

**Amendment to the Water Quality Control Plan – Los Angeles Region to incorporate the
Los Angeles Harbor Bacteria TMDL
(Inner Cabrillo Beach and Main Ship Channel)**

Proposed for adoption by the California Regional Water Quality Control Board, Los Angeles Region on July 1, 2004.

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Chapter 7. Total Maximum Daily Loads (TMDLs) Summaries, Section 7-11 (Los Angeles Harbor Bacteria TMDL - Inner Cabrillo Beach and Main Ship Channel)

This TMDL was adopted by the Regional Water Quality Control Board on July 1, 2004.

This TMDL was 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].

The following table includes the elements of this TMDL.

Table 7-11.1. Los Angeles Harbor Bacteria TMDL (Inner Cabrillo Beach and Main Ship Channel): Elements

Element	Key Findings and Regulatory Provisions
<i>Problem Statement</i>	Elevated bacterial indicator densities are causing impairment of the water contact recreation (REC-1) beneficial use of Inner Cabrillo Beach and the potential REC-1 uses of the Main Ship Channel in the Los Angeles Harbor. Swimming in marine waters with elevated bacterial indicator densities has long been associated with adverse health effects. Specifically, local and national epidemiological studies compel the conclusion that there is a causal relationship between adverse health effects and recreational water quality, as measured by bacterial indicator densities.
<i>Numeric Target</i> <i>(Interpretation of the numeric water quality objective, used to calculate the waste load allocations)</i>	<p>The TMDL has a multi-part numeric target based on the bacteriological water quality objectives for marine waters to protect the water contact recreation use. These targets are the most appropriate indicators of public health risk in recreational waters.</p> <p>These bacteriological objectives are set forth in Chapter 3 of the Basin Plan.¹ The objectives are based on four bacterial indicators and include both geometric mean limits and single sample limits. The Basin Plan objectives that serve as the numeric targets for this TMDL are:</p> <ol style="list-style-type: none"> 1. <u>Rolling 30-day Geometric Mean Limits</u> <ol style="list-style-type: none"> a. Total coliform density shall not exceed 1,000/100 ml. b. Fecal coliform density shall not exceed 200/100 ml. c. Enterococcus density shall not exceed 35/100 ml. 2. <u>Single Sample Limits</u> <ol style="list-style-type: none"> a. Total coliform density shall not exceed 10,000/100 ml. b. Fecal coliform density shall not exceed 400/100 ml. c. Enterococcus density shall not exceed 104/100 ml. d. Total coliform density shall not exceed 1,000/100 ml, if the ratio of fecal-to-total coliform exceeds 0.1. <p>These objectives are generally based on an acceptable health risk for marine recreational waters of 19 illnesses per 1,000 exposed individuals as set by the US EPA. For Cabrillo Beach, the targets will apply at existing monitoring sites, with samples taken at ankle depth as they are now. For the Main Ship Channel, the targets will apply at existing or new monitoring sites with samples collected at the surface. Any new monitoring sites must be approved by the Executive Officer. These targets apply during both dry and wet weather, since there is water contact recreation throughout the year, including during wet weather.</p> <p>Implementation of the above bacteria objectives and the associated TMDL numeric targets is achieved using a 'reference system/anti-</p>

¹ The bacteriological objectives were revised by a Basin Plan amendment adopted by the Regional Board on October 25, 2001, and subsequently approved by the State Water Resources Control Board, the Office of Administrative Law and finally by U.S. EPA on September 25, 2002.

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	<p>degradation approach’ rather than the alternative ‘natural sources exclusion approach subject to antidegradation policies’ or strict application of the single sample objectives. As required by the CWA and Porter-Cologne Water Quality Control Act, Basin Plans include beneficial uses of waters, water quality objectives to protect those uses, and an anti-degradation policy, collectively referred to as water quality standards, and other plans and policies necessary to implement water quality standards. This TMDL and its associated waste load allocations, which shall be incorporated into relevant permits, and load allocations are the vehicles for implementation of the Region’s standards.</p> <p>The ‘reference system/anti-degradation approach’ means that on the basis of historical exceedance levels at existing monitoring locations, including a local reference beach within Santa Monica Bay, a certain number of daily exceedances of the single sample bacteria objectives are permitted. The allowable number of exceedance days is set such that (1) bacteriological water quality at any site is at least as good as at a designated reference site within the watershed and (2) there is no degradation of existing bacteriological water quality. This approach recognizes that there are natural sources of bacteria that may cause or contribute to exceedances of the single sample objectives and that it is not the intent of the Regional Board to require treatment or diversion of natural coastal creeks or to require treatment of natural sources of bacteria from undeveloped areas.</p> <p>The geometric mean targets may not be exceeded at any time. The rolling 30-day geometric means will be calculated on each day. For the single sample targets, each existing monitoring site is assigned an allowable number of exceedance days for three time periods (1) summer dry-weather (April 1 to October 31), (2) winter dry-weather (November 1 to March 31), and (3) wet-weather (defined as days with 0.1 inch of rain or greater and the three days following the rain event.)</p>
<i>Source Analysis</i>	<p>Dry-weather urban runoff and storm water conveyed by storm drains are major sources of elevated bacterial indicator densities to Inner Cabrillo Beach and the Main Ship Channel during dry and wet-weather. As of March 2004, there are 15 active individual and 15 active general, NPDES permits for discharges to the Inner or Outer Los Angeles Harbor including the Terminal Island Treatment Plant. While the fecal coliform counts in the wastewater field indicate a contribution of bacteria to the Harbor by the Terminal Treatment Plant, the wastewater field is sufficiently diluted and the bacterial densities are so much lower in the Harbor than the high bacterial densities and exceedances at the sites at Cabrillo Beach and in the Main Ship Channel that it appears that the Treatment Plant is not a significant source of bacteria to the Beach or to the Ship Channel.</p> <p>Potential nonpoint sources of bacterial contamination at Inner Cabrillo Beach and Main Ship Channel include marina activities such as waste disposal from boats, boat deck and slip washing, swimmer “wash-off”,</p>

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	restaurant washouts and natural sources from birds, waterfowl and other wildlife. The bacteria loads associated with these nonpoint sources are not well quantified. However, bacterial contamination at the beach is concentrated in the shallow (ankle depth) waters more than even waters a few feet away (at knee or chest depth). This supports the contention that high bacterial densities may be largely from the beach, itself.
<i>Loading Capacity</i>	Studies (for example, Haile, R.W., Witte, J.S. 1997. Addendum to “An epidemiological study of possible adverse health effects of swimming in Santa Monica Bay.” Santa Monica Bay Restoration Project) show that bacterial degradation and dilution during transport from the watershed to the receiving water do not significantly affect bacterial indicator densities. Therefore, the loading capacity is defined in terms of bacterial indicator densities, which is the most appropriate for addressing public health risk, and is equivalent to the numeric targets, listed above. As the numeric targets must be met at the point where the effluent from storm drains or other sources initially mix with the receiving water throughout the day, no degradation or dilution allowance is provided.
<i>Waste Load Allocations (for point sources)</i>	<p>Waste load allocations are expressed as allowable exceedance days because the bacterial density and frequency of single sample exceedances are the most relevant to public health protection.</p> <p>The allowable number of exceedance days for a monitoring site for each time period is based on the lesser of two criteria (1) exceedance days in the designated reference system and (2) exceedance days based on historical bacteriological data at the monitoring site. This ensures that bacteriological water quality is at least as good as that of a largely undeveloped system and that there is no degradation of existing water quality.</p> <p>For each monitoring site, allowable exceedance days are set on an annual basis as well as for three time periods. These three periods are:</p> <ol style="list-style-type: none"> 1. summer dry-weather (April 1 to October 31) 2. winter dry-weather (November 1 to March 31) 3. wet-weather days (defined as days of 0.1 inch of rain or more plus three days following the rain event). <p>For the MSC and the Inner Harbor, the City of Los Angeles and the County of Los Angeles are the responsible agencies². The City of Los Angeles is the primary jurisdiction because Inner Cabrillo Beach and Main Ship Channel are located entirely in the City of Los Angeles. The Los Angeles Harbor is owned and operated by the City.</p> <p>All proposed WLAs for summer, dry-weather, single sample bacterial</p>

² For the purposes of this TMDL, “responsible jurisdictions and responsible agencies” are defined as (1) local or state agencies that have jurisdiction over Los Angeles Harbor including Inner Cabrillo Beach and Main Ship Channel, (2) local agencies that are permittees or co-permittees on a municipal storm water permit.

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	<p>densities in the MSC or the Inner Harbor are zero (0) days of allowable exceedances.³ The proposed WLAs for single sample winter dry-weather and wet-weather for the monitoring location HW07 is as shown in Table 7-11.2. WLAs for storm drains in the Inner Harbor for summer, dry-weather, single sample bacterial densities are also zero (0) days of allowable exceedances. The waste load allocation for the rolling 30-day geometric mean during any time period or monitoring site in MSC or the Inner Harbor is zero (0) days of allowable exceedances.</p> <p>Discharges from general NPDES permits, general industrial storm water permits and general construction storm water permits are not expected to be a significant source of bacteria. Therefore, the WLAs for these discharges are zero (0) days of allowable exceedances for all three time periods and for the single sample limits and the rolling 30-day geometric mean. Any future enrollees under a general NPDES permit, general industrial storm water permit or general construction storm water permit within the Watershed will also be subject to a WLA of zero days of allowable exceedances.</p> <p>For Inner Cabrillo Beach, the City of Los Angeles is the responsible agency.</p> <p>For the Southern area of Inner Cabrillo Beach, the proposed WLAs for summer, dry-weather, winter dry-weather and wet-weather single sample bacterial densities at the ICB swimming beach are zero (0) days of allowable exceedances. Further study of the storm drains on the north part of ICB may lead to the establishment of WLAs for single sample winter dry-weather and wet-weather for these storm drains.</p> <p>The waste load allocation for the rolling 30-day geometric mean during any time period or monitoring site at ICB is zero (0) days of allowable exceedances.</p>
Load Allocations (for nonpoint sources)	<p>Load allocations are expressed as allowable exceedance days because the bacterial density and frequency of single sample exceedances are the most relevant to public health protection.</p> <p>All proposed LAs for summer, dry-weather, winter dry-weather and wet-weather, single sample bacterial densities in the MSC are zero (0) days of allowable exceedances. The load allocation for the rolling 30-day geometric mean during any time period or monitoring site in MSC or the Inner Harbor is zero (0) days of allowable exceedances.</p> <p>All proposed LAs for summer, dry-weather, single sample bacterial densities at the ICB swimming beach are zero (0) days of allowable</p>

³ In order to fully protect public health, no exceedances are permitted at any monitoring location during summer dry-weather (April 1 to October 31). In addition to being consistent with the two criteria, waste load allocations of zero (0) days of allowable exceedances are further supported by the fact that the California Department of Health Services has established minimum protective bacteriological standards – the same as the numeric targets in this TMDL – which, when exceeded during the period April 1 to October 31, result in posting a beach with a health hazard warning (California Code of Regulations, Title 17, Section 7958).

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	<p>exceedances. The proposed LAs for single sample winter dry-weather and wet-weather for the monitoring locations CB1 and CB2 are as shown in Table 7-11.2. Further study of the the north part of ICB may lead to the establishment of LAs for this area.</p> <p>The waste load allocation for the rolling 30-day geometric mean during any time period or monitoring site at ICB is zero (0) days of allowable exceedances.</p>
Implementation	<p>The regulatory mechanisms used to implement the TMDL will include the Los Angeles County Municipal Storm Water NPDES Permit (MS4), general and individual NPDES permits, general industrial storm water permits, general construction storm water permits, and the authority contained in Sections 13263 and 13267 of the Water Code. Each NPDES permit assigned a WLA shall be reopened or amended at reissuance, in accordance with applicable laws, to incorporate the applicable WLAs as a permit requirement. Load allocations for nonpoint sources will be implemented within the context of this TMDL.</p> <p>This TMDL will be implemented in three phases over a five-year period (see Table 7-11.3. Within five years of the effective date of the TMDL, there shall be no allowable exceedances of the single sample limits at any location during summer dry-weather (April 1 to October 31) or winter dry-weather s (November 1 to March 31) and the rolling 30-day geometric mean targets must be achieved. Within five years of the effective date of the TMDL, compliance with the allowable number of wet-weather exceedance days and rolling 30-day geometric mean targets must be achieved.</p> <p>For those monitoring locations subject to the antidegradation provision (HW07, wet weather), there shall be no increase in exceedance days during the implementation period above the estimated days for the monitoring location in the critical year as identified in Table 7-11.2.</p> <p>The Regional Board intends to reconsider this TMDL, consistent with the scheduled reconsideraton of the Santa Monica Bay (SMB) beaches TMDLs. The SMB beaches TMDLs are scheduled to be reconsidered in four years to re-evaluate the allowable winter dry-weather and wet-weather exceedance days based on additional data on bacterial indicator densities in the wave wash; to re-evaluate the reference system selected to set allowable exceedance levels; to re-evaluate the reference year used in the calculation of allowable exceedance days, and to re-evaluate the need for revision of the geometric mean implementation provision.</p> <p>The Regional Board intends to conduct a similar review of this TMDL within 4 years after the effective date. In addition, if a suitable reference watershed that is representative of an enclosed harbor has not been found by this time, the Regional Board may consider implementing a ‘natural source exclusion approach subject to antidegradation policies’ to the Los Angeles Harbor in lieu of the ‘reference</p>

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	watershed/antidegradation approach’.
<i>Margin of Safety</i>	A margin of safety has been implicitly included through several conservative assumptions, such as the assumption that no dilution takes place between the on-shore sources and where the effluent initially mixes with the receiving water, and that bacterial degradation rates are not fast enough to affect bacteria densities in the receiving water. In addition, an explicit margin of safety has been incorporated, as the load allocations will allow exceedances of the single sample targets no more than 5% of the time on an annual basis, based on the cumulative allocations proposed for dry and wet weather. Currently, the Regional Board concludes that there is water quality impairment if more than 10% of samples at a site exceed the single sample bacteria objectives annually.
<i>Seasonal Variations and Critical Conditions</i>	<p>Seasonal variations are addressed by developing separate waste load allocations for three time periods (summer dry-weather, winter-dry weather, and wet-weather) based on public health concerns and observed natural background levels of exceedance of bacterial indicators.</p> <p>The critical condition for bacteria loading is during wet weather, when historic monitoring data for Los Angeles Harbor and the reference beach indicate greater exceedance probabilities of the single sample bacteria objectives then during dry-weather. To more specifically identify a critical condition within wet-weather, in order to set the allowable exceedance days shown in Table 7-11.2, the 90th percentile ‘storm year’⁴ in terms of wet days⁵ is used as the reference year. Selecting the 90th percentile year avoids a situation where the reference system is frequently out of compliance. It is expected that because responsible jurisdictions and agencies will be planning for this ‘worst-case’ scenario, there will be fewer exceedance days than the maximum allowed in drier years. Conversely, in the 10% of wetter years, it is expected that there may be more than the allowable number of exceedance days.</p>
<i>Compliance Monitoring</i>	The City of Los Angeles will continue to monitor at sites CB1, CB2 and HW07 as required by Terminal Island Treatment Plant NPDES Permit. This permit is scheduled to be revised in 2004 and will consider this TMDL. Additional monitoring sites may be added by responsible parties as necessary and the compliance monitoring requirement may be moved to another permit if determined to be more appropriate by the Regional Board.

⁴ For purposes of this TMDL, a ‘storm year’ means November 1 to October 31. The 90th percentile storm year was 1993 with 75 wet days at the LAX meteorological station.

⁵ A wet day is defined as a day with rainfall of 0.1 inch or more plus the 3 days following the rain event.

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	<p>A special study shall be conducted by the City of Los Angeles in the North area of Inner Cabrillo Beach to assess water quality and compliance with the standards in this TMDL. The special study of the North portion of Inner Cabrillo Beach can include details to support development of a Natural Sources Exclusion in this area if it is found that natural sources such as birds are the sources of bacterial impairment of the northern area of Inner Cabrillo Beach.</p> <p>Beach monitoring sites will be taken in compliance with AB411 and the Southern California Beach Water Quality Working Group procedures. Open water sampling sites will be taken at the surface.</p> <p>A special study shall be conducted by the County of Los Angeles and City of Los Angeles to assess water quality and compliance with the standards in this TMDL in the MSC. The schedules for special studies are shown in Table 7-11.3.</p>

Note: The complete staff report for the TMDL is available for review upon request.

Attachment A to Resolution No. 2004-011

Table 7-11.2 Los Angeles Harbor Bacteria TMDL: Final Allowable Exceedance Days by Sampling Location

Compliance Deadline		5 years after effective date		5 years after effective date		5 years after effective date ²	
		Summer Dry Weather ^		Winter Dry Weather ^*		Wet Weather ^*	
		April 1 - October 31		November 1 – March 31		November 1 - October 31	
Station ID	Location Name	Daily sampling (No. days)	Weekly sampling (No. days)	Daily sampling (No. days)	Weekly sampling (No. days)	Daily sampling (No. days)	Weekly sampling (No. days)
<i>CB1; CB2</i>	Inner Cabrillo Beach	0	0	3 (LA)	1 (LA)	17 (LA)	3 (LA)
<i>HW07</i>	Main Ship Channel	0	0	3 (WLA)	1 (WLA)	15** (WLA)	3** (WLA)

Notes: The number of allowable exceedances is based on the lesser of (1) the reference system or (2) existing levels of exceedance based on historical monitoring data.

The allowable number of exceedance days during winter dry-weather is calculated based on the 10th percentile storm year in terms of dry days at the LAX meteorological station

The allowable number of exceedance days during wet-weather is calculated based on the 90th percentile storm year in terms of wet days at the LAX meteorological station.

^ A dry day is defined as a non-wet day. A wet day is defined as a day with a 0.1-inch or more of rain and the three days following the rain event.

*A revision of the TMDL is scheduled for four years after the effective date of the Los Angeles Harbor TMDL in order to re-evaluate the allowable exceedance days during winter dry-weather and wet-weather based on additional monitoring data and the results of the study of relative loading from sources including but not limited to storm drains, boats, birds and other nonpoint sources.

**The Main Ship Channel (HW07) is already meeting the allowable exceedance days for wet weather and is subject to the antidegradation provision; there shall be no increase in exceedance days during the implementation period above that estimated for the monitoring location in the critical year (15 days/daily sampling, 3 days/weekly sampling).

Table 7-11.3 Inner Cabrillo Beach & Main Ship Channel Bacteria TMDL: Significant Dates

Implementation Action	Responsible Party	Date
Implementation (ICB): Implement additional simple Best Management Practices at ICB including additional trash pickup and educational signage. (Tier 1)	<ul style="list-style-type: none"> City of Los Angeles 	Six months after Effective Date of TMDL.
Implementation (ICB): Submit Work Plan to Implement Best Management Practices and Source Control at ICB for Executive Officer Approval including, but not limited to storm drain repair and reroute; inspect and repair gravity sewer line; implement sand cleaning; repair bird exclusion structure; additional education and signage. (Tier 1)	<ul style="list-style-type: none"> City of Los Angeles 	Six months after Effective Date of TMDL
Special Studies (ICB): Submit work plan to assess water quality in the northern area of Inner Cabrillo Beach for Executive Officer approval including a plan to monitor northern ICB and assess the discharge from storm drains into the Saltwater Marsh (Tier 2).	<ul style="list-style-type: none"> City of Los Angeles 	Six months after Effective Date of TMDL.
Special Studies (MSC): Submit work plan to assess water quality in the Inner Harbor for Executive Officer approval including a plan to monitor in proximity to selected storm drains. (Tier 2).	<ul style="list-style-type: none"> City of Los Angeles County of Los Angeles 	Six months after Effective Date of TMDL.
Implementation (ICB): Submit work plan for Tier 2 BMPs for Executive Officer approval, including but not limited to alteration of bird exclusion structure, control of sources from cat population, and sand management. (Tier 2)	<ul style="list-style-type: none"> City of Los Angeles 	Six months after Effective Date of TMDL
Implementation (ICB): Complete implementation of Source Control and BMPs at ICB as identified in work plan including, but not limited to storm drain repair and reroute; inspection and repair gravity sewer line; trash disposal, sand cleanup; and repair bird exclusion structure. (Tier 1)	<ul style="list-style-type: none"> City of Los Angeles 	Twelve months after Effective Date of TMDL
Compliance (ICB): After implementation of Tier 1 and 2 actions, submit results of monitoring to determine degree of compliance with allowable exceedance days. (Tier 3)	<ul style="list-style-type: none"> City of Los Angeles 	Two years after Effective Date of TMDL
Implementation (MSC): Based on the results of the MSC special studies and compliance evaluation, submit Work Plan for Executive Officer approval for source control or diversion of storm drains that are found to be sources of bacterial loading to the	<ul style="list-style-type: none"> City of Los Angeles County of Los Angeles 	Two-1/2 years after Effective Date of TMDL

MSC.		
Implementation (ICB): If compliance is not achieved at the southern portion of Inner Cabrillo Beach, provide report to be approved by the Executive Officer of Tier III actions, to include but not be limited to, nearshore circulation or treatment of shallow water improvements, with a time schedule to attain water quality objectives. (Tier 3)	<ul style="list-style-type: none"> • City of Los Angeles 	Three years after Effective Date of TMDL
<p>Regional Board shall reconsider this TMDL to:</p> <p>a) refine allowable exceedance days based on additional data on bacterial indicator densities</p> <p>b) re-evaluate the reference system selected to set allowable exceedance levels, including a reconsideration of whether the allowable number of exceedance days should be adjusted annually dependant on the rainfall conditions and an evaluation of natural variability in the reference system(s), and if an appropriate reference system cannot be identified for this enclosed harbor, evaluate using the ‘natural sources exclusion approach subject to antidegradation policies’ rather than the ‘reference system/antidegradation’ approach,</p> <p>c) re-evaluate the reference year used in the calculation of allowable exceedance days, and</p> <p>d) Re-evaluate whether there is a need for further clarification or revision of the geometric mean implementation provision.</p> <p>e) Evaluate the feasibility of a natural sources exclusion for the non-swimming portion of ICB</p> <p>f) Re-evaluate the implementation schedule.</p>	<ul style="list-style-type: none"> • Regional Board 	Four years after Effective Date of TMDL, or at the time of reconsideration of the Santa Monica Beaches Bacteria
Final Compliance (MSC): Within five years of the effective date of the TMDL, there shall be no exceedances in excess of the numbers in Table 6-3 and 6-4 of the single sample limits at any location during summer dry-weather (April 1 to October 31) or winter dry-weather (November 1 to March 31) and the rolling 30-day geometric mean targets must be achieved.	<ul style="list-style-type: none"> • City of Los Angeles • County of Los Angeles 	Five years after Effective Date of TMDL
Implementation (ICB): All tier 3 remedies to be completed within five years of the Effective Date of the TMDL. (Tier 3)	<ul style="list-style-type: none"> • City of Los Angeles 	Five years after Effective Date of TMDL

<p>Final Compliance (ICB): Within five years of the effective date of the TMDL, there shall be no allowable exceedances of the single sample limits at any location during any of the periods (Tables 6-3, 6-4 and 6-5) and the rolling 30-day geometric mean targets must be achieved.</p>	<ul style="list-style-type: none"> • City of Los Angeles 	<p>Five years after the Effective Date of the TMDL</p>
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