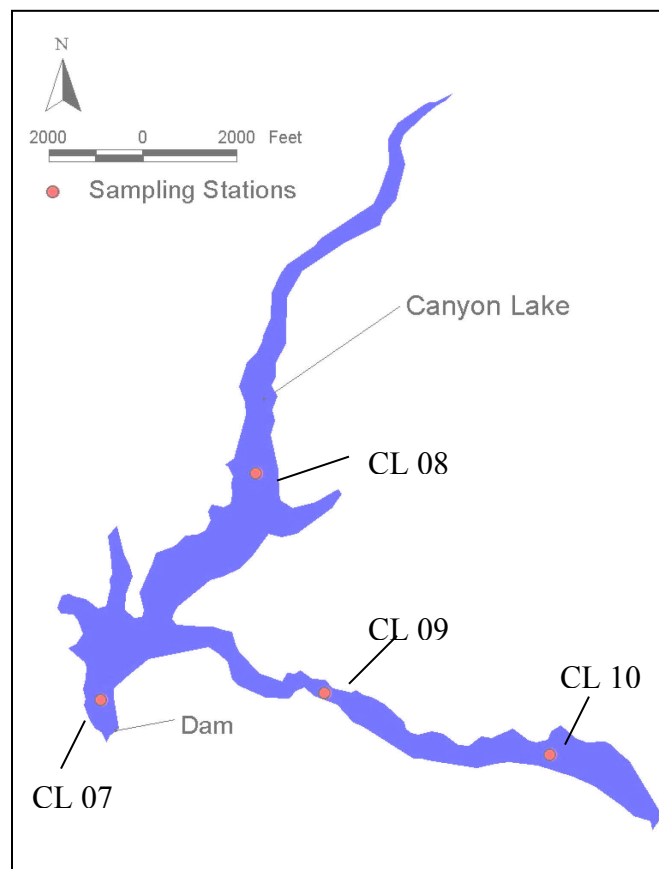


Figure 5-5 Canyon Lake Nutrient TMDL Monitoring Station Locations

At a minimum, in-lake samples must be analyzed for the following constituents:

- specific conductance
- water temperature
- pH
- chlorophyll *a*
- organic nitrogen
- nitrite nitrogen
- organic phosphorus
- total hardness
- total dissolved solids (TDS)
- chemical oxygen demand (COD)
- dissolved oxygen
- water clarity (secchi depth)
- ammonia nitrogen
- nitrate nitrogen
- turbidity
- ortho-phosphate (SRP)
- total suspended solids (TSS)
- biological oxygen demand (BOD)

In lieu of this coordinated monitoring plan, one or more of the parties identified above may submit a proposed individual or group monitoring plan for Regional Board approval. This individual plan shall be implemented upon Regional Board approval at a duly noticed public meeting. An annual report of data collected pursuant to approved individual/group plan(s) shall be submitted by August 15 of each year. The report shall summarize the data and evaluate compliance with the numeric targets.

It may be that implementation of these requirements will be required through the issuance of Water Code Section 13267 letters to the affected parties. The monitoring plan(s) will be considered by the Regional Board and implemented upon the Regional Board's approval.

#### **Task 5: Agricultural Activities**

No later than September 30, 2007, the agricultural operators within the Lake Elsinore and Canyon Lake watershed (see Task 2), in cooperation with the Riverside County Farm Bureau, the UC Cooperative Extension, Western Riverside County Ag Coalition shall, as a group, submit a proposed Nutrient Management Plan (NMP). The Nutrient Management Plan shall be implemented upon Regional Board approval at a duly noticed public meeting.

In lieu of a coordinated plan, one or more of the parties identified above may submit a proposed individual or group Nutrient Management Plan to conduct the above studies for areas within their jurisdiction. Any such individual or group plan shall also be submitted for Regional Board approval no later than September 30, 2007. This Nutrient Management Plan shall be implemented upon Regional Board approval at a duly noticed public meeting.

At a minimum, the NMP shall include, plans and schedules for the following. In order to facilitate any needed update of the numeric targets and/or the TMDLs and/or agricultural LA, the proposed schedule shall take into consideration the Regional Board's triennial review schedule.

- implementation of nutrient controls, BMPs and reduction strategies designed to meet load allocations;
- evaluation of effectiveness of BMPs;
- development and implementation of compliance monitoring; and
- development and implementation of focused studies that will provide the following data and information

- ~~inventory of crops grown in the watershed;~~
- ~~amount of manure and/or fertilizer applied to each crop with corresponding nitrogen and phosphorus amounts; and~~
- ~~amount of nutrients discharged from croplands.~~

The Regional Board expects that the NMP will be submitted and implemented pursuant to these TMDL requirements. Where and when necessary to implement these requirements, the Regional Board will issue appropriate waste discharge requirements.

Compliance with the agricultural load allocation may be achieved through a Regional Board approved pollutant trading program.

#### **Task 6: ~~On-site Disposal Systems (Septic System) Management Plan~~**

No later than 6 months after the effective date of an agreement between the County of Riverside and the Regional Board to implement regulations adopted pursuant to Water Code Sections 13290-13291.7, or if no such agreement is required or completed, within 12 months of the effective date of these regulations, the County of Riverside and the Cities of Perris, Moreno Valley and Murrieta shall, as a group, submit a Septic System Management Plan to identify and address nutrient discharges from septic systems within the San Jacinto watershed. The Septic System Management Plan shall implement regulations adopted by the State Water Resources Control Board pursuant to California Water Code Section 13290-13291.7.

At a minimum, the Septic System Management Plan shall include plans and schedules for the development and implementation of the following. In order to facilitate any needed update of the numeric targets and/or the TMDLs and septic system LA, the proposed schedule shall take into consideration the Regional Board's triennial review schedule.

- ~~public education program;~~
- ~~tracking system, including maintenance thereof;~~
- ~~maintenance standards;~~
- ~~enforcement provisions;~~
- ~~monitoring program; and~~
- ~~sanitary survey.~~

In lieu of a coordinated plan, one or more of the agencies with septic system oversight responsibilities may submit an individual or group Management Plan to develop the above Plan for areas within their jurisdiction. Any such individual or group plan shall also be submitted no later than March 31, 2006. This Septic System Management Plan shall be implemented upon Regional Board approval at a duly noticed public meeting.

Compliance with the septic systems load allocation may be achieved through a Regional Board approved pollutant trading program.

#### **Task 7: ~~Urban Discharges~~**

Urban discharges, including stormwater runoff, are those discharges from the cities and unincorporated communities in the San Jacinto River watershed. These discharges are regulated under the Riverside County MS4 NPDES permit, the San Jacinto Watershed Construction Activities Storm Water permit, the State Board's General Permit for Storm Water Runoff from Construction Activities, and the State Board's General Permit for Storm Water Runoff from Industrial Activities. Nuisance and stormwater runoff from

state highways and right of ways is regulated under the State of California, Department of Transportation (Caltrans) statewide general NPDES permit. Finally, nuisance and stormwater runoff from the March Air Reserve Base is also regulated through an NPDES permit.

#### ~~7.1 Revision to the Drainage Area Management Plan (DAMP)~~

~~Provision XIII.B. of Order No. R8-2002-0011 (see 2.1, above) requires the permittees to revise their Drainage Area Management Plan (DAMP) to include TMDL requirements. By August 1, 2006, the permittees shall review and revise the DAMP and or WQMP (see 7.2 below) as necessary to address the requirements of these nutrient TMDLs. Further review and revision of the DAMP needed to address these TMDLs shall be completed in accordance with the requirements of Order No. R8-2002-0011 or amendments/updates thereto that are adopted by the Regional Board at a public hearing. The DAMP revisions shall include schedules for meeting the interim and final nutrient wasteload allocations. In order to facilitate any needed update of the numeric targets and/or the TMDLs and urban discharge WLA, the proposed schedule shall take into consideration the Regional Board's triennial review schedule. The revised DAMP/WQMP shall also include a proposal for 1) evaluating the effectiveness of BMPs and other control actions implemented and 2) evaluating compliance with the nutrient waste load allocation for urban runoff. The proposal must be implemented upon approval by the Regional Board after public notice and public hearing, or upon approval by the Executive Officer if no significant comments are received during the public notice period.~~

#### ~~7.2 Revision of the Water Quality Management Plan (WQMP)~~

~~Provision VIII.B. of Order No. R8-2002-0011 (see 2.1, above) requires the permittees to develop and submit a WQMP by June 2004 for approval. On September 17, 2004, the Board approved a WQMP developed by the permittees. The approved WQMP includes source control BMPs, design BMPs and treatment control BMPs. Further revisions to the WQMP and/or the DAMP may be necessary to meet the WLA for urban runoff. By August 1, 2006, the permittees shall submit a revised WQMP and/or revised DAMP (see 7.1 above) that addresses the nutrient input from new developments and significant redevelopments to assure compliance with the nutrient wasteload allocations for urban runoff. The WQMP shall also address requirements currently in Order No. 01-34 (see 2.2, above). Once the WQMP is approved, Order No. 01-34 may be rescinded. Further review and revision of the WQMP necessary to assure that TMDL requirements are addressed shall be completed in accordance with the requirements of Order No. R8-2002-0011 or amendments/updates thereto that are adopted by the Regional Board at a public hearing.~~

#### ~~7.3 Revision of the State of California, Department of Transportation (Caltrans) Stormwater Permit~~

~~Provision E.1 of Order No. 99-06-DWQ requires Caltrans to maintain and implement a Storm Water Management Plan (SWMP). Annual updates of the SWMP needed to maintain an effective program are required to be submitted to the State Water Resources Control Board.~~

~~Provision E.2 of Order No. 99-06-DWQ requires Caltrans to submit a Regional Workplan by April 1 of each year for the Executive Officer's approval. By April 1, 2006, Caltrans shall submit a Regional Workplan that includes plans and schedules for meeting the interim and final nutrient wasteload allocations, and provides a proposal for 1) evaluating the effectiveness of BMPs and other control actions implemented and 2) evaluating compliance with the nutrient waste load allocations for urban runoff, which includes runoff from Caltrans facilities. In order to facilitate any needed update of the numeric targets and/or the TMDLs and urban discharge WLA, the proposed schedule shall take into consideration the Regional Board's triennial review schedule. The proposal shall be~~

~~implemented upon the Executive Officer's approval. Annual updates to the Regional Workplan shall include, as necessary, revised plans and schedules for meeting the interim and final nutrient wasteload allocations and revised proposals for evaluating the efficacy of control actions and compliance with the nutrient wasteload allocations.~~

#### ~~7.4 Revision to the United States Air Force, March Air Reserve Base, Stormwater Permit~~

~~Order No. R8-2004-0033 specifies monitoring and reporting requirements for stormwater runoff from the US Air Force, March Air Reserve facility. Provision C.17 indicates that the order could be reopened to incorporate TMDL requirements. Provisions C.18.a and C.18.b require that March Air Reserve Base submit a report and revise the Stormwater Pollution Prevention Plan (SWPPP) to address any pollutants that may be causing or contributing to exceedances of water quality standards. Results from the TMDL nutrient monitoring program conducted pursuant to Task 3, shall serve as the basis for revision of the SWPPP and/or reopening the order.~~

~~Development of the Municipal permittee's WQMP and revisions to their DAMP, development of the Caltrans SWMP and Regional Workplan, and Revision to the March Air Reserve Base SWPPP, shall address the urban component of the nutrient TMDL.~~

~~Compliance with the urban wasteload allocation may be achieved through a Regional Board approved pollutant trading program.~~

#### **~~Task 8: Forest Area Identification of Forest Lands Management Practices~~**

~~No later than September 30, 2007, the US Forest Service shall submit for approval a plan with a schedule for identification, development and implementation of Management Practices to reduce nutrient discharges emanating from the Cleveland National Forest and the San Bernardino National Forest. The Plan shall identify watershed specific appropriate Best Management Practices (BMPs) that will be implemented to achieve the interim and final load allocations for forest/. The proposal shall include specific recommendations and a schedule for 1) evaluating the effectiveness of control actions implemented to reduce nutrient discharges from forest and 2) evaluating compliance with the nutrient load allocation from forest/open space. The revised watershed specific Management Practices shall be implemented upon Regional Board approval at a duly noticed public meeting.~~

~~Compliance with the open space/forest load allocation may be achieved through a Regional Board approved pollutant trading program.~~

#### **~~Task 9: Lake Elsinore Sediment Nutrient Reduction Plan~~**

~~No later than March 31, 2007, the US Forest Service, the US Air Force (March Air Reserve Base), March Joint Powers Authority, the State of California, Department of Transportation (Caltrans), the State of California, Department of Fish and Game, the County of Riverside, the cities of Lake Elsinore, Canyon Lake, Hemet, San Jacinto, Perris, Moreno Valley, Murrieta, Riverside and Beaumont, Eastern Municipal Water District<sup>†</sup>, Elsinore Valley Municipal Water District, concentrated animal feeding operators and other agricultural operators within the San Jacinto watershed shall, as a group, submit to the Regional Board for approval a proposed plan and schedule for in-lake sediment nutrient reduction for Lake Elsinore. The proposed plan shall include an evaluation of the applicability of various in-lake treatment technologies to prevent the release of nutrients from lake sediments to support development of a long-term strategy for control of nutrients from the sediment. The submittal shall also contain a proposed sediment nutrient monitoring program to evaluate the effectiveness of any strategies that are~~

~~implemented. The Lake Elsinore In-lake Sediment Nutrient Reduction Plan shall be implemented upon Regional Board approval at a duly noticed public meeting.~~

~~In lieu of this coordinated plan, one or more of the parties identified above may submit a proposed individual or group In-lake Sediment Nutrient Reduction Plan for approval by the Regional Board. Any such individual or group Plan is due no later than March 31, 2007 and shall be implemented upon Regional Board approval at a duly noticed public meeting.~~

~~Compliance with the Lake Elsinore Sediment Nutrient Reduction Plan requirement may be achieved through a Regional Board approved pollutant trading program.~~

#### **Task 10: ~~Canyon Lake Sediment Nutrient Treatment Evaluation Plan~~**

~~No later than March 31, 2007, the US Forest Service, the US Air Force (March Air Reserve Base), March Joint Powers Authority, California Department of Transportation (Caltrans), California Department of Fish and Game, the County of Riverside, the cities of Canyon Lake, Hemet, San Jacinto, Perris, Moreno Valley, Murrieta, Riverside and Beaumont, Elsinore Valley Municipal Water District, concentrated animal feeding operators and other agricultural operators within the San Jacinto watershed shall, as a group, submit to the Regional Board for approval a proposed plan and schedule for evaluating in-lake sediment nutrient treatment strategies for Canyon Lake. The proposed plan shall include an evaluation of the applicability of various in-lake treatment technologies to prevent the release of nutrients from lake sediments in order to develop a long-term strategy for control of nutrients from the sediment. The submittal shall also contain a proposed sediment nutrient monitoring program to evaluate the effectiveness of any strategies that are implemented. The Canyon Lake In-lake Sediment Nutrient Treatment Plan shall be implemented upon Regional Board approval at a duly noticed public meeting.~~

~~In lieu of this coordinated plan, one or more of the parties identified above may submit a proposed individual or group In-lake Sediment Nutrient Treatment Evaluation Plan for approval by the Regional Board. Any such individual or group Plan is due no later than March 31, 2007 and shall be implemented upon Regional Board approval at a duly noticed public meeting.~~

#### **Task 11: ~~Update of Watershed and In-Lake Nutrient Models~~**

~~No later than March 31, 2007, the US Forest Service, the US Air Force (March Air Reserve Base), March Joint Powers Authority, California Department of Transportation (Caltrans), California Department of Fish and Game, the County of Riverside, the cities of Lake Elsinore, Canyon Lake, Hemet, San Jacinto, Perris, Moreno Valley, Riverside and Beaumont, Eastern Municipal Water District<sup>1</sup>, Elsinore Valley Municipal Water District, concentrated animal feeding operators and other agricultural operators shall, as a group, submit to the Regional Board for approval a proposed plan and schedule for updating the existing Lake Elsinore/San Jacinto River Nutrient Watershed Model and the Canyon Lake and Lake Elsinore in-lake models. The plan and schedule must take into consideration additional data and information that are generated from the respective TMDL monitoring programs. In order to facilitate any needed update of the numeric targets and/or the TMDLs/WLAs/LAs, the proposed schedule shall take into consideration the Regional Board's triennial review schedule. The plan for updating the Watershed and In-lake Models shall be implemented upon Regional Board approval at a duly noticed public meeting.~~

~~In lieu of this coordinated plan, one or more of the parties identified above may submit a proposed individual or group plan for update of the Lake Elsinore/San Jacinto River Nutrient Watershed Model and the Canyon Lake and Lake Elsinore in-lake models. The plan and schedule must take into consideration additional data and information that are generated from the respective TMDL monitoring programs. In~~

~~order to facilitate any needed update of the numeric targets and/or the TMDLs/WLAs/LAs, the proposed schedule shall take into consideration the Regional Board's triennial review schedule. Any such individual or group Plan is due no later than March 31, 2007 and shall be implemented upon Regional Board approval at a duly noticed public meeting.~~

#### **~~Task 12: Pollutant Trading Plan~~**

~~No later than September 30, 2007, the US Forest Service, the US Air Force (March Air Reserve Base), March Joint Powers Authority, California Department of Transportation (Caltrans), California Department of Fish and Game, the County of Riverside, the cities of Lake Elsinore, Canyon Lake, Hemet, San Jacinto, Perris, Moreno Valley, Riverside and Beaumont, Eastern Municipal Water District<sup>1</sup>, Elsinore Valley Municipal Water District, concentrated animal feeding operators and other agricultural operators shall, as a group, submit to the Regional Board for approval a proposed Pollutant Trading Plan. At a minimum, this plan shall contain a plan, schedule and funding strategy for project implementation, an approach for tracking pollutant credits and a schedule for reporting status of implementation of the Pollutant Trading Plan to the Regional Board. The Pollutant Trading Plan shall be implemented upon Regional Board approval at a duly noticed public meeting.~~

~~In lieu of this coordinated plan, one or more of the parties identified above may submit a proposed individual or group Pollutant Trading Plan. Any such individual or group Plan is due no later than September 30, 2007 and shall be implemented upon Regional Board approval at a duly noticed public meeting.~~

#### **~~Task 13: Review and Revision of Water Quality Objectives~~**

~~By December 31, 2009, the Regional Board shall review and revise as necessary the total inorganic nitrogen numeric water quality objectives for Lake Elsinore and Canyon Lake. In addition, the Regional Board shall evaluate the appropriateness of establishing total phosphorus and un-ionized ammonia numeric water quality objectives for both Lake Elsinore and Canyon Lake. Given budgetary constraints, completion of this task is likely to require substantive contributions from interested parties.~~

#### **~~Task 14: Review/Revision of the Lake Elsinore/Canyon Lake Nutrient TMDL~~**

~~The basis for the TMDLs and implementation schedule will be re-evaluated at least once every three years<sup>2</sup> to determine the need for modifying the load allocations, numeric targets and TMDLs. Regional Board staff will continue to review all data and information generated pursuant to the TMDL requirements on an ongoing basis. Based on results generated through the monitoring programs, special studies, modeling analysis, and/or special studies by one or more responsible parties, changes to the TMDL, including revisions to the numeric targets, may be warranted. Such changes would be considered through the Basin Plan Amendment process.~~

~~The Regional Board is committed to the review of this TMDL every three years, or more frequently if warranted by these or other studies~~

---

<sup>2</sup> ~~The three year schedule will coincide with the Regional Board's triennial review schedule.~~