

SECTION A-11
WATER QUALITY MONITORING COMPONENT



FOR THE COUNTY OF ORANGE
AND
THE ORANGE COUNTY FLOOD CONTROL DISTRICT



SECTION A-11, WATER QUALITY MONITORING

A-11.0 WATER QUALITY MONITORING

The Water Quality Monitoring Section of the LIP describes the monitoring and follow-up activity implemented by or on behalf of the County in compliance with the Monitoring and Reporting Program contained in the Fourth Term Santa Ana Region MS4 Permit (Order No. R8-2009-0030) and Permit Directive C (Non-Stormwater Action Levels), Directive D (Stormwater Action Levels), Directive F.4.d/e (Illicit Discharge Screening and Investigation), Directive G.7 as applicable (Aliso Creek WRMP), Directive I as applicable (TMDLs), Directive J as applicable (Effectiveness Assessment), and Attachment E (Receiving Waters and MS4 Discharge Monitoring) of the Fourth Term San Diego Region MS4 Permit (Order No. R9-2009-0002). Water quality monitoring may also be conducted or supported by the County in conjunction with BMP evaluations or other special studies.

A-11.1 MONITORING AND FOLLOW-UP ACTIVITY CARRIED OUT BY THE COUNTY AS PRINCIPAL PERMITTEE

Within the Santa Ana Region of Orange County

Through the annual cost-share agreement described in Section A-2.0, the County as Principal Permittee, implements the following required monitoring programs on behalf of the Santa Ana Region Permittees:

- **Mass emissions monitoring:** Currently the County monitors 11 mass emissions stations to estimate the total mass emissions (range of urban contaminants and loads) from the MS4; assess trends in mass emissions over time; and to determine if the MS4 is contributing to exceedances of water quality objectives or beneficial uses, by comparing results to the California Toxics Rule (CTR), Basin Plan, Ocean Plan and/or other relevant standards. Samples are collected from the first storm event and two more storm events during the rainy season. A minimum of three dry-weather samples are also collected.
- **Estuary/wetlands monitoring:** Currently the County monitors 20 sites in Upper Newport estuary, Talbert Marsh, and Bolsa Chica wetlands areas to determine the effects of storm water and non-storm water runoff associated with increased urbanization on these systems. These monitoring locations include representative areas surrounding channel outfalls and areas away from channel outfalls to enable the determination of storm water and non-storm water effects on sediment chemistry, toxicity, benthic communities, nutrient status, and spatial extent of sediment fate within the estuarine environment.
- **Bacteriological/pathogen monitoring:** This monitoring element uses measurements of a suite of bacterial indicators to identify spatial and temporal patterns of elevated level in order to prioritize problem areas. The County currently monitors 9 representative areas along the Orange County coastline and six inland water bodies/channels, for total coliform, fecal coliform, and enterococcus in order to determine the impacts of storm water and non-storm water runoff on loss of beneficial uses to receiving waters.



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- **Bioassessment:** Using a “triad” of indicators (bioassessment, chemistry, toxicity), the Permittees currently monitor 12 stations in cooperation with the Southern California Coastal Water Research Project (SCCWRP) in efforts to evaluate the biological index approach for Southern California and to design a research project for developing an Index of Biological Integrity (IBI) for the region.
- **Reconnaissance:** Using measurements of key pollutants, reconnaissance monitoring identifies potential illegal discharges and illicit connections, based on comparison with historical data and available estimates of background levels.
- **Water Column Toxicity Monitoring:** The current monitoring program analyzes for toxicity to freshwater and marine species on mass emissions samples to determine the impacts of storm water and non-storm water runoff on toxicity of receiving waters.
- **Sediment:** The Principal Permittee monitors sediment toxicity at seven stations in Newport Bay and seven stations along Huntington Harbour/Talbert Marsh areas.
- **Land use correlations:** Using an experimental, “before-after,” design, this monitoring element identifies changes in runoff associated with the urbanization of previously agricultural land.
- **TMDL/303(d) Listed Waterbody Monitoring:** The County participates in the Regional Monitoring Program for the San Diego Creek Nutrient and Toxics TMDLs, and evaluate the impacts of runoff on all impairments within the Newport Bay watershed and other 303(d) listed waterbodies.

For the Mass Emissions Monitoring, Bioassessment and receiving waters monitoring programs described above, associated follow-up special investigations to determine the extent and causes of MS4 discharge contributions to key identified impacts are generally conducted by the County, with City financial or logistic support as needed, as described in the Monitoring and Reporting Program. Follow-up investigation findings are used to inform the prioritization and implementation of management actions to reduce/eliminate sources.

Within the San Diego Region of Orange County

Through the annual cost-share agreement described in Section A-2.0, the County as Principal Permittee, implements the following required monitoring programs on behalf of the San Diego Region Permittees:

- **Regional Bacteria Monitoring, Stormwater Monitoring Coalition Regional Monitoring, Sediment Toxicity Study, and Trash and Litter Impairment Investigation**, as required under the Fourth Term San Diego Region MS4 Permit in Attachment E.II.A.5 and E.II.D. These monitoring efforts are new under the Fourth Term Permit.
- **Long-term Mass Loading Station Monitoring** (MLS - see Fourth Term San Diego Region MS4 Permit Attachment E.II.A.1) -This program measures loads of key pollutants defined in Tables 1 and 2 in major creek receiving waters during dry and wet weather. Loads are tracked over a time frame of years to decades to compare trends from the past to the present. This program approximately represents a continuation of a program that existed under the Third Term Permit.



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- **Urban Stream Bioassessment** (BA – see Fourth Term San Diego Region MS4 Permit Attachment E.II.A.2) - Using a “triad” of indicators (bioassessment, chemistry, toxicity), this program is intended to describe impacts on stream macroinvertebrate and algal communities and the relationship of any impacts to runoff in each Watershed Management Area (WMA), based on comparisons with unimpacted reference locations, on a year-to-year time frame. This program is an expansion of a program that existed under the Third Term Permit.
- **Ambient Coastal Receiving Waters** (ACRW – see Fourth Term San Diego Region MS4 Permit Attachment E.II.A.4) - Using measurement of runoff plume characteristics and extent, as well as measures of a suite of physical, chemical, and biological indicators, this program, continued from the Third Term Permit, is intended to improve understanding of the impacts of wet and dry weather runoff plumes on near shore ecosystems.
- **Dry Weather Non-stormwater Action Levels** (NALs – see Fourth Term San Diego Region MS4 Permit Directive C and Attachment E.II.C) - Dry-weather MS4 discharges are sampled during summer and winter dry weather at one or more representative major outfalls to the City’s receiving waters. Effluent flow rate is estimated and effluent samples are analyzed for the 16 constituents for which NALs are listed in Directive C, and for the 16 additional constituents listed in Attachment E - Table 1 of the Order. If one or more NALs are exceeded, receiving water samples are collected upstream and downstream of the discharge, and data are provided for appropriate follow-up and reporting, as required under Directive C (refer to Section 11.2 below).
- **Stormwater Action Levels** (SALs – see Fourth Term San Diego Region MS4 Permit Directive D and Attachment E.II.B) - Wet-weather MS4 discharges are sampled as composites during storms at one or more major outfalls to the County’s receiving waters, with sites selected regionally to achieve representation of all Hydrologic Sub-Areas. Samples are analyzed for constituents listed in Directive D of the Fourth Term San Diego Region MS4 Permit. If the likely and expected cause of the SAL exceedance is not determined to be non-anthropogenic, data are provided for follow-up and reporting, as required under Directive D (refer to Section 11.2 below).
- **Aliso Creek 13325 Directive Monitoring Program** (see Fourth Term San Diego Region MS4 Permit Directive G.7) - Discharges from a selected high-priority drain and sites in the receiving waters are monitored for status and trends in fecal indicator bacteria concentrations, on a focused basis during the warmest dry weather months each year. Data are provided to assist in assessing management practices (see Section 11.2 below).

For the Mass Loading, Bioassessment and receiving waters monitoring programs described above, associated follow-up special investigations to determine the extent and causes of MS4 discharge contributions to key identified impacts are generally conducted by the County, with City financial or logistic support as needed, as described in Fourth Term San Diego Region MS4 Permit Attachment E.II.A.3. Follow-up investigation findings are used to inform the prioritization and implementation of management actions to reduce/eliminate sources.



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A-11.2 JURISDICTIONAL MONITORING AND FOLLOW-UP ACTIVITY BY THE COUNTY

The following monitoring and follow-up activities are carried out by the County on a jurisdictional level:

Within the Santa Ana Region of County of Orange/OCFCD Jurisdiction

- **Follow-up Investigations and Enforcement for the Illicit Connection/Illegal Discharge Program:** As described in **Section A-10** of the County LIP, the County may conduct water quality sampling as a component of follow-up investigations and/or enforcement actions to help determine the source(s) of significant pollution identified via hotline reports and dry weather monitoring programs.
- **BMP Effectiveness Evaluation:** As described in **Section A-3.3**, the County conducts water quality monitoring to verify whether Best Management Practices are effective in reducing the constituents of concern at a specific problem location, at MS4 outfalls, in receiving waters, or at research sites; or whether another iteration of BMPs should be considered to make progress toward attaining water quality objectives. The County may also conduct water quality monitoring to verify the effectiveness of other stormwater management activities.

Within the San Diego Region of County of Orange/OCFCD Jurisdiction

- **NAL Exceedances** (see Fourth Term San Diego Region MS4 Permit Directive C) - When notified regarding exceedances of one or more action levels at its dry weather NAL monitoring stations, the County investigates and attempts to identify the source(s) of the exceedances in a timely manner, in accordance with Fourth Term San Diego Region MS4 Permit Directive C.2/C.3 and using the protocols described in Section 3.6.4 of the County's Receiving Water and MS4 Monitoring Plan dated October 1, 2010. The investigations may be prioritized, if necessary due to resource constraints. All investigations include work to determine whether the action level exceedance(s) impacted the receiving waters. Depending on the source of the exceedance, the County may take the following actions following investigation:
 - 1) If the source is non-anthropogenic, documentation is forwarded to the San Diego Region Board within 14 days of the finding.
 - 2) If the source is an exempted category of non-stormwater discharge, a determination is made as to whether it is an isolated circumstance or a wider problem justifying a new categorical prohibition. Findings, including any additional steps to be taken, are reported in the subsequent PEA.
 - 3) If the source is not reasonably identifiable, the pollutant is given high priority for focused sampling and potential programmatic updates in the subsequent Annual Jurisdictional Work Plan submitted with the Annual LIP PEA Report
 - 4) If the source is identified as a prohibited discharge or illicit connection, appropriate



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- actions or enforcement measures are taken to eliminate the discharge and to submit documentation to the San Diego Regional Board within 14 days of the identification. If the discharge is not eliminated within 14 days, an action plan is submitted instead.
- 5) If the source is identified as subject to an existing separate NPDES permit, findings are submitted to the San Diego Regional Board within 3 business days.
- **SAL Exceedances** (see Fourth Term San Diego Region MS4 Permit Directive D) - Following three years of SAL monitoring, if a constituent at a County monitoring station has exceeded the action level greater than 20% of the time, the County will amend its subsequent annual jurisdictional work plan within **Section A-3** of its **LIP**, to augment its stormwater controls and management measures in an iterative manner to reduce discharges of the problem pollutant(s), unless it is demonstrated that the likely and expected cause of the SAL exceedance is not anthropogenic in nature. The magnitude, frequency, and number of constituents exceeding the SALs, as well as receiving water quality data, will be taken into consideration.
 - **Aliso Creek 13325 Directive** (see Fourth Term San Diego Region MS4 Permit Directive G.7) - The County utilizes the Aliso 13225 Monitoring Directive data evaluations conducted to help guide and assess its implementation of structural and nonstructural management practices to reduce discharges of fecal indicator bacteria/pathogens in the Aliso Creek watershed.
 - **Follow-up Investigations and Enforcement for the Illicit Connection/Illegal Discharge Program** (see Fourth Term San Diego Region MS4 Permit Directive F.4.d/e) - As described in **Section A-10** of its **LIP**, the County may conduct water quality sampling as a component of follow-up investigations and/or enforcement actions to help determine the source(s) of significant pollution identified via hotline reports and dry weather monitoring programs.

A-11.3 REPORTING

Santa Ana Region

Data from the Monitoring and Reporting Program conducted by the County on behalf of the Permittees are assessed by quantitative evaluation of data and analyses of short- and long-term trends as appropriate, and are reported to the Santa Ana Regional Board by the County.

San Diego Region

Data from the Urban Stream Bioassessment, Long-Term Mass Loading, Coastal Storm Drain, Coastal Receiving Waters, Stormwater Action Levels, Aliso 13325 Monitoring Directive, and Non-stormwater Action Levels Monitoring Programs conducted by the County on behalf of the Permittees are assessed by quantitative evaluation of data and analyses of short- and long-term trends as appropriate, and are reported to the San Diego Regional Board by the County.