



## Status Summary for Nitrogen Offsets Credits Generated by LEAMS (2011-2018)

- 1) Dr. Horne has made three separate estimates of the total nitrogen reduction attributed to LEAMS. The unweighted average of these three estimates is 57,883 kg/yr. Therefore, for the eight-year period from 1/1/2011 thru 12/31/2018 LEAMS has generated a total of 463,064 kg of TN offsets.

**Table 1: Dr. Horne's Estimates of TN Credits Generated by LEAMS**

Report Date	Data Period	Calculated N-Offset
Nov. 25, 2013	2010-11	80,739 kg/yr
March 5, 2015	2014	65,310 kg/yr
April 2, 2018	2017	27,600 kg/yr
<b>Unweighted Annual Average</b>		<b>57,883 kg/yr</b>
<b>Cumulative Total (2011-2018)</b>		<b>463,064 kg</b>

- 2) Nitrogen offset credits generated by LEAMS are initially reserved for use by EVMWD to demonstrate compliance with the effluent limits in their NPDES permit for discharges of recycled water to Lake Elsinore. Under their current permit, EVMWD is required to offset all Nitrogen in excess of 1 mg/L for any discharges to the lake. The following table shows the amount of recycled water discharged to Lake Elsinore each year, the average N-concentration in that discharge, the total mass discharged, the total mass allowed, the net difference requiring an offset, and the residual number of N-offset credits not needed by EVMWD to assure recycled water complies with the mass limits in the NPDES permit.

**Table 2: TN Credits Reserved to Offset Loads from Recycled Water Discharged to Lake Elsinore**

Calendar Year		Discharge Flow (MGY)	Total Nitrogen Mass (kg)			
TN Offset Generated	TN Offset Expires		Discharged to Lk. Els.	Allowed by Permit*	Offset Required	Unused Offsets
2011	Dec., 2020	626.34	7,210	2,371	4,839	53,044
2012	Dec., 2021	1,809.13	17,546	6,848	10,698	47,185
2013	Dec., 2022	1,903.00	20,028	7,204	12,824	45,059
2014	Dec., 2023	1,882.01	17,511	7,124	10,387	47,496
2015	Dec., 2024	1,752.85	25,578	6,635	18,943	38,940
2016	Dec., 2025	1,653.70	28,735	6,260	22,475	35,408
2017	Dec., 2026	1,849.83	32,783	7,002	25,781	32,102
2018	Dec., 2027	1,777.95	34,581	6,730	27,851	30,032
<b>8-year Sum for EVMWD</b>		<b>13,254.81</b>	<b>183,972</b>	<b>50,174</b>	<b>133,798</b>	<b>329,266</b>

\*EVMWD's effluent limit for TN: "The 12-month running average Total Nitrogen (TN) concentration of the discharge from DP-002 [to Lake Elsinore] shall not exceed 1 mg/L and the 5 year running average mass of TN discharged to the Lake shall not exceed 16,372 pounds/year ..."

- 3) Any excess nitrogen offset credits not needed by EVMWD to assure compliance for the recycled water discharged to Lake Elsinore are reserved for use by the City of Lake Elsinore and the County of Riverside to demonstrate compliance with the TMDL load reduction requirements in their MS4 permit. Under the proposed TMDL, these agencies are required to offset all nitrogen loads in excess of 0.92 mg/L for their runoff that reaches Lake Elsinore.

**Table 3: TN Credits Reserved to Offset MS4 Runoff from City of Lk. Elsinore & Co. of Riverside**

TN to Lk. Elsinore	City of Lake Elsinore	County of Riverside	Total
Est. Existing Annual Load	2,310 kg/yr	8,577 kg/yr	10,887 kg/yr
Annual Load Allowed	1,176 kg/yr	5,490 kg/yr	6,666 kg/yr
Est. Offset Needed	1,134 kg/yr	3,087 kg/yr	4,221 kg/yr
<b>8-Year Offset Sum (2011-18)</b>	<b>9,072 kg</b>	<b>24,696 kg</b>	<b>33,768 kg</b>

In the 8-year period from 2011 to 2018, the City of Lake Elsinore and the County of Riverside used 33,768 kg of the 329,266 excess TN offset credits not needed by EVMWD. Thus, at the conclusion of 2018, there was 295,498 kg in residual unused TN offset credits available.

- 4) Any excess nitrogen offset credits not needed by EMVWD, the City of Lake Elsinore and the County of Riverside are made available to others thru a licensing agreement. These offset credits may be used by other dischargers to demonstrate compliance with their own TMDL load reduction requirements in their MS4 permit. Under the proposed TMDL, these agencies will be required to offset all nitrogen loads in excess of 0.92 mg/L in their stormwater runoff that reaches Lake Elsinore.

**Table 4: Est. TN Loads and Potential Offsets Demand for Other Stakeholders Named in the TMDL**

Stakeholder	TN Load (kg/yr)		TN Offset Needed (kg)	
	Existing	Allowed	Annual Avg.	8-Year Sum
Banning	11	4	7	56
Baumont	74	31	43	344
Canyon Lake	429	164	265	2,120
Hemet	926	323	603	4,824
Moreno Valley	3,621	1,214	2,407	19,256
Murrieta	82	27	56	448
Perris	1,924	712	1,213	9,704
City of Riverside	119	38	82	656
San Jacinto	270	103	167	1,336
Menifee	3,581	1,305	2,276	18,208
Wildomar	892	367	525	4,200
Caltrans	474	114	361	2,888
March JPA	164	82	81	648
March ARB	336	99	237	1,896
CAFOs	60	30	31	248
Irrigated Ag.	202	411	0	0
Non-Irrigated Ag.	1,117	315	802	6,416
Small Ag (<20 ac.)	185	115	70	560
<b>Total</b>	<b>14,467</b>	<b>5,454</b>	<b>9,226</b>	<b>73,808</b>

- 5) The three LEAMS operating partners (EVMWD, City of Lake Elsinore and County of Riverside) began offering excess unused offset credits to others beginning in 2016. Since then, numerous stakeholders have elected to participate in the offset program by licensing a portion of the excess credits generated in calendar years 2016, 2017 and 2018. The number of LEAMS operating hours and number of offset credits licensed each year by each stakeholder summarized in the table below. TN offset credits licensed by WRCAC may be used by their dues-paying members to demonstrate compliance for irrigated or non-irrigated ag operations.

**Table 5: TN Offset Credits Licensed to Other Stakeholders Named in the TMDL**

Stakeholder	LEAMS Hours Licensed				TN Offsets Licensed (kg)				2011-18 Offsets	
	2016	2017	2018	Total	2016	2017	2018	Total	Needed	Diff.
Banning	0	0	0	0	0	0	0	0	56	-56
Beaumont	0	0	0	0	0	0	0	0	344	-344
Canyon Lake	17	17	17	51	374	374	374	1,122	2,120	-988
Hemet	47	47	47	141	1,034	1,034	1,034	3,102	4,824	-1,722
Moreno Valley	128	128	128	384	2,816	2,816	2,816	8,448	19,256	-10,808
Murrieta	3	3	3	9	66	66	66	198	448	-250
Perris	48	48	48	144	1,056	1,056	1,056	3,168	9,704	-6,536
City of Riverside	5	5	5	15	110	110	110	330	656	-326
San Jacinto	1	1	1	3	22	22	22	66	1,336	-1,270
Menifee	128	128	128	384	2,816	2,816	2,816	8,448	18,208	-9,760
Wildomar	32	32	32	96	704	704	704	2,112	4,200	-2,088
Caltrans	10	10	10	30	220	220	220	660	2,888	-2,228
March JPA	5	5	5	15	330	330	330	990	648	+342
March ARB	3	3	3	9	66	66	66	198	1,896	-1,698
CAFOs	0	9	9	18	0	198	198	396	248	+148
Irrigated Ag.	0	0	0	0	0	0	0	0	0	0
Non-Irrigated Ag.	0	0	0	0	0	0	0	0	6,416	-6,416
Small Ag (<20 ac.)	0	0	0	0	0	0	0	0	560	-560
WRCAC Members	0	14	47	61	0	308	1,034	1,342	0	+1,342
<b>Total</b>	<b>427</b>	<b>450</b>	<b>483</b>	<b>1360</b>	<b>9,614</b>	<b>10,120</b>	<b>10,846</b>	<b>30,580</b>	<b>73,808</b>	<b>-45,050</b>

6) **Summary of LEAMS Nitrogen Offset Credits (2011-2018)**

LEAMS Nitrogen Offset Credit (2011-2018)	Total Nitrogen
Total Offset Credits Generated from 2011 thru 2018	+463,064 kg
Offset Credits Reserved for Recycled Water (8 years)	-133,798 kg
Offset Credits Reserved for City of Lake Elsinore MS4 (8 years)	-9,072 kg
Offset Credits Reserved for County of Riverside MS4 (8 years)	-24,696 kg
Offset Credits Licensed to Other TDML Stakeholders (8 years)	-30,580 kg
<b>Residual Offset Credits Available (Unassigned &amp; Unlicensed)</b>	<b>+264,918 kg</b>

In the near-term (next 5 years), it would be prudent to reserve 30,000 kg/yr of TN offsets for recycled water and 5,000 kg/yr for the City of Lake Elsinore and the County of Riverside's MS4 obligations. Since LEAMS generates an average of about 58,000 kg/yr of TN offsets, this leaves approximately 23,000 kg/yr of credits available for others to license.

### **Additional Notes and Clarifications:**

- 1) Dr. Horne estimates the nitrogen offset credits generated by comparing certain water quality parameters in the current monitoring year to the average water quality for those same parameters in the baseline years (2002-2006) before LEAMS began operations. Dr. Horne attributes 100% of any difference observed exclusively to the operation of LEAMS. However, there are a number of other factors which would also be responsible for improving net water quality over the same time period including, but not limited to: the addition of recycled water to Lake Elsinore and implementation of BMPs in the surrounding watershed.
- 2) The Existing TN Load and TN Offset Needed shown in the tables above are annualized estimates based on long-term average rainfall. Since the 8-year period from 2011 thru 2018 was dominated by prolonged drought conditions, it is likely that the estimated loads and offsets shown in the tables are somewhat higher than what actually occurred during this time. However, because the winter of 2019 appears to be wetter than normal, the overall 10-year average may be relatively close to the long-term values used to develop the estimates shown in these tables. The true TN load should be calculated using actual yearly precipitation data in each stakeholder jurisdiction.
- 3) The estimated offsets needed should also be adjusted to account for any local Best Management Practices (BMPs) that have been implemented. Responsibility for determining the effectiveness of these BMPs and calculating the appropriate net offset demand rests with each stakeholder jurisdiction not the Task Force. All stakeholders retain discretionary authority to select their own preferred approach for achieving compliance. Stakeholders are under no obligation to participate in any offset program including LEAMS.
- 4) The number of offset credits needed to assure compliance with EVMWD's NPDES permit depends on the amount of recycled water discharged to the lake. In 2017 and 2018, EVMWD discharged about 5 million gallons per day to Lake Elsinore. The proposed TMDL assumes that, on average, about 7.5 MGD of recycled water is needed to prevent lake levels from falling below 1240' msl. Therefore, at this higher discharge volume, EVMWD will ultimately need nearly 38,000 kg/yr of TN offsets to maintain compliance.
- 5) EVMWD's offset demand was based on the requirements in their current permit to offset all nitrogen loads in excess of 1 mg/L for the recycled water discharged to Lake Elsinore. Under the proposed TMDL, EVMWD would likely have to offset all nitrogen loads in excess of 0.92 mg/L. However, under the current (2004) TMDL, EVMWD will probably have to offset all nitrogen loads in excess of 0.75 mg/L for all recycled water discharged after December 31, 2020. This is the date on which the "final" Nitrogen target specified in the 2004 TMDL takes effect. Neither of these more stringent requirements has been reflected in any of the tables shown above.
- 6) Although the WLA adopted in the 2004 TMDL is specified as a 10-year running average, EVMWD's current NPDES permit limit for TN mass is expressed as a 5-year running annual average. This effluent limit should be changed to a 10-year running annual average to be consistent with the applicable wasteload allocation in accordance with 40 CFR §122.44[d][vii][B]. The revised TMDL proposes to make this adjustment so that all discharges to the lake are regulated using the same averaging period.
- 7) In the long-term, EMVWD will need nearly 38,000 kg/yr of TN offsets and the other two operating partners may need nearly 7,000 kg/yr. This leaves less than 13,000 kg/yr for others to use unless future monitoring data shows LEAMS long-term average effectiveness is better than 58,000 kg/yr.