

APRIL 2010

---

# Los Angeles River Watershed Bacteria TMDL – Technical Report Section 6: Dry Weather Load and Wasteload Allocations

*Prepared for:*

CLEANER RIVERS THROUGH EFFECTIVE STAKEHOLDER-LED TMDLS  
(CREST)

*Prepared by:*

CREST CONSULTING TEAM

## Table of Contents

6.1	Introduction.....	2
6.2	Final Dry Weather Load Allocations.....	2
6.3	Final Dry Weather Wasteload Allocations .....	3
6.4	Implementation of Dry Weather Wasteload Allocations.....	4
6.5	Natural Sources Exclusion.....	5

## List of Tables

Table 1.	Final Dry Weather LAs and WLAs for LA River Segments by Discharge Type .....	7
Table 2.	Final Dry Weather LAs and WLAs for LA River Tributaries by Discharge Type .....	8

## 6.1 Introduction

---

The numeric form of a TMDL represents the assimilative capacity of the LA River, or the maximum loading of bacteria that LA River segments and tributaries can receive and still attain water quality standards. The bacteria TMDL for each LA River segment and tributary can be expressed with the equation below. Section 5 detailed the calculation of the TMDL and MOS. This section allocates the TMDL into wasteload allocations (WLAs) for NPDES-permitted point sources and load allocations (LAs) for non-point sources.

$$TMDL = \sum WLA + \sum LA + MOS, \text{ where:}$$

**TMDL** = total maximum daily load for an LA River segment or tributary [MPN/day]  
(see Table 2 and 3 in Section 5)

**WLA** = wasteload allocations for point (NPDES-regulated) sources that discharge to the segment or tributary [MPN/day]

**LA** = load allocations for non-point sources that discharge to the segment or tributary [MPN/day]

**MOS** = margin of safety to account for uncertainty/error in TMDL development [MPN/day]  
(see Table 4 and 5 in Section 5)

## 6.2 Final Dry Weather Load Allocations

---

As described in **Section 4** (Source Assessment), the non-point sources in the Watershed include onsite wastewater treatment systems (OWTS), in-channel sources, and runoff from the headwaters (see **Figure 3** in **Section 5** [Linkage Analysis] for a Watershed map). These non-point sources are assigned load allocations (LAs) for this TMDL.

Bacteria discharges from OWTS to waterbodies are not allowed and given an LA of zero.

Discharges from the headwaters and in-channel sources are accounted for with the Exceedance Day Approach. Specifically, there is an allowable frequency that the SSM WQO can be exceeded (see **Table 4** of **Section 3**, Numeric Targets), which has not been accounted for during the TMDL calculations (i.e., the TMDL calculations were based on the WQO, and were not increased to correspond to allowable WQO exceedance days). Thus the loading associated with allowable exceedances can be “allocated” as LAs for these natural/non-point sources. As such, natural and in-channel sources were not given a numeric LA (with units of MPN/day), but they have been properly accounted for during development of TMDLs and allocations. Note this approach is consistent with previous bacteria TMDLs in the region (e.g., Ballona Creek) in that all capacity below the allowable in-stream loading is allocated to the point sources in the Watershed, while a naturally low rate of WQO exceedance is allowed and allocated to address exceedances from natural, non-point sources.

## 6.3 Final Dry Weather Wasteload Allocations

---

The TMDL for each LA River segment or tributary (see **Figure 3** in **Section 5** for a Watershed map) is shared among the various types of NPDES-permitted discharges<sup>1</sup>, with each type receiving a wasteload allocation (WLA). The final allocations for each LA River segment are shown in **Table 1**. The final allocations for LA River tributaries are shown in **Table 2**.

Allocations for specific discharge types were calculated as follows:

1. **Municipal Wastewater** – the three WRPs in the Watershed – D.C. Tillman, City of LA-Glendale, and Burbank – have NPDES permits that require (1) the median number of coliform organisms in effluent not to exceed 2.2 per 100 milliliters and (2) the number of coliform organisms cannot exceed 23 per 100 milliliters in more than one sample within any 30-day period. The WRP permit limits will not be adjusted due to this TMDL, they will continue to be based on the current coliform limits. However, it is important to account for WRP loading for calculation of non-WRP WLAs. To be conservative for calculation of non-WRP WLAs, the permit limits of 2.2 MPN/100mL total coliform were converted directly to *E. coli*<sup>2</sup>. Thus, the WLAs for WRPs are set equal to 2 MPN/100mL of *E. coli* times the flow rate at the time of sampling. For calculation of non-WRP WLAs, however, the WRP flow rate was assumed to be equal to the WRP design flow<sup>3</sup>.
2. **Municipal Stormwater** – the MS4 NPDES Permittees in the Watershed are LA County and 41 co-Permittees, City of Long Beach, and Caltrans (see **Table 4-1** in the Source Assessment). The WLAs for MS4 discharges were set equal to the TMDL minus the WLAs for WRPs.

As describe below, all other categories of NPDES discharges are either given WLAs of zero or assigned concentration-based WLAs that prohibit discharges with concentrations above the *E. coli* WQO. In this manner, the flows associated with these sources provide assimilative capacity equal to or greater than their loading, so their contribution does not affect the calculation of mass-based WLAs for WRPs and MS4s.

3. **Industrial Stormwater** – general and individual industrial NPDES stormwater permits in the Watershed (**Section 4.1.3** and **Table 4-3** in the Source Assessment) normally prohibit dry weather discharges and typically do not include specific effluent limits or monitoring requirements for *E. coli*. Thus the dry weather WLA for industrial stormwater discharges is zero. However, there may be cases when industrial stormwater NPDES permits allow dry weather discharges. In this case, the WLA is a (non-zero) concentration-based WLA of 235 MPN/100mL *E. coli*.

---

<sup>1</sup> See **Section 4** for a description of the various types of NPDES permits in the Watershed.

<sup>2</sup> To be conservative for calculation of non-WRP WLAs, the permit limits of 2.2 MPN/100mL total coliform were converted directly to *E. coli*. The *E. coli* to total coliform ratio is by definition less than 1:1 as *E. coli* is a subset of total coliform, and thus the applied conversion is conservative because it slightly reduces the WLAs for non-WRP Permittees.

<sup>3</sup> The WLAs for non-WRP Permittees equals the TMDL minus the WLAs for WRPs. Thus assumption of WRP design flows for calculation of non-WRP WLAs is conservative because it slightly reduces the WLAs for non-WRP Permittees. See **Table 4-2** in the Source Assessment for a summary of WRP design flows and permit requirements.

4. **Industrial Wastewater** – the individual NPDES permit for industrial wastewater discharges (see **Table 4-4** in the Source Assessment) do not include specific effluent limits or monitoring requirements for *E. coli*. It is expected that industrial wastewater discharges should not contain fecal indicator bacteria. Thus the dry weather WLA for industrial wastewater discharges is zero. However, there may be cases when industrial wastewater NPDES permits allow dry weather discharges. In this case, the WLA is a (non-zero) concentration-based WLA of 235 MPN/100mL *E. coli*.
5. **Other NPDES Discharges** – there are multiple other (non-MS4 and non-wastewater) types of NPDES discharges (see **Table 4-5** in the Source Assessment), including discharges from construction sites. However, the permits for these discharges do not include specific effluent limits or monitoring requirements for *E. coli*. Dry weather discharges from construction sites are prohibited. Thus the dry weather WLA for “other” NPDES discharges is zero. However, there may be cases when other NPDES permits allow dry weather discharges. In this case, the WLA is a (non-zero) concentration-based WLA of 235 MPN/100mL *E. coli*.

## 6.4 Implementation of Dry Weather Wasteload Allocations

---

The dry weather WLAs developed herein are expressed as loading rates in units of MPN/day. These numeric wasteload allocations shall be incorporated into NPDES permits consistent with the assumptions and approach outlined in Section 7.<sup>4</sup> The WLAs are calculated such that their attainment will also result in attainment of the TMDL targets.

In the case that TMDL targets are met at an in-stream ambient monitoring location, then the MS4 WLAs for the segment or tributary that corresponds to that in-stream monitoring location are assumed to be met (i.e., existing level of treatment/source control by MS4s for dry weather discharges is sufficient), and the TMDL monitoring of outfalls is no longer required (see Monitoring Section 8). However, already-implemented BMPs and source control measures by MS4s must be continued and maintained.

Any agency with zero dry weather discharge from its site/jurisdiction is considered in compliance with the dry weather components of this TMDL.

In the case of NPDES provisions for MS4 Permittees, the WLAs shall be attained by implementing BMPs consistent with the implementation strategy detailed in **Section 7**. One possible mechanism of compliance, as outlined in **Section 7**, is the implementation of a Load Reduction Strategy.<sup>5</sup> That is, outfall monitoring will be used to develop a Monte Carlo (or equivalent) model of discharges from storm drain outfalls along each segment. The expected (median) storm drain loading based on the Monte Carlo (or equivalent) model will be used to determine the necessary load reduction, expressed as the number of storm drain outfalls (and

---

<sup>4</sup> The WRP permit limits, however, will not be adjusted due to this TMDL; they will continue to be based on the current coliform limits.

<sup>5</sup> As described in Section 7, a Load Reduction Strategy is both [1] a suite of actions performed by MS4s along an LA River segment or tributary and [2] a document submitted to the Regional Board EO for approval. The document describes the suite of actions that will be performed by MS4s and demonstrates reasonable assurance of WLA attainment.

types of proposed BMPs) that will be addressed during the subsequent TMDL implementation phase. The purpose of the proposed Load Reduction Strategy approach is to allow the MS4s to employ an adaptive and iterative approach to TMDL implementation, while ensuring the implemented actions are sufficient to eventually attain WLAs and water quality standards. Prior to the final compliance date of this TMDL, timely and accurate implementation of the Regional Board-approved Load Reduction Strategies represents compliance with this TMDL, as described in **Section 7**.

The WLAs for MS4 are group-based and shared among various MS4 Permittees. The group allocation will apply to all NPDES-regulated MS4 Permittees along each LA River segments and tributaries (including LA County and co-Permittees, City of Long Beach, and Caltrans). It is recommended that this TMDL be implemented using a coordinated, watershed-based approach. In the case that individual MS4 Permittees or subgroups of MS4 Permittees choose to develop and implement a Load Reduction Strategy or alternative implementation strategy, then the group-based WLAs are distributed based on proportional drainage area.

During TMDL implementation, dry weather flow conditions in the LA River and/or its tributaries may change significantly due to a variety of factors, including altered discharge rates from the WRPs. Discharges from WRPs may increase due to changes to WRP operations to utilize available treatment capacity, or decrease due to additional effluent reuse. In this case, these WLAs would be re-calculated and revised during a TMDL reopener.

## 6.5 Natural Sources Exclusion

---

Under the natural sources exclusion implementation provision of the Basin Plan bacteria objectives, after all anthropogenic sources of bacteria have been controlled such that they do not cause an exceedance of the single sample objectives, a certain frequency of exceedance of the single sample objectives shall be permitted based on the residual exceedance frequency in the specific water body. The residual exceedance frequency shall define the background level of exceedance due to natural sources. The ‘Natural Sources Exclusion’ approach may be used if an appropriate reference system cannot be identified due to unique characteristics of the target water body. This approach is consistent with the State Antidegradation Policy (State Board Resolution No. 68-16) and with federal antidegradation requirements (40 CFR 131.12). Application of the Natural Source Exclusion to the LA River Watershed would affect the TMDL targets and thus the allocations developed herein.

Special studies conducted along Reach 2 of the LA River have identified potential non-point sources of *E. coli* that may contribute to WQO exceedances. However, loading of *E. coli* from the MS4 along Reach 2 was also shown to contribute to WQO exceedances. If the targets for this TMDL continue to be exceeded after the MS4s have reduced their loading to below the WLAs, and the WLAs have been shown to be appropriate based on review of recent data (e.g., flow rates in the LA River and tributaries), then Reach 2 may be a potential candidate waterbody for the natural sources exclusion. The process of evaluating compliance with WLAs and targets, including consideration of special studies information, is described in the Implementation Section (**Section 7**). After MS4 loading of *E. coli* has been reduced to below the WLA, if the responsible agencies for Reach 2 (or other segment) intends to pursue a Natural Source

Exclusion, it will conduct a natural sources study in order to determine its eligibility for such an exclusion. If the Natural Sources Exclusion is appropriate, a Basin Plan Amendment can be developed with stakeholder participation for Regional Board consideration.

It is important to note that many bacteria sources that are non-human may not qualify for a Natural Source Exclusion, and thus it would be critical to evaluate whether identified sources were natural (e.g., birds using a migratory flyway) or driven by anthropogenic activities (e.g., rats and raccoons in storm drains).

**Table 1. Final Dry Weather LAs and WLAs for LA River Segments by Discharge Type**

LA River Segment	Included LA River Reaches	LA River Segment for which Dry Weather Allocations are Required (see map, Figure 3 in Section 5)		Wasteload and Load Allocations ( <i>E. coli</i> Loading Rate [10 <sup>9</sup> MPN/day])					LA for Natural, Non-point Sources (Single Sample Maximum Exceedance Days) <sup>6</sup>
		Upstream End	Downstream End	WLA for WRP Discharges to Segment <sup>1</sup>	WLA for MS4 Discharges to Segment <sup>2,3,4</sup>	WLA for Industrial Stormwater and Wastewater Discharges to Segment <sup>5</sup>	WLA for Other NPDES Discharges to Segment <sup>5</sup>	LA for OWTS Discharges to Segment	
A	1 and 2	Rosecrans Ave.	Willow St.	0	274	0	0	0	5
B	2	Figueroa St.	Rosecrans Ave.	0	471	0	0	0	5
C	3 and 4	Tujunga Ave.	Figueroa St.	2 x Q <sup>a</sup>	422	0	0	0	5
D	4 and 5	Balboa Blvd.	Tujunga Ave.	2 x Q <sup>b</sup>	412	0	0	0	5
E	6	Headwaters	Balboa Blvd.	0	29	0	0	0	5

<sup>1</sup> –The WRP permit limits, however, will not be adjusted due to this TMDL, they will continue to be based on the current coliform limits.

<sup>2</sup> – When multiple MS4 Permittees drain into a segment, the WLA for MS4s is to be shared among Permittees based on proportional drainage area within the segment subwatershed

<sup>3</sup> – In the case that TMDL targets are demonstrated to be met at an in-stream ambient TMDL monitoring location, then the MS4 WLAs for the segment or tributary that corresponds to that in-stream monitoring location are assumed to be met (i.e., existing level of treatment/source control by MS4s for dry weather discharges is sufficient), and the TMDL monitoring of outfalls is no longer required (see Monitoring **Section 8**). However, already-implemented BMPs and source control measures must be continued and maintained.

<sup>4</sup> – Discharges from the MS4 due to SSOs are not considered an MS4 discharge. Discharges from SSOs are prohibited. During monitoring of outfalls during implementation, verified SSO discharges (if any) will not be categorized as loading from the MS4. The occurrence of SSOs would be reported based on state and location regulations.

<sup>5</sup> – The allocation of zero MPN/day for Industrial and “Other” applies to all NPDES permits that prohibit dry weather discharges. Some NPDES permits may allow dry weather discharges; in this case, the WLA is concentration-based and *E. coli* may not exceed 235 MPN/100mL at any time.

<sup>6</sup> – Natural, non-point sources are accounted for using the Exceedance Day Approach (see **Section 3**, Targets). That is, a small number of WQO exceedances are allowed due to natural, non-point sources that occur naturally. Thus, the allocations for non-point, natural sources are expressed as allowable days of exceedance of the SSM WQO at the compliance monitoring site(s). The reported number is based on daily sampling (see **Section 3.3.3** to determine corresponding number of exceedances for less frequent sampling).

**a** – This WLA is for City of LA-Glendale WRP. **b** – This WLA is for D. C. Tillman WRP. **Q** represents the WRP flow rate at the time the water quality measurement is collected and a conversion factor to 10<sup>9</sup> MPN/day based on the units of measurement for the flow rate.

**Table 2. Final Dry Weather LAs and WLAs for LA River Tributaries by Discharge Type**

Tributary for which Dry Weather Allocations are Required (see map, Figure 3 in Section 5)	LA River Reach at Tributary Confluence	Wasteload and Load Allocations ( <i>E. coli</i> Loading Rate [10 <sup>9</sup> MPN/day])					LA for Natural, Non-point Sources (Single Sample Maximum Exceedance Days) <sup>6</sup>
		WLA for MS4 Discharges to Tributary <sup>1,2,3</sup>	WLA for WRP Discharges to Tributary <sup>4</sup>	WLA for Industrial Stormwater and Wastewater Discharges to Tributary <sup>5</sup>	WLA for Other NPDES Discharges to Tributary <sup>5</sup>	LA for OWTS Discharges to Tributary	
Compton Creek	1	6	0	0	0	0	5
Arroyo Seco	2	22	0	0	0	0	5
Rio Hondo	2	2	0	0	0	0	5
Verdugo Wash	3	46	0	0	0	0	5
Burbank Western Channel	3	78	2 x Q <sup>a</sup>	0	0	0	5
Tujunga Wash	4	9	0	0	0	0	5
Bull Creek	5	8	2 x Q <sup>b</sup>	0	0	0	5
Aliso Canyon Wash	6	21	0	0	0	0	5
Dry Canyon	6	6	0	0	0	0	5
McCoy Canyon	6	6	0	0	0	0	5
Bell Creek	6	13	0	0	0	0	5

**1** – In the case that TMDL targets are met at an in-stream ambient TMDL monitoring location, then the MS4 WLAs for the segment or tributary that corresponds to that in-stream monitoring location are assumed to be met (i.e., existing level of treatment/source control by MS4s for dry weather discharges is sufficient), and the TMDL monitoring of outfalls is no longer required (see Monitoring **Section 8**). However, already-implemented BMPs and source control measures by MS4s must be continued and maintained.

**2** – When multiple MS4 Permittees drain into a tributary, the WLA for MS4s is to be shared among Permittees based on proportional drainage area within the tributary watershed.

**3** – Discharges from the MS4 due to SSOs are not considered an MS4 discharge. Discharges from SSOs are prohibited. During monitoring of outfalls during implementation, SSO discharges (if any) will not be categorized as loading from the MS4. The occurrence of SSOs would be reported based on state and location regulations.

**4** –The WRP permit limits, however, will not be adjusted due to this TMDL, they will continue to be based on the current coliform limits.

**5** – The allocation of zero MPN/day for Industrial and Other applies to all NPDES permits that prohibit dry weather discharges. Some NPDES permits may allow dry weather discharges; in this case, the WLA is concentration-based and *E. coli* may not exceed 235 MPN/100mL at any time.

**6** – Natural, non-point sources are accounted for using the Exceedance Day Approach (see **Section 3**, Targets). A small number of WQO exceedances are allowed due to natural, non-point sources that occur naturally. Thus, the allocations for non-point, natural sources are expressed as allowable exceedance days at the compliance monitoring site(s). The reported number is based on daily sampling (see **Section 3.3.3** to determine corresponding number of allowable exceedance days for less frequent sampling).

**a** – This WLA is for City of Burbank WRP. **b** – This WLA is for D. C. Tillman WRP. **Q** represents the WRP flow rate at the time the water quality measurement is collected and a conversion factor to 10<sup>9</sup> MPN/day based on the units of measurement for the flow rate.