TMDL Technical Report Errata

Page 1-2 (Comment 185)

The Canyon Lake model was completed in 2012 and was instrumental in selecting alum applications as the most cost-effective nutrient control strategy for that lake (Anderson 2012a,c).

Page 2-33 (Comment 5)

Depth profiles of temperature, DO, pH, conductivity, ~~and water clarity~~ are also measured at 1-m intervals on the day of sampling for nutrients. For the first time, these measures are now being performed twice during the day (am and pm) to assess diel variability…

Page 2-33 (Comment 186)

~~Beginning in July 2016, the monitoring frequency of Lake Elsinore was increased to bi-weekly during the summer months of July, August, and September.~~

Page 2-36 (Comment 7)

For the summaries that follow, only TP is presented for direct comparability to Basin Plan objectives and the existing TMDL targets (Note: TP measurement includes concentrations associated with algal biomass since collected samples are unfiltered). In general, a majority of the TP is in the organic form and trends between TP and dissolved inorganic Ortho-P ~~the two~~ are tightly coupled.

Page 2-39 (Comment 9)

Ammonia is a toxic component of the nitrogen cycle, formed and released from the breakdown of organic material ~~under anoxic conditions~~.

Page 2-47 (Comment 188)

– a finding that may be expected for a shallow eutrophic lake (Horne and Goldman, 1994).

Page 2-48 (Comment 11)

- Microcystin was the dominant cyanotoxin~~bacteria~~ found, as it was detected in all months except February 2018 (**Figure 2-29).**

Page 2-56 (Comment 12)

These values encompass the range observed by the Santa Ana Water Board in 2000-2001. ~~As in Lake Elsinore, a~~ A majority of the phosphorus in the water column in Canyon Lake exists in soluble reactive form (Ortho-P).

Page 2-71 (Comment 17)

Measured inflows to Canyon Lake and outflows from Canyon Lake to Lake Elsinore show that extended drought, upstream runoff retention, and the very large drainage area exacerbate ~~exasperate~~ long-term fluctuations in water delivered to the lakes.

Page 3-3: (Comment 9)

- *Un-ionized Ammonia*: ~~Anoxic conditions in the lake bottom, an indirect result of algae decay and enrichment of bottom sediments as described above, facilitates the process of ammonification~~. Ammonification is the conversion of organic nitrogen to ammonia by anaerobic decomposition. In its un-ionized form (NH3), ammonia is toxic to aquatic species.

Page 3-4 (Comment 196)

The revised TMDL includes a numeric target for chlorophyll-*a*, which is a measure of a pigment found within algae, and a commonly used ~~measure~~ indicator of algae concentration in surface waters (Horne and Goldman, 1994).

Page 3-5 (Comment 197)

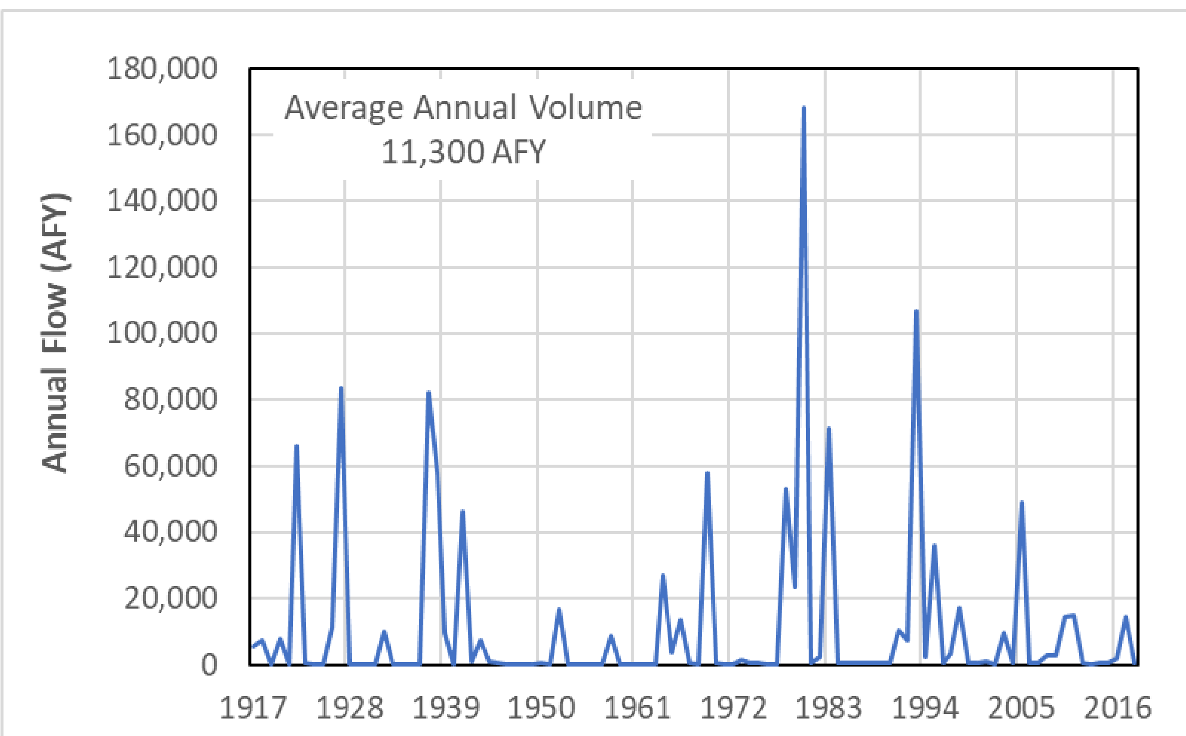
Chlorophyll-*a*, a pigment found within algae, is a commonly used ~~measure~~ indicator of algae concentration in surface waters and therefore numeric targets in nutrient TMDLs are based on concentrations of chlorophyll-*a*.

Page 3-11 (Comment 200)

This expression of the targets is based on the ~~logical~~ premise that returning loads from the watershed to reference levels would cause in-lake use impairment indicators to exhibit the same spatial and temporal variability expected for a reference watershed condition.

Page 3-16 (Comment 57)

Updated Figure 3-6 in response to comment.



Page 3-17 (Comment 23)

The US Forest Service (USFS) collected 54 samples from this reference site over the course of 11 wet weather events in 2003-2005, 2008, and 2010 (see the water quality data stored in CEDEN under the following Station Name: San Jacinto River at Cranston Guard Station).

Page 3-18 (Comment 204)

This is appropriate for Lake Elsinore because it has a fairly uniform morphology. For Canyon Lake, there is substantial variability in the lake basin morphology and water quality processes, which required the development of a 3-D hydrodynamic model, the Estuary and Lake Computer Model (ELCOM) (Hodges and Dallimore 2006).

Page 3-19 (Comment 205)

3.3.2 Canyon Lake

The reference condition for Canyon Lake is based on a computationally intensive application of a 3-D model (ELCOM-CAEDYM) described in more detail in Section 5, Linkage Analysis. ELCOM-CAEDYM model results of water quality for the reference watershed scenario for the period from 2000-2016….

Page 4-27 (Comment 27)

Table 4-9 updated to support response to comment.

Table 4-9. Model Results for Long-Term Average (1948-2017) Annual Runoff and Nutrient Load Delivered to Lake Segments

Receiving Lake Segment	Runoff Inflow (AFY)	TP (kg/yr)	TN (kg/yr)
Canyon Lake Main Lake (Zones 2, 5, 6)	7,280~~6,855~~	4,798~~4,653~~	19,563~~18,196~~
Canyon Lake East Bay (Zones 3, 4)	3,562~~3,447~~	2,776~~2,849~~	9,776~~9,616~~
Local Lake Elsinore (Zone 1)	2,011~~2,011~~	921~~923~~	4,469~~4,458~~
Mystic Lake Overflow (Zones 7, 8, 9)	1,980~~1,974~~	1,047~~1,037~~	3,092~~3,069~~
Total (Zones 1-9)	14,834~~14,288~~	9,543~~9,461~~	36,900~~35,839~~

Page 4-30: (Comment 9)

Anoxic conditions and higher temperatures in the lake bottom sediments increase the rate of ~~diagenesis and~~ nutrient release via chemical reduction of iron-bound phosphorus~~, dephosphorylation and deamination of organic matter, and other reactions~~. The flux of these solubilized nutrients from porewater across the sediment-water interface to the water column.

Page 4-32 (Comment 26)

The nutrient flux for the reference watershed condition is an~~ rough~~ approximation that was developed based on the multiple lines of evidence presented below ~~for illustrative purposes~~.

Page 4-38 (Comments 27 and 29)

Tables 4-14 updated to support responses to comments.

Table 4-14. Summary of Nutrient Loads from All General Source Categories

General Source Category	Canyon Lake Main Lake		Canyon Lake East Bay		Lake Elsinore	
	TP (kg/yr)	TN (kg/yr)	TP (kg/yr)	TN (kg/yr)	TP (kg/yr)	TN (kg/yr)
Watershed Runoff	1,916~~1,861~~	7,820~~7,511~~	1,111~~1,139~~	3,911~~3,856~~	6,499~~6,461~~	25,174~~24,593~~
Sediment Nutrient Flux	2,293	8,433	704	2,590	23,034~~20,754~~	184,772~~166,478~~
Atmospheric Deposition	17	1077	5	331	156	9,682
Supplemental Water	n/a	n/a	n/a	n/a	2,211	16,911
Total Average Annual Loading	**4,226~~4,171~~**	**17,330~~17,021~~**	**1,820~~1,849~~**	**6,832~~6,777~~**	**31,900~~29,581~~**	**236,539 ~~217,663~~**

Page 6-13 (Comment 30)

Add footnote to watershed runoff rows in Table 6-7 as follows "allocations for watershed runoff are equal to the nutrient loads estimated from a reference watershed"

Page 7-3 (Comment 225)

Climate change predictions for the next 100 years estimate an increased frequency and duration of extended droughts and severity of extreme wet weather events in southern California (Blickenstaff et al. 2013; EPA and CDWR 2011).

Page 7-23 (Comment 107)

LEAMS relies on a combination of slow-turning propellers submerged in the lake and shoreline compressors that disperse air from pipelines anchored to the bottom of the lake to circulate water in Lake Elsinore (Figure 7-6) (see Horne [2018] for additional information on how LEAMS functions).

Section 12

Additional references added based on Comments #188, #204 and #225:

- Blickenstaff, K., S. Gangopadhyay, I. Ferguson, and L.T. Pruitt. 2013. *Colorado Climate Change Analysis for the Santa Ana River Watershed Santa Ana Watershed Basin Study, California Lower Colorado Region*. Technical Memorandum No. 86-68210-2013-02, U.S. Bureau of Reclamation, Water and Environmental Resources Division (86-68200), Water Resources Planning and Operations Support Group (86-68210), Technical Services Center, Denver.
- Hodges, B. and C. Dallimore. 2006. *Estuary, Lake and Coastal Ocean Model User Guide*.
- Horne, A.J. and C.R. Goldman. 1994. *Limnology*. McGraw-Hill.